STATE OF GEORGIA

BEFORE THE

GEORGIA PUBLIC SERVICE COMMISSION

In Re:

Georgia Power Company's 2025 Integrated Resource Plan	**)**	**Docket No. 56002**

Georgia Power Company's 2025 Application for the Certification, Decertification, and Amended Demand-Side Management Plan	**)**	**Docket No. 56003**

DIRECT TESTIMONY OF

AJ GOULDING

ON BEHALF OF NATURAL RESOURCES DEFENSE COUNCIL (NRDC),

THE SIERRA CLUB, AND

THE SOUTHERN ALLIANCE FOR CLEAN ENERGY (SACE)

MAY 2, 2025

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I. INTRODUCTION AND OVERVIEW

INTRODUCTION AND QUALIFICATIONS

Q. Please state your name, title, and employer business address.

A. My name is AJ Goulding. My business address is 717 Atlantic Avenue, Suite 1A, Boston, MA 02111. I am the President of London Economics International, LLC. I also serve as an adjunct associate professor at Columbia University's School of International and Public Affairs, where I teach a course in electricity markets and oversee graduate workshops.

Q. Please describe London Economics International LLC.

A. London Economics International LLC ("LEI") is a global economic, financial, and strategic advisory professional services firm specializing in energy, water, and infrastructure. LEI is organized as a limited liability corporation, domiciled in Massachusetts. It is US-owned and US-operated. LEI's areas of expertise include (i) price forecasting and asset valuation; (ii) regulatory economics, performance-based ratemaking, and market design; (iii) expert testimony and litigation consulting; (iv) transmission and distribution; (v) renewable energy; and (vi) procurement. LEI has more than 25 years' experience modeling and analyzing regulatory and market issues across the United States.

The firm combines a detailed understanding of specific network and commodity industries, such as electricity generation and distribution, with sophisticated analysis and a suite of proprietary quantitative models to produce reliable and comprehensible results. LEI has its roots in advising on the initial round of privatization of electricity, gas, and water companies in the United Kingdom. Since then, the firm has supported private sector clients, market institutions, regulatory agencies, public advocates, and governments on privatization, asset valuation, deregulation, tariff design, market power, and strategy worldwide, in virtually all the deregulated markets. LEI also has decades of experience in the vertically integrated power systems in the United States.

Q. Please briefly summarize your relevant educational and professional background.

A. I hold a master's degree in International Business from Columbia University's School of International and Public Affairs, and a bachelor's degree in economics from Earlham College. I have over 30 years of experience in the energy sector, having advised clients in North American Europe, Asia, and the Middle East. I began my career performing natural gas market analysis and later advised the United States Agency for International Development ("USAID") on electric power sector restructuring in India.

In my role as president of LEI, I manage an international consulting firm focused on finance, economic, and strategic consulting to the energy and infrastructure industries. In addition to serving as a sector expert in electricity and gas markets, my responsibilities include project management, marketing, budget and financial control, and recruiting. I have led and completed many of LEI's regulatory engagements related to utility proceedings, including testifying in proceedings in the United States, including the in Southeast, and in Canada. Through these engagements, I have directed and authored independent reports to commissions, prepared discovery questions, responded to interrogatories from parties, authored rebuttals, provided cross-examination of expert witnesses, and provided oral testimony.

I have published widely on energy issues, and I have extensive experience testifying, including before FERC, other federal agencies, international arbitration panels, and state and provincial regulatory bodies.

Q. What is your experience related to the matters in this case?

A. As the President of LEI, I have had oversight of the company's engagements including: analysis of data center load and implication for rate design, transmission system planning, integrated resource planning, fuel price forecasting, and review of competitive solicitations.

My CV is included as Attachment A.

Q. Was this testimony prepared under your supervision? Who else assisted in the preparation of this testimony?

A. Yes, this testimony was prepared under my supervision. Several members of the LEI team assisted in the underlying research, review and analysis stages. However, I will be able to testify orally to all matters in this testimony.

Q. What is the purpose of your testimony in this proceeding?

A. LEI was retained by the Natural Resources Defense Council, Sierra Club, and Southern Alliance for Clean Energy to provide expert technical analysis related to certain aspects of Georgia Power Company's ("GPC's") 2025 IRP filed in this docket.[1] LEI was asked to look at specific aspects of the IRP. LEI examined GPC's outlook for large load customers, the methodology used to project transmission needs, its approach to forecasting natural gas commodity prices, and its process for procurement of new generating resources. LEI was not asked to perform a review of the entire IRP (which would include analysis of total load growth, retirements, and adequacy of existing fleet, among other aspects). The views stated in this testimony are based on material that was available as of the time LEI performed our analysis. We reserve our right to change our findings if new information comes to light.

The purpose of my testimony is to summarize the findings from LEI's analysis and provide recommendations.

Q. On whose behalf are you testifying in this case?

A. I am testifying on behalf of the Natural Resources Defense Council, the Sierra Club, and the Southern Alliance for Clean Energy.

Q. Are you sponsoring any exhibits with your testimony?

A. Yes, I am sponsoring the exhibits listed below.

[1] GPSC Docket #56002. Georgia Power Company. *2025 Integrated Resource Plan*. January 2025.

Table 1. List of Exhibits

Exhibit #	Title	Confidential
AJG-1	Resume of AJ Goulding	Public
AJG -2	Company response to Staff discovery request STF-JKA-1-2a	Public
AJG -3	Company response to Staff discovery request STF-GS-1-8	Public
AJG -4	Company response to Staff discovery request STF-PIA-5-17	Trade Secret
AJG -5	Company response to Staff discovery request STF-GS-1-1	Public
AJG -6	Company response to Staff discovery request STF-JKA-1-12	Public
AJG -7	Company response to Staff discovery request STF-JKA-2-6	Public
AJG -8	Company response to Hearing Request HR-1-1 Attachment	Trade Secret
AJG -9	Company response to Staff discovery request STF-JKA-1-12 Attachment B	Trade Secret

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Q. Please summarize your primary conclusions and recommendations.

A. Our primary conclusions include the following:

- GPC's outlook for large customer load is an important component of its total load outlook. LEI's careful review of GPC's quarterly large load announcement reports indicates that growth through 2028 and perhaps beyond is likely to be slower than GPC is projecting. GPC is considering not just load with contracts but also load under various stages of development, including those under technical review. Not all these load projects are guaranteed to materialize - and likely will not for a variety of reasons.

  Because of the inherent uncertainty about data center load growth, and because GPC's large load announcement reports reflect a potential near-term slowdown in project commitment, LEI recommends that GPC continue to monitor attrition in its quarterly *Large Load Economic Development Report* to ensure that its large load forecast does not outrun the actual pace of load growth. LEI also believes a more realistic projection of large load demand is called for. LEI created an alternative baseline scenario which

reflects recent experience with attrition in GPC's announcements of potential large load customers.

- GPC's transmission plan identifies projects that it believes are needed to reliably support load and generation resources across the Georgia Integrated Transmission System ("GA ITS") over a ten-year planning horizon. Transmission constraints are identified and alternative solutions are subsequently evaluated using a cost/benefit analysis framework that considers economic factors and engineering benefits. Though LEI did not examine each project in detail and does not have a view as to whether or not GPC overstated or understated its need for transmission investment, GPC's projections of transmission needs did not consider the possibility that load growth may be slower than assumed, though they did examine a scenario in which load growth would be higher than in the base case. Testing a lower load forecast sensitivity (which would reflect the substantial uncertainty associated with prospective large load customers) would enable GPC to identify which transmission projects could potentially be deferred. GPC's projections of transmission needs also did not consider a longer (20-year) planning horizon. Extending the transmission planning horizon is important to capture the longer-term benefits of projects and enable more proactive investments that are better equipped to respond to the evolving nature of the grid. LEI recommends consideration of these two issues in the forecasting of transmission needs.

- GPC's forecast of natural gas prices employs a reasonable methodology for annual and monthly gas prices. However, gas prices can be volatile (gas purchase contracts are usually not for fixed prices, but are indexed to market prices), and GPC's approach ignores the impact of volatility on customer costs. LEI recommends that GPC refer to historical short-term volatility of gas prices and examine the impact of such volatility on ratepayer costs across its scenarios.

- GPC's process for procuring supply resources meets Commission requirements, but it could be made more competitive if it incorporated practices used by other utilities, such as allowing a longer period from Commission-approved RFP to bid deadline and not requiring a bid security payment before short-listing bidders. Making the RFP

process more bidder-friendly reduces risk and cost to bidders, which can result in more competition and lower prices, to the benefit of ratepayers.

- Any aspects of GPC's 2025 IRP not discussed in this testimony should not be interpreted as agreement with GPC on those aspects.

ORGANIZATION OF TESTIMONY

Q. How is the remainder of your testimony organized?

A. LEI's testimony is organized as follows: Part II addresses LEI analysis of GPC's large customer load forecast; Part III addresses GPC's methodology for projecting transmission needs; Part IV addresses GPC's gas price forecasting approach, and Part V addresses GPC's process for competitive solicitation of generation resources.

II. GPC'S FORECAST OF DATA CENTER LOAD DOES NOT REFLECT RECENT ATTRITION IN ITS LOAD ANNOUNCEMENT DATA

Q. How did LEI evaluate GPC's forecast of large loads?

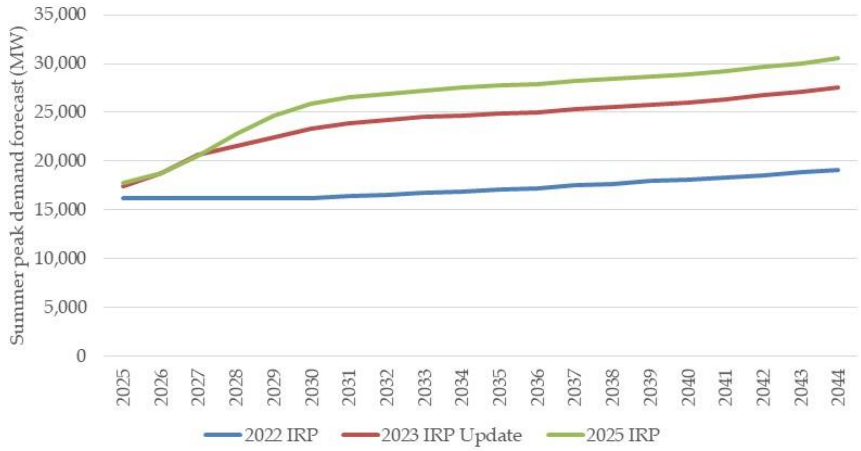
A. LEI examined trends in US data center electricity demand and compared them to recent experience for announced projects in GPC's quarterly reports, known as *Large Load Economic Development* reports, as well as GPC's methodology for projecting load growth. As described in detail in this section, GPC very likely overestimated future load from data centers for the period of its IRP because it did not reflect the attrition of data center projects that is evident in GPC's quarterly *Large Load Economic Development* reports in 2024, nor the very slow growth in signed contracts for service and requests for service that also appears in GPC's *Large Load Economic Development* reports. LEI concludes this section with an alternative outlook and recommends that GPC carefully track trends in the quarterly attrition reported in the *Large Load Economic Development* reports to ensure that its outlooks for large load do not run ahead of actual experience with this customer class.

Q. Is GPC's forecast of large loads a material portion of its load outlook?

A. Yes. In GPC's 2025 IRP, it projected an increase of approximately 9.7 GW of new summer peak demand by 2034 (the green line in Figure 1). GPC projected a similar increase in new

winter peak demand – a 9.2 GW increase by 2034. GPC noted that this load growth is driven by a continued increase in requests for service from large load customers.

Figure 1. GPC base case summer peak demand (2025-2044)



Note: GPC refers to its base load forecast as "Budget 2025" in the 2025 IRP document.

Source: GPSC Docket #56002. GPC. *2025 IRP Update, Technical Appendix Volume 1: Load and Energy Forecast.* January 2025. https://psc.ga.gov/search/facts-document/?documentId=221233.

Q. Are there any issues to consider in projecting GPC's large customer load growth?

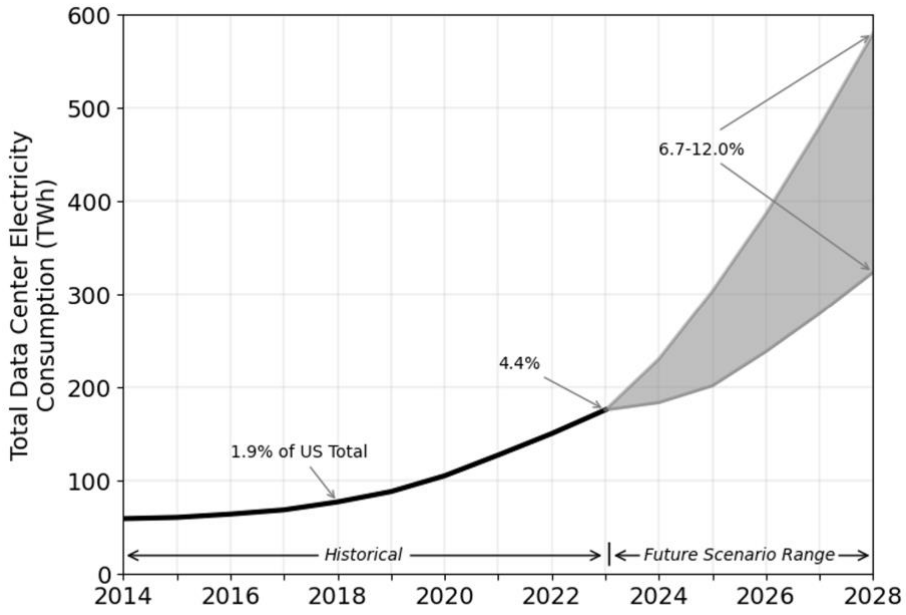
A. Yes, as discussed in detail below, much of the large customer load growth that GPC is projecting would be from data centers. Data center development is subject to particular demand and supply factors that can lead to difficulties in forecasting their load. These factors are discussed next.

NEW DATA CENTER LOAD IS DRIVEN BY A VARIETY OF DEMAND AND SUPPLY FACTORS

Q. Why is data center load growth hard to forecast?

A. Growth in electricity demand from data centers has been rapid in the United States and other regions, but it is a nascent phenomenon and forecasts for future growth from this customer sector show a wide range of uncertainty (see, for example, the graph below displaying a wide range of future data center energy requirements that were recently estimated by Lawrence Berkeley National Labs, Figure 2). This uncertainty is driven by a variety of factors, related to both demand and supply.

Figure 2. Total US data center electricity consumption from 2014 through 2028



Source: Shehabi, A., Smith, S.J., Hubbard, A., Newkirk, A., Lei, N., Siddik, M.A.B., Holecek, B., Koomey, J., Masanet, E., Sartor, D. 2024. *2024 United States Data Center Energy Usage Report*. Lawrence Berkeley National Laboratory, Berkeley, California. LBNL-2001637.

Q. What are some supply factors impacting data center growth?

A. On the supply side, there are uncertainties related to the future efficiency of equipment for computing and the speed of expansion of chip manufacturing capability, both of which can impact the rate of growth of power needs of data centers.

Q. What are some demand factors impacting data center growth?

A. On the demand side, the key question is whether a data center is needed, and this is best understood in the context of the services the data center provides. Services provided by data centers include training and use of artificial intelligence ("AI") tools, which in turn depend on and the pace of uptake of AI tools; cryptocurrency mining; and traditional data center services for data storage and cloud computing services supplied by technology companies such as Amazon, Microsoft, and Google. Data centers which provide services to a variety of clients may expect a ramping of load. In other words, even if such a data center expects to use 1,000 MW eventually, in the first years, it will start with lower level

and ramp up as it adds tenants (which is why data center customers often ask the utility for a ramping period when they request service).

Q. How does a utility plan for meeting future data center load?

A. A utility has an obligation to provide electricity to customers in its territory—and it cannot jeopardize the reliability of the service it provides to existing customers to take on new customers. Therefore, the utility periodically performs forward-looking load studies, which must incorporate assumptions about the interest of new potential customers, and the load growth which will ultimately materialize. To serve a large load customer, utilities often require a signed energy service agreement ("ESA") in addition to the terms and conditions of the tariff. A customer which has signed such a contract has "skin in the game" if the contract includes terms that penalize the customer for not using the level of demand that it initially requested. This creates an incentive for the customer not to overstate the service it will need and supports an accurate load forecast by the utility. The ESA serves as a formal milestone in the process of bringing potential load growth to realization. Potential customers which may have requested service but have not signed an ESA do not have the same level of obligations and therefore are not formally committed to ultimately becoming a customer of the utility.

The utility must also acquire the resources and build the infrastructure to serve the new customer. This process is much more complex than adding a new household to the grid, as many elements (such as construction of new distribution facilities, and, potentially, transmission and generation facilities) need to be coordinated to ensure that all the pieces come together. Because of the complexity, there will inevitably be delays and those delays can lead to attrition of initially interested large load customers as part of this process. In instances where new generation resources are needed to serve a new customer, it is important to recognize that getting the generation designed, permitted, financed, and built is a lengthy process and often subject to some delays. The potential data center customer may not have the appetite for facing such delays, especially if they have options at other potential sites (which we discuss further below). In addition, whether an integrated utility can get new utility scale generation built quickly enough to serve the needs of a new customer in the near term could be in doubt given global supply chain issues. Tight supplies

of power generation equipment could become a bottleneck to supplying the potential load from data centers. Industry observers report an average lead time of three years for delivery of large transformers; and in some cases, lead times as long as five years.[2] Siemens and GE Vernova, two industry leaders in turbine manufacturing, are seeing lead times increase for turbine delivery; the lead time for a 200 MW Siemens turbine has increased to three years,[3] and GE Vernova has a company backlog through 2028 for delivery times on orders.[4] Therefore, in addition to having an ESA with the potential customer, until the utility orders necessary equipment it needs to procure, and a notice to proceed ("NTP") on construction of substation or other required facilities is authorized, there is no clear timeline of when the utility can serve the new load. If generation equipment is delayed, then load growth will have to be deferred.[5]

Furthermore, even assuming many data centers are built in the United States (rather than elsewhere in the world), until a new customer signs an ESA or some other contract requiring financial commitment, there is no guarantee that the data center would be built in any given utility's territory versus somewhere else; and developers have an incentive to duplicate interconnection requests, as explained below.

Q. How do data center developers determine where to locate?

A. The design of a data center may be for a specific activity and therefore varies, but at its most basic, data center developers have to take into account certain essential requirements: availability of affordable land, accessibility to fiber capacity (and adequate latency), water for cooling (if the design uses water cooling), and high quality electricity service. There

[2] Seiple, Chris. "Gridlock: The demand dilemma facing the US power industry." *Wood Mackenzie.* October 2024. <https://www.woodmac.com/horizons/gridlock-demand-dilemma-facing-us-power-industry/?__FormGuid=81d8a1b9-fba3-4634-bdc1-67c626a6af21&__FormLanguage=en&__FormSubmissionId=0696f8bf-d3df-4fde-a7bc-09d3bbce9d7d>

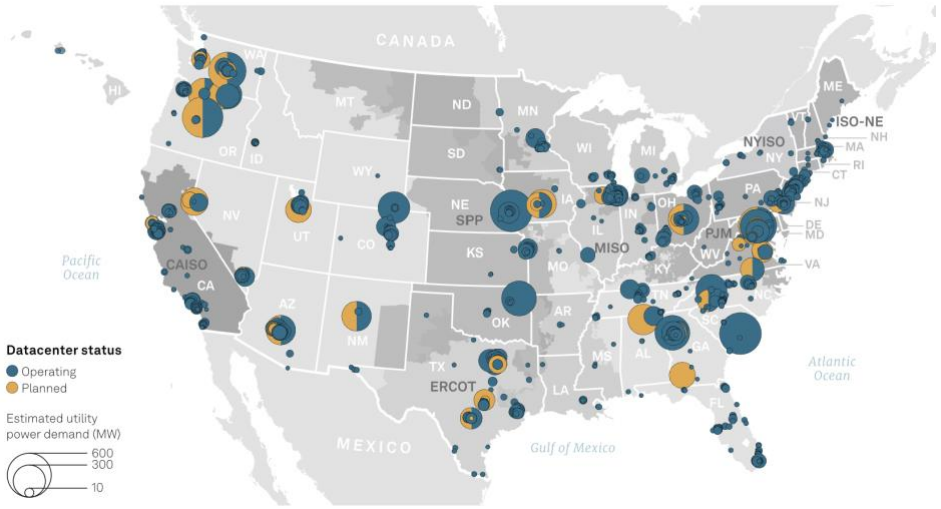
[3] Malik, Maureen S. "Gas Power Won't Provide an Easy Fix for AI Boom." *Bloomberg*. January 8, 2025. <https://www.bloomberg.com/news/newsletters/2025-01-08/gas-power-won-t-provide-an-easy-fix-for-ai-boom>

[4] Casey, Simon. "GE Vernova CEO Sees Order Backlog Stretching Into 2028." *Bloomberg.* March 11, 2025. <https://www.bloomberg.com/news/articles/2025-03-11/ge-vernova-ceo-sees-order-backlog-stretching-into-2028?utm_source=chatgpt.com&embedded-checkout=true>

[5] GPC noted that it has already contracted the gas turbines necessary for its Plant Yates Units 8-10; this amounts to 1.3 GW of new gas capacity, with Units 8, 9, and 10 set to come online in December 2026, May 2027, and August 2027, respectively. Source: GPSC Docket #56002. GPC. *2025 IRP Main Document*. January 2025. P. 126. https://psc.ga.gov/search/facts-document/?documentId=221233.

are many locations in the United States that meet these criteria and are home to a large and growing data center sector (see Figure 3).

Figure 3. Data centers in the United States as of 2023



Source: Anderson, Jared; Sweeney, Darren; and Canonica, Rocco. "POWER OF AI: Wild predictions of power demand from AI put industry on edge." S&P Global. October 16, 2023. https://www.spglobal.com/commodity-insights/en/news-research/latest-news/electric-power/101623-power-of-ai-wild-predictions-of-power-demand-from-ai-put-industry-on-edge.

Developers also want flexibility to choose between different sites because the centers can be developed quickly compared to the time it takes to develop and build energy generation, transmission and delivery facilities. It typically takes two to three years to design, permit, and build a data center, though some potential customers are looking to build large data centers in as little as six to nine months.[6] In contrast, the time it takes for a utility to plan and construct a power plant and/or expand transmission capacity is usually much longer.

