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BEFORE THE PUBLIC UTILITIES COMMISSION OF UTAH

RMP's 2023 Integrated Resource Plan	)	Docket No. 23-035-10

COMMENTS OF THE INTERWEST ENERGY ALLIANCE

December 12, 2023

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Introduction

The Interwest Energy Alliance (Interwest) is a non-profit 501(c)(6) trade association representing the leading renewable energy and energy storage developers and manufacturers working in collaboration with environmental non-governmental organizations to promote robust renewable energy markets throughout the states of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming. Interwest participates regularly in most major utilities' generation resource planning processes in these states, and Interwest is aware of trends, deficiencies, and differences between and among utility planning processes.

In the comments below, Interwest identifies several areas of concern, which warrant additional investigation into this and future Rocky Mountain Power (RMP) Integrated Resource Plans (IRPs). Specifically, RMP has recently "paused" its 2022 All-Source RFP (2022ASRFP), thus potentially rendering virtually every aspect of the IRP irrelevant and moot, as discussed below. We recommend that the Utah Public Service Commission (PSC or Commission) decline to acknowledge the 2023 IRP submitted by RMP or alternatively only acknowledge specific portions of the IRP and Action Plan with directions to resolve the deficiencies described within these comments.

Summary of Recommendations

Interwest recommends the Commission decline to acknowledge or alternatively only acknowledge specific portions of the IRP and the 4-Year Action Plan, with cautionary conditions to be placed on the problems created by the pause of the 2022ASRFP and actions outside of the Action Plan period.

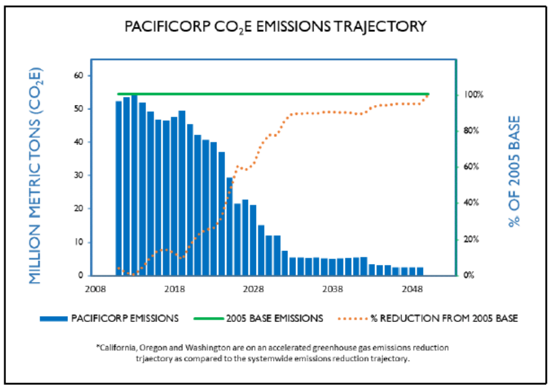
RMP's IRP was submitted to the Public Service Commission of Utah ("Commission" or "PSC") pursuant to the 1992 Order on Standards and Guidelines for Integrated Resource Planning (Docket No. 90-2035-01, "Order on Standards and Guidelines"). Under the Utah PSC Guidelines, the Commission is tasked with deciding whether to acknowledge the IRP and the analysis used to prepare the Preferred Portfolio and the Action Plan to carry out its goals over the next four years. Acknowledgement does not create any presumption of regulatory approval for any of the resources or strategies contained within the IRP. These decisions related to approval and cost recovery are reserved for separate dockets where prudency of specific investments is determined. The IRP, Vol. 2 Table B.1 documents how RMP complies with regulatory requirements in each state within its service territory.

To be acknowledged in Utah, the IRP must include the following:

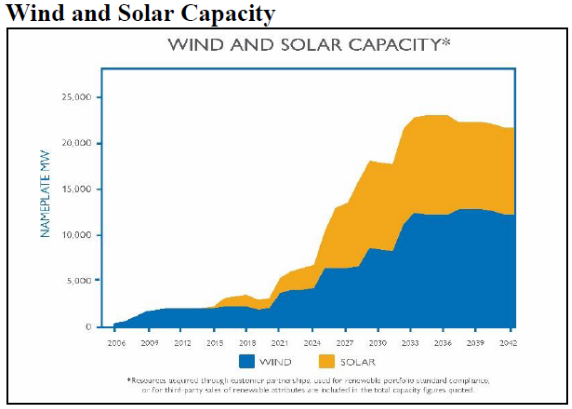
- A range of forecasts of future load growth
- Evaluation of all present and future resources, including demand side, supply side and market, on a consistent and comparable basis
- Analysis of the role of competitive bidding
- A plan for adapting to different paths as the future unfolds
- A cost effectiveness methodology
- An evaluation of the financial, competitive, reliability and operational risks associated with resource options, and how the action plan addresses these risks
- Definition of how risks are allocated between ratepayers and shareholders

Interwest generally supports the goals presented by RMP in the IRP. Notably, RMP continues to incorporate higher levels of renewable energy into its Preferred Portfolio, and will achieve reduced greenhouse gas emissions, which is critically important within the electricity sector. Overall, RMP could be on the right path to meet goals of reduced emissions and increasing renewable, inverter-based resources, with the understanding that significant renewable resources are acquired through the 2022ASRFP. These important goals are reflected in the graphs within the executive summary:

Emissions



Wind and Solar Capacity



To achieve these goals, however, RMP must complete the 2022ASRFP on schedule. Instead RMP filed notice on September 29, 2023, in Docket No. 21-035-52 that its 2022ASRFP would be suspended "to adapt to changing conditions while making critical decisions for the long-term benefit of its system."[1]

This 2022ASRFP filing effectively reduces what would be a solid foundation of reasonable expectations presented in RMP's IRP to possibly nothing more than wishful thinking. Without the

[1] November 9, 2023. Rocky Mountain Power's Response to Motion for Order to Preserve Records. Docket No. 21-035-52.

expectation of the fulfilment of the 2022ASRFP, the 2023 Action Plan is not based upon analysis, but rather is based on an alternate history that may or may not be a reasonable estimate of RMP's current situation. This Action Plan is indeed unique; the economic, reliability, and emission reduction benefits from Action Plan resources was so pronounced that RMP identified that the main procurement risk to this IRP was not over procurement, but rather the inability to procure enough resources in the required timeframe.[2] Given the critical importance of procurement to this Action Plan, RMP's suspension of the 2022ASRFP casts extreme uncertainty over the Action Plan and all of the IRP's analysis.

In addition, the Commission should scrutinize certain resources included in RMP's Preferred Portfolio. The Preferred Portfolio includes a combination of wind, solar with storage, and stand-alone storage (battery and pumped hydro), along with demand-side resources, reflecting the continued price reductions and other market changes which causes the model to select emissions-free zero marginal cost renewable energy when available. But the remaining resources in the Preferred Portfolio, including small modular reactor (SMR) nuclear and non-emitting peaker units, do not reflect the least cost/least risk selection by the software modeling. For example, the nuclear resources were "forced-in" rather than selected by the model through system optimizing, and the zero-emitting peaking resources reflect reliance on the development of technologies which are not yet commercially viable. This practice warrants heightened Commission attention and scrutiny to ensure that a portfolio with those resources included represents a least-cost-least-risk portfolio.

Interwest recommends the Commission order, in this 2023 IRP docket that:

[2] "The main procurement risk is an inability to procure resources in the required timeframe to meet the least-cost, least-risk mix of resources identified in the preferred portfolio." IRP, Action Plan, page 375.

- The Commission direct RMP to resume its 2022ASRFP immediately.
- The Commission direct RMP to only consider SMRs and non-emitting peaker units to be extremely risky that cannot be relied on for planning purposes.
- The Commission direct RMP to specifically identify areas in future IRPs where regional coordination or market changes are likely, expected, or would be beneficial.
- The Commission direct RMP to incorporate best practices and probabilistic modeling in future IRP reliability assessments.
- The Commission direct RMP to incorporate a specific section in future IRPs to describe its pursuit of federal funding opportunities for cleaner energy resources and more efficient technology.
- The Commission direct RMP to incorporate a specific scenario in future IRPs to address potential elimination GHG emitting thermal generation by 2035.
- The Commission direct RMP to incorporate best practices and probabilistic modeling to best plan for climate change repercussions, specifically including increased likelihood of drought and wildfire impact.

