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April 1, 2024

Via Alternative Electronic Filing

Ms. Sallie Tanner
Executive Secretary
Georgia Public Service Commission
244 Washington Street S.W.
Atlanta, GA 30334-5701

RE: Microsoft Comments on Georgia Power's 2023 Integrated Resource Plan Update
Fulton County Georgia
Docket No. 55378

Dear Ms. Tanner:

For filing in the above-styled docket, please find the enclosed Microsoft Comments on Georgia Powers's 2023 Integrated Resource Plan update.

As required by the electronic filing procedures, a physical copy of this filing will be mailed to the Commission. Thank you for your attention to this matter.

Should you have any questions, please do not hesitate to contact our office.

Sincerely,

L. Craig Dowdy
For TAYLOR ENGLISH DUMA LLP

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Microsoft

BEFORE THE GEORGIA PUBLIC SERVICE COMMISSION

Microsoft Comments on Georgia Power's 2023 Integrated Resource Plan Update

I. Introduction

Microsoft Corporation (Microsoft) appreciates the opportunity to provide comments to the Georgia Public Service Commission (Commission) on Georgia Power Company's (GPC) 2023 Integrated Resource Plan (IRP) Update. Microsoft is a customer of GPC and the owner and operator of three data center campuses in the GPC service territory. Microsoft's footprint in GPC's territory is growing, along with Microsoft's need for reliable and sustainable electricity over the 2023-2038 IRP planning period.

Microsoft appreciates the new load growth paradigm that GPC faces and the effort GPC put into its 2023 IRP Update. GPC is a key partner, collaborator, and enabler of Microsoft's growth in the State of Georgia. Microsoft also appreciates the multiple interests that GPC and the Commission must balance when considering the 2023 IRP Update.

In these comments, Microsoft focuses its recommendations on and proposed modifications to the 2023 IRP Update and looks forward to the 2025 IRP on several key issues.

- **Section 1.** Microsoft is concerned that GPC's load forecasting method, which includes large load projects that are considering but have not ultimately selected Georgia as a location and/or GPC as a service provider, potentially results in the acquisition of an excessive amount of carbon-intensive generation. Microsoft urges the Commission to approve near-term resource planning decisions in the 2023 IRP Update based primarily on known, mature projects that have made firm commitments to Georgia Power.
- **Section 2.** Several of GPC's modeling assumptions undervalue renewable energy's contribution to meeting energy and capacity needs and resource adequacy on GPC's system. This undervaluation then results in overbuilding carbon-intensive resources that may otherwise not be necessary. Microsoft recommends that the Commission order GPC to:
  - Update assumptions regarding energy storage options and capacity accreditation for solar;
  - Use utility industry best practices and consistently apply Effective Load Carrying Capacity (ELCC) approaches to determine resource adequacy to properly plan for a robust system without overbuilding.
- **Section 3.** As the State of Georgia enters a new era of high load growth, commercial and industrial (C&I) customers can provide crucial insights to both GPC and the Commission through improved stakeholder engagement mechanisms. Microsoft

encourages improved transparency and the establishment of stakeholder engagement forums in future IRP proceedings.

II. Microsoft's Data Centers in Georgia

Microsoft is a worldwide technology company. As a significant component of our business platform, Microsoft constructs, owns and operates data centers around the world. Microsoft's data centers are designed to scale and oversee very large amounts of data, including cloud services that provide critical business and societal functions.[1] Microsoft's Georgia data centers deliver world-class data security and privacy. Microsoft provides faster access and the company's broadest range of Microsoft Azure cloud services to customers in the immediate region, which will be available to customers across Georgia and the United States.

Microsoft has had a growing presence in Georgia since 2007. There are currently three confirmed data center projects under construction southwest of Atlanta, which are expected to come online late next year. In addition, Microsoft is looking to grow its data center footprint in Georgia with two more campuses identified southwest of Atlanta and another in Rome.

