The Future of U.S. Electricity Efficiency Programs Funded by Utility Customers

Program Spending and Savings Projections to 2030

Technical Appendices

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U.S. Department of Energy and U.S. Environmental Protection Agency

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All opinions, errors and omissions remain the responsibility of the authors. All reference URLs were accurate as of the date of publication.

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Acronyms and Abbreviations

AEO	Annual Energy Outlook
CHP	Combined heat and power
C&I	Commercial & Industrial
CSE	Cost of Saved Electricity
DR	Demand response
DSM	Demand-side Management
EE	Energy efficiency
EEPS	Energy Efficiency Portfolio Standard
EERS	Energy Efficiency Resource Standard
EIA	Energy Information Administration
EMM	Electricity Market Module
GWh	Gigawatt-hour
IOU	Investor-owned utility
IRP	Integrated Resource Plan
LBNL	Lawrence Berkeley National Laboratory
NEMS	National Energy Modeling System
NYSERDA	New York State Energy Research and Development Authority
PUC/PSC	Public utility commission/public service commission
RPS	Renewable Portfolio Standard
TVA	Tennessee Valley Authority
TWh	Terawatt-hour

Appendix A. Methodology and Assumptions Used to Develop Spending and Savings Projections for Electricity Efficiency Programs

This technical appendix describes the methods and assumptions used to develop projections of electricity efficiency program spending and savings through 2030.

Low, medium, and high projections of future electricity efficiency program savings and spending were developed on a state-by-state basis. Although many of the specific assumptions and the approach to defining scenarios varied by state, the basic methodology used in all states consisted of several common components, including:

- Developing projections of retail electricity sales and revenues from retail electricity sales;
- Defining low, medium, and high scenarios of future utility customer-funded efficiency program savings and spending for the electricity sector; and
- Estimating the amount of spending required to achieve different levels of savings.

Each of these elements is described further below.

A.1. Baseline Retail Sales and Revenue Projections

Projections of annual retail electricity sales and revenues were used as an input to develop efficiency program savings and spending projections. An initial set of baseline retail sales and retail price projections was developed by applying annual growth rate projections from the Energy Information Administration's (EIA) 2016 Annual Energy Outlook (AEO2016) reference case forecast to actual 2016 retail sales and price data for each state, as reported on EIA Form-861. EIA specifies electricity retail sales and price projections in AEO2016 at a regional level, as described in the Electricity Market Module (EMM) level. The regions in the EMM are used in EIA's National Energy Modeling System (NEMS). Table A - 1 summarizes the annual compound average growth rates (2016 to 2030) of retail electricity sales and electricity prices in each EMM region. LBNL then developed state-level retail electricity sales and average retail electricity price projections by applying the EMM-level growth rates to historical (2015 or 2016) retail sales and revenues for each state in the region. Finally, LBNL developed projections for future retail revenues for each state by multiplying projected retail electricity prices by projected retail sales.

This step of creating a baseline retail sales and revenue projection to 2030 is helpful for benchmarking purposes as it allows us to compare states of differing sizes by normalizing savings as percent of retail sales and spending as percent of electric utility revenues.

Table A - 1. AEO2016 projected growth rates in retail electricity sales and prices

Electricity Market model (EMM) Region	States	AEO 2016 Compound Average Annual Growth Rates (2016-2030)	
		Retail Electricity Sales	Retail Electricity Prices (nominal)
Electric Reliability Council of Texas	TX	1.1%	2.7%
Florida Reliability Coordinating Council	FL	0.6%	2.9%
Midwest Reliability Council / East	WI	0.4%	3.4%
Midwest Reliability Council / West	IA, MN, ND, NE, SD	0.6%	1.9%
Northeast Power Coordinating Council / Northeast	CT, MA, ME, NH, RI, VT	-0.4%	3.4%
Northeast Power Coordinating Council / NYC-Westchester	NY	-0.1%	2.5%
Northeast Power Coordinating Council / Long Island	NY	-0.3%	2.2%
Northeast Power Coordinating Council / Upstate New York	NY	-0.2%	4.1%
Reliability First Corporation / East	DC, DE, MD, NJ, PA	0.1%	3.5%
Reliability First Corporation / Michigan	MI	0.3%	2.3%
Reliability First Corporation / West	IL, IN, OH, WV	0.4%	3.1%
SERC Reliability Corporation / Delta	AR, LA, MS	1.2%	4.0%
SERC Reliability Corporation / Gateway	MO	0.4%	2.4%
SERC Reliability Corporation / Southeastern	AL, GA	0.8%	2.3%
SERC Reliability Corporation / Central	KY, TN	0.9%	1.8%
SERC Reliability Corporation / Virginia-Carolina	NC, SC, VA	0.8%	2.8%
Southwest Power Pool / North	KS	0.5%	2.2%
Southwest Power Pool / South	OK	1.2%	3.5%
Western Electricity Coordinating Council / Southwest	AZ, NM, NV	0.9%	2.4%
Western Electricity Coordinating Council / California	CA	0.1%	4.1%
Western Electricity Coordinating Council / Northwest Power Pool Area	ID, MT, OR, WA, WY	0.5%	1.4%
Western Electricity Coordinating Council / Rockies	CO, UT	0.9%	2.0%

A.2. Adjustments to Baseline Retail Sales Forecast to Account for Projected Electricity Savings

Future retail sales (and retail revenues) in each state will also depend, in part, on the amount of savings achieved from future customer-funded energy efficiency programs. In order to maintain internal consistency, we adjusted the retail sales and revenue projections for electric utilities in each state for each scenario (low, medium and high) to reflect the energy efficiency savings assumed for that scenario. The adjustments consisted of decreasing (or increasing) the baseline retail sales and revenue in each year to account for the cumulative difference between the savings assumed for that scenario and the savings assumed to be implicit in the AEO2016 forecast. For example, assume that future

annual incremental electricity savings in a state will be equal to 0.3% of retail sales in each year in the medium scenario and that the savings assumed to be implicit in the EIA baseline retail sales forecast are 0.1% of retail sales. In this case, we would then reduce the load forecast in each year to account for the cumulative effect of the additional 0.2% of retail sales saved each year (i.e., reduce the retail sales projection by 0.2% in year one, by 0.4% in year two, and by 0.6% in year three and so on).

The foregoing adjustment requires an estimate of the savings embedded in the AEO-derived baseline retail sales forecast for each state. NEMS does not explicitly account for the impacts of future utility customer-supported efficiency programs. However, EIA has indicated that the NEMS model operates under the implicit assumption that historical trends in utility customer-funded efficiency programs will continue over the AEO forecast period.[1] We therefore assumed that the baseline retail sales projections, derived from the AEO2016 forecasted growth rates, implicitly account for a continuation of customer-funded energy efficiency program savings equal to the average level achieved over the 2013-2015 period.[2] LBNL aggregated historical state-level savings from 2013 to 2015 as reported by the American Council for an Energy Efficient Economy in its annual State Energy Efficiency Scorecard (ACEEE 2014, 2015, 2016). These estimates were matched with state-level retail electricity sales, as reported to EIA through its Form 861 survey for each of those years. These state savings and sales values were aggregated up to the level of each U.S. Census Division and used to calculate average annual efficiency program savings as a percent of retail sales for each Census division. This process yielded the annual incremental energy efficiency program savings assumed to be embedded in the AEO-derived baseline retail sales forecast for each U.S. Census Division (see Table A - 2).

Table A - 2. Estimated customer-funded energy efficiency program savings embedded in the AEO forecast

Census Division	Annual Incremental Savings (% of Retail Sales)
Pacific	1.4%
Mountain	0.9%
West North Central	0.7%
East North Central	0.9%
West South Central	0.2%
East South Central	0.2%
South Atlantic	0.3%
Middle Atlantic	0.9%
New England	2.0%

[1] NEMS is calibrated to historical data on end-use stock efficiency and shipments, and the customer adoption simulation operates under the assumption that, in essence, consumers will continue purchasing equipment that meets or exceeds minimum efficiency standards to the same extent as has historically occurred.
[2] We chose the 2013-2015 time frame based on discussions with EIA staff.

A.3. Develop Scenarios That Characterize the Potential Evolution of Electricity Efficiency Programs

The next step in the process is to develop scenarios of future spending and savings to 2030 that utilities and other program administrators could achieve from their electricity efficiency programs. The key drivers of these scenarios are: (1) each state's unique policies on energy efficiency (e.g., energy efficiency resource standards, system benefit charges); (2) resource planning requirements (e.g., integrated resource plans, demand-side management plans); (3) past and current performance of program administrators and actions of state legislatures or public utility commissions (PUCs); and (4) the overall policy environment for energy efficiency (e.g., attractive business model for the program administrator, rate or spending caps, option for large C&I customers to opt out of efficiency programs).

We defined distinct time periods of the analysis: (1) historical (2013-2015); (2) a policy period where there are explicit state policies that inform scenario development; and (3) a post-policy period where a state may not have explicit efficiency policies or where there is much more uncertainty regarding whether existing policies will continue and where we may rely more on regional "best practices" (high scenario) or extrapolation from historical performance (medium scenario).

Figure A - 1. U.S. Census regions used for scenario development

There often are synergies among states in a region either because there are similar energy efficiency policies in that region or because IOUs operate in multiple states in a region. To simplify the scenario

development and characterization process, we grouped states into one of four Census regions: West, Midwest, Northeast and South (see Figure A - 1). In Table A - 3, we summarize the policy and regulatory framework and market factors in each state that are most salient for development of future scenarios for efficiency programs funded by customers of IOUs. Unless otherwise indicated, the assumptions regarding future scenarios for the evolution of electricity efficiency programs apply only to IOUs. However, we do list drivers and assumptions for publicly owned utilities and rural electric cooperatives in a few states where these utilities are covered by state efficiency policies or savings targets (e.g., CA, MD) or where publicly owned utilities and cooperatives comprise a significant part of the state's load (e.g., AL, NE, TN, WA) (see Table A - 3). Assumptions and scenarios used to model and project energy efficiency spending and savings for publicly owned utilities and cooperatives are described in more detail in Appendix A, section A1.5.

