BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of a Determination of Special Contemporary Resource Planning Issues to be Addressed by Evergy Missouri West, Inc. d/b/a Evergy Missouri West in its Next Triennial Compliance Filing or Next Annual Update Report	))))))))	Case No. EO-2026-0036

SUGGESTED SPECIAL CONTEMPORARY ISSUES

COMES NOW the Office of the Public Counsel ("OPC") and for its *Suggested Special Contemporary Issues*, states as follows:

1. On August 8, 2025, the Commission issue an *Order* opening the above styled case and further ordering that "[a]ny party wishing to suggest a special contemporary issue that Evergy Missouri West should consider in its next annual update report shall file its written suggestions no later than September 15, 2025."

2. Pursuant to that August 8 *Order*, the OPC offers the attached verified memorandum (and incorporates the same by reference) suggesting what special contemporary issues Evergy Missouri West should consider in its next annual update report.

WHEREFORE, the Office of the Public Counsel respectfully requests the Commission accept this filing, order Evergy Missouri West to consider the special contemporary issues identified in the OPC's attached memorandum, and order such other relief as is just and reasonable under the circumstances.

Respectfully submitted,

By: /s/ John Clizer
John Clizer (#69043)
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CERTIFICATE OF SERVICE

I hereby certify that copies of the forgoing have been mailed, emailed, or hand-delivered to all counsel of record this fifteenth day of September, 2025.

/s/ John Clizer

MEMORANDUM

To: Missouri Public Service Commission Official Case File,
Case No. EO-2026-0036

From: Geoff Marke, Chief Economist
John Robinett, Utility Engineering Specialist
Jordan Seaver, Policy Analyst

Re: Special Contemporary Issues for Evergy West in its Next Annual Update Report

Date: 9/15/2025

Issue 1: Model RES Requirement Generation in Various Large Load Scenarios

Background:

The RSMO statute 393.1030.1(4) for renewable energy standards requires that Missouri electric utilities' share of renewable electric generation be "No less than fifteen percent in each calendar year beginning in 2021." Each year after 2021, each investor-owned electric utility in the state must maintain a renewable generation portfolio of 15% of its total generation fleet. Evergy Missouri West ("EMW") filed an application for approval of new and modified tariffs for serving large load customers (Case No. EO-2025-0154). In this docket, EMW witness Mr. Kevin Gunn states that EMW is "currently working with over 20 prospective large load customers with more than six gigawatts of incremental demand" and has already secured "a large Google data center in Missouri."[1]

Even a smaller portion of this planned load coming on would necessitate large generation buildout. Because of statute 393.1030.1(4), the amount of renewable construction would need to increase significantly. EMW is required by that statute to continue maintaining 15% of its generation fleet as renewables. Because this is a percentage, hence a relative amount to the total, the increase of load caused by new large load customers, and the corresponding increase in generation to meet that load will necessitate an increase in the acquisition of new renewable generation or in the purchasing of renewable energy credits (RECs). The increase in renewable generation in the SPP interconnection queue in the last 5 years has led to long wait times for building generation. As of the date of writing, the SPP generation interconnection queue has 522 projects totaling 130.5 GW. Solar makes up 26% of the queue, battery storage makes up 20% of the queue, and wind projects make up 15% of the queue. Generation in the queue to be built in Missouri makes up 8,577 MW, meaning that there is already a significant portion of sites staked for development at this time.

Request for Modeling:

OPC asks that the Commission order the Company to model for renewable generation buildout and REC purchases under various large load scenarios. These large load scenarios should vary based on different levels of commitment by large load customers. Current commitments and lack thereof should guide how each scenario's load varies. The model should include a least cost constraint, while also prioritizing speed of RES compliance. Where adding generation is more costly but quicker than other options, and can be shown to lower net-present value revenue

[1] Kevin D. Gunn, Direct Testimony, Case No. EO-2025-0154, pp. 12-13.

requirement, this should be seen as preferable to other options. RECs are RES-compliant and should be considered as important assets to meet the RES compliance percentage due to the interconnection queue in SPP and any large transmission buildout that would need to accompany renewable generation build.

Issue 2: Review New Developments in Small Modular Nuclear Reactor Technology and Commitments

Background:

In 2023 TVA, GE Hitachi, Ontario Power Generation, and Synthos Green Energy made a commitment to invest $400 million in nuclear plant design[2]. Ontario Power Generation is expected to have a BWRX-300 small modular nuclear reactor ("SMR") in operation by the end of 2029. As of 2023, TVA was also planning to construct a BWRX-300 SMR, and has recently signed an agreement with ENTRA1 (financing and operating venture for NuScale SMRs) for up to 6 gigawatts of new nuclear power generation by deployment of 6 ENTRA1 plants[3]. This technology appears to be becoming more viable as more firm commitments are made and we continue to approach the expected in-service dates of the 2023 agreements.

