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Bartletts Ferry Units 1-4

Investment Justification

The primary goal of the Georgia Power Company (GPC) Hydro Modernization program is to modernize and extend the life of turbine/generator units and Balance of Plant Electrical systems, Mechanical systems, Instrumentation and Controls, and Civil Infrastructure in the GPC Hydro Fleet for another 40 to 50 years. Additional focus will be on reduction of oil capacities in various hydraulic systems within the powerhouse where possible by implementing new technologies.

The Bartletts Ferry facility was initially constructed in the 1920s, with additional generating capacity added in 1951 and 1985. There are two powerhouses. The original powerhouse on the west side of the river contains four vertical Francis turbines (Units 1 through 4). The newer powerhouse on the east side of the river contains two vertical Francis turbines (Units 5 and 6). For both powerhouses, the units are numbered beginning from the middle point of the river outward toward each bank. GPC is planning to install new runners on Units 1 through 4 and rewind generators of Units 1 through 4 from 2023 through 2027. After the 2023-2027 upgrade, the total nameplate capacity of the development will increase from 173 megawatts (MW) to 186.65 MW.

All applicable and available common systems at Bartletts Ferry are planning to be replaced as part of the scope GPC's Hydro Modernization Program. The first unit at Bartletts Ferry Dam to undergo modernization efforts is Unit 1, and where appropriate, common systems shared by multiple or all units will be modified or upgraded during the first outage to support outages for Units 2, 3 and 4. Common systems that are part of the scope of work included in GPC's Hydro Modernization Program include the following:

- Switchyard and Substation
- General Service Water
- Station Service
- Service Facilities
- Fire Protection
- Computer System

All Units 1 through 4 components that are available and near the end of their service lives will be replaced with modern components. The Bartletts Ferry Unit 1 through 4 turbine upgrade capital improvement project for which GPC seeks Hydroelectric Efficiency Improvement Incentive funding for includes the following key scopes of work:

- Turbine Component Assessment and Engineering
- Bearing Lube Oil System - Thrust and Guide Bearing
- Install new supply and return lines and install new carbon steel isolation valves for the guide and thrust bearings
- Install new and/or refurbish Bottom Ring
- Install new Hydraulic Power Unit (HPU) Governor Oil System, HPU Skid, and Concrete housing for skid

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- Install new automatic Grease System
- Install new and/or refurbish Headcover
- Replace Shaft Packing Box with mechanical seal
- Install High Pressure Oil Lift System, piping and concrete housekeeping pad
- Install new Runner
- Install new Servo Motors
- Inspect Stay Ring and Spiral Case and replace/refurbish
- Install new and/or refurbish Turbine Guide Bearing
- Install new and/or refurbish Turbine Shaft
- Replace existing vacuum breaker with air admission valve
- Install new and/or refurbish Wicket Operating Ring mechanism
- Install new and/or refurbish Wicket Gates
- Disassembly and reassembly of existing components
- Instrumentation

The Bartletts Ferry Unit 1 through 4 turbine upgrade capital improvement project will result in an estimated expected combined efficiency improvement of **over 7%.** Unit-specific numbers cannot be disclosed in documents that would be publicly available, but GPC may be able to provide more specific figures and rationales during award negotiations under non-disclosure agreement with United States Department of Energy –Grid Deployment Office (GDO).

In addition to improving the overall efficiency of the Bartletts Ferry facility, the project will also accomplish the following objectives:

- increase energy production through more efficient utilization of available river flows by replacing vintage turbines with state-of-the-art turbines.
- Extend the life of the facility and increase energy resiliency at the hydroelectric development to provide customers with additional low-cost, renewable hydro generation to meet peak and off-peak power demand.
- Increase individual unit reliability, including increasing the ability of each unit to perform at its maximum efficiency when needed to meet power demand. Unit reliability is measured by lower operating temperatures, a decrease in outages, less bearing wear, and lower maintenance costs.
- Continue GPC's commitment to the development and maintenance of clean, renewable energy sources and responsible stewardship of natural resources and local habitats.
- Contribute to local and national economies and communities by creating skilled jobs in the manufacturing and construction industries, and will advance diversity, equity, inclusion and accessibility and contribute to the Justice40 Initiative.

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Documentation Demonstrating Efficiency or Generation Increase Beyond Original Design

Georgia Power Company's (GPC) Bartlett's Ferry Units 1-4 turbine upgrade capital improvement project will result in a combined unit efficiency improvement of **over 7%** and the total nameplate capacity of the development will increase from 173 megawatts (MW) **to over 186 MW**.