Microsoft is also investing to meet its leading sustainability targets, notably: (1) by 2025, we will shift to a 100% supply of renewable energy, meaning that we will have power purchase agreements for green energy contracted for 100% of carbon-emitting electricity consumed by all our data centers, buildings, and campuses, and (2) by 2030, 100% of Microsoft's electricity consumption, 100% of the time, will be matched by zero-carbon energy purchases. Microsoft is committed to using our voice to advance electricity policy because electricity is an enabler of economic development, social welfare, improved health, and other positive societal outcomes.[2] Microsoft is not alone in such efforts. There is a movement of companies, customers, and consumers of all sizes that are increasingly setting their own sustainability goals to shift to carbon-free energy. As a result, the ability of Microsoft to procure reliable, sustainable, and cost-effective energy for our operations is one of the key factors in selecting the location of data centers and other operations. Microsoft commends GPC for steps already taken in its clean energy transition, especially with its Clean and Renewable Energy Subscription (CARES) Program, allowing C&I customers to support their clean energy goals by offering the opportunity to subscribe to new renewable energy options.[3] Microsoft encourages GPC and the Commission to look for additional opportunities to increase the volume of renewable energy and energy storage offered in the program.

Furthermore, Microsoft's Georgia data centers provide significant benefits to the community and GPC's larger service territory's economic development. Microsoft's data centers support the creation of local jobs directly through the construction and operations of the site, and indirectly through a business transformation in digital services and attendant efficiencies that increase competitiveness and growth. These jobs include roles in IT operations, electrical and mechanical engineering, as well as facility security and maintenance. In addition to local job creation, Microsoft's data centers support Georgia organizations and businesses through its various cloud services. Microsoft estimates that Atlanta-based data center projects will require 1,050 construction roles annually and by the end of 2026, 225 full-time employees and contractors at the operational facilities. Additionally, over the 12 months of 2020-2021, the data center industry,

[1] *See* 'Critical to our modern society: How data centers power everyday necessities' https://news.microsoft.com/europe/
[2] Microsoft electricity policy brief - 2022
[3] https://www.georgiapower.com/clean-and-renewable-energy-subscription.html

including Microsoft's operations, provided $5.3 billion in direct total economic output and $1.5 billion associated with employee pay and benefits within Georgia.

III. Microsoft's Recommendations

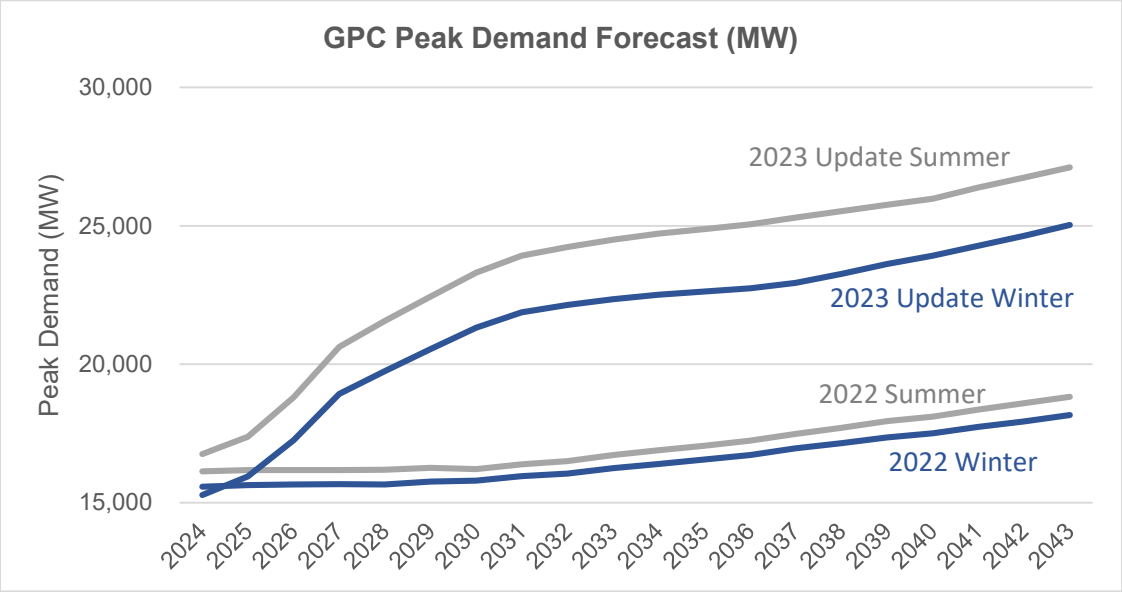
1. GPC should provide greater focus within its load forecasting and near-term resource requirements, which should be based only on mature projects with firm commitments

Overall, Microsoft appreciates GPC's commitment to reliably serve all customers, and ensure power is available to support Georgia's robust economic growth. Microsoft agrees that most of the load growth associated with data centers in the 2023 IRP Update is real and that GPC does require additional capacity. However, Microsoft has concerns with GPC's approach potentially leading to over-forecasting near-term load (through 2030) and procuring excessive, carbon-intensive generation.