Request for Modeling:

OPC requests that the Commission order the Company to monitor new developments in SMR technology and to model for potential additions of SMR to its generating fleet. The modeled technology should include those listed above and any others that are being considered in known agreements.

Issue 3: Mothball Energy Generation

Background: The practice of closing facilities over a long time or storing equipment and tools that are still in working order is called mothballing. In 2015 Germany began mothballing oil and coal plants, and creating a capacity reserve system in which mothballed resources were only dispatched under emergency scenarios surrounding energy shortfalls.7 In July of 2022, German Chancellor Olaf Schloz's government announced the temporary reactivation of 27 mothballed oil and coal-fired power plants (4.3 GW of coal plants) to help fill the energy shortfall until March 2024 as a result of the war in the Ukraine.[4]

Request for Modeling:

The Commission should order Evergy West to analyze and produce estimated costs for mothballing any dispatchable generation resource that is subject to a planned retirement in the 20-year planning period. Estimates should include all costs including the minimum continued O&M of the mothballed units.[5]

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[2] Stephen Singer, "TVA, GE Hitachi, 2 others commit to $400M international small modular reactor project", Utility Dive, March 24, 2023, https://www.utilitydive.com/news/tva-ge-hitachi-small-modular-reactor-smr-nuclear/645861/

[3] Scott Fiedler, "TVA and ENTRA1 Energy Announce Collaborative Agreement in Landmark 6-Gigawatt NuScale SMR Deployment Program—Largest in U.S. History", Tennessee Valley Authority Press Release, September 2, 2025, https://www.tva.com/news-media/releases/tva-and-entra1-energy-announce-collaborative-agreement-in-landmark-6-gigawatt-nuscale-smr-deployment-program--largest-in-u.s.-history

[4] Connolly, K. (2022) Germany to reactive coal power plants as Russia curbs gas flow. *The Guardian.* https://www.theguardian.com/world/2022/jul/08/germany-reactivate-coal-power-plants-russia-curbs-gas-flow

[5] This recommendation is also consistent with RSMo. §393.1715.6 & 393.401.

Issue 4: Supercritical Carbon Dioxide Power Cycles

Background:

The Southwest Research Institute has built a 10 MW Supercritical Transformational Electric Power (STEP) facility in San Antonio, Texas at a cost of $169 million. This project was built in partnership with US Department of Energy[6], General Electric GTI Energy[7], and the National Energy Technology Laboratory[8]. The objective of the STEP Demo is to demonstrate the highly efficient, so-called Brayton power cycle in a pilot-scale, grid-connected power plant.[9] The project broke ground in 2018, completed construction in 2023, and generated electricity for the first time in 2024.[10] The project completed phase one testing in 2024 and achieved a full operational speed of 27,000 rpm operating at 500°C.[11] The unit generated 4 MW of grid-synchronized power; enough to supply electricity to 4,000 homes. The next phase of the project, expected to start in 2025, will reconfigure the plant to a Recompression Brayton Cycle (RCBC) configuration and increase the turbine inlet temperature to 715°C to provide a significant boost in efficiency.[12]

The pilot plant's supercritical CO2 (sCO2) turbomachinery is approximately one-tenth the size of conventional power plant components, which shrinks the physical footprint and construction cost of any new facilities. Additionally, the sCO2 power cycles are compatible with many heat sources, including concentrated solar power, industrial waste heat, geothermal power, and advanced nuclear power plants.

Request for Modeling:

OPC requests that the Commission order Evergy Missouri West to investigate the option of a supercritical carbon dioxide power cycle plant as a resource candidate in future supply-side generation planning and modeling scenarios.

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[6] US DOE (2024) Pilot Plant: Supercritical CO2 Power Cycles. https://www.energy.gov/pilot-plant-supercritical-co2-power-cycles

[7] Southwest Research Institute (2024) STEP Demo supercritical CO2 pilot plant generates electricity for the first time. https://www.swri.org/newsroom/press-releases/step-demo-supercritical-co2-pilot-plant-generates-electricity-the-first-time

[8] GTI Energy (2024) A STEP closer to transformational electric power: https://www.gti.energy/step-demo/

[9] GTI Energy (2024) STEP Demo Technology. https://www.gti.energy/step-demo/step-demo-project/technology/

[10] Friedman, C (2024) Experimental power plant using CO2 in San Antonio could be future of energy production. https://www.ksat.com/news/local/2024/06/26/experimental-power-plant-using-co2-in-san-antonio-could-be-future-of-energy-production/

[11] STEP Demo Pilot Achieves Phase 1 Testing Milestone, Paving the Way for Next-Generation Supercritical CO_2 Power Production: https://www.gti.energy/step-demo/achievTes-phase-1-testing-milestone/

[12] Power Magazine (2024) Breakthrough for sCO2 Power Cycle as STEP Demo Completes Phase 1 of 10-MW Project: https://www.powermag.com/breakthrough-for-sco2-power-cycle-as-step-demo-completes-phase-1-of-10-mw-project/

