



Georgia's State Water Plan

**Altamaha Regional Water Planning Council Meeting
September 10, 2019**

waterplanning.georgia.gov



Georgia's State Water Plan

Meeting Agenda

Council Meeting Agenda



Council Meeting
Altamaha Regional Water Council
Draft Agenda – September 10, 2019

Objectives:

- 1) Provide an Overview of Power Generation and Energy Sector Forecasting for Regional Water Planning
- 2) Learn about Local Energy Providers in the Region
- 3) Tour and Learn about Water Conservation and Sustainability Practices at Plant Hatch

- | | |
|--------------------|----------------------------------------------------------------------------------------------------|
| 9:45 – 10:00 a.m. | Registration |
| 10:00 – 10:15 a.m. | Welcome and Introductions |
| | Approve meeting minutes from January 31, 2019 Council Meeting |
| | Approve meeting agenda |
| 10:15 – 11:15 a.m. | Power Generation and Energy Sector Forecasting for Regional Water Planning - Bill Davis, CDM Smith |
| 11:15 - 11:30 p.m. | Water Conservation and Sustainability Practices at Plant Hatch - Plant Hatch Representative |
| 11:30 – 12:00 p.m. | Lunch |
| 12:00 - 12:45 p.m. | Council Business Meeting |
| 12:45 - 1:00 p.m. | Public Comments/Local Elected Official Comments |
| | Wrap Up |
| 1:00 p.m. | Adjourn Public Portion of Meeting |
| 1:00 - 2:00 p.m. | Tour of Plant Hatch (seating is limited to Council Members) |



Georgia's State Water Plan

Power Generation and Energy Sector Forecasting for Regional Water Planning

Energy Discussion Outline

- How electricity is generated
- How water is used in generating electricity
- How electricity is transported
- What is the forecast for Georgia's future



Thermoelectric Power Plant

Terminology

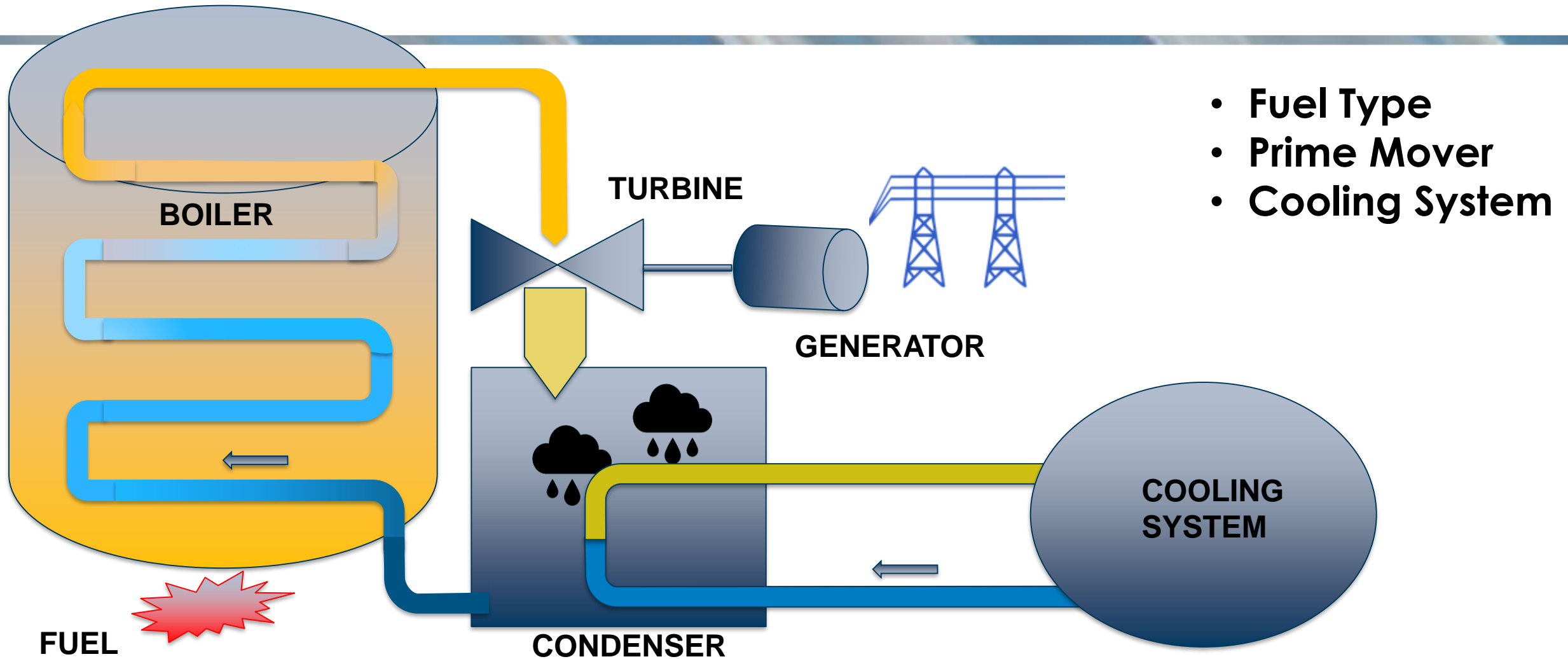
- **Voltage** (Volts) – an electrical force
- **Current** (Amps) – a steady flow of electrons
- **Power** (Watts) = voltage (V) times current (A)
- **Kilowatt** (kW) = 1,000 Watts
- **Energy** (kWh) = power (kW) times time (hour)

