



**MISSOURI PUBLIC SERVICE COMMISSION**

**STAFF**

**REBUTTAL REPORT**

**APPENDIX 2**

**Staff Schedules**

**UNION ELECTRIC COMPANY,  
d/b/a AMEREN MISSOURI**

**CASE NO. EO-2018-0211**

*Jefferson City, Missouri  
August 2018*

\*\* Denotes Confidential Information \*\*

Ameren Missouri's  
Response to MPSC Data Request - MPSC  
EO-2018-0211  
Ameren Missouri's 3rd Filing to Implement Regulatory Changes in Energy Efficiency by  
MEEIA

No.: MPSC 0076.1

Please provide all support documentation that Ameren Missouri relied upon to make each assumption used in the excel file that was provided in response to Staff Data Request No. 0076. If Ameren Missouri did not rely on any support documentation to make each assumption, please provide a detailed explanation for why each assumption is appropriate to use in the estimations provided in response to Staff Data Request No. 0076. DR requested by J. Luebbert ([j.luebbert@psc.mo.gov](mailto:j.luebbert@psc.mo.gov)).

**RESPONSE**

**Prepared By: Shelly Hendry**  
**Title: Manager, Energy Efficiency**  
**Date: July 19, 2018**

Measure counts from the Residential Workpapers - Residential Submittal Tool were the starting point to determine participation for the Residential programs. The following describes the rationale for each assumption:

Overall – Given the variety of program offerings (Lighting, Home Energy Report, Products, Appliance Recycling), it's likely that customers will participate in multiple programs

Lighting – Assumption of 8 bulbs per participant - Mutli-pack LEDs are becoming more common. The table below shows the package size of bulb purchases. Without direct data on purchases per participant (most purchases are not linked to individuals given the program design) an assumption of 8 bulbs per participant was used.

Pack Size	Total Packs	Total Bulbs	% of LEDS by Pack Size
1	230,536	230,536	14%
2	167,218	334,436	21%
3	49,298	147,894	9%
4	181,892	727,568	45%
5	783	3,915	0%
6	23,330	139,980	9%
8	1,304	10,432	1%
10	2,109	21,090	1%
Grand Total	656,470	1,615,851	

Lighting – assumed 75% of lighting participants participated in other programs. Given the variety of program offerings (Home Energy Report, Products, Appliance Recycling), it's likely that customers will participate in multiple programs.

HVAC – ECMs were removed from the count of HVAC measures as they are installed in conjunction with a HVAC measure incented through the program.

Products – assumed 50% of customers participated in multiple programs. Given the variety of program offerings (Products, Appliance Recycling, HVAC, etc.), it's likely that customers will participate in multiple programs or purchase multiple measures within the Products Program.

Home Energy Report - assumed 7% participated in other MEEIA programs per EM&V trends. It is assumed that the HER recipients that participate in other programs will double from PY2017 data bringing the number to an estimated 16,000 or 7%. The following data was provided by the Program Evaluator.

PY2016: 4,760 HER recipients participated in other programs

PY2017: 8,884 HER recipients participated in other programs

Multi-family - Assumes MEEIA programs non kit measures were as a result of an upsell from the kit install. Measures such as central ACs and insulation are typically installed as an additional program offering after kits are installed in units. Also assumes that 50% participated in other programs given the variety of program offerings (Products, Appliance Recycling, HVAC, etc).

Appliance Recycling - assumed total measure count for fridge and freezer, excluded room AC and dehumidifier as joint pickup. In order for customers to have a room AC or dehumidifier recycled, they must also recycle either a fridge or freezer as it would be cost prohibitive to only pick up room ACs or dehumidifier. Also assumes that 50% participated in other programs given the variety of program offerings (Products, Appliance Recycling, HVAC, etc).

**State Energy Efficiency Resource Standards (EERS)  
 January 2017**

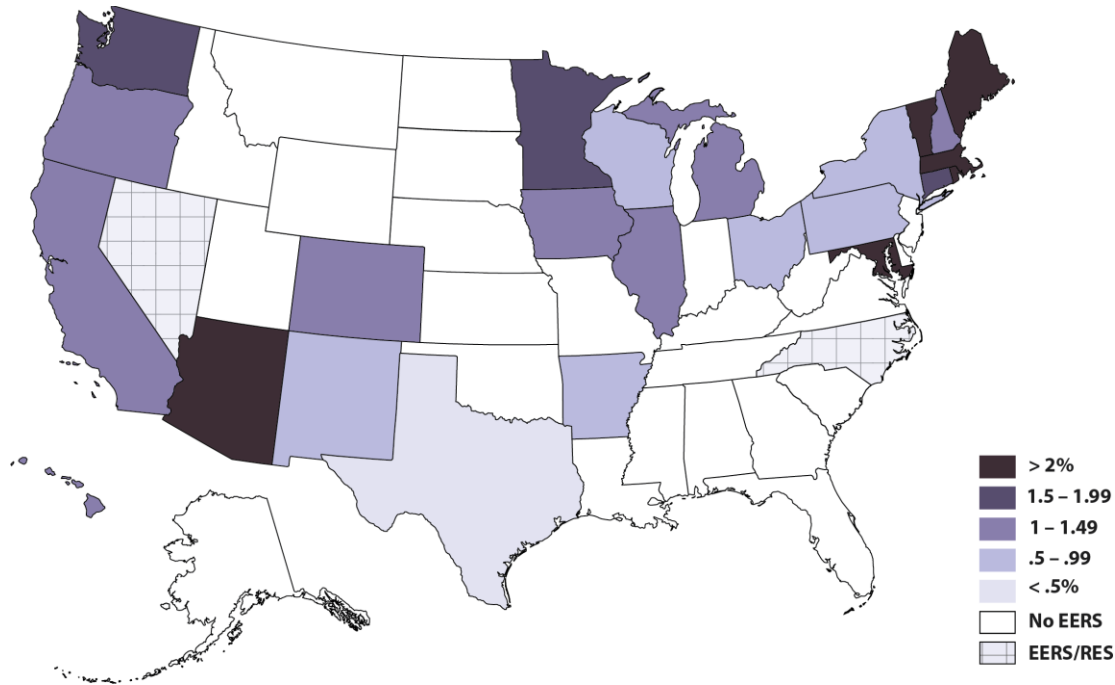


Figure 1. States with electric EERS policies in place (as of January 2017).

