Georgia Power

Bin 10230
241 Ralph McGill Boulevard NE
Atlanta, GA 30308-3374

PUBLIC DISCLOSURE

November 4, 2024

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

RE: Georgia Power Company's Integrated Hydrogen Microgrid Report, Docket Nos. 44160 and 44161

Dear Ms. Tanner:

In accordance with the Georgia Public Service Commission's (the "Commission") July 29, 2022 Order Adopting Stipulation in Georgia Power Company's ("Georgia Power" or the "Company") 2022 Integrated Resource Plan in Docket Nos. 44160 and 44161, enclosed for filing is Georgia Power Company's Q3 Integrated Hydrogen Microgrid Report ("Report").

The Report contains certain information that is being filed under the trade secret rules of the Commission. As such, a redacted version of this information and the basis for the trade secret assertion are also enclosed for public disclosure.

If you have any questions regarding this filing, please contact Cheryl Johnson at 404-506-6837.

Sincerely,

/s/ Jeremiah Haswell

Jeremiah C. Haswell
Director, Regulatory Affairs
Georgia Power Company
jhaswell@southernco.com

Enclosure

BEFORE THE GEORGIA PUBLIC SERVICE COMMISSION

GEORGIA POWER COMPANY
DOCKET NOS. 44160 and 44161

Basis for the Assertion that Redacted Portions of the Information Submitted are Protected Trade Secrets

In accordance with the Order Adopting Stipulation Agreement issued by Georgia Public Service Commission ("Commission") in Docket Nos. 44160 and 44161, Georgia Power Company ("Georgia Power" or the "Company") is providing to the Commission the Q3 Integrated Hydrogen Microgrid Report (the "Report"). The Report contains confidential information relating to the Company's business plans, forecasted costs, and projected budget (the "Information"). Such Information constitutes trade secret information of Southern Company, Georgia Power, and its affiliates, and is therefore protected from public disclosure under Commission Rule 515-3-1-.11.

The trade secret portions of the Information derive economic value from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from their disclosure or use. Specifically, the Information contains confidential details on the timing and estimated amount of forecasted costs, as well as a sensitive project schedule. The trade secret portions of the Information are considered confidential and proprietary by the Company and its contractors and are not generally known by the public. If the timing and projected costs were disseminated to the public, vendors, and service providers as well as competing projects could use the information to set a floor on pricing thereby arbitrarily increasing costs to Georgia Power's customers. In addition, if the timing of the costs were made public, a competitor or service provider on another project could leverage this information to gain access to equipment, supplies, and services in an already constrained market. Georgia Power's competitors are generally not required to reveal similar information and to require the Company to do so could place it at an economic disadvantage to the detriment of its customers.

The trade secret portions of the Information are subject to substantial procedures to maintain its secrecy. Only select Georgia Power and Southern Company personnel, and their legal counsel, are granted access to this information. Those personnel receive access only on a "need to know" basis. Parties outside Georgia Power and Southern Company and their legal counsel who have been granted access to the Information, if any, have been required to sign confidential agreements with respect to the Information.

Jeffrey R. Grubb, first being duly sworn, deposes and states that he has reviewed the attached document and that the information included in such document is accurate to the best of his knowledge and that the specific information designated as trade secret constitute trade secrets pursuant to Article 27, Chapter 1, Title 10 of the Georgia Code.

Jeffrey R. Grubb
Resource Planning Director

Subscribed and sworn to before me this 31 day of Oct, 2024.