Q. Why do data center developers have an incentive to duplicate requests for electric service?

A. The timing mismatch noted above, coupled with the low barrier to entry in submitting a request for service to a utility (no deposit seems to be required to begin the GPC technical

[6] Ben Levitt. "AI and Energy, the Big Picture." S&P Global December 2024, and Bain and Company. "Utilities Must Reinvent Themselves to Harness the AI-Driven Data Center Boom." <https://www.bain.com/insights/utilities-must-reinvent-themselves-to-harness-the-ai-driven-data-center-boom>

review phase), is a strong incentive for potential data center customers to submit duplicate requests for service across several utility jurisdictions. Industry experts have observed that *"[D]ata center developers consider multiple states as possible locations for data centers, and they query multiple utilities simultaneously for electricity rates and incentives prior to making a final selection."*[7] Parties to a recent FERC docket noted "… *PJM has no way to cross-check whether a data center in, for example, Exelon's service territory has also made the same proposal in Dominion's territory, and both proposals end up in PJM's forecast even though only one will be built. … [I]n a recent presentation at the Pennsylvania Environmental Law Forum, PJM's own Senior Manager of Government Services, Stephen Bennett, stated that data center companies "are pitching the same data centers in different locations*.""[8]

Because of concerns over potential duplication of requests, executives in the US natural gas industry have recently tempered their expectations for growth in gas demand from data center electric power customers. The Vice President of New Ventures for pipeline company Williams noted at an industry event: *"… if you look at how these [data center] projects are coming into different organizations, there is double and triple [counting] … it is the same project because you have different players that are developing pieces*." [9] "*It's creating a lot of problems for these regulators and utilities because how do you differentiate between a real project and a fake project?*" said the president of a shale gas producer at the same event, remarking that he expects that only 10% of data center projects that have been announced will be built.[10]

[7] Koomey, Jonathan (Koomey Analytics), Schmidt, Zachary (Koomey Analytics), and Das, Tania (Bipartisan Policy Center). Electricity Demand Growth and Data Centers: A Guide for the Perplexed. February 2025. P. 10. </https://bipartisanpolicy.org/download/?file=/wp-content/uploads/2025/02/BPC-Report-Electricity-Demand-Growth-and-Data-Centers-A-Guide-for-the-Perplexed.pdf>

[8] FERC Docket No. EL25-49-000. Public Interest Organizations. *Comments of Public Interest Organizations in response to PJM Interconnection, L.L.C.'s 03/24/2025 Answer to FERC's 02/20/2025 Order under EL25-49.* April 23, 2025. P. 17. https://elibrary.ferc.gov/eLibrary/filedownload?fileid=9D23F7BC-5484-CAA9-9030-96645FF00000.

[9] Energy Intelligence. "US Gas Companies Temper Data Center Demand Expectations." *Natural Gas Week*, Vol. 41, No. 11. March 14, 2025. https://www.energyintel.com/00000195-9503-d464-a7b7-d7bff5ce0000.

[10] *Id.*

In addition to the uncertainty around counting new projects, a recent industry report indicates that a slowdown in data center growth may be on the horizon. Microsoft is walking away from preliminary agreements for projects in which it planned to lease space developed by a third party and has put some of its self-build projects on hold globally; *"[n]umerous multi-hundred-MW Microsoft campuses have shown underwhelming progress, despite our research indicating that these projects have secured energy and all necessary approvals."*[11]

GPC'S OUTLOOK LIKELY OVERESTIMATES FUTURE LOAD FROM DATA CENTERS

Q. How does GPC project new large load?

A. In a reporting process separate from its IRP, GPC tracks requests for interconnection (referred to as "announcements") by large load customers and classifies them as to the type of customer and stage of development.[12] This tracking is reported in the quarterly *Large Load Economic Development Report* referred to earlier. The three stages of development are, from earliest to latest: "technical review," "request for electric service," and "contract for electric service."

GPC stated that it relied on its June 2024 (Q2 2024) *Large Load Economic Development Report* in its IRP load forecast.[13] A few projects are in the stages referred to as "request for electric service" or "contract for electric service" with GPC. However far more projects - those in the "technical review" phase - have no contract, have not selected GPC as their utility service provider yet, or have not even selected Georgia as the construction location (see Figure 4). The vast majority of announcements in terms of MW (83% as of Q2 2024) were from data centers.[14]

[11] Patel, Dylan; Jeremie Eliahou Ontiveros; Maya Barkin. "Microsoft's Datacenter Freeze - 1.5GW Self-Build Slowdown & Lease Cancellation Misconceptions." *SemiAnalysis*. April 28, 2025. https://semianalysis.com/2025/04/28/microsofts-datacenter-freeze/.

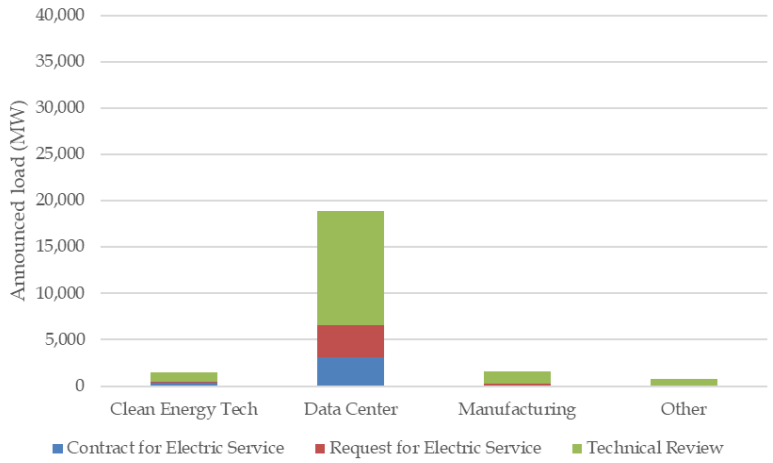
[12] GPSC Docket #55378. GPC. *Large Load Economic Development Report* (various dates). https://psc.ga.gov/search/facts-document/?documentId=219697

[13] GPSC Docket #56002. GPC. *2025 IRP Main Document.* January 2025. P. 36. https://psc.ga.gov/search/facts-document/?documentId=221233.

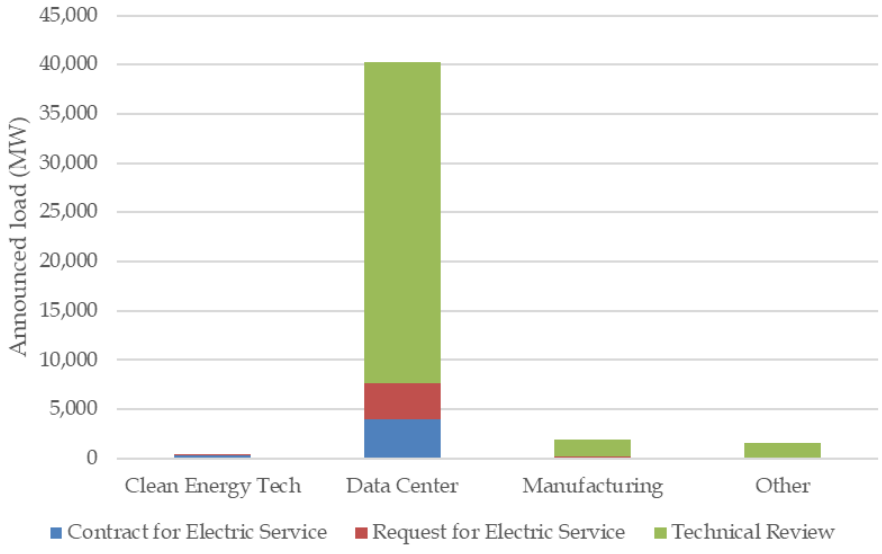
[14] GPC relied on its Q2 2024 report for the purposes of projecting large load for its 2025 IRP. LEI examines more recent quarterly reports later in this section.

Figure 4. GPC large load project announcements

As of June 30, 2024



As of December 30, 2024



Source: GPSC Docket #55378. GPC. *Q2 2024 Large Load Economic Development Report.* August 2024. https://psc.ga.gov/search/facts-document/?documentId=219697 and GPC. Q4 2024 *Large Load Economic Development Report*. February 2025. https://psc.ga.gov/search/facts-document/?documentId=221545.

Note: Though GPC has filed more recent *Large Load Economic Development Reports*, the Q2 2024 report was the one that was available to GPC and relied on by GPC at the time of its 2025 IRP filing, so LEI refers to it in our analysis.

GPC included all large load projects, including those in technical review, in its Load Realization Model ("LRM"), and applied a probabilistic (i.e., statistical) analysis to project future large load. GPC said that it assigned a lower probability to projects in the technical review stage, but it did not disclose what those probabilities were.[15] Georgia Rule 515-3-4-.03(3)(d) dictates that "*[w]here statistical or econometric methods are used in developing forecast inputs or in the forecasting process, analyses of the reasonableness of such methods and models shall be presented, including computer outputs with parameter estimates.*"[16] GPC provided the probabilities that it assigned to some characteristics of large customers (such as [redacted] load but did not provide information as to resulting probabilities for the classification of load (e.g., whether it is a contracted project, versus those with requests for service, versus those in the technical review stage).

GPC then used the results of its probabilistic analysis in a Monte Carlo simulation producing 100,000 load forecasts, which GPC ranked from lowest to highest in terms of projected load. GPC selected the 50th percentile forecast of large load to add to its overall load forecast (see Figure 5).[17]

[15] GPC response to DR STF-JKA-1-2a.
[16] GA R&R 515-3-4-.03(3)(d).
[17] [TRADE SECRET] GPSC Docket #56002. GPC. *2025 IRP, Technical Appendix Volume 1: B2025 Load and Energy Forecast.* January 2025. P. 107. https://psc.ga.gov/search/facts-document/?documentId=221233 [TRADE SECRET].

Figure 5. [TRADE SECRET] GPC's P50 outlook for large load (data centers and other segments)

Q. What adjustments did LEI make to GPC's large load forecast, and why?

A. GPC's large load announcements are dominated by data center projects (the second stacked bar from left in Figure 4 shown previously) that are not committed to GPC, because most data center projects are in the "technical review" phase (as shown by the relative size of the green portion of the bars in Figure 4). In the six months since GPC's Q2 2024 report, data center projects in the "contract for electric service" category with target on-line dates through 2028 increased by only 0.6 GW; and "requests for service" for data centers with target on-line dates through 2028 declined by 0.2 GW (see Figure 6). Only if **all** the 2.56 gigawatts ("GW") of contracted and **all** the 1.60 GW of requested load materializes (and on time) for a total of 4.16 of new data center load would there be a need for 4.37 GW of additional service to large loads by 2028. GPC is projecting [redacted] which implies more than just all contracted and all the requested load would have to materialize.

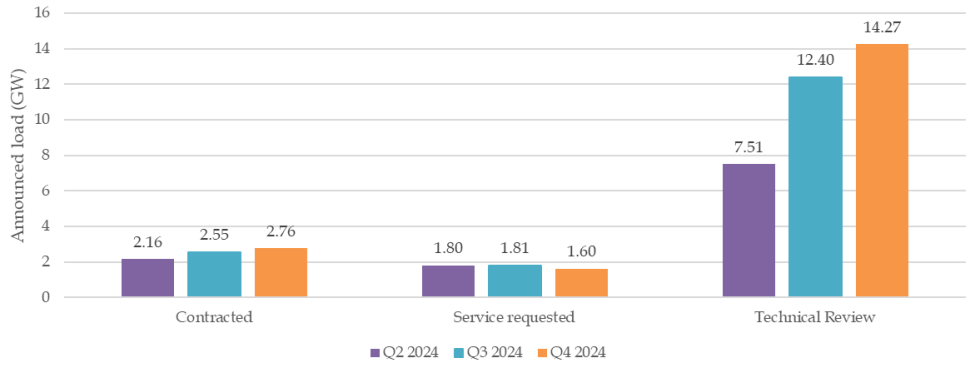
Given that requests for service ultimately either become contracted customers or drop out, this analysis also indicates that the 3-year data center pipeline (projects which have

requested service and intend to be operating by 2028) at 1.6 MW as shown in Figure 6, is not very large relative to projects in technical review. Growth that can materialize in the near term depends on projects which have contracts and have requested service—the projects which are in technical review generally have online dates further into the future. These contracted and requested categories reflect an initial surge of interest by data centers as evidenced by the level of contracted load as of Q2 2024 but the pipeline increased only slowly during 2024, as shown in the comparison of data center service requests for Q2 2024, Q3 2024, and Q4 2024 (see Figure 6).

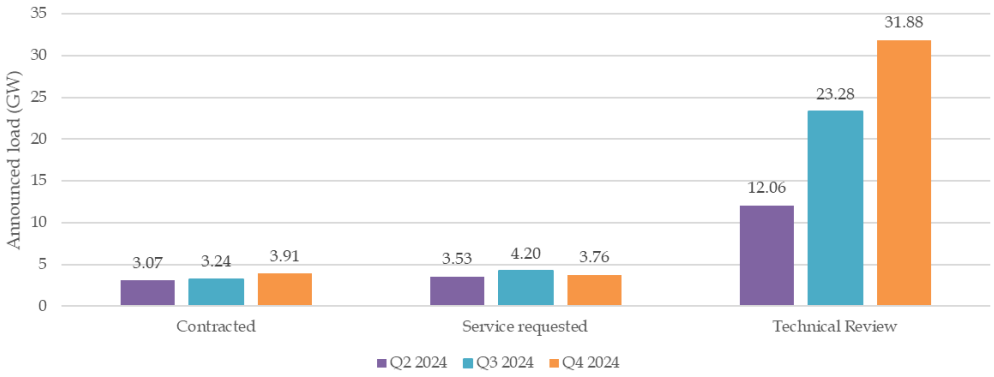
The majority (77%) of announced data center load for 2028 based on the Q4 2024 report is from projects in technical review (see Figure 6). For the longer term (targeted online dates out to 2034) the percentage in technical review is 81%. These online dates are far into the future, so the projects may never materialize given the various uncertainties discussed above.

Figure 6. GPC's data center announcements and status of projects

Target online through 2028



Target on line through 2034



Sources: GPSC Docket #55378. GPC. *Q2 2024 Large Load Economic Development Report.* August 2024. https://psc.ga.gov/search/facts-document/?documentId=219697; GPSC Docket #55378. GPC. *Q3 2024 Large Load Economic Development Report.* November 2024. https://psc.ga.gov/search/facts-document/?documentId=220461; GPSC Docket #55378. GPC. *Q4 2024 Large Load Economic Development Report.* February 2025. https://psc.ga.gov/search/facts-document/?documentId=221545.

Q. Do the *Large Load Development* reports show reductions in previously identified loads for proposed data centers?

A. Yes. In the most recent reporting quarter (Q4 2024), GPC's data center announcements lost about half the new capacity that they gained (see Figure 7). New uncontracted projects with projected in-service dates through 2028 amounted to 5,177 MW. During the same quarter, 1,698 MW targeting service by 2028 were removed owing to project cancellations or the

developer choosing a location outside of GPC's territory.[18] In addition, planned capacity for existing data center projects was reduced by 957 MW.[19] These changes in aggregate amounted to a 51% attrition for the quarter, for data center projects targeted to be in service by 2028 as seen in the figure below.

Figure 7. GPC data center Q4 2024 activity (projects with target in-service dates through 2028)

New projects added (MW)	5,177
Projects removed (MW)	(1,698)
Changes to planned capacity (MW)	(957)
Percent attrition	51%

Source: GPSC Docket #55378. GPC. *Large Load Economic Development Report for Q4 2024*. February 2025. File: "PD Lg Ld Econ Dev Report Q4 2024 – Attachment." <https://psc.ga.gov/search/facts-document/?documentId=221545>

This systematic review of GPC's large load pipeline from Q2 2024 through Q4 2024 indicates that growth through 2028 and perhaps beyond may be slower than GPC had projected at the time of its IRP because the projects with the status "service requested " for operations by 2028 are such as small share of announced projects.

GPC has provided evidence of a near-term weakness in its outlook for large load demand. GPC compared the P50 outlook it relied upon for the large load forecast in the 2025 IRP with the P50 outlook that would result from applying the same methodology to its February 2025 large load data.[20] HR-1-1 Attachment Trade Secret [redacted]

[18] GPSC Docket #55378. GPC. *Q4 2024 Large Load Economic Development Report*. February 2025. File: "PD Lg Ld Econ Dev Report Q4 2024 – Attachment." <https://psc.ga.gov/search/facts-document/?documentId=221545>.

[19] *Id.*

[20] GPSC Docket # 56002. GPC. HR-1-1 Attachment Trade Secret.

LEI'S DETAILED REVIEW INDICATES ADJUSTMENTS ARE CALLED FOR

Q. Based on this analysis, what does LEI recommend?

A. Because of the inherent uncertainty about data center load growth for any given utility, and because GPC's project announcements reflect a potential near-term slowdown in project commitment, LEI recommends that an additional demand forecast be considered which reflects the real-world realized levels of attrition of GPC's data center load.

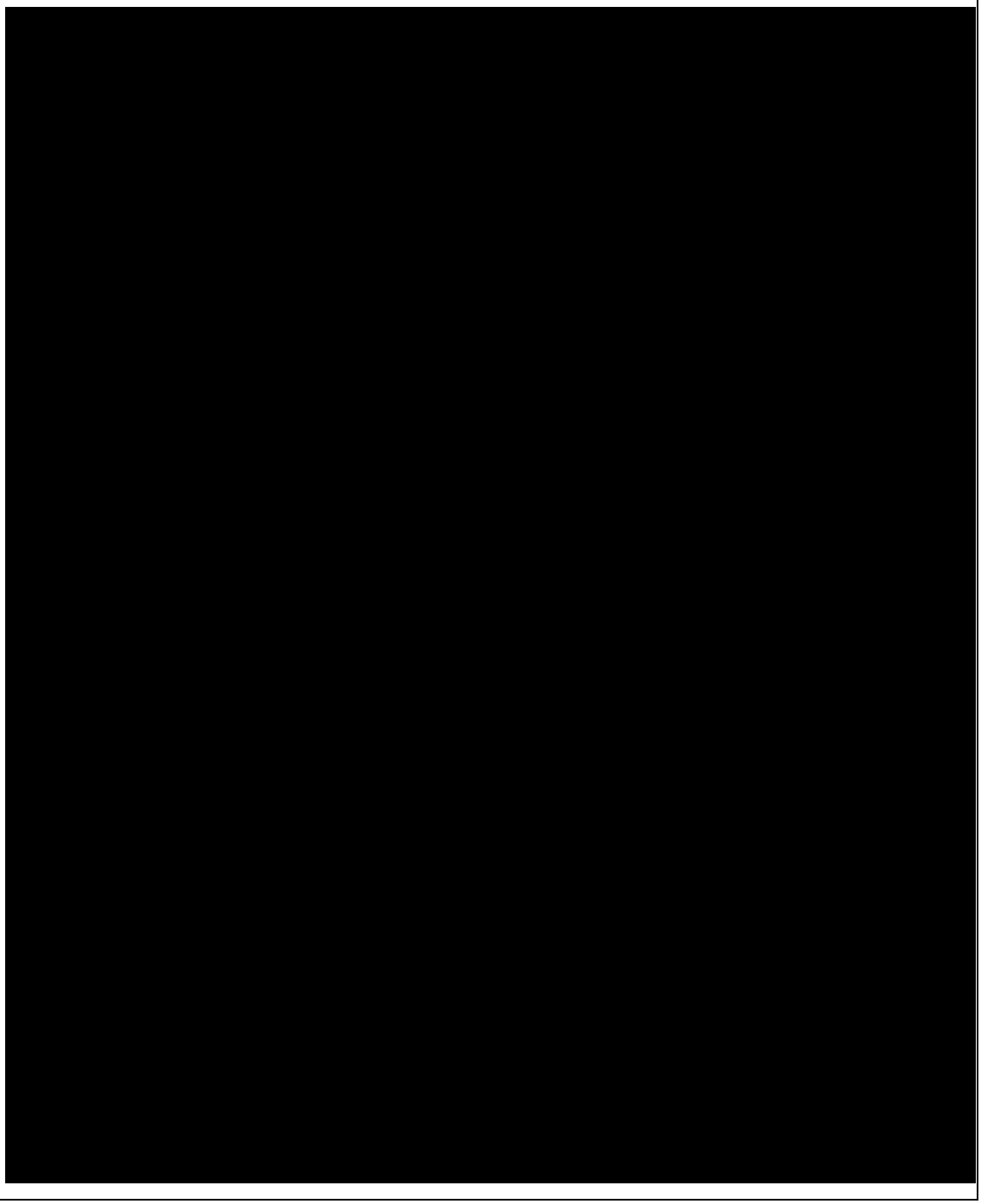
To reflect this attrition, LEI developed an alternative forecast method that assumed that incremental new data center load for 2025-2027 would reflect an attrition rate of 25%, and incremental new load for 2028 – 2044 would reflect an attrition rate of 37% (about halfway between 25% and 51%).[21] LEI assumed more attrition in the longer term because timing becomes more challenging: data centers want fast service, but it takes time to build the resources, and the data center could in the meantime choose another jurisdiction. LEI's assumed attrition rates are lower (in other words, the rates allow more projects to go forward) than the attrition rate of 51% from the Q4 2024 report shown above, but the 51% included projects which were only in technical review, whereas GPC's near-term outlook probably includes a greater share of projects which have signed ESAs or requested service. LEI applied the 25% and 37% to GPC's P50 total large load projections (not only data centers) and arrived at a forecast of new large load of about 3 GW by 2028, and about 5.5 GW for the longer term (see Figure 8).

[21] Adjusting large load pipelines which include large quantities of data center load based on actual experience is becoming an accepted practice. For example, the Electric Reliability Council of Texas ("ERCOT") reduces the outlooks it receives from its transmission and distribution service providers based on actual experience. Source: ERCOT. *2025 ERCOT System Planning, Long-term Hourly and Peak Demand Energy Forecast*. April 8, 2025.

Figure 8. [TRADE SECRET] GPC P50 large load outlook, and LEI large load outlook

In order to capture the change to GPC's load forecast from this realistic adjustment, the difference between LEI's outlook for large load and GPC's outlook should be subtracted from GPC's total load outlook, to arrive at a total outlook which reflects the attrition evidenced by LEI's detailed review of GPC's large load announcements (see Figure 9).