Table A - 3. Summary of future scenarios for electricity efficiency programs in each state

Census Region: West (including Hawaii and Alaska)

State	Policy Context and Scenario	Scenario Description
AK	**Policy and Regulatory Framework**	• Uncommitted in terms of EE policies; cooperatives and publicly owned utilities serve electric loads.
	Low	• Assume savings achieved by cooperatives increase to 0.1% of retail sales by 2030.
	Medium	• Assume savings achieved by cooperatives increase to 0.25% of retail sales by 2030.
	High	• Same as medium scenario.
AZ	**Policy and Regulatory Framework**	• Long-running energy efficiency portfolio standard (EEPS) sunsets in 2020 (22% cumulative savings). EEPS targets may be met with EE programs, system savings, building codes, combined heat and power (CHP) and demand response (DR). Regulators recently eased limits on DR as an eligible resource, and IOU efforts to meet the 2020 targets have faltered somewhat. The state's largest utility, Arizona Public Service, sought a waiver from compliance and has advocated for a major shift in demand-side management (DSM) emphasis to DR. Most utility integrated resource plans (IRPs) show a sharp drop-off in EE after the EEPS ends. • The Salt River Project, a large utility that serves the Phoenix area, has published plans to match and, in some cases, exceed the IOUs in energy savings.
	Low	• Same as medium case in near-term to 2020. From 2021 on, assume IOUs adhere to their IRPs and EE savings decrease for all major IOUs and level off at about 0.5% of retail sales from 2025 on. • **IOU savings % sales:** 2016 - 1.8%; 2020 - 1.2%; 2030 - 0.5% • **Savings % sales** (Salt River Project): 2016 - 2.0%; 2020 - 1.5% 2030 - 1.0%
	Medium	• Assume IOUs meet the EEPS to 2020 or fall only slightly short. From 2021 on, assume EE savings decrease for all major IOUs and level off at about 1.0% of retail sales. This is a more modest decline in savings compared to the low case. Assume Salt River Project continues on current trend and sustainability plan, with aggressive savings targets (2%). • **IOU savings % sales:** 2016 - 1.8% 2020 - 1.2%; 2030 - 1% • **Savings as % sales** (Salt River Project): 2016 - 2.0%; 2020 - 2.0%; 2030 - 2%
	High	• Assume EEPS requirements remain largely in place. Salt River Project continues to meet its savings objectives. • **IOU savings % sales:** 2016 - 1.8% 2020 - 1.7%; 2030 - 1.5% • **Savings % sales** (Salt River Project): 2016 - 2.0%; 2020 – 2%; 2030 - 2%

CA	**Policy and Regulatory Framework**	● Statutory mandate for IOUs to acquire "all cost-effective energy savings"; savings targets for IOUs and publicly owned utilities based on recent EE potential studies. ● Clean Energy and Pollution Reduction Act of 2015 (SB 350) requires state to set annual targets for all potential sources (EE programs administered by IOUs and publicly owned utilities and cooperatives, codes and standards, financing including Property Assessed Clean Energy) to achieve a doubling of 2015 savings by 2030. ● IOUs continue as program administrators, but CPUC has directed IOUs to bid out design and implementation of core, statewide programs transferred to third-party contractors.
	Low	● Assume IOU savings decline in near term to reflect a slow transition to the new, third-party program management model. State law requires a doubling of energy savings from 2015 levels such that savings levels recover somewhat in later years. ● **IOU savings % sales:** 2016/17 - 1.7%; 2018 - 1.2%; 2020 - 1%; 2026 - 1.3% and remaining at that level through 2030 ● **Publicly owned utility savings as % of sales:** 2018 - 1.5%; 2030 - 0.9%
	Medium	● Assume IOU savings decline somewhat to match CPUC-set targets and reflect the transition to greater role for third parties in program design and implementation in the near-term. Low-income energy savings are assumed to decline somewhat after 2020. Publicly owned utility targets as specified in their latest status report. ● **IOU savings % sales:** 2017 - 1.7%; 2021 - 1.8%; 2025 - 1.5%; 2030 - 1.4% ● **Publicly owned utility savings % sales:** 2018 - 1.5%; 2030 - 1.1%
	High	● Assume that savings from IOU programs gradually increase to the highest identified achievable market potential scenario. Low-income savings are assumed to persist at 2016 levels through 2030. ● **IOU savings % sales:** 2017 - 1.7%; 2024 - 1.85%; 2030 - 1.7% ● **Publicly owned utility savings % sales:** 2018 - 1.5%; 2030 - 1.1%
CO	**Policy and Regulatory Framework**	● Statutory energy efficiency resource standard (EERS): At least 0.5% of revenues must be spent on DSM and must acquire savings of at least 5% by 2018, compared to a 2006 baseline ● Commission sets targets, now in 2015-2020 cycle. Program spending is capped at $98M/year through 2020. ● IOUs that meet or exceed targets can earn performance incentives capped at $30M (roughly a third of recent program budgets).
	Low	● Same as medium scenario to 2020, then ramp down to savings of 1.25 % of retail sales through 2030 as IOUs are challenged to meet aggressive savings goals given lower market potential. ● **Savings % of sales:** 2016 - 1.5%; 2030 - 1.25%
	Medium	● Assume IOUs meet their savings targets through 2018 (1.5% gross savings). Assume that IOUs meet the new 500 GWh targets for 2019 to 2025 (which translate into gross savings of 1.7% of retail sales). Savings decrease to 1.5% in 2030. ● **Savings % of sales:** 2016 - 1.5%; 2025 – 1.75%; 2030 - 1.5%
	High	● Same as medium case through 2023 Assume savings ramp to 1.8% in 2025 and remain at that level to 2030, e as utilities are motivated by attractive business model ● **Savings % of sales:** 2016 - 1.5%; 2030 - 1.8%
HI	**Policy and Regulatory Framework**	● EERS calls for cumulative savings of 30% of loads projected in past IRPs by 2030. In part because energy prices are high, the most recent potential study indicated economic potential about 45% over the target. ● The state-contracted third-party program administrator (Hawaii Energy) is eligible for a performance incentive (or a penalty) and has been meeting or exceeding targets. EE is funded through a system benefit charge (2% of revenues) and IOUs have decoupling.
	Low	● Assume Hawaii Energy has difficulty maintaining low EE costs and meeting mandated savings targets cost-effectively. ● **Savings % of sales:** 2020 - 1.6%; decline to 1.2% by 2030
	Medium	● Assume Hawaii Energy sustains current levels of savings to 2030 ● **Savings % of sales:** Remain at 1.6% to 2030

	High	• Assume Hawaii Energy continues achieving EE targets to 2020 and then savings goals increase over time, which are closer to the identified economic potential. • **Savings % of sales:** 2020 - 1.6%; gradual rise to 1.8% in 2030
ID	**Policy and Regulatory Framework**	• Utilities submit DSM plans with their desired savings targets. • Utility business model: Fixed cost recovery allowed and typically approved
	Low	• Assume IOUs continue saving at current levels in the near term (to 2020). After 2020, low wholesale prices from hydro and wind maintain downward pressure on program cost-effectiveness. Assume savings track a low-conservation scenario modeled by the Northwest Planning and Conservation Council (NPCC) and decrease to 0.8% by 2025. Between 2026 and 2030, savings levels decrease sharply given reduced achievable market potential for EE program administrators due to transformation of lighting market and impact of federal lighting and equipment standards. • **Savings % of sales:** 2017 - 1.2%; 2025 - 0.8%; 2030 - 0.47%
	Medium	• Assume IOUs continue saving at current levels in the near term, then move slightly higher in 2020-2025 consistent with level of savings from a medium case as modeled by NPCC and utility IRPs. By 2030, savings level decrease significantly given reduced achievable market potential for EE program administrators due to transformation of lighting market and impact of federal lighting and equipment standards. • **Savings % of sales:** 2017 - 1.2%; 2025 - 1.5%; 2030 - 0.54%
	High	• Assume IOUs continue saving at current levels in the near term, then savings gradually rise to meet and sustain the maximum achievable potential identified by Avista, about 1.67% through 2025. Between 2027 and 2030, savings levels decrease due to transformation of lighting market and impact of federal lighting and equipment standards, consistent with Idaho Power's IRP and NPCC modeling. • **Savings % of sales:** 2017 - 1.2%; 2025 - 1.7%; 2030 - 0.7%
MT	**Policy and Regulatory Framework**	• IOUs must file IRP; no EERS or other formal policy supports for energy efficiency.
	Low	• Assume slightly steeper decline in savings (compared to medium scenario). • **Savings % of sales:** 2016 - 0.4%; 2030 - 0.3%
	Medium	• Assume IOU follows its proposed IRP projection for EE which results in gradually lower EE savings. • **Savings % of sales:** 2016 - 0.4% to 0.33% in 2025, remain at that level through 2030
	High	• Assume IOU achieves savings that gradually increase from current levels to approach achievable market potential. • **Savings % of sales:** 2018 - 0.4%, then rise to 0.5% through 2025, and 0.6% in 2030
NV	**Policy and Regulatory Framework**	• Renewable Portfolio Standard (RPS) allows EE as an eligible compliance resource, with limits, through 2025. • Utility IRP proposed gradual lowering of planned EE savings, citing low gas prices, declining solar costs and federal energy standards as factors. Recent state law (SB150) calls on regulators to approve new savings targets and award performance incentives if meet or exceed targets. • Business model: IOUs are eligible to recover sales lost from energy saved by efficiency programs.
	Low	• Assume savings track downward IRP projections. • **Savings % of sales:** 2020 - 1%; 2030 - 0.6%
	Medium	• Assume savings rise somewhat in keeping with new state law that allows performance incentives. • **Savings % of sales:** 2020 - 1%, then remain flat to 2030
	High	• Assume regulators adopt savings targets close to drafts of the new state law, and utilities are motivated by performance incentives to meet those targets. • **Savings % of sales:** 2020 - 1.2%; 2030 - 1.25%