Notary Public

My Commission expires:

DANIEL MCLEAN NOTARY PUBLIC COWETA COUNTY GEORGIA EXPIRES APRIL 26, 2026



Integrated Hydrogen Microgrid Project

Quarterly Report

Reporting Period End Date: September 30, 2024

Reporting Submission Date: November 4, 2024

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Key Updates (July 1 – Sept 30, 2024)

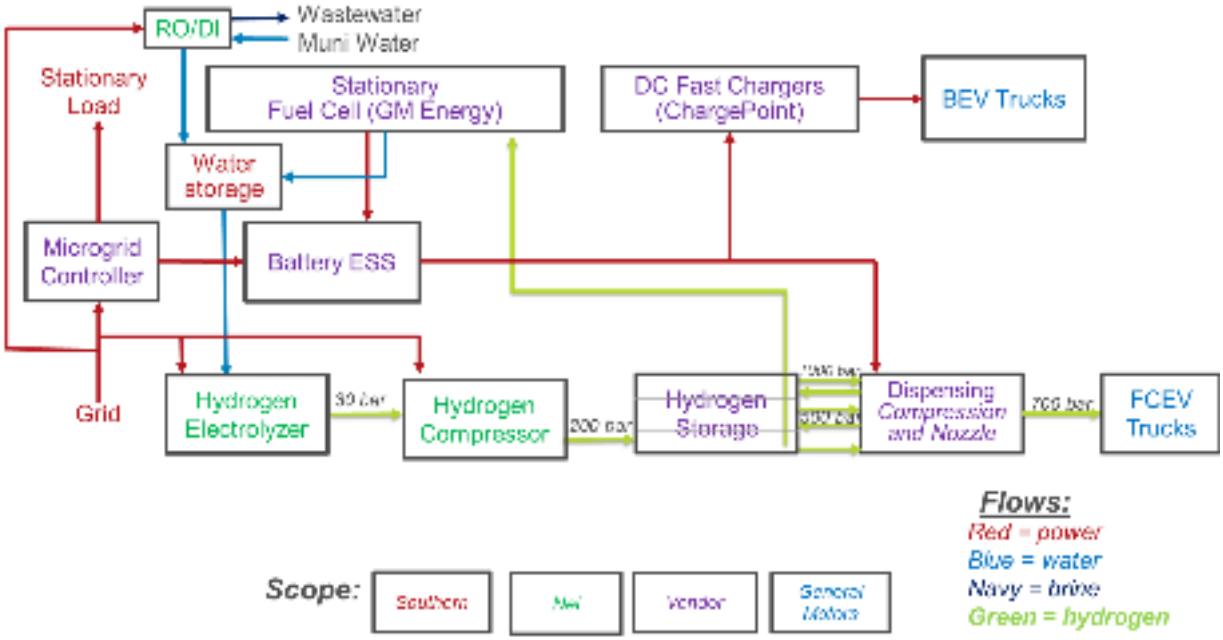
- Project layout and conceptual design to a sufficient level of detail to enable estimate of microgrid installation was completed.
- Updates have been made to the schedule reflecting:
    - About 1 month delay in deployment of mobile refueler and first vehicle from GM, primarily due to resource constraints in aftermath of Hurricane Helene
    - About 2-3-month delay in deployment of temporary refueler system due to manufacturing delays
    - About 2-month delay in subrecipient agreement with EPRI

Project Background

Hydrogen is an area that may provide customers with benefits as renewable penetration increases and technology improvements occur. Using a process known as electrolysis, energy providers can create hydrogen using electrical energy and water. The hydrogen created from this process can be utilized for many purposes. For electricity production, hydrogen fuel can offset or eliminate natural gas while reducing carbon emissions. Hydrogen can also be utilized in Distributed Energy Resources ("DER") applications, as a transportation fuel, or even in certain industrial processes. Through stored hydrogen, these energy end uses could be decarbonized, providing additional low-carbon energy to energy users throughout Georgia.

To prepare for this possibility, as approved by the PSC in the 2022 IRP, Southern Company Services ("SCS") and Georgia Power Company ("Georgia Power" or the "Company") are partnering with key stakeholders to develop an integrated hydrogen microgrid as illustrated in Figure 1. This project seeks to create hydrogen from an electrolysis system utilizing grid energy. The hydrogen produced will then be used in a fuel cell microgrid application and for transportation fuel. The fuel cell component will create electricity that can be utilized to charge electric vehicles, provide backup power, or provide peaking services, thus demonstrating the flexible nature of stored energy via hydrogen for both vehicles and stationary power loads.