Steam Turbine

(Source: Explain That Stuff)



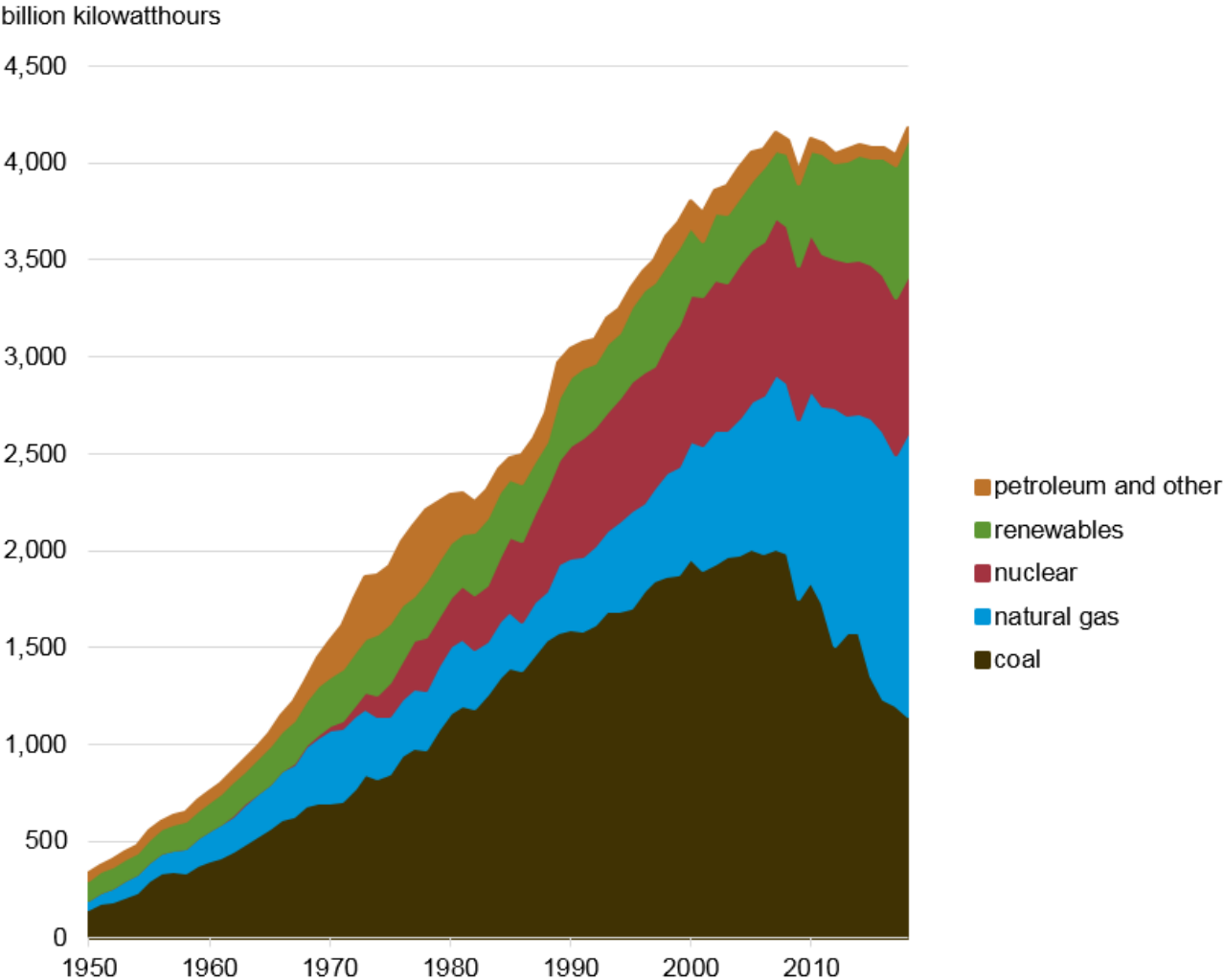
Thermoelectric Power Overview



More Terminology

- **Generator** – converts mechanical movement into electricity, opposite of an electric motor
- **Generating Capacity** – the maximum electric output of a generator
- **Nameplate Capacity** – maximum output designated by manufacturer
- **Net Generation** – electricity generated minus the electricity used to operate the power plant
- **Capacity Factor** (percent) – ratio of actual output to maximum output during a specific period of time

U.S. electricity generation by major energy source, 1950–2018



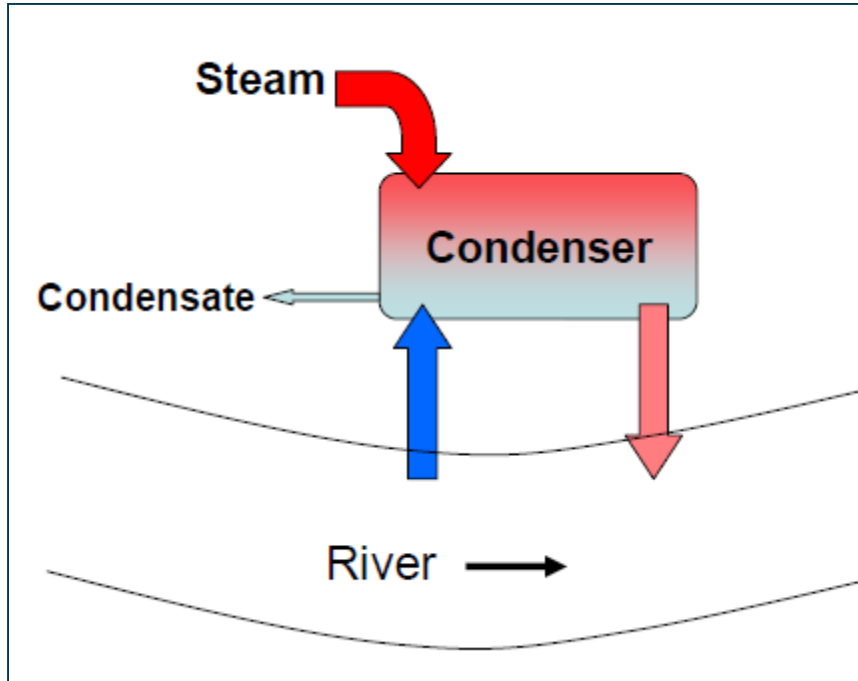
Note: Electricity generation from utility-scale facilities.
Source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 7.2a, March 2019