An energy efficiency resource standard (EERS) is a long-term (3+ years), binding energy savings target for utilities or third-party program administrators. Savings are achieved through energy efficiency programs for customers. An EERS is one of the most effective ways for a state to guarantee long-term energy savings. In 2015, states with an EERS achieved incremental electricity savings of 1.2% of retail sales on average, compared to average savings of 0.3% in states without an EERS.

Twenty-six states are currently implementing EERS policies requiring electricity savings (Figure 1).<sup>1</sup> Of these states, 16 also have EERS policies in place for natural gas. Seven of the 26 states have requirements that utilities or third-party administrators achieve all cost-effective energy efficiency.<sup>2</sup>

<sup>1</sup> This count includes 24 states with a standalone EERS policy and two states that allow energy efficiency to count toward renewable energy standards (RES). This count does not include Indiana, where EERS guidelines have been rolled back. Additional states have some form of targets, but for the following reasons we do not consider them to have an EERS: Florida (previous targets were underfunded, and recent targets are so low as to be negligible); Utah, Missouri, and Virginia (voluntary standards with no binding requirement). It should also be noted that as of the time of publication, EERS policies are pending in Delaware but final targets have not yet been approved.

<sup>2</sup> The seven states that have chosen to enforce all cost-effective efficiency requirements are California, Connecticut, Maine, Massachusetts, Rhode Island, Vermont, and Washington. In addition, New Hampshire’s EERS has set forth a

Texas adopted the nation’s first EERS in 1999, and many states followed suit in the mid-2000s. These policies have contributed to notable energy and bill savings in many states. All of the top fifteen energy-saving states in 2015 had an EERS policy in place.<sup>3</sup> Furthermore, nearly every state with an EERS has met or surpassed their targets in recent years.<sup>4</sup> This policy brief summarizes each state electricity and natural gas EERS policy currently in place. Table 1 outlines current policy approaches for electricity EERS policies. Table 2 describes natural gas EERS policies. For a more in-depth look at individual state EERS policies, visit ACEEE’s [State and Local Policy Database](#).<sup>5</sup>

**Table 1. Electricity EERS policy status by state**

	· State · Year enacted · Authority · Applicability (% sales affected) <sup>6</sup>	Electricity energy efficiency resource standard	Reference
1	Arizona 2010 Regulatory <sup>7</sup> IOUs, Co-ops (~59%)	Incremental savings targets began at 1.25% of sales in 2011, ramping up to 2.5% in 2016 through 2020 for cumulative electricity savings of 22% of retail sales, of which 2% may come from peak demand reductions. <sup>8</sup> Co-ops must meet 75% of targets.	<a href="#">Docket No. RE-00000C-09-0427, Decision 71436</a> <a href="#">Docket No. RE-00000C-09-0427, Decision 71819</a>
2	Arkansas 2010 Regulatory IOUs (~53%)	Incremental savings targets began at 0.25% in 2011, ramping up to 0.9% annually for 2015 – 2018 and 1.00% for 2019.	<a href="#">Order No. 15, Docket No. 08-137-U</a> <a href="#">Order No. 17, Docket No. 08-144-U</a> <a href="#">Order No. 1, Docket No. 13-002-U</a> <a href="#">Order No. 7, Docket No. 13-002-U</a> <a href="#">Order No. 31, Docket No. 13-002-U</a>

long-term goal of achieving all cost-effective efficiency, which is anticipated to be met through planning and goal-setting in future implementation cycles.

<sup>3</sup> 2015 is the most recent year for which complete data is available. See *The 2016 State Energy Efficiency Scorecard* (Berg et. al, 2016) for more details. <http://aceee.org/research-report/u1606>

<sup>4</sup> See *Energy Efficiency Resource Standards: A New Progress Report on State Experience* (Downs and Cui, 2014) for more details: <http://aceee.org/research-report/u1403>

<sup>5</sup> <http://database.aceee.org/>

<sup>6</sup> This does not take into account whether large customers are eligible to opt-out of programs. For more information on large customer opt-out, see *The 2016 State Energy Efficiency Scorecard* (Berg et. al, 2016). <http://aceee.org/research-report/u1606>

<sup>7</sup> EERS policies can either be established through legislation or regulatory action. EERS policies under regulatory authority were set without legislation requiring specific savings levels or calling upon the state public utility commission to set savings targets. Thus far, a total of 21 states have legislatively established EERS policies, while five states have done so solely through regulatory orders.

<sup>8</sup> Incremental savings are one year of energy savings from measures implemented under programs in a given year. Cumulative savings are the savings in a given year from all the measures that have been implemented under the programs in that year and in prior years that are still saving energy.

