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MISSOURI PUBLIC SERVICE COMMISSION

CASE NO.: EA-2024-0292

SURREBUTTAL TESTIMONY

OF

JOHN CARLSON

ON BEHALF OF

EVERGY MISSOURI WEST

Kansas City, Missouri

May 2025

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Case No. EA-2024-0292

1 **I. INTRODUCTION**

2 **Q: Please state your name and business address.**

3 A: My name is John R. Carlson. My business address is 1200 Main, Kansas City, Missouri
4 64105.

5 **Q: Are you the same John R. Carlson who filed Direct testimony in this docket on**
6 **October 25, 2024?**

7 A: Yes.

8 **Q: Who are you testifying for?**

9 A: I am testifying on behalf of Evergy Missouri West, Inc. d/b/a Evergy Missouri West
10 (“Evergy Missouri West,” “EMW,” “Evergy,” or “the Company”).

11 **Q: What is the purpose of your Surrebuttal testimony?**

12 A: The purpose of my Surrebuttal testimony is to respond to various witnesses from the
13 Missouri Public Service Commission Staff (“Staff”) and their testimony set forth in the
14 Staff Report & Recommendation (“Staff Recommendation”), along with J Luebbert’s
15 Rebuttal testimony. See generally J Luebbert Rebuttal. Specifically, I respond as to the
16 following: (1) Staff’s proposed economic and engineering conditions, including the
17 warranty liability, (2) Sunflower Sky, LLC’s (“Sunflower Sky”) and Foxtrot Solar Energy
18 LLC’s (“Foxtrot”) (collectively, the “Projects”) Effective Load Carrying Capability

1 (“ELCC”) and its relationship to the Projects’ need, and (3) the impact of utilizing the
2 levelized cost of energy (“LCOE”) to determine the Projects’ economic feasibility.
3 Additionally, I respond to the Office of the Public Counsel (“OPC”) Dr. Geoff Marke’s
4 Rebuttal pertaining to solar grazing and data sharing.

5 **II. STAFF’S PROPOSED ECONOMIC AND ENGINEERING CONDITIONS**

6 **Q: Does Evergy Missouri West agree with Staff’s Recommendation, on pages 50-51, that**
7 **the Missouri Public Service Commission (“Commission”) should approve the**
8 **Company’s Certificate of Convenience and Necessity (“CCN”) for Projects, subject**
9 **to Staff’s economic and engineering conditions?**

10 A: Not entirely. Evergy Missouri West agrees to some of the economic and engineering
11 conditions, but disagrees with others, as discussed herein. See J Luebbert Rebuttal at 3; see
12 also G. Marke Rebuttal at 8 (stating OPC supports Staff’s conditions).

13 **A. Staff’s Proposed Economic Conditions**

14 **Q: Will you address any of Staff’s proposed economic conditions?**

15 A: The only economic condition I will address is Staff’s recommendation for EMW to:

16 “** [REDACTED]

17 [REDACTED]

18 [REDACTED]

19 [REDACTED] “**” EMW agrees with this economic condition, which is specific to
20 Foxtrot’s contract.

21 **B. Staff’s Proposed Engineering Conditions**

22 **Q: Will you address any of Staff’s proposed engineering conditions?**

23 A: Yes. I will address all four (4) engineering conditions proposed on page 51 of Staff’s
24 Recommendation.

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1 **Q: Which of Staff’s proposed engineering conditions does Evergy Missouri West agree**
2 **with?**

3 A: EMW agrees to provide: “a site-specific Emergency Action Plan Operations and
4 Maintenance Plan for the Projects within 60-days of the facility being placed in service,”
5 and “quarterly reporting of the progress of construction of the Projects” which “shall
6 include, but not be limited to, quarterly progress reports on permitting, plans,
7 specifications, and construction progress for the Projects.” See Staff Rec. at 51.
8 Additionally, EMW will work with Staff on the format of the quarterly reporting, similar
9 to the proposed language in the Unanimous Partial Settlement Agreement Regarding Solar
10 Facility at 5-6, In re Evergy Kansas Central et al. Determination Ratemaking Principles,
11 Docket No. 25-EKCE-207-PRE.