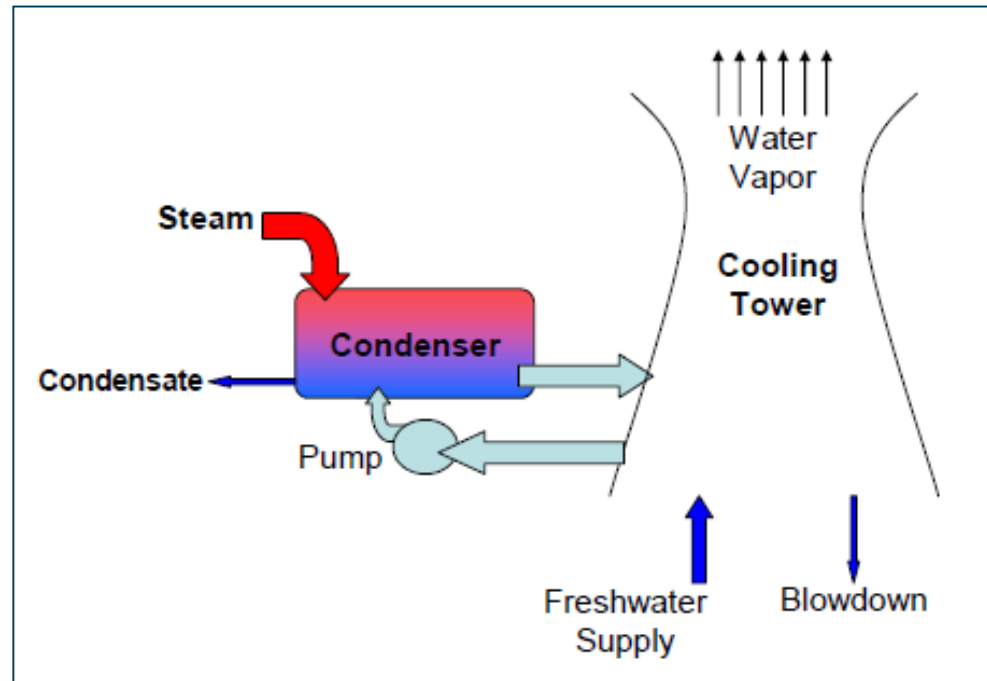
Fuel Types

	Thermoelectric Power Generation	Non-Thermo-electric Power Generation
Non-renewable	Fossil Fuels <ul style="list-style-type: none">CoalCrude OilPetroleumNatural Gas Nuclear	
Renewable	Biomass from plants	Hydropower Solar Wind Geothermal

