EVERGY MISSOURI WEST

FILING SCHEDULE, FILING REQUIREMENTS, AND STAKEHOLDER PROCESS

INTEGRATED RESOURCE PLAN

4 CSR 240-22.080

APRIL 2021

** CONFIDENTIAL **

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VOLUME 8: FILING SCHEDULE, FILING REQUIREMENTS, AND STAKEHOLDER PROCESS

This rule specifies the requirements for electric utility filings to demonstrate compliance with the provisions of this chapter. The purpose of the compliance review required by this chapter is not commission approval of the substantive findings, determinations, or analyses contained in the filing. The purpose of the compliance review required by this chapter is to determine whether the utility's resource acquisition strategy meets the requirements of Chapter 22. However, if the commission determines that the filing substantially meets these requirements, the commission may further acknowledge that the preferred resource plan or resource acquisition strategy is reasonable in whole or in part at the time of the finding. This rule also establishes a mechanism for the utility to solicit and receive stakeholder input to its resource planning process.

SECTION 1: IRP REQUIREMENTS

(1) Each electric utility which sold more than one (1) million megawatt-hours to Missouri retail electric customers for calendar year 2009 shall make a filing with the commission every three (3) years on April 1. The electric utilities shall submit their triennial compliance filings on the following schedule:

(A) Kansas City Power & Light Company and KCP&L Greater Missouri Operations Company, or their successors, on April 1, 2012, and every third year thereafter;

Evergy Missouri West will file the required triennial compliance filing by April 30, 2021.

SECTION 2: TRIENNIAL COMPLIANCE REQUIREMENTS

(2) The utility's triennial compliance filings shall demonstrate compliance with the provisions of this chapter and shall include at least the following items:

(A) Letter of transmittal expressing commitment to the approved preferred resource plan and resource acquisition strategy and signed by an officer of the utility having the authority to bind and commit the utility to the resource acquisition strategy;

A Corporate Approval Statement signed by officers of Evergy, Inc. has been included in Volume 7, Resource Acquisition Strategy Selection per Rule 4 CSR 240-22.070(7).

(B) If the preferred resource plan is inconsistent with the utility's business plan, an explanation of the differences and why the differences exist;

The Preferred Resource Plan is not inconsistent with Evergy Missouri West's business plan.

(C) Technical volume(s) that fully describe and document the utility's analysis and decisions in selecting its preferred resource plan and resource acquisition strategy.

Volume 7, "Resource Strategy Selection Strategy" is included in this filing pursuant to 4 CSR 240-22.070.

1. The technical volume(s) shall include all documentation and information specified in 4 CSR 240-22.030–4 CSR 240-22.070 and any other information considered by the utility to analyze and select its resource acquisition strategy.

2. The technical volume(s) shall be organized by chapters corresponding to 4 CSR 240-22.030–4 CSR 240-22.070.

Volumes 3 through Volumes 8 correspond to 4 CSR 240-22.030 through 4 CSR 240-22.080.

3. A separate chapter shall be designated in the technical volume(s) to address special contemporary issues pursuant to 4 CSR 240-22.080(4) and input from the stakeholder group pursuant to 4 CSR 240-22.080(5). The chapter shall identify the issues raised, how the utility addressed them, and where in the technical volume(s) the reports, analyses, and all resulting actions are presented.

Volume 8 herein, addresses the special contemporary issues pursuant to rule 4 CSR 240-22.080(4).

(D) The forecast of capacity balance spreadsheet completed in the specified form, included herein, for the preferred resource plan and each candidate resource plan considered by the utility.

The capacity balance spreadsheet for the preferred resource plan and each candidate resource plan has been included in Volume 6 Rule (4)(B)9.

(E) An executive summary, separately bound and suitable for distribution to the public in paper and electronic formats. The executive summary shall be an informative non-technical description of the preferred resource plan and resource acquisition strategy. This document shall summarize the contents of the technical volume(s) and shall be organized by chapters corresponding to 4 CSR 240-22.030–4 CSR 240-22.070. The executive summary shall include:

1. A brief introduction describing the utility, its existing facilities, existing purchase power arrangements, existing demand-side programs, existing demand-side rates, and the purpose of the resource acquisition strategy;

2. For each major class and for the total of all major classes, the base load forecasts for peak demand and for energy for the planning horizon, with and

without utility demand-side resources, and a listing of the economic and demographic assumptions associated with each base load forecast;

3. A summary of the preferred resource plan to meet expected energy service needs for the planning horizon, clearly showing the demand-side resources and supply-side resources (both renewable and non-renewable resources), including additions and retirements for each resource type;

4. Identification of critical uncertain factors affecting the preferred resource plan;

5. For existing legal mandates and approved cost recovery mechanisms, the following performance measures of the preferred resource plan for each year of the planning horizon:

A. Estimated annual revenue requirement;

B. Estimated level of average retail rates and percentage of change from the prior year; and

C. Estimated company financial ratios;

6. If the estimated company financial ratios in subparagraph (2)(E)5.C. of this rule are below investment grade in any year of the planning horizon, a description of any changes in legal mandates and cost recovery mechanisms necessary for the utility to maintain an investment grade credit rating in each year of the planning horizon and the resulting performance measures of the preferred resource plan;

7. Actions and initiatives to implement the resource acquisition strategy prior to the next triennial compliance filing; and

8. A description of the major research projects and programs the utility will continue or commence during the implementation period; and

(F) Such other information or format as the commission may determine.

An Executive Summary has been included in this compliance filing and is entitled "Volume 1 Evergy Missouri West Executive Summary".

SECTION 3: ANNUAL UPDATE WORKSHOP

(3) Beginning in 2012, on or about April 1 of every year in which the utility is not required to submit a triennial compliance filing, each electric utility shall host an annual update workshop with the stakeholder group. The utility at its discretion may host additional update workshops when conditions warrant. Any additional update workshops shall follow the same procedures as the annual update workshop.

(A) The purpose of the annual update workshop is to ensure that members of the stakeholder group have the opportunity to provide input and to stay informed regarding the—

1. Utility's current preferred resource plan;

2. Status of the identified critical uncertain factors;

3. Utility's progress in implementing the resource acquisition strategy;

4. Analyses and conclusions regarding any special contemporary issues that may have been identified pursuant to 4 CSR 240-22.080(4);

5. Resolution of any deficiencies or concerns pursuant to 4 CSR 240-22.080(16); and

6. Changing conditions generally.

Evergy Missouri West will host an annual workshop with the Stakeholders in the years a triennial filing is not due.

(B) The utility shall prepare an annual update report with both a public version and a highly-confidential version to document the information presented at the annual update workshop and shall file the annual update reports with the commission no less than twenty (20) days prior to the annual update workshop. The depth and detail of the annual update report shall

generally be commensurate with the magnitude and significance of the changing conditions since the last filed triennial compliance filing or annual update filing. If the current resource acquisition strategy has changed from that contained in the most-recently-filed triennial compliance filing or annual update filing, the annual update report shall describe the changes and provide updated capacity balance spreadsheets required pursuant to 4 CSR 240-22.080(2)(D). If the current resource acquisition strategy has not changed, the annual update report shall explicitly verify that the current resource acquisition strategy is the same as that contained in the most-recently filed triennial compliance filing or annual update filing.

Evergy Missouri West will prepare a public and confidential annual update report documenting the information presented at an annual update workshop.

(C) The utility shall prepare a summary report that shall list and describe any action items resulting from the workshop to be undertaken by the utility prior to next triennial compliance filing or annual update filing. The summary shall be filed within ten (10) days following the workshop. If there are no changes as a result of the workshop, the utility is required to file a notice that it will not be making any changes to its annual update report.

Evergy Missouri West will prepare a summary report listing and describing any action items resulting from an annual update workshop.

(D) Stakeholders may file comments with the commission concerning the utility's annual update report and summary report within thirty (30) days of the utility's filing of the summary report.

SECTION 4: SPECIAL CONTEMPORARY ISSUES

(4) It is the responsibility of each utility to keep abreast of evolving electric resource planning issues and to consider and analyze these issues in a timely manner in the triennial compliance filings and annual update reports. An order containing a list of special contemporary issues shall be issued by the commission for each utility to analyze and document in its next triennial compliance filing or next annual update report. The purpose of the special contemporary issues lists is to ensure that evolving regulatory, economic, financial, environmental, energy, technical, or customer issues are adequately addressed by each utility in its electric resource planning. Each special contemporary issues list will identify new and evolving issues but may also include other issues such as unresolved deficiencies or concerns from the preceding triennial compliance filing. To develop the list of special contemporary issues—

(A) No later than September 15, staff, public counsel, and parties to the last triennial compliance filing of each utility may file suggested special contemporary issues for each utility to consider;

(B) Not later than October 1, the utilities, staff, public counsel, and parties to the last triennial compliance filings may file comments regarding the special contemporary issues filed on September 15; and

(C) No later than November 1, an order containing a list of special contemporary issues shall be issued by the commission for each utility to analyze and document in its next triennial compliance filing or annual update report. The commission shall not be limited to only the filed suggested special contemporary issues. If the commission determines that there are no special contemporary issues for a utility to analyze, an order shall be issued by the commission stating that there are no special contemporary issues.