Figure 1: Hydrogen microgrid energy system



This project will include four hydrogen fuel cell Class 4 trucks and three battery electric Class 4 trucks – the most used trucks in the utility industry, but no zero-emission options are currently available. This project leverages federal funding[1] and collaboration between General Motors ("GM"), Southern Company Services and Georgia Power Company, Nel Hydrogen, and the Electric Power Research Institute ("EPRI").

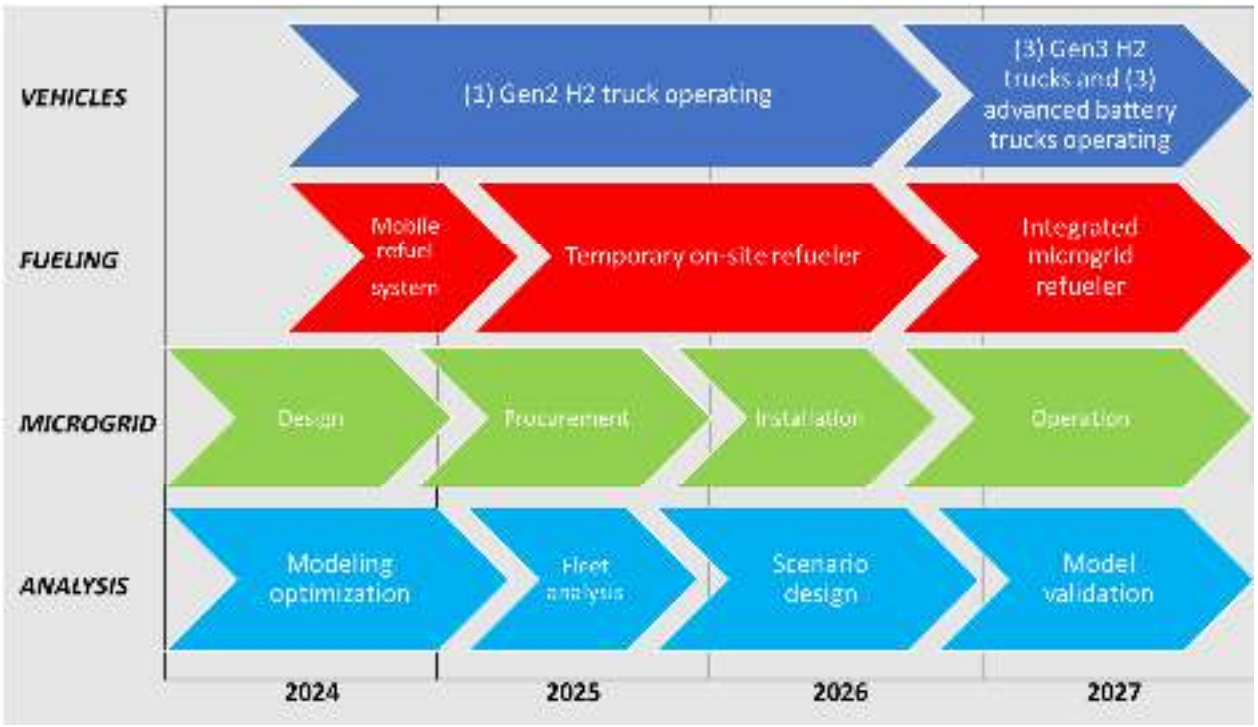
Specific objectives include:

- Demonstrate system benefits to grid and create value through use-case stacking:
  - Electrolyzer and fuel cell as dispatchable loads
  - Fuel cell for peak shaving
  - Fuel cell for back-up power
- Develop path toward deployment of energy storage systems
- Design and demonstrate zero-emission vehicles for utility applications
- Illustrate Green House Gas ("GHG") emissions reductions
- Demonstrate microgrid and zero-emission vehicle integration for customers

The project is executed through four workstreams, with associated high-level activities shown in **Error! Reference source not found.**. Specific updates are provided in the following sections.