2022ASRFP Suspension

The 2022 All-Source RFP sought approximately 1,345 megawatts (MW) of new wind and solar generation resources and 600 MW of energy storage resources with commercial operation date at the end of the year, 2027. The preferred portfolio in this 2023 IRP shows approximately 400 MW wind, 1400 MW solar, and 2500 MW battery storage in 2027 and 2028 and another 1900 MW wind, 200 MW solar, and 1100 MW battery storage in 2029. These needs are significant, and

RMP is unlikely to be able to acquire this level of resources unless the 2022ASRFP is resumed immediately.

It is unrealistic, and imprudent, to gamble reliability and GHG reductions on an expectation that the procurement environment will become less volatile in the near term, that the EPA will cease its rulemaking process, that wildfire risk will cease to exist, or that other consequences of extreme weather due to climate change will ameliorate. Further suspension, or worse, termination of the 2022ASRFP, does not mitigate RMP's stated reasons for suspension, and in fact only exacerbates them. Therefore, we request the Commission direct the company to resume the 2022ASRFP as soon as possible.

Economic Trends

In Utah, wind, solar, and energy storage developers employ 6,700 Utahns and have invested $4 billion into the Utah economy, contributing $9.2 million in property, state, and local taxes in 2022. These projects provided $11.2 million in lease income to farmers, ranchers, and other private landowners.[3]

The wider market that RMP currently participates in, the California Independent System Operator (CAISO) Energy Imbalance Market (EIM), has realized over $4.65 billion for customers in savings since 2014, with RMP customers benefitting from $37.37 million in savings just in the third quarter of 2023 alone.[4] A significant contributor to EIM benefits is transfers across balancing areas, providing access to lower cost supply. This integration of Western utilities shows that

[3] American Clean Power, Utah Fact Sheet, Available at https://cleanpower.org/wp-content/uploads/2023/11/Utah_clean_energy_factsheet.pdf

[4] CAISO. *Western Energy Imbalance Market Benefits*. Available at: https://www.westerneim.com/Pages/About/QuarterlyBenefits.aspx

ratepayers across the West reap savings and enjoy enhanced reliability benefits when regional needs are considered.[5]

Significant market dynamics have shifted toward cost-effective renewable resources and broader market integration. Voluntary procurement of clean energy by corporate buyers is growing at a rate of about 20% year over year,[6] and that deliverability is a key factor in acquisitions going forward.[7] In a case study of two neighboring Colorado counties, The Western Way found that pro-renewable energy policies led to a 63% higher property value increase, 36% higher overall economic growth, significant job growth, and significantly higher tax revenue.[8] It is imperative for Utah's economic growth that the state offer opportunities for new and diverse businesses to locate in Utah by offering these businesses the clean, low-cost energy they desire.

Unproven technology risk

Small modular reactors

RMP is incorporating the unproven Natrium small modular reactor (SMR) demonstration project in the preferred portfolio without fully recognizing its cost and risks, potentially missing opportunities in proven technologies which have reached market maturity. One of the preferred

[5] CAISO. *Western Energy Imbalance Market Benefits Report Q3 2023*. Available at: https://www.westerneim.com/Documents/iso-western-energy-imbalance-market-benefits-report-q3-2023.pdf
[6] Clean Energy Buyers Association Deal Tracker (https://cebuyers.org/deal-tracker/ and NREL "Status and Trends in the Voluntary Market", available at:https://www.nrel.gov/docs/fy23osti/84419.pdf
[7] G. Miller, G. Pease, W. Shi, (2023), Singularity Energy/Brattle Group, "Executive Summary: Where matters: Integrating deliverability into voluntary clean energy market boundaries", available at: https://singularity.energy/boundaries-report
[8] The Western Way, "A Tale of Two Counties: The Fiscal Impacts of Pro-Growth Renewable Energy Policies at the Local Level,", Available at: https://www.thewesternway.org/s/TWW_Tale-of-Two-Counties_v2.pdf

portfolio variants, P06 - No Forward Tech—which excludes this project *and* non-emitting resources—indicates that procuring hybrid solar plus storage and standalone storage resources provides sufficient reliability, with higher estimated costs but reduced risks of severe project delays or lack of market viability to nearly zero.

Nuclear technology is replete with examples of delayed schedules and cost overruns. The Utah Associated Municipal Power Systems (UAMPS) NuScale SMR was recently cancelled amidst significant cost estimate increases.[9] The NuScale SMR technology was the first SMR to achieve federal regulatory approval, yet still was unable to even begin construction to achieve its planned 2029 in-service date. The Plant Vogtle Units 3 and 4 in the Southeast U.S. had an initial cost projection of $14 billion, and current filings place the cost to complete at over $30 billion. The project is also seven years behind schedule, after it was originally planned to go in service in 2016.[10] The risks of both cost and time overruns with nuclear generating units are the rule rather than the exception. Since 2009, the levelized cost of energy of nuclear energy has risen 36%, the only utility scale generation source that had costs rise during that timeframe.[11] RMP needs to establish milestones for any SMR project that include off-ramps and replacement renewable technology in case the SMR project are unable to come to fruition on schedule and on budget. These milestones cannot wait for the 2025 IRP.

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[9] https://www.bloomberg.com/news/articles/2023-11-08/first-us-small-nuclear-project-canceled-after-costs-climb-53

[10] Z. Bright, (2023), "What Vogtle's stumbling finish means for U.S. nuclear energy," Energy Wire, available at https://www.eenews.net/articles/what-vogtles-stumbling-finish-means-for-u-s-nuclear-energy/

[11] Lazard. Lazard's Levelized Cost of Energy+. Available at https://www.lazard.com/research-insights/levelized-cost-of-energyplus/.

Given the uncertainties and unproven technologies in the proposed small modular reactor plant design and the track record of other nuclear unit construction, RMP is likely significantly underestimating the risks and potential costs. Alternative portfolios indicate that RMP could instead rely on existing proven inverter-based technologies such as wind, solar and battery storage to serve its demand without the need to risk system reliability in the hands of these demonstration projects. Interwest continues to caution against investment in risky technologies where fuel supply interruptions or development/acquisition costs and delays are so likely that RMP's customers cannot rely on timely energy generation.

Non-Emitting Peakers

RMP is taking on additional risk by incorporating its proposed non-emitting peakers. This risk presents itself in several ways. These resources---presumably relying on hydrogen-fueled turbines---have significant fuel-cost risk, technology development risk, and the risk that units may not reach emission performance requirements and become stranded assets. A 20% blending of hydrogen corresponds to only a 6-7% decrease in CO_2 emissions at the gas generating unit.[12] To be emission free, these units must have the capability of burning 100% renewable hydrogen and RMP must have the infrastructure in place to deliver 100% renewable hydrogen to these units. As shown above, any blending with natural gas will not be adequate to qualify as a non-emitting resource.

[12] J. Bard, et al., (2022), "The Limitations of Hydrogen Blending In The European Gas Grid", Fraunhofer Institute for Energy Economics and Energy System Technology, available at https://www.iee.fraunhofer.de/content/dam/iee/energiesystemtechnik/en/documents/Studies-Reports/FINAL_FraunhoferIEE_ShortStudy_H2_Blending_EU_ECF_Jan22.pdf.