Order EO-2021-0067 was received by Evergy Missouri West with an effective date of November 14, 2020 providing a list of special contemporary issues to be analyzed and documented: The following submittal is the list of issues provided in the Order and Evergy Missouri West's responses:

A. Impact of Falling Energy Market Prices in SPP Market.

Model the current preferred plan both with stable (flat) and with declining market prices. The resulting modeled bill impacts should be compared to the currently forecasted bill impacts to give a more likely range of bill impacts of the utility's preferred resource plan.

Evergy modeled the Missouri West Preferred Plan, WDDBU, under the assumption of both flat and declining wholesale market energy prices. The flat assumption held market pricing constant at the projected 2023 prices under the assumed low natural gas price and low CO_2 cost assumptions used in the Integrated Analysis. The declining market price assumptions were based on an annual reduction of 1% per year, compounded, starting in 2023. These flat and declining market price results are compared to the low natural gas, low CO_2 scenario average rates. Note that in most years, average rates decreased with lower market prices reflecting Missouri West as a net energy buyer.

C

B. Virtual Power Plant.

(1) Determine the necessary customer-owned solar penetration and the steps it would need to take to achieve the penetration within its service territory to justify a virtual power plant option as a resource candidate in future supply-side generation planning and modeling scenarios. (ii) Foreseeable energy storage technologies; and

(2) Examine the possibility of using other DER resource candidates in addition to customer-owned solar as the basis for development and operation of a virtual power plant.

A virtual power plant (VPP) is a control system used to dispatch dispatchable distributed energy resources (DER) such as distributed generation (DG), battery electric storage, electric vehicles (EV), demand response (DR) technologies, and other flexible loads. Evergy's existing Distributed Energy Resource Management System (DERMS) is a VPP and is used to dispatch existing DR program resources for generation capacity mitigation.

Customer sited solar is a distributed generation resource but the majority of existing installations use legacy inverter technologies and are served under the net metering tariff. As such they are not a dispatchable resource and therefore are not viable resources for inclusion in a VPP. Future customer-sited solar and storage installations that incorporate emerging "smart" inverters, that conform to the IEEE 1547-2018, have the potential to be dispatchable resources. To be a dispatchable resource that can be dispatched by Evergy's DERMS would also require the customer to enroll in a tariff or program that allowed utility or third-party control and the addition of communications infrastructure to each DER for monitoring and control.

Evergy recently completed a projection of customer sited solar and storage adoption and these projections have been incorporated into customer load forecasts and modeling scenarios include in this triennial IRP. More details on

this study can be found in Volume 5 Section 2 and the full report in Appendix 5G. An analysis of the BTM average rate impacts for selected ARPs can also be found in Volume 6 Section 5(M).

This triennial IRP evaluated several forms of distributed generation and storage technologies as candidate supply-side resources and EVs and other demand response technologies were evaluated as candidate demand-side management (DSM) programs in the most recent potential study. In the future, as these potential resources become viable candidate resource options, they can be incorporated into the Evergy DERMS and dispatched as a VPP.

(C) Small Modular Reactors

Investigate the option of a small nuclear reactor as a resource candidate in future supply-side generation planning and modeling scenarios.

Evergy developed an Alternative Resource Plan that included a small modular reactor (SMR). This 600 MW SMR was added to the Evergy Preferred Plan ERVFL starting in 2032. Capital and operating costs were based on EIA data.

Based on the expected value 20-year NPVRR, the plan ranked 33 out of 45 Evergy level plans. While ranking low on an expected value basis, the plan ranked 2nd, just behind the Evergy Preferred Plan in the six High CO_2 cost scenarios that included Mid or High natural gas prices.

(D) Combustion Turbine Conversion to Combined Cycle Units

(1) Identify existing combustion turbines and consider (to the extent applicable) the conversion of combustion turbine units to combined cycle units as a resource candidate in supply-side generation planning and modeling scenarios.

(2) As an alternative to the conversion to combined cycle units, evaluate the redevelopment of fossil-fueled generations sites that are either set for retirement or requiring environmental mitigation for opportunities to integrate lower or zero-emitting energy production including storage as resource candidates in supply-side generation planning and modeling scenarios.

In the Evergy Missouri West combustion turbine (CT) fleet, there is one station that could possibly convert the three existing combustion turbines to a 3-on-1 combined cycle unit. A high-level estimate for conversion of a set of CTs to combined cycle is +$900/kW but an indicative cost to consider this conversion would require an extensive design study to refine the cost. It should be noted that permitting concerns as well as cost of constructing a new natural gas pipeline to supply the needed pressure and natural gas quantity required for a combined cycle station is estimated to be in excess of $3 Million per year for a ~300 MW unit. Again, an extensive design study would also be required to construct the new natural gas pipeline to serve a combined cycle unit at this current CT site to further define pipeline construction costs.

Regarding redevelopment of fossil fuel generation sites set for retirement, the only planned retirement in the next few years in the Evergy Missouri West fleet is Lake Road 4/6. Because this unit is situated among several other generating units at Lake Road Station, there is very little physical space to add other resource options such as battery storage.

(E) Grain Belt Express Energy

Include Grain Belt Express Energy as a Power Purchase Agreement resource candidate in supply-side generation planning and modeling scenarios.

Given early results of the 2021 IRP analysis indicated benefits to renewable resource additions to the Evergy long-term generation portfolio, in February 2021 Evergy issued a Request for Proposals (RFP) for renewable resources. The RFP solicited offers for ownership options as well as Purchased Power Agreements. Invenergy, the developer of the Grain Belt Express (GBX) 600 kV high voltage direct current transmission line, submitted a response to the RFP. GBX starts near Dodge City, Kansas and runs through Missouri and to states further east. [redacted]

Based on the capital cost, wind performance, and GBX annual O&M cost information provided by Invenergy, Evergy modeled an Alternative Resource Plan (ARP) [redacted] The 20-year Net Present Value of Revenue Requirements (NPVRR) for the GBX ARP were calculated for each of the 27 scenarios developed for the 2021 IRP.

Given the ability of this project to deliver energy directly to Evergy load, thus avoiding SPP transmission congestion and potential generation curtailment, additional project benefits were included in this analysis. These benefits were based on the historical basis difference between Evergy Metro's Spearville Wind and Evergy load and estimated Spearville generation curtailments.

This project could create large economic development opportunities for the states of Missouri and Kansas, with job creation and economic impacts of the project stretching across several counties in both states. While these impacts are not modeled in IRP analyses, this is a qualitative factor to be considered in any future evaluation of the project as compared to other renewable projects. Similar to other ARPs that included wind resource additions, IRP modeling results indicated that there are benefits to the project at some level of future CO_2 emissions restrictions. For the GBX/Thresher project, this would occur somewhere between the Mid and High scenario CO_2 levels. Under the High CO_2 cost scenario, the results show an $880 million net benefit. At the Mid CO_2 cost scenario, the results show a $336 million net cost. As modeled in the IRP, CO_2 restrictions result in increased wholesale energy market prices which increase the value of wind energy production. Given the total project benefits were less than other options modeled, this project was not included in the Evergy Preferred Plan. On an expected value NPVRR basis over the 27 scenarios modeled, the GBX/Thresher ARP ranked 13th out of 45 total plans.

(F) Long-Duration Storage

Consider the potential feasibility of long-duration electricity storage applications within a 20-year planning horizon. That is, at least a cursory review of best available technology and promising options of new long-duration electricity storage systems (as opposed to old technology such as pumped hydro). This does not require specific modeling of long-duration electricity storage technology that has not been proved commercially. (The Commission is interested in the stacking concrete blocks for purposes of energy storage as one possible option.)

Key drivers for continued interest in energy storage technologies include continued declines in the costs of battery storage technologies, and the role that storage can play in maintaining grid reliability as more intermittent renewable resources are added to the grid. Long-duration storage technologies (which can provide 6 to 10 hours or more of storage capability) offer additional capabilities to enhance grid reliability. Long-duration storage provides additional grid benefits through enhanced flexibility and the potential to improve system resilience during extreme weather events.

Based on a recent report issued by the North American Electric Reliability Corporation (NERC), storage technologies considered to be the most promising include lithium-ion (Li-ion) batteries and flow batteries, based on costs, efficiency and energy revenue potential.[1] (Per the MPSC's request, Evergy has excluded from this list technologies which are not considered "new," such as pumped storage.)

