COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC 2022 JOINT INTEGRATED RESOURCE PLANNING REPORT OF KENTUCKY POWER COMPANY	)))))	**CASE No. 2023-00092**

JOINT INTERVENORS' INITIAL COMMENTS ON KENTUCKY POWER COMPANY'S 2022 INTEGRATED RESOURCE PLAN

Ashley Wilmes
Byron Gary
Tom FitzGerald
Kentucky Resources Council
P.O. Box 1070
Frankfort, KY 40602
(502) 551-3675
Ashley@kyrc.org
Byron@kyrc.org
FitzKRC@aol.com

Counsel for Joint Intervenors Mountain Association, Appalachian Citizens' Law Center, Kentuckians for the Commonwealth, and Kentucky Solar Energy Society

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Mountain Association, Appalachian Citizens' Law Center, Kentuckians for the Commonwealth, and Kentucky Solar Energy Society ("Joint Intervenors") submit the following comments regarding Kentucky Power Company's ("Kentucky Power" or "the Company") 2022 Integrated Resource Plan ("IRP").

I. INTRODUCTION

This IRP comes at a critical time for Kentucky Power, as it lays the foundation for the Company's transition away from its long-term reliance on the Rockport UPA and the Mitchell coal plant. Overall, the Company's IRP takes important steps to evaluate renewable energy sources, such as wind and solar, in its resource assessment, which led to their inclusion in the preferred portfolio. However, Kentucky Power falls short of identifying the best strategies for meeting its four stated objectives of customer affordability, rate stability, maintaining reliability, and local impact and sustainability,[1] and of demonstrating that it has satisfied the applicable regulatory standard of setting forth a "lowest possible cost" plan for providing its customers with adequate and reliable service.[2] These comments are submitted with the goal of encouraging Kentucky Power to go further in striving to meet those objectives.

In particular, the Company's IRP modeling does not tap into the full potential of resources available to the Company, overestimates the costs of the buildout of renewable energy sources, and underestimates the costs and risks of the increased gas capacity included in the Preferred Plan. As it stands, the Company arrived at its Preferred Plan without having adequately analyzed potential contributions from distributed energy resources, without allowing additional battery storage until the year 2035, without considering a reasonably broad set of demand-side

[1] Kentucky Power 2022 Integrated Resource Plan, Volume A – Public Version, Case No. 2023-00092, at 13 (Mar. 20, 2023) ("KPCo 2022 IRP-Vol. A").
[2] 807 KAR 5:058 Section 8(1), (4).

management programs, and without a load forecast that accurately reflects current load projections, among other shortcomings.

Joint Intervenors' comments are informed in substantial part by the work of experts Chelsea Hotaling and Stacy Sherwood of Energy Futures Group, whose report is attached to and adopted in full as part of these comments.[3] Joint Intervenors' silence on any issue, analysis, or conclusion advanced in the Companies' IRP should not be taken as support.

II. STAKEHOLDER PROCESS

Joint Intervenors acknowledge there is no requirement for Kentucky Power to hold stakeholder meetings, and so we appreciate that Kentucky Power held two meetings during the IRP development process that allowed stakeholders to receive information, provide comments, and ask questions. Including stakeholders is a crucial part of the IRP process. Stakeholders bring perspectives, ideas, and information that may not be available to the utility, and the resource decisions made during the IRP process have significant long-term effects on Kentucky Power's customers and eastern Kentucky communities.

Joint Intervenors believe there are important ways in which Kentucky Power could even further improve its stakeholder process by adopting best practices that are already in use by utilities in other states. Increasing and enhancing IRP stakeholder participation creates a more transparent and robust planning process that ultimately leads to better-informed decisions that create better outcomes for customers.

The attached Energy Futures Group Report provides specific recommendations for the process, which include establishing clear timeframes where stakeholder feedback is solicited,

[3] C. Hotaling & S. Sherwood, *Report on Kentucky Power 2022 Integrated Resource Plan* (Oct. 6, 2023), attached hereto as Exhibit 1 (hereinafter "EFG Report").

submitted and considered, sharing data and modeling, and providing illustrative examples from other states.[4] These process recommendations have the goal of meaningfully involving stakeholders at all critical decision points and assuring time for consideration and possible inclusion of their feedback. A shared schedule with stakeholders, like EFG recommends, allows for timely review of and feedback on the modeling assumptions and data that the Company is using to support its IRP.

Kentucky Power should be commended for its efforts to engage stakeholders early in their IRP process, and Joint Intervenors encourage continued efforts to make Kentucky Power's stakeholder process even more valuable—both to the Company and its customers.

III. DEMAND-SIDE MANAGEMENT AND ENERGY EFFICIENCY

In addition to comments on the Company's evaluation of Demand-Side Management ("DSM") and Energy Efficiency ("EE") resources provided in the attached EFG Report,[5] Joint Intervenors below briefly summarize the regulatory requirements and a make a particular program recommendation.

A. The IRP Regulation Requires Evaluation of Demand-Side Management Resources.

The Commission's IRP regulation requires an evaluation of all potentially cost-effective resources, importantly including demand-side resources.[6] With each IRP, a utility must provide a description of "conservation and load management or other demand-side programs not already in place";[7] information on each "existing and new conservation and load management or other

[4] EFG Report at Sec. 2.
[5] EFG Report at Sec. 5.
[6] *E.g.*, Case No. 2021-00393, *Electronic 2021 Joint Integrated Resource Plan of Louisville Gas and Electric Company and Kentucky Utilities Company*, Commission Staff's Report on the 2021 Integrated Resource Plan of Louisville Gas and Electric Company and Kentucky Utilities Company (Ky. PSC Sept. 16, 2022).
[7] 807 KAR 5:058(2)(b).

demand-side programs included in the plan";[8] information in the acquisition plan that takes into account reductions from new conservation and load management or other demand-side programs;[9] and discussion of the criteria used to screen potential demand-side programs.[10]

Specific to Kentucky Power, Commission Staff's Report on the 2019 IRP included a series of specific DSM recommendations.[11] Commission Staff observed the potential for expiration of the Rockport UPA to have a significant impact on new DSM program potential, and urged the Company to continue robust evaluation of cost-effectiveness in DSM planning.[12] Commission Staff further recommended examination of "additional low-income programs that allow for more participants and easier access to [energy efficiency] alternatives."[13]