RMP has included over 1200 MW of non-emitting peakers in its preferred portfolio. RMP may be underestimating the risks and potential costs of these units, and thus their inclusion in any portfolio cost cannot be considered accurate. Interwest recommends RMP provide significant study and substantially more definition and cost support in this area in future IRP filings. Green hydrogen being available and in sufficient quantities to achieve this result requires substantially more detailed information than has peen presented to date. RMP has not put forth any cogent, articulated plan on how it will supply these units with fuel, and Interwest is not aware of any current or planned green hydrogen production, storage, and transportation system capable of fueling such a demand. It is not reasonable, without significant additional information, to adopt the inputs utilized by RMP in this 2023 IRP that project a robust green hydrogen market, in terms of either cost or availability.

Capacity Modeling

Interwest recommends that the Commission order RMP to perform and utilize an Effective Load Carrying Capability (ELCC) study for all system resources, including thermal generation, to provide an apples-to-apples comparison.

This need is immediate and highlighted by a recent Tri-State Generation and Transmission (Tri-State) ELCC study performed by Astrape Consulting filed in its 2023 Electric Resource Plan (ERP) in Colorado.[13] The Tri-State ELCC study includes an ELCC calculation for certain thermal resources that should be an eye-opener for RMP. This study looked at the standard Equivalent Forced Outage Rate (EFOR) for certain coal and combined cycle (CC) natural gas units and

[13] Colorado Public Service Commission Proceeding No, 23A-0585E *Hearing Exhibit 101 LKT-1 – Attachment G-1 – Public – ELCC and PRM Study (Astrape)* page 11 of 68.

compared it to an ELCC calculation that is equivalent to the capacity calculation used to value wind, solar, and storage resources. As you can see from the table below, Laramie River Station, a large coal fired thermal generating unit similar to several RMP units, has been given an EFOR derived capacity value of 90.7%, when its ELCC is actually 58.8%.

The table below shows the ELCC of the coal and CC units.

Table 16. Coal and CC ELCC

Resource	EFOR	ELCC
Shafer CC	7.8%	64.4%
Springerville Coal	9.2%	63.8%
Laramie River Coal	9.3%	58.8%

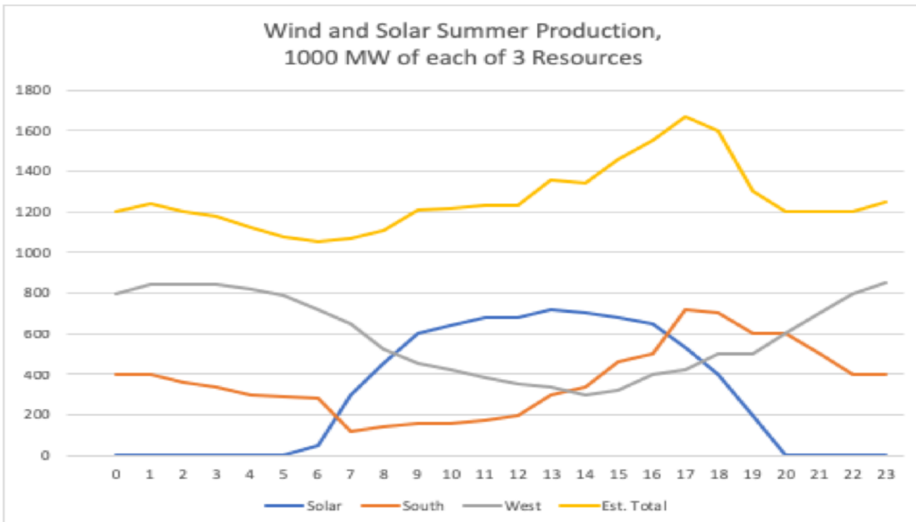
This is not simply an academic exercise. As shown throughout these comments, thermal generation is a significant point of failure for loss of load events, and the Commission should require RMP to perform ELCC studies for all of its generating units, not just wind, solar, and storage, to have a true understanding of system capabilities and to ensure new resources are valued fairly.

A networked aggregation of many customers and sources of supply greatly reduces costs because changes in individual sources of electricity supply and demand are not perfectly correlated. With variable renewable resources like wind and solar over a large geographic footprint, these diversity benefits are significant. Even a relatively small amount of geographic distance between generators is enough for the output profiles of two wind plants[14] or two solar

[14] H. Holttinen, et al., *Design and Operation of Power Systems with Large Amounts of Wind Power*, at 15, (2009), available at: https://community.ieawind.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=c7a0f97c-b01c-713b-b51a-46f33d62b5db&forceDialog=0.

plants[15] to be less than perfectly correlated, as local weather phenomena no longer affect both plants simultaneously.

A study of the growing Texas portfolio of wind and solar resources provides a graphic example of how wind and solar resources can work together to balance the supply resources:[16]



Slusarewicz and Cohen, "Assessing Solar and Wind Complementarity in Texas," *Renewables: Wind, Water and Solar*, 2018, Vol. 5, No. 7.

As demonstrated by several recent industry studies,[17] renewable output diversity and load diversity is greater over a larger and larger geographic area. Expanded ties to neighboring power

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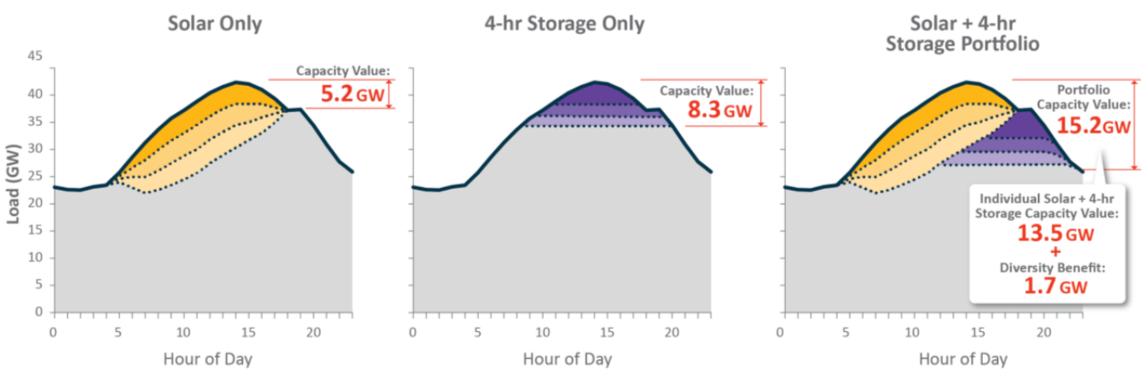
[15] Andrew Mills & Ryan Wiser, *Implications of Wide-Area geographic Diversity of Short-Term Variability of Solar Power*, Lawrence Berkeley National Laboratory (September 2010), available at: https://emp.lbl.gov/sites/all/files/presentation-lbnl-3884e-ppt.pdf.

[16] Carl Linvill, Ph.D., Regulatory Assistance Project, "Electricity Trends and Critical PUC Activities" (April 11, 2019), Slide 13, citing Slusarewicz and Cohen, "Assessing Solar and Wind Complementarity in Texas," *Renewables: Wind, Water and Solar*, 2018, Vol. 5, No. 7. Available at https://www.raponline.org/knowledge-center/electricity-trends-critical-puc-activities/.

[17] *See, e.g., Macro Grids in the Mainstream: An International Survey of Plans and Progress*, available at: also Brown and Botterud, *The Value of Inter-Regional Coordination and Transmission in Decarbonizing the U.S. Electricity System* (2020), available at: https://www.cell.com/joule/fulltext/S2542-4351(20)30557-2;
also Americans for a Clean Energy Grid, *Consumer, Employment and Environmental Benefits of Electricity Transmission Expansion in the Eastern U.S.* (2020), https://cleanenergygrid.org/wp-

systems provides greater access to flexible resources that are critical at higher penetrations of renewable energy.[18] Because wind and solar have negatively correlated output profiles, and because solar and wind complement storage by shortening the duration of peak net load periods (as illustrated in the figure below[19] for a hypothetical power system), portfolios of wind, solar, and storage resources provide a capacity value that is greater than the sum of the capacity values of their component parts.