NM	**Policy and Regulatory Framework**	● Statutory EERS (Efficient Use of Energy Act) requires "best effort" to acquire "cost effective and achievable" energy savings. Goals are cumulative savings of 8% by 2020. Spending on EE and DR is set at 3% of billings with under or over-spending carrying over to a future year. ● IRPs indicate continuation of current levels of savings. ● IOUs can qualify for a performance incentive capped at the utility Weighted Average Cost of Capital (~8%) of total program spending.
	Low	● Assume EERS does not remain in force after 2020 and IOUs continue recent spending levels given that the funding levels are capped. ● **Savings % of sales:** 0.7% through 2030
	Medium	● Assume IOUs maintain current levels of EE performance with some very modest savings growth in the later years. ● **Savings % of sales:** 2020 - 0.8%; 2030 - 0.9%
	High	● Assume EERS extended and updated with slightly higher targets, with commensurate easing of the spending cap. ● **Savings % of sales:** 2020 - 0.9%; 2030 - 1.2%
OR	**Policy and Regulatory Framework**	● The statewide third-party program administrator, Energy Trust of Oregon (ETO), has long-term savings targets laid out in its five-year strategic plans. Each five-year plan is divided into annual goals that are reviewed by the state PUC. A public purpose charge of 3% of total IOU revenues (over half of the charge goes toward efficiency programs for utility customers) is in place through 2025 and pays most of the cost of programs. That charge is augmented by a second charge on customers smaller than 1 average MW in load, which is set, in combination with the public purpose charge, to fulfill the needs of the utilities' integrated resource plans. Currently, revenue collections from the second charge exceed those under the first. ● Utilities file IRPs and the state's largest IOU has decoupling. ● The Northwest Energy Efficiency Alliance contributes significant savings in Oregon through its advancement of building energy codes, end-use and equipment standards and other market transformation efforts.
	Low	● Assume ETO acquires fewer projects with large savings and has declining savings opportunities overall as new federal end-use and equipment standards come into force. Savings projection is modeled after a NPCC "low-savings" scenario, accelerated slightly to account for the maturity of Oregon efficiency markets. ● **Savings % of sales:** 2019 - 1.9%, then decline to 0.54% savings in 2025 and maintain that level through 2030
	Medium	● Assume ETO maintains its present course for savings in the near term, but savings decline as recently enacted federal end-use and equipment standards go into effect and efficiency markets in Oregon mature further. Savings projections are derived from an NPCC medium-savings scenario. ● **Savings % of sales:** 2020 - 1.9%; 2025 - 1%; 2030 - 0.54%
	High	● Assume ETO is able to sustain its high level of efficiency efforts longer, with more aggressive and expansive multi-measure retrofits and new construction programs in later years. Savings projections are derived from an NPCC high savings case to 2030. ● **Savings % of sales:** Savings track the medium case through 2022 (1.9%); 2030 - 0.66%
UT	**Policy and Regulatory Framework**	● Utah IOUs have voluntary savings targets (currently annual savings at 1% of retail sales). ● Utilities file IRPs and DSM plans. Latest IRP shows a decline in projected energy savings, driven in part by a shift to DR.
	Low	● Assume some decline in support for EE; assume savings levels are slightly lower than IRP projections. ● **Savings % of sales:** 2016 - 1.3%; 2020 - 1%; 2030 - 0.7%
	Medium	● Assume savings decline moderately in the near term compared to 2017 levels; after 2022, savings levels decrease further and follow trend line similar to PacifiCorp's latest IRP. ● **Savings % of sales:** 2016 - 1.3%; 2020 - 1.2%; 2030 - 0.9%

	High	● Assume greater support for EE yields somewhat rising targets (1.4% by 2020) and maintain that level through 2030. ● **Savings % of sales:** 2016 - 1.3%; 2030 - 1.4%
WA	**Policy and Regulatory Framework**	● The Energy Independence Act requires utilities "to pursue all available conservation that is cost-effective, reliable and feasible," and IOUs provide 10-year "resource conservation assessments" every two years with binding targets for the next two-year cycle. ● IOUs have decoupling but face a financial penalty if they fail to meet savings targets. ● IOUs also pay for, and claim credit for, energy savings acquired by the Northwest Energy Efficiency Alliance, which advances codes and standards and other market transformation efforts in the region. ● Publicly owned utilities and cooperatives account for more than 60% of state load and account for a substantial share of statewide electricity savings.
	Low	● Assume wholesale power costs remain very low and adversely impact the cost-effectiveness of EE programs. Savings from 2025 also decline sharply as federal end-use and equipment standards reduce savings potential for EE program administrators. ● **Savings % of sales:** Assume IOUs, publicly owned utilities and cooperatives sustain current levels of savings acquisition through 2018. From 2019, savings are assumed to decline to 0.75% in 2025 and 0.47% in 2030, as reflected in a "low-conservation" scenario modeled by the NPPC for its Seventh Power Plan.
	Medium	● Assume IOUs, publicly owned utilities and cooperatives stay the course on savings for the near term. Starting in 2025, EE program savings decline sharply as federal end-use and equipment standards take effect and reduce savings potential. ● **Savings % of sales:** Assume savings track the NPCC "existing policy" case, a low- to moderate savings scenario with savings rising to 1.6% in 2025, dropping to 0.54% in 2030.
	High	● Assume IOUs, publicly owned utilities and cooperatives secure somewhat higher savings in the mid-years compared to the medium scenario. ● **Savings % of sales:** Assume IOUs, publicly owned utilities and cooperatives maintain current savings levels through 2018, then track an NPCC high-savings scenario in which savings rise to 1.8% then fall to about 0.66% in 2030.
WY	**Policy and Regulatory Framework**	● Utilities file multi-year DSM plans and periodic IRPs.
	Low	● Assume utility EE efforts decline slightly faster than projected in the latest IRP. ● **Savings % of sales:** 2024 - 0.3% and remain at that level through 2030
	Medium	● Assume savings follow the latest DSM plan through 2020 and then the WY portion of projected incremental DSM in PacifiCorp's 2017 IRP. ● **Savings % of sales:** 2020 - 0.5%; 2021-2026 - 0.6%; 2030 - declines to 0.45%
	High	● Assume savings tracks with the latest DSM plan and maintains that level over time. ● **Savings % of sales:** 2021 - 0.6%; 2030 - 0.6%

Census Region: Midwest

State	Policy Context and Scenario	Scenario Description
IA	**Policy and Regulatory Framework**	● Historically, Iowa utilities have offered full suite of EE programs based on targets set by IOUs; new law passed in May 2018 allows all customers to opt out of participating in any five-year efficiency plan if the DSM plan fails to pass the ratepayer impact measure test. The new law also caps efficiency spending at 2% based on revenues of remaining customers that do not request exemption. ● IOUs submit DSM plans to the Iowa Utilities Board (IUB).

	Low	• Assume that IOUs meet their near-term spending and savings goals in their proposed DSM plans (2019-2023). From 2024 on, assume that DSM plan does not pass the RIM test and that customers representing 65% of revenues opt out by 2030. • **Savings % of sales:** 2017 - 1.2%; 2030 - 0.35%
	Medium	• Assume that IOUs meet their near-term spending and savings goals in their proposed DSM plans (2019-2023). From 2024 on, assume that DSM plan does not pass the RIM test and that customers representing 45% of revenues opt out by 2030. • **Savings % of sales:** 2017 - 1.2%; 2030 - 0.51%
	High	• Same as medium scenario through 2023. From 2024 on, assume that DSM plan does not pass the RIM test and that customers representing 35% of revenues opt out by 2030. • Savings % of sales: 2017 - 1.2%; 2030 - 0.58%
IL	**Policy and Regulatory Framework**	• Bipartisan legislation in 2017 (Future Energy Jobs Act) established an EERS and excludes large customers (>10 MW peak demand) from EE. • Cumulative savings goals encourage lifetime savings; shareholder incentive.
	Low	• Assume utilities meet savings targets in DSM plans to 2021; then assume savings decrease to 1% by 2030 as program administrators struggle to adapt to loss of largest C&I customers. • **Savings % of sales:** 2017 - 1.4%; 2030 - 0.9%
	Medium	• Assume utilities meet savings targets in their DSM plans to 2021; then assume savings decrease very modestly to 2030 as utility business model motivates the IOUs despite loss of large C&I customers**.** • **Savings % sales:** 2017 - 1.4%; 2030 - 1.2%
	High	• Assume utilities meet savings targets in their DSM plans to 2021; then assume that utilities are able to maintain 2021 savings levels (1.4%) to 2030 given the attractive business model**.** • **Savings % sales:** 2017 - 1.4%; 2030 - 1.4%
IN	**Policy and Regulatory Framework**	• IOUs establish their own voluntary savings goals; a limited lost revenue adjustment mechanism and performance incentives are allowed. • Large C&I customers (>1 MW) have option to opt-out.
	Low	• Assume IOUs meet DSM plan savings goals, then increasing opt-outs by customers slowly reduce aggregate savings**.** • **Savings % of sales:** 2017 - 0.7 %; 2030 - 0.3%
	Medium	• Assume IOUs meet DSM plan savings goals (which vary somewhat by utility) and continue to perform at that level until 2030. • **Savings % of sales:** 2017 - 0.7%; 2030 - 0.5%
	High	• Assume IOUs meet the maximum achievable potential in their potential studies. • **Savings % of sales:** 2017 - 0.7%; 2030 - 0.7%
KS	**Policy and Regulatory Framework**	• 2014 law states "goal of the state to promote the implementation of demand-side programs in Kansas." However, recently one IOU DSM plan was withdrawn after regulators rejected most programs.
	Low	• Same as medium scenario.
	Medium	• IOUs continue to offer small portfolio of programs with modest savings. • **Savings % of sales:** 2017 - 0.06%; 2030 - 0.06%
	High	• Assume savings track current performance then ramp to earlier IOU proposal for a fuller portfolio, with some lag, to 2023. Assume savings then rise to a moderate level for the region. • **Savings % of sales:** 2019 - 0.06%; ramp gradually to 1% in 2030

