IRP Emissions Projection Methodology

Data Inputs

* Capacity:
  + Georgia Power Territorial Base Case Load vs. Existing Capability Table Nameplate Capacity
  + IRP Main Document Attachment A – Planned and Committed Owned and Contracted Resources
  + PD Capacity Expansion Plans, MG0 – Base GPC
  + Resource Mix Study, Figure 2 – MG0 2041 Capacity Mix
    - Capacity differences dispersed from 2034 – 2040
* Load:
  + PD B2022 Load and Energy Forecast.pdf, Attachment 2.0-1: Budget 2022 Forecast Annual Summary, Total Retail
* Capacity Factors:
  + Utility Transition Hub historical owned and purchased generation and capacity by resource
* Emissions:
  + Utility Transition Hub historical owned and purchased emissions by resource

Methodology

To find projected emissions, we must calculate projected generation. To find the projected generation mix of the IRP proposed capacity, we create projects of capacity factors by technology and multiply those capacity factors by utility projected capacity. We group together similar resources to create technology specific projections.

Capacity Factor Projections by Resource:

* Mature inflexible technologies:
  + Technologies: 'Nuclear', 'Other Waste Biomass', 'Conventional Hydroelectric', 'Wood/Wood Waste Biomass', 'Municipal Solid Waste', 'Landfill Gas', 'Hydroelectric Pumped Storage', 'Other Gases', 'Geothermal', 'Natural Gas with Compressed Air Storage'
  + Projection: Average capacity factor over past 10 years
* Immature inflexible technologies:
  + Technologies: 'Batteries', 'Onshore Wind Turbine', 'Solar Photovoltaic', 'Flywheels', 'Solar Thermal without Energy Storage', 'Solar Thermal with Energy Storage', 'Offshore Wind Turbine', 'Natural Gas Fired Combustion Turbine', 'Solar Photovoltaic plus Storage'
  + Projection: Average capacity factor over past 5 years
  + Note: Georgia Power’s historical average capacity factor for solar and solar plus storage was unusually low due to the limited data for this utility. To ensure projections we accurate, projected capacity factor was input using average capacity factor for those technologies in the utility region.
    - Solar: 24.3%
    - Solar plus storage: 24.6%
* Retiring technologies:
  + Technologies: 'Conventional Steam Coal', 'Petroleum Liquids', 'Natural Gas Steam Turbine', 'Petroleum Coke', 'Coal Integrated Gasification Combined Cycle'
  + Projection: Decreasing from most recent EIA data year based on historical percent change in capacity factor
* Flexible technologies:
  + Technologies: 'Natural Gas Fired Combined Cycle', 'Natural Gas Internal Combustion Engine', 'All Other', 'Other Natural Gas'
  + Projection: Used to backfill generation to meet projected load with capacity factor capped at 80%

Emissions Projections:

* All technologies:
  + Emissions intensities calculated by resource using most recent historical data year emissions and generation by technology
  + Emissions intensities applied to projected generation to find yearly emissions by resource