Issue 5: Geologic Hydrogen Onsite or Near Natural Gas Storage

Background:

A research paper published in late 2024[13] used stochastic modeling to estimate the amount of viable geologic hydrogen for energy use. The predictions were then expounded on by USGS to develop a map of prospective geologic hydrogen resources in the United States. The map shows potential reservoirs of considerable amounts of geologic hydrogen in northwestern Missouri and northeastern Kansas, southeastern Missouri and southern Illinois, and in lesser amounts scattered throughout Missouri[14]. HyTerra, which is "a start-up that's developing a pair of geological hydrogen sites…estimates that its main project, in northeastern Kansas, could yield 250,000 t of hydrogen along with 2,200 t of helium"[15]. In August of 2024 the mining company Fortescue Metals Group invested $21.9 million in HyTerra, making its stake in the company 40%[16]. HyTerra has at least 3 wells now and appears to have found significant amounts of hydrogen as well as significant amounts of helium[17]. Two other companies, Top End Energy and Koloma are also mining in the same area, and all companies are quickly expanding their acreage[18].

Request for Modeling:

At this point the technology for production of electricity by geologic hydrogen is not in use and is in the preliminary stages, but the potential for its use is high and the investment into geologic hydrogen production warrants further study. OPC requests that the Commission order Evergy Missouri West to model for the use of potential geologic hydrogen resources at sites where natural gas turbines are located, to model for the transport of potential geologic hydrogen to natural gas turbines located nearby, and to model for the potential siting of new natural gas turbines at locations of potential geologic hydrogen sites.

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[13] Geoffrey S. Ellis and Sarah E. Gelman, "Model predictions of global geologic hydrogen resources", Science Advances, December 13, 2024, Vol. 10, Issue 50, https://www.science.org/doi/10.1126/sciadv.ado0955

[14] USGS Communications and Publishing, "USGS releases first-ever map of potential for geologic hydrogen in U.S.", January 16, 2025, https://www.usgs.gov/news/national-news-release/usgs-releases-first-ever-map-potential-geologic-hydrogen-us

[15] Craig Bettenhausen, "Trillions of tons of hydrogen may be waiting under our feet", March 14, 2025, Chemical & Engineering News, https://cen.acs.org/energy/hydrogen-power/Trillions-tons-hydrogen-waiting-under/103/i7

[16] *Ibid.*

[17] William Hadrian, "Hyterra Ltd Achieves 96.1% Hydrogen Concentration in Kansas Discovery", July 3, 2025, Discovery Alert, https://discoveryalert.com.au/news/helium-discovery-kansas-unexpected-concentrations-blythe/

[18] Fuel Cells Works, "Top End Energy Secures 30,000+ Acres for Serpentine Natural Hydrogen Project in Kansas", May 12, 2025, https://fuelcellsworks.com/2025/05/12/green-hydrogen/top-end-energy-secures-30-000-acres-for-serpentine-natural-hydrogen-project-in-kansas

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

AFFIDAVIT OF GEOFF MARKE

STATE OF MISSOURI)
) SS.
COUNTY OF COLE)

COMES NOW GEOFF MARKE and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Memorandum* and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

Geoff Marke
Chief Economist

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 12th day of September, 2025.

TIFFANY HILDEBRAND
NOTARY PUBLIC - NOTARY SEAL
STATE OF MISSOURI
MY COMMISSION EXPIRES AUGUST 8, 2027
COLE COUNTY
COMMISSION #15637121

Tiffany Hildebrand
Notary Public

My Commission expires August 8, 2027.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

AFFIDAVIT OF JOHN A. ROBINETT

STATE OF MISSOURI)
) SS.
COUNTY OF COLE)

COMES NOW JOHN A. ROBINETT and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Memorandum* and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

John A. Robinett
Utility Engineering Specialist

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 11th day of September, 2025.

TIFFANY HILDEBRAND
NOTARY PUBLIC - NOTARY SEAL
STATE OF MISSOURI
MY COMMISSION EXPIRES AUGUST 8, 2027
COLE COUNTY
COMMISSION #15637121

Tiffany Hildebrand
Notary Public

My Commission expires August 8, 2027.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

AFFIDAVIT OF JORDAN SEAVER

STATE OF MISSOURI)
) SS.
COUNTY OF COLE)

COMES NOW JORDAN SEAVER and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Memorandum* and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

Jordan Seaver
Policy Analyst

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 11th day of September, 2025.

TIFFANY HILDEBRAND
NOTARY PUBLIC - NOTARY SEAL
STATE OF MISSOURI
MY COMMISSION EXPIRES AUGUST 8, 2027
COLE COUNTY
COMMISSION #15637121

Tiffany Hildebrand
Notary Public

My Commission expires August 8, 2027.