MI	**Policy and Regulatory Framework**	• EERS expires in 2021; IOUs develop Energy Waste Reduction Plans (DSM plans). • Business model: Increasing performance incentives for IOUs if they achieve savings levels of 1.5% of retail sales.
	Low	• Assume IOUs meet EERS mandate until 2021 (1%), then EERS is not renewed and IOUs offer EE programs voluntarily, but reduce their efforts. • **Savings % of sales:** 2017 - 1.1%; 2030 - 0.8%
	Medium	• Assume IOUs meet their DSM plan savings goals through 2021 (1.5%) and maintain these savings goals, motivated by attractive performance incentives. • **Savings % of sales:** 2017 - 1.1%; 2030 - 1.5%
	High	• Assume IOUs achieve additional savings based on achievable market potential and the opportunity to earn attractive performance incentives. • **Savings % of sales:** 2017 - 1.1%; 2030 - 1.75%
MN	**Policy and Regulatory Framework**	• Non-binding savings target (1.5% of average of previous 3 years' sales); most utilities submit DSM plans. • Business model: shared savings incentive mechanism
	Low	• Assume IOUs petition to lower savings target to 1% and perform at that level through 2030. • **Savings % of sales:** 2017 - 1.2%; 2030 - 1.0%
	Medium	• Assume IOUs meet DSM plan savings through 2019 and continue at that level to 2030. • **Savings % of sales:** 2017 - 1.2%; 2030 - 1.2%
	High	• Assume IOUs meet DSM plan targets, then outperform their savings goals, as they have historically, motivated by attractive business model. • **Savings % of sales:** 2017 - 1.2%; 2030 -0 1.7%
MO	**Policy and Regulatory Framework**	• IOUs required to file IRPs and DSM plans. • Voluntary all cost-effective EE statute (using Total Resource Cost test). Performance incentives are allowed and a type of lost revenue adjustment mechanism is used. • Large C&I customers (> 5 MW) can opt out of EE programs.
	Low	• Assume current levels of effort and performance continue. • **Savings % of sales:** 2017 - 0.7%; 2030 - 0.6%
	Medium	• Assume IOUs follow DSM plans and then increase savings somewhat, following the ramp up in state goals until 2020, then gradually return to current levels of activity. • **Savings % of sales:** 2017 - 0.7%; 2030 - 0.6%
	High	• Assume IOU savings meet the realistic achievable savings potential by 2025 described in their potential studies (1.2%); savings levels then decrease somewhat by 2030 as opportunities diminish. • **Savings % of sales:** 2017 - 0.7 %; 2025 - 1.2%; 2030 - 0.9%
ND	**Policy and Regulatory Framework**	• No explicit EE policies. • DSM is considered in IOU IRPs. Several ND IOUs operate across borders in states with EE policies, so they have limited EE program offerings.
	Low	• Savings continue at current levels. • **Savings % of sales:** 2017 - 0.0%; 2030 - 0.0%
	Medium	• Assume IOUs ramp up savings to meet same level as South Dakota's medium scenario. • **Savings % of sales:** 2017 - 0.0%; 2030 - 0.3%
	High	• Same as medium scenario until 2025, then ramp up closer to regional average in Midwest. • **Savings % of sales:** 2017 - 0.0%; 2030 - 0.5%

NE	**Policy and Regulatory Framework**	• Uncommitted in terms of state policy commitments for EE • Publicly owned utilities and cooperatives only (no IOUs)
	Low	• Assume utilities maintain historic level of EE savings (2015) to 2030. • **Savings % of sales**: 2015 - 0.3%; 2030 - 0.3%
	Medium	• Assume utilities increase their EE efforts somewhat over time compared to recent savings levels. • **Savings % of sales:** 2015 - 0.3%; 2030 - 0.5%
	High	• Assume utilities increase their EE effort over time to capture more of the achievable potential. • **Savings % of sales:** 2015 - 0.3%; 2030 - 0.7%
OH	**Policy and Regulatory Framework**	• EERS (may include non-EE savings—e.g., CHP, DR) and proposed legislation would reduce savings targets) • Business model - decoupling on a utility-by-utility basis; performance incentives tied to current, demand-side EE-specific savings • Large C&I customers allowed to opt out (>45 GWh/year) and proposed legislation would expand opt-out to smaller customers • Utilities file IRPs every 3 years
	Low	• Assume proposed legislation is adopted and reduces savings targets and expands opt-out for large C&I customers; assume performance incentive rules revised to include wider variety of measures • **Savings % of sales:** 2017 - 0.7%; 2030 - 0.5%
	Medium	• Assume proposed legislation passes in a modified form and reduces savings targets but does not change current rules on size threshold for large C&I customers eligible to opt out; assume performance incentive rules for utilities are not changed • **Savings % of sales:** 2017 - 0.7%; 2030 - 0.8%
	High	• Assume existing EERS stays in place and IOUs increase efforts to meet savings goals (cumulative savings of 22% by 2027), incented by business model. After 2027, assume annual savings decrease to 1.0% of sales. • **Savings % of sales:** 2017 - 0.7%; 2025 - 1.8%; 2030 - 1.0%
SD	**Policy and Regulatory Framework**	• Performance incentives and lost revenue adjustment mechanism; a plan to meet consumption with renewable, recycled and conserved energy is in place, utilities have focused on renewable resources. • Utilities file IRPs and DSM plans
	Low	• Same as medium scenario • **Savings % of sales:** 2017 - 0.2%; 2030 - 0.3%
	Medium	• Savings continue at current levels to 2030. • **Savings % of sales:** 2017 - 0.2%; 2030 - 0.3%
	High	• Assume IOUs take full advantage of the favorable business model policies, ramp up their EE programs to 2025 and then maintain that level of performance to 2030. • **Savings % of sales:** 2017 - 0.2%; 2025 - 0.5%; 2030 - 0.5%
WI	**Policy and Regulatory Framework**	• IOUs subject to a statutory spending cap (1.2% of electric and gas operating revenues on EE and renewable resources collected through rates). • PUC directed utilities to hire a third-party administrator; WI has long history with EE and a comprehensive technical reference manual and evaluation, measurement and verification (EM&V) working group. • Recent EE potential study provides possible savings trajectories that vary with assumed incentive levels and funding limits. • Publicly owned utilities collect $8 per meter to fund efficiency.
	Low	• Assume political support for efficiency programs erodes during the next several years, leading to decrease in EE funding and savings. • **Savings % of sales:** 2017 - 1.0%; 2030 - 0.4%

	Medium	● Assume IOU (and the third-party administrator) continue to offer EE programs and that savings follow "Business as Usual" case in recent potential study. ● **Savings % sales:** 2017 - 1.0%; 2030 - 0.8%
	High	● Assume spending cap is relaxed and savings are based on the "Moderate Incentives" case from recent potential study. ● **Savings % sales:** 2017 - 1.0%; 2030 - 1.1%

Census Region: Northeast

State	Policy Context and Scenario	Scenario Description
CT	**Policy and Regulatory Framework**	● State mandates that program administrators acquire all cost-effective efficiency; however, in recent years, state has faced significant budgetary challenges and regulatory commission has approved significant reductions in utility EE program budgets. ● Connecticut relies on the Connecticut Energy Efficiency Board, an advisory board, to provide input to the Public Utility Regulatory Authority, the legislature and utility program administrators on the distribution of the CT Energy Efficiency Fund (e.g., program design, budgets, EM&V, input on policies). ● Business model: Revenue decoupling and performance incentives in place
	Low	● Assume state budgetary challenges continue to adversely impact EE program budgets and EE program savings continue to decline from 2019 savings levels. ● **Savings % of sales:** 2017 - 1.7%; 2030 - 0.8%
	Medium	● Assume state budgetary challenges continue to adversely impact EE program budgets and thus IOU savings levels stay constant at 1% to 2030. ● **Savings % sales:** 2017 - 1.7%; 2030 - 1.1%
	High	● Assume state budgetary challenges diminish and historic and policy support for EE translates into increased program budgets and savings (1.7% by 2030). ● **Savings % sales:** 2017 - 1.0%; 2030 - 1.7%
MA	**Policy and Regulatory Framework**	● All cost-effective mandate and 3-year planning cycle overseen by the Massachusetts Energy Efficiency Advisory Council (EEAC); EE savings goals include CHP projects.[3] ● Business model**:** Shareholder incentives and revenue decoupling mechanism
	Low	● Assume program administrators achieve 90% of savings potential identified by EEAC in 2019-2021**.** From 2022 on, program savings decrease because of more limited CHP opportunities, impact of standards, and transformation of lighting market. ● **Savings % of sales:** 2017 - 3.5%; 2030 - 1.75%
	Medium	● Assume utility program administrators achieve savings goals proposed by EEAC for 2019-2021. Assume strong policy support for EE continues. However, from 2022 on, gross savings decrease as CHP opportunities decrease and equipment/appliance standards and transformation of the lighting market reduces savings opportunities for program administrators. ● **Savings % sales:** 2017 - 3.5%; 2030 - 2.2%
	High	● Same as Medium case for 2019-2021 period. From 2022 on assume strong policy support for EE continues and program administrators are able to obtain additional savings (e.g., deep retrofits) through innovative programs that are effective in targeting underserved markets. ● **Savings % sales:** 2017 - 3.5%; 2030 - 2.5%
ME	**Policy and Regulatory Framework**	● All cost-effective mandate and spending cap (4% of customer revenues). Additional funds for EE programs may come from ISO-NE Forward Capacity Market and Regional Greenhouse Gas Initiative. ● Third-party administrator (Efficiency Maine) and three-year planning cycles.

[3] On October 30, 2018, the Massachusetts Energy Efficiency Advisory Council adopted a resolution supporting the program administrators' proposed efficiency budgets, program design and savings goals for the 2019-2021 period.