Types of Cooling Systems



Open-Loop (Once-through) Cooling System



Closed-Loop Cooling System

Withdrawal =
Consumption +
Return

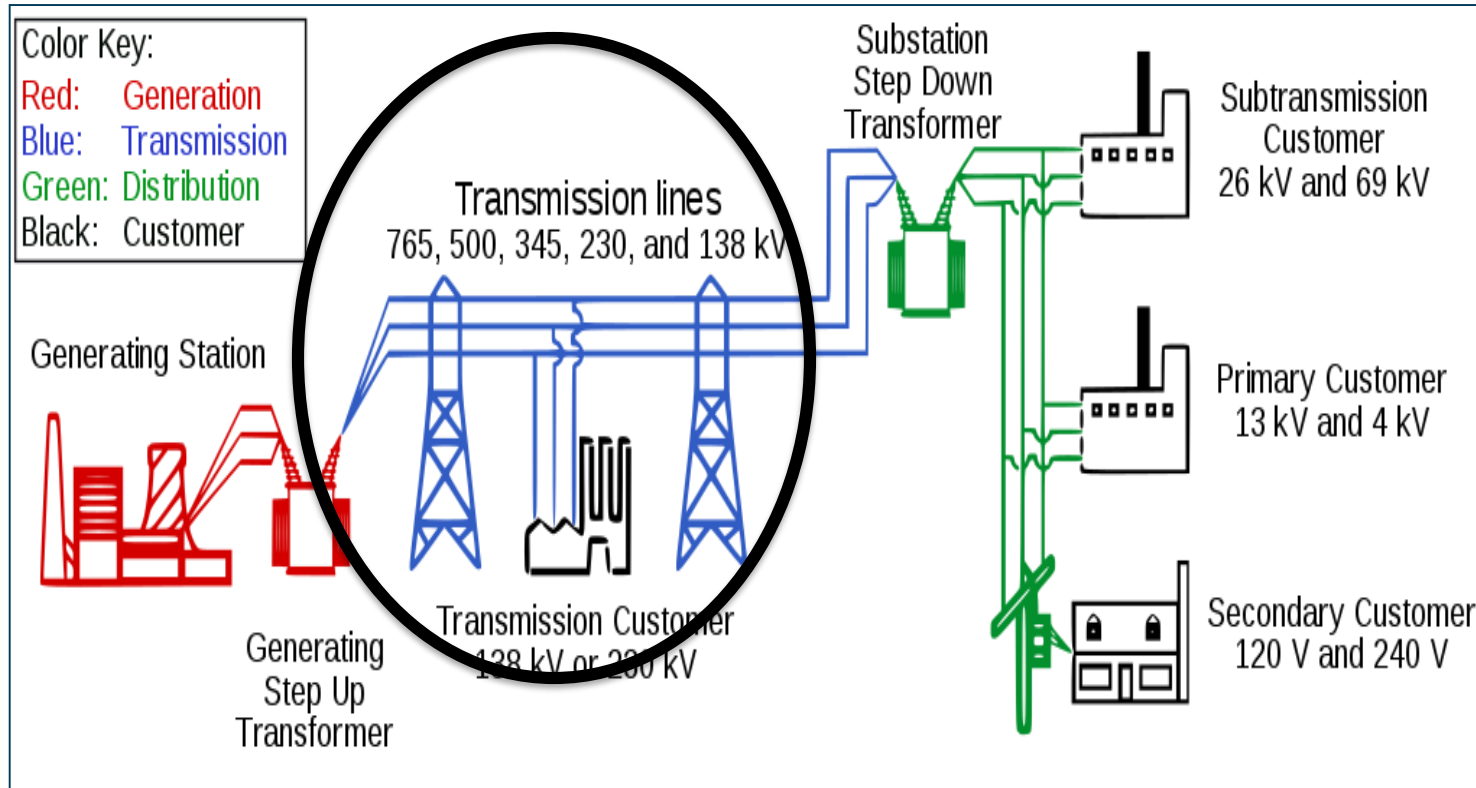
Consumption =
Withdrawal -
Return

Source: *ENERGY DEMANDS ON WATER RESOURCES*, DOE 2006

Water Use by Generation Combination

POWER GENERATION COMBINATION	WATER WITHDRAWALS (Gal/MWh)	WATER CONSUMPTION (Gal/MWh)
Fossil Fuel/Biomass, Steam Turbine, Once-Through Cooling	41,005	0
Fossil Fuel/Biomass, Steam Turbine, Cooling Tower	1,153	567
Fossil Fuel/Biomass, Gas (Combustion) Turbine	0	0
Natural Gas, Combined-Cycle, Cooling Tower	225	198