12 **Q: Does Evergy Missouri West agree to utilize the in-service criteria in Staff’s**
13 **Confidential Schedule 4?**

14 A: Partially. EMW agrees to “utilize the in-service criteria and capacity test procedures
15 recommended by Staff in Confidential Schedule 4 of this report,” with the exception of
16 Item #5. See Staff Rec. at 51. For Item #5, EMW agrees that the facility should meet at
17 least 95% of the guaranteed AC capacity based on the facility’s corrected capacity at the
18 design point conditions. However, the capacity test procedures attached to Confidential
19 Schedule 4 of Staff’s report outline specific calculations and methodology for determining
20 the capacity of the site that are incorrect. The methodology that Staff has recommended
21 mirrors what was provided in the original Exhibit E of the Foxtrot BTA, which is currently
22 in the process of being amended to resolve this error. See JC-12_CONF, Response to Staff
23 Data Request (“DR”) No. 0051.1. In lieu of being overly prescriptive of the calculation

1 process, EMW proposes that the specific methodology for determining the tested AC
2 capacity of the site be consistent with typical industry standards, such as ASTM 2848 and
3 ASTM 2939. Additionally, the results of such performance tests ** [REDACTED]
4 [REDACTED] **. Similarly for
5 Sunflower Sky, EMW will contract with an Owner’s Engineer (“OE”) to certify the results
6 of the performance testing that will be completed by the Engineering, Procurement and
7 Construction (“EPC”) contractor. EMW substantially mirrored the Commission-approved
8 in-service criteria in Stip. & Agree. at 3, In re Ameren CCN Renewable Generation Facility,
9 No. EA-2023-0286 (Mar. 5, 2024).

10 **Q: Which of Staff’s proposed engineering conditions does Evergy Missouri West**
11 **disagree with?**

12 A: Evergy Missouri West disagrees with the following engineering condition proposed by
13 Staff: ** [REDACTED]
14 [REDACTED] **.
15 See Staff Rec. at 51.

16 **Q: Why does EMW disagree with this engineering condition?**

17 A: In response to DRs in this proceeding, Evergy Missouri West has explained that reducing
18 the inverter warranty was to conform with standard warranty duration in the industry, as
19 well as to capture Project savings benefitting customers. For example, as set forth in Evergy
20 Missouri West’s response to Staff’s DR No. 0051.2: “Evergy is proposing to reduce the
21 inverter warranty to the standard period of 5-years” to increase Foxtrot’s economic
22 feasibility. See Sched. JC-13_CONF, Evergy Response to Staff DR No. 0051.2. The 10-
23 year inverter warranty was “at an added cost of approximately \$1.2 million,” an

1 “approximately a 14%” increase “to the total inverter cost.” Id. “Given the overall risk
2 profile of the project, the purchase price caps, the customer benefit from reduced upfront
3 costs for the inverters, and the fact that 5 years is sufficient to get through any premature
4 failure on the inverters, Evergy felt this scope reduction was an effective trade to offset
5 other increased costs.” Id. While the Foxtrot project remains under the Purchase Price Cap,
6 it has experienced similar cost increases to Sunflower Sky. As indicated in the response to
7 DR No. 0053, the expected cost for the balance of system (BOS) KPI category is
8 approximately ** [REDACTED] ** higher than the baseline. This increase was only partially
9 offset by savings on other KPI categories; therefore, Evergy identified the elimination of
10 the inverter warranty extension as an additional feasible cost saving measure for the benefit
11 of customers. See Sched. JC-14_CONF, Evergy Response to Staff DR No. 0053. Staff
12 has not cited any factual or legal basis to essentially penalize the Company by requiring it
13 to ** [REDACTED] **

14 **III. TARTAN¹ FACTOR - NEED**

15 **Q: Do EMW, Staff, OPC, and Renew Missouri agree that the Company needs the**
16 **capacity from the Projects?**

17 **A:** Yes. See Staff Rec. at 14; J. Owen Rebuttal at 3 (Renew Mo.); G. Marke Rebuttal at 1, 7-
18 8.

¹ In re Tartan Energy Co., No. GA-94-127, 1994 WL 762882 (1994).

1 **Q: How is the capacity for solar generating facilities accredited in the Southwest Power**
2 **Pool, Inc. (“SPP”)?**

3 A: The SPP uses the Effective Load Carrying Capability (“ELCC”) metric to determine the
4 accredited capacity of solar generating facilities. ELCC is defined as the amount of
5 incremental load a resource can dependably and reliably serve while being measured
6 against a reliability metric threshold. The SPP uses ELCC to determine the capacity
7 accreditation of the generation facility as a percentage of the nameplate capacity of the
8 facility.