	Low	● Same as medium scenario for 2018 and 2019. From 2020 on, assume program savings goals decrease over time as program administrator is unable to find large remaining market opportunities. ● **Savings % of sales:** 2017 -1.0%; 2030 - 1.0%
	Medium	● Assume Efficiency Maine reaches savings goals in 2018/19 DSM Plan (2.5% and 2.9% of sales). Assume program savings goals decrease to 2% by 2023 driven largely by evolution of lighting markets (e.g., LEDs, standards). Efficiency Maine finds savings through upstream programs that slow the decline in savings. ● **Savings % sales:** 2017 - 1.0%; 2019 - 2.9%; 2030 - 1.4%
	High	● Same as medium scenario for 2018 and 2019. From 2020 on, assume that Efficiency Maine expands program offerings and achieves savings levels that are slightly lower than regional leaders in the Northeast (MA and RI). ● **Savings % sales:** 2017 - 1.0%; 2019 - 2.9%; 2030 - 1.6%
NH	**Policy and Regulatory Framework**	● In 2016, PUC issued an order that established acquiring all cost-effective efficiency as a long-term goal for the state and program administrators. ● Business model: The PUC adopted a lost revenue adjustment mechanism and shareholder performance incentive policy. ● Three-year planning cycle
	Low	● Same as medium scenario for near-term goals (2018-2020). From 2021 to 2030, savings level gradually declines following the trend line in the low scenario for other New England states. ● **Savings % of sales:** 2017 - 0.6%; 2030 - 1.1%
	Medium	● Assume utilities achieve their near-term DSM savings goals (2018-2020) and that savings goals increase between 2021 and 2030 as programs mature (but at a level that is somewhat lower than regional leaders in Northeast). ● **Savings % sales:** 2017 - 0.7%; 2020 - 1.3%; 2030 - 1.7%
	High	● Assume utilities achieve their near-term DSM savings goals (2018-2020). Assume PUC allows CHP to be included in EE goals and IOUs savings increase towards levels of regional leaders in 2030. ● **Savings % sales:** 2017 - 0.7%; 2030 - 1.9%
NJ	**Policy and Regulatory Framework**	● New Jersey Clean Energy Program (NJCEP) has been primary vehicle for EE since the late 1990s. New legislation (SB2314) has passed, pending the Governor's signature, which establishes EERS savings goals for each utility, orients efficiency administration towards IOUs, appears to provide utilities with an opportunity to recover "lost revenue" and increase their earnings if they achieve EE goals. ● System benefit charge collects funds that NJCEP administers (~350M per year; 70% for electric efficiency but the state has diverted a portion of these funds in some years). Details of IOU efficiency business model to be resolved through dockets with the Board of Public Utilities (BPU).
	Low	● Assume that it takes much longer to implement the new legislation and resolve issues related to program design, utility business model, program administration, and what activities utilities can count toward achieving the savings targets. Thus, savings goals for customer-funded EE end up being lower. ● **Savings % of sales:** 2017 - 0.5%; 2025 - 1.3%; 2030 - 1.4%
	Medium	● Assume that most IOUs ramp up their EE programs significantly over time to achieve savings targets specified in new legislation by 2025. Assume that BPU, IOUs and third-party administrator resolve issues related to program administration and/or are effective in coordinating program offerings. ● **Savings % sales:** 2017 - 0.5%; 2025 - 1.9%; 2030 - 1.8%
	High	● Same as medium scenario, but assume the BPU increases goals during 2025-2030. ● **Savings % sales:** 2017 - 0.5%; 2025 - 19%; 2030 - 2.0%

NY	**Policy and Regulatory Framework**	● IOUs operate efficiency programs under framework of Reforming the Energy Vision (REV) as does New York State Energy Research and Development Authority (NYSERDA) that administers the Clean Energy Fund. The public service commission (PSC) reviews and approves Energy Efficiency Transition Implementation Plans (ETIP) with EE programs and budgets through 2020. ● New York Power Authority (NYPA), and Long Island Power Authority (LIPA) also administer efficiency programs. ● The Governor announced new statewide energy savings goals in April 2018. Pending regulatory decisions will provide more structure to utility business models and the relationship between IOUs and state agencies that currently administer EE programs.
	Low	● Same as medium scenario for near-term (2017-2020) and through 2025 as utilities and NYSERDA reach target savings. After 2025, assume savings decline to 1.6% in 2030, consistent with low scenario savings for regional leaders. ● **Savings % of sales:** 2017 - 1.1%; 2030 - 1.6%
	Medium	● Assume IOUs, achieve updated ETIP savings goals between 2017-2020; assume NYSERDA achieves the non-CHP savings described in the 2018 Clean Energy Fund Investment Plan and LIPA and NYPA continue saving at historic levels. ● From 2021-2025, assume that NY reaches its savings goal of 22,500 GWh for utility and NYSERDA programs between 2015 and 2025 by ramping up savings to 2% by 2025. After 2025, assume savings decline slightly to 1.9% in 2030. ● **Savings % sales:** 2017 - 1.1%; 2030 - 1.9%
	High	● Same as medium scenario for near-term (2017-2020) and through 2025 as utilities and NYSERDA reach state goals. After 2025, assume savings remain at 2.0% per year through 2030. ● **Savings % sales:** 2017 - 1.1%; 2030 - 2.0%
PA	**Policy and Regulatory Framework**	● Legislative mandate for utility EE programs (Act 129). Utilities operate under 5-year DSM plans informed by potential studies conducted by statewide evaluator. ● Cap on spending utilities can recover for EE (2% of 2006 revenues).
	Low	● Assume medium scenario for near-term (to 2020). From 2021-2030, assume EE budgets remain at 2020 levels given spending cap but savings levels decrease as IOUs are not fully able to replace savings from lighting and equipment programs that are covered by new standards. ● **Savings as % of sales:** 2017 - 0.9%; 2020 - 0.7%; 2030 - 0.5%
	Medium	● Assume IOUs achieve savings goals in current DSM plan (2016-2020). From 2021-2030, assume EE budgets remain at 2020 levels given spending cap and savings levels decrease modestly. Assume IOUs will have to make significant changes to their EE portfolio as lighting currently accounts for 60% of overall savings. ● **Savings % sales:** 2017 - 0.9%; 2020 - 0.8%; 2030 - 0.7%
	High	● Assume medium scenario for near-term (to 2020). Assume spending cap is lifted in 2021, which allows savings to increase to 1% by 2025. ● **Savings % sales:** 2017 - 0.9%; 2030 - 1.0%
RI	**Policy and Regulatory Framework**	● All cost-effective mandate and 3-year planning cycle overseen by stakeholder council (Rhode Island Energy Efficiency and Resource Management Council). EE and CHP contribute to savings targets. ● IOUs can earn shareholder incentives and have revenue decoupling.
	Low	● Same as medium scenario for near term (2018-2020). From 2020-2030, savings levels decrease at a faster rate than medium scenario, assuming lower remaining achievable market potential. ● **Savings % of sales**: 2017 - 3.3%; 2025 - 2.3%; 2030 - 1.3%

	Medium	• Assume utilities achieve near-term EE savings goals (2018-2020). From 2021-2030, levels decrease and follow the trend line of MA as we assume that RI is impacted by same trends (e.g., transformation of lighting market, impact of standards). • **Savings % of sales:** 2017 - 3.3%; 2025 - 2.5%; 2030 - 1.8%
	High	• Same as medium scenario for near term (2018-2020). From 2021-2030, savings levels decrease and follow same downward trend line in MA high scenario. • **Savings % of sales:** 2017 - 3.3%; 2030 - 2.0%
VT	**Policy and Regulatory Framework**	• All cost-effective mandate and societal cost test. • Third-party administrator (Efficiency Vermont) operates under 3-year EE plans.
	Low	• Assume program administrators achieve goals through 2020. From 2021-2030, assume savings follow 90% of Realistic Achievable Potential in potential study. • **Savings % of sales:** 2017 - 2.1%; 2030 - 1.2%
	Medium	• Assume program administrators achieve goals through 2020. From 2021-2030, assume savings follow the Realist Achievable Potential in recent potential study. • **Savings % of sales:** 2017 - 2.1%; 2030 - 1.3%
	High	• Assume program administrators achieve goals through 2020. Assume savings are halfway between Realistic and Maximum Achievable Potential in 2021 and 2022 and follow Maximum Achievable Potential thereafter to 2030. • **Savings % of sales:** 2017 - 2.1%; 2030 - 1.8%

Census Region: South

State	Policy Context and Scenario	Scenario Description
AL	**Policy and Regulatory Framework**	• No explicit state EE policies. TVA savings are included in modeling for publicly owned utilities and cooperatives. • Utilities are required to file an IRP.
	Low	• Same as medium scenario. • **Savings % of sales:** 2017 - 0.02%; 2030 - 0.02%
	Medium	• Assume IOU savings as a % of sales remain at 2016 level each year to 2030. • **Savings % of sales:** 2017 - 0.02%; 2030 - 0.02%
	High	• Assume IOU savings as a % of sales increase by 0.1% per year to a maximum of 0.5% of prior year sales, based on achievable EE potential. • **Savings % of sales:** 2017 - 0.02%; 2030 - 0.5%
AR	**Policy and Regulatory Framework**	• EERS order sunsets in 2019, and large C&I customers can opt out of EE programs. IOUs can earn performance incentives. • Utilities are required to file an IRP and DSM plan. 2017-2019 DSM plans for IOUs and statewide EE potential study for 2015-2025. Assume no increase or decrease in amount of load that opts-out over time.
	Low	• Same as medium scenario • **Savings % of sales:** 2017 - 1.5%; 2030 - 1.0%
	Medium	• In near term, savings based on 2017-2019 IOU DSM plans. From 2020-2030, the scenario is guided by the achievable potential identified in the statewide potential study. Statewide, 18% of load opts out. • **Savings % of sales:** 2017 - 1.5%; 2030 - 1.0%
	High	• In near term, savings based on 2017-2019 IOU DSM plans. From 2020-2030, assume IOU savings as % of sales remain at 2019 level (1.5%) to 2030. • **Savings % of sales:** 2017 - 1.5%; 2030 - 1.5%
DC	**Policy and Regulatory Framework**	• Third-party administrator (DC Sustainable Energy Utility) delivers programs. • D.C. Department of Energy and Environment develops request for proposals (RFP) that establishes EE budgets and minimum and maximum savings goals for the program administrator.

	Low	• Assume program administrator achieves minimum savings goals in RFP (1%) by 2021, but then savings decline to 0.5% per year to 2030 as lighting savings opportunities decrease. • **Savings % of sales:** 2017 - 0.5%; 2030 - 0.5%
	Medium	• Assume savings increase through 2021 to mid-point of minimum and maximum savings goals listed in the RFP (1.2%) and remain at that level to 2030. • **Savings % sales:** 2017 - 0.6%; 2030 - 1.2%
	High	• Assume program administrator achieves maximum achievable savings goals identified in RFP (1.5%) by 2021 and savings remain at that level to 2030. • **Savings % sales:** 2017 - 0.7%; 2030 - 1.5%
DE	**Policy and Regulatory Framework**	• EE programs in Delaware are administered by a mix of public sector (state energy office and a third-party administrator, the Delaware Sustainable Energy Utility (DSEU)) and utility administrators (Delmarva Power, rural cooperatives and publicly owned utilities). • Legislation passed in 2014 allowed IOUs to implement efficiency programs to augment the DSEU. Delmarva Power introduced its first DSM plan for 2017-2019.
	Low	• Assume that IOU and DSEU maintain existing modest savings levels. • **Savings % of sales:** 2017 - 0.5%; 2030 - 0.5%
	Medium	• Assume IOU programs grow modestly but lack business model to support larger savings. • Assume DSEU achieves somewhat higher savings under new governance model. • **Savings % sales:** 2017 - 0.5%; 2030 - 0.8%
	High	• Assume improved business model encourages IOUs to achieve higher savings that are comparable to program administrators in nearby states. • **Savings % sales:** 2017 - 0.5%; 2030 - 1.3%
FL	**Policy and Regulatory Framework**	• EE goals are set every five years by the PSC in Florida Energy Efficiency and Conservation Act (FEECA) proceeding; utilities are required to file 10-year site plan and DSM plan. • FEECA utilities—IOUs, JEA (Jacksonville) and Orlando Utilities Commission are included in IOU savings data below.
	Low	• Same as medium scenario. • **Savings % of sales:** 2017 - 0.07%; 2030 - 0.06%
	Medium	• Assume FEECA utilities achieve 2014 FEECA savings goals until 2024 and remain at that level to 2030. • **Savings % of sales:** 2017 - 0.07%; 2030 - 0.06%
	High	• Assume FEECA utilities achieve FEECA savings goals to 2019. From 2020-2030, assume savings levels increase by 0.15% per year to a maximum of 0.5% of prior year sales based on achievable potential studies and previous performance of Florida utilities. • **Savings % of sales:** 2017 - 0.07%; 2030 - 0.5%
GA	**Policy and Regulatory Framework**	• EE goals set every three years by the PSC for Georgia Power (GPC). • Utilities are required to file IRP and DSM plans.
	Low	• Same as medium scenario. • **Savings % of sales:** 2017 - 0.60%; 2030 - 0.55%
	Medium	• Use 2016 GPC IRP as guidance for EE savings for 2017-2028; assume GPC savings remain at 2028 level to 2030. • **Savings % of sales:** 2017 - 0.60%; 2030 - 0.55%