B. The Company Should Include an Inclusive Utility Investment Program in their 2024 DSM/EE Plan Proposal.

Joint Intervenors are encouraged that Kentucky Power appears to be preparing to propose expanded DSM/EE program offerings to customers in 2024. It appears, however, that the Company has not yet considered the potential to make energy saving measures more accessible and affordable to customers by including an inclusive utility investment program that

[8] 807 KAR 5:058(3)(e).
[9] 807 KAR 5:058(4)(b)(5).
[10] 807 KAR 5:058(5)(c).
[11] Case No. 2019-00443, *Electronic 2019 Integrated Resource Planning Report of Kentucky Power Company*, Staff Report on the 2019 Integrated Resource Plan of Kentucky Power Company at 16 (Ky. PSC Feb. 15, 2021).
[12] *Id.*
[13] *Id*.

incorporates the Pay As You Save ("PAYS®") program standards.[14] That is a missed opportunity, and one worth correcting.[15]

Through inclusive utility investment programs, also known by the program name PAYS®, a utility makes capital investment directly in energy efficiency and load control measures installed in customers' homes and businesses. To be effective, inclusive utility investment programs must include certain elements, in particular:

- The utility investment is recovered through a fixed monthly tariffed charge assigned to the meter.
- Installed measures must be cost-effective, with verifiable energy savings.
- The energy savings (which will be realized on each monthly bill) must be greater than the fixed monthly repayment of the utility's investment.

In concert, these elements enable cost-effective direct utility investment in behind-the-meter energy savings. Unlike utility investment in generation and transmission assets, investment in energy savings can directly lower a household or business's monthly bills, while also reducing overall system costs.

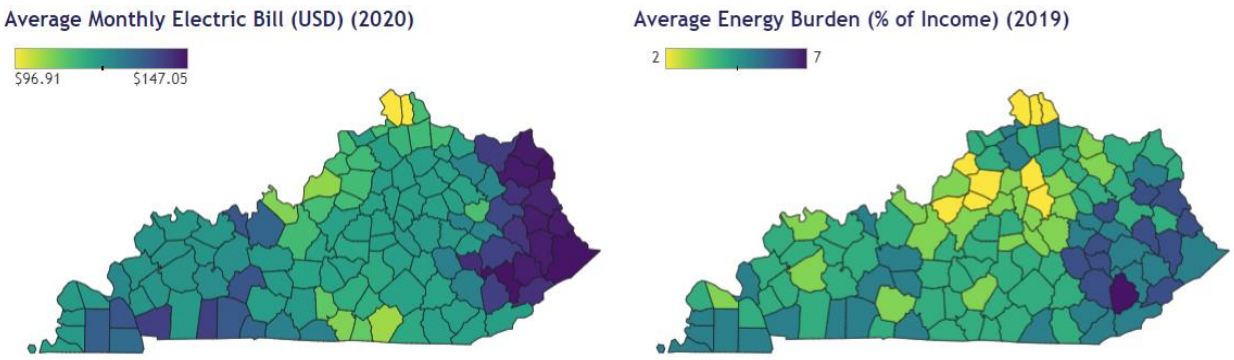
If Kentucky Power were to offer an inclusive utility investment program, it would make their market-rate DSM/EE programs more accessible and accelerate customers' energy savings. The introduction of programs providing audits and rebates on certain efficiency measures (as in,

[14] PAYS® is registered to Energy Efficiency Institute, Inc. *See* Energy Efficiency Inst., Inc., *Pays® Essential Elements & Minimum Program Requirements* (updated July 20, 2021), https://www.eeivt.com/pays-essential-elements-minimum-program-requirements-2/.

[15] In addition to the comments provided here, Joint Intervenors also recently submitted testimony concerning inclusive utility investment programs in Kentucky Power's pending rate case. *See* Case No. 2023-00159, *Application of Kentucky Power Co. for General Adjustment of its Rates for Electric Service*, Direct Testimony of Joshua Bills at 8–24 (Oct. 2, 2023) (providing additional information on customer needs and the potential value of inclusive utility investment programs to reducing usage, improving bill affordability, and contributing to workforce development).

for example, the Home Energy Improvement Program evaluated in the Company's Market Potential Study) will newly help customers access energy savings. At the same time, those rebates are certain to fall short for some households and businesses. Without cash or access to capital, some retrofits will remain out of reach for some customers. An inclusive utility investment program can be just the thing to overcome those financial barriers, enabling cost-effective energy savings that otherwise would have been missed or postponed.

Assistance overcoming financial barriers is especially needed for Kentucky Power's customers. Kentucky Power already has the highest residential energy bills in the Commonwealth,[16] and the highest energy burdens,[17] which refers to the portion of income that goes to paying utility bills. Though bills are already remarkably high, Kentucky Power is presently seeking a rate increase, with residential customers facing a possible 18.3% increase.



Ever-increasing bills are unsustainable generally, and particularly so in eastern Kentucky where residents and business have struggled for generations with deep-seated economic challenges. As it stands today, even without any further rate increases, too many Kentucky Power customers struggle to keep up with electric bills. In the twelve months ending June 2023, Kentucky Power

[16] Evan Moser, *Kentucky Energy Profile*, Ky. Energy & Env't Cabinet, at 11–12, 30 (8th ed. 2023), https://eec.ky.gov/Energy/KY%20Energy%20Profile/Kentucky%20Energy%20Profile%202023.pdf.
[17] Ky. Ctr. for Statistics, *Kentucky Energy Affordability* (2020), https://kystats.ky.gov/Reports/Tableau/2022_EnergyDash.

sent 189,584 termination notices to customers.[18] Notably, that is more termination notices than Kentucky Power has customers, suggesting that at least some customers are falling behind on their electric bill multiple times over those twelve months.[19] By investing directly in helping customers to eliminate energy waste and increase energy efficiency, Kentucky Power can reduced overall system costs and reduce customer bills.

Inclusive utility investment programs have been successful in Kentucky and elsewhere, and there is every reason to think such a program could make a difference for Kentucky Power customers, too. PAYS® Program investments in excess of $50 million have been made across ten states, including being offered by every investor-owned utility in the state of Missouri and several rural electric cooperatives in Kentucky.[20] In Arkansas, Ouachita Electric Cooperative focused particular attention on investment in weatherization and HVAC upgrades, as well as distributed solar installations. The energy savings and avoided costs from those upgrades contributed to Ouachita Electric Cooperative requesting a 4.5% rate *decrease*.[21] Kentucky Power can and should be going after similar results.