GPC's 2023 IRP Update load forecasting methodology potentially over-estimates new load that will select GPC as a provider.

In the 2023 IRP Update, GPC attributes the revised load forecast to extraordinary economic growth driven by an influx of large load projects.[4] GPC predicts 7,100 MW of summer load growth and 6,600 MW of winter load growth by 2031 (Figure 1).

Figure 1. Georgia Peak Demand Forecast 2022 IRP vs 2023 IRP Update [5]



GPC's Technical Appendix provides further details on the load forecast and methodology. GPC's load forecasting approach for large projects accounts for both known projects that have committed to GPC and projects that are still undecided on location and/or service provider. This approach contrasts with other utilities that have also experienced an unprecedented spike in demand.

[4] *GPC Company's 2023 Integrated Resource Plan Update*, Docket No. 55378, GPC's 2023 IRP Update, at 2 (Oct. 27, 2023) *available at* https://docket.images.azcc.gov/ (GPC 2023 IRP Update).
[5] *Id.* at 2023 IRP Update Load and Energy Forecast Technical Appendix.

Dominion Energy Virginia[6], Duke Energy Carolinas / Duke Energy Progress[7], and APS[8], for example, base their new load forecasts primarily on known projects that have made various levels of financial commitment in their respective service territory. It is reasonable for near-term resource planning decisions to be based solely on known projects rather than also including projects that have not selected a location and/or service provider. It is unclear the extent to which GPC's resource requests in the 2023 IRP Update are based on these contemplated projects. By not constraining near-term needs only to projects that have selected GPC, the 2023 IRP Update may over-estimate the actual near-term resources required.

GPC uses a Monte Carlo simulation to quantify the range of expected outcomes for the 2023 IRP Update large load forecast.[9] The result of this simulation effectively provides 100,000 load forecasts, which are ranked from lowest to highest. GPC chose to plan for the P95 load value in the 2023 IRP Update. While this approach increases the probability that a new load will be able to be served, it also increases the likelihood of over-forecasting load in all but 5% of the scenarios assuming reasonable accuracy of the underlying model's input assumptions. Evaluating a load sensitivity case such as P95 in a high-growth scenario would be reasonable. However, as GPC only modeled one load forecast in the 2023 IRP Update, Microsoft recommends using actual, committed loads among the large load customer class and those having made significant progress backed by resource commitments in developing load growth assumptions, particularly in the near term. This ensures the ability to serve new loads and limits the potential for over-procuring unnecessary resources.

Recommendations on GPC's 2023 IRP Load Forecast

In the context of the 2023 IRP Update, the over-forecasting of load could result in procuring excessive and non-optimal generation. To be clear, Microsoft agrees that the State of Georgia is facing a high-load-growth environment and that GPC needs additional capacity to be approved in the 2023 IRP Update. But, from a customer perspective, over-procuring generation has significant impacts on customers' costs and emissions in the future.

To mitigate potential over-procurement based on over-forecasting load growth, Microsoft makes the following three recommendations:

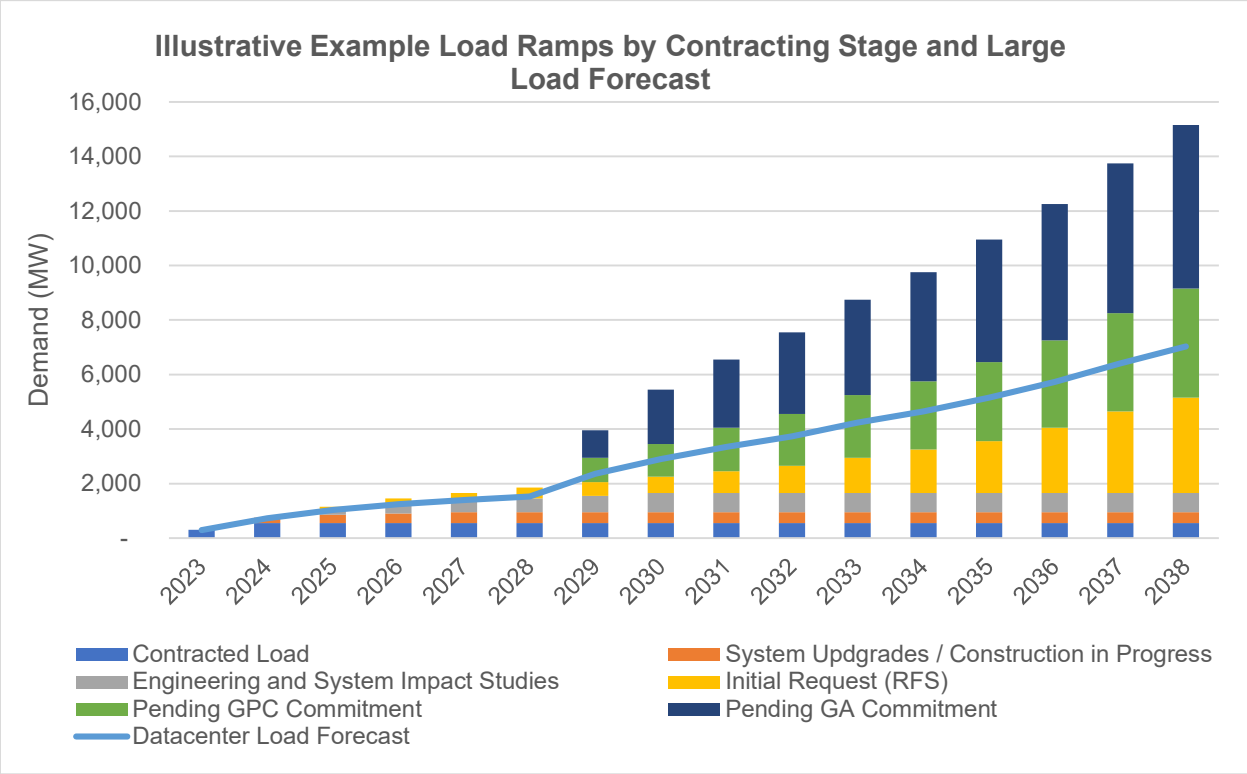
1. GPC should ensure that the methodology it is using to forecast large load projects, particularly data center load, relies on a standardized set of assumptions based on the commitment level associated with the load. That is, as data centers and other large-load customers seek to secure power from GPC, they go through various stages of contracting with progressive levels of commitment. For example, an initial request is made in the form of a request for electric service (RFS), which has no or a minimal financial commitment. Subsequent requests such as system impact studies and upgrades, substation construction, and final agreements for energization have significant financial

[6] *Virginia Electric and Power Company – 2023 Integrated Resource Plan,* Docket No. PUR-2023-00066, Witness Rebuttal Testimony of Alan W. Bradshaw, at 17 (Sep. 21, 2023) *available at* https://www.scc.virginia.gov/
[7] *Duke Energy Carolinas, LLC and Duke Energy Progress, LLC 2023 Biennial CPIRP*, Docket No. E-100 Sub 190, Supplemental Planning Analysis, at 13 (Jan. 31, 2024) *available at* https://starw1.ncuc.gov/
[8] *In the Matter of Resource Planning and Procurement in 2021, 2022, and 2023*, Docket No. E-99999A-22-0046, APS's 2023 IRP, at 21 (Nov. 1, 2023) *available at* https://docket.images.azcc.gov/
[9] GPC 2023 IRP Update, Load and Energy Forecast Technical Appendix at 19.

commitments. These increased levels of commitment reflect the increased likelihood that the load will be implemented. Thus, GPC should analyze the different commitment levels it is aware of from known and potential data centers and other large load customers and assign standardized and decreasing discount levels to each stage that reflect the greater likelihood that the load will appear at levels with increased commitments.