	High	• Assume savings in near term are based on 2017-2019 DSM plan; for 2019-2030, assume savings are slightly lower than medium achievable potential case from GPC's most recent EE potential study. • **Savings % of sales:** 2017 - 0.60%; 2030 - 1.0%
KY	**Policy and Regulatory Framework**	• Performance incentives for EE, and large C&I customers can opt-out. TVA savings are included in modeling for publicly owned utilities and cooperatives. • Utilities required to file IRP and DSM plans.
	Low	• From 2016-2030, assume IOU savings levels remain at 2015 level. • **Savings % of sales:** 2017 - 0.10%; 2030 - 0.10%
	Medium	• Assume that long-term IOU DSM plans provide basis for savings levels. Use projected energy savings from Louisville Gas and Electric Company and Kentucky Utilities Company (LGE/KU) DSM plan (2019-2030), American Electric Power (AEP) IRP (2018-2030), and Duke Kentucky IRP (2015-2030). • **Savings % of sales:** 2017 - 0.25%; 2030 - 0.15%
	High	• Use medium case for 2017-2019. For 2020-2030, use energy savings from LGE/KU high achievable potential, AEP IRP, and Duke Kentucky economic potential. • **Savings % of sales:** 2017 - 0.44%; 2030 - 0.55%
LA	**Policy and Regulatory Framework**	• Utilities required to file IRP and DSM plans and large C&I customers (>5 MW) can opt out. "Quick Start" EE programs have budget cap (0.5% of 2012 revenues)
	Low	• From 2017-2030, assume IOU savings remain at 2016 level to 2030. • **Savings % of sales:** 2017 - 0.11 %; 2030 - 0.11%
	Medium	• Assume that PSC will continue and expand Quick Start EE programs somewhat over time. About 25% of load opts out. • **Savings % of sales:** 2017 - 0.26%; 2030 - 0.30%
	High	• Assume that PSC and IOUs will support a more comprehensive portfolio of EE programs based on success of Quick Start programs. • **Savings % of sales:** 2017 - 0.31%; 2030 - 0.75%
MD	**Policy and Regulatory Framework**	• EERS legislation sunsets in 2023. IOUs can receive performance incentives. Southern Maryland Electric Coop is modeled as an IOU because it is included in EERS legislation. • Utilities required to file DSM plan.
	Low	• Same as medium scenario to 2020; then assume PSC sets more conservative savings goals in later years (1.5% of 2019 baseline year sales for 2021-2030). • **Savings % of sales:** 2017 - 1.3%; 2030 - 1.5%
	Medium	• Assume utilities ramp up EE programs from current level to meet EERS goals (2%) by 2021. Assume absolute savings level is adjusted upward to reflect new baseline year in 2022, 2025 and 2028. • **Savings % of sales:** 2017 - 1.3%; 2021 - 2%; 2030 - 2.0%
	High	• Same as medium scenario to 2020. Assume PSC sets slightly more aggressive savings goals (2.1%) between 2028 and 2030. Assume absolute savings level is adjusted upward to reflect new baseline year in 2022, 2025 and 2028. • **Savings % of sales:** 2017 - 1.3%; 2030 - 2.1%
MS	**Policy and Regulatory Framework**	• Utilities receive "Lost Contribution to Fixed Cost" recovery. • Utilities required to file DSM plan.
	Low	• Assume utilities continue to offer Quick Start EE programs and IOU savings decline to 0.13% in 2018 in part because large C&I customers are allowed to opt out. • **Savings % of sales:** 2017 - 0.23%; 2030 - 0.13%
	Medium	• Assume PSC directs utilities to expand Quick Start programs and adopt comprehensive EE programs. From 2018-2030, savings levels increase by 0.15% per year to a maximum of 0.8% of prior year sales. Assume large C&I customers are allowed to opt out and 20% of eligible load opts out. • **Savings % of sales:** 2017 - 0.23%; 2030 - 0.80%

	High	• Ramp up of EE programs is same as medium scenario but assume that large C&I customers are not allowed to opt out. • **Savings % of sales:** 2017 - 0.23%; 2030 - 0.80%
NC	**Policy and Regulatory Framework**	• EE is allowed as an eligible resource to comply with the renewable energy requirement (REPS). Large C&I customers are allowed to opt out (27% of IOU load in 2017). • Utilities are able to earn performance incentives and are required to file IRP and DSM reports.
	Low	• Same as medium scenario for near-term (2018). For 2019-2030, assume IOU savings are based on the IRP base case (which decrease compared to 2016) and more C&I customers decide to opt-out over time. • **Savings % of sales:** 2017 - 1.3%; 2030 - 0.63%
	Medium	• Assume IOUs achieve near-term DSM plan savings targets (2018). For 2019-2030, assume savings levels are held at the maximum amount permitted for compliance with the REPS, which reduces EE savings to 0.75% • **Savings % of sales:** 2017 - 1.3%; 2030 - 0.75%
	High	• Same as medium scenario for near-term. For 2019-2030, assume IOU continue to perform and achieve savings at 2016 levels and bring more industrial customers back into the EE programs (assume opt-out decreases by 0.25% per year). • **Savings % of sales:** 2017 - 1.3%; 2030 - 1.3%
OK	**Policy and Regulatory Framework**	• IOUs file DSM plans with savings targets on three-year cycles, lately with their IRPs. Targets have been rising, and utilities often have exceeded them. • IOUs may recover lost revenues and are eligible for performance incentives if they achieve at least 85% of goals. Performance incentives are capped at 15% of total program costs. • Large C&I customers with aggregate annual load over 15 million kWh may opt out of paying for, and participating in, energy efficiency programs. Most eligible load opts out.
	Low	• Assume low-cost wind becomes an even larger part of the resource mix and poses a challenge for the cost-effectiveness of EE over time for IOUs. • **Savings % of sales:** 2017 - 0.5%; 2022 - 0.8%; 2025-2030 - 0.5%
	Medium	• Assume IOUs achieve their targets and continue acquiring modestly rising savings. • **Savings % of sales:** 2017 - 0.5%, 2019 - 0.8%; 2022-2030 - 1%
	High	• Assume business model is primary driver (e.g., decoupling and rising performance incentives) for IOUs and, with new savings opportunities (e.g., voltage optimization), drive higher savings. • **Savings % of sales:** 2017 – 0.5%, 2022 - 1%; 2025-2030 - 1.3%
SC	**Policy and Regulatory Framework**	• C&I opt-out and utility performance incentive. • Utilities required to file annual DSM report.
	Low	• Same as medium case • **Savings % of sales:** 2017 - 1.0%; 2030 - 0.4%
	Medium	• Assume IOUs achieve near-term DSM plan savings targets. For 2019-2030, assume IOU savings are based on the IRP base case (which decrease compared to 2016 level) and that more C&I customers decide to opt out over time (increase opt out share of total load by 0.25% per year). • **Savings % of sales:** 2017 - 1.0%; 2030 - 0.4%
	High	• Same as medium scenario for near-term. For 2019-2030, assume IOUs continue to perform and achieve savings at 2016 levels and bring more industrial customers back into EE programs (assume opt-out decreases share of total load by 0.25% per year). • **Savings % of sales:** 2017 - 1.0%; 2030 - 0.9%
TN	**Policy and Regulatory Framework**	• TVA is dominant provider (98% of load in state) and files an IRP and annual DSM report.

	Low	• Assume TVA is ramping down EE programs that offer incentives to customers. • **Savings % of sales:** 2017 - 0.12%; 2030 - 0.10%
	Medium	• Assume savings from TVA programs continue at 2016 level from 2017 to 2030. • **Savings % of sales:** 2017 - 0.24%; 2030 - 0.24%
	High	• Assume TVA ramps up from 2016 savings levels by 0.15%/year to 0.7% of prior year sales by 2019 based on achievable EE potential; savings continue at that level to 2030. • **Savings % of sales:** 2017 - 0.5%; 2030 - 0.7%
TX	**Policy and Regulatory Framework**	• Program administrators are primarily transmission and distribution utilities. EERS rules currently require utilities to reduce summer peak demand by at least 0.4% and achieve energy savings no lower than in the previous year. PUC requires utilities to report both peak demand and energy savings. EE costs are capped in the statute, although utilities have the option of petitioning the PUC to spend above the cap as part of their cost recovery application. • Program administrators are eligible for performance incentives; most utilities have exceeded their mandatory targets in recent years.
	Low	• Assume the PUC and legislature are increasingly concerned about rate impacts. Spending caps remain in place, and PUC does not grant waivers, so IOU spending on EE remains constrained. • **Savings % of sales:** 2020 - 0.25% and remain at that level through 2030
	Medium	• IOUs achieve their latest projected savings, which in most cases exceed EERS targets. Given economic growth and resulting increases in statutory spending cap, program spending is assumed to rise and thus savings increase modestly. • **Savings % of sales:** 2020 - 0.25%; 2030 - 0.35%
	High	• Assume that the legislature eases caps on DSM spending, or IOUs request and receive approval to exceed caps. Energy savings increase significantly over time to capture more of the achievable potential. • **Savings % of sales:** 2020 - 0.25%; 2030 - 1%
VA	**Policy and Regulatory Framework**	• 2018 legislation requires utilities to spend minimum amount on DSM (EE and DR) each year (about $100M/year) and utilities must file DSM plan and IRP. Legislation requires utilities to significantly ramp up their current EE efforts. • Large C&I customers (> 500kW) allowed to opt out of EE programs
	Low	• Assume IOUs spend 60% of designated budget on EE; other assumptions same as medium scenario. • **Savings % of sales:** 2017 - 0.3% 2030 - 0.6%
	Medium	• Assume IOUs spend 70% of designated budget on EE and 17% of load opts out. Given only projected EE budgets, we use cost of first-year savings for comparable Southern utilities to project savings in future. • **Savings % of sales:** 2017 - 0.3%; 2030 - 0.7%
	High	• Same as medium scenario
WV	**Policy and Regulatory Framework**	• Utilities required to file DSM plan and IRP; large C&I customers (>1 MW) can opt out of EE programs
	Low	• Same as medium scenario
	Medium	• Assume utilities maintain current programs and savings levels and 7% of large C&I customers continue to opt out (per AEP data). • **Savings % of sales:** 2017 - 0.3%; 2030 - 0.3%
	High	• Assume utilities decide to modestly expand their program offerings over next several years to include more programs that they offer in surrounding jurisdictions. • **Savings % of sales:** 2017 - 0.3%; 2030 - 0.5%