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[18] Case No. 2019-00366, *Investigation of Home Energy Assistance Programs Offered by Investor-Owned Utilities Pursuant to KRS 278.285(4)*, Kentucky Power Company Appendix B 2023 Annual Report on Home Energy Assistance Programs (Ky. PSC Aug. 15, 2023) ("KPCo 2023 Annual HEA Report"), KPCO_R_KPSC_A_6_Attachment1 tab "A_6", https://psc.ky.gov/pscecf/2019-00366/mmcaldwell@aep.com/08152023125323/Closed/KPCO_R_KPSC_A_6_Attachment1.xlsx.

[19] KPCo 2022 IRP-Vol. A at 15 ("Kentucky Power serves approximately 163,000 retail customers in eastern Kentucky.").

[20] Liberty Homes & Energy Efficiency Inst., Inc., *2022 PAYS® Status Update* (Mar. 29, 2022), https://www.eeivt.com/status-reports/.

[21] Se. Energy Efficiency All., *A Tale of Two Tariffs: Ouachita Electric Cooperative and Roanoke Electric Cooperative* (Mar. 16, 2020), https://www.seealliance.org/a-tale-of-two-tariffs-ouachita-electric-cooperative-and-roanoke-electric-cooperative/.

C. EFG Report Recommendations Regarding DSM/EE Evaluations and Portfolio Development.

Further discussion and recommendations regarding Kentucky Power's DSM/EE planning process is provided in Section 5 of the attached EFG Report. That portion of the EFG Report begins with a summary of the significant and quantifiable benefits derived from cost-effective DSM/EE portfolios, including workforce development and affordability benefits dearly needed in eastern Kentucky.[22] Although the GDS Market Potential Study was not available during the discovery period of this IRP proceeding, the EFG Report considers the analysis and assumptions used for that study, including observations about the pros and cons of the specific programs considered.[23]

The EFG Report offers a number of specific programmatic recommendations for Kentucky Power's consideration as it develops an expanded DSM/EE portfolio.[24] In particular, the EFG Report emphasizes the importance of developing a cost-effective portfolio that invites broad participation from all customers, specifically highlighting the needs of residential customers in manufactured homes and/or using resistance heating, and small business customers. Finally, the EFG Report comments on the potential for Kentucky Power's DSM/EE portfolio to leverage federal funding and incentives for energy efficiency.[25]

Joint Intervenors appreciate this opportunity to offer feedback on Kentucky Power's DSM/EE planning as part of this IRP proceeding, and welcome additional dialogue and collaboration as this proceeding continues.

[22] EFG Report, Sec. 5.1.
[23] EFG Report, Sec. 5.2.
[24] EFG Report, Sec. 5.3.
[25] EFG Report, Sec. 5.4.

IV. DISTRIBUTED ENERGY RESOURCES

Joint Intervenors highlight the following considerations for Kentucky Power to incorporate in its Integrated Resource Plan. As the EFG Report highlights, it is unclear if and how the Company incorporated an evaluation of DERs to help avoid distribution system upgrades.[26] Joint Intervenors recommend including an evaluation of potential supply side DERs, as well as DER forecasts, in future IRP filings and IRP stakeholder workshops, and evaluating multiple forecasts for DER resources that consider higher levels of DER adoption.[27] The Company should show how these evaluations are incorporated into its IRP.

In addition, as highlighted in witness Andrew McDonald's testimony in Case No. 2023-00159, DERs serve as a low-cost resource that can supply capacity requirements, reduce fuel price volatility, improve reliability of the distribution grid, increase resilience, and overcome barriers to deployment of new resources.[28] In this IRP, the Company did not conduct a comprehensive analysis of DERs, overlooking huge potential for the Company to tap into to meet its future capacity need. DERs, particularly solar and battery storage as described in this section, can offer significant benefits and should be given full consideration in the IRP and brought up during stakeholder discussions.

A. The Company's IRP Overlooks Distributed Solar as a Key Tool for Meeting Its Capacity Need.

Kentucky Power acknowledges in its IRP filing that local impact and sustainability can be furthered "through inclusion of renewable and advanced generation technologies as resource

[26] EFG Report at 16 (or Sec. 4.2).
[27] EFG Report at 16–18.
[28] Direct Testimony of Andrew McDonald, *In re Electronic Application of Kentucky Power Company for (1) A General Adjustment of Its Rates For Electric Service; (2) Approval of Tariffs And Riders; (3) Approval of Accounting Practices to Establish Regulatory Assets and Liabilities; (4) A Securitization Financing Order; and (5) All Other Required Approvals And Relief,* Case No. 2023-159, at 8–9 (Oct. 2, 2023) ("McDonald Direct").

options to enable a greener future for all as well as responding to customers' other needs including demand for clean energy, electrification, and customer-sited generation."[29] The Company is also in the position of needing additional capacity by 2026 to fully supply its customers.

One viable option to address this capacity shortfall is expanding distributed solar in the Company's service territory. There are indicators that Kentucky Power's IRP underestimates the potential for distributed solar to fill this capacity gap, as described below and in the EFG Report. Joint Intervenors urge the Company to consider the role DERs can play to address its capacity need, and to enable its customers to pursue DERs such as small-scale solar.

Statewide, there is significant room for growth in small-scale solar; the Commonwealth ranks 40th among the states in installed capacity of small-scale solar (solar PV systems under 1 MW).[30]

The small-scale PV capacity achieved in other states illustrates what is possible in Kentucky Power service territory. Vermont and Maine—two smaller rural states, and with longer winters than Kentucky—currently have 26 times more small-scale solar installed per electric customer than Kentucky Power does.[31] Vermont has 173 MW small PV and Maine has 420 MW small PV installed, or nearly 0.5 kW per customer each. Meanwhile Kentucky Power has only

[29] KPCo 2022 IRP-Vol. A at 22.
[30] U.S. Energy Info. Admin., *Form EIA-861M (formerly Form EIA-826), Small scale PV estimate* (preliminary data for July 2023), https://www.eia.gov/electricity/data/eia861m/ (last updated July 2023).
[31] U.S. Energy Info. Admin., *Form EIA-861M (formerly EIA-826) detailed data Small-Scale PV Estimate: Current Month* (Preliminary, July 2023), https://www.eia.gov/electricity/data/eia861m/; U.S. Energy Info. Admin., *Form EIA-861M (formerly EIA-826) detailed data: Revenue, sales, customer counts, and retail price by state and sector* (updated Sept. 26, 2023), https://www.eia.gov/electricity/data.php (Vermont has 381,415 customers, and Maine has 837,848, based on July data).