Figure 9. [TRADE SECRET] GPC P50 total load and LEI adjusted total load



Because of the inherent uncertainty about data center load growth for any given utility, and because GPC's project announcements reflect a potential near-term slowdown in project commitment, LEI recommends GPC should also carefully monitor its *Large Load*

Development reports to ensure its large load projections do not outrun the actual pace of large load demand and result in over-building of system facilities.

III. GPC'S TRANSMISSION ASSUMPTIONS DID NOT CONSIDER LOWER LOAD OUTCOMES OR LONGER PLANNING HORIZONS

Q. What are GA PSC transmission planning requirements?

A. GA PSC Utility Rule 515-3-4-.04, *Identification of Capacity Resources,* requires GPC to submit a comprehensive and detailed bulk transmission plan of the Georgia Integrated Transmission System ("GA ITS") every three years.[22] The GA ITS includes GPC, Georgia Transmission Corporation ("GTC"), the Municipal Electric Authority of Georgia ("MEAG"), and Dalton Utilities ("DU"). The plan must identify transmission investments required to reliably support load and resources across the GA ITS over a ten-year planning horizon.

The Rule also requires GPC to file specific transmission-related documentation with the GA PSC. GPC met these filing requirements in its 2025 IRP (see Figure 10). Most transmission-related documentation is included in Volume 3 of the IRP's Technical Appendix, which spans 979 pages. Given the volume of transmission-related documentation provided by GPC, as well as the limited time LEI had for review and to prepare testimony, LEI relied primarily on Chapter 11 of GPC's 2025 IRP, which focuses on transmission planning, as well as the GA ITS Ten-Year Plan (2025-2034), which is included in GPC's 2025 IRP Technical Appendix, Volume 3(A). LEI is not an engineering firm, so LEI reviewed these materials from an economic perspective.

[22] GPSC Docket #25981-U*, Order Adopting Rule: Georgia Public Service Commission Rulemaking Regarding Revisions of Commission Utility Rule 515-3-4-.04 "Identification of Capacity Resources".* December 4, 2007.

Figure 10. Transmission planning documents required in GPC's 2025 IRP

GA PSC required documentation	GPC's 2025 filing
Executive summary with an overview of the plan, results, conclusions, and recommendations	• 2025 IRP • Volume 3(D) Georgia ITS
Processes, procedures, guidelines, and applicable planning standards used in the development of the plan	• Volume 3(A) Transmission Planning Description and Process • Volume 3(B) Planning Guidelines
Review and analysis of any major outage events in the prior three years	• Volume 3(C) System Operations
Ten-year plan for the transmission network	• Volume 3(D) Georgia ITS • Volume 3(E) Interface and Interconnections • Volume 3(F) GPC Distribution Substation Projects & Forecast (Five-Year Loading Plan) • Volume 3(G) Budgeting
Appendix with load flow program data files	• Volume 3(H) Appendix
Preferred sites for interconnection of new generation	• Volume 3(E) Interface and Interconnections

Source: GPSC Docket #25981-U. *Order Adopting Rule: Georgia Public Service Commission Rulemaking Regarding Revisions of Commission Utility Rule 515-3-4-.04 "Identification of Capacity Resources".* December 4, 2007.

HIGHLIGHTS OF GPC'S TEN-YEAR PLAN

Q. What does GPC's transmission planning process entail?

A. GPC's most recent GA ITS Ten-Year Plan, published in Fall 2024, outlines planned transmission investments to reliably meet generation and load growth forecasts for GPC, GTC, MEAG, and DU. Specifically, GPC's transmission planning model identifies transmission constraints over the next ten years and evaluates alternative solutions (projects) to address those constraints. As discussed in more detail below, GPC's 2024 GA ITS Ten-Year Plan incorporates load from 24 large load customers, five of whom require transmission upgrades. This implies that the remaining 19 large load customers might be sited such that they don't trigger a need for transmission upgrades, although GPC does not say this explicitly.

Evaluation of transmission solutions and non-transmission alternatives is conducted using a cost/benefit analysis framework, which considers economic factors and engineering

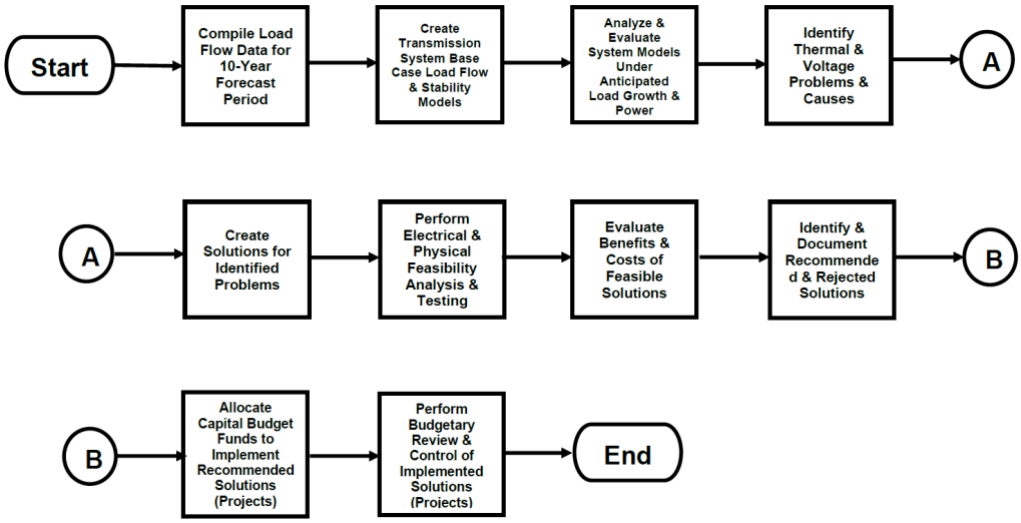
benefits. According to GPC, the benefits considered include: (1) the extent to which the alternative restores the transmission system to an acceptable operational level; (2) whether the alternative addresses other problems (not specified in detail by GPC); (3) improvement in reliability levels in terms of loss of load and system security; (4) degree of flexibility with regard to future development; (5) ease and simplicity of operation; (6) improvement in system stability; (7) increase in interchange capability; (8) ease of protection (not measurable, per GPC); and (9) environmental factors (not measurable, per GPC).[23]

Although the plan identifies projects over a ten-year planning horizon, more in-depth transmission project proposals are only developed for the first five years; projects in the latter five years of the planning horizon are not fully scoped or budgeted due to higher uncertainty.[24] Planned transmission projects are then reassessed every year until they transition from a planned project to a committed project, confirming details such as continued need, timing, and scope. In LEI's view, this approach of only committing projects closer to the time of need provides GPC with the benefits of flexibility and optionality to defer transmission investments as needed.

An overview of key steps in GPC's transmission planning process is illustrated in Figure 11 below.

[23] GPC. *2025 IRP, Technical Appendix, Volume 3(A): Transmission Planning Description & Process.* P. 22-26.
[24] *Id.* P. 15.

Figure 11. GPC transmission planning process flow chart



Source: GPC. *2025 IRP, Technical Appendix, Volume 3(A): Transmission Planning Description & Process.* P. 36.

Q. What is GPC's assumed transmission build-out in the 2024 GA ITS Ten-Year Plan (2025-2034)?

A. GPC's 2024 GA ITS Ten-Year Plan identifies 214 transmission projects over the 2025-2034 planning horizon (see Figure 12). These projects include 59 new transmission lines, 111 transmission lines requiring rebuilding or reconductoring, 1 transmission line requiring upgrading, as well as installation of 31 transformers, 5 capacitor banks, 6 series reactors, and 1 Static Var Compensator ("SVC") system. Estimated costs for these projects identified over the 2025-2034 planning horizon total $10.99 billion for the GA ITS, $6.78 billion of which is attributable to GPC (or 62% of the total).

Figure 12. GPC planned transmission projects, 2025-2034

Project type	Number of projects for 2025-2029 (first 5 years)	Number of projects for 2025-2034 (full 10 years)
New transmission lines requiring new right of way	38	59
Transmission lines to be rebuilt/reconductored	81	111
Transmission lines to be upgraded	1	1
Transformers to be installed	16	31
Capacitor banks to be installed	2	5
Series reactors to be installed	2	6
SVC systems to be installed	1	1
Total	**141**	**214**

Source: GPC. *2025 IRP, Technical Appendix, Volume 3(D1): Georgia ITS Ten Year Transmission Expansion Plan (2025-2034).* P. 5-6.

Notably, 90 of these 214 planned transmission projects (or 42%) incorporate advanced transmission technologies ("ATTs"). Of these 90 ATT projects, 87 leverage advanced conductors (a wires-based solution), whereas the remaining 3 leverage static synchronous compensators ("STATCOM") and power flow controllers.[25]

GPC'S TEN-YEAR PLAN DOES NOT CONSIDER POTENTIAL FOR LOWER LOAD OR LONGER PLANNING HORIZONS

Q. Does LEI take issue with any aspect of GPC's transmission planning approach?

A. LEI takes issue with two aspects of GPC's 2024 GA ITS Ten-Year Plan: a lack of consideration of lower load forecasts, as well as use of the use of 10-year horizon for assessing the benefits, which likely results in lower benefits than if a 20-year horizon had been used. We discuss each of these issues in turn below.

Lack of consideration of lower load forecasts:

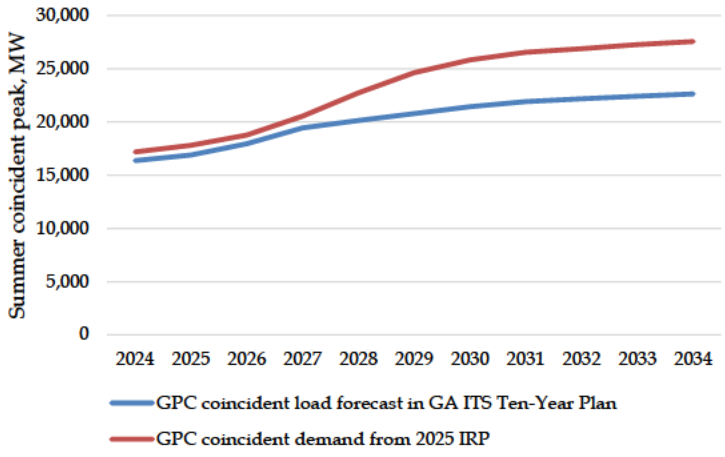
GPC's 2024 GA ITS Ten-Year Plan is predicated on a load forecast that is slightly lower that the near-term load forecast included in GPC's 2025 IRP (in the first four years of the forecast period), which LEI has critiqued above (see Figure 13). Furthermore, GPC's 2024 GA ITS Ten-Year Plan incorporates load from 24 large load customers, five of whom

[25] GPC response to DR STF-GS-1-8.

require [redacted]

[redacted] GPC does not specify in public information how many of these 24 customers have signed ESAs. GPC's public filings also did not specify what accounts for the difference between the load forecast used in the 2025 IRP and the load forecast used in the GA ITS Ten-Year Plan.

Figure 13. GPC load forecast underlying 2024 GA ITS Ten-Year Plan versus 2025 IRP



Sources: GPC. *2025 IRP, Technical Appendix, Volume 3(D1): Georgia ITS Ten Year Transmission Expansion Plan (2025-2034).* Table 5; GPC. *2025 IRP, Technical Appendix, Volume 1: Budget 2025 Load and Energy Forecast 2025 to 2044.* Attachment 6.0-1.

LEI's concerns with GPC's load forecast have been outlined above. These concerns carry over to GPC's 2024 GA ITS Ten-Year Plan, given that the level of transmission investments identified depends on the underlying load growth assumptions. Specifically, LEI is concerned that in its 2024 GA ITS Ten-Year Plan, GPC did not test any sensitivities relative to its load growth forecast, particularly a lower load forecast to reflect the substantial uncertainty associated with prospective large load customers.

[26] GPC response to DR STF-PIA-5-17.

Relatively short-term planning horizon:

GPC's 2024 GA ITS Ten-Year Plan considers only a ten-year planning horizon. However, recent rulings emphasize the importance of considering longer-term (20-year) planning horizons (as well as explicitly acknowledging uncertain future trends in demand which we have already critiqued above). For example, the Federal Energy Regulatory Commission ("FERC") issued Order No. 1920 in May 2024, setting out regional transmission planning requirements to "improve long-term assessments of transmission needs and adequately prepare for the future of the electric grid" through a "sufficiently long-term, forward-looking, and comprehensive approach."[27] Specifically, under FERC Order No. 1920, transmission providers are required to consider 20-year transmission planning horizons and assess at least three scenarios and subsequent sensitivities to serve as "stress tests" when conducting regional transmission planning. These sensitivities should consider "uncertain operational outcomes", such as outages due to extreme weather events, cyberattacks, significant forecast error, or fuel price volatility. Then, the selection of proposed transmission facilities should be based on benefits, including the extent to which each project can mitigate these "unexpected system conditions."

GPC itself acknowledges the importance of considering longer planning horizons, and has indicated that it plans to move to a 20-year planning horizon for the purposes of Southeast Regional Transmission Planning ("SERTP") on or before June 12, 2026.[28] GPC stated: *"Across the utility industry, it is becoming more common to extend the transmission planning horizon, with FERC Order No. 1920 driving the industry towards longer planning horizons in regional planning processes. While these FERC requirements and some industry activity may push the boundaries on what future assumptions are reasonable for planning, strategic planning beyond ten years will be an important part of the Company's planning process going forward. The Company's longer-term planning horizon will ensure projects are identified with sufficient lead time to provide timely construction and optionality while balancing the appropriate local customer value with regional*

[27] FERC. *Explainer on the Transmission Planning and Cost Allocation Final Rule.* September 25, 2024.
[28] GPC response to DR STF-GS-1-1.

considerations."[29] LEI agrees – adoption of a longer-term planning horizon enables more proactive investments that are better equipped to respond to the evolving nature of the grid. LEI suggests that GPC adopt a 20-year transmission planning horizon in time for its next IRP filing in 2028.

IV. GPC'S NATURAL GAS PRICE FORECASTS IGNORE VOLATILITY

Q. What was GPC's process for developing its gas fuel price outlook?

A. GPC's 2025 IRP relied on a range of natural gas price scenarios derived from a combination of natural gas forwards and the US Energy Information Administration's ("EIA") 2023 Annual Energy Outlook ("AEO").[30] GPC relied on three AEO scenarios for natural gas price projections starting in 2029:

- **Lower Price Case:** Based on AEO's High Oil and Gas Supply scenario, this case assumes higher recoverable gas resources and improved technology, translating into cheaper gas development costs and lower long-run prices for natural gas.

- **Moderate (Reference Case):** Based on AEO's Reference Case, this case reflects mid-range assumptions for supply and demand drivers (including recoverable gas resources and production technology) (see Figure 14). This serves as the primary or "base" gas price forecast in GPC's IRP.

- **Higher Price Case:** Based on AEO's Low Oil and Gas Supply scenario, this case assumes constrained supply (lower resource recovery and slower technology gains), resulting in higher natural gas prices over time. This reflects a future where it is more expensive to developing gas, pushing prices upward.

[29] GPC. *2025 IRP Main Document.* January 2025. P. 114.
[30] EIA did not produce a 2024 AEO, so the 2023 AEO was EIA's current view during 2024. https://www.eia.gov/outlooks/aeo/.

Figure 14. Key natural gas assumption for EIA's AEO 2023 Reference Case

Driver	Key Values for AEO 2023 Reference Case
Resource Size	• 445.3 Tcf in proved shale reserves (20.1 Tcf decrease from AEO 2022) • 2,973 Tcf in total technically recoverable (TTR) U.S. dry natural gas resources (1.6% growth from AEO 2022 to AEO 2023)
Technological Improvement	• Drilling costs fall by 1%/yr • Equipment costs fall by 0.5%/yr • Well productivity increase up to 4%/ yr

Source: AEO 2023.

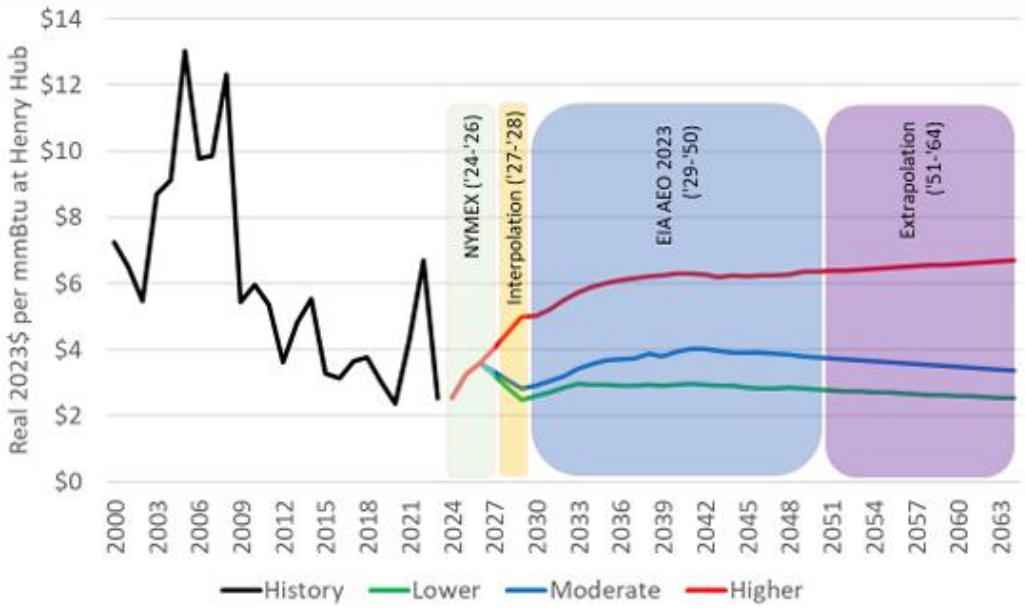
The long-term forecast scenarios from AEO provide annual price projections through 2050 in real dollars; GPC then escalated these prices by GPC's forecast of inflation.[31]

For the near-term forecast years of 2024-2026, GPC used average closing prices on the New York Mercantile Exchange ("NYMEX") for natural gas contracts for future delivery. It relied on a 20-day average (August 5-30, 2024), rather than a single-day outlook. This yields a single near-term price outlook, which GPC applied across all scenarios (no divergence between scenarios). For the transition period of 2027–2028, GPC applied a linear interpolation between the last NYMEX-based price (2026) and the AEO price in 2029 price for each scenario.

All three scenarios started from the same near-term market-based level (reflecting current future prices), then diverged to the different scenarios: the Moderate (Reference) case exhibited a gradual rise followed by a decline starting in 2043, the Lower case stayed relatively flat or declining, and the Higher case climbed more steeply over the long run (see Figure 15).

[31] GPC response to STF-JKA-1-12.

Figure 15. GPC's 2025 IRP Henry Hub price forecast, 2023 dollars



Source: GPC 2025 IRP.

Note: For modeling beyond 2050, GPC extrapolated the trend for another decade (though the IRP's planning focus is a 20-year horizon).

GPC then adjusted nominal annual AEO outlooks for Henry Hub prices to reflect monthly average gas prices, based on monthly percentage assumptions (see Figure 16). These appear to reflect typical seasonal trends in Henry Hub gas prices, though GPC did not explain how it arrived at the shaping percentages.

Figure 16. GPC's monthly shaping assumption [TRADE SECRET]

[redacted]

Finally, GPC added additional costs to arrive at local gas prices and delivered prices for generic gas units in each of Georgia, Alabama, and Mississippi to be used in its model.[32]

Q. Is GPC's gas price forecasting approach reasonable?

A. Overall, the approach was reasonable, but LEI has a few concerns. First, the long-term Henry Hub price outlook was based on stale information. GPC relied on EIA's AEO, which is a widely used, well-documented, publicly available projection developed using the National Energy Modeling System ("NEMS"), which is detailed and transparent. GPC also incorporated three distinct scenarios, which acknowledge the uncertainty of long-term gas prices reflecting technology and the extent of the resource base.

However, the EIA AEO 2023 was out of date at the time GPC was preparing its gas price forecast—EIA did not issue an AEO for 2024 (it took a year-long hiatus to re-tool the NEMS). Therefore, the long-term gas price forecasts do not account for potential impacts from recent supply and demand trends, geopolitical uncertainties, or proposed tariff measures, all of which could introduce additional volatility, and increase or reduce demand. GPC could have contracted for an up-to-date gas price outlook from a specialized energy consultancy such as Wood Mackenzie, or RBAC, but chose not to.

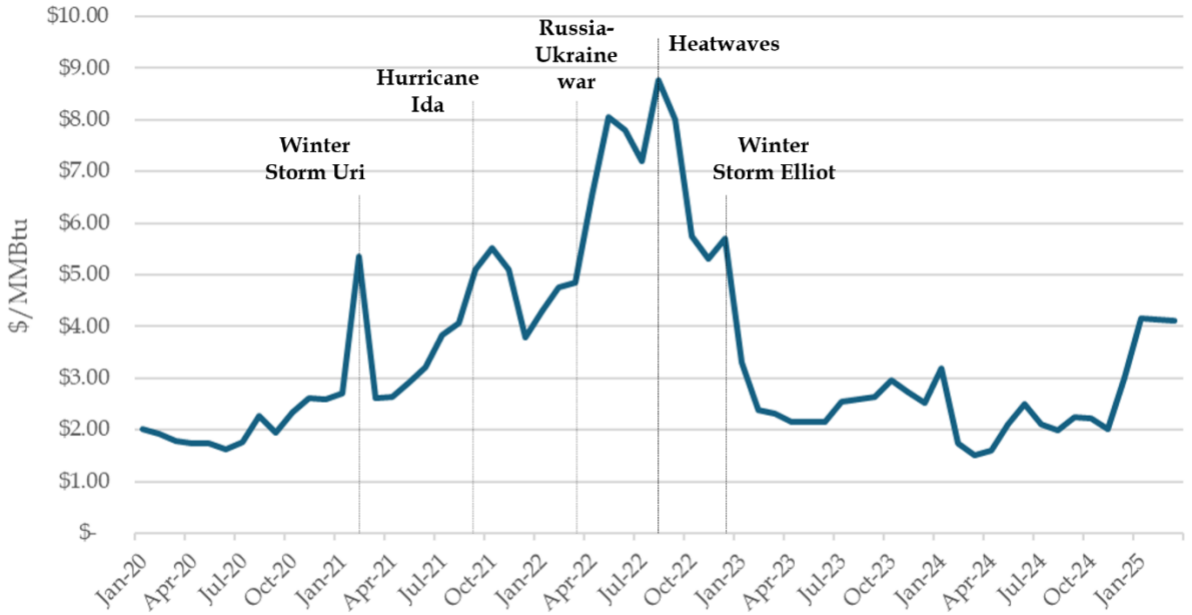
For the near-term portion of its outlook, GPC relied on a 20-day sample of NYMEX Henry Hub future prices, rather than a single-day outlook, which is reasonable.