A.4. Projecting the Cost of Electricity Savings for IOUs in Future Years

Many state policies on energy efficiency allow us to estimate electricity savings in future years (e.g., EERS, IRPs that include a portfolio of efficiency programs), but do not include information on projected

spending. Thus, we developed an analytic method that models and projects future spending for efficiency programs, given estimates of future program savings. Specifically, we created a cost of electricity savings function that translated first-year program savings by state into annual program spending. The cost of savings function was then applied to each state by scaling the historical state-specific cost of saving electricity value (2013-2015) to anchor the values used in future years. This cost function is based on the assumption that the cost of electricity savings is associated with the level of savings achieved by the program administrator relative to their retail sales.

First, we conducted a statistical regression analysis using portfolio-level values for savings and spending for ~115 program administrators between 2009 and 2015.[4] The first-year cost of savings for the program administrator in each year was regressed on first-year savings as a percent of retail electricity sales in that year as the independent variable.[5] We grouped program administrators in states by our four simplified census regions and found that a quadratic form provided the best fit for the relationship between the cost of savings and savings level. Each regional curve was somewhat different in slope but the "best fit" line had a concave or "U" shape in each region, as shown in Figure A - 2.

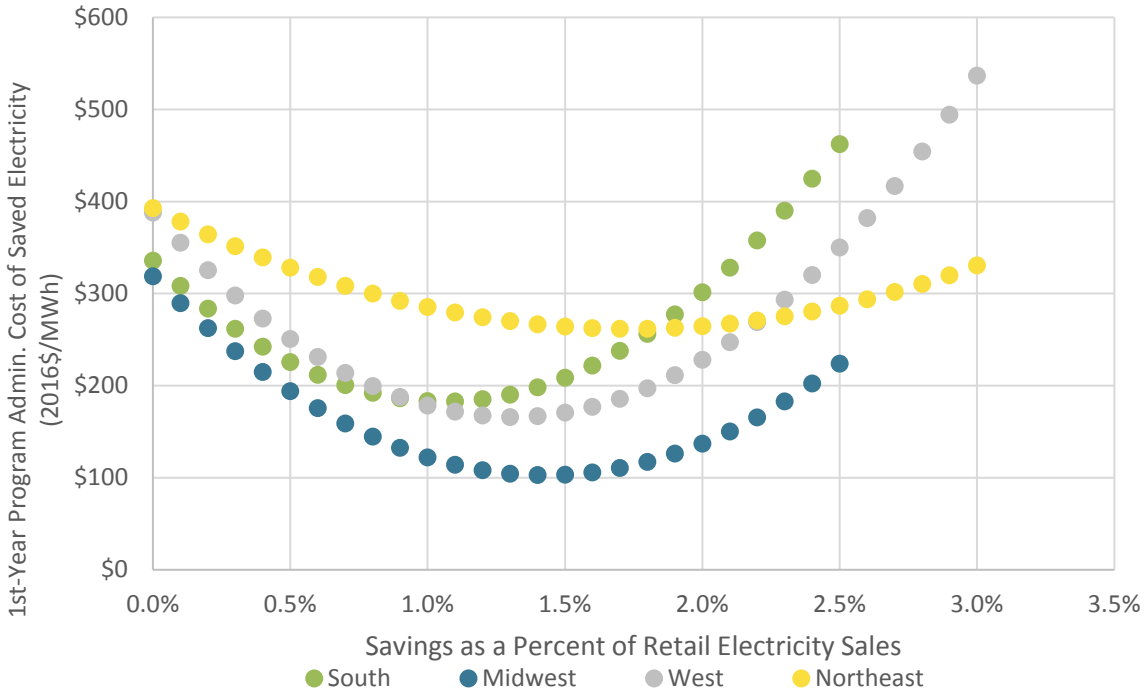

Figure A - 2. Regional cost of saving electricity curves for efficiency programs (2009-2015)

Source: LBNL DSM Program database, Cost of Saved Energy Project

The regression analysis indicated that the costs to acquire savings (on a dollar per MWh basis) can be somewhat higher when portfolio savings levels are low, due to the effect of fixed program delivery costs and because the utility may be implementing pilot programs and ramping up its administrative

[4] These values were drawn from the LBNL Cost of Saved Energy Project and its database—the LBNL Demand-Side Management Program Database, which includes efficiency programs funded by customers of investor-owned utilities in 41 states.
[5] Retail electricity sales data are published by EIA.

and delivery infrastructure. Thus, based on historic data, the first-year cost of saved electricity for program administrators, on average, initially declines as the percent savings increases beyond pilot programs. The cost of savings reaches a minimum at around 1.3% of retail sales in most regions and then increases as savings increase.

Using coefficients from the regressions, we developed regional cost functions for (1) efficiency programs funded by IOU customers and (2) programs funded by customers of publicly owned utilities and cooperatives. For each incremental tenth of a percent change in the level of savings, we generated a cost of saved electricity value in each region.

The cost of savings function was then applied to each state by "scaling" the historic state-specific cost of saving electricity values into future values in each state. Specifically, using historic (2013-2015) and current data (2016-2017), we calculated the first-year cost of saved electricity for each state and used this value to anchor the cost of savings values for future years.

As the percent savings were projected over time, the model compared the new level of savings to the level of savings for the anchor point and applied that ratio to the cost of savings at the anchor point in order to generate a new cost of savings corresponding to the new level of savings. The ratio of the savings levels thus provided a regional slope for changes in the cost of saved electricity as the level of savings increased or decreased for a given state.

Thus, two states in the same region that had different starting values for the cost of saved electricity in 2016 would have those values increase at the same rate over time (if their level of savings increased similarly), but their first-year cost of saved electricity in future years would still reflect differences in their starting value.

A.5. Projecting the Cost of Electricity Savings for Publicly Owned Utilities and Cooperatives

In our 2013 study, we treated publicly owned utilities and cooperatives as "uncommitted" in the sense that it was difficult to link projections of future savings and spending for these utilities to explicit policy drivers in most states. Moreover, publicly owned utilities and cooperatives were typically not subject to the type of reporting requirements for efficiency programs that many PUCs require of regulated, investor-owned utilities. Thus, we relied on our expert judgment and developed stylized and standardized low, medium and high scenarios for the energy efficiency activities of publicly owned utilities and cooperatives.[6]

In this study, we chose a different approach and relied more heavily on the historic efficiency activity of publicly owned utilities and cooperatives in most states as the starting place for projecting future

[6] Savings levels for publicly owned utilities and cooperatives at the end of the prior study period (2025) were set at levels that were very modest in the low case (0.2% of retail sales), moderate in the medium scenario (0.5%), and close to the national average in 2013 in the high scenario (0.8%) (Barbose et al. 2013).

savings and spending.[7] First, we characterized the historical performance of electricity efficiency programs administered by these utilities using EIA Form 861 data for 2013 to 2015 in order to establish a cost of savings performance baseline. For each state, we developed a time series of historical savings, spending, and first-year cost of saved electricity (CSE). Some publicly owned utilities and cooperatives do not offer electricity efficiency programs or report their efficiency program activities to EIA on Form 861. Thus, we also calculated the share of each state's load currently covered by efficiency programs administered by publicly owned utilities and cooperatives so that we could understand the potential for additional efficiency programs administered by these types of utilities to be offered in each state.

We used a regression analysis approach that was similar to what we used for IOUs (see section A.4). For each census region, we performed a regression on the first year CSE as a function of savings in terms of percent of retail sales. The dataset analysis was composed of individual publicly owned utilities and cooperatives that reported efficiency spending and savings to EIA between 2009 and 2015. We also used this dataset to construct a distribution of savings as a percent of retail electricity sales for publicly owned utilities and cooperatives in each region. We ranked savings by these utilities in each region from lowest to highest and then determined the savings levels at each percentile. Our objective was to better understand the current range in first-year cost of saving electricity values among publicly owned utilities and cooperatives in each region for the purpose of identifying benchmarks and bounds (e.g., maximum savings level among publicly owned utilities and cooperatives in a region) to use in constructing scenarios (e.g., assume that savings as a percent of sales increases to the next highest percentile in a high scenario).

We segmented publicly owned utilities and cooperatives into two groups in each state: those with efficiency programs that were active based on reported savings to EIA (2015) and those utilities that either do not offer efficiency programs or report results to EIA. We treat these two groups of publicly owned utilities and cooperatives differently in our modeling because of differences in market maturity (e.g., publicly owned utilities and cooperatives that do not currently offer efficiency programs may start with pilot programs, while experienced publicly owned utilities and cooperatives may achieve economies of scale over time).

Similar to the approach used for IOUs (see section A.4), we calculated the first-year cost of saving electricity for publicly owned utilities and cooperatives in each state and used this value to anchor the cost of savings values for future years.