2.9 MW small-scale solar installed, or just 0.018 kW per customer.[32] Using Vermont as a comparison point, if Kentucky Power had as much distributed solar per customer, it would have 73 MW small PV installed today.

Historical growth in DERs in Kentucky Power Territory also indicates the Company is underestimating potential distributed solar growth. Table 1 shows the potential installed capacity and total generation from installed net metering within Kentucky Power's territory under two scenarios for 2028 and 2030. As Table 2 shows, if net metering were to continue growing at its recent historic rate of 60% per year, Kentucky Power could have 42 MW of customer-sited solar by 2028 and 107 MW by 2030, which would be 7.8% of the Company's annual peak load.[33]

Table 1. Two Scenarios of Distributed Solar Growh in Kentucky Power Company Territory: Solar Capacity (MW) and Energy Generation (MWh/year) Potential

	2028			2030		
	MW	MWh/yr	% Annual Peak	MW	MWh/yr	% Annual Peak
Scenario A - KPC IRP 2022	3.33	4,211	0.2%	3.67	4,642	0.3%
Scenario B - DER Continued Growth at Historic Rate	42	52,715	3.1%	107	134,957	7.8%

Distributed solar on this scale would also lead to an increase in customer participation. Table 2 offers two illustrations of how customer solar adoption could unfold and how many customer-generators might be in each class. The number of customers required to meet these

[32] U.S. Energy Information Administration, Form EIA-861M (formerly Form EIA-826), Small scale PV estimate (preliminary data for July 2023), https://www.eia.gov/electricity/data/eia861m/ (last updated July 2023). KPC has approximately 163,000 customers (KPCo 2022 IRP Report-Vol. A at 23).

[33] U.S. Energy Information Administration, *Form EIA-861* for years 2018 to 2022. The data reported on Form EIA-861 shows annual growth in net metering capacity for KPCo averaged 90% per year for 2018 to 2022 and 60% per year for 2020 to 2022. Capacity figures in years 2028 and 2030 for Scenario B is based on projecting actual installed net metering capacity in 2022 at an annual growth rate of 60%. PV energy generation estimate based on performance estimates from the *National Renewable Energy Laboratory's 2023 Annual Technology Baseline v1*. Scenario A figures based on KPCo IRP Report-Vol. A at 41. KPC's maximum peak demand from KPCo 2022 IRP Report-Vol. A at 23.

targets could be lower, as some commercial customers with very large loads can install systems much larger than 45 kW without ever exporting energy back to the utility. Such customers would not qualify for net metering service, but instead as Small Power Producers (Tariff Cogen/SPP1 or 2)[34] and would still contribute to the overall capacity of distributed solar on Kentucky Power's system.[35]

Table 2: Number of Residential and Commercial & Industrial Net Metering Customers Needed to Reach Scenario B Targets by 2028 and 2030

Illustration 1 assumes Residential and Commercial/Industrial NM are each 50% of total.
Illustration 2 assumes Residential NM is 30% and Commercial/Industrial NM is 70% of total.

	2028		2030	
	MW	# Customers	MW	# Customers
Illustration 1				
Residential, 50% @ 10 KW each	20.8	2,082	53.3	5,330
Commercial/Industrial , 50% @ 45 KW each	20.8	463	53.3	1,184
Illiustration 2				
Residential, 30% @ 10 KW each	12.5	1,249	32.0	3,198
Commercial/Industrial, 70% @ 45 KW each	29.1	648	74.6	1,658

An additional benefit of increasing distributed solar to this scale would be the jobs and economic development that would be created for the installation of solar on rooftops.

[34] *See* KPCo Tariffs NMS-2, Cogen/SPP I and Cogen/SPP II.

[35] The National Renewable Energy Laboratory ("NREL") has a Distributed Generation Market Demand Model ("dGen") to simulate customer adoption of DERs for residential, commercial, and industrial customers in the United States and other countries through 2050. In 2017 NREL published a study based on the dGen model projecting distributed solar adoption in Kentucky through 2040. *See* Pieter Gagnon and Paritosh Das, *Projections of Distributed Photovoltaic Adoption in Kentucky Through 2040*, NREL (June 2017), https://www.nrel.gov/docs/fy17osti/68656.pdf. The study looked at the utilities LG&E-KU, EKPC, and Big Rivers Electric, and the state as a whole, but analyze Kentucky Power. The study found that Kentucky as a whole could reach 83–793 MW of distributed PV by 2030, depending on the future price of PV. Joint Intervenors did not have the resources to develop a dGen model specific to KPCo for this case, but the software is freely available from NREL and could be employed by Kentucky Power to gain greater insights into distributed solar development.

DERs can provide a number of resiliency benefits as well, if they are designed to do so. A report by the National Association of Regulatory Utility Commissioners (NARUC) identifies eight traits of resilient DERs:

1. **Dispatchability**: Resilient DERs can respond to a disruption at any time with little to no advance warning.
2. **Islanding Capability**: Resilient DERs have the ability to island from the distribution grid and serve load during a broader outage.
3. **Siting at Critical Loads/Locations**: Resilient DERs reside at critical loads or at critical points on the grid (e.g., areas of high residential density).
4. **Fuel Security**: Resilient DERs do not rely on the availability of a limited physical fuel to provide power.
5. **Quick Ramping**: Resilient DERs are capable of changing output quickly to match rapidly changing load.
6. **Grid Services**: Resilient DERs can provide voltage support, frequency response, and other grid services.
7. **Decentralization**: Resilient DERs are sized and sited to support a load in the distribution system.
8. **Flexibility**: Resilient DERs can be deployed quickly and cheaply (when compared to centralized generation, transmission, and/or distribution) at locations and times where resources are needed.[36]

[36] Kiera Zitelman, *Advancing Electric System Resilience with Distributed Energy Resources: A Review of State Policies*, Nat'l Ass'n of Reg. Util. Comm'rs, at 9 (Apr. 2020), https://pubs.naruc.org/pub/ECD7FAA5-155D-0A36-3105-5CE60957C305. Resilient DERs offer distinct advantages from 'non-resilient' DERs – those not designed with resilience as an explicit objective. All

The need for greater resilience is especially important for Kentucky Power's customers due to the region's specific geography, its vulnerability to and history of natural disasters (including recent flooding), and the economic hardship facing the region.[37] The deployment of customer-sited solar plus storage systems could play a further critical role in improving resilience of the communities and customers that the Company serves.