[1] Super Truck 3 – DOE Proposal Awarded - https://www.energy.gov/articles/doe-announces-nearly-200-million-reduce-emissions-cars-and-trucks

Figure 2. Overall project timeline organized by workstreams



Vehicles Update

GM is providing a Gen2 hydrogen fuel cell electric vehicle (FCEV) for initial demonstration (Figure 3), followed by three (3) Gen3 FCEV and three (3) battery electric vehicles (BEV), all of which will be medium-duty vehicles for vocational service. The initial vehicle will be a Class 4 pickup with a shop-service body for use by GPC Fleet Services (Sands Place facility in Marietta) in support of system maintenance. This vehicle has already been constructed by GM using an existing conventional vehicle frame atop a new chassis with two (2) GM Hydrotec fuel cells and with an estimated range of greater than 300 miles at Gross Vehicle Weight, or greater than 100 miles range with 10 hours of export power at a worksite. It is planned for delivery by the end of November 2024 following performance validation by GM at the Milford Proving Ground. Notable meetings of this budget period (BP) include: a joint meeting with GM and the Georgia Power Company (GPC) Fleet Services team. and joint meetings in Michigan to inspect and drive the first vehicle. Once it is on-site in Georgia, additional safety and operational training will be provided by GM.



Figure 3. Gen2 FCEV is similar to vehicle to be demonstrated in this project. The GPC vehicle will have conventional cab, not crew cab, and longer toolbox.

Fueling Update

Initial fueling for the first FCEV will be provided from a mobile refueler supplied by GM to the site at Georgia Power's Plant McDonough. This self-contained dispenser will be mounted on-board a flat-bed trailer and parked at the Plant McDonough site. The fourth

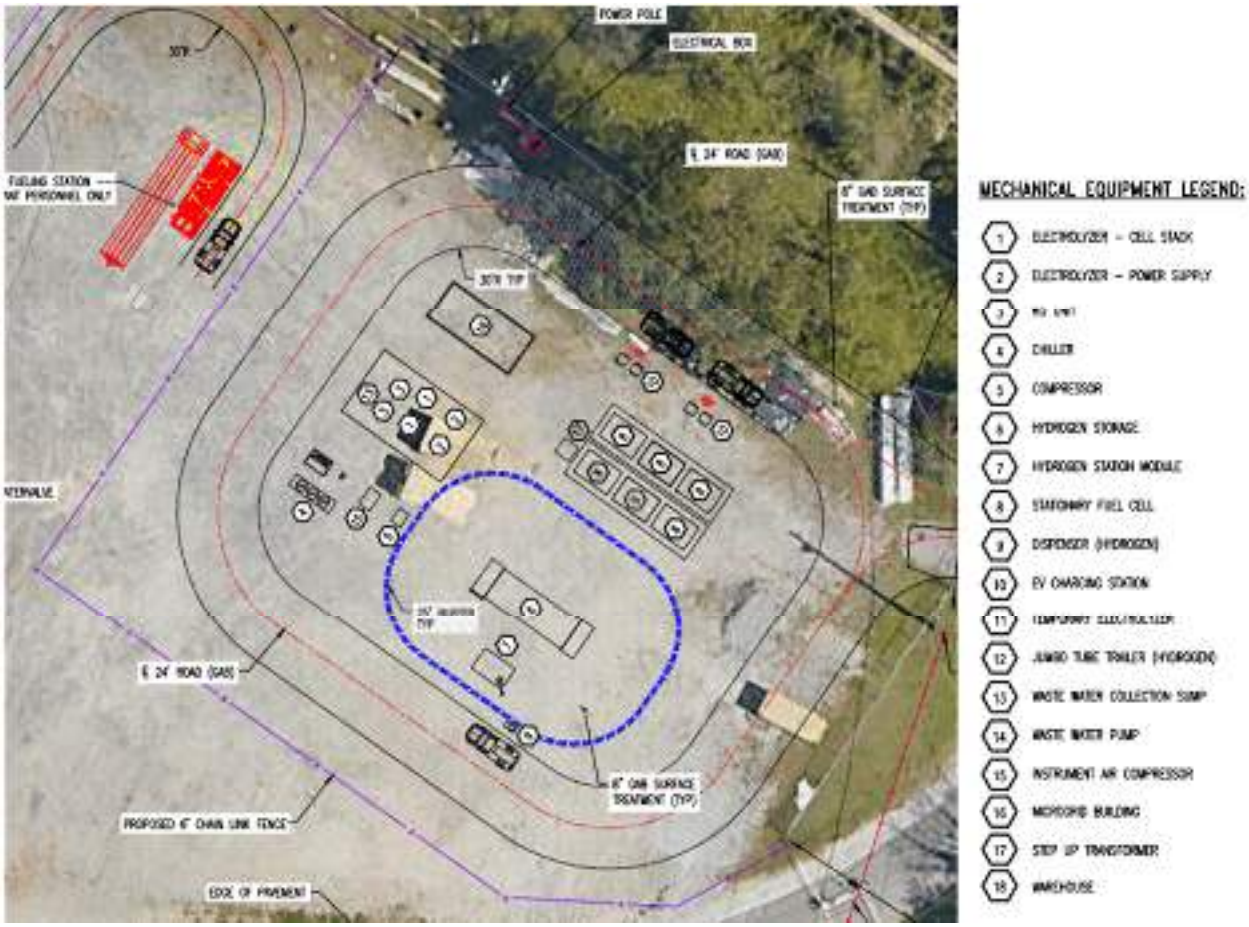
quarter 2024 delivery of the mobile refueler is expected to coincide with delivery of the first vehicle. Site prep work for the mobile refueler is largely completed.