9 **Q: Is Sunflower Sky’s accreditation factor unclear, as Staff claims in its**
10 **Recommendation?**

11 A: No. Sunflower Sky and Foxtrot are both “expected to be fully operational, and used and
12 useful for service by December 31, 2026.” See App. at 9. Additionally, Foxtrot and
13 Sunflower Sky are located at similar latitudinal ordinates, and both are positioned near the
14 Missouri / Kansas state line, with Foxtrot in Missouri and Sunflower Sky in Kansas. Their
15 locations would suggest that both sites should have similar solar generation profiles
16 throughout the year, an input to the load shape analysis SPP performs as part of its ELCC
17 methodology. Foxtrot and Sunflower Sky should receive a similar ELCC capacity
18 accreditation based on their locations and commercial operation dates.

19 **Q: Is there a cohesive link between ELCC and “need” for the Projects?**

20 A: No. There is no clear line between “need” and ELCC, as Staff seems to assert. See generally
21 Staff Rec. at 10-11. The “need” for the Projects was identified through the Company’s
22 robust IRP process, as discussed by witness Cody VandeVelde in his Direct testimony.

1 ELCC is only applicable after a project has been identified and placed in service. There
2 can be a need for the Projects no matter the ELCC, as is certainly the case here.

3 **IV. TARTAN FACTOR – ECONOMIC FEASIBILITY**

4 **Q: Are the individual project costs for Foxtrot and Sunflower Sky consistent with the**
5 **pricing assumptions used in the Company’s IRP?**

6 A: Yes. Counter to Staff’s assertion, it is not difficult “to compare individual project costs in
7 the application to those expected in the 2024 IRP.” See Staff Rec. at 22-23. The costs for
8 Foxtrot and Sunflower Sky, excluding AFUDC, are **[REDACTED]**
9 (See Sched. JC-15_CONF, attachment to Evergy response to Staff DR 0053), which
10 includes 7 MW of flex-up capacity, and **[REDACTED]** (See Sched.
11 JC-16_CONF, attachment to Evergy response to Staff DR 0053), respectively, and are right
12 in-line with the IRP solar pricing assumption of **[REDACTED]**.

13 **Q: Did the Company overstate the energy generation of the Projects by utilizing the**
14 **lower-level degradation throughout the duration of the solar facilities, as Staff**
15 **claims?**

16 A: No. On page 36 of its Recommendation, Staff claims that the economic analysis for
17 Sunflower Sky and Foxtrot is an unreliable overestimation of the economic feasibility of
18 the Projects because the Company used the lower level of annual degradation for the solar
19 facilities. However, this is inaccurate for a couple of reasons. First, Evergy Missouri West
20 used the Commission’s longstanding standard of the levelized cost of energy (“LCOE”) to
21 analyze the economic feasibility of the Projects when compared to alternatives in the
22 Company’s Request for Proposal (“RFP”) process. See J. Carlson Direct at 5-6, 10; see
23 also Report & Order on Remand at 26, In re Grain Belt Express CCN, No. EA-2016-0358

1 (Mar. 20, 2019). Additionally, Staff inappropriately ignores the Company's congestion
2 study analysis performed by 1898 & Co. during the administration of the RFP, as discussed
3 further herein. See J. Carlson Direct at 11 and Conf. Sched. JC-9.

4 Furthermore, the degradation rates for both Projects are directly based on the
5 degradation of the solar modules themselves, which are the primary driver of time-based
6 capacity reduction for a solar facility. The module suppliers for both Foxtrot and Sunflower
7 Sky warranty the average degradation of the modules to be no more than 0.40% per year
8 over the 30-year life of the modules. See Sched. JC-17_CONF, Evergy Response to Staff
9 DR No. 0036 (regarding panel degradation for Sunflower Sky). While not yet executed,
10 the draft module supply agreement for Foxtrot indicates the same 0.40% degradation
11 factor.

12 A key difference between the degradation rate assumed in Evergy's LCOE models
13 and the NREL report that is referenced in the Staff Rec. at 35, is that the NREL report
14 includes other operational factors beyond just equipment degradation. Per the NREL
15 report, they "emphasize that 1.3%/year is a *system-level* estimate that captures more than
16 just module degradation (e.g., including soiling, balance of plant degradation, and
17 downtime for maintenance and/or other events)." Of the additional factors noted in the
18 NREL report, soiling is a primary driver of capacity reduction and is already included in
19 the assumptions used to calculate the expected capacity factors for the sites. For Sunflower
20 Sky, the average loss for soiling is 0.9%. See Sched. JC-18_CONF at 4, attachment to
21 Evergy Response to Staff DR No. 0010. For Foxtrot, the average loss for soiling is 1.0%.
22 See Sched. JC-19_CONF at 4.