B. The Company Should Consider the Full Potential of Distributed Battery Storage as an Additional DER to Meet Its Capacity Need.

The Company's IRP limits its modeling on battery storage as a DER source. As the EFG Report highlights, in its modeling, Kentucky Power constrained its annual build limit on battery storage, limited the book life of battery storage resources, and did not model 8 or 10 hour lithium ion battery and multiday storage as a resource.[38] This failure to consider the full potential role for battery storage in meeting Kentucky Power's resource needs is a significant oversight given the growth of battery storage deployment today and the significant potential benefits it offers. As a 2021 Pennsylvania state energy assessment stated:

> Energy storage deployment has grown rapidly across the United States over the last decade and can address many priorities and challenges currently facing the energy sector. Energy storage can help integrate increasing levels of renewable energy into the grid and reduce the environmental impacts of electricity production. Additionally, energy storage can improve the resilience of the

DERs, resilient or not, are decentralized and offer benefits distinct from large generators. Single or aggregated DERs can both offer resilience benefits, although aggregated DERs have increased ability to provide grid services. Islanding capability is a unique trait of resilient DERs that requires intent during project design to configure the resource to island from the distribution grid. Several traits are enabled by energy storage paired with a generating DER: dispatchability, quick ramping, and flexibility. Renewable DERs remove the need to rely on a physical fuel supply, but they do exhibit intermittency driven by limited availability of sun or wind. Pairing these resources with battery energy storage enables access to electricity for longer or different time periods than when it is generated, although durations are limited by what the battery can provide.

[37] KPCo 2022 IRP-Vol. A, at 147 (discussing a recent winter storm that led to "forced generator outages, high wholesale gas prices, and high electricity prices, to which Kentucky Power's customers were exposed.").

[38] EFG Report at 11, 22.

> electrical grid, ensure reliable service, and decrease costs to ratepayers.[39]

Battery storage can provide multiple grid services. As explained in the Pennsylvania Assessment, battery storage on the distribution system can support the following:

- managing peak demand,
- integrating renewable energy,
- providing voltage regulation,
- mitigating power outages,
- providing alternatives to more costly traditional wires infrastructure investments,
- transmission congestion relief,
- transmission and distribution cost avoidance by siting storage near congested infrastructure to defer or avoid system upgrades. [40]

The Pennsylvania Assessment also notes that "obstacles remain for effectively integrating energy storage into utility planning. Emerging storage technologies are not familiar investment options for utility planners, so the initial obstacle is to ensure they are being considered on an equal basis with all other potential solutions."[41]

Yet utilities in multiple states are now rising to this challenge. Some are considering integrating customer-sited batteries into "Virtual Power Plants" that can be remotely discharged

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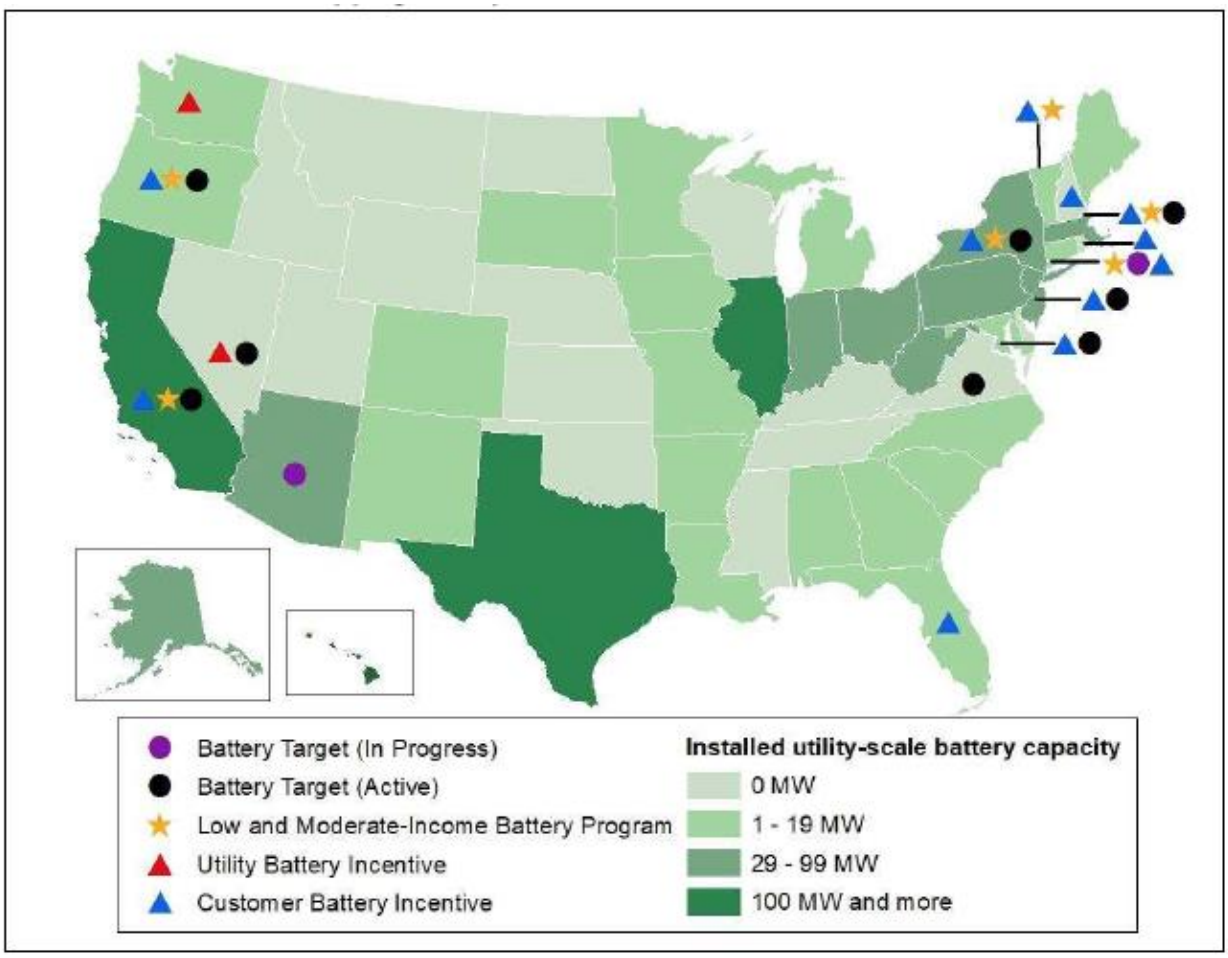
[39] Strategen, *Pennsylvania Energy Storage Assessment: Status, Barriers, and Opportunities*, at 1 (Apr. 2021), https://files.dep.state.pa.us/Energy/Office%20of%20Energy%20and%20Technology/OETDPortalFiles/EnergyAssurance/Strategen_PA_Energy_Storage_Assessment_April_2021.pdf ("Pennsylvania Energy Storage Assessment").
[40] *Id.* at 23–27.
[41] *Id.* at 24.