Although the mobile refueler will be available for up to one year, GM has procured a site-based refueling system from Air Liquide which is under construction currently in Houston and planned for installation in early 2025. This system will use hydrogen supplied from a conventional tube trailer and compress it for dispensing into the vehicle. This conventional tube trailer is the same type used at Plant McDonough to supply hydrogen for generator cooling.

Microgrid Update

Conceptual design and layout are complete for the integrated hydrogen microgrid at the site. Figure 4 Site Layout shows the layout for the project. Piping and instrumentation diagrams as well as detailed civil design are underway. The preliminary electrical load list was created to size electrical infrastructure needed to power the project. Following the detailed mechanical design, a hazard identification (HAZID) process will take place. Hydrogen will be produced (approximately 160 kg/day) at the site using up to 400 kW electrolyzer supplied by Nel (two C30 units) installed in a small building. Hydrogen compression, compressed gas storage, and a stationary fuel cell are also designed, as well as a 350-kW fast charger from Chargepoint. The stationary fuel cell will provide the energy for the fast charger, thus avoiding impacts to the local power distribution system. The stationary fuel cell will also provide resilient power to a nearby warehouse at Plant McDonough site. A battery energy storage system will be designed and added to site to help stabilize the microgrid in islanded operations and maximize economic dispatch in grid-connected operations.

Figure 4 Site Layout



Analysis Update

Preliminary operational simulation has been completed and it has been shown that most of the stored hydrogen would be used in support of peaking or resilient power. Furthermore, analysis indicates that the integrated hydrogen microgrid can achieve operational (excluding capital costs) cost parity and a 75% emissions reduction of conventional Class 4 vocational vehicles at around $0.12/kWh for grid power price and 0.1 $kgCO_2/kWh$. While the typical grid is currently about 0.4 kgCO2/kWh, the carbon intensity of the grid is declining over time in the Southeast.[2] Additionally, strategies such as purchase of renewable energy certificates and integration of solar resources can further reduce the carbon intensity of the power used in electrolysis. Further analysis, including refining the baseline Class 4 vocational vehicle fueling efficiency and emissions, is ongoing through the end of 2024.