In addition to the NERC report referenced above, Evergy also referenced several reports issued by the US Department of Energy (DOE) as part of the Energy Storage Grand Challenge (ESGC) Roadmap, released on December 21, 2020. [2]

[1] NERC, Energy Storage, Impacts of Electrochemical Utility-Scale Battery Energy Storage Systems on the Bulk Power System, February 2021, pg 7

[2] https://www.energy.gov/articles/department-energy-releases-energy-storage-grand-challenge-roadmap

The ESGC Draft Roadmap (Roadmap),[3] provides descriptions of a wide range of storage technologies and technology maturity levels, and activities underway to address barriers to commercialization, which includes focusing on longer durations, increasing power densities and reducing costs. The Energy Storage Market Report 2020 [4] also identifies several emerging long-duration storage technologies, including pumped storage, redox flow batteries, chemical (e.g., hydrogen) and thermal storage and electrochemical couples.

Based on the guidance provided in these reports, Evergy selected the following technologies for discussion, each of which are discussed further below:

- Concrete block stacking
- Flow batteries
- Hydrogen storage
- Liquid Air Energy Storage

Given the market interest and support by the DOE to advance the development of storage technology, there is a strong possibility that long-duration technologies will achieve commercialization within the 20-year planning horizon. An objective of the ESGC, for example, is to drive technology advancements and position the US as a leader in the storage technology supply chain by 2030. Given the status of technology development at this time, however, and given a lack of projects in which cost and performance capabilities of emerging technologies has been demonstrated, it is challenging to predict which of these technologies are more likely than another to achieve commercialization. Also, as was seen in the development of solar photovoltaic technology, many external factors, including changes in the costs of raw materials and the ability of new technologies to attract

[3] US DOE Energy Storage Grand Challenge Draft Roadmap, July 2020
[4] US DOE Energy Storage Grand Challenge Energy Storage Market Report 2020, December 2020

sufficient capital to support research and development activities, can also determine whether a specific technology ultimately emerges as a winner.

Evergy will continue to monitor developments in long-duration storage as these emerging technologies evolve.

Concrete Block Stacking

Concrete block stacking is a mechanical energy storage system using gravity, which is under development by a company called Energy Vault. The technology uses a crane to lift 35-ton composite concrete blocks and stack them methodically around the crane structure. When the blocks are lowered to the ground, kinetic energy produced by rotating arms of the crane and the motion of lowering the blocks to the ground is converted to electricity. A video showing the motion of the crane and blocks is shown on Energy Vault's website. [5]

According to Energy Vault, specially designed software will be used to control placement of the blocks as they are lifted and stacked around the circumference of the tower (consuming energy) and then lowered to the ground (producing energy). Energy Vault expects each tower site, approximately 400 feet in height, to be capable of delivering peak power of approximately 9 MW with 35 MWh of energy. The tower height and ground surface area required for the tower and the blocks stacked around its circumference will ultimately determine the power capabilities for each tower structure.

The benefits of this technology are envisioned to include use of inexpensive raw materials (for the blocks), the ability to store and maintain energy for long periods without degradation, and a longer project life than batteries. The primary revenue model for this application would likely be similar to that of pumped storage, where concrete blocks are stacked during periods when energy prices are low and the blocks are lowered to produce energy when prices are high. With such applications, value is typically driven based on the ratio of peak to low-peak prices

[5] https://energyvault.com

(i.e., energy arbitrage) so the economic benefits of this technology may be market- or location-dependent.

Energy Vault is developing a 5 MW commercial demonstration unit in Switzerland. The project achieved mechanical completion in July 2020 and is currently in final commissioning, according to Energy Vault's website. [6] The project is expected to allow demonstration of operational parameters, including roundtrip efficiency, flexibility and response rates (i.e., ramp rates, speed of deployment, cycles per day), mechanical availability, and capital and operating costs. Although the technology offers the benefit of using low-cost and potentially environmentally friendly materials, response rates for a mechanical storage device will be important to the technology's flexibility and revenue potential. The ability of Li-ion batteries, for instance, to respond within seconds to load fluctuations and frequency control will be a key value-driver in a future grid experiencing increased penetration of intermittent renewable energy supplies.

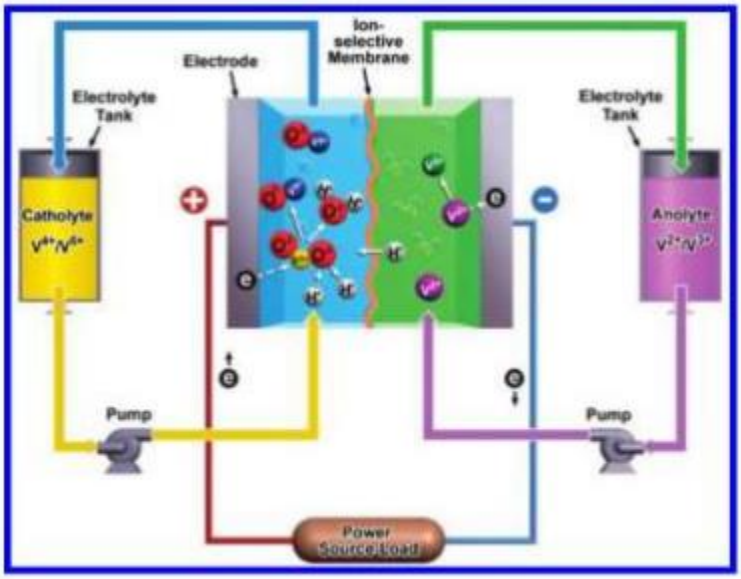
Flow Batteries

A "flow battery" (also referred to as a "Redox (reduction-oxidation) Flow Battery") stores energy in a liquid electrolyte solution stored in tanks. Electricity is generated when the liquid electrolytes are pumped through a core consisting of positive and negatively charged electrodes. When an ion exchange occurs through a membrane, the chemical energy in the solution is converted to electrical energy, as shown in the figure below. The process is reversed to charge the battery. The storage capacity and duration of a flow battery can be increased by increasing the storage tank volume, with some manufacturers designing systems which can be expanded through the addition of modular storage tanks.

A schematic of an all-vanadium flow battery is provided below.

[6] https://energyvault.com/commercial-demonstration-unit/; accessed March 10, 2021.

Figure 1: Schematic of a Flow Battery



Flow batteries are projected to be cost-effective for durations greater than 6-8 hours, depending on the battery chemistry. The benefits of flow batteries are to include high cycle life and durability, with the capability to sustain performance over their lifecycle (compared to the steady degradation in performance of lithium-ion batteries with each cycle of use). Flow batteries are also projected to have a relatively high conversion efficiency. The major drawbacks of flow batteries include the high cost of materials, including the membranes, storage tanks, electrode materials, and solution. Most of the commercial batteries today, for example, use vanadium salt in a sulfuric acid solution as the electrolyte with graphite bipolar plates. The use of vanadium reduces corrosion though membrane replacement.[7] Research on lower-cost materials is one of the technology improvements being evaluated by the DOE for flow batteries.

A flow battery manufacturer, Form Energy, has announced that a pilot project with 1 MW of capacity and up to 150 hours of storage will be installed for Minnesota

[7] NERC, Energy Storage, Impacts of Electrochemical Utility-Scale Battery Energy Storage Systems on the Bulk Power System, February 2021, pg 8

utility Great River Energy. Form Energy uses proprietary materials for its technology. The project for Great River Energy is targeted for operation in 2023.[8]

Hydrogen Storage

Market interest in the potential role of hydrogen in a future decarbonized world continues to grow. When stored properly, hydrogen can be suitable for long-duration storage, since energy potential does not degrade as with lithium-ion batteries. The principal interest in hydrogen production, however, stems from its versatility as a fuel and the ability to enable cleaner emissions in the transmission sector.

Applications for long duration storage in a decarbonized future usually envision hydrogen produced by renewable energy. The term "green hydrogen" is often used to describe a system where hydrogen is produced using electrolysis where energy source is a form of renewable energy such as wind and solar. The electrolysis process produces hydrogen by splitting water into hydrogen and oxygen, which requires energy. The economics of this process, while resulting in a cleaner emissions profile compared to conventional hydrogen production methods, remain challenged, compared to the cost of natural gas.

The cost of "green hydrogen" produced with electrolysis and renewable energy is estimated by some at approximately two to three times the cost of natural gas. Processes in which less expensive storage methods can be derived (such as use of storage caverns instead of pressurized storage tanks), and increasing demand (expected to lead to better economics through the creation of wider distribution networks and broader demand in the transportation sector) may improve the cost-effectiveness of this technology in the future.

Liquid Air Energy Storage

[8] https://greatriverenergy.com/long-duration-battery-project-in-the-works

A liquid air energy storage (LAES) project utilizes cryogenically-frozen air as a long-duration storage medium. In this process, air is compressed and cooled to approximately -300 F, then stored as a liquid in an insulated tank at low pressure. When electricity is needed, the liquid air is pumped from tanks and exposed to ambient temperatures. The liquid air is re-gasified and expanded through a turbine to create energy without using a combustion process. The economics of this technology will be driven in part by using lower-cost, off-peak energy during the compression process and discharging energy during peak-energy periods when prices are high.