by the utilities as a DR resource to reduce peak loads.[42] Even in 2019, several states were already seeing significant deployment of utility scale battery storage, as shown in Figure 1 below.[43]

Figure 1 – 2019 Installed Utility-Scale Battery Capacity, and State Programs Incentivizing Battery Installation



Recognizing the benefits of battery storage, many states now offer customer battery incentive programs. One review of battery incentives in the six New England states, which all offer such programs, found that the programs share three common features:

[42] Bryndis Woods et al., *ConnectedSolutions: A Program Assessment for Massachusetts,* Applied Econ. Clinic, at 5 (Sept. 2021), https://www.cleanegroup.org/wp-content/uploads/ConnectedSolutions-An-Assessment-for-Massachusetts.pdf ("Mass. Program Assessment").
[43] *Id.* at 26, Fig. 4 (reproduced here).

1. All programs offer participating customers performance payments through contracts with their electric utility, based on the utilities' ability to discharge the batteries during peak times. Some also provide up-front incentives such as rebates or low-cost financing.
2. All programs are deployed as "virtual power plants – that is, a system of aggregated distributed battery resources that can be dispatched by the utility in concert during peak demand hours to lower costs associated with serving regional demand peaks."[44]
3. All New England programs support customer resilience, enabling customers to use the batteries for back-up power during grid outages.[45]

Similarly, customer-sited battery storage in Kentucky Power service territory could be deployed as a dispatchable power plant by Kentucky Power, and also allow customers reliable back-up power during outages.

In terms of capacity, customer-sited batteries can benefit the Company significantly. Batteries can be integrated into the utility grid as an aggregated resource which can be dispatched by the utility to support grid reliability and reduce peak loads. Batteries also can be scaled up and deployed quickly. For example, Massachusetts deployed 286 MW of customer-sited batteries within two years of program launch.[46] And customers are quick to sign up; a Vermont utility, Green Mountain Power, reached its 2023 annual enrollment cap of 500 new

[44] Mass. Program Assessment at 5.
[45] *Id.*
[46] *Id.* at 4.

participants by April, prompting GMP to request permission to remove the cap, which was granted by the Vermont PUC in August 2023.[47]

If the Company were to begin a battery DER program and enrolled residential customers at the same rate as Green Mountain Power, it could install 300 residential batteries per year.[48] Table 3 presents a scenario in which a Kentucky Power battery program starts with 100 participants in 2024 and expands to reach 300 by 2026, matching Green Mountain Power's rate. If the program then expands by 50% annually until 2030, Kentucky Power could deploy 43 MW of residential batteries through 2030, a significant contribution towards Kentucky Power's anticipated 2030 capacity shortage of 715 MW.[49]

Table 3. Residential Customer-Sited Battery Deployment Scenario – Annual Growth 50 % After 2026

	2024	2025	2026	2027	2028	2029	2030
Residential Customers w/ Batteries - Annual additions	100	200	300	450	675	1013	1519
Cumulative Total Customers	100	300	600	1,050	1,725	2,738	4,256
Battery Capacity - Annual Additions - KW	1,000	2,000	3,000	4,500	6,750	10,125	15,188
Battery Capacity - Cumulative Total - KW	1,000	3,000	6,000	10,500	17,250	27,375	42,563
Total Battery Capacity - MW	**1.0**	**3.0**	**6.0**	**10.5**	**17.3**	**27.4**	**42.6**

[47] News Release, *GMP Requests Removal of Cap on Powerwall and BYOD Home Battery Programs to Expand Customer Access to Cost-Effective Backup Power*, Green Mountain Power (Apr. 26, 2023), https://greenmountainpower.com/news/gmp-requests-removal-of-cap-on-powerwall-and-byod-home-battery-programs/; News Release, *GMP's Request to Expand Customer Access to Cost-Effective Home Energy Storage Through Popular Powerwall and BYOD Battery Programs is Approved*, Green Mountain Power (Aug. 18, 2023), https://greenmountainpower.com/news/gmps-request-to-expand-customer-access-to-cost-effective-home-energy-storage-is-approved/.

[48] KPC has 60% as many customers as GMP (163,000 / 270,000). GMP installed 500 batteries per year. If KPC installed batteries at the same rate as GMP, they could install 300 batteries annually (500 x 0.6 = 300).

[49] *See* KPCo 2022 IRP-Vol. A at 13, Fig. ES-1, ("Kentucky Power 'Going-In' Capacity Position Throughout Planning Period").

The experiences of other states have shown that, compared to the residential sector, the commercial and industrial (C&I) sectors have a much larger potential for hosting battery capacity, which can also be deployed quickly. For example, in Massachusetts, the C&I sector has 100 times as much battery capacity as the residential sector.[50] If Kentucky Power deployed a battery DR program with similar rates of uptake by C&I customers, the Company could have hundreds of MW of batteries installed at customer locations by 2030, with all the attendant resilience benefits on top of the capacity and reliability values.

DERs are great tools to support both the Company in its goals and Kentucky Power's customers. DERs reduce the Company's reliance on fossil fuel generation, thereby reducing customer exposure to fuel price volatility. Battery storage systems can provide back-up power to homes and critical community facilities, like nursing homes and schools. Solar plus storage systems provide an even greater level of resilience, as such systems can operate indefinitely during grid outages, with the solar array re-charging the battery and the battery enabling the solar power to be used directly even when the grid is down.