For most well-balanced combinations of wind and solar, the diversity benefits increase the capacity value of the total existing and new wind and solar fleet by several percentage points, which translates into dozens of MW of additional capacity value. As consulting firm E3 has explained, "[a]s the penetrations of these resources grow to represent significant shares of the electricity system across the U.S., these interactive effects cannot be ignored or rounded away.

content/uploads/2020/10/Consumer-Employment-and-Environmental-Benefits-of-Transmission-Expansion-in-the-Eastern-U.S..pdf.

[18] *Western Flexibility Assessment*, Energy Strategies for Western Interstate Energy Board (2019), available at: https://westernenergyboard.org/wp-content/uploads/2019/12/12-10-19-ES-WIEB-Western-Flexibility-Assessment-Final-Report.pdf.

[19] N. Schlag, et al., *Capacity and Reliability Planning in the Era of Decarbonization*, at 6. Energy and Environmental Economics, Aug. 2020, available at https://www.ethree.com/wpcontent/uploads/2020/08/E3-Practical-Application-of-ELCC.pdf.

Rather they must be addressed head-on to ensure that electricity systems continue to provide both reliability and economic efficiency."[20]

Increasing solar energy penetration can increase the capacity factor of energy storage, boosting the overall reliability of the portfolios. An issue brief from Energy Systems Integration Group (ESIG), "The Uses of Probabilistic Forecasts in Operating a High-Renewables Grid", explains the elements of a probabilistic determination of resource adequacy for high-renewables portfolios.[21]

NERC-sponsored discussions now promote probabilistic methodologies, described in one recent report as follows:[22]

> *In a future with higher penetrations of variable and energy-limited resources, the dominant sources of resource adequacy risk begin to shift from (assumed) independent thermal unit outages to spatially- and temporally-correlated weather-driven phenomena.*

Wind generators can provide voltage ride-through abilities through voltage disturbances.[23] Solar plants are also able to provide these services, but until FERC Order 828 were not required to do so.[24] Not all resources can provide this service. Gas-fired generation is often taken offline by grid disturbances, and therefore has not always provided substantial voltage ride-through

[20] Id at 7.
[21] IEEE Power and Energy Magazine November-December 2019, "The Uses of Probabilistic Forecasts in Operating a High-Renewables Grid", Adapted from S. Haupt, et al., "The Use of Probabilistic Forecasts: Applying Them in Theory and Practice," available at https://www.esig.energy/wp-content/uploads/2020/10/ESIG-brief-probabilistic-forecasts.pdf.
[22] See, e.g., Steven Gordon, NREL, "Probabilistic Assessment of High-Renewables Power Systems: Current Work and Future Directions", U.S. Dept. of Energy Office of Scientific and Technical Information (Feb. 18, 2020), available at: https://www.osti.gov/biblio/1601584.

[23] Id.
[24] Id.

capability.[25] Similarly, coal plants often go offline during voltage faults because some combination of the generator or critical plant equipment such as pumps and conveyor belts cannot ride through the disturbance.[26] Nuclear plants can go offline for similar reasons.[27] The inability of some large generators to ride through a disturbance has contributed to large-scale blackouts in Washington, D.C. and Florida.[28] Interwest recommends that RMP to provide peer-reviewed effective load carrying capacity reports including accurate probabilistic analysis on all resource types in an equal manner.[29]

Regional Market Changes

RMP is actively participating in regional efforts to develop day-ahead markets and a resource adequacy program that will help unlock regional diversity and facilitate market transactions over the longer term,[30] which Interwest strongly supports. It is imperative that this transition ultimately results in the formation of a full organized wholesale market regime that captures a significant part of the load served in the Western Interconnection. Day ahead markets provide important grid operational improvements, but only a full-scale organized wholesale

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[25] Id., citing TRC Solutions (2015) "Revisions to NERC PRC Standards Have Significant Implications for Utility Compliance Programs", available at: https://www.trcsolutions.com/writable/images/Regulatory-Update-NERC-PRC-Standards-Changes-Nov-2015-FINAL.pdf.

[26] Id., citing NERC (2015) "Standard PRC-024-2 – Generator Frequency and Voltage Protective Relay Settings", available at: https://www.nerc.com/pa/Stand/Reliability%20Standards/PRC-024-2.pdf.

[27] Id.

[28] Id., and Reuters, (2008), "FPL cites human error as cause of Florida blackout", available at: https://www.reuters.com/article/us-florida-blackout/fpl-cites-human-error-as-cause-of-florida-blackout-idUSWNAS318320080229.

[29] A. Mills, P. Rodriguez, 2019, "Drivers of the Resource Adequacy Contribution of Solar and Storage for Florida Municipal Utilities", Lawrence Berkeley National Laboratory, available at https://escholarship.org/uc/item/9xz19063.

[30] e.g. IRP Vol. I, p.89-90, pdf 107-108/400.

market provides critical transmission planning and eliminates pancaked transmission rates necessary to unlock the most geographic diversity and diversity in demand and supply resources.[31]

The Western States Market Study found that an RTO or ISO is expected to provide increasing levels of gross benefits over time. If an RTO were formed today, it could generate as much as $1.3 billion benefits annually. By 2030, this estimate is nearly $2 billion per year. Capacity savings make up the majority of the overall benefits identified.[32]

Summary Market Factor Scorecard for Increased use of Clean Energy Technologies

Increased Use of Clean Energy Technologies	Bilateral	Real-Time	Day-Ahead	RTO
Efficient grid operation which allows low (and zero) marginal cost resources to be dispatched and reduces overall costs of integrating clean energy technologies	Fair	Good	Very Good	Excellent
Lower barriers to access new generation in high-quality renewable resource locations	Poor	Poor	Good	Excellent
Opportunities for clean electricity resources to be added to the grid (e.g. direct customer access to renewable/clean resource power purchase agreements)	Good	Good	Very Good	Excellent
Provides financing opportunities and a variety revenue stream opportunities for clean electricity technologies	Fair	Good	Very Good	Excellent
Economically facilitates emissions reduction goals/requirements via market signals	Fair	Good	Very Good	Excellent
Transparent and timely information on pricing, resource operations, and emissions	Fair	Good	Very Good	Excellent

[31] Utah Office of Energy Development, *Western States' Market Study: Exploring Western Organized Market Configurations: A Western States' Study of Coordinated Market Options to Advance State Energy Policies*, (July, 2021), at 7 (technical report)("Western States Market Study"). Available at https://energy.utah.gov/wp-content/uploads/State-Study-Final-Report-1.pdf.

[32] Western States Market Study, fn. 32, *supra*, at 7.