[2] In the latest available CDP Climate Change Disclosure, Southern Company indicated a 46% reduction from 2007 baseline of GHG emissions through the end of 2022.

EPRI has agreed in principle to be a subrecipient to SCS for analyzing impacts of broad deployment of the hydrogen microgrid approach, including an assessment of fleets and scenarios for providing infrastructure as those fleets convert to ZEV. Finalization of the EPRI contract is expected by end of Q4 2024. EPRI is providing cost-share to this project by doing the work in the Low Carbon Resources Initiative program, and by doing so, provides additional opportunities to highlight the entire project to electric and/or gas utilities.

Southern Company Accomplishments During Previous Reporting Period

Task	Accomplishments
Task 1: Simulation & Analysis	See detail in Tasks below for Southern Company scope
Task 1.2: Fleet identification, baselining, and planning	**Complete**
Task 1.2.1: Identification of vocational fleet vehicles for the demonstration	**Complete**
Task 1.2.2: Collection of baseline fueling and performance data	**Complete** • MPG ranges from 5.5 to 9.4 and average of ~8,000 miles (about 12874.75 km) per year • Additional telematics provided to GM for drive train optimization • Trucks from Sands Place facility
Task 1.2.3: Simulation and analysis for charging and electrolysis scenarios for GHG and price optimization	**Ongoing with expected complete by end of BP4** • Operational model completed to calculate maximum price and GHG from primary power (typical grid ~0.4 kgCO2/kWh) • Most of the stored hydrogen needed to support resilient power
Task 1.2.4: Model impacts of utility scale adoption	**Moved to BP3 and BP4** • EPRI is being added as a subrecipient with plans to complete this scope over next 2 years. The overall subtasks within this Task are: • Assessment of medium duty vehicles in the utility sector • Cost and GHG estimation for refueling and recharging if all MD utility vehicles were ZEV • Cost and GHG estimation for nationwide deployment of integrated hydrogen microgrids for vehicles in utility sector
Task 2: Design	See detail of Tasks below for Southern Company scope
Task 2.4.: Site planning and design at the fleet site	**Ongoing** • Site layout and general arrangements for all three types of refueling completed in 24Q2 • Preliminary P&ID completed in 24Q2 • Collected budgetary quotes for hydrogen delivery for 2025 and 2026 until installation is complete.

Southern Company Plans for Next Reporting Period

Task 1.2.4

- Execute EPRI Subrecipient Agreement and update funding forecast

Task 2.4

- During 24Q4, SCS will complete the P&ID and design for the site. This will include cost estimate for installation.
- Draft scope and estimate challenge meeting to be held in October 2024.
- Finalization of estimate anticipated in Q4 2024.
- Equipment specifications will be written in preparation of procurement activities.
- Site preparation activities will be completed for receiving the first temporary refueling system.

The resource-loaded schedule is being updated and will culminate in a revision supplied to GM following the finalization of estimate in early 24Q4 and execution of sub-recipient agreement with EPRI. This will support the contract amendment authorizing the transition to BP3 under the sub-recipient agreement. Once that contract amendment is executed, procurement on major equipment and site prep will be authorized.

Task 4

- Anticipate delivery of first truck by GM in November 2024

Southern Company Budget and Schedule

Table 1. Revised actual and forecasted costs per calendar year. 2024 includes actual through September 30, 2024 and forecasted costs for remainder of 2024.

Year	**2023**	**2024**	**2025**	**2026**	**2027**	**Total**
Federal Cost ($)	$14,062	**REDACTED**	**REDACTED**	**REDACTED**	**REDACTED**	**REDACTED**
Company Cost ($)	$27,298	**REDACTED**	**REDACTED**	**REDACTED**	**REDACTED**	**REDACTED**
Total Cost ($)	$41,360	**REDACTED**	**REDACTED**	**REDACTED**	**REDACTED**	**REDACTED**

Overall Project Schedule

This schedule is fully redacted.