A pilot plant using this technology has been developed by Highview Power. The 350 kW/2.5 MWh project used heat from a biomass plant (to improve system efficiency) and is now located at the University of Birmingham Centre for Cryogenic Energy Storage to support further research.[9] The development of larger-scale projects are underway, including a 50 MW/400 MWh storage facility in Northern Vermont. An additional grid-scale facility is under development in the United Kingdom (Carrington), with a targeted commercial operation date of 2022.[10]

[9] Plants | Highview Power
[10] Ibid.

(G) Securitization

Analyze and document the prospects for using securitization to support cost-effective accelerated retirement of coal generation assets and to channel the savings into cost-effective investments such as demand-side management, wind and solar generation, and storage.

Securitization is a financial tool that would create customer-backed commercial bonds through state legislative actions. These bonds would carry a AAA rating. Given such bonds could lower a utility's debt service costs and potentially the return on financing a securitized asset, savings would be created relative to the utility's traditional debt/equity financing. These bonds could be used to recover the remaining net book value of retired or existing generating assets.

Based on the Evergy Preferred Plan that retires Lawrence 4 and 5 in 2024, the company has estimated the potential savings associated with securitization. For this estimate, it was assumed that the remaining net book value is securitized with a lower cost of debt and only a return of the remaining net book value. Under traditional rate making recovery mechanisms, the Net Present Value of Revenue Requirements (NPVRR) for the remaining $340 million in net book value would be $369 million with an assumed debt rate of 4.7% and an assumed cost of equity of 9.3%. Recovering this same remaining net book value under securitization would be $233 million for a net savings of $136 million at an assumed debt rate of 2.56%.

Securitization is not innately limited to plant retirements alone as this financial tool can be applied to any type of debt or future cash flow, but the applicability depends on state legislation and associated Commission actions. As a result, these savings could be achieved independent of plant retirements. The same holds true for alternative resource investments as well.

(H) Integrated Distribution Planning

Analyze the benefits of integrated distribution planning as a way to manage distribution grid investments in a manner that reduces peaks and fills valleys in load profiles and lowers overall system costs with a combination of energy efficiency, demand response, electric vehicles, distributed generation, storage, advanced metering, and pricing strategies such as time-of-use rates (TOU) for electric vehicles and inclining block rate (IBR).

There are many different facets of Integrated Distribution Planning and many different definitions of it in the industry, but, as an example, the Smart Electric Power Alliance (SEPA) in its "Integrated Distribution Planning: A Framework for the Future" defines it as:

1. Integration of internal elements and processes within the utility to enhance distribution planning, and

2. Integration of distribution planning with transmission and generation planning (as it applies).

Evergy has already begun its journey toward these two goals and continues to progress efforts in this area, but, through this effort, maintains a slightly broader definition of its goal as "Integrated Planning" and not just "Integrated Distribution Planning". While this seems like an insignificant distinction, it serves two purposes: 1) it broadens the scope outside of the traditional utility silo of "Distribution" to include all aspects of utility planning, and 2) it allows for the inclusion of other "non-traditional assets" – like grid-scale energy storage as a transmission asset, for example – into the framework and the discussion as opposed to focusing almost entirely on distributed energy resources (DERs, including demand response, distributed generation, electrification). With the continued proliferation of DERs, customer programs, and energy storage, a move to more Integrated Planning is required in order to evaluate the potential benefits and impacts of these technologies holistically. Overall, the benefits to be evaluated are broader than

simply smoothing grid utilization across peak and off-peak times, although there is certainly potential there, and the potential investments are broader than just distribution investments. It's likely that many of the technologies which will end up playing a key role in the grid of the future may not even be known yet, but the critical goal is establishing a foundation where the grid can be analyzed, planned, controlled, and operated as a network of distributed technologies versus relying just on traditional grid assets. With that in mind, Evergy has continued its steps toward Integrated Planning.

Key Actions Taken To-Date:

Organizational Alignment

In 2019, Evergy brought all of its operations planning functions (generation, transmission, and distribution) into one "Long Term Planning" organization and out of their traditional, functional siloes. While this was simply an organizational move to start with, it was a large step toward item number 2 in the definition above. In addition to the "traditional" planning functions, this new organization also includes Evergy's distribution automation and standards functions. The reason for this inclusion is fairly simple: if the devices in the field are not able to integrate, communicate with, and (where appropriate), control non-traditional grid assets like distributed energy resources, these resources ultimately will have dramatically reduced (or no) value as grid assets. This is a vital component of true Integrated Planning because it allows for the move from the "theory" of Integrated Planning (i.e., incorporating non-traditional assets into planning models and forecasts) to successfully operationalizing these plans in the field. The final key part of Integrated Planning is the customer: forecasts of customer adoption of DERs (including electrification and demand-side management programs), future customer programs and their expected impact on customer behaviors / assets, and data on current customer programs and behavior which can inform future forecasts. At Evergy, all of this is managed by Energy Solutions, and the

partnership between Energy Solutions and Long Term Planning is what lays the foundation for Evergy's activities in the area of Integrated Planning.

DER Communication and Control

Ultimately, distribution planning must plan to keep the system safe, reliable, and resilient at all times, but particularly at peak where the strain on the system is most significant. DERs can provide the ability to offset and manage that peak, but, unless they can be depended on and visible to system operators in the same way a "traditional" field asset would, they can create risk for customers and the system in the event that they do not perform as modeled. With that in mind, Evergy's activity to date with assets like this and with its continued progress toward Integrated Planning, has been focused on piloting these devices and different control systems/schemes that would prepare Evergy to be able to integrate and manage DERs at scale so that they could be depended on like a more traditional asset. Evergy is taking this communication-and-controls-first approach while DER penetration in our service territory is fairly low so that, as adoption expands significantly in the future, the operational systems and knowledge will be there to enhance grid and customer benefits.

A key example is Evergy's ongoing study program with Sunverge. Sunverge is a provider of "intelligent energy storage systems" which combines behind-the-meter (BTM) energy storage with advanced control capabilities through their energy management system. Evergy began working with Sunverge to explore benefits of combining BTM storage with distributed energy resources (DER).

The project is designed to evaluate: 1) communication and control systems required to communicate with and manage BTM DER; 2) the ability of the technology to optimize the operation of storage and customer loads in conjunction with TOU and/or demand rate plans; 3) the degree to which BTM storage can mitigate the potential grid impacts of behind the meter distributed generation (DG); and 4) the potential impact of BTM storage for capacity management.

The high-level plan for this project is outlined in three phases:

Phase 1 - Lab Testing – Install two (2) Sunverge systems, one (1) in Topeka and one (1) at the Evergy Innovation Hub by the MO-Metro Midtown substation. This phase will test and evaluate the Sunverge system's functionality and operation under various grid conditions. We will also validate the local, backhaul, and back office communications and systems integrations requirements and develop communications and test plans for field trial.

This phase is currently underway and the second system in the Topeka location is currently being commissioned.

Phase 2 - Field trial – Install 4-6 units at a yet to be determined customer location; deploy the required field and local communications network; and implement integrations between Sunverge and the Evergy DERMS and Advanced Distribution Management (ADMX) systems. This phase will provide additional validation to Phase 1 testing and allow Evergy to further evaluate the Sunverge system's ability to: 1) integrate customer solar DER and other customer controllable loads; 2) provide real-time optimization of customer resources for customer benefits; and 3) minimize grid impacts and assist with demand response activities around system capacity and/or distribution constraints.

Phase 3 - BTM Storage Pilot Program: Based on the knowledge gained during the successful execution of Phases 1 and 2, Evergy may design and seek regulatory approval for a BTM Storage Pilot Program that would be offered to its customers. Under the program, as currently envisioned, Evergy would own and maintain approximately one hundred (100) customer sited BTM storage systems sited on customer premises. Customer benefits would include optimization of the customer's energy usage under time variant rates. Benefits for the Company would include the ability to use the system for demand response (DR) services and reduced grid impacts. Phase 3 program attributes will continue to be assessed and finalized prior to filing with each respective state commission.

Advanced Distribution Management – Voltage Management

In addition, and as mentioned in Volume 4.5, Evergy has also continued to evaluate broader voltage management schemes which have the potential to provide benefit at all levels (distribution, transmission, and generation) of planning. Voltage management involves using more traditional grid assets (like load tap changes, regulators, and/or capacitors) paired with sophisticated control schemes and platforms. Voltage Management has the potential to reduce peak load on different parts of the system in a way similar to demand response, but without any impact on the customers or action from customers. As the potential for this type of technology is evaluated through Evergy's ADMX deployment, these could be used as demand offsets in future Integrated Resource Plans which reduce the need for generation. Similar to the challenge with using DERs as grid assets, because of the criticality of depending on these non-traditional resources as a replacement for generation, system implementation will be based on successful pilots, engineering review and planning.