Summary Market Factor Scorecard for Reliable, Affordable Provision of Energy to Consumers

Ability of Market Construct to Support Reliable, Affordable Provision of Energy to Consumers	Bilateral	Real-Time	Day-Ahead	RTO
Efficient grid operation which reduces costs and increases flexibility of transactions	Fair	Good	Very Good	Excellent
Ability to unlock full potential of existing generation (lowering costs) and to decrease generation capital costs/investments	Poor	Fair	Good	Very Good
Ability to unlock full potential of existing transmission system (lowering costs) and to decrease transmission capital costs/investments	Fair	Good	Very Good	Excellent
General ability to support reliable operations	Good	Very Good	Very Good	Excellent
Visibility into electric system conditions to improve reliability	Fair	Good	Very Good	Excellent
Transparent and timely information available to state PUCs, consumer advocates and other stakeholders	Fair	Good	Very Good	Excellent
Long-term mechanisms to support a system with adequate electric resources	Fair	Good	Good	Very Good
Increased opportunities for cost-effective demand-side resource participation	Fair	Good	Very Good	Excellent

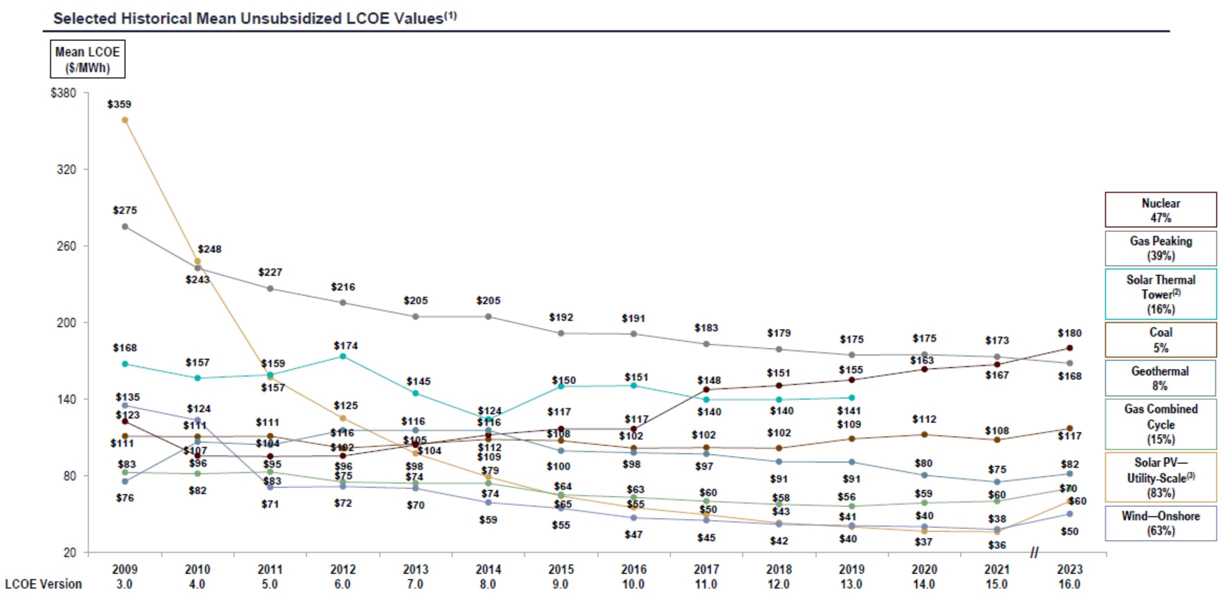
The various market structures studied support the concept that the broader a footprint an RTO can achieve, the bigger the benefits. Integration benefits, reliability benefits, and capacity savings from resource and load diversity will replace and likely exceed any lost energy benefits driven by an involving resource mix.

RMP's IRP references both the CAISO Extended Day-Ahead Market (EDAM) and the Western Power Pool's Western Resource Adequacy Program (WRAP) but is not specific on how both programs are reflected in the modeling. Interwest is particularly concerned that resources are being modeled for capacity needs that are unnecessary due to participation in the WRAP. Interwest recommends that RMP include significant study and information in future IRPs on regional market participation, including the potential benefits of a full-scale organized wholesale market.

Grid scale renewables remain the least cost resources

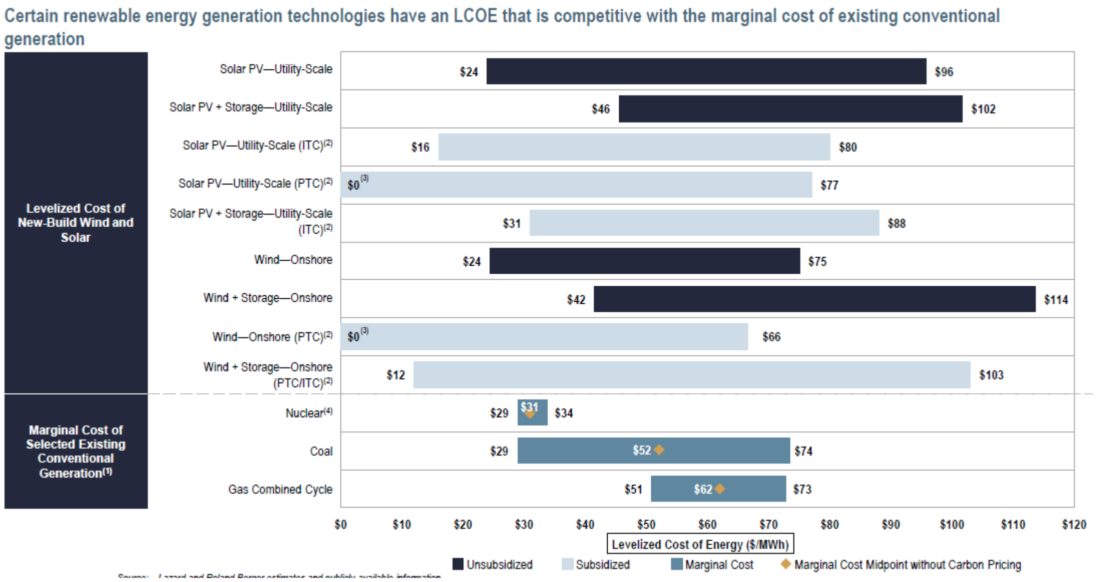
Wind and solar energy are typically the lowest-cost resources available in the wholesale electricity market because they have zero fuel cost and near-zero variable operating and maintenance costs. Wind plants benefit from large economies of scale, with a 17% reduction in installed cost in moving from 5-20 MW projects to projects larger than 200 MW.[33]

Wall Street firm Lazard reports that since 2009, the levelized cost of wind energy has fallen by 63%, while solar energy costs have fallen 83%.[34]

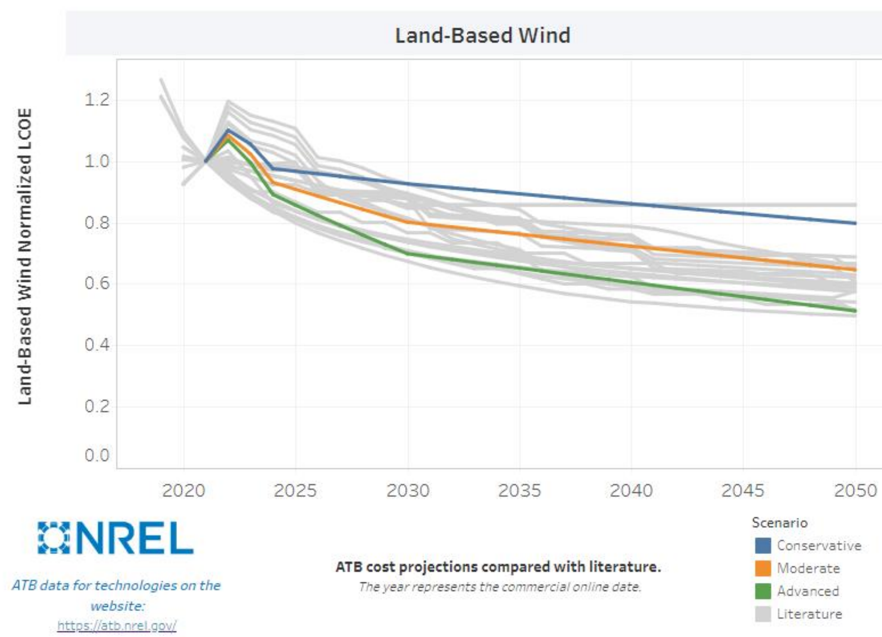


In fact, many renewable energy technologies have a levelized cost that is under or competitive with the marginal cost of existing thermal generation.[35]

[33] R. Wiser et al., *Wind Energy Technology Data Update: 2020 Edition*, (August 2020), available at: https://emp.lbl.gov/wind-technologies-market-report.
[34] Lazard. *Lazard's Levelized Cost of Energy+. LCOE Version 16.0.* Available at https://www.lazard.com/media/2ozoovyg/lazards-lcoeplus-april-2023.pdf
[35] Id.