1 Taking these factors into account, Evergy remains confident that the degradation
2 factor utilized in the LCOE models is accurate.

3 **Q: Does Evergy Missouri West’s LCOE assume degradation when evaluating the**
4 **Projects in the RFP?**

5 A: Yes. The LCOE calculation used in the RFP project evaluation assumed a degradation
6 value. If the developer of the project proposed a degradation value as part of their RFP
7 offer, then that degradation value was used for the LCOE analysis of the given project. If
8 no degradation value was included with the project offer, then a generic degradation
9 assumption of 0.5% per year was assumed. For all solar projects evaluated during the RFP,
10 the degradation values provided by the bidders ranged from 0.30% to 0.50% per year. See
11 J. Carlson Direct at 7-8. Maintaining this relatively consistent degradation rate allowed
12 EMW to evaluate all solar projects submitted to the RFP on an apples-to-apples basis,
13 which resulted in the projects that exhibited the lowest risk and highest cost effectiveness
14 to move forward in the evaluation process.

15 **Q: Does Evergy Missouri West agree with Staff’s statement on page 33 of its**
16 **Recommendation that the “LCOE is an incomplete metric” to determine the Projects’**
17 **economic feasibility?**

18 A: No. While LCOE is not the only technique used by the Company to determine the Projects’
19 economic feasibility, it is an important comparative technique (particularly in combination
20 with an IRP portfolio that minimizes the net present value of the revenue requirement) that
21 has been recognized by the Commission. In the Commission’s Report & Order on Remand
22 at 26, In re Grain Belt Express CCN, No. EA-2016-0358 (Mar. 20, 2019) as aff’d Missouri
23 Landowners Alliance v. PSC, 593 S.W.3d 632 (E.D. Mo. 2019), the Commission held that

1 the “levelized cost of energy analysis” is “the best financial technique to compare different
2 energy generation sources.” The Commission determined that the Grain Belt Express
3 project was economically feasible because it had the lowest LCOE in the company’s RFP,
4 “compared to Missouri wind, combined cycle gas, and Missouri utility-scale solar
5 generation.” Id. at 43-44.

6 Indeed, LCOE is a standardized way for regulators and stakeholders to compare the
7 long-term cost of generating electricity from different technologies by calculating the total
8 lifecycle cost per megawatt-hour of energy produced—including capital investment,
9 operations and maintenance costs, and projected performance over the Projects’ useful
10 lives—to consistently assess relative affordability and efficiency of various generation
11 resources.

12 **Q: Why were Sunflower Sky and Foxtrot chosen from the Company’s RFP?**

13 A: The Projects were selected from the Company’s RFP for multiple reasons. Foxtrot had a
14 mature SPP queue position, availability for tax credits, and “low permitting and
15 environmental risk, and while located slightly outside of Evergy’s service territory, the
16 congestion analysis revealed low LMP and curtailment risk when delivering energy to
17 EMW’s load.” Additionally, “** [REDACTED]
18 [REDACTED] **.” See J. Carlson Direct at 11-12. “Sunflower Sky was
19 selected for many of the same reasons.” Id. at 12.

20 **Q: Did Evergy Missouri West’s 1898 & Co. congestion study evaluate negative pricing
21 to determine the Projects’ economic feasibility?**

22 A: Yes. The analysis of the congestion study indicated that relative to other projects offered
23 into the RFP, “both Foxtrot and Sunflower Sky are ideally situated, with relatively high

1 LMP's ("Locational Marginal Price") and low curtailment risk in each of the modeled
2 futures." See J. Carlson Direct at 11 and Conf. Sched. JC-9. Although Staff references the
3 congestion study in footnote 82 of its Recommendation, it inappropriately ignores the
4 analysis pertaining to LMPs and low curtailment risk in its conclusion that the Projects are
5 not economically feasible. See Staff Rec. at 35 footnote 82. For added clarity, the LMP
6 and congestion analysis performed as part of this process are not intended to be a prediction
7 of actual market revenues, but rather to serve as a comparative metric to evaluate potential
8 projects against one another. As noted in Mr. Humphrey's Surrebuttal testimony, specific
9 market nodes are not assigned to individual projects until they are constructed and
10 forecasting market pricing for sites that do not yet exist is impractical and speculative.

11 **V. RESPONSE TO OPC**

12 **Q: Does EMW agree to investigating solar grazing as discussed in Dr. Marke's Rebuttal?**

13 A: EMW would most likely agree to investigate the feasibility of solar grazing for a limited
14 period of time after Commission approval of the Projects so the Company can study the
15 potential benefits and risks of sheep and their relation to solar facilities. See G. Marke
16 Rebuttal at 9-10.