Centralized DER Database

As described in Section 4.B above, Evergy has implemented a Distributed Energy Resource Management System (DERMS) as a centralized system to track, manage, and dispatch customer sited Distribution Energy Resources (DER). To date the Evergy DERMS functionality has focused on managing the existing Demand Response (DR) program resources for generation capacity mitigation. Evergy's current roadmap for DERMS, expands the functionality incorporate all customer sited DER including interconnected distributed generation and storage resources enrolled in Evergy's net metering and parallel generation tariffs.

The recent Federal Energy Regulatory Commission Order 2222 directs regional grid operators to revise their tariffs to establish distributed energy resource (DER) aggregators as a type of market participant. Order 2222 requires that the SPP must coordinate with distribution utilities to develop a distribution utility review

process that includes criteria by which the distribution utilities would determine whether (1) each proposed DER is capable of participation in a DER aggregation; and (2) the participation of each proposed DER in a DER aggregation will not pose significant risks to the reliable and safe operation of the distribution system. This distribution utility review process must not exceed 60 days for most reviews.

While distribution utility review criteria has not yet been developed, Evergy will be required to implement new processes and enhance existing systems or implement new systems to comply. The evaluation and registration of individual DER will require the creation of a common unique DER_ID that can be used for all parties involved in DER registration and operations, a process for collecting such information in the interconnection process, and new standards or systems for collecting and maintaining a DER Registry.

Evergy is actively engaged and involved in ongoing stakeholder proceedings as stakeholders discuss and weigh amendments to SPP market policy which will be required in response to Order No. 2222. In addition, Evergy is participating in a supplemental program sponsored by the Electric Power Research Institute ("EPRI") which provides a collaborative forum for industry participants to share information regarding potential impacts associated with implementation of Order No. 2222. Evergy is also working with our DERMS system provider to identify the expanded functionality that will be required for DERMS to fully support the DER registration requirements to comply with Order 2222.

Time of Use Rate Offering

As a result of the Stipulation & Agreement and approval by the MPSC as part of Evergy's 2018 Rate Case, Evergy began offering opt in TOU rates to its Missouri customers on October 1, 2019. As of April 26, 2021, Evergy had 2620 customers enrolled in Missouri Metro and 2920 customers in Missouri West, which is nearly 160% of the enrollment target of 3500 customers.

Evergy completed an initial evaluation, measurement and verification (EMV) for the period October 2019 through September 2020. Key findings included:

- Results indicate that the TOU rate and associated program design has had the desired effect of reducing consumption during the on-peak period (4-8pm M-F) in both the summer and winter seasons and driving participant bill savings (on average).
- Peak System Impacts – TOU participants lowered their demand by 4-9% at system coincidence peak
- Bill Impacts - On average, participants are saving 3-10% annually depending on the tiered rate that they were on prior to enrolling. Summer bills see the greatest savings, approximately half of which are driven by behavioral changes while winter bills see an increase for those previously on the electric heating rate primarily driven by rate structure changes.
- Average annual savings for residential general customer ranges from 5 to 10%
- Average annual savings for residential space heating customer ranges from 3 to 6%
- Evergy exceeded stipulated enrollment targets within the evaluation year and is currently at 142% of the overall Missouri enrollment target of 3500 customers.
- Approximately 50% of the 700 total un-enrollments that occurred during the evaluation year were from customers moving.

The Company will complete a second EMV by December 31, 2021.
Additionally, Evergy will file a rate design case limited to TOU issues by June 15, 2021.
Evergy sees great value in offering residential customers choices when selecting their rates and has developed a roadmap to help guide rate offering development in future rate cases to build on the success of the TOU rate.

Future Opportunities:

Evergy is still fairly early in its journey toward truly Integrated Planning. Many new challenges and opportunities will continue to emerge in this area, particularly as DER penetration increases in the future, but two of the primary opportunities of focus are described below.

Integrated Forecasting & Analysis

For the 2021 IRP, Evergy completed its first high-level forecasts for electrification (beyond electric vehicles, which have been forecasted historically) and behind-the-meter generation. However, these forecasts were done at the jurisdiction and customer class level (residential, commercial and industrial) and provided only annual estimates of the impact of these technologies on peak demand and energy usage. The next step to go from this type of forecast to truly Integrated Planning is to move to a more geographically granular (e.g., by-circuit) forecast which can be integrated into distribution planning models, and a more temporally granular (e.g., sub-hourly) view of grid impacts which can incorporated into distribution automation schemes. Historically, distribution planning incorporates existing DERs (as load reductions) in load models which are used for analysis, but, until these granular forecasts are available and can be automatically incorporated into load flow analyses, truly integrated forecasting and analysis will not be practical. Many utilities currently have this same need as they look to implement Integrated Planning and, as a result, there will likely be significant advancement in this space in the near-term which Evergy will continue to monitor to look for a viable solution.

Another key component of Integrated Analysis is leveraging real-/ near-real-time from existing DERs as an input into automation schemes and operational systems. Because Evergy has fully deployed AMI across its service territory, much of this data is available, but continued work is in process to integrate the data in an actionable way into other operational systems.

Integrated Non-Wires Alternative Evaluation

Finally, the next step from Evergy's ongoing pilots is to begin evaluating / testing DERs as potential solutions for grid needs. This step needs to build on the testing of communication and control capabilities (e.g., through the Sunverge pilot) so that distribution planners will know how these devices will operate in the field (as compared to traditional grid devices). Once this information is known and DER data is able to be utilized automatically in load flow analyses (as discussed above), identifying any locations where non-wires solutions may provide a cost-effective, operationally-effective solution can follow.

(I) Solar

(1) Assess the value of a solar tariff that encourages distributed solar installers to optimize the direction that solar panels face to provide ore kWh during the utility's peak and provide maximum benefits for all utility customers.

Evergy's analysis concludes that there is little benefit or need to optimize the direction that solar panels face. Thus, there is not a need for additional tariffs for this purpose. Fixed tilt systems, typically installed on roofs, facing directly west instead of directly south, would at most shift the solar production later in the day by one hour, but at a significant loss in total output. For ground mounted systems, single-axis tracking systems are quickly dropping in price and are soon expected to dominate new installations without additional incentives. They also get all the benefits of the late afternoon output of west facing systems without the loss in energy output. Furthermore, the utility scale solar in Evergy's preferred plan are projected to be single-axis tracking systems.

To evaluate this question, Evergy first conducted an analysis using NREL's PVWatts[11] calculator to determine the energy production of south facing roof-mounted systems compared to west facing roof-mounted systems. The analysis used a location of Kansas City, MO and the PVWatts default for system characteristics for south and west facing fixed-tilt systems and a single-axis system. For the south facing system an azimuth of 180 degrees was used. For the west facing system an azimuth of 270 degrees was used to maximize any possible effect that could occur due to the orientation of the solar panels. A tilt angle of 20 degrees was used for all systems. The default system size is 4 kW DC, but for the purposes of this analysis, the system size is not impactful. The PVWatts hourly data was utilized for this analysis.

South Facing vs West Facing Fixed-Tilt Systems

[11] PVWatts Calculator (nrel.gov)

The comparison of south facing and west facing solar installations reveals several notable differences in annual and seasonal energy production profiles. First, that in some months, the energy production shifts slightly to later in the day. Second, that in other months no shift occurs at all. Third, that orienting solar panels to face west instead of south comes at a significant penalty in total energy production.

In the summer months, during periods of peak demand, a slight shift in energy production occurs to later in the day when panels are oriented to the west. The month of July has the greatest shift in the time of peak energy production, as well as the highest total output. Figure 2 shows the average hourly July solar production from the PVWatts model, where the west facing curve (red) is shifted slightly to the right of the south facing curve (blue). For July, this results in a rightward shift of approximately one hour. But this shift does not occur in all months. In December, the west facing solar panels do not produce energy any later in the day compared to the south facing panels. Instead it only results in a reduction in total output. Figure 3 shows that the average hourly December energy production in the late afternoon for the last two hours is the same whether south facing or west facing but is lower for the west facing panels for all other hours of the day. For all other months, the size of the shift is in between that of July and December.