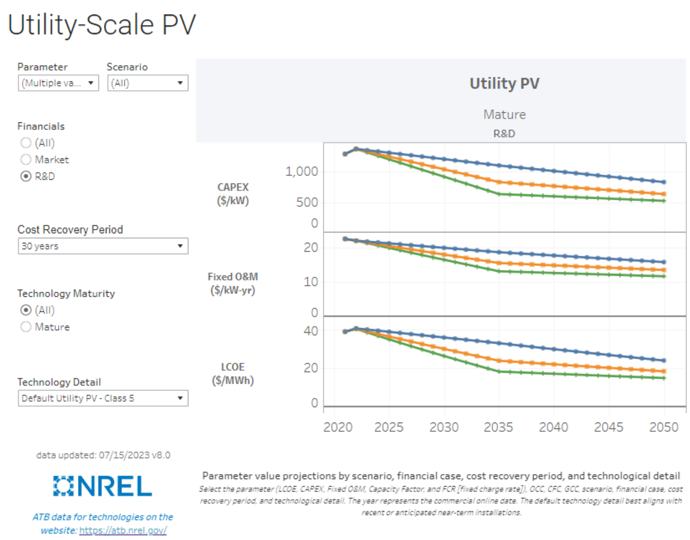


The National Renewable Energy Laboratory (NREL) expects the levelized cost of land-based wind energy to continue to fall through 2050 in all scenarios.[36]

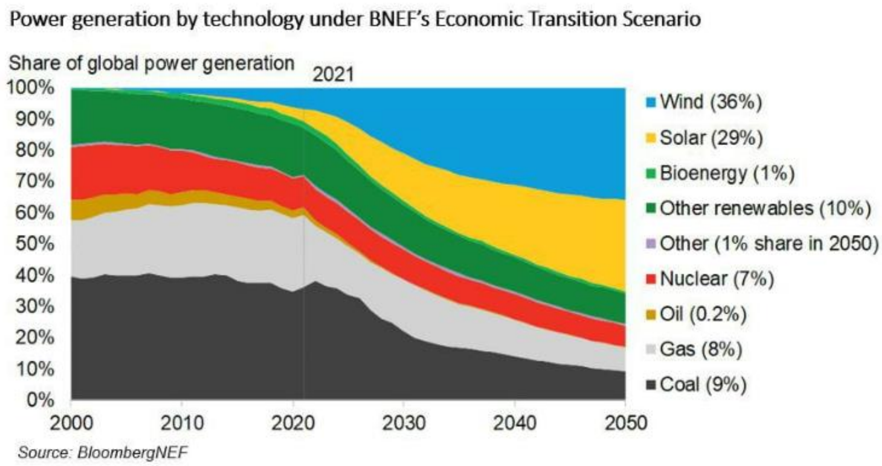


[36] NREL (National Renewable Energy Laboratory). 2023. "2023 Annual Technology Baseline." Golden, CO: National Renewable Energy Laboratory. https://atb.nrel.gov/electricity/2023/land-based_wind

Utility scale solar levelized costs are similarly expected to continue to fall through 2050 in all scenarios.[37]



Other analysts agree. Bloomberg New Energy Finance expects renewable energy to dominate utility investment going forward, given its growing cost advantage.[38]



[37] NREL (National Renewable Energy Laboratory). 2023. "2023 Annual Technology Baseline." Golden, CO: National Renewable Energy Laboratory. https://atb.nrel.gov/electricity/2023/utility-scale_pv

[38] BloombergNEF, New Energy Outlook 2022, (2022), available at: https://about.bnef.com/new-energy-outlook/.

Natural gas resources remain volatile and risky

Natural gas prices have fluctuated wildly over the recent past.[39] While the IRP relies upon current cost projections,[40] many experts expect prices to remain highly volatile, a trend confirmed by forward spot market prices.[41] RMP is planning to convert Jim Bridger Units 1 and 2 to natural gas peaking units, which introduces greater natural gas market uncertainty into the risk profile of the system.

Gas price risk carries an economic cost to consumers, and there are tools that can quantify the economic value of the risk reduction provided by greater use of renewable resources and storage relative to gas generation. Lawrence Berkeley National Laboratory (LBNL) has developed more than one such tool RMP could use to account for gas price risk.[42] Interwest recommends that RMP use these tools to evaluate the exposure of portfolios to natural gas fuel price risk to consumers in future IRP analysis. Methane leakage is a significant risk vector as well. The Inflation Reduction Act Section 60113, the Methane Emission Reduction Program, includes a methane leakage fee of $900/ton in 2024, $1200/ton in 2025, and $1500/ton in 2026 and thereafter for facilities that report greater than 25,000 tons of CO2 equivalent of greenhouse gases emitted per year. Whether or not RMP facilities will be directly liable for these costs is as yet unknown,

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[39] Fig. 3.7, Daily 2022 Henry Hub Spot Prices, Vol. I, p. 50, pdf 68/400.
[40] Fig. 3.8, Henry Hub Futures, Vol. I, p. 52, pdf 70/400.
[41] EIA, “Natural Gas Spot and Futures Prices (NYMEX),” available at https://www.eia.gov/dnav/ng/ng_pri_fut_s1_d.htm.
[42] M. Bolinger, (2017), “Using Probability of Exceedance to Compare the Resource Risk of Renewable and Gas-Fired Generation”, available at https://emp.lbl.gov/publications/usingprobability-exceedance-compare/ and M. Bolinger, R. Wiser, W. Golove, “Accounting for Fuel Price Risk When Comparing Renewable to Gas-Fired Generation: The Role of Forward Natural Gas Prices”, available at https://www.osti.gov/servlets/purl/886817.

however these costs are likely to flow through in gas costs to RMP, and therefore its customers, but was not considered in this IRP.

In addition to the above risk factors, the large-scale modification of plans to convert several coal-fired generating units to natural gas is given without any significant analysis. The impact of these changes to operating costs, decommissioning costs, or future reclamation costs is not part of this IRP analysis and are not robust enough to be relied upon for system planning.

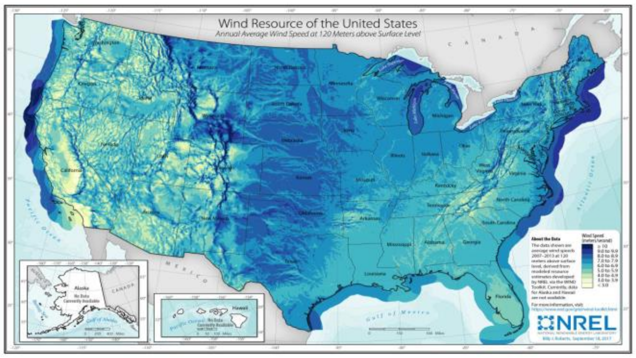
Notably, RMP's own modeling reveals that there are less risky alternative portfolio(s) which rely upon hybrid solar plus storage, standalone storage, and pumped-hydro to meet the company's needs to help ensure that RMP's customers are not left with uneconomic assets in the long run.[43] A diverse group of market participants apparently agree that investments in natural gas resources is economically imprudent, as the 2020 All Source RFP (the most current available RMP RFP results available) produced no new gas proposals.

