

Ameren Missouri

**Renewable Energy Standard
Compliance Plan
2022-2024**

Prepared in Compliance with 20 CSR 4240-20.100

April 14, 2022



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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) (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:

<u>Time Period</u>	<u>Total Renewable Requirement</u>	<u>Solar*</u>
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, 2018 to the end of 2021 in meeting the RES requirements for calendar year 2021. 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 2022-2024.

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. The estimated annual generational output of the facility for 2022-2024 is 928,634 MWh.¹ 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. The estimated annual generational output of the facility for 2022-2023 is 224,847 MWh. In 2024, the Pioneer Prairie power purchase agreement will expire on August 31, 2024. The expected generation that Ameren Missouri will receive from the facility in 2024 is reduced to 168,635 MWh. The generational output from Pioneer Prairie has ranged from 238,844 to 342,678 MWhs annually but has been gradually declining since 2013. For that reason, the assumed generational output for the remaining contract years is assumed to closely match the 2021 output, 224,847 MWhs.

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. The estimated annual generational output of the facility for 2022-2024 is 51,247 MWh.² 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 64,059 MWhs towards the compliance requirements.

¹ This value is the 5-year average output for Keokuk.

² This value is the 5-year average output for Maryland Heights.

On December 23, 2020, the 400 MW High Prairie Renewable Energy Center (HPREC) became commercially operational. This wind farm is located in Adair and Schuyler counties, Missouri and consists of 175 wind turbines covering about 50,000 acres. The estimated generational output is approximately 1,163,270 MWh in 2022 and 1,351,200 MWh for 2023 and beyond.³ 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 1,454,088 MWhs in 2022 and 1,689,000 MWhs in 2023 and 2024.

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 1,094,469 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 1,368,086 MWhs 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.

³ 2022 production is assumed to remain slightly lower than expected due to ongoing efforts to mitigate bat activity at the facility.

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.

During calendar year 2021, Ameren Missouri acquired 82,480 S-RECs from customer generators. Ameren Missouri estimates that between 2022-2024 approximately 120,000 S-RECs per year will be acquired from customer generators. 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 approximately 150,000 MWhs 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 \$19 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. This solar facility is a 221 kW (DC) PV project located in a Habitat for Humanity St. Louis parking lot in St. Louis City. The total generational output of this facility during CY 2021 was 114 MWhs. Additional solar resources are planned for construction in 2022 and 2023 through the Neighborhood Solar Program, with an expected annual generational output of 4,582 MWhs by 2024 for all program resources. 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 5,727 MWhs 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 2022-2024 is approximately 6,127 MWhs.⁴ 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 7,659 MWhs 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 2021 was 1,861 MWhs and is assumed to remain at a similar level for years

⁴ This value is the 5-year average output for OREC.

2022-2024. 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 2,315 MWh towards the compliance requirements.

Planned Actions

For the 2022-2024 compliance years, Ameren Missouri will 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 2021 generation from these facilities into the North American Renewable Registry (NAR) account.

For the 2022-2024 compliance years, Ameren Missouri will 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 2021 generation from these facilities into the NAR account.

Existing solar resources are expected to be sufficient to fulfill the solar RES requirement in each year from 2022-2024. Excess S-RECs can then be utilized to meet non-solar compliance in each period. However, a shortfall in non-solar compliance is expected in all years (2022-2024) even after using projected excess S-RECs for non-solar compliance. As noted above, the annual renewable generation for solar, wind, and hydroelectric resources is subject to significant year over year variation based on weather. In order to more accurately account for this variation, Ameren Missouri will enhance its assessment of 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 basis⁵. To that end, Table 4 includes the overall compliance position for 2022-2024 under both a 50% probability of exceedance scenario and a 90% probability of exceedance scenario.⁶

The 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 (2022-2024) to meet compliance and will add an additional renewable resource to the generation portfolio. In the attached model, *10 yr MO Compliance Model 2022_31*, a 200 MW solar facility is modeled to come on-line in late 2024 to mitigate the long-term compliance deficiency and near-term uncertainties in

⁵ 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. Past compliance planning has focused only on average or mean output values, which equate to P-50 probability of exceedance levels.