	· State · Year enacted · Authority · Applicability (% sales affected) <sup>6</sup>	Electricity energy efficiency resource standard	Reference
3	California 2004, 2009, and 2015 Legislative <sup>9</sup> IOUs (~78%)	Average incremental savings targets average about 1.15% of retail sales electricity.  In October 2015, California enacted SB 350, calling on state agencies and utilities to work together to double cumulative efficiency savings achieved by 2030. The CEC's SB 350 energy efficiency target setting efforts are anticipated to be completed in late 2017.  Utilities must pursue all cost-effective efficiency resources.	<a href="#">CPUC Decision 04-09-060</a> <a href="#">CPUC Decision 08-07-047</a> <a href="#">CPUC Decision 14-10-046</a> <a href="#">CPUC Decision 15-10-028</a> <a href="#">AB 995</a> <a href="#">SB 350 (10/7/15)</a> <a href="#">AB 802 (10/8/15)</a>
4	Colorado 2007 Legislative IOUs (~57%)	Black Hills follows PSCo incremental savings targets of 0.8% of sales in 2011, increasing to 1.35% of sales in 2015. For the period 2015-2020, PSCo must achieve incremental savings of at least 400 GWh per year.	<a href="#">Colorado Revised Statutes 40-3.2-101, et seq.;</a> <a href="#">Docket No. 12A-100E Dec. R12-0900;</a> <a href="#">Docket 10A-554EG</a> <a href="#">Docket No. 13A-0686EG Dec. C14-0731</a>
5	Connecticut 2007 & 2013 Legislative IOUs (~94%)	Average incremental savings of 1.51% of sales from 2016 through 2018.  Utilities must pursue all cost-effective efficiency resources.	<a href="#">Public Act No. 07-242</a> <a href="#">Public Act No. 13-298</a> <a href="#">2016-2018 Electric and Natural Gas Conservation and Load Management Plan</a>
6	Hawaii 2004 and 2009 Legislative Statewide goal (100%)	In 2009, Hawaii transitioned away from a combined RPS-EERS to a standalone EEPS goal to reduce electricity consumption by 4,300 GWh by 2030 (equal to ~30% of forecast electricity sales, or 1.4% incremental savings per year).	<a href="#">HRS §269-91, 92, 96</a> <a href="#">HI PUC Order, Docket 2010-0037</a>
7	Illinois 2007 and 2016 Legislative Utilities with over 100,000 customers, Illinois DCEO (~88%)	Incremental savings targets vary by utility, averaging 1.77% of sales from 2018 to 2021, 2.08% from 2022 to 2025, and 2.05% from 2026 to 2030. SB 2814 also sets a rate cap of 4%, allowing targets to be adjusted downward should utilities reach spending limits.	<a href="#">S.B. 1918</a> <a href="#">Public Act 96-0033</a> <a href="#">§ 220 ILCS 5/8-103</a> <a href="#">Case No. 13-0495</a> <a href="#">Case No. 13-0498</a> <a href="#">S.B. 2814</a>
8	Iowa 2009 Legislative IOUs (75%)	Incremental savings targets vary by utility from ~1.1-1.2% annually through 2018.	<a href="#">Senate Bill 2386</a> <a href="#">Iowa Code § 476</a> <a href="#">Docket EEP-2012-0001</a>

<sup>9</sup> Legislation governing EERS policies may not include specific targets. In many cases, referenced legislation requires or explicitly enables the state public utility commission to set targets.

	· State · Year enacted · Authority · Applicability (% sales affected) <sup>6</sup>	Electricity energy efficiency resource standard	Reference
9	Maine 2009 Legislative Statewide goal (100%)	Electric savings of 20% by 2020, with incremental savings targets of ~ 1.6% per year for 2014-2016 and ~2.4% per year for 2017-2019.  Efficiency Maine operates under an all cost-effective mandate.	<a href="#">Efficiency Maine Triennial Plan (2014-2016)</a> <a href="#">Efficiency Maine Triennial Plan (2017-2019)</a> <a href="#">H.P. 1128 - L.D. 1559</a>
10	Maryland 2008; 2015 Legislative through 2015, regulatory thereafter Electric IOUs (99%)	15% per-capita electricity use reduction goal by 2015 (10% by utilities, 5% achieved independently). 15% reduction in per capita peak demand by 2015, compared to 2007. After 2015, targets vary by utility, ramping up by 0.2% per year to reach 2% incremental savings.	<a href="#">Md. Public Utility Companies Code § 7-211</a> <a href="#">MD PSC Dockets 9153-9157</a> <a href="#">Order No. 87082</a>
11	Massachusetts 2009 Legislative IOUs, Co-ops, Muni's, Cape Light Compact (~86%)	Average incremental savings of 2.93% percent of electric sales for 2016-2018.  All cost-effective efficiency requirement.	<a href="#">D.P.U. 15-160 through D.P.U. 15-169</a> (MA Joint Statewide Three-Year Electric and Gas Energy Efficiency Plan 2016-2018) <a href="#">M.G.L. ch. 25, § 21;</a>
12	Michigan 2008 and 2016 Legislative Statewide Goal (100%)	1.0% incremental savings through 2021.	<a href="#">Act 295 of 2008</a> <a href="#">S.B. 438</a>
13	Minnesota 2007 Legislative Statewide Goal (100%)	1.5% incremental savings in 2010 and each year thereafter.	<a href="#">Minn. Stat. § 216B.241</a>
14	Nevada 2005 and 2009 Legislative IOUs (~62%)	20% of retail electricity sales to be met by renewables and energy efficiency by 2015, and 25% by 2025. Energy efficiency may meet a quarter of the standard through 2014, but is phased out of the RPS by 2025.	<a href="#">NRS 704.7801 et seq.</a> <a href="#">NRS 704.7801 as amended</a>
15	New Hampshire 2016 Regulatory Statewide goal (100%)	0.8% incremental savings in 2018, ramping up to 1.0% in 2019 and 1.3% in 2020.	<a href="#">NH PUC Order No. 25932, Docket DE 15-137</a>