2. GPC should provide greater transparency to stakeholders regarding its large load forecasting methodology and the underlying data used to support it. For example, using the methodology described above, GPC should compile the information from known and potential new large load customers, sort the commitment levels (including less certain load that has not committed to Georgia and/or GPC), aggregate the information, and identify the varying levels of load expected at each commitment level in a year-over-year (YoY) breakout. Figure 2 below provides an illustrative example of a data center load forecast showing YoY aggregated loads at varying commitment levels.

Figure 2. An illustrative example of aggregated load by commitment level and load forecast



3. Near-term resource requirements in the 2023 IRP Update should only be based on known mature projects that have made firm commitments to GPC versus load that has yet to select GPC or the State of Georgia.

2. GPC's modeling assumptions undervalue renewable energy's contributions to capacity and resource adequacy needs and result in overly carbon-intensive capacity additions

Microsoft commends GPC for its consideration of a range of resources, including pilots of Tall Wind, hydrogen, and long-duration battery storage. Microsoft expresses concern, however, that GPC's modeling limits the build options for storage resources and does not adequately value capacity accreditation for solar resources, resulting in a more carbon-intensive resource mix. Microsoft urges GPC to consider what a net zero or more stringent carbon-constrained scenario would look like.

GPC places restrictions on build options for energy storage resources in its Aurora modeling.

The only options available in the 2023 IRP Update for energy storage are a 4-hour BESS option and a 12-hour medium-duration energy storage system. Between the 2022 IRP and the 2023 IRP Update, an 8-hour BESS was removed from the list of candidate generators. The 12-hour 'middle duration energy storage system' is representative of pumped hydro, based on cost and round-trip efficiency. GPC did not explain this decision; however, pumped hydro is typically more geographically constrained and more expensive than battery energy storage options. The higher cost and lower round-trip efficiency of pumped hydro compared to 8-hr BESS likely limits its economic build (no MDESS was built in most scenarios). The application of the IRA ITC to battery storage capital costs is unclear and possibly not accounted for, or under-accounted for, in technology costs. The 2023 IRP Update also fails to include any long-duration energy storage options (100+ hours), as is becoming standard in IRP processes as a later-year candidate generator. This leaves a crucial operational gap in the ability of intermittent renewables to provide firm capacity and likely contributes to further limiting the buildout of clean resources.

GPC's modeling does not apply adequate capacity accreditation to solar resources and should reflect industry best practices for modeling resource adequacy

In addition to GPC's limitations on solar and storage builds, Microsoft is also concerned that GPC's approach to capacity accreditation does not adequately value solar as a resource and that GPC's use of an Incremental Capacity Equivalence (ICE) Factor to compute the capacity contribution of variable and energy-limited resources does not adhere to best practices. Without an appropriate underlying accreditation for these resources to meet capacity needs, the system is forced to build additional fossil-intensive resources to meet the load.

GPC employs an Incremental Capacity Equivalence (ICE) Factor to compute the capacity contribution of variable and energy-limited resources. During the 2021 PURPA proceedings, the Commission prompted GPC to explore a more common approach to resource accreditation. Consequently, in the 2022 IRP, GPC conducted a study comparing two accreditation approaches: the ICE Factor and the LOLE-based ELCC method.

Despite exploring the more widely used LOLE-based, probabilistic accreditation method, GPC concluded that choosing ICE over ELCCs would not have a significant impact on the planning results and opted to continue using the ICE Factor method. Microsoft does not agree with GPC's

assertion that the approach to capacity accreditation will have a limited impact on the Company's planning results. Rather, this decision may result in sub-optimal cost decisions and may lead to over- or under-building.

The LOLE approach is better able to capture declining capacity contributions of variable resources at higher penetrations and capture synergies between technologies. The ICE model is deterministic and only considers a single possible weather year when assessing the capacity contribution of a resource. Microsoft strongly supports a seasonal approach to capacity expansion, as provided by the LOLE approach. This will ensure that the seasonal weather trends and load shapes are accurately reflected in capacity expansion modeling and will allow GPC to make decisions that support resource and energy adequacy during both the Winter and Summer months.

The ICE approach employed by GPC does not correctly reflect the binding season (Winter) because it uses average capacity factors. Modeling the system in this manner will lead to overbuilding since the higher winter planning reserve margin is employed across the entire year and no capacity accreditation is given to solar.[10] This will artificially favor non-clean technologies to meet the capacity needs since no capacity contribution is given to solar resources.