Q. Are there any issues with GPC's gas price outlooks that could lead to higher-than necessary costs for ratepayers?

A. Yes. Where GPC's gas outlook does not incorporate an analysis that reflects the risk to customers of the impact of gas price volatility. Weather and political events can significantly influence natural gas prices (see Figure 17). Extreme weather (heatwaves or cold spells) can spike demand or disrupt supply, driving prices up dramatically, though briefly. Political events including wars, sanctions, and shifts in energy policy, can disrupt global energy flows and affect gas prices, and for longer periods than weather events.

[32] GPC response to STF-JKA-1-12.

Figure 17. Monthly historical Henry Hub gas prices



Source: EIA

Gas price volatility represents an additional risk to ratepayers which is particular to natural gas fired plants. Changes in natural gas prices directly impact ratepayers, and for GPC customers this cost is passed through the Fuel Cost Recovery mechanism. In the 2023 Fuel Cost Recovery docket, the Commission approved GPC's $2.1 billion in additional fuel expenses from the three prior years.[33]

The risk and potential cost of gas price volatility is not addressed by GPC's IRP, despite the potentially large impact on customers. A utility may use mechanisms to hedge such volatility, but these cannot be evaluated without an estimate of the impact of volatility on ratepayers.

Q. What does LEI recommend?

A. LEI recommends the GPC include an analysis in which it examines the cost to ratepayers of a temporary but substantial surge in gas prices, across its base case and other scenarios.

[33] GPC. "2023 Fuel Cost Recovery." Accessed April 2025. <https://www.georgiapower.com/about/company/filings/fuel-cost html>.

If GPC examines hedging, it would be important to reflect potential drops in price as well as increases, because hedging against a spike in price incurs a cost to settle the hedge if prices fall.

V. GPC'S PROCUREMENT PROCESS COULD BE IMPROVED TO THE BENEFIT OF RATEPAYERS

GPC'S TWO-TRACK SOLICITATION OF GENERATION RESOURCES COULD BE MADE MORE COMPETITIVE

Q. How does GPC procure new generation resources?

A. GPC utilizes two separate solicitations for competitive solicitations to add new resources: i) all-source capacity requests for proposals ("RFPs") to meet general capacity needs, and ii) Clean and Renewable Energy Subscription ("CARES") utility-scale RFPs to supply renewables for the voluntary CARES program. Under the CARES program, customers can sign up for renewable capacity that GPC then acquires through the dedicated CARES RFPs; participating customers pay for a pro-rata share of the production of renewable resources procured and receive the associated renewable energy credits ("RECs").[34]

GPC's 2025 IRP described a series of RFPs and procurement programs, some already underway and others planned, to meet identified capacity needs. Below is an overview of the procurement activities and timeline as described in the IRP:

- **Current active RFPs (approved in prior proceedings):** GPC is currently conducting two major solicitations initiated under the 2022 IRP and 2023 IRP to address capacity needs through the winter of 2030/2031. These are: (1) an All-Source Capacity RFP for 2029–2031, issued on June 20, 2024;[35] and (2) a Winter 2027/2028 battery energy storage system ("BESS") RFP targeting new storage resources, issued on August 9,

[34] Georgia Power. "Clean And Renewable Energy Subscription." Accessed April 2025. <https://www.georgiapower.com/business/products-programs/business-solutions/commercial-solar-solutions/clean-and-renewable-energy-subscription html>.

[35] GPSC Docket #52268. "Georgia Power Company's 2029-2031 All-Source Capacity Request For Proposal ("RFP")." <https://psc.ga.gov/search/facts-docket/?docketId=55268>.

2024.[36] GPC is currently evaluating bids received for both solicitations with oversight from an independent evaluator and GA PSC Staff, and is also assessing whether additional backup options are needed in case these RFPs do not fully meet the capacity requirements.

- **Proposed All-Source RFP in 2025:** The 2025 IRP proposed to issue a new All-Source Capacity RFP in the third quarter of 2025 to address resource needs in 2032 and 2033. The exact MW target for this RFP would be determined closer to issuance, factoring in how much capacity is already secured via the outstanding RFPs and the final approved IRP. The timeline envisioned is: i) GA PSC approval of the RFP plan in mid-2025, ii) issuance of the RFP in Q3 2025, iii) bid submissions and evaluations in late 2025/early 2026, and iv) selection of a shortlist of projects by 2026.

- **Proposed 2025 CARES RFP:** The 2025 IRP proposed to issue a CARES utility-scale RFP in the second quarter of 2025 with a target procurement of 475 MW of renewable resources.

- **Proposed 2026-2027 CARES RFPs:** In addition to the 2025 CARES RFP, the 2025 IRP also seeks approval to issue three subsequent RFPs to secure additional renewable resources, including utility-scale renewable resources and distributed generation ("DG") solar, to supply GPC's voluntary CARES program:

    - For utility-scale projects (typically solar or wind), GPC seeks approval for 1,000 MW of new renewable capacity. This RFP would include the possibility of procuring an additional 3,000 MW beyond the 1,000 MW target if beneficial opportunities exist to supply capacity needs identified by GPC (outside of the CARES program). GPC expects to issue this RFP in the third quarter of 2026, pending GA PSC approval.[37]

    - For DG projects (smaller, localized projects), the 2025 IRP proposed two DG solar RFP rounds, each targeting 50 MW (total 100 MW) to reach commercial operation

[36] GPSC Docket #55763. "Georgia Power Company's Winter 2027 - 2028 BESS RFP." <https://psc.ga.gov/search/facts-docket/?docketId=55763>.
[37] GPC response to STF-JKA-2-6.

in 2027, 2028, and 2029. GPC expects to issue these RFPs in the first quarters of 2026 and 2027, pending GA PSC approval.[38]

Q. What is GPC's process for solicitation and procurement?

A. The 2025 IRP does not provide details on the process and rules for resource procurement. Therefore, LEI reviewed the latest RFPs to examine GPC's procurement process: the 2029–2031 All-Source Capacity RFP (Docket #55268) and the 2023 CARES Utility-Scale RFP (Docket #45084).[39] LEI found that both solicitations followed standard utility procurement practices including alignment with a Commission approved IRP and the oversight of an IE.[40]

As an example of an independent energy regulator's standards, FERC provides four high-level regulatory framework principles as a guideline for Commissions to assess fairness in utility competitive procurement:

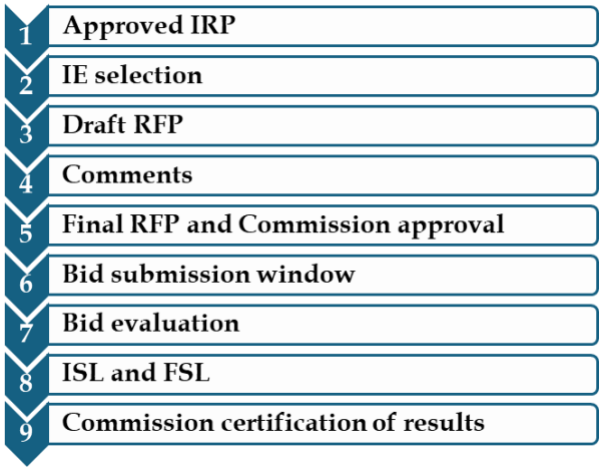
> *"a. Transparency: the competitive solicitation process should be open and fair;*
> *b. Definition: the product or products sought through the competitive solicitation should be precisely defined;*
> *c. Evaluation: evaluation criteria should be standardized and applied equally to all bids and bidders;*
> *d. Oversight: an independent third party should design the solicitation, administer bidding, and evaluate bids prior to the company's selection."* [41]

GPC followed this basic framework and conducted a multi-step RFP process (see Figure 18), which began by defining the needs to be met by the IRP, followed by the selection of

[38] GPC response to STF-JKA-2-7.
[39] GPSC Docket #45084. "Georgia Power Company's CARES 2023 Utility Scale Renewable Request For Proposals." Docket #45084. <https://psc.ga.gov/search/facts-docket/?docketId=45084>
[40] Rules and Regulations of the State of Georgia. Department 515, Chapter 515-3, Subject 515-3-4 Integrated Resource Planning, Rule 515-3-4-.04 Identification of Capacity Resources, Item (3) Request for Proposals Procedure for Long-Term New Supply-Side Options. Accessed April 2025. <https://rules.sos.state.ga.us/gac/515-3-4>
[41] FERC. "Order Granting Authorization to Make Affiliate Sales." Docket No. ER04-730-000, 108 FERC ¶ 61,082. Issued July 29, 2004.

an IE.[42] For both the 2029-2031 All-Source and 2023 CARES RFPs, Accion Group LLC was selected as the IE. The IE acts as a neutral administrator, hosting the RFP website, collecting bids, and overseeing evaluation with GA PSC Staff involvement.

Figure 18. GPC's RFP multi-step process



After the selection of the IE, the RFP process is launched and GPC, the IE, and GA PSC Staff collaborate to draft RFP documents including pro forma contracts for power purchase agreements ("PPAs"), build-transfer agreements ("BTAs"), and asset purchases. GPC hosts a bidders' webinar to explain RFP requirements, including transmission and interconnection guidelines. A public comment period is provided for each RFP's draft documents: stakeholders and potential bidders review the draft, suggest edits (often via a redline comment process on the IE's website), and seek clarifications. After addressing comments, the final RFP is filed for GA PSC approval. Once GA PSC approves it, the RFP is formally issued to the market. The next steps are:

- ***Submitting company and affiliate bids:*** GPC must submit any self-build or affiliate proposals before seeing market bids. This ensures a fair "blind" evaluation of utility proposals against third-party bids.

[42] The utility must engage an IE pursuant to GPSC's RFP process rules. Source: Rules and Regulations of the State of Georgia. Department 515, Chapter 515-3, Subject 515-3-4 Integrated Resource Planning, Rule 515-3-4-.04 Identification of Capacity Resources, Item (3) Request for Proposals Procedure for Long-Term New Supply-Side Options. Accessed April 2025. <https://rules.sos.state.ga.us/gac/515-3-4>

- The All-Source 2029–2031 RFP tentative schedule provided a one-month response time from RFP issuance date (June 20, 2024) and affiliate bid due date (July 18, 2024).

- ***Submitting market bids:*** After company and/or affiliate bids are submitted, the bid window opens to all third-party bidders.
  - Market bids were due one day after the affiliate bids (this timing is not unusual, as other jurisdictions such as Oregon also use a one-day difference). This ensures that there is no bias or information asymmetry, and that market bids are essentially based on the same market information relied upon by affiliates.

- ***Initial evaluation and shortlisting:*** Once the bidding window is closed, GPC's evaluation team – under IE supervision – conducts a two-stage evaluation: an Initial Short List ("ISL") screening, followed by a more detailed Final Short List ("FSL") selection. The bid evaluation process includes the following steps:
  1. **Error cure period:** First, the IE reviews key elements of each bid to screen for errors and omissions and, if necessary, reach out to the bidder. In consultation with Staff and the Evaluation Team, the IE could provide the bidder an opportunity to cure deficiencies. The time allowed to correct errors was not specified, and there is no guarantee that a bidder would be given the opportunity to correct errors.
  2. **Minimum eligibility criteria:** The evaluation first checks compliance and viability, assessing whether bids meet minimum requirements (such as creditworthiness, development feasibility, conforming contract terms) and eliminates non-conforming bids.
  3. **ISL:** Then GPC applies an economic scoring framework to all conforming bids, calculating the total cost to customers and reliability value of each proposal – with active oversight from the IE and GA PSC Staff – for the selection of the ISL. The ISL is the set of top-ranked bids after this preliminary scoring.
  4. **FSL:** The ISL bids then move to a second-stage evaluation, which includes more in-depth analyses including production cost modeling for system impact, transmission studies for deliverability, and credit for dispatchability or firm capacity. GPC's evaluation team refines the scores and the FSL of winning projects

is selected. Once a FSL is selected, GPC must file a certification application for the winning bids for GA PSC approval.

5. **Selection of winners and contracting:** After final GA PSC authorization, GPC proceeds to implement the selected projects with IE oversight.

This process seems to be generally consistent with what LEI has seen used in other jurisdictions. The only question is the extent to which non-pricing terms are renegotiated one-on-one and therefore the final winner is given some accommodation that other bidders did not receive.

In the 2025 IRP, GPC is also seeking approval of the following procurement process enhancements for the upcoming CARES RFPs:

- flexible Commercial Operation Dates ("CODs");
- new processes including the "buy down" option[43] and extended RFP periods with a goal to maximize project selection and procurement;
- expand DG procurements to seek flexible resources that include dispatchable storage and updated locational value assessments (to help determine whether a DG project's location on the distribution system would create reliability challenges or alternatively support reliability); and
- require visibility and control of new renewable resources through integration with GPC's Distributed Energy Resource Management System ("DERMS").

Q. Do any of GPC's solicitation practices inhibit competition?

A. A generic goal of a competitive bidding process is the identification of the lowest cost, lowest risk resource. LEI has extensive experience serving as an IE and procurement monitor across US jurisdictions. Based on LEI's experience, GPC procurement process meets basic practices for electric utility procurement in terms of regulatory compliance with GA PSC's RFP process rules. However, in several areas GPC procurement process

[43] The buy down option proposes extending the RFP process to allow for additional bids to be selected, where bids in the RFP not selected in ISL would be provided an option to buy-down the price of the bid to meet the average Total Net Benefits of the selected portfolio. This process will be designed in compliance with Commission rules to ensure additional bids selected meet the Commission's certification requirements.

practices can inhibit participation by qualified third-party bidders. In a solicitation, the more qualified bidders which are involved, the more competition there is among potential suppliers. In turn, competition is generally expected to put pressure on bidders to bid as low as they can and therefore reduce the price for winning projects and cost for ratepayers. The following areas could use some improvement compared to practices seen in recent new supply RFPs in other US jurisdictions:[44]

- **RFP timeline:** GPC provided only a 30-day period from Commission-approved RFP to bid deadline. This is a tight timeline for preparation of bids, compared to 60-90 days offered in similar competitive solicitations in other jurisdictions.

- **Lack of transparency regarding resource needs and modeling assumptions:** GPC does not clearly state their resource needs in terms of MW and resource types. It also uses a proprietary model for which assumptions are not provided in the RFP. This makes it difficult for bidders to understand how they will be evaluated and how they compete against other resources.

- **Bid security fee is required for all qualified bids:** GPC requires a high bid security payment for all qualifying bids (bids that meet the minimum eligibility criteria) to move to the shortlist phase: "*Any Bidder with a Bid that advances to the Conforming List must post Bid Security by no later than 15 Business Days after Bidder receives notice from GPC. […] The Bid Security amount must equal the product of in the amount of either: (i) 2% multiplied by the sum of the expected revenues during the PPA Term; or (ii) 2% of the purchase price for an APA or BTA Bid.*"[45] This fee is refundable if the bid is released from consideration or after the contract is executed, but it is non-refundable if the bidder withdraws its bid or otherwise fails to execute the pro forma contract after being advanced to the Short List.

[44] The other RFPs reviewed are: (1) Public Service Company of Colorado, an operating company subsidiary of Xcel Energy Inc., 2022 All-Source RFP. Colorado PUC proceeding 21A-0141E; (2) Idaho Power Company's ("IPC") 2028 All-Source RFP. Oregon PUC docket UM 2255.

[45] GPSC Docket #55268. "Georgia Power Company's 2029-2031 All-Source Capacity Request For Proposal ("RFP")." <https://psc.ga.gov/search/facts-docket/?docketId=55268>.

- The non-refundable clause for bids not executing a contract gives GPC leverage during contract negotiation. This is particularly concerning given the short time to review all materials, including pro-forma contracts, before submitting a bid.
- Other jurisdictions (for example Idaho Power 2028 All-Source RFP,[46] and the Xcel Energy 2022 All-Source RFP)[47] do not require a bid security payment before the ISL phase, or even later.

LEI reviewed a recent RFP process in Colorado as an example of a competitive bidding process that yielded what the Colorado utility referred to as an "unprecedented response with 1,073 total proposals (approximately 170 individual projects) received from bidders".[48] Below is a summary of key features of the process.

- **IRP and RFPs approved in the same docket**
  - Commission approved resource needs, planning assumptions, RFP documents, and modeling parameters as part of the IRP; and
  - Utility then conducted a competitive all-source RFP to fulfill approved needs.
- **All-source RFP with a single MW target for procurement**
  - Three RFPs were issued on the same day with three separate bidding instructions and pro-forma contracts tailored to i) dispatchable, ii) renewable, and iii) company owned resources (which applies to the following commercial structures: build-own transfer ("BOT"), existing resource sales, and company self-build (affiliate). The RFP announced that bids from affiliates would be considered. The separate bidding instructions made it easier for the bidders, because they do not have to wade through dozens of pages of instructions that do not apply to their bid. The same timeline

[46] Idaho Power Company's 2028 All-Source RFP, Oregon PUC docket UM 2255.
[47] Public Service Company of Colorado ("PSCo") an operating company subsidiary of Xcel Energy Inc., 2022 All-Source RFP, Colorado PUC proceeding 21A-0141E.
[48] Xcel Energy. Proceeding No. 21A-0141E. Appendix C: Phase II Process Overview 120-Day Report. September 18, 2023. <www.xcelenergy.com/staticfiles/xe-responsive/Company/Rates%20&%20Regulations/Appendix%20C%20-%20Phase%20II%20Process%20Overview.pdf>.

and submission deadlines applied to all the bidders. Ultimately all types of resources competed with one another within the RFP.

- **Timeline and oversight**
  - 90-day bid window, 120-day evaluation, followed by IE and stakeholder review; and
  - the IE monitored every step and filed a 30-day post-bid report.
- **Portfolio-based evaluation**
  - models considered reliability, emissions, and cost using consistent assumptions;
  - final plan selected a least-cost, policy-compliant portfolio; and
  - security fee was required at the contract negotiation phase.
- **Transparency and stakeholder input**
  - all assumptions, bid categories, and scoring criteria were public; and
  - stakeholders could comment on Xcel's 120-Day Report and IE's report before Commission approval.
- **Strong market response**

The bidding demonstrated strong market interest and price discovery.[49]

- over 1,073 proposals, including:
- 900+ renewable or hybrid bids;
- ~90 standalone storage bids; and
- 262 utility ownership proposals.

Xcel Energy reported that this RFP attracted an unprecedented bid volume and record-low prices (see Figure 19).

[49] *Id.*

Figure 19. Xcel 2022 RFP bid price

Table C2 – Solicitation Responses by Generation Technology

Company Ownership RFP Bids

Generation Technology	# of Bids*	Bid MW**	Median Bid Price ($/kW Installed)
Gas	25	10,397	$965
Biomass	1	19	small sample
Solar	66	19,493	$1,635
Solar/Storage	61	28,712	$1,628
Storage	11	2,065	$1,627
Wind	96	36,206	$1,822
Wind/Solar	2	601	small sample

Renewable and Dispatchable RFP Bids

Generation Technology	# of Bids*	Bid MW**	Median Bid Price ($/MWh levelized)	Median Bid Price ($/kW-mo levelized)
Gas	13	3,347	-	$10.65
Other***	3	163	small sample	small sample
Solar	210	55,212	$32.73	-
Solar/Storage	223	110,119	$39.89	$ 9.69
Storage	80	14,833	-	$12.14
Wind	210	84,533	$21.99	-
Wind/Solar	10	15,801	$28.67	-
Wind/Solar/Storage	40	19,703	$38.20	$6.94
Wind/Storage	6	3,156	$19.62	$12.61

* # of Bids reflects number of proposals, the unique projects are less than this value
** Bid MW column provides total MW bid across all proposals, the MWs of unique projects are less than this value
*** Includes biomass and compressed air storage.

Source: *Id.*

Xcel's process had a longer timeline for bidders to respond than GPC allows; it was transparent as to resource needs, and it did not require a bid security fee for qualifying bids, only for contract negotiations. In LEI's opinion, these factors made the process in Xcel's competitive solicitation bidder-friendly, which in turn contributed to large volume of bidders, competition and low prices, which benefit customers. Industry commentary owed the large number of bids and low prices to the fact that it was an all-source procurement, with appropriate Commission involvement, and a transparent process.[50]

[50] Trabish, Herman. *"Xcel's record-low-price procurement highlights benefits of all-source competitive solicitations.*" Utility Dive. June 1, 2021. https://www.utilitydive.com/news/xcels-record-low-price-procurement-highlights-benefits-of-all-source-compe/600240/.

Q. What does LEI recommend for the solicitation process?

A. LEI recommends the Commission make the process more attractive to bidders, thereby increasing competition and reducing costs to ratepayers. This could involve extending the timeline for bids due from 30 days to 60 or 90 days; increasing the transparency of modeling assumptions and resource targets; and delaying the bid security fee until after the ISL or FSL is determined.

CONCLUSIONS AND RECOMMENDATIONS

Q. Please summarize your primary conclusions and recommendations.

A. Our conclusions and recommendations are:

- GPC's outlook for large customer load is an important component of its total load outlook. LEI's careful review of GPC's quarterly large load announcement reports indicates that growth through 2028 and perhaps beyond is likely to be slower than GPC is projecting because GPC is considering not just load with contracts but also load under various stages of development, include those under technical review. Not all these load projects are guaranteed to materialize. LEI recommends considering a baseline scenario which reflects recent experience with attrition in GPC's announcements of potential large load customers. LEI also recommends that GPC continue to monitor attrition in its quarterly *Large Load Economic Development Report* to ensure that its large load forecast does not outrun the actual pace of load growth.

- GPC's projections of transmission needs did not consider the possibility that load growth may be slower than assumed. Testing a lower load forecast sensitivity (which would reflect the substantial uncertainty associated with prospective large load customers) would enable GPC to identify which transmission projects could potentially be deferred. GPC's projections of benefits around proposed transmission investment also did not consider a longer (20-year) planning horizon. LEI recommends consideration of these two issues in transmission planning.