	<ul style="list-style-type: none"> <li>· State</li> <li>· Year enacted</li> <li>· Authority</li> <li>· Applicability (% sales affected)<sup>6</sup></li> </ul>	Electricity energy efficiency resource standard	Reference
16	New Mexico 2008 and 2013 Legislative IOUs (68%)	5% reduction from 2005 total retail electricity sales by 2014, and an 8% reduction by 2020.	<a href="#">N.M. Stat. § 62-17-1 et seq.</a>
17	New York 2008, 2016 Regulatory Statewide Goal (100%)	<p>Under current Reforming the Energy Vision (REV) proceedings, utilities have filed efficiency transition implementation plans (ETIPS) with incremental targets varying from 0.4% to 0.9% for the period 2016–2018.</p> <p>In January, the PSC authorized NYSERDA's Clean Energy Fund (CEF) framework, which outlines a minimum 10-year energy efficiency goal of 10.6 million MWh measured in cumulative first year savings.</p> <p>The PSC issued a REV II Track Order in May prescribing that the Clean Energy Advisory Council also propose utility targets supplemental to ETIPS by October 2016. In response, the Council generated a report in November describing options for energy efficiency target setting, but did not yet offer a consensus recommendation. Some degree of overlap of program savings is anticipated between utility targets and NYSERDA CEF goals.</p>	<a href="#">NY PSC Order, Case 07-M-0548</a> <a href="#">NY PSC Case 14-M-0101</a> <a href="#">NY PSC Case 14-M-0252</a> <a href="#">2015 New York State Energy Plan</a> <a href="#">NY PSC Order Authorizing the Clean Energy Fund Framework</a> <a href="#">Energy Efficiency Metrics and Target Options Report (November 2016)</a>
18	North Carolina 2007 Legislative Statewide Goal (100%)	Renewable Energy and Energy Efficiency Portfolio Standard (REPS) requires renewable generation and/or energy savings of 6% by 2015, 10% by 2018, and 12.5% by 2021 and thereafter. Energy efficiency is capped at 25% of target, increasing to 40% in 2021 and thereafter.	<a href="#">N.C. Gen. Stat. § 62-133.8</a> <a href="#">04 NCAC 11 R08-64, et seq.</a>
19	Ohio 2008, 2014 Legislative IOUs (~89%)	Beginning in 2009, incremental savings of 0.3% per year, ramping up to 1% in 2014 and 2% in 2021. Savings targets resumed in 2017 following a “freeze” (S.B. 310) in 2015-2016 that allowed utilities that had achieved 4.2% cumulative savings to reduce or eliminate program offerings.	<a href="#">ORC 4928.66 et seq.</a> <a href="#">S.B. 221</a> <a href="#">S.B. 310</a>
20	Oregon 2010 Regulatory Energy Trust of Oregon (~70%)	Incremental targets average ~1.3% of sales annually for the period 2015-2019.	<a href="#">Energy Trust of Oregon 2015-2019 Strategic Plan</a> <a href="#">Grant Agreement between Energy Trust of Oregon and OR PUC</a>



	· State · Year enacted · Authority · Applicability (% sales affected) <sup>6</sup>	Electricity energy efficiency resource standard	Reference
21	Pennsylvania 2004 and 2008 Legislative Utilities with over 100,000 customers (~93%)	Varying targets have been set for IOUs amounting to yearly statewide incremental savings of 0.8% savings for 2016-2020. EERS includes peak demand targets. Energy efficiency measures may not exceed an established cost-cap.	<a href="#">66 Pa C.S. § 2806.1</a> ; <a href="#">PUC Order Docket No. M-2008-2069887</a> ; <a href="#">PUC Implementation Order Docket M-2012-2289411</a> <a href="#">PUC Final Implementation Order Docket M-2014-2424864</a>
22	Rhode Island 2006 Legislative IOUs, Muni's (~99%)	Incremental savings of 2.5% in 2015 2.55% in 2016, and 2.6% in 2017. EERS includes demand response targets. Utilities must acquire all cost-effective energy efficiency.	<a href="#">R.I.G.L § 39-1-27.7</a> <a href="#">Docket No. 4443</a>
23	Texas 1999 and 2007 Legislative IOUs (~73%)	20% incremental load growth in 2011 (equivalent to ~0.10% annual savings); 25% in 2012, 30% in 2013 onward. Peak demand reduction targets of 0.4% compared to previous year. Energy efficiency measures may not exceed an established cost cap.	<a href="#">Senate Bill 7</a> ; <a href="#">House Bill 3693</a> ; <a href="#">Substantive Rule § 25.181</a> <a href="#">Senate Bill 1125</a>
24	Vermont 2000 Legislative Efficiency Vermont, Burlington Electric (100%)	Average incremental electricity savings of about 2.1% per year from 2015 – 2017. EERS includes demand response targets. Energy efficiency utilities must set budgets at a level that would realize all cost-effective energy efficiency.	<a href="#">30 V.S.A. § 209</a> ; <a href="#">VT PSB Docket EEU-2010-06</a> <a href="#">Efficiency Vermont Triennial Plan 2015-17 (2016 Update)</a>
25	Washington 2006 Legislative IOUs, Co-ops, Muni's (~81%)	Biennial and Ten-Year Goals vary by utility. Law requires savings targets to be based on the Northwest Power Plan, which estimates potential incremental savings of about 1.5% per year through 2030 for Washington utilities. All cost-effective conservation requirement.	<a href="#">Ballot Initiative I-937</a> <a href="#">Energy Independence Act, Chapter 19.285.040</a> <a href="#">WAC 480-109-100</a> <a href="#">WAC 194-37</a> <a href="#">Seventh Northwest Power Plan (adopted 2/10/16)</a>
26	Wisconsin 2011 Legislative Statewide Goal (100%)	Focus on Energy targets include incremental electricity savings of ~0.81% of sales per year in 2015-2018. Energy efficiency measures may not exceed an established cost-cap.	<a href="#">Order, Docket 5-FE-100: Focus on Energy Revised Goals and Renewable Loan Fund (10/15)</a> <a href="#">Program Administrator Contract, Docket 9501-FE-120, Amendment 2 (3/16)</a> <a href="#">2005 Wisconsin Act 141</a>