Figure 2 Average Hourly July Solar Energy Production (Watt)

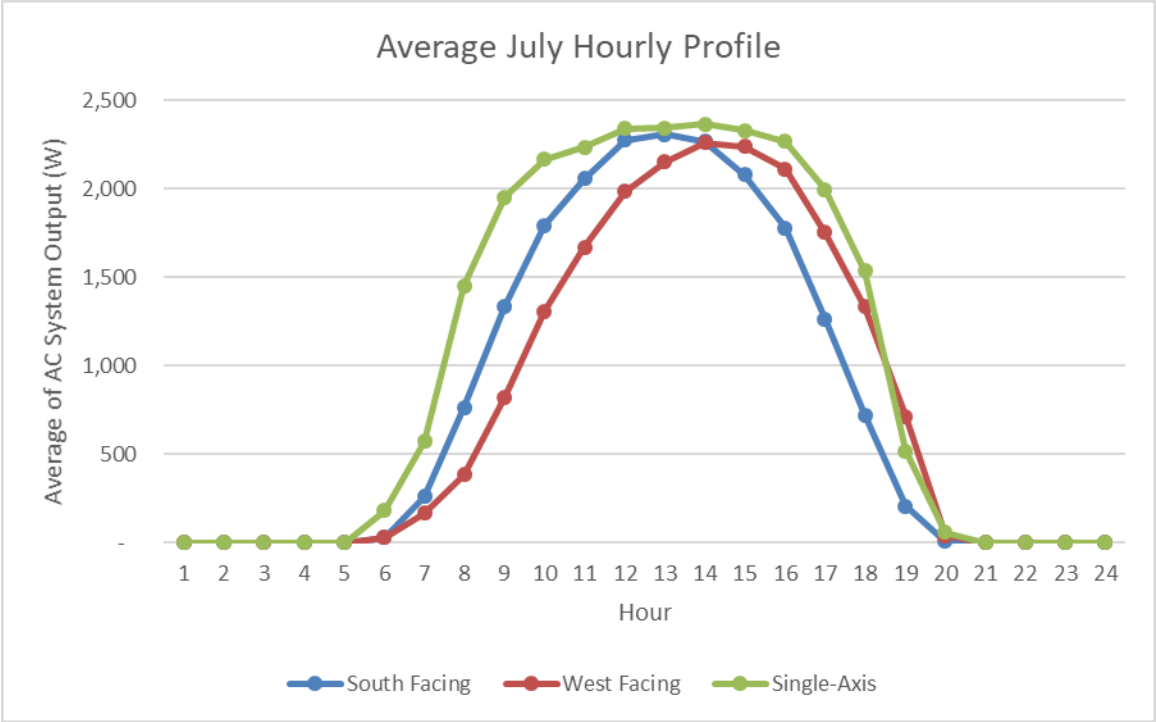
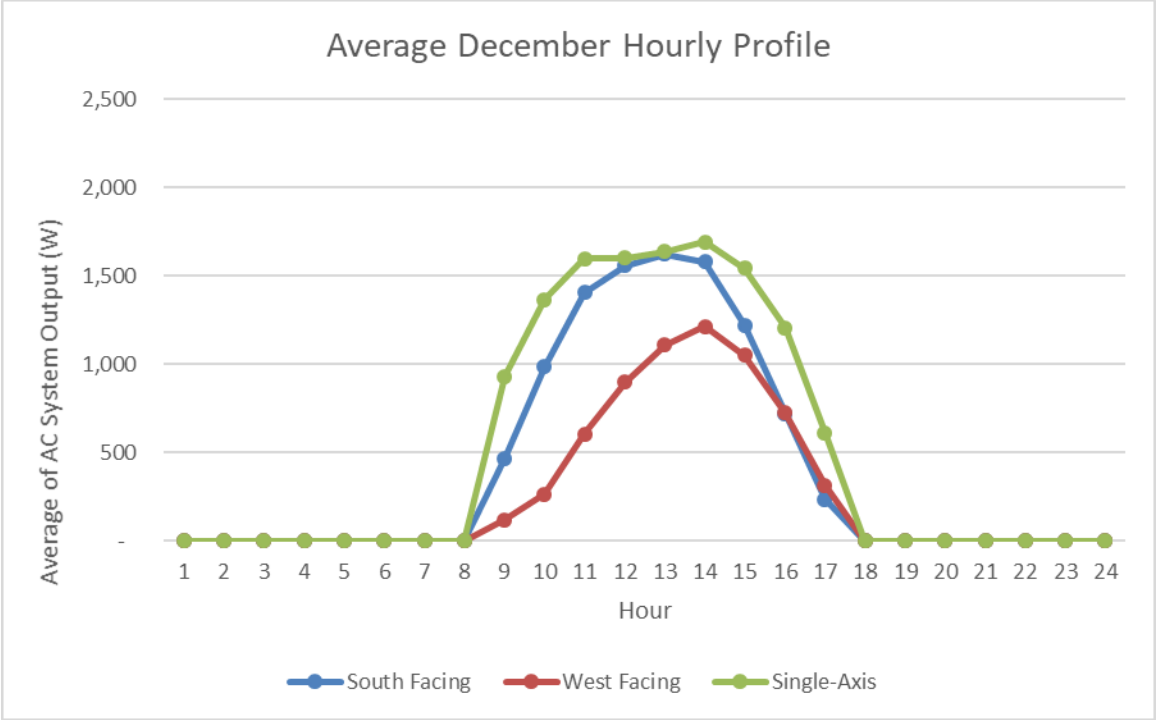


Figure 3 Average Hourly December Solar Energy Production (Watt)



Unfortunately, the small shift achieved by orienting solar panels west comes with a large annual performance penalty. While total energy production in the summer

months only declines slightly for June through August (by one to five percent), it is dramatically lower for the winter months of December and January (by 35 percent). Overall, for the calendar year, west facing panels would produce approximately fifteen percent less energy than south facing panels (see Table 1).

Table 1 South Facing vs West Facing Single-Axis Systems (Watt-hours)

Year	South Facing	West Facing	% Reduction
Jan	347,447	227,757	34.4%
Feb	378,234	276,034	27.0%
Mar	495,790	399,529	19.4%
Apr	521,739	476,592	8.7%
May	549,798	532,702	3.1%
Jun	558,384	552,126	1.1%
Jul	594,109	588,309	1.0%
Aug	543,582	518,269	4.7%
Sep	510,422	439,221	13.9%
Oct	432,345	329,117	23.9%
Nov	362,826	254,206	29.9%
Dec	303,740	195,481	35.6%
Annual	5,598,415	4,789,344	14.5%

Moreover, for roof mounted residential systems it is not known whether residents have the flexibility to choose what direction the panels face. For many roofs, there might only be one obvious choice due to roof design or shading from trees.

Solar Tracker Systems

Ground mounted solar panels do not have the orientation limitations that some roof mounted systems do, however, there are other mounting options that may suit many ground-based systems. There are three main types of mounting systems used for solar panels; fixed-tilt (such as used for most rooftop systems), single-axis tracking, and dual-axis tracking. The fixed-tilt systems are set at a predetermined angle from horizontal and orientation, and for roof-mounted systems this is often dictated by the roof construction. Systems with “tracking” are

designed to follow the sun throughout the day. The PVWatts analysis shows an increase total annual energy of about 27 percent for single-axis systems compared to fixed-tilt systems and an additional increase of about 12 percent for dual-axis systems over single-axis systems (see Table 2 and Table 3).

Additionally, solar panels with tracker systems achieve all the benefit of the late summer afternoon “shifting” (see Figure 2) as west facing systems, but with even greater total energy output than either fixed-tilt system.

Table 2 South Facing vs Single-Axis Systems (Watt-hours)

	South Facing	1-Axis	% Increase
Jan	347,447	439,747	26.6%
Feb	378,234	471,915	24.8%
Mar	495,790	621,582	25.4%
Apr	521,739	656,116	25.8%
May	549,798	690,394	25.6%
Jun	558,384	701,524	25.6%
Jul	594,109	754,271	27.0%
Aug	543,582	704,936	29.7%
Sep	510,422	660,382	29.4%
Oct	432,345	557,411	28.9%
Nov	362,826	466,816	28.7%
Dec	303,740	378,029	24.5%
Annual	5,598,415	7,103,124	26.9%

Table 3 Single-Axis vs Dual-Axis Systems (Watt-hours)

	1-Axis	2-Axis	% Increase
Jan	439,747	529,394	20.4%
Feb	471,915	534,094	13.2%
Mar	621,582	675,464	8.7%
Apr	656,116	713,296	8.7%
May	690,394	754,023	9.2%
Jun	701,524	770,305	9.8%
Jul	754,271	824,687	9.3%
Aug	704,936	775,388	10.0%
Sep	660,382	730,388	10.6%
Oct	557,411	630,821	13.2%
Nov	466,816	559,235	19.8%
Dec	378,029	469,735	24.3%
Annual	7,103,124	7,966,829	12.2%

Tracking systems typically increase the overall system cost by 15-20%[12] and also require more land area (about 20 percent) with dual-tracking systems costing more than single-tracking systems. However, Solar Power World Online reported in 2018 that the costs of tracker systems were dropping due to both price competition and design developments[13]. In fact, utility scale single-axis bifacial and monofacial PV are the two lowest cost technologies on a levelized cost of energy (LCOE) basis[14]. Single-axis trackers were already dominant in the US in 2017 and are expected to grow significantly over the next few years and expected to account for the majority of systems in 2021[15]. As such, additional incentives should not be needed to boost penetration of single-axis trackers. Tracking systems may not be

[12] Fixed-Tilt vs. Axis Tracker Solar Panels, https://www.kiewit.com/plant-insider/current-issue/fixed-tilt-vs-axis-tracker-solar-panels/
[13] Fixed-tilt vs. tracker: Why a one-size-fits-all approach can limit solar production, https://www.solarpowerworldonline.com/2018/02/fixed-tilt-vs-tracker-one-size-fits-approach-can-limit-solar-production/
[14] Single-axis bifacial PV offers lowest LCOE in 93.1% of world's land area, https://www.pv-magazine.com/2020/06/05/single-axis-bifacial-pv-offers-lowest-lcoe-in-93-1-of-worlds-land-area/
[15] IHS Markit: 9 key stats from PV Structural Balance of System Report for North America, https://leedpoints.com/ihs-markit-9-key-stats-from-pv-structural-balance-of-system-report-for-north-america/

suitable for all site locations due “mainly [to] wind loads, site topography and soil conditions”[16]. However, the economics of systems with single-axis tracking will likely begin to guide site selection criteria. In fact, the many ARPs in this triennial filing project that single-axis systems will be used.