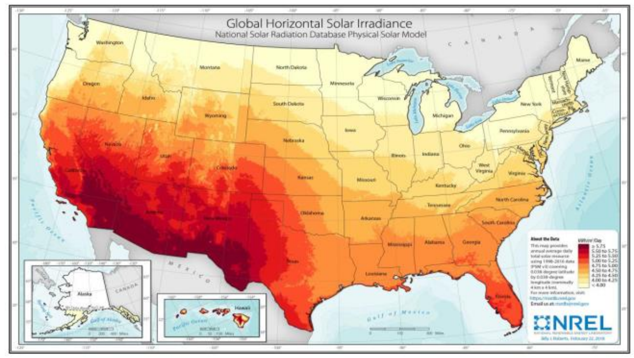
Reliability

Regional transmission planning

[43] e.g., 2023 IRP, Vol. I, at 267, pdf 285/400.In the P06 No Forward Tech modeling, where the model optimizes without the risky nuclear or non-emitting peakers.

RMP's service territory spans several wind and solar resource rich states and could potentially act as a network between these areas providing valuable capacity and energy diversity to its members and bringing value from exporting energy over and across its system.[44 and 45]





Interwest recommends that RMP participate in and include in detail in future IRPs, its efforts in coordinated planning under the NorthernGrid and WestConnect Regional Planning Authorities. Many regional utilities have transmission expansions planned in close proximity to many RMP transmission projects. The opportunity to study options regarding interconnection, transfer capacity, and transmission expansion offer an avenue for Utah stakeholders and parties to this docket to gain more information about the reliability benefits of transmission expansion. Interwest recommends that RMP participate in both regional planning authorities, and include in future IRPs detailed information on the various planning groups and reports and recommendations that come from these endeavors. Interwest also recommends that the Commission direct RMP to

[44] C. Draxl, et al., (2015), "Overview and Meteorological Validation of the Wind Integration National Dataset Toolkit", (Technical Report, NREL/TP-5000-61740). National Renewable Energy Laboratory. Available at https://www.nrel.gov/gis/wind-resource-maps.html.
[45] M. Sengupta, et al., (2018), "The National Solar Radiation Data Base (NSRDB)." National Renewable Energy Laboratory. Available at: https://www.nrel.gov/gis/solar-resource-maps.html.

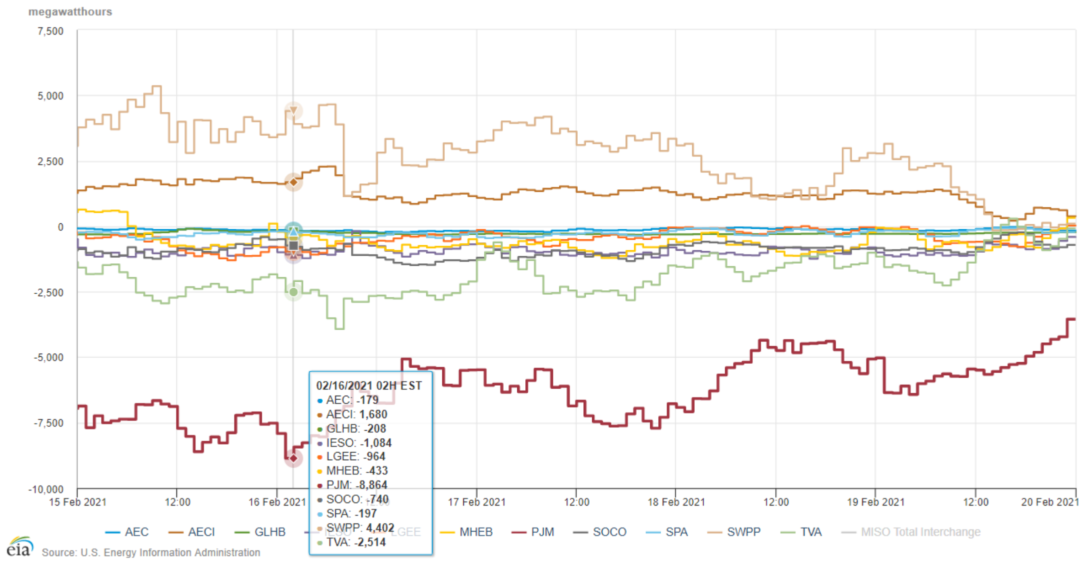
participate in, and report on, other transmission planning endeavors, specifically the Western Transmission Expansion Coalition (WTEC).

Interconnection expansion

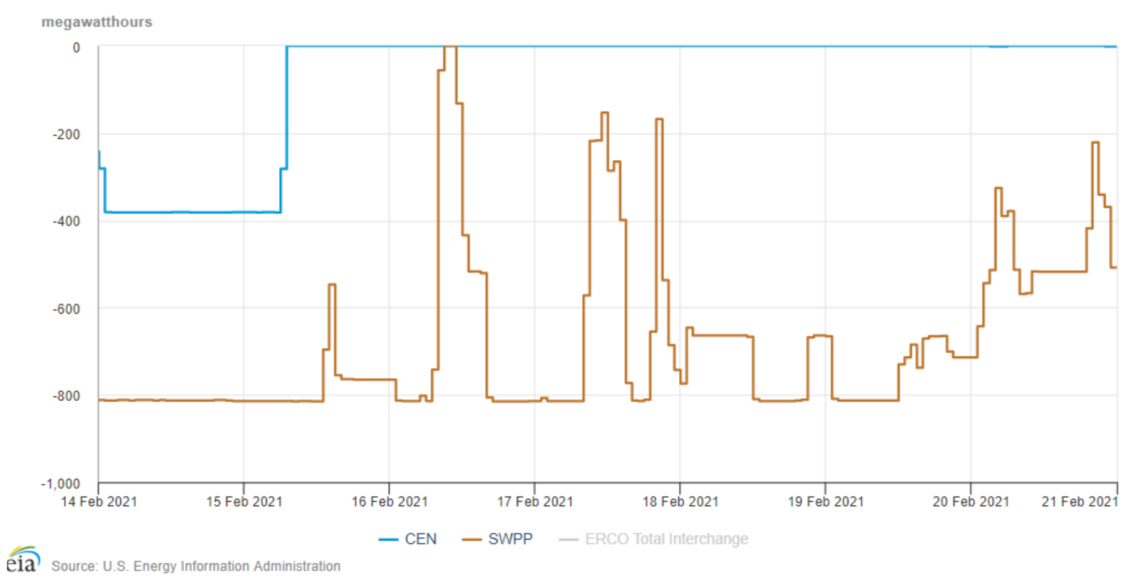
Extreme weather events tend to be at their most severe across only limited geographic areas, making large regional power systems with strong transmission ties an essential mitigation solution. Just as large geographic areas balance out local fluctuations in wind or solar output ensuring a higher capacity value, these large geographic areas also mitigate the effect of extreme weather. Expanded transmission ties and organized wholesale markets must be a primary part of the solution to extreme weather events like the one that led to the February 2021 Winter Storm Uri (Uri) outages in Texas and neighboring states.[46]

[46] M. Goggin, (2021), "Transmission Makes the Power System Resilient to Extreme Weather", available at https://acore.org/wp-content/uploads/2021/07/GS_Resilient-Transmission_proof.pdf.