Table 2. Natural gas EERS policy status by state

	· State · Year enacted · Authority · Applicability (% sales affected)	Natural gas energy efficiency resource standard	Reference
1	Arizona 2010 Regulatory IOUs (~85%)	~0.6% incremental savings per year (for cumulative savings of 6% by 2020).	<a href="#">Docket No. RG-00000B-09-0428 Dec. No. 71855</a>
2	Arkansas 2010 Regulatory IOUs (~60%)	Annual incremental reduction target of 0.50% for 2017-2019 for natural gas IOUs.	<a href="#">Order No. 15, Docket No. 08-137-U</a> <a href="#">Order No. 1, Docket No. 13-002-U</a> <a href="#">Order No. 7, Docket No. 13-002-U</a> <a href="#">Order No. 31, Docket No. 13-002-U</a>
3	California 2004 and 2009 Legislative IOUs (~82%)	Incremental savings target of 0.42% for natural gas. Utilities must pursue all cost-effective efficiency resources.  In October 2015, California enacted SB 350, calling on the California Energy Commission, California Public Utilities Commission, and publicly owned utilities to work together to double cumulative efficiency savings achieved by 2030.	<a href="#">CPUC Decision 04-09-060</a> <a href="#">CPUC Decision 08-07-047</a> <a href="#">CPUC Decision 14-10-046</a> <a href="#">CPUC Decision 15-10-028</a> <a href="#">AB 995</a> <a href="#">SB 350 (10/7/15)</a>
4	Colorado 2007 Legislative IOUs (~72%)	Savings targets commensurate with spending targets (at least 0.5% of prior year's revenue).	<a href="#">Colorado Revised Statutes 40-3.2-101, et seq.</a> <a href="#">Docket 10A-554EG</a> <a href="#">Docket No. 13A-0686EG Dec. C14-0731</a>
5	Connecticut 2007 & 2013 Legislative IOUs (100%)	Average incremental savings of 0.61% per year from 2016 through 2018.  Utilities must pursue all cost-effective efficiency resources.	<a href="#">Public Act No. 13-298</a>  <a href="#">2016-2018 Electric and Natural Gas Conservation and Load Management Plan</a>
6	Illinois 2007 Legislative Utilities with over 100,000 customers, Illinois DCEO (~88%)	8.5% cumulative savings by 2020 (0.2% incremental savings in 2012, ramping up to 1.5% in 2019).	<a href="#">S.B. 1918</a> <a href="#">Public Act 96-0033</a> <a href="#">§ 220 ILCS 5/8-103</a> <a href="#">Case No. 13-0495</a> <a href="#">Case No. 13-0498</a> <a href="#">S.B. 2814</a>
7	Iowa 2009 Legislative IOUs (100%)	Incremental savings targets vary by utility, ~0.66% -1.2% annually through 2018.	<a href="#">Senate Bill 2386</a> <a href="#">Iowa Code § 476</a> <a href="#">Docket EEP-2012-0001</a>

	<ul style="list-style-type: none"> <li>· State</li> <li>· Year enacted</li> <li>· Authority</li> <li>· Applicability (% sales affected)</li> </ul>	Natural gas energy efficiency resource standard	Reference
8	Maine 2009 Legislative Efficiency Maine (100%)	Incremental savings of ~0.2% per year for 2017-2019. Efficiency Maine operates under an all cost-effective mandate.	<a href="#">Efficiency Maine Triennial Plan (2014-2016)</a> <a href="#">Efficiency Maine Triennial Plan (2017-2019)</a> <a href="#">H.P. 1128 – L.D. 1559</a>
9	Massachusetts 2009 Legislative IOUs, Co-ops, Muni's (100%)	Average incremental savings of 1.24% per year for 2016-2018. All cost-effective efficiency requirement.	<a href="#">D.P.U. Order 09-121 through 09-128</a> <a href="#">D.P.U. Order 12-100 through 12-111</a> <a href="#">M.G.L. ch. 25, § 21;</a>
10	Michigan 2016 Legislative Statewide Goal (100%)	Incremental savings of 0.75% through 2021.	<a href="#">Act 295 of 2008</a> <a href="#">S.B. 438</a>
11	Minnesota 2007 Legislative Statewide Goal (100%)	0.75% incremental savings per year in 2010-2012; 1% incremental savings in 2013 and each year thereafter.	<a href="#">Minn. Stat. § 216B.241</a>
12	New Hampshire 2016 Regulatory Statewide Goal (100%)	0.7% incremental savings in 2018; 0.75% in 2019; and 0.8% in 2020.	<a href="#">NH PUC Order No. 25932, Docket DE 15-137</a>
13	New York 2008, 2016 Regulatory Companies with 14,000+ customers (~100%)	Under current Reforming the Energy Vision (REV) proceedings, utilities have filed efficiency transition implementation plans (ETIPS) with incremental targets averaging 0.28% for the period 2016–2018.  In January, the PSC authorized NYSERDA's Clean Energy Fund (CEF) framework, which outlines a minimum 10-year energy efficiency goal of 13.4 million MMBtus measured in cumulative first year savings.  The PSC issued a REV II Track Order in May prescribing that the Clean Energy Advisory Council also propose utility targets supplemental to ETIPS by October 2016. In response, the Council generated a report in November describing options for energy efficiency target setting for electricity. The	<a href="#">NY PSC Order, Case 07-M-0548</a> <a href="#">NY PSC Case 14-M-0101</a> <a href="#">NY PSC Case 14-M-0252</a> <a href="#">2015 New York State Energy Plan</a> <a href="#">NY PSC Order Authorizing the Clean Energy Fund Framework</a> <a href="#">Energy Efficiency Metrics and Target Options Report (November 2016)</a>

