Ameren Missouri

Renewable Energy Standard Compliance Plan 2023-2025

Prepared in Compliance with 20 CSR 4240-20.100

April 15, 2023

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Introduction

The Missouri Renewable Energy Standard (RES) began as a public initiative and was placed on the Missouri ballot during the November 4, 2008 election. Labeled as Proposition C, it required Ameren Missouri to acquire renewable energy resources as a percentage of total retail sales.

As part of the statute and rulemaking, Section (8) (A) required investor-owned utilities to file a report demonstrating how compliance was met in the previous calendar year, and Section (8) (B) requires investor-owned utilities to file a plan that covers their intended compliance measures for the current year plus the following 2 years.

Compliance with RES can be achieved using RECs from qualified renewable generation resources (wind, hydro, biomass, solar etc.) certified by the Missouri Department of Natural Resources (MoDNR). The MoDNR Division of Energy is responsible for providing renewable certification. The RES requires a percentage of RECs come from designated solar resources or (S-RECs).

The RES allows for two methods to achieve compliance. The first is based on providing enough RECs to meet the requirement, and the other is related to the 1% rate cap calculation. A utility will be in compliance with the RES if the cost of compliance is equal to or greater than the 1% rate cap calculation. Thus, a utility could fall short of meeting the RECs requirement, but if the 1% calculation is met, then the utility is in full compliance.

The following table details the renewables percentage requirements of retail electric sales for the non-solar and solar RES:

Time Period	Total Renewable Requirement	Solar*
2011-2013	2%	2%
2014-2017	5%	2%
2018-2020	10%	2%
2021-forward	15%	2%

*Solar percentages are applied to the Total Renewable Requirement RES amounts

As referenced above, the MoDNR is responsible for certifying all eligible renewable resources that can be utilized to meet the RES requirement. MoDNR rule 10 CSR 140-8.010 (2), contains the list of renewable resources eligible to achieve RES compliance.

Ameren Missouri's compliance with the RES, as demonstrated in this report, adheres to the use of only those renewable resources as currently defined by the above referenced rule.

In addition, the RES rules allow for the banking of RECs for up to a three-year time period. This will allow for the use of eligible RECs generated from January 1, 2019 to the end of 2022 in meeting the RES requirements for calendar year 2022. Any generation and/or

RECs from a Missouri renewable resource are entitled to a factor of 1.25 applied to each MWh or REC.

The following information in this report demonstrates the specific means by which Ameren Missouri intends to meet its obligations under both the non-solar and solar RES for the calendar years 2023-2025.

Section (8) (B) 1 A: Planned Actions to Comply

Non-Solar RES

Ameren Missouri currently operates or has contracted for generation with the following eligible renewable resources:

- Keokuk Hydro-Electric Generation Station
- Horizon (EDPR) Pioneer Prairie I Wind Farm
- Maryland Heights Renewable Energy Center (Landfill Gas)
- High Prairie Renewable Energy Center (Wind)
- Atchison County Renewable Energy Center (Wind)

The Ameren Missouri Keokuk Hydro-Electric Generation Station is located on the Mississippi River in Keokuk, Iowa. The station consists of 15 separate generators.The individual nameplate ratings range from 7.2 to 8.8 megawatts (MWs). This generation facility is wholly owned by Ameren Missouri and has been operational since 1913. Due to fluctuations in river flows, generation can range from approximately 738,833 to 1,017,277 MWh annually.

In June 2009, Ameren Missouri and Pioneer Prairie Wind Farm I LLC entered into a 15-year power purchase agreement. Ameren Missouri is purchasing 102.3 MWs of generation from the Pioneer Prairie Wind Farm consisting of 65 turbines located in Northeast Iowa. The facility site covers approximately 10,000 acres of land located in Mitchell County, Iowa in Wayne and Stacyville Townships. Over the last five years, the facility has produced 269,104 MWhs on average annually. The Pioneer Prairie power purchase agreement will expire on August 31, 2024.

On June 16, 2012, the Maryland Heights Renewable Energy Center (MHREC) became commercially operational. This facility burns methane gas produced by the IESI Landfill in Maryland Heights, Missouri in three Solar 4.9 MW Mercury 50 gas turbines to produce electricity. In recent years, the generation has ranged from 34,495 to 67,284 MWh annually. In accordance with RSMo 393.1030, a factor of 1.25 is applied to the in-state generation from this facility such that the expected generation counts as 43,119 to 84,105 MWh towards the compliance requirements.