Low Scenario

In the low scenario, we assume that publicly owned utilities and cooperatives already running efficiency programs continue to do so at historical savings and spending levels through 2030. Programs do not

[7] In a few states where energy efficiency policy drivers apply to publicly owned utilities and/or cooperatives (e.g., Arizona, Maryland, California) or where third parties administer energy efficiency programs that includes loads from customers of investor-owned utilities, publicly owned utilities and cooperatives, we were able to model and project future spending and savings using these policy drivers.

increase in scale, and we assume that publicly owned utilities and cooperatives that do not currently offer efficiency programs continue that approach to 2030.

Medium Scenario

In the medium scenario, we focus only on publicly owned utilities and cooperatives with existing efficiency programs in each state. In this scenario, we assume that publicly owned utilities and cooperatives that already offer efficiency programs will expand their efforts somewhat to 2030. We construct a forecast that includes two phases for publicly owned utilities and cooperatives that already offer programs. In the near-term (2017-2020), we assume that savings as a percent of retail sales will ramp up 25 percentiles on the regional distribution of savings levels achieved by publicly owned utilities and cooperatives. In the second phase (2021-2030), programs expand more slowly and move up 25 more percentiles over a 10-year period. For states with higher performing publicly owned utilities or cooperatives (e.g., a publicly owned utility is at the 80th percentile in savings levels in 2015), we cap their movement along the distribution at the 100th percentile. By imposing this ceiling, we are implicitly assuming that state-level savings as a percent of retail sales will not exceed the levels of the highest performing publicly owned utility or cooperative in that region.

We assume that publicly owned utilities and cooperatives move up the same number of rungs on the percentile ladder. However, the space between these rungs (the increase in savings as percent of retail sales) differs by region and by location on the distribution.

High Scenario

In the high scenario, we treat publicly owned utilities and cooperatives that already offer existing efficiency programs in a similar fashion as in the medium scenario. However, we assume that publicly owned utilities and cooperatives that do not offer efficiency programs will start programs. For publicly owned utilities and cooperatives new to efficiency, we construct a two-phase forecast approach similar to the one used in the medium case. In the near term (to 2020), we assume that these utilities ramp up savings from zero to the 25th percentile of the regional savings distribution for publicly owned utilities and cooperatives. From 2021–2030, we assume these utilities will continue to ramp up their programs to a level that is comparable to the median savings level (50th percentile) in their region by 2030.

Overall, we think that modeling publicly owned utilities and cooperatives with this approach is conservative given our reliance on historical savings levels as the basis for the low scenario and the foundational starting place in the medium and high scenarios. We use this approach to model publicly owned utilities and cooperatives in nearly all states, with the exception of states where the efficiency activities or savings goals for publicly owned utilities and/or cooperatives are driven by explicit state policies or resource planning practices (e.g., CA, FL, MD, TN and WA).

Appendix B. State-level Spending and Savings Projections

Appendix B provides additional state-level details on projected spending and savings for electricity efficiency programs to 2030, which form the basis for national and regional results presented in Chapter 4. Table B-1 presents projected electricity efficiency program spending by state; Table B-2 presents projected electricity efficiency program savings by state. Spending projections are presented in terms of nominal dollars, as used throughout the report, and savings projections are presented in terms of first-year gigawatt-hours (GWh) savings.

Table B - 1. Electricity efficiency program spending projections by state ($ millions, Nominal)

State	2016	Low			Medium			High		
		2020	2025	2030	2020	2025	2030	2020	2025	2030
AK	0.1	0.1	0.1	0.1	0.5	1	3	2	4	8
AL	20	22	26	30	33	46	43	85	129	143
AR	69	64	76	90	64	76	91	80	90	100
AZ	131	153	120	144	167	178	208	237	233	269
CA	1,164	1,296	1,463	1,492	1,339	1,578	1,605	1,537	1,678	1,650
CO	92	105	102	119	121	138	135	135	173	200
CT	205	136	133	132	151	163	181	160	203	256
DC	10	9	10	12	9	18	19	9	22	23
DE	8	4	4	5	6	7	8	7	11	13
FL	82	62	75	88	77	95	116	150	432	504
GA	51	69	76	86	66	74	83	67	98	116
HI	30	30	31	32	30	34	40	30	35	42
IA	108	63	55	39	63	63	56	63	67	64
ID	49	68	52	39	69	85	43	73	96	53
IL	219	453	424	382	457	429	464	461	496	540
IN	87	99	87	69	105	109	114	115	140	169
KS	8	3	4	5	6	8	11	22	48	75
KY	26	19	22	26	33	35	35	41	46	49
LA	6	6	7	9	16	19	22	43	51	60
MA	521	618	579	429	687	625	523	706	686	589
MD	184	402	266	284	402	464	484	403	465	543
ME	33	50	28	22	52	40	37	52	41	41
MI	188	191	198	202	260	287	316	261	310	344
MN	163	144	163	185	175	196	220	178	216	281
MO	61	60	65	70	69	80	75	73	98	106
MS	12	7	9	10	23	40	50	31	45	56
MT	13	13	15	17	12	14	18	15	21	27
NC	146	93	104	125	116	119	135	146	167	192
ND	1	1	1	1	3	7	10	5	11	16
NE	11	11	13	15	12	16	19	16	21	27
NH	28	58	59	61	59	73	91	59	77	101
NJ	159	169	337	382	175	457	489	223	574	676
NM	19	24	29	34	26	33	39	31	43	51
NV	33	47	49	49	47	54	62	54	63	73
NY	426	432	793	756	435	795	894	436	858	1,067
OH	159	113	132	155	169	196	227	176	348	237
OK	65	109	71	79	109	147	168	113	200	230
OR	173	166	102	106	208	129	109	211	236	126

State	2016	Low			Medium			High		
		2020	2025	2030	2020	2025	2030	2020	2025	2030
PA	238	230	170	195	231	237	269	232	321	360
RI	75	95	70	46	104	85	68	104	85	75
SC	53	36	40	46	36	41	47	57	68	81
SD	4	6	7	8	7	7	8	8	13	14
TN	53	20	24	28	46	53	62	100	115	130
TX	200	202	236	275	247	316	382	266	439	625
UT	61	56	59	64	63	67	67	75	86	99
VA	16	61	61	61	72	73	73	73	75	77
VT	43	51	36	31	51	40	35	51	52	59
WA	234	133	198	173	269	372	221	297	397	257
WI	69	40	47	54	80	92	103	98	113	129
WV	10	13	15	17	13	15	17	19	22	25
WY	9	12	12	13	13	19	19	15	22	26
U.S.	**5,823**	**6,329**	**6,753**	**6,791**	**7,085**	**8,347**	**8,614**	**7,903**	**10,341**	**11,072**

Table B - 2. Electricity efficiency program savings projections by state (first year GWh)

State	2016	Low			Medium			High		
		2020	2025	2030	2020	2025	2030	2020	2025	2030
AK	0.8	0.4	0.4	0.4	3.0	7	11	13	25	38
AL	53	54	56	59	97	194	292	273	488	597
AR	342	211	225	241	213	228	245	387	416	443
AZ	1,357	1,017	581	623	1,173	1,126	1,169	1,371	1,342	1,382
CA	4,056	3,137	3,182	2,837	3,271	3,468	3,139	3,754	3,688	3,227
CO	551	579	518	540	720	784	780	737	847	904
CT	498	269	236	211	288	279	277	317	370	425
DC	80	108	55	55	108	132	127	108	157	150
DE	8	48	40	41	63	65	68	82	106	107
FL	252	173	186	196	298	343	386	458	1276	1353
GA	505	424	427	433	517	523	532	640	888	943
HI	165	146	132	119	149	153	158	149	157	166
IA	443	313	288	183	313	330	261	313	350	299
ID	212	282	180	113	282	315	119	298	354	151
IL	1,987	1,556	1,517	1,224	1,580	1,551	1,505	1,596	1,793	1,765
IN	428	515	407	290	549	523	494	615	685	759
KS	17	16	17	17	22	26	31	61	168	351
KY	171	102	107	111	291	314	347	348	375	411
LA	64	67	71	75	182	192	200	608	628	641
MA	1,676	1,395	1,071	710	1,553	1,161	877	1,558	1,277	987
MD	740	1081	803	768	1081	1050	981	1081	1050	1027
ME	192	277	168	120	283	194	161	283	199	181
MI	1,113	1,023	954	874	1,528	1,511	1,494	1,531	1,737	1,721
MN	986	725	736	748	885	887	891	901	1,000	1,095
MO	377	386	371	359	479	462	394	523	758	637
MS	64	34	36	39	129	220	256	195	263	300
MT	54	50	46	48	42	44	49	51	70	90
NC	983	532	534	536	807	690	704	1,058	1,094	1,131
ND	6	4	4	4	21	40	58	37	70	106
NE	79	78	80	83	92	111	130	121	164	208

State	2016	Low			Medium			High		
		2020	2025	2030	2020	2025	2030	2020	2025	2030
NH	59	145	132	123	153	170	190	153	180	210
NJ	371	465	978	1006	495	1364	1308	503	1366	1431
NM	137	121	128	135	140	167	177	168	239	258
NV	219	342	283	221	343	353	364	416	437	458
NY	1,742	1,962	2,666	2,022	1,980	2,683	2,400	1,981	2,669	2,524
OH	1,298	718	755	794	1,083	1,134	1,185	1,239	2,478	1,494
OK	278	365	206	205	363	446	453	371	569	579
OR	637	609	255	270	690	430	296	718	744	378
PA	1,180	1,079	715	734	1,079	997	1,014	1,084	1,421	1,427
RI	235	225	150	87	225	166	118	225	166	131
SC	347	175	178	181	177	183	190	366	392	418
SD	25	26	28	30	35	45	56	42	71	88
TN	219	104	109	114	249	260	270	694	712	723
TX	965	974	1,023	1,069	1,177	1,360	1,549	1,200	2,244	3,315
UT	310	255	228	196	305	284	235	366	383	400
VA	233	431	479	535	511	579	657	518	592	677
VT	126	110	84	64	110	93	71	110	83	92
WA	944	504	681	470	1,025	1,271	607	1,130	1,353	704
WI	653	265	278	293	529	545	564	743	765	790
WV	75	91	93	95	91	93	95	150	153	155
WY	41	55	42	39	57	84	64	66	100	108
U.S.	**27,552**	**23,623**	**22,522**	**20,340**	**27,835**	**29,629**	**27,997**	**31,711**	**38,907**	**37,957**