	<ul style="list-style-type: none"> <li>· State</li> <li>· Year enacted</li> <li>· Authority</li> <li>· Applicability (% sales affected)</li> </ul>	Natural gas energy efficiency resource standard	Reference
		report did not consider natural gas efficiency, although it noted that gas efficiency targets should exist and should be developed after electricity targets are determined.	
14	Oregon 2010 Regulatory Energy Trust of Oregon (~89%)	Incremental savings of 0.3% of sales annually for the period 2015-2019.	<a href="#">Energy Trust of Oregon 2015-2019 Strategic Plan</a> <a href="#">Grant Agreement between Energy Trust of Oregon and OR PUC</a>
15	Rhode Island 2006 Legislative IOUs, Muni's (100%)	Incremental savings of 1% in 2015, 1.05% in 2016, and 1.1% in 2017. Utilities must acquire all cost-effective energy efficiency.	<a href="#">R.I.G.L § 39-1-27.7</a> <a href="#">Docket No. 4443</a>
16	Wisconsin 2011 Legislative Statewide Goal (100%)	Focus on Energy targets include incremental natural gas savings of ~0.6% of sales per year in 2015-2018. Energy efficiency measures may not exceed an established cost-cap.	<a href="#">Order, Docket 5-FE-100: Focus on Energy Revised Goals and Renewable Loan Fund (10/15)</a> <a href="#">Program Administrator Contract, Docket 9501-FE-120, Amendment 2 (3/16)</a> <a href="#">2005 Wisconsin Act 141</a>

For more information on energy efficiency resource standards, please visit <http://aceee.org/topics/energy-efficiency-resource-standard-eers>

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Staff Cycle 3 EO Summary (\$)

	PY2019		PY2020		PY2021		PY2022		PY2023		PY2024		Total Cycle 3	
	Target	Maximum	Target	Maximum	Target	Maximum	Target	Maximum	Target	Maximum	Target	Maximum	Target	Maximum
Low-Income Multifamily	\$ 333,333	\$ 433,333	\$ 500,000	\$ 650,000	\$ 500,000	\$ 650,000	\$ 500,000	\$ 650,000	\$ 500,000	\$ 650,000	\$ 500,000	\$ 650,000	\$ 2,833,333	\$ 3,683,333
Low-Income Single Family (Excluding Efficiency Home Grants)	\$ 333,333	\$ 433,333	\$ 333,333	\$ 433,333	\$ 333,333	\$ 433,333	\$ 333,333	\$ 433,333	\$ 333,333	\$ 433,333	\$ 333,333	\$ 433,333	\$ 2,000,000	\$ 2,600,000
Home Energy Report	\$ 264,375	\$ 343,688	\$ 264,375	\$ 343,688	\$ 264,375	\$ 343,688	\$ 264,375	\$ 343,688	\$ 264,375	\$ 343,688	\$ 264,375	\$ 343,688	\$ 1,586,250	\$ 2,062,125
Residential Lighting	\$ 146,064	\$ 189,883	\$ 152,344	\$ 198,047	\$ 129,674	\$ 168,576	\$ 65,450	\$ 85,085	\$ 15,281	\$ 19,865	\$ 14,220	\$ 18,486	\$ 523,034	\$ 679,944
EE MWh	\$ 4,645,164	\$ 6,967,746	\$ 7,190,990	\$ 10,786,486	\$ 8,799,728	\$ 13,199,592	\$ 9,697,022	\$ 14,545,534	\$ 9,877,128	\$ 14,815,692	\$ 9,876,630	\$ 14,814,945	\$ 50,086,662	\$ 75,129,993
EE Coincident MW <10 Year EUL	\$ 89,881	\$ 116,846	\$ 160,550	\$ 208,715	\$ 182,834	\$ 237,684	\$ 202,111	\$ 262,744	\$ 206,348	\$ 268,252	\$ 200,305	\$ 260,397	\$ 1,042,029	\$ 1,354,637
EE Coincident MW >=10 Year EUL	\$ 3,854,845	\$ 5,782,267	\$ 5,643,949	\$ 8,465,923	\$ 6,698,247	\$ 10,047,371	\$ 7,566,522	\$ 11,349,784	\$ 7,906,464	\$ 11,859,695	\$ 8,161,704	\$ 12,242,556	\$ 39,831,731	\$ 59,747,596
DR Cumulative Enrolled MW	\$ 481,486	\$ 625,932	\$ 987,238	\$ 1,283,410	\$ 2,898,017	\$ 3,767,422	\$ 3,495,561	\$ 4,544,230	\$ 4,223,535	\$ 5,490,596	\$ 5,012,173	\$ 6,515,825	\$ 17,098,010	\$ 22,227,413
<b>Total</b>	<b>\$ 10,148,482</b>	<b>\$ 14,893,028</b>	<b>\$ 15,232,780</b>	<b>\$ 22,369,602</b>	<b>\$ 19,806,208</b>	<b>\$ 28,847,665</b>	<b>\$ 22,124,375</b>	<b>\$ 32,214,397</b>	<b>\$ 23,326,463</b>	<b>\$ 33,881,121</b>	<b>\$ 24,362,741</b>	<b>\$ 35,279,230</b>	<b>\$ 115,001,049</b>	<b>\$ 167,485,043</b>
												<b>Annual Average</b>	<b>\$ 19,166,842</b>	<b>\$ 27,914,174</b>

**SCHEDULE JAR-r3**

**HAS BEEN DEEMED**

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## Revised Appendix A

Performance Metric	Ameren Missouri						
	Payout Rate	Payout Unit	% of Target EO	100% payout	Target @ 100%	Cap/100% Multiplier	Cap
Home Energy Report criteria will be effective, prudent spend of budget	n/a		7.19%	\$ 2,000,000			\$ 2,000,000
EE MWh (Excl. Home Energy Report, TStat & LIMF): criteria will be the cumulative of the 1st yr incremental MWh during the 3 year plan	\$ 7.50	\$/MWh	15.11%	\$ 4,201,935	560,258	130%	\$ 5,462,516
EE Coincident MW (Excl. Home Energy Report, TStat & LIMF): criteria will be cumulative of the 2023 MW reduction, coincident with system peak	\$ 141,428.57	\$/MW	71.22%	\$ 19,800,000	140	150%	\$ 29,700,000
Number of Learning Thermostats Installed	\$ 30.62	\$/Unit	1.80%	\$ 500,000	16,331	150%	\$ 750,000
Low Income Multi-Family (LIMF) and Low Income Assistance Program: criteria will be effective, prudent spend of budget	n/a		4.68%	\$ 1,300,000			\$ 1,300,000
				<b>\$ 27,801,935</b>			<b>\$ 39,212,516</b>
Total Cap Including TD Adjustments							\$ 54,212,516