On December 23, 2020, the 400 MW High Prairie Renewable Energy Center (HPREC) became commercially operational. This wind farm is in Adair and Schuyler counties, Missouri and consists of 175 wind turbines covering about 50,000 acres. The estimated generational output is approximately 945,033 MWh to 1,351,200 MWh annually, weather dependent. In accordance with RSMo 393.1030, a factor of 1.25 is applied to the in-state generation from this facility such that the expected generation counts as 1,181,291 to 1,689,000 MWh towards the compliance requirements.

On March 2, 2021, the Atchison County Renewable Energy Center (AREC) became operational at a reduced capacity of 120.0 MW and by December 22, 2021 reached its full

operational capacity of 298.6 MW. This wind farm is located in Atchison County Missouri and consists of 91 turbines covering about 30,000 acres. The estimated generational output is approximately 866,400 MWh to 1,099,600 MWh annually, weather dependent. In accordance with RSMo 393.1030, a factor of 1.25 is applied to the in-state generation from this facility such that the expected generation counts as 1,083,000 to 1,374,500 MWh towards the compliance requirements.

Solar RES

In late 2010, Ameren Missouri completed the installation of approximately 100 kilowatts (kW) of solar generation capacity at its headquarters facility located in St. Louis. Generation from this facility will be utilized to help meet the solar requirements of the RES.

In addition, Ameren Missouri filed a Standard Offer Contract (SOC) tariff with the PSC in November 2011. This tariff became effective on January 1, 2012. Under the terms of the tariff, Ameren Missouri bought S-RECs from its electric customers who installed or are installing net metered solar facilities (100 kW or less) at their homes and/or businesses. The price per S-REC was $50 per S-REC and the program was funded to a total of $2.0 million. The program was fully subscribed in 2012.

Based on the success of the program, a revised tariff was filed in November 2012 with additional funding of $1.0 million to continue the purchase of S-RECs from customers during the 2013 calendar year. Due to various factors influencing pricing for installations, the price per S-REC was reduced to $5 per S-REC. For systems 10 kW or larger installed prior to January 1, 2013, a five-year contract was used but an additional meter was required, and customers are paid based on actual production. For systems 10 kW or larger installed after January 1, 2013 and before August 28, 2013, the contract term was extended to 10 years. Due to the implementation of the provisions associated with House Bill 142 (HB 142), systems greater than 10 kW that are installed after August 28, 2013 no longer require a second meter and their generational output is determined in the same fashion as systems less than 10 kW, utilizing the PV Watts formula.

However, on August 28, 2013, due to the passage of HB 142, the RES law was amended. That amendment provided that if a customer accepts a solar rebate from the utility, the S-RECs transfer to the utility.

In 2018, Senate Bill 564 (SB 564) became law. One of the provisions of this law is that up to $28 million in solar rebates be made available to customers that install solar generation on their property between 2019-2023. Ameren Missouri expects to receive the S-RECs from these customer-owned resources pursuant to the provisions of SB 564.

Ameren Missouri estimates that in 2023 approximately 200,000 S-RECs will be acquired from customers, and from 2024-2025 approximately 100,000 S-RECs per year will be acquired from customer generators. 2023 customer S-RECs are expected to be higher due to the late certification of customer installations from 2020-2022, which is expected to

provide additional S-RECs that will be utilized in 2023. In accordance with RSMo 393.1030, a factor of 1.25 is applied to the in-state generation from these facilities such that the expected generation counts as 125,000 to 250,000 S-RECs annually towards the compliance requirements. Solar rebate costs have been included as a RES compliance cost and are accounted for in the Company's 1% calculation, although given recent rebate payment levels the expected total rebate spend has been reduced from $28 million to just over $21 million by 2023.

In addition to solar rebate payments, SB 564 requires Ameren Missouri to invest at least $14 million in additional utility-owned solar generation. The $14 million will be utilized to support community-based projects through Ameren Missouri's Neighborhood Solar Program. On July 21, 2021 the South St. Louis Renewable Energy Center (REC) became commercially operational – the first solar facility supported by the Neighborhood Solar Program. And on July 20, 2022, the Cape Girardeau Renewable Energy Center (REC) became commercially operational. Additional solar resources are planned for construction in 2023 through the Neighborhood Solar Program, with an expected annual generational output of 4,085 MWh by 2024 for all program resources combined. In accordance with RSMo 393.1030, a factor of 1.25 is applied to the in-state generation from these facilities such that the expected generation counts as 5,107 MWh towards the compliance requirements.