- GPC's forecast of natural gas prices relied upon a long-term Henry Hub forecast which was out of date. It did not recognize the potential impact of volatility on ratepayer costs. LEI recommends developing a case based on historical volatility, to examine the impact on ratepayers across scenarios.
- GPC's process for procuring supply resources could be made more competitive if it incorporated practices used by other utilities. Making the RFP process more bidder-friendly reduces risk and cost to bidders, which can result in more competition and lower prices, to the benefit of ratepayers.

Q. Does this conclude your testimony?

A. Yes.

AJG-1:
Resume of AJ Goulding

Curriculum Vitae

AJ GOULDING

President, London Economics International LLC

LONDON ECONOMICS

KEY QUALIFICATIONS:

In his role as president of London Economics International LLC, AJ Goulding manages a growing international consulting firm focused on finance, economic, and strategic consulting to the energy and infrastructure industries. In addition to serving as a sector expert in electricity and gas markets, his responsibilities include project management, marketing, budget and financial control, and recruiting. AJ also serves as an Adjunct Associate Professor at Columbia University, where he teaches a course on electricity market design and regulatory economics while also supervising graduate workshops.

With over twenty-five years of experience in evolving electricity and natural gas markets, AJ's diverse background enables him to work effectively in both emerging markets and OECD countries. In North America, AJ has been articulate in describing market relationships between wholesale power marketers, merchant plants, aggregators, and the existing investor-owned utilities. In emerging markets, AJ has considerable experience dealing with the challenges of mixed private and public ownership, difficulties in creating credit-worthy distribution and retail entities, and the realities of line losses, unreliable fuel deliveries, and politicized labor relations.

AJ began his career performing natural gas market analysis for the ICF Resources subsidiary of ICF Kaiser International. Later, he lived for two years in New Delhi, India, where he advised the United States Agency for International Development (USAID) on electric power sector restructuring in India. He continued his work on India while pursuing his MA at Columbia University, leading to the publication of an article on Indian privatization. Simultaneously, he researched the process of power sector reform in Pakistan, contrasting it with the Indian experience. Upon completion of his MA, AJ served as business development associate for Citizens Power LLC, a top ten US wholesale power marketer. He then moved to London Economics, where he has held roles of progressively increasing responsibility.

EDUCATION:

Earlham College, Richmond, Indiana, B.A. in Economics, 1991. College honors, scholar-athlete, public service graduate fellowship.

Columbia University, New York, New York, M.A. in International Business, 1997. Foreign Language and Area Studies fellowship, Cordier prize.

EMPLOYMENT RECORD:

From: 1996	**To:** present
Employer:	*London Economics International LLC, United States* President (July 1999 to present), Senior Consultant (January 1998 to July 1999), Summer Associate (June 1996 to August 1996)
From: September 2003	**To**: present
Employer:	*Columbia University* Adjunct Associate Professor (2014 to present), Adjunct Assistant Professor (2003-2014)
From: 1997	**To**: 1997
Employer:	*Citizens Power LLC; Boston, MA* Associate
From: 1994	**To**: 1995
Employer:	*USAID; New Delhi, India* Energy Consultant
From: 1991	**To**: 1993
Employer:	*ICF Resources, Inc.; Fairfax, VA* Analyst

SAMPLE PROJECT EXPERIENCE:

The projects briefly described below are typical of the work AJ has performed throughout his career at London Economics, Citizens Power, USAID/India, and ICF Resources. AJ also serves as an adjunct professor at Columbia University, where he teaches a course in electricity market design.

Electricity and Natural Gas Asset Valuation and Transaction Advisory Work

- ***Commercial Advisory Services for Expansion Projects:*** London Economics International LLC ("LEI") was engaged by a private client for commercial advisory services associated with 7 generation expansion projects in Saudi Arabia. To address the security of supply concerns, the client expects to sign Energy Conversion Agreements ("ECAs") on fast-track generation projects with counterparties. LEI's role is to assist the client across 4 milestones for each of the 7 projects: (i) Milestone 1: reviewing non-binding offers and financial models prior to ECA signing; (ii) Milestone 2: Assisting on ECA preparation and review of pertinent documentation; (iii) Milestone 3: Assistance post-ECA signing and submission of documents to lenders/banks; and (iv) Milestone 4: Assisting on Financial Close

- ***advised on Energy Transition Accelerator:*** London Economics International LLC ("LEI") was engaged by a nonprofit organization to support in designing a jurisdictional-scale carbon crediting standard to encourage emission reductions in eligible developing countries. The project involved setting out methodologies and procedures addressing issues including

crediting baselines, additionality, and monitoring and verification rules, as well as host jurisdiction eligibility criteria with respect to governance and safeguards. Specifically, LEI performed a scenario analysis that evaluated several alternative crediting approaches for three test developing countries, and provided an analysis of the results, including assessing the implications of each approach and providing recommendations

- ***expert support for assistance to OEB staff in the Generic Proceeding on cost of capital and other matters:*** London Economics International LLC ("LEI") was engaged by Ontario energy Board ("OEB") to assist the OEB staff in finalizing the issues list in the Generic Proceeding on cost of capital and other matters related to OEB's prescribed interest rates and cloud computing deferral account (EB-2024-0063), preparing an expert report answering the questions identified in the issues list, and providing proceeding related support to the OEB staff

- ***network tariff reform case studies:*** LEI supported Frontier Economics in preparing international case studies for the New Zealand Electricity Authority on network tariff reforms. LEI focused on two North American jurisdictions - Ontario and Texas.

- ***exploring a State of the World where QC becomes net importer:*** LEI was hired by a large utility to brainstorm over a State of the World where the historical energy flows between Quebec, and its neighboring markets (NY, NE and ON) are reversed; essentially a World in which Quebec becomes a net importer of energy. The brainstorming exercise focused on identifying the reasonable volume of energy QC could rely upon to satisfy its planning obligations, identify potential challenges (regulatory, planning, supply availability, etc..) associated with the reliance on such imports, and debate over a planning strategy adequate for such State of the World. The brainstorming session included LEI and the utility's senior trading team

- ***advised on battery storage project:*** LEI was engaged by a financial development bank to assess the technical adequacy and suitability of a battery energy storage project (in development) to be co-located with a hydroelectric facility and provide technical support in the drafting of financing documents required to reach financial close. As part of this process, LEI performed (i) an operating performance review of an existing asset; (ii) forecasts for energy prices, ancillary service prices, and energy storage modeling over a 25-year timeframe, as well as the development of a revenue profile for the target portfolio; and (iii) provided a detailed market report of the Alberta market.

- ***independent expert in Ontario:*** LEI was retained to act as an independent expert in a legal proceeding between a consulting firm and developers of a 300 MW wind project in Ontario. On behalf of the consulting firm, LEI prepared an expert report concerning the services the consulting firm provided to the wind developers, and how the fees for such services would be compensated in accordance with the terms of their services agreement

- ***supported gas supply RFP:*** on behalf of a client developing a new gas distribution utility in Ontario, LEI was engaged to develop and prepare a Request for Proposal ("RFP") for the physical supply and delivery of natural gas and related services. The RFP included an outline

of the client's objectives, a description of the characteristics of the services the client was seeking, and the development of criteria used in evaluating proposals

- ***due diligence for the acquisition of a portfolio of PSH and NPD across the US:*** LEI was hired by a private equity firm to provide technical assistance and due diligence on the acquisition of a portfolio of hydropower projects located in multiple states across the US. The Projects consisted of a mix of run of river hydro and large pumped storage at various level of development. As part of its due diligence, LEI carried out a general review of the hydropower and pumped storage markets to evaluate the relative competitiveness of these technologies especially in markets with high renewables and storage penetration; LEI also developed a 20-year forecast of revenue streams for the relevant assets in the market of interests and reviewed the assets marketability post contract expiration. Finally, LEI reviewed key offtake contract to make recommendations on replicability (or lack thereof) of such contracts especially in highly competitive regions

- ***Hong Kong ROE study:*** in the context of investment incentives required to achieve Hong Kong government's net zero target, a vertically integrated Asian utility retained Frontier/LEI to conduct a study that scans the regulatory landscape and regulatory returns (both allowed and achieved) by a relevant sample of utilities around the world. A key objective is to understand factors that contribute to differences between: (i) the level of ex ante allowed returns set by the regulators; and (ii) the level of actual ex post returns earned by utilities. In this assessment, the impact of inflation needs to be considered separately; and the study needs to focus on level of over/under performance as well as types of regulatory instruments that lead to such over/under performance. The analysis is expected to draw relevant lessons for the client in the context of the setting of the Permitted Returns in Hong Kong

- ***Abu Dhabi Department of Energy review:*** London Economics International LLC ("LEI"), in partnership with Frontier Economics, was retained by the Department of Energy ("DoE") in Abu Dhabi to work through Deloitte to advise the DoE in Abu Dhabi on: (i) Phase 1: the definition of non-for-profit for Emirates Water and Electricity Company ("EWEC"), the single-buyer and system operator; and (ii) Phase 2: a suitable framework for economic regulation of EWEC

- ***accreditation curve (Effective Load Carrying Capability) for a BESS:*** LEI was hired by a large electric utility to project an accreditation curve for a BESS under development in NYISO, amidst NYISO's proposed new accreditation rules. The goal of the study was to estimate over a 20-year horizon potential accreditation of the proposed Project based on its marginal contribution to the system reliability. The capacity credit (accreditation) was needed to derive the UCAP values the Project would be capable of offering in the NY capacity market

- ***strengthening Utility Accountability for Reliability:*** LEI advised provincial regulator on the design and implementation of the benchmarking model for the Ontario's electricity distribution utilities. The objective of the project was to develop a custom model to benchmark reliability performance, and to develop reliability performance expectations to improve the utility accountability for reliability. The work was conducted in close cooperation with the

working group that included utilities, industry associations, and customers. The work included also conduct of stakeholder workshops and presentations to the Board

- ***ROE expert evidence:*** London Economics International LLC ("LEI") was retained by the legal counsel for the Prince Edward Island Regulatory and Appeal's Commission ("IRAC") to provide independent expert evidence on a just and reasonable return on equity ("ROE") for the Maritime Electric Company, Limited ("MECL"), associated with their General Rate Application ("GRA") for 2023-2025

- ***Economic Study - Madrid Protocol:*** London Economics International LLC ("LEI") was engaged as a subcontractor by a Middle Eastern client to conduct an economic study assessing the costs and benefits of Saudi Arabia potentially joining the Madrid Protocol. The study involved: quantifying the expected benefit to KSA trademark holders in registering their trademarks internationally; assessing the financial impact on KSA trademark agents; estimating the operating cost of implementing the protocol; reviewing the pros and cons of joining the protocol; and assessing the impact on key macroeconomic drivers in the Kingdom

- ***led Alberta performance review:*** LEI was engaged to perform an assessment of the Alberta Energy Framework, which encompasses the wholesale generation market, retail market, agencies, transmission planning, access and distribution, as well as the operations of the Alberta Interconnected Electricity System. The analysis included both qualitative and quantitative components

- ***conducted overview of hydro-dominated market:*** LEI was hired to provide an understanding of the dynamics underpinning hydro-dominated power markets as opposed to thermal systems. As part of this project, LEI reviewed in details the dynamics and key drivers of energy markets in a sample of Latin America countries including Colombia, Panama, Brazil and Chile. Colombia was the point of focus of the report, in this respect LEI compared and contrast several aspects of the Colombian markets to other jurisdictions and created a scoring card to evaluate Colombia against similar jurisdictions.

- ***evaluated peaker units in New England:*** London Economics International LLC ("LEI") was retained to evaluate the economics of constructing peaking units in two possible existing New England hydro facilities. Specifically, LEI conducted an analysis on existing peaker technologies, the permits required, and determined how much investment would be justified to make the project economic.

- ***evaluated cost economics of installing energy storage technologies at existing hydro power plants in Massachusetts and New York:*** The analysis was conducted in three phases – phase 1 consisted of literature reviews and primary information collection (from manufacturers and service providers) on the available types of energy storage technologies and associated fixed and variable costs. Phase 2 consisted of an economic cost-benefit analysis of the least cost storage technologies to understand the viability of the investment. Phase 3 consisted of developing comprehensive criteria for selecting the energy storage manufacturer/service provider and presenting implementation recommendations.

- ***conducted PJM price forecasting:*** London Economics International LLC ("LEI") was retained to provide forecasted energy and capacity prices as well as supply curves for a plant located in PJM's SWMAAC region

- ***led Ontario gas LDC performance-based ratemaking project:*** LEI was engaged by Union Gas to review Union's proposed 2014 to 2018 incentive ratemaking ("IR") plan as presented to stakeholders on April 29th, 2013 and to examine case studies of approaches to IR applied to other North American gas distribution utilities. In the case study analysis, Union particularly requested LEI to examine approaches to a set list of ratemaking parameters: productivity and X-factor trends, alternative approaches to designing an I-X framework, approaches to establishing inflation factors, approaches in other jurisdictions to applying an Earnings Sharing Mechanism ("ESM"), use of capital trackers for unknown costs, appropriateness of deferral accounts for unaccounted-for gas ("UFG"), and service quality indicators ("SQIs") and how they are measured. LEI was subsequently requested by Union to provide comments on Union's draft Settlement Agreement

- ***submission to Ontario LTEP consultations regarding value of capacity imports:*** On behalf of a large Canadian hydropower generator, LEI analyzed the potential economic benefits of the export of capacity and energy from Quebec to Ontario. The engagement included a review of the treatment of imports in capacity markets in the Northeast, an examination of the impact on capacity prices of imports, and a discussion of the reliability benefits that long term contracts for capacity imports provide. In addition, LEI discussed how Ontario can create a level playing field for clean energy imports relative to other potential future sources of supply in Ontario

- ***market briefing on renewables in El Salvador:*** LEI was engaged by a private equity firm focused on small-scale renewable energy projects considering expanding into South America to develop a market briefing on El Salvador, focused on the challenges and opportunities in developing small hydro projects in the country

- ***cost benefits analysis of US transmission line:*** for a utility in the northeastern US, LEI prepared a cost-benefit analysis of a proposed transmission line with the potential to change existing market arrangements. In the analysis, LEI developed a base case and multiple project cases based on different configurations of the transmission project. Using its proprietary modeling tool, POOLMod, LEI simulated energy and capacity prices in each configuration over a 15-year timeframe, and compared the price differences against various cost allocation scenarios for the transmission line's construction. LEI also tested the statistical significance of the project case results against the base case results, and conducted further analysis on the economic effects of additional renewable generation projects that construction of the transmission line would make possible

- ***review of RRO in Alberta:*** London Economics International LLC ("LEI") was asked by ENMAX Energy Corporation ("EEC") to review EEC's request for continuation of the practice of earning a fixed margin associated with expenses incurred as a result of operation of the Regulated Rate Option ("RRO"). For the client, LEI reviewed the settled practice in Alberta,

investigated the risk of operating the RRO, and calculated an indicative range of margin for EEC

- ***review of risk management practices:*** LEI was engaged by the client to review its risk management practices and provide meaningful insights with regards to the risk management related issues. Analysis included quantification of the magnitude and probability of risks being faced, as well as research into the best practices of other similar organizations

- ***conducted Independent Evaluation review:*** LEI provided advisory services to assist the OPA in evaluations of applications made to the Aboriginal Renewable Energy Fund ("AREF") and the Aboriginal Transmission Fund ("ATF"). LEI provided advice and analysis related to the technical, financial and regulatory viability of each proposed project

- ***conducted a report on net metering programs in New Hampshire and New York:*** for a private equity power sector investor, LEI conducted a report on net metering programs to determine if the client's facilities would qualify. Project work included determining load at the sites, examination of net metering in the applicable regions, assessment of potential solar installation, exploration of installation options to determine which would be most suitable, and analyzing potential returns

- ***assessment of small hydro properties:*** as part of a retainer agreement with a growing private equity firm focused on the roll-up of small hydro properties, LEI performed a variety of supporting activities, including examination of forward markets, review of PPAs, assessment of renewable energy policies, and strategic analysis

- ***review of North American hydro assets:*** LEI was engaged by a large Canadian hydro generator to evaluate the potential renewable premium associated with its hydro assets in North America. LEI developed an economic model to project legacy Renewable Energy Certificate ("REC") prices in New York and New England. LEI also provided alternative methodologies such as projecting the premium based on forecasted carbon allowance prices and analyzing potential sales to large corporations on a voluntary basis

- ***analyzed current and future dynamics in the British Columbia power markets for of British Columbia power producers:*** topics analyzed included costs of independent power producers ("IPPs") relative to BC Hydro, uncertainty around future demand levels in BC, implications of moving away from use of Critical Water Year analysis in planning, risks and uncertainties regarding import availability, and the overall macroeconomic contributions of IPPs. LEI also analyzed the provincial government's Review of BC Hydro and provided an assessment

- ***valuation of distribution company in Bolivia:*** LEI provided inputs into the valuation of a Bolivian distribution company, including developing the cost of capital; assessing demand, cost, and tariff forecasts; and reviewing the overall cash flow model. LEI also reviewed the company's historical performance relative to efficiency and performance targets

- ***wrote paper on investments by electric and natural gas utilities:*** LEI authored a paper on the successes and failures associated with international investment by electric and natural gas

utilities for a major Japanese utility. The paper focused on the activities of over forty companies, both within North America and internationally

- ***European power market analysis:*** LEI worked with one of North America's largest independent operator of power generation facilities to develop a comprehensive analysis of central European power markets including price forecasts and renewable energy policies. As part of its client's efforts to acquire a portfolio of hydroelectric power generating facilities, LEI's team developed a medium-term price forecast, stress tested critical assumptions, and provided detailed insight into federal and state renewable energy policies

- ***developed several forecasts of the long-term Alberta electricity power pool prices (2010 to 2030) based on different market parameters and build decisions:*** the forecast also made special note of the effect on the market, if any, of the following conditions: (i) greenhouse gas legislation; (ii) increase in unconventional (shale) natural gas production; (iii) effect of the enactment of Bill 50; and (iv) effect on the market by external jurisdictions

- ***market analysis for a client interested in purchasing a portfolio of global generation assets:*** in this project, the LEI team, led by AJ, provided a market analysis of California, Mexico, and the Philippines. This market analysis included the following aspects: description of portfolio assets in the jurisdiction, supply/demand balance in the jurisdiction, regulatory framework, contract description and impact of competition on specific portfolio assets in the jurisdiction, indicative position of target asset on supply curve presently and in the future, impact of climate change and other environmental regulations, observations from material in dataroom, review of pool price projections, and remarks about the jurisdiction. In addition, LEI performed a 20-year price forecast for these markets, which was delivered in a spreadsheet form and incorporated into the management presentation

- ***review of business plans for hydrokinetics technology company:*** for start up hydrokinetics technology company, LEI reviewed business plans and applicability of technology worldwide. Tasks included commenting on strategic plan, advising board members on the evolution of renewable energy markets worldwide, and assessing US Federal Energy Regulatory Commission polices towards hydrokinetic projects

- ***due diligence and valuation of engineering consulting firm:*** for a Middle Eastern investment fund, AJ led the evaluation of the acquisition of an engineering consulting firm with offices in the US, Europe, and the Middle East focused on the power sector; the project included creation of a pro forma for the business, evaluation of business prospects and strategy, and an examination of the relevant economic conditions and their impact on value

- ***assessment of plant pro formas and underlying market environment in six Asian countries:*** for leveraged buyout of major global IPP developer, assessed plant financial models, state of reform efforts, and potential for unbundling in Bangladesh, China, India, Philippines, Thailand, and Turkey

- ***valuation of Singapore generating asset:*** on behalf of a large Asian generating company, provided revenue forecasts from spot, retail, and vesting contracts for successful acquisition

of Singapore generator Analysis included review of repowering options, assessment of regulatory evolution, assessing the relevant cost of capital, and potential for strategic behavior; AJ later performed a similar exercise for a second Asian generating company also seeking to purchase a similar set of assets in Singapore, as well as subsequently assisting in analysis associated with refinancing of the acquisition performed by initial client

- ***modeling future Japanese electricity market dynamics:*** for a leading Japanese financial institution, led workshop and directed the creation of an interactive model of the Japanese electric power sector. Issues addressed included quantification of plant asset values under various market scenarios, an assessment of the potential for stranded costs, review of debt coverage ratios, and exploration of the evolution of transmission assets

- ***due diligence support associated with the evaluation of the possible acquisition of a minority stake in a major Ontario transmission and distribution company:*** LEI prepared reports and analysis which contributed to the analytic framework for this proposed transaction, including analysis of the regulatory framework, review of impact of PBR on revenues, strategic issues, and the potential for revenue growth

- ***advised Japanese company on potential US power sector acquisitions:*** reviewed project economics for multiple acquisition targets of Japanese investor. Tasks included providing long term revenue forecasts, reviewing motivations of sellers, providing insights on the associated market, and examining the role of hedge funds and private equity

- ***examination of markets and generation asset values in Mexico, Philippines, and California:*** assisted Asian IPP in assessing generating assets in Mexico and Philippines, as well as export potential from Mexican plants to the US; mandate included developing long run marginal cost forecasts for Philippines and Mexico, and providing detailed dispatch modeling of the California market

- ***valuation of generation and distribution assets in Philippines and the Caribbean:*** provided detailed analysis of regulatory trends in the Philippines and in selected Caribbean countries. Used regulatory filings, PPAs, and public information to develop a value for generation and distribution assets in these markets. Advised potential buyer on relative risk in each country examined, including country risk, regulatory risk, and fuel supply and load growth issues

- ***power price forecast for Balkans:*** to support potential bid to acquire nuclear station in Bulgaria, led team forecasting revenues from future spot power market sales. Issues included treatment of carbon emission credits, extent of regional integration, and availability of existing transmission capacity

- ***revenue forecast and financing advisory for renewables acquisition:*** for newly established private equity firm, managed acquisition process for small hydro and biomass site. Process included revenue forecasting, negotiating term sheets with banks, obtaining quotes for power purchase agreements, reviewing operating agreements, and overseeing all aspects of transaction process

- ***prices for merchant generators and IPPs:*** provided expert opinion on the extent to which value of a generating station could change over a 12 to 18 month period, based on historical analysis of price changes for individual generation assets as well as for generation asset portfolios

- ***biomass investment evaluation:*** on behalf of growing private equity investor, performed extensive analysis of economics of restart of several biomass plants in California and elsewhere. Tasks included PPA review, examination of permits, assisting in arranging financing, and examination of California market dynamics