(2) Conduct a Value of Solar study to inform efforts relating to integrated resource planning. A Value of Solar study is a comprehensive analysis of the cost avoided and benefits created for the grid, electricity customers, and society as result of the generation of solar energy. Because solar energy is often interconnected at the distribution level of the grid, such a study, done correctly, will capture distribution level benefits and costs that cannot be captured by wholesale level avoided cost estimates. The immediate benefit of such a study is to understand the contributions and costs related to distributed solar generation beyond simplistic and subjective allegations of cross subsidies. The utility’s Value of Solar study should consider the National Association of Regulatory Utility Commission’s Distributed Energy Resources Rate Design and Compensation manual, National Renewable Energy Laboratory’s Value of Solar: Program Design and Implementation Considerations, and the National Energy Screening Project’s National Standard Practice Manual for Distributed Energy Resources among any other industry guidance on value of solar study development and implementation.

Evergy’s response to this issue can be found in Appendix 8F Evergy Solar Valuation Study.pdf.

[16] Fixed-Tilt vs. Axis Tracker Solar Panels, https://www.kiewit.com/plant-insider/current-issue/fixed-tilt-vs-axis-tracker-solar-panels/

(J) FERC Order 2222

Evaluate the options of potential upgrades to the utility's distribution system needed in light of FERC Order 2222.

On September 17, 2020, FERC issued Order No. 2222 ("Order") requiring each RTO/ISO to revise its tariff "to establish DER Aggregators as a type of market participant that can register DER aggregations under one or more participation models in the RTO/ISO tariff." [17] The deadline for compliance filings is July 19, 2021. Compliance with the Order requires a significant paradigm shift in the industry to allow aggregations of DER to participate in wholesale markets and the industry is just beginning the process of understanding all that will be required to comply.

On February 18, 2021, Southwest Power Pool, Inc. ("SPP") filed a Motion for Extension of Time to submit revisions to its Open Access Transmission Tariff to comply with the Order by April 28, 2022. FERC approved the extension request on April 9, 2021.[18]

In its motion SPP provided justification for the request based on the "design complexities inherent in implementing the ordered changes; to coordinate (during a pandemic) with hundreds of distribution utilities, relevant electric retail regulatory authorities ("RERRA"), and state regulators in the SPP Regional Transmission Organization's 14 state footprint."[19]

SPP further noted that "Order No. 2222 directly impacts two challenging areas within the RTO. First, […] the necessary communication paths between the RTO, the transmission entities and market participants, and the distribution utilities steer

[17] *Participation of Distributed Energy Resource Aggregations in Markets Operated by Regional Transmission Organizations and Independent System Operators*, Order No. 2222, 172 FERC ¶ 61,247 (2020) ("Order").
[18] In Reply Refer to Order, Docket No. RM18-9-000, 175 FERC ¶ 61,013; April 9, 2021
[19] See, *Motion for Extension of Time of Southwest Power Pool, Inc*, filed February 18, 2021; Docket No. RM18-9-000 ("SPP Motion")

all into largely uncharted waters. Planning to effectively change an established, ingrained, and decades-old communication precedent will take significant time and close coordination with hundreds of parties that have not previously engaged in communication with the RTO or in bi-directional communication."[20]

Evergy is actively engaged in the SPP stakeholder process as SPP and stakeholders discuss amendments to its tariff and market rules to respond to the Order as there are many areas of potential impact to Evergy resulting from compliance to the Order. The Company wants to stress that currently development of SPP market protocols to accommodate the impacts of this Order are still in the early stages of discussion.

Evergy is also actively participating in an Electric Power Research Institute ("EPRI") FERC 2222 collaborative project that will identify current gaps across a range of technical areas and provide industry recommendations on how market participants might address those gaps. The EPRI effort is addressing electricity market design and operations; transmission and distribution reliability; operational coordination, data management and communication; and metering, telemetry, and cyber security across systems.

On February 24, 2021, the Missouri Commission opened docket EW-2021-0267, Establishment of a Working Case Regarding FERC Order 2222 Regarding Participation of Distributed Energy Resource Aggregators in Markets Operated by Regional Transmission Organizations ("RTO") and Independent System Operators ("ISO"), directing electric utilities to respond with suggestions by March 31, 2021 and directed the Missouri Public Service Commission ("Staff") to file its report with recommendations by April 30, 2021. Evergy anticipates that this working case will be the logical forum to inform the Commission on the upgrades to utility systems and processes that will ultimately be required to comply with the Order.

[20] SPP Motion at P 7.

SECTION 5: STAKEHOLDER GROUP MEETINGS

(5) Each electric utility shall convene a stakeholder group to provide the opportunity for public input into electric utility resource planning in a timely manner that may affect the outcome of the utility resource planning efforts. The utility may choose to not incorporate some, or all, of the stakeholder group input in its analysis and decision-making for the triennial compliance filing.

(A) The utility shall convene at least one (1) meeting of the stakeholder group prior to the triennial compliance plan filing to present a draft of the triennial compliance filing corresponding to 4 CSR 240-22.030–4 CSR 240-22.050 and to present an overview of its proposed alternative resource plans and intended procedures and analyses to meet the requirements of 4 CSR 240-22.060 and 4 CSR 240-22.070. The stakeholders shall make a good faith effort to provide comments on the information provided by the utility, to identify additional alternative resource plans, and to identify where the utility's analyses and intended approaches may not meet the objectives of the rules.

Stakeholder meetings were held electronically on July 23, 2020, October 19, 2020, December 16, 2020, January 21, 2021, and March 26, 2021. The materials presented at the stakeholder meetings are attached as Appendices 8A – 8D.

(B) Within thirty (30) days of the last stakeholder group meeting pursuant to subsection (5)(A) of this rule, any stakeholder may provide the utility and other stakeholders with a written statement summarizing any potential deficiencies in or concerns with the utility's proposed compliance with the electric resource planning rules. The utility has the opportunity to address the potential deficiencies or concerns identified by any stakeholder in its preparation of the triennial compliance filing.

Evergy Missouri West presented draft information corresponding to Rules 4 CSR 240-22.030 through 4 CSR 240-22.050 on February 25, 2021 electronically. Evergy Missouri West received comments from the Sierra Club on April 26, 2021.

(C) Any stakeholder input through the process described in section (5) of this rule does not preclude the stakeholder from filing reports in accordance with section (7) or (8) of this rule.

SECTION 6: COMMISSION DOCKETS

(6) The commission will establish dockets for the purpose of receiving the triennial compliance filings. Unless the commission specifies otherwise, the docket of the triennial compliance filing of each affected utility shall remain open to receive annual update reports including workshop summary reports, notifications of changes to the preferred plan, and other relevant documents submitted between triennial compliance filings. The commission will issue orders that establish an intervention deadline and provide for notice.

SECTION 7: TRIENNIAL COMPLIANCE FILING - STAFF REVIEW

(7) The staff shall conduct a limited review of each triennial compliance filing required by this rule and shall file a report not later than one hundred fifty (150) days after each utility's scheduled triennial compliance filing date. The report shall identify any deficiencies in the electric utility's compliance with the provisions of this chapter, any major deficiencies in the methodologies or analyses required to be performed by this chapter, and any other deficiencies and shall provide at least one (1) suggested remedy for each identified deficiency. Staff may also identify concerns with the utility's triennial compliance filing, may identify concerns related to the substantive reasonableness of the preferred resource plan or resource acquisition strategy, and shall provide at least one (1) suggested remedy for each identified concern. Staff shall provide its workpapers related to each deficiency or concern to all parties within ten (10) days of the date its report is filed. If the staff's limited review finds no deficiencies or no concerns, the staff shall state that in the report. A staff report that finds that an electric utility's filing is in compliance with this chapter shall not be construed as acceptance or agreement with the substantive findings, determinations, or analysis contained in the electric utility's filing.