Ameren Missouri completed construction on its first utility-scale solar generation project, the O'Fallon Renewable Energy Center (OREC) in November 2014. This 5.7 MW (DC) facility is located at the site of the Ameren Missouri O'Fallon substation in O'Fallon, Missouri. The expected annual output for 2023-2025 is approximately 5,776 MWh based on the last five years of historical performance data. In accordance with RSMo 393.1030, a factor of 1.25 is applied to the in-state generation from this facility such that the generation counts as 7,221 MWh towards the compliance requirements.

On September 16, 2019, the BJC Solar Facility became commercially operational. This facility is 1.8 MW (DC) PV project located on the top of an existing parking garage at Barnes Jewish Hospital in St. Louis, MO. The total generational output of this facility during CY 2022 was 1,708 MWh and is assumed to remain at a similar level for years 2023-2025. In accordance with RSMo 393.1030, a factor of 1.25 is applied to the in-state generation from this facility such that the expected generation counts as 2,135 MWh towards the compliance requirements.

Planned Actions

For the 2023-2025 compliance years, Ameren Missouri will continue to utilize the generational output from the Keokuk, MHREC, Pioneer Prairie, HPREC, and AREC facilities to meet non-solar RES compliance. Ameren Missouri will continue to place RECs associated with the actual generation from these facilities into the North American Renewable Registry (NAR) account.

For the 2023-2025 compliance years, Ameren Missouri will continue to use the generational output from OREC, BJC Solar, Neighborhood Solar facilities, and the S-RECs received from Ameren Missouri customer generators to meet solar RES compliance. Ameren Missouri will continue to place RECs associated with the actual generation from these facilities into the NAR account. In addition, on February 8, 2023, Ameren Missouri was issued a certificate of convenience and necessity to construct and own the Huck Finn Solar Project, a 200 MW solar resource located in Audrain and Ralls County, MO. The Huck Finn Solar Project will be utilized to meet RES compliance as soon as the facility comes online, which is expected in late 2024. The estimated generational output for Huck Finn Solar is approximately 411,979 MWh to 466,207 MWh annually, weather dependent. In accordance with RSMo 393.1030, a factor of 1.25 is applied to the in-state generation from this facility such that the expected generation counts as 514,974 to 582,759 MWh towards the compliance requirements.

Existing solar resources are expected to be sufficient to fulfill the solar RES requirement in each year from 2023-2025. Excess S-RECs can then be utilized to meet non-solar compliance in each period. However, even after the addition of Huck Finn Solar a shortfall in non-solar compliance is expected in all years (2023-2025). As noted above, the annual renewable generation for solar, wind, and hydroelectric resources is subject to significant year over year variation based on weather. To account for this variation, Ameren Missouri assesses multiple production levels for RES compliance facilities by modeling expected renewable generation output at higher probability of exceedance levels, to ensure compliance will be met on an annual basis[1]. To that end, Tables 2-4 reflect estimated generational output at approximately a P-90 production level for Ameren Missouri's largest compliance assets: High Prairie REC, Atchison REC, Keokuk, and Huck Finn Solar.

Actual retail load can also fluctuate annually, potentially causing a higher or lower required compliance level than forecasted. Ameren Missouri will continue to utilize spot market REC purchases in the short term (2023-2025) to meet compliance and will add the Huck Finn Solar Project to its generation portfolio in late 2024. In the attached model, *10 yr MO Compliance Model 2023_32*, Huck Finn Solar is modeled to come on-line January 1, 2025, and helps offset the loss of the Pioneer Prairie I Wind power purchase agreement which expires in 2024. To manage the projected shortfall beyond the addition of Huck Finn Solar, a 175 MW solar facility is modeled to come online in 2027. Ameren Missouri will continue to monitor the compliance position to determine if it is appropriate to add additional renewable resources to meet compliance over the coming years.

[1] Probability of exceedance levels ("p-levels") refer to the likelihood that the output of the resource will be above a specified level of MWh in any given year. A P-75 value indicates that in 75% of performance years, the output is expected to be above a specified level. Likewise, a P-90 value indicates that in 90% of performance years, resource output will be above the specified value. Therefore, an increase in the exceedance probability decreases the expected output.