- ***advised on purchase of small hydro station:*** for a newly established hydro-focused private equity investor, valued and performed regulatory review associated with successful purchase of a small hydro facility in Maine. Tasks including creating pro forma, reviewing material contracts, negotiating purchase and sale agreement, hiring operator, and monitoring ongoing performance

- ***bid for New York City gas and oil fired stations:*** for a major financial institution, AJ led a team of analysts in examining potential future revenues for a portfolio of peaking plants in New York City. Assignment included using proprietary models to forecast future capacity and energy revenues, and the application of real option techniques to determine value of plant flexibility

- ***bid for PJM coal-fired power station:*** worked closely with private equity fund in creating deal team, preparing first round bid, and valuation of facility, including coal supply, environmental compliance, site options, and forecast of future revenues; helped to develop second round bid, including assisting in arranging financing and risk management

- ***collateralized debt obligations ("CDOs"):*** led projects associated with detailed statistical analysis of the underlying economics of CDOs associated with distressed debt in the power sector, and with examining whether such a CDO could have been launched in the wake of the Enron collapse

- ***valuation of New England based generation portfolio:*** worked with potential acquirer of New England's largest generation portfolio to determine the costs of ongoing obligations associated with the portfolio, provide an understanding of long term market dynamics, and assess value of overall portfolio, including revenue forecasts and review of market rules

- ***valuation of integrated IOUs:*** coordinated evaluation effort for acquisition of Southeastern US utility and of Ontario municipal electric utility; tasks included assessment of impact of PBR, calculation of difference in profits from generation portfolio under ratebase versus in open market, and analysis of ratebase settlement

- ***valuation and regulation of LNG facilities:*** assessed potential for combination of strategically situated LNG facility with US wholesale power marketer; for separate client, advised on third party access requirements for LNG facilities in the US and relevance to potential regulatory changes in Japan

- ***valuation of Ontario generating plants, including assessment of regional electricity markets:*** organized and implemented major modeling effort to determine potential value of generation stations in Ontario. Assessed impact of transmission constraints and restructuring efforts in neighboring markets on future wholesale market prices

- ***assessment of value of coal station contracts circa year 2000:*** developed analysis of value of contracts to bear costs and benefits associated with output from coal fired power stations in Alberta. Engagement involved considering only information known as of 2000, for inclusion in tax litigation case. Created pro forma valuation of the contracts as of 2000, including forecast costs and revenues, as well as opining on the appropriate cost of capital to be used

- ***price forecasts in key Canadian markets and associated export zones:*** provided long term electricity price forecasts in multiple engagements for key Canadian markets, including Alberta, British Columbia, and Ontario, as well as related export markets such as New York, Midwest ISO, and PJM. Results used by clients for obtaining financing and assessing contract pricing

- ***revenues to wind generators in Alberta:*** AJ led the examination of merchant revenues to a portfolio of existing and under construction wind generators in the province of Alberta. Tasks included review of market design issues, 20 year scenario analysis for merchant revenues, review of contract terms and conditions, and an examination of the potential for additional revenues from the sale of emissions reduction credits and renewable energy certificates. Deliverables included market study supporting issuance of income trust units

- ***revenues to hydro portfolio in Ontario:*** for a large North American industrial company, AJ led the creation of a market study and report underlying the issuance of income trust securities. Tasks included multiple scenario analysis of merchant revenues, review of ancillary services revenues, and an examination of the Ontario hybrid market structure

- ***assessment of role of peaking plant in Ontario power sector:*** for Ontario government body, performed extensive scenario analysis to determine extent to which peaking plant should be a part of future procurement plans in the province; this analysis included assessment of revenues from ancillary services and of optionality

- ***developed price trends, in conjunction with the valuation of several Colombian power plants:*** LEI also provided an evaluation of the Colombian market, an overview of modeling methodologies and assumptions, and modeling results. The modeling results included forecast spot market prices, plant dispatch and revenues (energy and capacity), under a variety of scenarios

- ***conducted tariff review for Ente Nacional Regulador de la Electricidad ("ENRE"):*** the Argentine regulatory authority for the electricity sector (ENRE) awarded a contract for a tariff review of Edenor, a large utility serving the northern portion of Buenos Aires to a consortium led by LEI. The engagement entailed evaluating the performance of Edenor in the 1992-2002 tariff period; advising ENRE on international best-practice design of distribution tariffs; proposing a tariff setting methodology for the 2002-2007 tariff period; providing technical

assistance in the analysis of information presented to ENRE by Edenor; proposing tariffs for the 2002-2007 tariff period; and assisting ENRE during public hearings on the proposed tariffs. The consortium proposed that tariffs be set via an RPI-X approach employing Data Envelopment Analysis (DEA) for establishment of the X-factor

- ***revenue forecasting in Nicaragua:*** LEI developed revenue forecasts for two generating companies (GeCsa and GeOsa) being auctioned by the Nicaraguan government as part of the privatization of the country's electric power industry. The revenue forecasting was conducted in three stages: a production cost-based spot price and dispatch forecasting stage, a contracts valuation stage, and a Monte Carlo Simulation stage. Out Monte Carlo simulation quantified the impacts of hydrological and fuel price variation on the values GeCsa and GeOsa

- ***advised on bid strategy for Mexican IPP:*** LEI assisted a large foreign utility in its bid strategy for acquisition of generating assets in international jurisdictions (across North America, Europe, and Asia). The LEI team led the market analysis for assets located in Mexico; more specifically, LEI analyzed a series of macroeconomic risks (including political, economic, and regulatory risks) likely to impact operations of the assets in the long run, performed a full due diligence review of the targeted assets, and developed forecast of the Mexican wholesale spot energy prices in order to determine future profitability of the assets.

Power, Gas, and Infrastructure Sector Business Development and Strategy

- ***conducted workshop on generation reliability standard review in Malaysia:*** LEI held a two-day workshop on Generation Reliability Standard Review Seminar for TNB in Kuala Lumpur, Malaysia. The topics included: Malaysia reliability standard policy overview, jurisdiction review on reliability indices and benchmarking Malaysia's reliability standard against other countries, inter-play between government agencies in formulating the reliability standard, lessons learned from other counties, incorporating renewable energy, interconnection and distributed generation in calculating reliability indices, input parameter to derive the value of reliability indices, and lesson learned from LOLE studies from other jurisdictions.

- ***performed a peer-group analysis of Independent Power Producers ("IPPs") in the US market:*** LEI presented research to Osaka Gas with insights on the key economic, financial and strategic factors contributing to growth of mid-sized companies in the US merchant generation market. LEI identified nine categories of IPPs in the US merchant market and defined a subset of companies to be considered as the peer-group of Osaka Gas. For the peer-group, LEI reviewed key success criteria of each company including business focus, leadership, growth strategy and financial performance. LEI presented three peer-group companies as case studies to highlight examples of successful players in the US IPP market. Overall, LEI highlighted the implications that current market trends and key success factors of Osaka's peer-group would have on the company's future growth strategy in the US market.

- ***conducted water pricing in California:*** London Economics International LLC ("LEI") was retained to conduct a 30-year price curve for Metropolitan Water District of Southern California ("MET Water") in relation to a potential acquisition of a proposed desalination plant in California. The desalination plant's water rate specified in the draft Term Sheet of the

Water Purchase Agreement is based on MET Water's prices plus avoidable charge, subsidy, and a premium. LEI reviewed the regulatory arrangements of MET Water, supply-demand dynamics in Southern California, and water pricing mechanisms used by MET Water. LEI also assessed the different key drivers for each component of the MET Water price. Lastly, LEI created a cost of service model and projected the MET Water prices for the next 30 years.

- ***transmission review in Canada:*** LEI was hired by a French consulting firm to provide commentary insights on the state of the transmission and distribution market in a number of Canadian provinces including Alberta, Ontario, British Columbia, Manitoba, Saskatchewan and Quebec

- ***study on transmission and distribution:*** LEI collaborated with SratOrg, a French consultancy on the development of strategic recommendations for market penetration in the US transmission and distribution markets . As part of this work, LEI and StratOrg performed a detailed analysis of the US market structure, identifying key market players and recent development, as well as barriers of entry and market opportunities for a prospective European investor. LEI travelled to Paris for an internal workshop session with Stratorg and actively participated in the final presentation of the team findings before the client's top managers.

- ***analyzed cost implications of Ontario's Green Energy Act:*** on behalf of the Official Opposition in Ontario, analyzed the cost implications of the government proposed 2009 Green Energy Act. This included costing of the feed in tariff program, interconnection costs, conservation and demand management initiatives and the implementation of the smart grid. The company presented key results in a press conference

- ***advisory services on the development of a 75 MW hydroelectric power plant in Cameroon:*** under a USTDA contract, AJ Goulding acted as a Senior Energy Market Specialist in the LEI portion of the work for a consortium to provide financial and technical advisory assistance to the Ministry of Energy and Water Resources of the Government of Cameroon with respect to the development of a 75 MW hydroelectric power plant at Bini à Warak. Specific tasks included review of Cameroon's existing regulatory system, regional market demand analysis and assessment of developmental impact of the project

- ***business development opportunities in India:*** for UK electricity and mining conglomerate, provided detailed assessment of opportunities in construction of integrated mining and mine-mouth power stations and in distribution of electricity

- ***assessment of US natural gas storage business:*** for a large Japanese gas utility, examined trends in regulation and investment in the US natural gas storage business. Engagement included comparison of natural gas storage business risks to that of IPP investment

- ***European renewables investment strategy:*** on behalf of a global power and real estate investment company, reviewed policies towards renewable energy in Europe and individual European companies, as well as available assets, sites, and investment climate

- ***distressed asset acquisition strategy:*** advised a major Japanese utility on entry strategies to the US market, including performing a workshop on due diligence, US regional market analysis, and asset valuation; arranging for introductions to major asset sellers, potential investment partners, and advisors; and creating a screening methodology and database of potential acquisition targets

- ***unbundling of French state-owned vertically integrated monopoly:*** worked with leading French electricity generator and supplier to examine how to create independent profit and loss statement for its generation assets, benchmark performance against expectations, and separate revenues from plant operations from those gained through trading

- ***renewables value chain investment analysis:*** for Dutch foundation based in Switzerland, examined macro trends associated with renewable energy in several major global economies, including the global supply chain from component manufacturers to installation to operation. Objective was to determine where on the renewables value chain the most profitable opportunities could be found

- ***workshop on performance-based ratemaking strategy:*** for first stand-alone transmission company in North America, conducted day long workshop on issues associated with PBR, including the types of PBR and which one is most appropriate for what type of company, the sources of efficiency gains observed in other transmission companies worldwide, and the impact of performance standards on profitability and flexibility

- ***global generation investment strategy:*** for a major Canadian generation company, used modern portfolio theory to identify combination of asset classes and geographic locations which would result in optimal risk-reward combination for generator given its core competencies. Deliverables included interactive model to be used by generator staff on an ongoing basis

- ***development of regulatory and financing strategy for transco:*** for first stand-alone transmission company in North America, evaluated key transaction parameters, assessed allowed ROE, proposed strategy for attaining favorable incentive rates, and helped to identify potential cost savings

- ***impact of Ontario market changes on industrial consumers:*** for association of large power consumers in Ontario, assessed market trends and future entry and exit scenarios to determine long term price dynamics in the face of changes in government deregulation policies

Regulatory Economics

- ***regulatory innovation***: AJ led the LEI engagement for the Ontario Energy Board ("OEB") to prepare a jurisdictional scan that looks at energy regulators and regulators of other sectors, as may be relevant, from around the world and identifies new objectives for regulators, new areas of regulatory oversight/authority, regulatory oversight of long-term planning, regulators' role in indigenous reconciliation, regulators' role in determining/defining the role

of distributors, regulators' approaches to innovation and approaches to disruption by other sector regulators

- ***supported PBR filing:*** LEI assisted a large Alberta utility with its third generation performance-based ratemaking ("PBR") filing, including advising on incentives, effectiveness of inflation factors, potential for special capital expenditure provisions responsive to government electrification policies, productivity factors, length of regulatory period, and other matters associated with PBR

- ***policy evaluation framework revision:*** AJ Goulding, President of London Economics International LLC ("LLC"), worked alongside John Todd, President of Elenchus Research Associates, Inc., to revise the Ontario Energy Board ("OEB")'s existing Policy Evaluation Framework, which is used to assess the effectiveness of proposed and existing OEB policies

- ***referent pricing of comparable technologies and due diligence support on PPA negotiation:*** LEI was hired by a large electric utility to provide due diligence support on their renegotiation of long term contracts. LEI's scope of work consisted of developing a benchmark of future energy prices (2040-2060) by modeling referent prices (LCOE) for a portfolio of technologies likely to be developed in the markets of interest. The benchmark exercise was supplemented by commentaries on the potential state of energy markets in a 20 to 40 year horizon (by exploring the potential changes and evolution in energy markets dynamics and overall construct), and the review of potentially disruptive promising technologies. Finally, LEI provided technical support to the utility's leadership throughout their decision making process ahead of the start of the negotiations

- ***deep dive of regulation market design:*** Following completion of the above-mentioned engagement for a Middle Eastern greenfield smart city, FE and LEI have been retained by the same large Middle Eastern entity in 2022 to perform a deep-dive analysis and advise on the "Regulation" workstream. The ongoing project envisions two work packages: (i) WP 1: Regulation and rules. Under this work package, the project team is detailing the market operation principles and the required regulations across each value chain activity, which will facilitate and operationalize the market design concept selected by the client; and (ii) WP 2: Contrast of desirable regulation and rules with current law. Under this workstream, the project team shall provide the client with a detailed contrast of existing country-level laws/regulations with the city's laws/regulations. The team will also perform a gap analysis associated with ideal rules and regulations needed to achieve the city's objectives. In addition, the team will provide an implementation roadmap, including preparation needed for activation. In addition to these work packages, the team will provide adhoc assistance to the client, as well as present a series of workshops consistent with each area of regulation, to discuss preliminary findings, recommendations, and to incorporate feedback from the client

- ***member of OEB's Advisory Committee on Innovation:*** AJ, as LEI's President, was selected to serve on the Ontario Energy Board ("OEB")'s Advisory Committee on Innovation, to assist the OEB in sharpening its focus on enhancing efficiency, cost effectiveness, innovation and value for electricity customers. The Committee, reporting directly to the Chair of the OEB, focused on identifying actions that a regulator can take that will support and enable cost

effective innovation, grid modernization, and consumer choice to help inform regulatory policy development. The Committee's overarching goal was to support the OEB's embarkment on a process that would evaluate whether and how best to adapt regulation in order to keep pace with an evolving sector

- ***electric distribution sector resiliency:*** LEI was engaged by the Ontario Energy Board to analyze and define resilience and related policy questions as they apply to electricity distributors in Ontario within the context of climate change. LEI prepared a written report consisting of two key parts: (1) a description of current and anticipated future extreme weather impacts in Ontario as a result of climate change; and (2) a set of resiliency best practices, based on a review of approaches in other jurisdictions. LEI also presented its findings at a stakeholder workshop

- ***Enbridge Gas capital structure expert:*** London Economics International LLC ("LEI") was engaged by the Ontario Energy Board ("OEB") as a cost of capital / capital structure expert to review Enbridge Gas' application for 2024 rebasing and 2025-2028 price cap plan. LEI's responsibilities include analyzing the evidence and assisting OEB staff in preparing interrogatories, independent expert evidence, and participating in the technical conference following the review of interrogatory responses

- ***supported Manitoba cost of service review:*** London Economics International LLC ("LEI") was retained by Christian Monnin Law Corporation, at the request of Manitoba Public Utilities Board, to represent the interests of small commercial customers in its review of Manitoba Hydro's cost of service review

- ***supported setting of Nova Scotia Performance Standards:*** LEI was engaged by the Nova Scotia Regulatory Authority – the Nova Scotia Utility and Regulatory Board (NS UARB) to assist in setting performance standards for NSPI in respect of reliability, response to adverse weather conditions, and customer service for Nova Scotia

- ***conducted NYC entities capacity portfolio analysis:*** For a large Canadian hydropower generator, LEI performed a review and analysis of the capacity portfolio of several entities operating within New York City

- ***served as Ukraine Electricity Tariff Expert:*** As part of a team hired by the Anti-Crisis Energy Group of the Cabinet of Ministers of Ukraine, LEI was tasked with identifying opportunities to streamline and enhance procedures used to set tariffs and prices for electricity produced. LEI performed an extensive literature review of the Ukrainian electricity market, assessed the current tariff-setting regulations and procedures and carried out in-person interviews with stakeholders. LEI wrote a briefing memo on the Ukrainian market and a recommendations paper in line with its scope of work. The recommendations were incorporated into an Energy Resiliency Plan that would aid decision-making to the Cabinet of Ministers and the Verkhovna Rada

- ***Conducted 2015 Review of Non-Energy Margin***: London Economics International LLC ("LEI") was asked by ENMAX Energy Corporation ("EEC") to review EEC's proposed non-energy

return/risk margin associated with expenses incurred as a result of operation of the Regulated Rate Option ("RRO"). For the client, LEI reviewed the settled practice in Alberta, recent proposed changes providing for an all-inclusive return margin, and calculated an indicative range of margin for EEC.

- ***overview of Colombia market and revenue forecasts for target assets:*** LEI was hired by an electric operator for the purposes of valuing a portfolio of generating assets in Colombia. LEI's scope of work consists of a comprehensive review of the Colombia energy market (including fuel and power market drivers), describe in details the functioning of both wholesale power market and firm energy market (capacity market), develop forecasts of spot prices in order to derive expected revenues for the portfolio. Colombia being a hydro dominated system, as part of its modeling exercise, LEI ran a Monte Carlo simulation to develop a series of probabilities associated with generation profiles of Colombia's hydro resources to reflect the impact of weather conditions and water inflows on hydropower plants' output. LEI summarized its research and modeling results in a final report that was presented to lenders and other interested parties

- ***conducted analysis of Nova Scotia electricity systems:*** LEI was retained by Nova Scotia Department of Energy ("NS DOE") to perform analysis of the organization and governance of electricity systems both cross-jurisdictionally and within the province of Nova Scotia. The scope of work was divided into two main phases: (i) Review of international best practices and lessons learned; and (ii) Translation of best practices and lessons learned into best fit for NS

- ***assessed consistency of proposed Clean Energy Standard with existing Alberta electricity market design characteristics:*** Paper included discussion of potential additional program attributes, indicative cost assessment, impact on investment and reliability, and assessment of further required research

- ***Ontario electricity market paper:*** on behalf of a respected Canadian think tank, LEI provided an assessment of the ways in which the Ontario electricity sector could be improved to increase economic efficiency and reduce costs for consumers over the long run

- ***assisted generator in hydro development strategy:*** assisted Alberta generator on strategy related to new large scale hydro development, including justification as inflation hedge for potential pension fund investors, integration into competitive market while maintaining ability to finance, and other strategic and regulatory support

- ***conducted IBR workshop in Malaysia:*** LEI was retained by the largest electric utility company in Malaysia to conduct a workshop on incentive-based ratemaking ("IBR"). The topics for the workshop include theoretical conceptual overview of IBR regulatory framework, key elements of comprehensive IBR regimes, best practices of IBR in various jurisdictions, timing and framework in other jurisdictions, how to convince regulators and stakeholders, identifying barriers to successful implementation of the IBR, and moving from first to second generation IBR, to name a few.