SECTION 8: TRIENNIAL COMPLIANCE FILING - OTHER PARTIES REVIEW

(8) Also within one hundred fifty (150) days after an electric utility's triennial compliance filing pursuant to this rule, the public counsel and any intervenor may file a report or comments. The report or comments, based on a limited review, may identify any deficiencies in the electric utility's compliance with the provisions of this chapter, any major deficiencies in the methodologies or analyses required to be performed by this chapter, and any other deficiencies. The report may also identify concerns with the utility's triennial compliance filing and may identify concerns related to the substantive reasonableness of the preferred resource plan or resource acquisition strategy. Public counsel or intervenors shall make a good faith effort to provide at least one (1) suggested remedy for each identified deficiency or concern. Public counsel or any intervenor shall provide its workpapers, if any, related to each deficiency or concern to all parties within ten (10) days of the date its report is filed.

SECTION 9: JOINT AGREEMENT TIMELINE

(9) If the staff, public counsel, or any intervenor finds deficiencies in or concerns with a triennial compliance filing, it shall work with the electric utility and the other parties to reach, within sixty (60) days of the date that the report or comments were submitted, a joint agreement on a plan to remedy the identified deficiencies and concerns. If full agreement cannot be reached, this should be reported to the commission through a joint filing as soon as possible but no later than sixty (60) days after the date on which the report or comments were submitted. The joint filing should set out in a brief narrative description those areas on which agreement cannot be reached. The resolution of any deficiencies and concerns shall also be noted in the joint filing.

SECTION 10: ESTABLISHMENT OF HEARING

(10) If full agreement on remedying deficiencies or concerns is not reached, then, within sixty (60) days from the date on which the staff, public counsel, or any intervenor submitted a report or comments relating to the electric utility's triennial compliance filing, the electric utility may file a response and the staff, public counsel, and any intervenor may file comments in response to each other. The commission will issue an order which indicates on what items, if any, a hearing will be held and which establishes a procedural schedule.

SECTION 11: SUBMISSION OF DOCUMENTATION

(11) All workpapers, documents, reports, data, computer model documentation, analysis, letters, memoranda, notes, test results, studies, recordings, transcriptions, and any other supporting information relating to the filed resource acquisition strategy within the electric utility's or its contractors' possession, custody, or control shall be preserved and submitted within two (2) days of its triennial compliance or annual update filings in accordance with any protective order to the staff and public counsel, and to any intervenor within two (2) days of the intervenor signing and filing a confidentiality agreement, for use in its review of the periodic filings required by this rule. All information shall be labeled to reference the sections of the technical volume(s) to which it is related, and all spreadsheets shall have all formulas intact. Each electric utility shall retain at least one (1) readable copy of the officially adopted resource acquisition strategy and all supporting information for at least the prior three (3) triennial compliance filings.

Evergy Missouri West will submit workpapers, documents, reports, data, computer model documentation, analysis, letters, memoranda, notes, test results, studies, recordings, transcriptions, and any other supporting information within two days of submitting the triennial filing.

SECTION 12: NOTICE OF CHANGE TO PREFERRED PLAN

(12) If, between triennial compliance filings, the utility's business plan or acquisition strategy becomes materially inconsistent with the preferred resource plan, or if the utility determines that the preferred resource plan or acquisition strategy is no longer appropriate, either due to the limits identified pursuant to 4 CSR 240-22.070(2) being exceeded or for other reasons, the utility, in writing, shall notify the commission within sixty (60) days of the utility's determination and shall serve notice on all parties to the most recent triennial compliance filing. The notification shall include a description of all changes to the preferred plan and acquisition strategy, the impact of each change on the present value of revenue requirement, and all other performance measures specified in the last filing pursuant to 4 CSR 240-22.080 and the rationale for each change.

(A) If the utility decides to implement any of the contingency resource plans identified pursuant to 4 CSR 240-22.070(4), the utility shall file for review a revised resource acquisition strategy. In this filing, the utility shall specify the ranges or combinations of outcomes for the critical uncertain factors that define the limits within which the new alternative resource plan remains appropriate.

(B) If the utility decides to implement a resource plan not identified pursuant to 4 CSR 240-22.070(4) or changes its acquisition strategy, it shall give a detailed description of the revised resource plan or acquisition strategy and why none of the contingency resource plans identified in 4 CSR 240-22.070(4) were chosen. In this filing, the utility shall specify the ranges or

combinations of outcomes for the critical uncertain factors that define the limits within which the new alternative resource plan remains appropriate.

SECTION 13: GRANTING OF WAIVER OR VARIANCE

(13) Upon written application made at least twelve (12) months prior to a triennial compliance filing, and after notice and an opportunity for hearing, the commission may waive or grant a variance from a provision of 4 CSR240-22.030–4 CSR 240-22.080 for good cause shown. The commission may grant an application for waiver or variance filed less than twelve (12) months prior to the triennial compliance filing upon a showing of good cause for the delay in filing the application for waiver or variance.

On March 2, 2021 Evergy Missouri West filed a Motion for Extension of Time to file the 2021 Integrated Resource Plan. On March 11, 2021 the Commission granted the motion.

(A) The granting of a variance to one (1) electric utility which waives or otherwise affects the required compliance with a provision of this chapter does not constitute a waiver respecting, or otherwise affect, the required compliance of any other electric utility with a provision of these rules.

(B) The commission will not waive or grant a variance from this chapter in total.

SECTION 14: WAIVER FOR ANNUAL UPDATE WORKSHOP

(14) An electric utility which sells less than seven (7) million megawatt-hours to Missouri retail electric customers for the previous calendar year may apply for a waiver allowing it to conduct an annual update workshop pursuant to section (3) of this rule in place of its scheduled triennial compliance filing pursuant to section (1) of this rule, if the utility has no unresolved deficiencies or concerns from its prior triennial plan filing or annual update filing that materially affect its resource acquisition strategy.

Upon written application made at least twelve (12) months prior to a triennial compliance filing, and after notice and an opportunity for hearing, the commission may allow the utility to conduct the annual update workshop process in lieu of submitting its triennial compliance filing. No more than one (1) such waiver may be granted consecutively between triennial compliance filings.

SECTION 15: EXTENDING OR REDUCING TIME PERIODS

(15) The commission may extend or reduce any of the time periods specified in this rule for good cause shown.)

SECTION 16: COMMISSION ISSUED ORDER

(16) The commission will issue an order which contains its findings regarding at least one (1) of the following options:

(A) That the electric utility's filing pursuant to this rule either does or does not demonstrate compliance with the requirements of this chapter, and that the utility's resource acquisition strategy either does or does not meet the requirements stated in 4CSR 240-22.

(B) That the commission approves or disapproves the joint filing on the remedies to the plan deficiencies or concerns developed pursuant to section (9) of this rule;

(C) That the commission understands that full agreement on remedying deficiencies or concerns is not reached and pursuant to section (10) of this rule, the commission will issue an order which indicates on what items, if any, a hearing(s) will be held and which establishes a procedural schedule; and

(D) That the commission establishes a procedural schedule for filings and a hearing(s), if necessary, to remedy deficiencies or concerns as specified by the commission.

SECTION 17: COMMISSION ACKNOWLEDGEMENT OF PREFERRED RESOURCE PLAN

(17) If the commission finds that the filing achieves substantial compliance with the requirements outlined in section (16), the commission may acknowledge the utility's preferred resource plan or resource acquisition strategy as reasonable at a specific date. The commission may acknowledge the preferred resource plan or resource acquisition strategy in whole, in part, with exceptions, or not at all. Acknowledgment shall not be construed to mean or constitute a finding as to the prudence, pre-approval, or prior commission authorization of any specific project or group of projects. In proceedings where the reasonableness of resource acquisitions are considered, consistency with an acknowledged preferred resource plan or resource acquisition strategy may be used as supporting evidence but shall not be considered any more or less relevant than any other piece of evidence in the case. Consistency with an acknowledged preferred resource plan or resource acquisition strategy does not create a rebuttable presumption of prudence and shall not be considered to be dispositive of the issue. Furthermore, in such proceedings, the utility bears the burden of proof that past or proposed actions are consistent with an acknowledged preferred resource plan or resource acquisition strategy and must explain and justify why it took any actions inconsistent with an acknowledged preferred resource plan or resource acquisition strategy.

(A) The utility shall notify the commission pursuant to 4 CSR 240-22.080(12) in the event there is material reason why any plan acknowledged by the commission is no longer viable.

(B) Any interested stakeholder group may file a notice in the utility's most recent Chapter 22 compliance file with the commission if a substantial change in circumstances has occurred that it believes may result in the invalidation of any aspect of a preferred resource plan or portion of a resource acquisition strategy previously acknowledged by the commission.

(C) The utility about which a stakeholder group files a notice described in the previous section may file its response within fifteen (15) working days of the date the notice is filed.

SECTION 18: CERTIFICATION OF CONSISTANCY OF PREFERRED PLAN TO FUTURE CASE

(18) In all future cases before the commission which involve a requested action that is affected by electric utility resources, preferred resource plan, or resource acquisition strategy, the utility must certify that the requested action is substantially consistent with the preferred resource plan specified in the most recent triennial compliance filing or annual update report. If the requested action is not substantially consistent with the preferred resource plan, the utility shall provide a detailed explanation.