For reasons stated above, the Company should not shy away from fully analyzing the potential for DERs within its IRP and continue to engage with stakeholders about advancing DERs.[51] Based on the experiences of the Joint Intervenors, who work in the communities served by Kentucky Power, there is strong interest in distributed solar generation in the region. The Company should leverage this community support and collaborate with partners in the non-profit, private, and public sectors to drive sustained growth in the solar market, and hopefully soon, the storage market.

[50] Mass. Program Assessment at 19, 21 (2020 data).
[51] Specific areas that the Company and community partners can collaborate on include public education, consumer protection, permitting and codes, and workforce development.

V. COMPETITIVE PROCUREMENT

While the recently issued all-source RFPs are a positive development, changes are needed to help ensure that customers receive the significant benefits that can result from competitive procurement processes.

Joint Intervenors are heartened to see that the three-year action plan in the IRP includes the initiation of an all-source RFP process "to add cost-effective market capacity purchases and firm resources in the near future," and that the IRP "provid[es] optionality . . . for the type and timing of resources based on future RFP results."[52] Kentucky Power issued such RFPs on September 22, 2023. When carried out properly, all-source RFP processes can lead to lower cost and lower risk resource portfolios by ensuring that a utility's planning is informed by real-world competitive market data regarding a wide array of resource options. This is especially important here given the substantial capacity need that Kentucky Power faces over the coming years, and that the Preferred Plan in the IRP underestimates the cost and price volatility risks of the increased reliance on gas proposed therein, while undervaluing battery storage, renewables, and distributed generation options. While the all-source RFP process initiated by Kentucky Power could help remedy those flaws, information about that process available to date shows, as detailed in the EFG Report,[53] that the RFP process includes some significant shortcomings that need to be addressed for the benefits to customers of all-source competitive procurement to be fully realized. We write separately here to further expound on the benefits and best practices of an open and transparent all-source competitive procurement processes.

[52] KPCo 2022 IRP-Vol. A at 173, 183.
[53] EFG Report at 10–13.

Over the past decade, a growing number of utilities (often prodded by regulators and stakeholders) have begun adopting technology-neutral all-source competitive procurement practices with the stated goal of objectively evaluating the ability of different energy resources and technology mixes to meet a utility's overall resource needs. As detailed in a 2021 report by the U.S. Department of Energy's Grid Modernization Laboratory Consortium (hereinafter the "Competitive Solicitations Report"), increased interest in all-source competitive procurement has resulted from:

> its potential to discover region-specific competitive costs for a range of new resources; support the development of optimized portfolios of generation, energy storage, and demand-side resources; enable utilities to continuously optimize their portfolios as relative costs change; and coordinate DER procurement with bulk system resource procurement.[54]

We hope that Kentucky Power's all-source RFP process can help advance such results here.

To date, the increased focus on all-source competitive procurement by utilities has led to some positive results. As the Competitive Solicitations Report found:

> A growing number of utilities have undertaken all-source competitive solicitations for bulk power system resources. The results illustrate the potential of all-source solicitations as a tool for discovering competitive market prices across a range of technologies and for continuously optimizing resource portfolios in response to changing market conditions.[55]

One example of a utility that has had success with competitive procurement is the Northern Indiana Public Service Company ("NIPSCO"), which carried out all-source RFPs as part of its 2018 and 2021 IRP processes. NIPSCO received 90 responses to the 2018 RFP, with 59

[54] Fredrich Kahrl, *All-Source Competitive Solicitations: State and Electric Utility Practices*, 3rdRail Inc. & Lawrence Berkeley Nat'l Lab., at 4 (Mar. 2021), https://eta-publications.lbl.gov/sites/default/files/all_source_competitive_solutions_20210217_gmlc_format.pdf ("Competitive Solicitations Report").
[55] *Id.* at vii.

individual projects totaling more than 13 GW of capacity, including 2,209 MW of wind, 2,580 MW of solar, 1,220 MW of solar + storage, and 925 MW of storage.[56] In summarizing the results of the 2018 RFP, NIPSCO noted that:

> Overall, much of the cost information was relatively consistent with the third-party data review, but renewable offers were at the low end of the estimates observed in the public literature. This indicated that technology change and developer activity in a competitive process are dynamic forces that influence the costs of resource options for NIPSCO in the future.[57]

NIPSCO's 2021 all-source RFP received a total of 182 proposals involving 78 individual projects totaling 15 GW, including approximately 3,600 MW of solar, 4,200 MW of solar + storage, 1,200 MW of storage, and 1,300 MW of wind.[58] The pricing for such projects was "relatively consistent" with the 2018 RFP responses "subject to market adjustments."[59]

Numerous other utilities have had similarly robust responses to all-source RFPs. For example, a 2020 study provided an overview of how utilities Xcel Colorado, PNM, and El Paso Electric each issued all-source RFPs and "received large numbers of bids representing a wide range of technologies, development and ownership approaches, and competitively evaluated those bids within a system planning model to construct optimal portfolios."[60] In fact, Xcel's most

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[56] NIPSCO, Northern Indiana Public Service Company LLC 2018 Integrated Resource Plan at 53–56 (Oct. 31, 2018), https://www.in.gov/iurc/files/2018-NIPSCO-IRP.pdf.
[57] *Id.* at 56.
[58] NIPSCO, Northern Indiana Public Service Company LLC 2021 Integrated Resource Plan at 86–88 (Nov. 15, 2021), https://www.in.gov/iurc/files/NIPSCO_2021-Integrated-Resource-Plan-Document-1.pdf.
[59] *Id.* at 87–88.
[60] John D. Wilson et al., *Making the Most of the Power Plant Market: Best Practices for All-Source Electric Generation Procurement*, Energy Innovation Policy & Technology, LLC & Southern Alliance for Clean Energy, at 22 (Apr. 2020), https://energyinnovation.org/publication/making-the-most-of-the-power-plant-market-best-practices-for-all-source-procurement-of-electric-generation/ ("Best Practices Report").

recent all-source RFP issued in 2022 received proposals regarding 170 individual projects, the great majority of which were wind, solar, storage, or solar + storage hybrids.[61]

Results such as these suggest that there are many developers of solar, wind, storage, and other energy resources who would be interested in helping Kentucky Power fill its capacity need. The questions, therefore, become whether the RFPs issued by the Company are likely to lead to a large number of proposals covering the full range of potential resources, whether the Company will objectively and transparently evaluate such responses, and whether the RFP process will lead to a lower-cost, lower-risk, and cleaner resource plan than is proposed in the IRP. Based on a review of the RFPs and the process so far, however, we are concerned that the potential benefits of an all-source RFP competitive procurement process may not be fully realized here because it appears that some fundamental tenets of competitive procurement processes are not being followed.