**SCHEDULE JAR-r5**

**HAS BEEN DEEMED**

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**SCHEDULE JAR-r6**

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Missouri from Moody's Analytics, along with forecasts of each variable for the entire planning horizon.<sup>9</sup>

The following discusses only the independent variables used in the energy usage forecasts, since the peak load forecast comes from further processing the energy forecast. The growth rates in peak demand are driven by the energy forecasts for each class and end use as described later in this chapter, so the same economic variables used in the energy forecast are also being used to forecast the peak loads.

The prior projections involved in addressing this requirement are from the 2005 IRP, the 2008 IRP, the 2011 IRP, the 2012 Annual Update, the 2013 Annual Update, and the 2014 IRP. Besides these prior projections, projections for this 2017 IRP are included. Sales volume shown for the 2017 IRP includes the actuals for years up to 2016 and projections starting from 2018.

In some cases, the data vendor may have changed the 'base year' for the independent variables' values. In addition, between certain IRP's, Ameren Missouri has changed its methodology for weighting county level variables into a service territory indicator, so the absolute level of the values for the same year among various vintages may be significantly different. However, the key is the growth rate or trend in these values, so each table is expressed in terms of the year over year growth rate and is accompanied by a chart showing the same, which overcomes the problem of sometimes relying on different bases for some of the variables.

For the residential energy forecast, independent variables used in these forecasts were Households, Population, and Personal Income. For the commercial and industrial energy forecasts, independent variables used in these forecasts were total GDP and GDP for several sectors of the economy, including Manufacturing, Retail Trade, Information Services, Financial Services, Education/Health Services, total non-farm employment, and manufacturing employment. Service territory GDP variables from each archived forecast are shown below in Figure 3.1. The growth rates for each of the variables discussed above is shown in chart and tabular form in Appendix A.

### Forecasts<sup>10</sup>

Section 4 CSR 240-22.030(6)(C)4 requires a comparison of prior projections of energy and peak demand made in at least the last 10 years to the actual historical energy and peak demands and to projected values in the current IRP filing.

Figures 3.2 and 3.3 below show previous forecasts of energy and peak demand, including those for the 2005 IRP, 2008 IRP, 2011 IRP, 2012 Update, 2013 Update, the 2014 IRP,

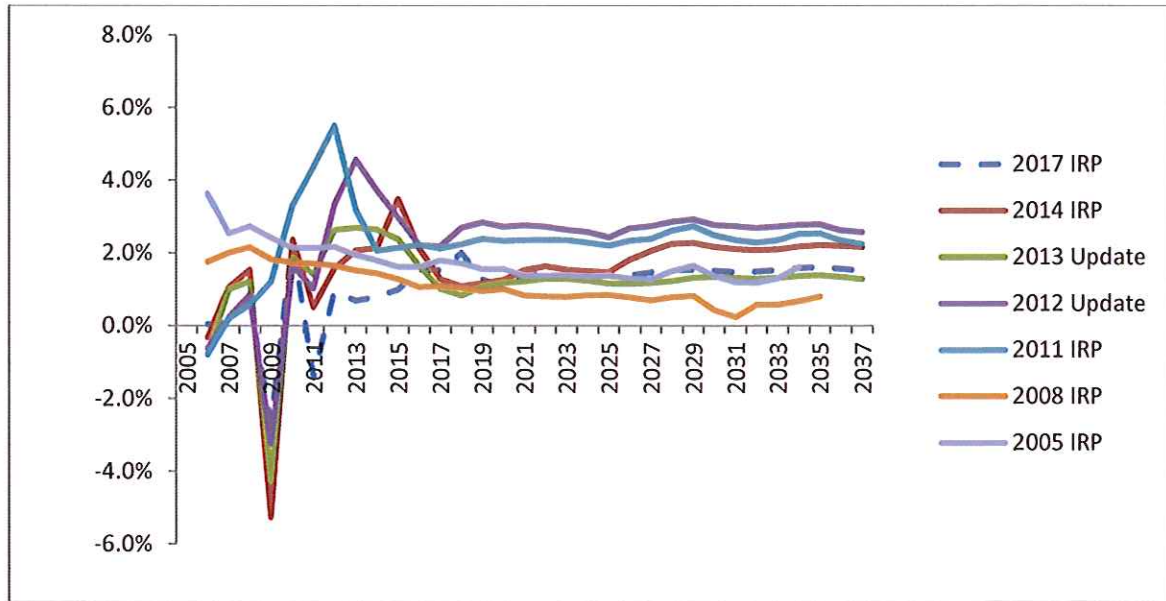
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<sup>9</sup> 4 CSR 240-22.030(6)(C)1

<sup>10</sup> 4 CSR 240-22.030(6)(C)4

the 2017 IRP and actual historical values. The data from these charts are presented in tabular form in Appendix A.