- ***developed a transmission cost causation study for the Alberta Electric System Operator ("AESO"):*** the study will be used for the determination of the AESO's Demand Transmission Service Rate DTS, and is expected to be filed with AESO's 2014 tariff application to the Alberta Utilities Commission ("AUC"). The study is intended to cover four main topics: (i) Functionalization of Capital Costs; (ii) Functionalization of Operating & Maintenance ("O&M") costs; (iii) Classification of Bulk and Regional System Costs; and (iv) Implementation Considerations

- ***conducted review of gas transmission sector in the US:*** for a European economic advisory firm, LEI reviewed the US gas transmission sector focusing on its regulatory structure. Tasks included researching the regulatory approach, legal framework, allowed capital costs and incentive mechanisms of the US gas industry

- ***review of rate of permitted return in Hong Kong:*** for the Hong Kong Government, LEI reviewed the rate base and the rate of permitted return for the power companies in Hong Kong under the Scheme of Control Agreements. This required reviewing the alternatives to using Average Net Fixed Assets as the rate base, examining the assumptions used and methodology to calculate the WACC of power companies, updating the indicative range for the permitted rate of return, and recommending changes to existing rates of return by identifying new international best practices

- ***provided a briefing for Alberta's Minister of Energy:*** briefings consisted of two 90 minute presentations – the first was a review of the Alberta Retail Market, and the second was a wholesale market review of ERCOT, Australia, Singapore, UK and Ontario

- ***supported client's transmission FBR reopener application:*** in particular, the client wanted LEI to provide an independent opinion on their argument (i) to amend the G factor calculation to eliminate the G-factor lag effective January 1, 2011 and (ii) to reduce EPC's current X factor of 1.2% to 0.0%. LEI provided support throughout the whole litigation proceeding by responding to information requests which involved additional research and analysis, including synthesis of publications on recent technological advances in electricity transmission sector, and updating the Ontario LDCs TFP model to ten years

- ***reviewed the US gas transmission sector focusing on its regulatory structure:*** on behalf of a European economic advisory firm, an LEI team, led by AJ, reviewed the US gas transmission sector. Tasks included researching the regulatory approach, legal framework, allowed capital costs, and incentive mechanisms of the US gas transmission industry. Analysis focused on US Federal Energy Regulatory Commission ("FERC") regulatory proceedings, as well as state commission findings, related to allowed returns, capital investment requirements, and treatment of capacity

- ***developed financial, commercial, and regulatory framework, in addition to drafting an investment strategy and model for Saudi clean energy institution:*** deliverables included: (i) A master plan on how to develop renewable and atomic energies based on local value chains in Saudi Arabia; (ii) An economic framework to create a favorable environment in order to follow this master plan; (iii) An investment strategy to make use of KSA resources and

available funds in an efficient way; (iv) A multitude of international case studies to avoid costly mistakes in the future and to know when to adopt; (v) A final report on 'National Policy for Investment in Alternative Energy Sources'; and (vi) Two 'sales pitch' documents for submittal to the King's Supreme Council and for the financial community

- ***advised Jordan regulator:*** advised the regulator on the weighted average cost of capital and optimal capital structure for Jordan's three distribution companies: EDCO, IDECO and JEPCO. The recommended optimal capital structure was consistent with targeted debt service and interest coverage ratios in line with the rating methodology for distribution companies from the global credit rating agencies. Work also included identifying salient risk factors for the distribution companies, identifying appropriate local and international metrics and benchmarks, developing a usable cost of capital model, and providing training workshops for local staff

- ***drafting National Renewable Energy Plan for Saudi Arabia:*** on behalf of the regulator, developed proposal for renewable energy plan for Saudi Arabia, including assessment of procurement methods, new institutions required, and determination of resource eligibility

- ***rate design for water and wastewater services in Saudi Arabia:*** on behalf of utility serving industrial areas in the Kingdom, examined appropriate regulatory structure and recommended approach to establishing new regulatory body, including composition of regulator, incentive structure, and tariff modeling

- ***design of wheeling tariff and pilot program for Saudi Arabia:*** for Saudi regulator, developed proposed plan for wheeling of power in Saudi Arabia, including proposed pilot program, assessment of impact on incumbent, relative economics of wheeling versus the industrial tariff, and review of associated commercial and regulatory issues

- ***tariff design for Kingdom of Saudi Arabia:*** led engagement with international team assessing tariff design, modeling, and electricity market evolution in Saudi Arabia; engagement resulted in a revised tariff system, including performance based rates, tolling agreements for generation, and an open access tariff. Included holding workshops for regulator in explaining cost of capital, tariff design, and other regulatory issues

- ***Electricity Industry Restructuring Plan for Saudi Arabia:*** AJ developed the blueprint for industry restructuring in Saudi Arabia, including unbundling of the current monopoly vertically integrated utility, introduction of wholesale competition, and creation of a Single Buyer

- ***developed regulatory incentives in Jordan:*** examined regulatory framework in Jordan, with particular focus on creating specific regulatory incentives for distribution companies to optimize their operational expenses. Proposals envision move away from cost of service regime to incentive based structure benefiting customers and shareholders

- ***global regulatory review:*** assisted private equity player in assessing electricity markets in Eastern Europe, Turkey, Asia, and Latin America to determine potential regulatory and

market issues associated with proposed purchase of diverse portfolio of generation, distribution, natural gas pipeline, and retail fuels businesses

- ***assessed retail margin review for generator in India:*** reviewed retail margins on electricity sales worldwide, in order to provide Indian generator insight with regards to appropriate retail margins that could be charged to selected customers in one Indian jurisdiction. Engagement involved review of case studies of electricity retail margins around the world, including the US, UK, and Australia. In addition, retail margins in other industries were reviewed, along with the progression of margins as an industry progresses from infancy to maturity

- ***institutional development for IPP promotion:*** contributed to Indian private power promotion efforts through technical assistance program to state electricity boards, central government agencies, and private firms, with particular emphasis on role of PURPA in creating US IPP industry

- ***bagasse cogeneration:*** worked extensively with Indian sugar mills, equipment suppliers, government investment promotion agencies, and state electricity boards to develop cost-effective targeted loan and technical assistance program to promote bagasse cogeneration

- ***barriers to introduction of new coal combustion technologies in emerging markets:*** served as liaison between India's National Thermal Power Corporation (NTPC) and US research institutions to assess ways to adapt US coal combustion technologies to Indian conditions

- ***recommendations for next Scheme of Control in Hong Kong:*** worked with the Hong Kong government to develop a series of recommendations regarding appropriate allowed returns, calculation of asset base, prevention of over-investment, and rate stability

- ***lessons from North American experience for Chinese regulators and grid companies:*** for a set of Chinese state-owned companies, including grid operators, the nuclear operating company, and provincial power companies, London Economics International LLC prepared a series of detailed briefings on developments in electricity market design worldwide, with a particular emphasis on lessons from the North American experience. This experience was then used to highlight the various alternatives for market design in China, and the potential outcomes

- ***implications of restructuring the Japanese power sector:*** for a major Japanese development bank, we analyzed the impact of proposed reforms on a Japanese transmission and generation company, including the potential for stranded costs, opportunities for expansion of transmission, and future tariff setting regimes. The engagement included extensive training of the development bank's staff, as well as the creation of a working model of the Japanese power sector

- ***preparing appropriate framework for private investment in Romanian distribution sector:*** on behalf of a private client, worked with Romanian regulators to develop a consensus on approaches to capital recovery, PBR application, performance standards, supply cost-pass

through, and cost of capital. These elements served as preconditions for the private investor's participation in the privatization process

- ***arguments for retaining vertical integration:*** for large French utility, reviewed cases worldwide in which during liberalization incumbents were allowed to remain active across the value chain, including retail. Our work included an assessment of the minimum competition enhancing measures regulators may require in order for the utility to continue operating in all or most of its traditional supply chain activities

- ***implications of performance based ratemaking (PBR) in the Caribbean:*** for a privately owned integrated electric company based on a well developed Caribbean island, directed strategic analysis of implications of PBR, suggested approach to regulators, and provided indicative benchmarking analysis

- ***review of stranded cost settlement and default supply pricing:*** prepared support for regulatory filing in Pennsylvania assessing benefits to customers from a proposal to extend recovery period for competitive transition charge while extending fixing price for default supply

- ***assessment of changes in market power for a FERC Section 203 filing:*** in connection with a proposed combination of generation portfolios, developed testimony concerning the change in market concentration as a result of the transaction, including an assessment of changes in HHIs under various market definitions

- ***review of durability of gas franchises in the face of competition:*** reviewed state regulator decisions and FERC rulings regarding sanctity of natural gas distribution franchises, assessed relevance in the face of deregulation of gas markets

- ***market response to tax credit:*** performed in-depth analysis of impact of Section 29 tax credit for non-conventional fuels production on supply and price response in US southwestern gas markets

- ***economic efficiency effects of retail market design:*** for major US electricity retailer, analyzed various forms of retail electricity competition and default service parameters and compared them to retail/wholesale structure in other industries to determine welfare effects

- ***assessed potential cost of Ontario Green Energy Act:*** explored costs of Green Energy Act, including feed in tariff provisions, grid connection funding, institutional development, loss of local control, and stakeholder mandates

- ***cost of capital for regulated generating assets:*** provided expert testimony on behalf of the Ontario Energy Board regarding risk factors associated with Ontario Power Generating's prescribed assets, as well as creating a risk-return continuum on which power sector assets could be placed

- ***incentive-based contract design:*** for Ontario Power Authority, advised on provisions of power purchase agreement associated with incentives for optimization of production in peak periods for hydro facility owned by a major generator

- ***upstream capability to deliver conservation and demand management:*** for Ontario Power Authority, performed examination of capabilities of Ontario to provide necessary inputs to assure that Ontario meets is conservation and demand management targets; report incorporated into Integrated Power System Plan submission to OEB

- ***design of incentive rate structure for Alberta utility:*** for a large metropolitan Alberta utility, AJ advised on design of a proposed incentive based rate structure, including a multi-year term, operating cost incentive structure, and earnings sharing mechanism. Deliverables aided in development of regulatory filings and included testimony before the Alberta Utilities Board

- ***regulation of generation in Ontario:*** for Ontario Energy Board, AJ authored paper described the ways in which legacy assets of Ontario Power Generation could be regulated, including incentive regulation and a set of regulatory contracts. Deliverables included providing technical advisory during public workshop

- ***potential for regulation of retail market auctions:*** for Ontario Energy Board, AJ led engagement to review practice of regulatory oversight of load auctions to serve default supply across North America

- ***examination of contracting processes in Ontario:*** on behalf of the Ontario Power Authority, met with over 50 stakeholder groups to determine potential ways in which contracting process for new supply could be improved. Engagement included assessing practices in other jurisdictions and review of standard offer processes

- ***critiquing and improving electricity market structure in Alberta:*** for market institutions and regulators in the Canadian province of Alberta, performed extensive analysis of current industry market structure, including role of Power Pool, Transmission Administrator, Market Surveillance Administrator, the Scheduling Coordinator, and the Balancing Pool. Directed detailed analysis of market power issues associated with divestiture of specific assets and advised on particular market rules to ameliorate strategic behavior

- ***recommendations regarding market power mitigation and retail market design:*** in two separate engagements, advised the Government of Alberta on alternatives for rate designs for small customers and on measures to monitor, measure, and ameliorate market power; both engagements included extensive modeling of Alberta wholesale market and of retail supply tariffs

- ***evaluation of rates across Canada:*** reviewed rates charged to final consumers across Canada and identified distortions in rate design across provinces; performed modeling to adjust for distortions; developed appropriate calculations to appropriately compare rates across jurisdictions

- ***resource adequacy mechanisms for Alberta:*** worked with generators association to assess alternative approaches to assuring resource adequacy. Reviewed mechanisms for capacity and default supply procurement worldwide, developed alternatives for Alberta, and engaged in intensive stakeholder consultation

- ***strategic implications of US deregulation:*** performed in-depth study of the impact of unbundling in the US on the fundamental economics of the electric power industry at all points on the value chain; identified regional investment opportunities congruent with these dynamics

- ***2nd generation PBR in Ontario:*** led Cdn. $1.5 million engagement focusing on design of second generation PBR in Ontario. Key components include estimating total factor productivity (TFP), determining appropriateness of yardstick competition, analyzing demand-side management programs in the context of PBR, and examining service quality indicators

- ***market power concerns in Ontario:*** determined concentration ratios for existing configuration of generation plant, developed set of recommended portfolios to minimize market power across all timeslots in hourly market in preparation for divestiture or other market power mitigation mechanisms

- ***Regulatory review of power markets for Chilean client:*** at the request of a major Chilean generating company, LEI performed a detailed review of the regulatory regimes of four restructured power markets (California, Colombia, Nord Pool, and Spain), as well as an analysis of the current Chilean regulatory regime and the changes to that regime that the regulator has proposed. The review addressed the positions of all stakeholders, with a particular focus on the implications of various types of market design on generators

Written and oral expert testimony

Note: expert testimony was also a component of some projects listed above, particularly regulatory projects for Ontario Power Authority, Ontario Energy Board, and involving incentive rates in Alberta.

- ***expert testimony on refiled Grid Plan:*** LEI provide the following services to Constellation Energy: (i) an assessment of proposals made by ComEd and other parties in the Case; (ii) preparation of data requests on behalf of Constellation and assessment of other parties' data requests and responses provided during the Case; (iii) preparation of multiple rounds of written expert testimony, as necessary, for filing in the Case; (iv) participation in the evidentiary hearing for the Case, including appearing for live testimony/cross-examination, as necessary; (v) consulting with Law Firm and Client regarding analysis and strategy relating to the Case; (vi) providing such other services related to its role as an expert witness in the Case as may be requested by the Law Firm

- ***provided expert witness services:*** London Economics International LLC ("LEI") was engaged by an international law firm to provide expert witness services in a legal dispute regarding interpretation of a Feed-in Tariff contract for a rooftop solar facility in Ontario

- ***avoided costs expert in South Carolina:*** LEI was engaged by the Public Service Commission of South Carolina ("SC PSC") for a second time to serve as a qualified, independent third-party consultant in the state's 2023 avoided cost proceedings (Docket No. 2023-15-E, Dominion Energy South Carolina; Docket No. 2023-16-E, Duke Energy Carolinas; Docket No. 2023-17-E, Duke Energy Progress). LEI had previously served a similar role in the 2021 avoided cost proceedings. As part of the 2023 engagement, LEI evaluated the avoided cost rates, methodologies, terms, calculations, and conditions outlined in each of the utility's applications, and then filed expert reports outlining LEI's opinion of each utility's calculation of avoided costs based on evidence in the record. The LEI team also responded to discovery and testified before the SC PSC.

- ***avoided costs expert in South Carolina:*** LEI was engaged by the Public Service Commission of South Carolina ("SC PSC") to serve as a qualified, independent third-party consultant in three avoided cost proceedings (Docket No. 2021-88-E, Dominion Energy South Carolina; Docket No. 2021-89-E, Duke Energy Carolinas; Docket No. 2021-90-E, Duke Energy Progress). LEI first evaluated the avoided cost rates, methodologies, terms, calculations, and conditions outlined in each of the applications, and then filed expert reports outlining LEI's opinion of each utility's calculation of avoided costs based on evidence in the record. The LEI team was also available to respond to discovery, be deposed, cross-examined, and to testify before the SC PSC as requested

- ***review of valuation metrics used in conjunction with tax payment challenge for an Alberta generator:*** assessed the appropriateness of valuations utilized to determine depreciation deductions related to the acquisition of a coal-fired generating station. Engagement also required creating forecasts that would have been appropriate at the time the acquisition was made several years previously, as well as calculating asset values using multiple valuation approaches. Multiple forecasting tools were used. Engagement included developing critiques of work by opposing expert witnesses

- ***examination of Swiss electricity market:*** for a US financial institution, AJ reviewed the development of the Swiss electricity market and specifically the position of hydro stations within that market. Analysis included a discussion of the factors that influence the value of hydro stations, presence of foreign owners in the Swiss electricity market, and use of post-tax cash flow to evaluate potential investments

- ***analysis of potential customer impacts due to holding company acquisition of merchant generator:*** discussed ways in which customer rates would be impacted by potential credit rating downgrades of regulated subsidiaries due to holding company parent's acquisition of merchant generator; engagement included examination of impact on default supply as well as reliability

- ***assessment and valuation of quantum merit claims:*** for advisor and developer of biomass facilities, provided expert opinion on value of services provided based on industry knowledge, review of correspondence, and experience providing or commissioning similar services

- ***conservation and demand management (C&DM) in Ontario:*** wrote testimony related to the alternative ratemaking approaches available regarding C&DM; addressed innovative alternatives and compared and contrasted various schemes in the Ontario context

- ***review of Dutch electricity market regulatory dynamics:*** in a case before the US Federal Court of Claims related to economic substance, provided understanding of how Dutch electricity market was structured in the mid-1990s, how it was expected to evolve, and how it did actually evolve. Issues addressed included market structure, regulation, role of non-utility investors, and role of private and international investors

- ***valuation of PPAs associated with IPPs in Thailand:*** as an expert witness in an arbitration case, AJ quantified the change in value resulting from modifications to several PPAs associated with a power project in Thailand. Engagement included review of PPAs, evaluation of Thai power sector restructuring process, extensive modeling of financial aspects of PPAs, and assessment of financing alternatives; client won on all claims

PUBLICATIONS:

Goulding, AJ. "Mind the Gap: The Impact of Budget Constraints on Ontario's Net Zero Plans." C.D. Howe Institute. May 2024.

Goulding, AJ. "Potential implications of the COVID-19 crisis on long-term electricity demand in the United States." Center on Global Energy Policy at Columbia University. October 2020.

Goulding, AJ and Jarome Leslie. "Dammed If You Do: How Sunk Costs Are Dragging Canadian Electricity Ratepayers Underwater." C.D. Howe Institute. January 2019.

Goulding, AJ and Stella Jhang. "Secretary Perry's Grid Resiliency Pricing Rule: On Market Interventions and Minimizing the Damage." Columbia University. SIPA – Center on Global Energy Policy. October 2017.

Goulding, AJ. "Railroads, Utilities and Free Parking: What the Evolution of Transport Monopolies Tells Us About the Power Network of the Future." Columbia University. SIPA – Center on Global Energy Policy. November 2016.

Goulding, AJ "A New Blueprint for Ontario's Electricity Market." C.D. Howe Institute. Commentary No. 389. September 2013.

Goulding, AJ and Serkan Bahçeci. "Stand-by rate design: Current issues and possible innovations." *Electricity Journal*, June 2007, pp 87 – 96.

Goulding, AJ and Bridgett Neely. "Picture of a Stalled Competitive Model" *Public Utilities Fortnightly*, February 2005, pp 35 - 42.

Goulding, AJ and Bridgett Neely. "Acceding to Succeed" *Public Utilities Fortnightly*, July 2004.

Goulding, AJ "Let's Get This Party Started: Why Ontario needs a competitive market" *Public Utilities Fortnightly*, May 2004, pp 16 - 20.

Goulding, AJ and Nazli Z. Uludere. "Uncovering the *true value* in merchant generation" *Electricity Journal*, May 2004, pp 49-58.

Goulding, AJ "On the Brink: Avoiding a Canadian California" *Public Utilities Fortnightly*, February 5, 2003.

Goulding, AJ, Julia Frayer, Jeffrey Waller. "X Marks the Spot: How UK Utilities Have Fared Under Performance-Based Ratemaking" *Public Utilities Fortnightly,* July 15, 2001.

Goulding, AJ, Julia Frayer, Nazli Z. Uludere. "Dancing with Goliath: Prospects After the Breakup of Ontario Hydro" *Public Utilities Fortnightly*, March 1, 2001.

Goulding, AJ, Carlos Rufin, and Greg Swinand. "Role of Vibrant Retail Electricity Markets in Assuring that Wholesale Power Markets Operate Effectively." *Electricity Journal*, December 1999.

Adamson, Seabron and AJ Goulding. "The ABCs of Market Power Mitigation: Use of Auctioned Biddable Contracts to Enhance Competition in Generation Markets." *Electricity Journal*, March 1999.

Goulding, AJ "Retreating from the Commanding Heights: Privatization in an Indian Context." Columbia University: *Journal of International Affairs*, Winter 1997, pp. 581-612.

Hass, Mark R. and AJ Goulding. "Impact of Section 29 Tax Credits on Unconventional Gas Development and Gas Markets." Society of Petroleum Engineers: SPE 24889, presented at 67th Annual Technical Conference, Washington, DC, October 6, 1992.

SPEAKING ENGAGEMENTS:

"One Year On: a Transatlantic Perspective for Clean Energy Investments" Panelist, Frontier Economics live webinar. February 28th, 2024

"Resilience in the Electricity Sector." Speaker, City of Toronto, Ontario, Canada. Seminar. February 9th, 2024.

"Innovations in Wholesale Market Design and Governance." Panelist, Ivey's 7th Annual Electricity Workshop. October 16th, 2023.

"Ensuring Affordability." Panelist, Electricity Canada's Regulatory Forum. Toronto, Ontario, Canada. May 10th, 2023.

"Meeting Ontario's Resource Challenges." Panelist, Ontario Energy Association ("OEA") Conference. Toronto, Ontario, Canada. September 19th, 2022.

"***Alternative Approaches to Modelling and Planning***." Speaker, APPrO. Toronto, Ontario, Canada. November 29th, 2021.

"International Lessons on Regional Transmission and Market Integration." Panelist, Electricity Transformation Canada Conference and Exhibition. Toronto, Ontario, Canada. November 17th, 2021.

"Is There a Future for Mega Energy Projects?" Panelist, Ivey's 4th Annual Workshop on the Economics of Electricity Policy and Markets. October 6th, 2020.

"COVID-19 related demand destruction and its implications for utilities and IPPs." Speaker, Bank of America's 2020 Future of Power Conference. September 23rd, 2020.

"Fortune-Telling and Fortune-Seeking: The Future of the Power Markets in New England." Panelist, Northeast Energy and Commerce Association ("NECA") Wholesale Panel discussion. Webinar. May 20th, 2020.

"Examining Risk & Opportunities In Canada's Procurement Models." Panelist, Gowling WLG's live webinar. May 23rd, 2019.

"***System and Tariffs impacts of increasing distributed generation."*** Speaker, CAMPUT. Calgary, Alberta, Canada. May 7th, 2019.

"Rate design and fixed cost recovery revisited." Panelist, Ivey Energy Policy and Management Centre ("EPMC"). Toronto, Ontario, Canada. October 22nd, 2019.

"Alternative Regulatory Approaches." Speaker, Electricity Distributors Association Energy Business Innovation Conference. Toronto, Ontario, Canada. October 22nd, 2019.

"Regulation" – Keeping up with the pace of change." Panelist, APPrO. Toronto, Ontario, Canada. November 12th, 2018.

"Blockchain and the Grid." Panelist, Wires Conference. Washington, DC, USA. October 25th, 2018.

"Considerations for policymakers regarding capacity mechanism design." Speaker, Independent Power Producers Society of Alberta ("IPPSA"). Calgary, Alberta, Canada. July 17th, 2017.

"Future Models for Utility Ownership and Regulation in Hawaii." Speaker, VERGE Hawaii: Asia Pacific Clean Energy Summit. Hilton Hawaiian Village, Honolulu, Hawaii, US. June 20th, 2017.

"Capacity Market Review: Workshop #2." Speaker, Independent Power Producers Society of Alberta ("IPPSA"). Calgary, Alberta, Canada. June 14th, 2017.

"Capacity Market Review: Workshop #1." Speaker, Independent Power Producers Society of Alberta ("IPPSA"). Calgary, Alberta, Canada. May 18th, 2017.

"Distributed Energy Resources: Regulatory Framework and Ratemaking Considerations." Speaker, CAMPUT Annual Conference 2017's CEA's Regulatory Innovation Task Group. Vancouver, British Columbia, Canada. May 10th, 2017.

"From Theory to Practice: Disruptive Technologies, Innovation and the Future of the Utility." Panelist, Northwind Professional Institute 13th Annual Electricity Invitational Forum, Langdon Hall, Cambridge, Ontario, Canada. January 27th, 2017.

"Ontario's Electricity Sector: Does the Current Institutional Framework Serve the Public Interest? Is it Times for Ontario to Consider a Fundamental Redesign?" Discussion Leader, Northwind Professional Institute 11th Annual Electricity Invitational Forum, Langdon Hall, Cambridge, Ontario, Canada. January 30th, 2015.

"What's Next for Ontario's Electricity Market?" Panelist, C.D. Howe Institute Roundtable, Toronto, Ontario, Canada. September 16th, 2014.

"Prices and Costs, Why Rates Don't Tell the Whole Story" Speaker, Making Markets Work Symposium – Manning Centre, Calgary, Alberta, Canada. June 25th, 2014.

"Examining the Future Structure of Ontario's Electricity Market: Should Ontario Incorporate a Capacity Market or Alternative Structural Framework?" Panelist, Ontario Power Conference, Toronto, Ontario, Canada. April 15th, 2014.

"Electricity Prices – Economics, Public Policy, Technologies and Affordability" Panelist, CCRE Energy Leaders Roundtable, Hockley Valley Resort, Orangeville, Ontario, Canada. March 27th, 2014.

"Priorities for enhancing Ontario's electricity market: What direction forward?" Panelist, APPrO, Toronto, Ontario, Canada. November 20th, 2013.