Recommendations to Support Customer Clean Energy Goals and Reduce Emissions on the GPC System

Microsoft recommends that GPC model long-duration storage options including 8+ hour battery storage and 100+ hour long-duration energy storage (LDES) in future IRPs. Microsoft acknowledges the relatively new nature of these technologies and is willing to participate in future stakeholder engagements with GPC to evaluate potential benefits.

Microsoft also recommends that GPC adopt a probabilistic, LOLE-based approach to capacity accreditation.

[10] GPC 2023 IRP 'Capacity Expansion and Generation Data' Aurora files for all scenarios

3. **Microsoft encourages higher levels of transparency throughout the IRP process and the establishment of stakeholder engagement forums to support navigating this new load growth paradigm.**

Microsoft appreciates that GPC and the Commission are facing a new paradigm of rapid load growth and the resulting need for new resources. The decisions made in these resource planning exercises ultimately have significant implications for customers on many fronts, including costs, corporate objectives, and the ability to conduct business within the State of Georgia. As such, Microsoft encourages the utmost transparency in GPC's resource planning filings and clear pathways to engagement so that customers can come to the decision-making process prepared and as effective contributors in the planning processes.

Below are areas for consideration that Microsoft recommends for future IRP proceedings.

I. Modeling Assumptions and Preferred Portfolios

We encourage GPC to fully report its modeling assumptions and rationale for selecting these underlying assumptions to stakeholders to ensure a transparent IRP process. Redacting data to the level it is in the 2023 IRP Update makes it difficult for the public to truly assess the IRP for its diligence. Microsoft would like to see the IRP clearly report assumptions for all resources including but not limited to capital expenditures, build limits, tax credits, planning reserve margins, and ELCC values.

Microsoft fully appreciates that the 2023 IRP Update was a targeted effort to address the identified capacity shortfall in the Winter months and acknowledges GPC for taking swift action to address the identified reliability risks; however, Microsoft encourages GPC to more clearly state modeling assumptions and explain the rationale for choosing these assumptions to better support stakeholder engagement. Additionally, the lack of a specified preferred portfolio makes scrutiny of long-term portfolios unclear. The connection between resulting capacity and energy procurements and scenario results from the GPC IRP is also unclear. As a result, Microsoft recommends that GPC incorporate transparency into how scenarios are structured and how results are used for decision-making.

II. Stakeholder Engagement Process

Lastly, Microsoft requests GPC and the Commission to consider establishing a formal stakeholder process in future IRP processes. Microsoft appreciates the opportunity to comment on the 2023 IRP Update but notes that many other states have stakeholder sessions and a comment period both before and after filing. Below are some reasons why GPC should consider including a formal stakeholder process throughout the IRP process rather than just after filing[11]:

- Educate stakeholders on the IRP process;
- Grow stakeholder trust and encourage new C&I customers to choose GPC as their electric provider;
- Enhance transparency in utility decision-making processes for resource planning;
- Establish a feedback loop for the utility on its resource plan;

[11] Berkely Lab, 'Training on Integrated Resource Planning for South Carolina Office of Regulatory Staff' available at https://lbl.gov/

- Promote dialogue on resource decisions;
- Build key stakeholder partner input to ensure a strong, beneficial commitment to GPC's service territory; and
- Mitigate utility regulatory risks associated with intervenors and review processes by building understanding and support for utility resource decisions.

Respectfully Submitted,

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Energy Markets Director
Cloud Operations + Innovation
Microsoft Corporation

/s/ Phuong Le
Energy Markets Director
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Energy Manager
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BEFORE THE

GEORGIA PUBLIC SERVICE COMMISSION

In re: **Georgia Power Company's 2023 Integrated Resource Plan Update**	**Docket No.: 55378**

CERTIFICATE OF SERVICE

I certify that the foregoing Microsoft Comments on Georgia Power's 2023 Integrated Resource Plan was filed with the Georgia Public Service Commission in Docket No. 55378 via the Commission's Alternative eFile method, in accordance with said method a physical copy of the same was mailed or hand delivered to the Executive Secretary of the Georgia Public Service Commission, and was served upon all parties of record by statutory electronic service as follows:

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This 1th day of April, 2024

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