**Figure 3.1: Ameren Missouri Service Territory GDP Forecasts from Prior IRP Forecasts**



**Figure 3.2: Ameren Missouri Actual Historical Energy Sales and Past IRP Energy Forecasts**

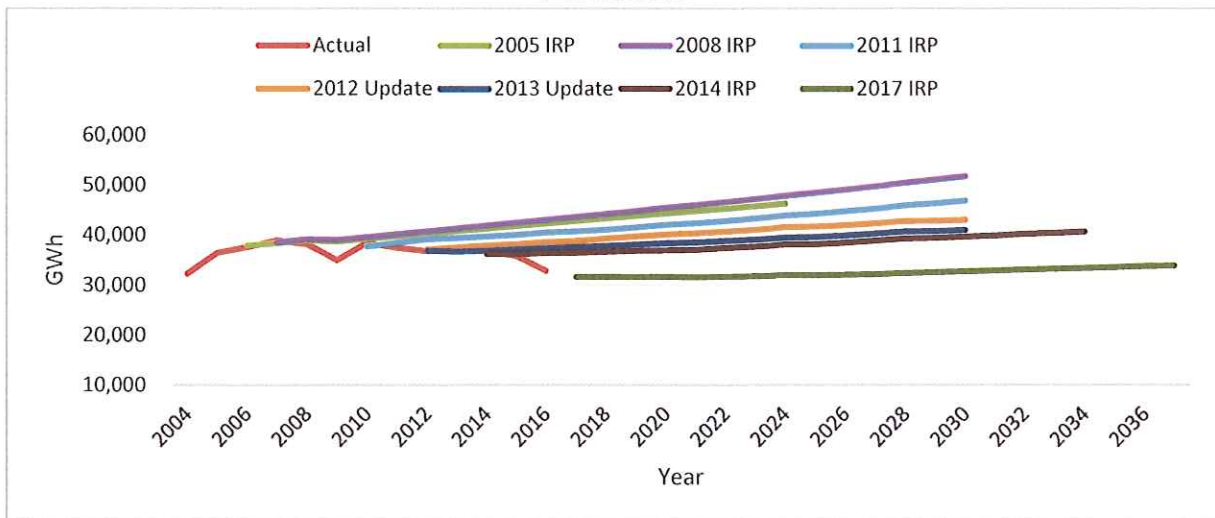
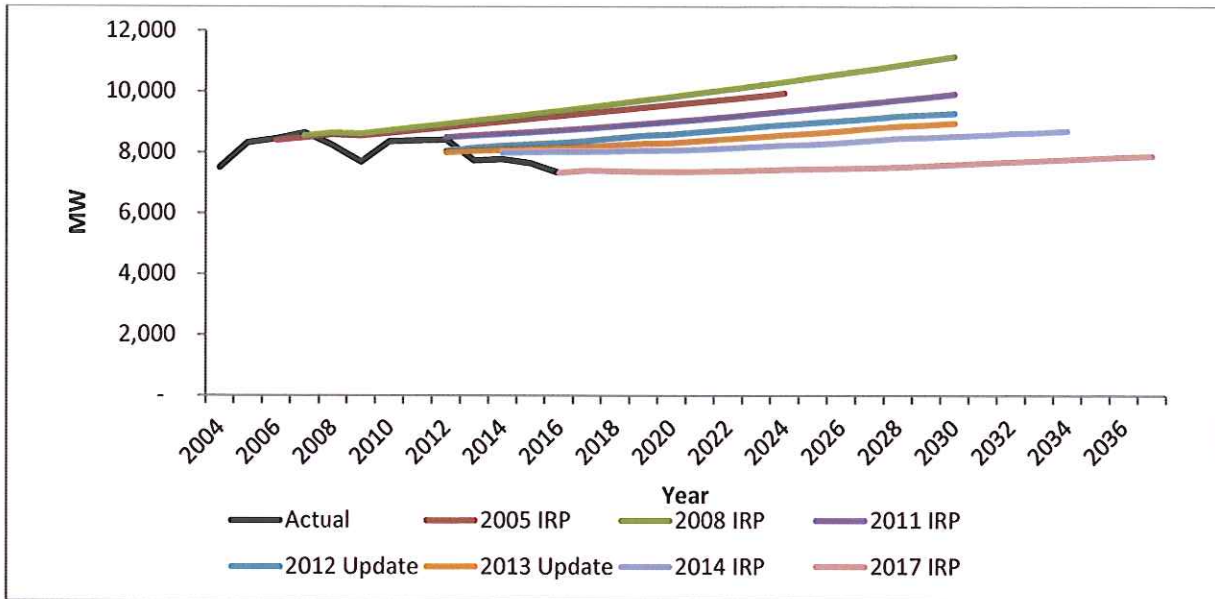




Figure 3.3: Ameren Missouri Actual Historical Peak Demand and Past IRP Peak Demand Forecasts



As is evident from the forecasts in the tables, the projections of both energy consumption and peak demand have decreased quite significantly over time. This is due to three factors. First, increases in the efficiency of end uses of electricity has reduced electric consumption relative to the earlier projections. As an example, the Energy Independence and Security Act of 2007 included an efficiency standard for light bulbs that significantly reduces the energy consumption associated with lighting. This and other standards, as well as the energy efficiency programs under the MEEIA that have already been implemented by Ameren Missouri have served to reduce the rate of growth in energy and peak demand below what they otherwise would have been. Secondly, Ameren Missouri anticipates a significant increase in customer-owned solar and other distributed sources of energy over next 20 years which negatively impacts both the energy and peak forecast. Ameren Missouri's base forecast reflects 622 MW of installed customer owned solar generation within its territory by 2037. Finally, past IRP forecasts included sales to one of the largest aluminum smelting facilities in the country amounting more than 10% of annual sales when the customer operated at its full capacity. Due to the current state of operations at the smelter, Ameren Missouri did not include this customer in its forecast scenarios. The possibility of restored operations at the smelter is considered as part of a sensitivity case in Chapter 10.

Ameren Missouri has also assumed a significant increase in the adoption of electric vehicles and electrification of end uses in its territory over next 20 years. Adoption of electric vehicles is assumed to increase at an annual rate of approx. 17% over the planning horizon.