17 **Q: Does EMW agree to sharing land-use and conservation impact data with the non-**
18 **profit Renewable Energy Wildlife Institute's ("REWI") SolSource Database?**

19 A: With some knowledge of REWI, and no experience with the SolSource Database, EMW
20 would likely agree to evaluating the sharing of land-use and conservation impact data with
21 REWI depending on certain circumstances and use of resources to do so.

1 **Q: Does EMW agree to solicit feedback on solar grazing and SolSource Data sharing**
2 **from the U.S. Fish and Wildlife Service, the Missouri Department of Conservation,**
3 **and the Kansas equivalent?**

4 A: EMW would likely agree to solicit feedback on solar grazing and the SolSource Database
5 sharing from the specified organizations.

6 **Q: Please summarize your testimony.**

7 A: In conclusion, all parties are in agreement that the Projects satisfy the Tartan factors, except
8 for economic feasibility. Sunflower Sky and Foxtrot are needed to serve future load
9 requirements and should have similar ELCC accreditation due to their close proximate
10 commercial operation and in-service dates. Importantly, the need is identified through the
11 Company's IRP process, independent of the SPP ELCC accreditation level; there is no
12 direct link between the two.

13 As discussed herein and on the whole record, the Projects are economically feasible, as
14 their costs align with the pricing assumptions outlined in the IRP, ensuring financial
15 viability. Additionally, ** [REDACTED]

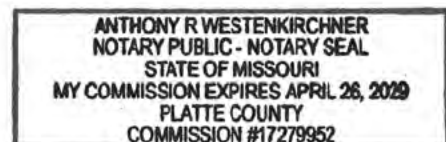
16 [REDACTED] ** and increases the economic
17 feasibility of the Foxtrot project. The economic feasibility of both projects was further
18 bolstered through the Company's accurate application of degradation factors within its
19 LCOE models. Lastly, the Company's congestion analysis included potential negative
20 LMP's and still showed low curtailment risk for the Projects. Sunflower Sky and Foxtrot
21 satisfy all the *Tartan* factors, as discussed on the whole record.

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1 Finally, EMW would likely agree to OPC conditions on solar grazing and data sharing, as
2 discussed herein, depending on certain circumstances, such as duration of the study, risks
3 to the solar facilities, and the use of Company resources to satisfy the conditions.

4 **Q: Does that conclude your testimony?**

5 A: Yes, it does.



**SCHEDULES JC-12 THRU JC-19
CONTAIN CONFIDENTIAL
INFORMATION
NOT AVAILABLE TO THE PUBLIC.

ORIGINALS FILED UNDER SEAL.**

**Evergy Metro, Inc. d/b/a Evergy Missouri Metro and
Evergy Missouri West, Inc. d/b/a Evergy Missouri West**

Docket No.: EA-2024-0292

Date: May 19, 2025

CONFIDENTIAL INFORMATION

The following information is provided to the Missouri Public Service Commission under CONFIDENTIAL SEAL:

Document/Page	Reason for Confidentiality from List Below
Carlson Direct, p. 2, lns. 16-19	3, 4, and 6
Carlson Direct, p. 4, lns. 3-4; 13-14	3, 4, and 6
Carlson Direct, p. 5, lns. 8 and 13	3, 4, and 6
Carlson Direct, p. 7, lns. 8, 10, and 12	3, 4, and 6
Carlson Direct, p. 10, lns. 17-18.	3, 4, and 6
Carlson Direct, p. 12, lns. 15-16	3, 4, and 6
JC-12 thru JC-19	3, 4, 6, 7, and 8

Rationale for the “confidential” designation pursuant to 20 CSR 4240-2.135 is documented below:

1. Customer-specific information;
2. Employee-sensitive personnel information;
3. Marketing analysis or other market-specific information relating to services offered in competition with others;
4. Marketing analysis or other market-specific information relating to goods or services purchased or acquired for use by a company in providing services to customers;
5. Reports, work papers, or other documentation related to work produced by internal or external auditors, consultants, or attorneys, except that total amounts billed by each external auditor, consultant, or attorney for services related to general rate proceedings shall always be public;
6. Strategies employed, to be employed, or under consideration in contract negotiations;
7. Relating to the security of a company's facilities; or
8. Concerning trade secrets, as defined in section 417.453, RSMo.
9. Other (specify) _____.

Should any party challenge the Company’s assertion of confidentiality with respect to the above information, the Company reserves the right to supplement the rationale contained herein with additional factual or legal information.