Efficiency and/or generation increases beyond original designs for Units 1-4 cannot be known with certainty until after installation and testing. Further, the requested documentation includes trade secrets/critically sensitive proprietary information of GPC and of the turbine manufacturer that is privileged and confidential. Consequently, GPC is uncomfortable providing supporting internal and/or manufacturer documentation attempting to demonstrate that the Units 1-4 turbine upgrade project increase efficiency and/or generation beyond original designs for Units 1-4. Consequently, in the event of oversubscription, GPC is not currently seeking consideration for the bonus point.

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Georgia Power Company has begun investment in the upgrade and modernization of the turbines for Units 1 though 4 at the Bartletts Ferry Hydroelectric Facility/Dam (Bartletts Ferry) (FERC Project 485) to replace the existing vintage generator turbines with state-of-the-art turbines. Bartletts Ferry is located on the mainstem Chattahoochee River along the border of Georgia and Alabama about 14 miles north-northwest of the cities of Columbus, Georgia, and Phenix City, Alabama. The project consists of a dam, two powerhouses, and an impoundment (Bartletts Ferry Reservoir, also known as Lake Harding).

The original powerhouse is on the west side of the river and the newer powerhouse is on the east side of the river. The west dam includes a non-gated auxiliary labyrinth spillway; a non-overflow section; a west powerhouse intake; and a gated spillway section equipped with 19 radial gates, two trash gates, and two spillway bays. The east dam consists of a non-overflow section. The west and east dams are separated by a 650-foot-long intake canal, which passes flows to the intake for the east powerhouse through two 25-foot-diameter penstocks. The west powerhouse houses three 15-MW and one 20-MW turbine generator units (Units 1-4), which total 65 MW. The east powerhouse houses two 54-MW turbine-generator units, which total 108 MW. Bartletts Ferry was initially constructed in the 1920s, with additional generating capacity added in 1951 and 1985.

- Bartletts Ferry Units 1 and 2 are vertical Francis turbine generator units, rated at 15 MW, and the turbines were manufactured by S. Morgan Smith in 1926.
- Bartletts Ferry Unit 3 is a vertical Francis turbine generator, rated at 15 MW, and the turbine was manufactured by Allis Chalmers in 1928.
- Bartletts Ferry Unit 4 is a vertical Francis turbine generator, rated at 20 MW, and the turbine was manufactured by S. Morgan Smith 1951.

The Bartletts Ferry Project was first licensed in 1924 to Columbus Electric Power Company and subsequently transferred to Georgia Power Company. The Federal Energy Regulatory Commission (FERC) issued a new major license for the project on April 13, 1978, with an expiration date of December 14, 2014. FERC issued a new license on December 22, 2014 with an authorized capacity of 173 MW. On May 6, 2022, Georgia Power Company filed an application for an amendment, proposing to upgrade four generating units in the west powerhouse, including replacing existing turbine runners, rehabilitating the generators and replacing intake trash racks, which it supplemented on October 25, 2022. On June 10, 2022, the FERC issued a notice of application accepted for filing and soliciting comments, intervention and protests. The FERC issued a letter on January 26, 2023 requesting additional information. Georgia Power Company submitted a response on March 2, 2023. The amendment application is still pending.

In addition to improving combined unit facility efficiency **over 3%**, upgrading Bartletts Ferry Units 1-4 will accomplish the following objectives:

- Increase energy production through more efficient utilization of available river flows by replacing vintage turbines with state-of-the-art turbines.
- Extend the life of the facility and increase energy resiliency at the hydroelectric developments to provide customers with additional low-cost, renewable hydro generation to meet peak and off-peak power demand.
- Increase individual unit reliability, including increasing the ability of each unit to perform at its maximum efficiency when needed to meet power demand. Unit reliability is measured by lower operating temperatures, a decrease in outages, less bearing wear, and lower maintenance costs.

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- Continue Georgia Power's commitment to the development and maintenance of clean, renewable energy sources and responsible stewardship of natural resources and local habitats.
- Contribute to local and national economies and communities by creating skilled jobs in the manufacturing and construction industries, and will benefit communities by advancing diversity, equity, inclusion, and accessibility and contribute to the Justice40 Initiative.

The total amount of project costs for turbine equipment, manufacture and installation for Bartletts Units 1-4 is $42,524,873. Therefore, Georgia Power requests $5,000,000 in funding for the project.