"Evolving Regulation in Ontario: Best Practices from Other Jurisdictions" Panelist, Ontario Energy Association's ENERGYCONFERENCE13, Toronto, Ontario, Canada. September 11th, 2013.

"Points to consider when valuing hydro in the US" Speaker, HydroVision 2013, Denver, Colorado, US. July 26th, 2013.

"Pricing Power in Ontario: Perspectives and Competitive Analysis on the Future Direction of Ontario Electricity Rates" Panelist, Ontario Power, Toronto, Ontario, Canada. April 17th, 2013.

"Why Alberta* is *Still Standing" Panelist, Independent Power Producers Society of Alberta's 19th Annual Conference – Last Market Standing?, Alberta, Canada. March 11th, 2013.

"Market Evolution in the context of the EMF and the post-election environment" Panel Moderator, Association of Power Producers of Ontario, Toronto, Ontario, Canada. November 16th, 2011.

"Green Energy Economics" Panelist, Electricity Distributors Association's ENERCOM, Toronto, Ontario, Canada. March 30th, 2011.

"Projected Supply-Demand Balance in Ontario: A Call to Inaction" Speaker, APPrO, Toronto, Ontario, Canada. November 18th, 2010.

"Changes in electricity policy: what will it cost?" Speaker, 2010 Ontario Energy Association Annual Conference, Niagara Falls, Ontario, Canada. September 21st, 2010.

"Energy Infrastructure Spending" Debate Panelist, Canadian Association of Members of Public Utility Tribunals (CAMPUT), Montreal, Ontario, Canada. May 5th, 2010.

"Strategic implications of the Ontario Green Energy Act" Presentation to Ontario Energy Association Green Energy and Conservation Joint Sector Committee, Toronto, Ontario, Canada. June 24th, 2009.

"Strategic implications of evolution of North American utilities sector in response to environmental initiatives" Presentation to Mitsui Canada Leadership Forum, Toronto, Ontario, Canada. June 17th, 2009.

"Making retail competition work in electricity" Speaker, Illinois Commerce Commission Retail Competition Workshop, Chicago, Illinois, US. October 2nd, 2006.

"Gods and monsters: the role of the Ontario Power Authority in Ontario's hybrid market" Speaker, Ontario Energy Association annual conference, Niagara Falls, Ontario, Canada. September 14th, 2005.

"Transmission investment in today's power markets: key considerations" Presentation to the Wyoming Infrastructure Authority, Casper, Wyoming, US. May 26th, 2005.

"The true cost of power: comparing rates for power across Canada" Speaker, Independent Power Producers Society of Alberta conference, Banff, Alberta, Canada. March 15th, 2005.

"Key considerations with regards to resource adequacy mechanisms in Alberta." Speaker, Independent Power Producers Society of Alberta luncheon, Calgary, Alberta, Canada. November 3rd, 2004.

"Finding the silver lining: investment opportunities in Canadian power markets" Speaker, 2004 Canada Power Conference, Toronto, Ontario, Canada. September 30th, 2004.

"Adding value for the shareholder: Managing small utilities in a period of regulatory change." Speaker, Ontario Electricity Distributors Association, London, Ontario, Canada. June 8th, 2004.

"Case studies in electricity market design: learning from experience." Guest lecturer, Columbia University Center for Energy and Marine Policy graduate program, International Energy Systems and Business Structures class, New York, New York, US. April 8th, 2003.

"'The grass is always greener' vs. 'All of your eggs in one basket': investment outlook for California and foreign markets." Speaker, Platt's Global Power Markets Conference, New Orleans, Louisiana, US. March 31st, 2003.

"Transmission congestion, valuation, and investment issues in the region surrounding Ontario." Speaker, Canadian Institute conference on Inter-jurisdictional Power Transactions, Toronto, Ontario, Canada. April 8th, 2002.

"Update on new generation development in Alberta." Speaker, Canadian Institute Conference on Managing Electricity Price Volatility in Alberta, Calgary, Alberta, Canada. February 27th, 2002.

'The Alberta market structure and implications of structural change." Speaker, Insight Conferences Alberta Power Summit, Calgary, Alberta, Canada. February 22nd, 2002.

"Implications for developers of key aspects of competing Midwest ISO designs." Speaker, INFOCAST conference on Maximizing the Value of QFs and IPPs, Orlando, Florida, US. February 1st, 2001.

"Risk and rewards from PBR for US utilities: lessons from overseas." Speaker, UTECH 2000 conference, St. Petersburg, Florida, US. November 30th, 2000.

"Dancing with Goliath: increasing competition in Ontario wholesale generation market." Speaker, Canadian Independent Power conference, Toronto, Ontario, Canada. November 27th, 2000.

"Asset valuation in evolving global power markets." Speaker and case study facilitator, World Bank conference on Emerging Issues in the Power Sector, Washington, DC, US. April 19th-21st, 2000.

"***Overseas exposure: is it worth the risk?***" Speaker at Global Power Markets Conference, organized by Global Power Report and McGraw-Hill, New Orleans, Louisiana, US. April 16th -19th, 2000.

"***Profiting from retail: challenges for MEUs.***" Speaker at conference on buying and selling electric utilities in Canada, organized by IBC USA conferences, Toronto, Ontario, Canada. November 15th-17th, 1999.

"***Assessing the US electricity market and evaluating US targets***." Facilitator for workshop on US acquisition opportunities for European energy firms, organized by IIR Limited, London, England. February 9th-11th, 1999.

AJG-2:

Company response to Staff discovery request
STF-JKA-1-2a

PUBLIC DISCLOSURE
Georgia Power Company
Docket Nos. 56002 & 56003
2025 Integrated Resource Plan and 2025 Demand-Side Management Application
STF-JKA Data Request Set No. 1

STF-JKA-1-2

Question:

Regarding economic development projects, provide the following electronically, with all formulae intact:

a. Describe the process that Georgia Power uses to determine load materialization risk and inclusion/exclusion of prospective loads into the various base and sensitivity forecasts.

b. Provide an analysis/workpapers describing the economic development pipeline assumed in the load forecast in the 2025 IRP and compare that to the pipeline assumed in the 2023 IRP Update.

c. Explain what level of commitment is required from a customer to be included in the load forecasts. Describe the various stages of contract negotiation (Request for Service, Electric Service Agreement, etc.) in your response.

d. Identify each project that is included in the economic development portion of the load forecast, including the status of the project, the location of where each project is constructing facilities, load ramp and the expected load for each project.

e. Does the Company have any additional signed contracts with any new loads it expects to now serve that it did not identify at the time Georgia Power prepared the 2025 IRP? If so, please provide a list of such contracts and when they were signed and copy of contract. Also, provide the load ramp and expected load of these customers.

Response:

a. The Company continues to utilize the Load Realization Model ("LRM") developed for the 2023 IRP Update. The LRM uses a probabilistic approach to evaluate the range and likelihood of future potential outcomes of load growth from new committed and prospective large load customers. The LRM accounts for the size and various progress stages of individual projects in Georgia Power's large load economic development pipeline. The LRM assesses the risk associated with announced loads being realized by assigning lower likelihoods than to committed customers. As such, all projects are included in the load forecast, but at different levels of materialization.

b. For a detailed list of the economic development pipeline assumed in the load forecast in the 2025 IRP, please refer to Georgia Power's Q2 2024 Large Load Economic Development Report filed on August 16, 2024. For a comparison with the 2023 IRP Update, please see Table 2 of the provided report.

c. The LRM is a probabilistic model that includes all customers in Georgia Power's economic development pipeline, capturing the size and various progress stages of projects. The LRM assesses load materialization based on individual project milestones and characteristics. As

such, all projects in the Q2 2024 Large Load Economic Development Report are included in the company's load forecast, but at different stages and levels of likelihood.

For example, customers who have signed an Electric Service Agreement ("ESA") are treated as having a higher likelihood in the Company's LRM. Conversely, customers earlier in the process are generally treated as having a lower likelihood.

The contract negotiation process involves several stages:

1. Proposal Development/Contracting Phase: This phase involves developing a rate proposal which includes the method of service, target timelines for construction completion, and rate offerings.
2. Request for Service ("RFS"): The Company sends the RFS along with the rate proposal to the customer.
3. ESA: Once the RFS is signed, the Company drafts an ESA for the customer to execute.
4. Fully Executed Phase: Once the ESA is executed by the customer and returned, the project moves to the fully executed phase.

This structured approach ensures that projects are appropriately included in the load forecast based on their progress and commitment level.

d. Please see the report and workpaper filed in Docket No. 55378; Georgia Power's Q2 2024 Large Load Economic Development Report filed August 16, 2024.

e. Since the preparation of the 2025 IRP, the Company has identified three additional signed contracts with the projects listed below (TS):

1. **REDACTED**
2. **REDACTED**
3. **REDACTED**

The respective contracts for electric service are provided as trade secret STF-JKA-1-2 Attachments A through C.

AJG-3:

Company response to Staff discovery request
STF-GS-1-8

Georgia Power Company
Docket Nos. 56002 & 56003
2025 Integrated Resource Plan and 2025 Demand-Side Management Application
STF-GS Data Request Set No. 1

STF-GS-1-8

Question:

Please list all Alternative Transmission Technology and Grid-Enhancing Technology solutions that are proposed for deployment in the Ten Year Transmission Expansion Plan, including the cost and scheduled deployment for each solution.

Response:

Refer to STF-DEA-2-10 Attachment A. For the project-associated costs and need dates, refer to Table 2 (p 7), in Section D1 2024 GA Integrated Transmission System ("ITS") Ten-Year Plan of Technical Appendix Volume 3.

AJG-4:

Company response to Staff discovery request
STF-PIA-5-17

Georgia Power Company
Docket Nos. 56002 & 56003
2025 Integrated Resource Plan and 2025 Demand-Side Management Application
STF-PIA Data Request Set No. 5

STF-PIA-5-17

Question:

For each large load assumed in the IRP, please provide the new transmission projects identified as required to interconnect each individual large load.

Response:

Please refer to STF-PIA-5-16 Attachment TRADE SECRET. The TEAMS Project Number in column F can be used to identify the corresponding Project Name, Year, Need Date, Sponsor, and Estimated Costs in the 2024 Georgia Integrated Transmission System Ten-Year Plan in Technical Appendix Volume 3 of the 2025 IRP.

Station Name	PSSE Bus Number	Customer Name	Bus Name	Zone	TEAMS Project Number	2025 MW	2025 MVar	2026 MW	2026 MVar	2027 MW	2027 MVar	2028 MW	2028 MVar	2029 MW	2029 MVar	2030 MW	2030 MVar	2031 MW	2031 MVar	2032 MW	2032 MVar	2033 MW	2033 MVar	2034 MW	2034 MVar	2035 MW	2035 MVar
TWO RUN RANCH	[redacted]				20175	[redacted]																					
GREAT VALLEY					20031																						
TRAE LANE					19962																						
SHUGART FARMS					18736																						
MIDWAY					18996																						
HYUNDAI MOTORS					19523																						
ALIGNED - WINSTON (BAGGETT)					20769																						
BULLARD ROAD					20134																						
TRAMMEL CROW - WALDRUP FARMS					20770																						
SUMMER LAKE					19433																						
AWS BUTTS COUNTY (TOWALIGA)					20716																						
TILFORD YARDS					19590																						
CENTENNIAL YARDS					19411																						
DC BLOX (FARMER RD)					20463																						
SOUTHMEADOW					19432																						
TA REALTY - ELLENWOOD					20518																						
T5 SHUGART					20993																						
TA REALTY (RED OAK)					20851																						
TONEWALL TELL ROAD (CUSTOMER OWNE					20216																						
VANTAGE DC (MALLORY RD)					20633																						
BOULDER PARK					20581																						
CHARLES (CUSTOMER OWNED)					19904																						
CREOLA (CUSTOMER OWNED)					19904																						
DOWNRANGE					20223																						

AJG-5:

Company response to Staff discovery request
STF-GS-1-1

Georgia Power Company
Docket Nos. 56002 & 56003
2025 Integrated Resource Plan and 2025 Demand-Side Management Application
STF-GS Data Request Set No. 1

STF-GS-1-1

Question:

Please see the statement at page 15 in section A (Transmission Planning Description and Process) of the Volume 3 Technical Appendix that "The transmission planning process follows an iterative process with a planning horizon looking 10 years into the future. However, due to the dynamics of the assumptions and data used to develop the latter years of the system model, project proposals are usually fully developed for the first five years only (considered to be the near-term planning horizon). These projects and their mutual effects are tested throughout the full ten-year period. For issues in the last five years of the planning horizon, viable projects are identified but not fully scoped, estimated, and budgeted unless long lead-time items such as right-of- way acquisition are included."

a. Please explain in more detail why "project proposals are usually fully developed for the first five years only… For issues in the last five years of the planning horizon, viable projects are identified but not fully scoped, estimated, and budgeted...". Why does Georgia Power only fully develop project proposals for the first five years and not the last five years?

b. Please list any proposed projects that were not fully developed because they resolve issues in the last five years of the planning horizon.

c. Are supply chain constraints affecting the lead time and availability for key transmission equipment, e.g. high-voltage transformers and breakers, considered "long lead-time items" that could lead to a proposed project in the last five years of the planning horizon being fully developed?

d. Are permitting timelines for high-voltage transmission considered "long lead-time items" that could lead to a proposed project in the last five years of the planning horizon being fully developed?

e. When does Georgia Power plan to move to a 20-year transmission planning horizon to comply with FERC Order 1920-A?

f. If the Transmission Expansion Plan used a 20-year planning horizon, would more projects be proposed in the first 5 and 10 years of the plan than under the current Ten-Year Transmission Expansion Plan?

Response:

a. The Company fully develops projects that are in the first five years to provide sufficient lead time for timely construction and material procurement, particularly for long lead time items. The transmission system is constantly evolving, and the model continues to be updated with new assumptions on generation and load that could potentially change the scope and/or timeline for the projects in the last five years.

b. Refer to Section 3, Table 2 (p 16-20) of Section D1, 2024 GA Integrated Transmission System ("ITS") Ten-Year Plan, in Technical Appendix Volume 3, for the list of projects with needs dates starting in 2030 through 2034.

c. Yes. Supply chain constraints are increasing the lead time of key transmission equipment such as autotransformers, breakers, and disconnect switches. Projects with an extensive scope that require equipment with long lead times or may require land acquisition will need to be fully developed for timely construction and in-service date.

d. Yes. As the Company evaluates long lead times for materials or activities required for a project, such as permitting, and begins to develop solutions, it may result in a project in the last five years of the planning horizon starting its lifecycle process earlier.

e. FERC issued a notice on March 6, 2025, granting a 12-month compliance extension for Orders 1920 and 1920-A. The revised compliance date is now June 12, 2026, for regional requirements and August 12, 2026, for interregional requirements. Following compliance and upon implementation, Georgia Power will move to a 20-year planning horizon for the purposes of Southeast Regional Transmission Planning ("SERTP") on or before this deadline.

f. The transmission system is continuously evaluated throughout the planning horizon, and projects will be identified based on need using the Steady State Transmission Planning Criteria of the NERC Reliability Standard (TPL-001-5). Refer to Section III.A, Table 6 of the 2024 GA ITS Ten-Year Plan and Section B2, R3 of the ITS Planning Procedure #9, in Technical Appendix Volume 3.

AJG-6:

Company response to Staff discovery request STF-JKA-1-12

STF-JKA-1-12

Question:

Regarding the Natural Gas Price Forecast, provide the following electronically, with all formulae intact.

a. Provide all workpapers used to derive the low, medium, and high natural gas price forecasts (in nominal dollars) and show where the source of the information was taken from and how it was prepared for input into Aurora.

b. Provide a narrative description of the methodology used to prepare the low, medium and high natural gas price forecasts.

c. Explain if the forecast methodology has changed compared to the methodology used to prepare the natural gas price forecasts (low, medium and high) in the 2023 IRP Update.

d. Confirm the forecast is presented as a Henry Hub forecast, without delivery or transportation costs included. If not, please provide the underlying Henry Hub forecast without delivery or transportation costs.

e. Please provide the derivation of the delivery and transportation costs by unit as modeled in Aurora.

f. Provide any additional workpapers that were used to enter fuel cost information into the Aurora database.

g. If any other assumptions were made regarding fuel consumption limits, storage assumptions, etc., please provide all workpapers that were used to prepare those natural gas input assumptions for submission to Aurora.

h. Provide any other current natural gas price forecasts from any other source that are in the Company's possession.

Response:

a. STF-JKA-1-12 Attachment A TRADE SECRET provides the construction of the annual long-term, nominal natural gas price forecasts from AEO projections and the Company's forecast of inflation. STF-JKA-1-12 Attachment B TRADE SECRET provides the construction of the monthly short-term, nominal natural gas price forecast. It also provides the creation of monthly values from the long-term annual average values using monthly shaping percentages in row 6 on tab "HH Gas Prices." These workpapers show the calculation of nominal Henry Hub natural gas prices. The Company uses delivered natural gas prices in Aurora; see response to subpart (e).

b. A description of the methodology used to prepare the low, medium, and high natural gas price forecasts is provided in Section 3.5 of Technical Appendix Volume 2, Resource Mix Study TRADE SECRET submitted on January 31, 2025. The U.S. Energy Information Administration's ("EIA") Annual Energy Outlook ("AEO") natural gas price projections are provided annually in real values, and the Company escalates them at its forecast of inflation.

c. The methodology used to produce the natural gas price forecasts to support this IRP has not changed from the methodology used for the 2023 IRP Update.

d. The forecasts presented in response to subpart (a) above and described in the response to subpart (b) above all are for natural gas at the Henry Hub (without delivery or transportation costs).

e. There are four components of the Company's forecasts of delivered natural gas price used in Aurora. These components and their assembly into delivered prices are illustrated in STF-JKA-1-12 Attachment C TRADE SECRET. The following items refer to this attachment.

   - Construction of delivered prices begins with the Company's forecast of natural gas price at the Henry Hub (as described in response to subpart (b) above). See tab "Henry Hub" in the attachment.
   - For each pipeline system serving Company facilities, there is a basis differential between marketing at the Henry Hub and marketing on that regional pipeline. See tab "Basis Diff" in the attachment.
   - For each facility, there are costs for pipeline transportation of natural gas to the facility. See tab "Transportation" in the attachment for these costs for example facilities.
   - For each facility, there is a tax rate on delivered fuel. See tab "Tax" in the attachment for the tax rate for example facilities.
   - The assembly of these components into a delivered price is shown on tab "Delivered Prices" of the attachment for each facility.

f. As described in the response to subpart (e) above, the Company constructs a delivered price for a generic gas unit in each of Georgia, Alabama, and Mississippi. For entry into Aurora, these three price forecasts are aggregated into a single forecast for a generic system CT and a generic system CC. See STF-JKA-1-12 Attachment D TRADE SECRET.

g. In its Aurora modeling, the Company does not place any constraints on the use of natural gas at expansion facilities. In its Aurora modeling, the Company does have limits on the aggregate capacity of CCs that can be built as described in response to STF-JKA-1-11.

h. See the following attachments.

   a. STF-JKA-1-12 Attachment E TRADE SECRET (Platts June 2024)

   b. STF-JKA-1-12 Attachment F TRADE SECRET (Platts January 2025)

   c. STF-JKA-1-12 Attachment G (STEO March 2024)

   d. STF-JKA-1-12 Attachment H (STEO Dec 2024)

AJG-7:

Company response to Staff discovery request
STF-JKA-2-6

Georgia Power Company
Docket Nos. 56002 & 56003
2025 Integrated Resource Plan and 2025 Demand-Side Management Application
STF-JKA Data Request Set No. 2

STF-JKA-2-6

Question:

Refer to the Main Document page 60 which articulates the Company's intention to, "Issue RFPs designed to procure energy from up to 4,000 MW of renewable resources by 2035, including the 2026 Utility Scale RFP targeting 1,000 MW of utility-scale renewable resources expected to reach commercial operation between November 30, 2030, and November 30, 2032."

a. Please explain how the targets (MW) were derived. Explain the methodology used and provide the workpapers developed to derive the targets. Provide this electronically, with all formulae intact.
b. Please explain how the timeline (November 2030-2032) was determined.
c. When does the Company expect to issue the RFP for the Nov 2030-2032 resources?
d. When does the Company expect to issue the RFPs for the remaining resources needed by 2035 to reach 4,000 MW of renewable resources.
e. Explain if these planned procurements are related to the results of the Resource Mix Study and how they may or may not overlap with existing resource procurement plans.

Response:

a. The Company's intent with proposing an initial 1,000 MW target amount with the ability to procure up to 3,000 MW of additional resources was selected based on procurement expectations from ongoing RFPs, recent Georgia Power Utility Scale Renewable RFP experience, expected customer demand for new renewable energy, and generic renewable allocations to Georgia Power across all scenarios in the Company's 2025 IRP Resource Mix Study. provides the average generic renewable allocations that helped to inform the plan to add up to 4,000 MW of new renewable resources by 2035. Note that the years 2025 through 2031 are excluded from this calculation due to either (i) selection of zero renewable resources in the generic expansion plan for a given year or (ii) overlap with procurement years for active Georgia Power Utility Scale Renewable RFPs.

b. Allowing for changes in flexibility in required Commercial Operation Dates ("COD") provides more flexibility for the market. RFP participants will have an opportunity to submit projects and proposals with CODs over a range of years rather than a single date certain. Allowing flexibility both within and beyond the COD window range allows for the market to bid the most competitive projects and for the Company to consider a more projects for selection and thereby providing more value for Georgia Power's customers.

c. Pending Commission approval, the Company expects to issue the CARES 2026 Utility Scale RFP in Q3 2026.

d. No dates for subsequent renewable RFPs have been determined. Future renewable RFPs will be proposed to the Commission for approval as informed by customer needs and the results of prior solicitations.

e. As noted above, generic renewable allocations to Georgia Power across all scenarios in the 2025 IRP Resource Mix Study helped to inform the plan to add up to 4,000 MW of new renewable resources by 2035. Note that the years 2025 through 2031 are excluded from this calculation due to either (i) selection of zero renewable resources in the generic expansion plan for a given year or (ii) overlap with procurement years for active Georgia Power Utility Scale Renewable RFPs.

AJG-8:

Company response to Hearing Request HR-1-1 Attachment

File has been redacted in its entirety.

AJG-9:

Company response to Staff discovery request
STF-JKA-1-12

Attachment B

File has been redacted in its entirety.