⁶ Resource-specific values in tables 2-4 sum to the P-50 Total Compliance Position (Table 4). The P-90 Total Compliance Position (Table 4) only varies the output of High Prairie REC, Atchison REC, and Keokuk, given that these resources are the largest in Ameren Missouri's compliance portfolio and therefore have the most meaningful impact on Ameren Missouri's compliance position in any given year.

resource output and load levels. This will also offset the loss of the Pioneer Prairie I Wind power purchase agreement which expires in 2024.

***Table 1. Compliance Requirements*

	<u>2022</u>	<u>2023</u>	<u>2024</u>
**TABLE CONFIDENTIAL **			

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Table 2. Non-Solar Compliance Resources

<i>Resource Output (MWh)</i>	<u>2022</u>	<u>2023</u>	<u>2024</u>
Keokuk	928,634	928,634	928,634
Maryland Heights REC*	64,059	64,059	64,059
Pioneer Prairie	224,847	224,847	168,635
High Prairie REC*	1,454,088	1,689,000	1,689,000
Atchison REC*	1,368,086	1,368,086	1,368,086
Non-Solar RECs purchased*	0	0	0
Non-Solar REC Bank Rollover*	393,526	0	0
TOTAL Non-Solar	4,433,240	4,274,626	4,218,415

**Includes 1.25 MO adjustment*

Table 3. Solar Compliance Resources

<i>Resource Output (MWh)</i>	<u>2022</u>	<u>2023</u>	<u>2024</u>
O'Fallon REC*	7,659	7,620	7,582
AMO Headquarters Solar*	100	100	99
BJC Solar*	2,315	2,303	2,291
Neighborhood Solar*	1,582	4,256	5,727
Customer-Owned Solar*	147,366	162,922	133,306
Solar REC's purchased*	0	0	0
Solar REC Bank Rollover*	0	0	0
TOTAL Solar	159,022	177,201	149,006

**Includes 1.25 MO adjustment*

*I**Table 4. Compliance Position Over/(Under)*

	<u>2022</u>	<u>2023</u>	<u>2024</u>
TABLE CONFIDENTIAL			

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

Table 5. List of Executed Contracts, 2022-2024

Contracting Party	Resource Type	Contract Type	Contract Duration	Time Period	Expected RECs	Contract Term
Horizon Pioneer Prairie I	Wind	Energy and RECs	15 years	2022	224,847	Contract will expire on 8/31/2024
				2023	224,847	
				2024	168,635	
Various Residential & Commercial Customers ⁷	Solar	S-REC only	10 years	2022	147,366	
				2023	162,922	
				2024	133,306	

Ameren Missouri has executed only one third-party contract (2009) associated with the purchase and delivery of renewable energy to the Ameren Missouri system that is being used to meet the non-solar RES compliance provisions. This is a 15-year power purchase agreement between Ameren Missouri and Horizon’s Pioneer Prairie Wind Farm.

Through the time period ending August 28, 2013, Ameren Missouri executed 1,965 agreements with its customers who have installed small scale solar net metered systems and have chosen to accept the terms and conditions of the Standard 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.

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

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

⁷ 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 D: Comparison to Preferred Resource Plan

The RES Compliance Plan detailed in this report is consistent with the Preferred Plan filed in Ameren Missouri's 2020 Integrated Resource Plan, and is expected to be consistent with the Change in Preferred Plan to be filed no later than July 15, 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 2022-2024 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 OREC, HPREC, and AREC
- Purchase of RECs
- Fixed and O&M costs associated with new solar resources required by SB 564

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 RS MO 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 RS MO 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 2022_31* (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 County 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.