Table 1. Compliance Requirements

	2023	2024	2025
Projected Retail Electric Load(MWh)	30,887,873	30,691,386	30,367,805
Renewable Requirement(%)	15%	15%	15%
Non-Solar	14.7%	14.7%	14.7%
Solar	0.3%	0.3%	0.3%
RES Requirement (MWh)	4,633,181	4,603,708	4,555,170
Non-Solar	4,540,517	4,511,634	4,464,067
Solar	92,664	92,074	91,103

** *Table 2. Non-Solar Compliance Resources* **

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Table 3. Solar Compliance Resources

Resource Ou.tout \'MWi	2023	2024	2025
O'Fallon REC*	7,221	7,184	7,148
AMO Headquarters Solar*	105	104	104
BJC Solar*	2,124	2,114	2,104
Neighborhood Solar*	3,944	5,107	5,081
Huck Finn Solar*			545,418
Customer-Owned Solar*	253,490	145,204	123,759
Solar REC Bank Rollover*			
TOTAL Solar	266,883	159,714	683,614

**Includes 1.25 MO adjustment*

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Table 4. Compliance Position Overl(Under)

	2023	2024	2025
Non-Solar	(725,276)	(771,528)	(925,789)
Solar	174,220	67,639	592,511
Total Compliance Position *(P-90 production level)*	**(551,057)**	**(703,888)**	**(333,278)**

Section (8) (B) 1 B: List of Executed Contracts

Table 5. List of Executed Contracts, 2023-2025

Contractin2 Party	Resource Type	Contract Type	Contract Duration	Time Period	Expected RECs	Contract Term
Horizon Pioneer Praide I	Wind	Energy and RECs	15 years	2023 2024	** ** ** **	Contract will expire on 8/31/2024
Vaiious Residential & Commercial Customers[2]	Solar	S-REC only	10 years	2023 2024 2025	253,490 145,204 123,759	

Ameren Missouri has executed only one third-party conb:act (2009) associated with the purchase and delively of renewable energy to the Ameren Missouri system that is being used to meet the non-solai· RES compliance provisions. This is a 15-year power purchase agreement between Ameren Missouri and Horizon's Pioneer Prairie Wind Faim.

Through the time period ending August 28, 2013, Ameren Missouri executed 1,965 agreements with its customers who have installed small scale solai· net metered systems and have chosen to accept the telms and conditions of the Standai·d Offer Contract (SOC). However, on August 28, 2013, due to the passage of HB 142, the RES law was amended. That amendment provided that if a customer accepts a solar rebate from the utility, the S-RECs transfer to the utility. Due to this change, the program was discontinued, and the $1.0 million Standard Offer Contract cap was not reached.

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[2] All S-RECs procured from customers are entitled to the additional in-state factor of 1.25 and the figures in this table reflect the total including the 1.25 factor.

Section (8) (B) 1 C: Projected Retail Sales by Year

Please see Table 1 for Ameren Missouri's projected retail sales by year.

Section (8) (B) 1 D: Comparison to Preferred Resource Plan

The RES Compliance Plan detailed in this report is consistent with the Change in Preferred Resource Plan filed by Ameren Missouri June 22, 2022.

Section (8) (B) 1 E: RES Compliance Plan Cost

The ability to utilize renewable resources that currently exist in rate base places Ameren Missouri and its customers in a unique position regarding compliance cost. As provided in the RES statute and rule, though the megawatt hours from these renewable resources can be utilized to meet the compliance requirements, some costs were incurred prior to the compliance requirements and are already included in the current rate base. Consequently, these particular renewable resources will have no cost applicable to RES compliance and therefore will result in no cost impact to the plan or the rate cap limitation of 1%.

The cost of the RES Compliance Plan for the 2023-2025 Compliance Plan periods is comprised of the following items:

- Solar Rebates paid to residential and commercial customers
- Purchase of solar RECs from residential and commercial customers
- Cost to register RECs with the North American Renewable Registry
- Fixed, Fuel and O&M associated with the MHREC
- Fixed and O&M costs associated with the Ameren Headquarters Solar, Huck Finn Solar, OREC, HPREC, and AREC
- Purchase of RECs

Standard Offer Contract

The price per REC ($5 per MWh) that was offered under the Ameren Missouri Standard Offer Contract was determined by taking into account the total cost to install solar in the region, the rebate required by statute and the eligibility for the federal tax credit in 2013. Total funding for the 2013 program was capped at $1 million.

However, on August 28, 2013, due to the passage of HB 142, the RES law was amended. That amendment provided that if a customer accepts a solar rebate from the utility, the S-RECs transfer to the utility. Due to this change, the program was discontinued, and the $1 million Standard Offer Contract cap was not reached.