First, all-source RFPs processes are most likely to be viewed as fair and competitive and, therefore, attract more bidders, when they establish a fully-level playing field on which resources can compete. As explained in the EFG Report, however, the Kentucky Power RFPs do not fully meet this standard because they unnecessarily limit the ability of battery storage projects to compete in at least two ways: (1) by restricting eligible storage projects to 10-year PPAs rather than the more economic 15- or 20-year period, and (2) by apparently not allowing solar + storage hybrid projects to bid into the process.[62] These limitations are especially problematic because the increasing competitiveness of battery storage is a primary reason for the growing interest in all-

[61] *Public Service Company of Colorado 2022 All-Source Solicitation 30-Day Report*, Xcel Energy, at 3, Attachment A (March 31, 2023), https://www.xcelenergy.com/staticfiles/xe-responsive/Company/Rates%20&%20Regulations/2022%20All-Source%20Solicitation%2030-Day%20Report.pdf.
[62] EFG Report at 12–13.

source competitive procurement.[63] As detailed in the Competitive Solicitations Report, battery storage is a unique resource that, for various reasons, can be challenging to directly compare to other resources from an economic standpoint.[64] The all-source RFP process provides a "market-based mechanism" to more fully account for the value of storage,[65] but the limitations on storage in the Kentucky Power RFPs would appear to undermine storage's ability to compete in that process. The apparent exclusion of solar + storage hybrids is especially problematic from this standpoint given that, as detailed above, such hybrids have been a significant portion of bids submitted in response to RFPs issued by other utilities. In fact, as of the end of 2021, there was more storage capacity in the U.S. in solar + storage hybrids than in standalone storage,[66] but the Kentucky Power RFPs appear to limit storage eligibility to only the latter.

Second, a key best practice for all-source RFPs is that they should be administered by an independent third-party to help ensure a fair and competitive procurement process.[67] The Kentucky Power RFPs, however, are being administered by American Electric Power Service Corporation ("AEPSC"), an affiliate of Kentucky Power's parent company. The Company may claim that an independent evaluator is not needed here because affiliates of AEP and/or Kentucky Power are not allowed to participate in these RFPs. However, the role of the independent evaluator is not only to prevent bias in favor of the utility's own projects; it is also to ensure that different resource types are treated equally and to provide potential bidders with reassurance that the process will be fair and competitive.[68] In addition, unless Kentucky Power is

[63] Competitive Solicitations Report at vii, 7–12.
[64] *Id.*
[65] *Id.*
[66] Mark Bolinger & Will Gorman, *2021 was a big year for hybrid power plants – especially PV+ storage*, Lawrence Berkeley Nat'l Lab. (Aug. 10, 2022), https://emp.lbl.gov/news/2021-was-big-year-hybrid-power-plants.
[67] Competitive Solicitations Report at ix, 36–38; Best Practices Report at 28.
[68] Competitive Solicitations Report at 38.

willing to completely rule out self-builds or resources owned by AEP or any affiliate, such options need to be bid into these RFP processes in order to ensure that they are compared on the same metrics and standards as non-utility-owned proposals.[69]

Third, transparency into the process and results is important to demonstrating that an RFP process is fair and objective, and to ensuring that decision makers and the public perceive it as such.[70] While it is still early in the process, the initial signs are that the Kentucky Power RFPs need to be more transparent. In particular, unlike the approach taken by other utilities such as NIPSCO, Kentucky Power did not solicit feedback from stakeholders (such as the parties to the IRP proceeding) regarding the RFPs before they were issued. Joint Intervenors urge Kentucky Power to take a different approach moving forward by, for example, disclosing to the Commission, Staff, and stakeholders the numbers and types of bids received; average, median, and ranges of prices; and reasons for advancing, selecting, or rejecting bids;[71] and providing adequate time for review and approval of any major projects from the RFP process that the Company decides it wishes to pursue. For example, if Kentucky Power were to decide that it wishes to pursue something as consequential and costly as a 10-year PPA for hundreds to as much as 1,300 MW of coal or gas capacity (which is a possibility contemplated by the thermal RFP), Joint Intervenors would certainly hope and expect Kentucky Power to provide the Commission, Staff, and stakeholders more than the five-and-a-half months for regulatory review and approval that is called for in the RFPs.

In conclusion, Kentucky Power's initiation of an all-source RFP competitive procurement process is a positive development. Changes and improvements to that process, however, are

[69] *Id.* at 35–36.
[70] Best Practices Report at 30.
[71] Such data regarding RFP bids is typically publicly disclosed by at least NIPSCO and Xcel Colorado.

needed to ensure that a truly competitive, objective, and transparent process is achieved and the chances of better resource outcomes is maximized.

VI. CONCLUSION

Joint Intervenors appreciate this opportunity to provide initial comments and recommendations related to Kentucky Power's 2022 Integrated Resource Plan, and look forward to future opportunities for ongoing constructive dialogue concerning Kentucky Power's planning efforts.

Respectfully submitted,

Tom FitzGerald
Ashley Wilmes
Byron Gary
Kentucky Resources Council
P.O. Box 1070
Frankfort, KY 40602
(502) 551-3675
FitzKRC@aol.com
Ashley@kyrc.org
Byron@kyrc.org

Counsel for Joint Intervenors Mountain Association, Appalachian Citizens' Law Center, Kentuckians for the Commonwealth, and Kentucky Solar Energy Society

CERTIFICATE OF SERVICE

In accordance with the Commission's July 22, 2021 Order in Case No. 2020-00085, *Electronic Emergency Docket Related to the Novel Coronavirus COVID*-19, this is to certify that the electronic filing was submitted to the Commission on October 6, 2023; that the documents in this electronic filing are a true representations of the materials prepared for the filing; and that the Commission has not excused any party from electronic filing procedures for this case at this time.

Tom FitzGerald