Midcontinent Independent System Operator, Inc. (MISO) electricity interchange with neighboring balancing authorities 2/15/2021 – 2/19/2021, Eastern Time



Electric Reliability Council of Texas, Inc. (ERCO) electricity interchange with neighboring balancing authorities 2/14/2021 – 2/20/2021, Eastern Time



During Uri, MISO was able to limit outages and electricity price spikes in parts of its southern footprint, despite widespread gas plant outages and interruptions of gas supplies, because it was able to import more than 13 GW of power from neighboring power systems. As shown in the EIA charts above,[47] during Uri, total MISO imports were consistently over 13,000 MW during the most challenging period from midday February 15 to midday February 16. In contrast, the Electric Reliability Council of Texas (ERCOT) was subject to days of extreme rolling outages because it lacks transmission interties. ERCOT was only able to import about 800 MW of power throughout the event, as shown in the charts above.

A more integrated western power system can reduce RMP's need for capacity and increase the capacity value of its wind, solar, and storage resources.[48] Joint planning to recognize system synergies, increase system resilience, and take full advantage of regional economies of scale and geographic diversity is essential. Energy and Environmental Economics' (E3) analysis of the Pacific Northwest confirms a large increase in renewable and storage capacity value and reduction in capacity needs when taking a regional view of resource adequacy.[49]

Transmission expansion and more efficient use of the existing grid will also reduce the risks addressed throughout these comments. A robust transmission network ensures customers can access low-cost power under a wide range of scenarios. Expanding RMP's ties with neighboring systems provides large diversity benefits to utilities on both sides of the interconnection through

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[47] These charts can be made with EIA's grid monitor. See EIA, Hourly Electric Grid Monitor, available at https://www.eia.gov/beta/electricity/gridmonitor/expandedview/electric_overview/US48/US48/InterchangeWithNeighbor-5/edit.

[48] Pfeifenberger, Spokas, Hagerty, Tsoukalis, Gramlich, Goggin, Caspary, and Schneider, "Transmission Planning for the 21st Century: Proven Practices that Increase Value and Reduce Costs," Available at https://gridprogress.files.wordpress.com/2021/10/transmission-planning-forthe-21st-century-proven-practices-that-increase-value-and-reduce-costs-7.pdf.

[49] Z. Ming, et al.,, Energy and Environmental Economics, (2019), "Resource Adequacy in the Pacific Northwest", available at https://www.ethree.com/wp-content/uploads/2019/03/E3_Resource_Adequacy_in_the_Pacific-Northwest_March_2019.pdf.

greater access to more geographically diverse loads and renewable resources. A recent update to the Joint Targeted Interconnection Queue Study by the Midwestern Independent System Operator (MISO) and Southwest Power Pool (SPP)[50] showed that $1.1 billion in transmission investments across seams could allow between 28 and 53 GW of renewable generating capacity to interconnect with the grid.[51] Interwest recommends that RMP include analysis of potential interconnection points to other utilities and analysis of potential agreements to minimize the cost of these investments in future IRPs.

Advanced Transmission Technologies

Technologies such as dynamic line ratings (DLR), advanced power flow and topology control, and advanced conductors improve the efficiency and flexibility of the grid and have the potential to vastly increase renewable energy capacity at a reasonable cost.[52] These technologies have the potential to be significantly more time-efficient than, and be complimentary to, other large-scale transmission projects. Interwest recommends that RMP include advanced transmission technologies and grid-enhancing technologies as selectable upgrades in all future IRPs.

Reducing curtailment and integration costs

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[50] Presentation available at https://cdn.misoenergy.org/20230337%20MISO%20SPP%20JTIQ%20Update628357.pdf

[51] SPP-Miso Joint Targeted Interconnection Queue (JTIQ) Study Available at: https://www.spp.org/engineering/spp-miso-jtiq/

[52] See, e.g., The Brattle Group "Unlocking the Queue," Available at https://watt-transmission.org/unlocking-the-queue/.

Curtailed renewable generation can be dispatched to provide contingency reserves, frequency regulation, and other operating reserves,[53] as well as other grid services like primary frequency response. Analysis has confirmed that using curtailed renewable resources instead of keeping inflexible conventional generators online at minimum levels provides flexibility and reduces curtailment.[54] Flexibly dispatching curtailed renewable generators is often a low-cost way to balance the power system.[55] The net benefits of flexibly dispatching curtailed renewable resources are likely to further increase at higher renewable penetrations.

The entire paradigm of integration costs must be reconsidered. Uncertainty is only a problem for inflexible resources that must make irreversible commitment decisions hours or days in advance of operating. This inflexibility includes scheduling fuel purchases and deliveries in advance. With highly flexible resources like batteries now available to replace inflexible resources like thermal facilities, Interwest believes that inflexibility costs should be assigned to resources that cause irreversible decisions rather than to inverter-based technologies such as wind and solar energy. At the very least, these costs should be viewed as a system cost and these costs should be eliminated over time as the system becomes more flexible. Interwest recommends that RPM study and report in its next IRP the costs of inflexible thermal resources in assigning integration costs.

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[53] D. Lew, et al., (2019), "Secrets of Successful Integration: Operating Experience with High Levels of Variable, Inverter-Based Generation", available at https://www.esig.energy/wpcontent/uploads/2020/01/MPE2930855-final-Lew.pdf.

[54] J. Nelson, et al., (2018), "Investigating the Economic Value of Flexible Solar Plant Operation", Energy and Environmental Economics, available at https://www.ethree.com/wpcontent/uploads/2018/10/Investigating-the-Economic-Value-of-Flexible-Solar-Power-Plant-Operation.pdf.

[55] M. Putnam, J. Sterling, M. Ahlstrom, (2019), "'Grid-Flexible' Solar and Wind – What it Means for Our Future", available at https://www.esig.energy/grid-flexiblesolar-and-wind-what-it-means-for-our-future/.

Conclusion

Interwest promotes the selection of the most efficient portfolio of resources available and the immediate testing of the market in an all-source RFP. RMP's pause of its 2022ASRFP rendered virtually every aspect of the IRP analysis irrelevant and moot, as discussed above. We recommend that the Commission only acknowledge the 2023 IRP submitted by with directions to resolve significant deficiencies. Interwest recommends the Commission order, in this 2023 IRP docket that:

- The Commission direct RMP to resume its 2022ASRFP immediately.
- The Commission direct RMP to only consider SMRs and non-emitting peaker units to be extremely risky and cannot be relied on for planning purposes.
- The Commission direct RMP to specifically identify areas in future IRPs where regional coordination or market changes are likely or expected.
- The Commission direct RMP to incorporate best practices and probabilistic modeling in future IRP reliability assessments.
- The Commission direct RMP to incorporate a specific section in future IRPs to describe its pursuit of federal funding opportunities for cleaner energy resources and more efficient technology.
- The Commission direct RMP to incorporate a specific scenario in future IRPs to address potential elimination GHG emitting thermal generation by 2035.

- The Commission direct RMP to incorporate best practices and probabilistic modeling to best plan for climate change repercussions, specifically including increased likelihood of drought and wildfire impact.

Respectfully submitted this 12th day of December 2023.

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CERTIFICATE OF SERVICE
23-035-10

I hereby certify that a true and correct copy of the foregoing was e-filed and served by email this 12th day of December, 2023, as follows:

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