Solar Rebates

Solar rebates required by RSMo 393.1030 were at $2.00 per watt and limited to an individual maximum of $50,000. This amount per watt was adjusted downward based on the provisions of HB 142. The rebate amount was reduced to $1.50 per watt for systems

that became operational between July 1, 2014, and June 30, 2015. A further reduction was made to $1.00 per watt for systems that became operational between July 1, 2015 and June 30, 2016 and to $0.50 per watt for systems that become operational between July 1, 2016 and June 30, 2019; and $0.25 per watt for systems that become operational between July 1 2019, and June 30, 2020. SB 564 subsequently provided for a new funding requirement for utilities and extended the $0.25 per watt rebate to systems installed on or before December 31, 2023.

On November 26, 2013, a $91.9 million rebate cap associated with RS MO 393.1030 was agreed upon by Ameren Missouri, the MPSC staff and various stakeholders. The cap encompasses all rebate applications received after August 1, 2012. While all $91.9 million was committed to customer applications on December 17, 2013, the final payout did not occur until 2019 as a result of the queue processes established in the solar rebate tariff.

Under RSMo 393.1670, Ameren Missouri's solar rebate funding requirement is up to $28 million over the period January 1, 2019 through December 31, 2023. Ameren Missouri's solar rebate tariff specifies $0.8 million to be available for low-income customers and the remainder to become available in annual allotments according to the schedule included in the solar rebate tariff.

REC Registration Fees

In accordance with 4 CSR 240-20.100 Section (3) (F), utilities are to use a commission designated common central third-party registry for REC accounting of the RES requirements. The North Ameren Renewable Registry (NAR) was selected by the Commission for this purpose. Tracking and registration fees are charged by NAR for all RECs deposited and then retired from the utilities' accounts.

Section (8) (B) 1 F: RES Retail Rate Impact

The *10 Year MO RES Compliance Model 2023_32* (provided to Staff and others as a work paper to this filing) calculates the retail rate impact, as required by 4 CSR 240-20.100(5). The "Report" tab of the model sets forth the size and timing of the new renewable resources that would be needed in the next ten years to fully meet the unconstrained Renewable Energy Standard (RES) requirements along with the size and timing of those renewable resources that can be built while meeting the 1% retail rate impact limitation. The model includes the projection of generation, costs and benefits from existing resources including Keokuk, Maryland Heights REC, Ameren Missouri's headquarters solar, Pioneer Prairie Wind, O'Fallon REC, BJC Solar, High Prairie REC, Atchison REC, and the solar investments required by SB 564. A detailed projection of the S-REC purchases from customer-owned solar projects is shown in the "Cust Solar" tab. Additionally, many assumptions needed to develop RES compliance projections, including Ameren Missouri's projected revenue requirements (adjusted for exclusion of costs for existing renewable energy resources), market values for capacity and energy and costs for new wind and solar resources, are also included.

The “Mgmt Build” tab in the spreadsheet is where a ten-year sum of Ameren Missouri’s annual costs for compliance are summarized to provide a framework to determine the amount of renewables that can be built to meet RES compliance and yet stay within the 1% rate impact limitation. This tab summarizes annual ongoing costs, including administrative, solar rebate, REC and existing renewable generation resource costs. The tab also includes an interactive section that allows for assumed wind and solar projects in each of the ten years to determine the impact of adding additional renewable resources in the plan based on assumptions identified in the plan. This interactive section allows Ameren Missouri to input a compliance plan that shows the dollar impact to the rate impact limitation.

With this information, it is possible to develop an annual projection of the amount of wind and solar renewable energy resources that can be built to meet the planning needs of the utility and yet remain within the rate impact limits of the renewable energy standard if so needed. In addition, there is a tab labeled “Test” that provides an overall view of year-by-year targets, how they are determined and how they will be met for both the solar and non-solar REC requirements. These tabs are also repeated in the model for an unconstrained view of the amount of wind and solar generation that would be built to fully meet the RES if there were no rate cap limitations imposed. This model is used to provide a view of RES compliance and the amount of additional generation needed for both an unconstrained and constrained view of compliance.

Section (8) (B) 1 G: Compliance with Air, Water or Land Use Requirements

All generating facilities utilized by Ameren Missouri to meet the requirements of the Missouri Renewable Energy Standard have been certified by the Missouri Department of Economic Development in accordance with 393.1030.4, RSMo.