Nuclear, Steam Turbine, Cooling Tower	1,372	880

The Grid - Transmission



All power stations are connected through a transmission network

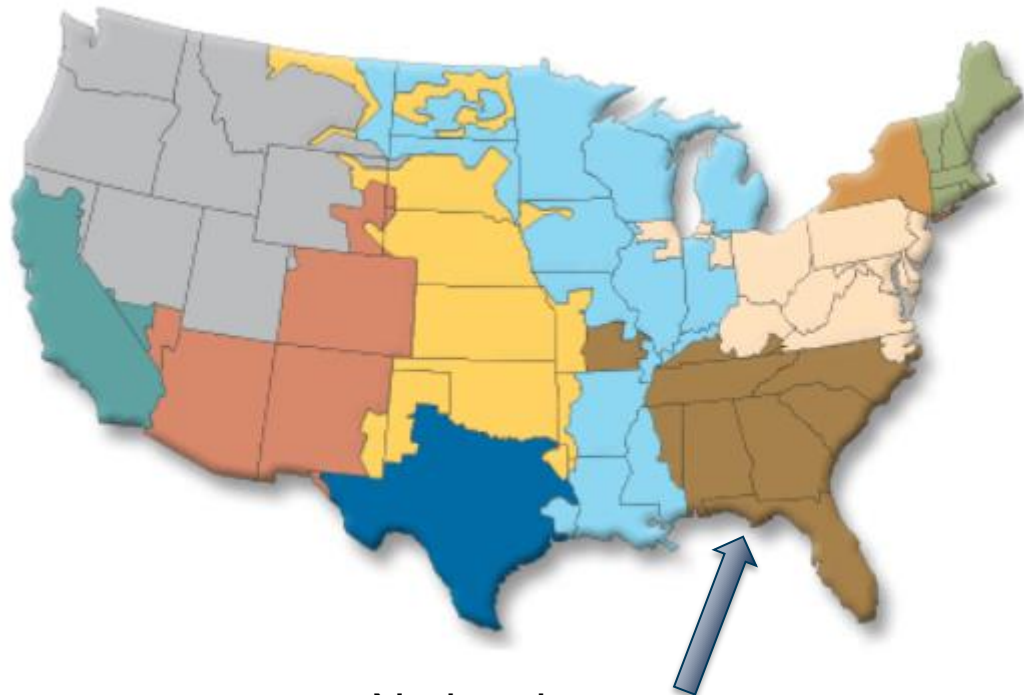
Power stations “feed the grid”

Power moves through the grid to the demand

- Baseload stations
- Peak load stations

<http://www.ferc.gov/industries/electric/indus-act/reliability/blackout/ch1-3.pdf>
<https://commons.wikimedia.org/w/index.php?curid=5577847>

The Grid – Power Pools



National
Southeast Reliability Corporation SERC

Southeast Electric Regions



Regional



Figure 2: New 2018 Subregions

SERC SE

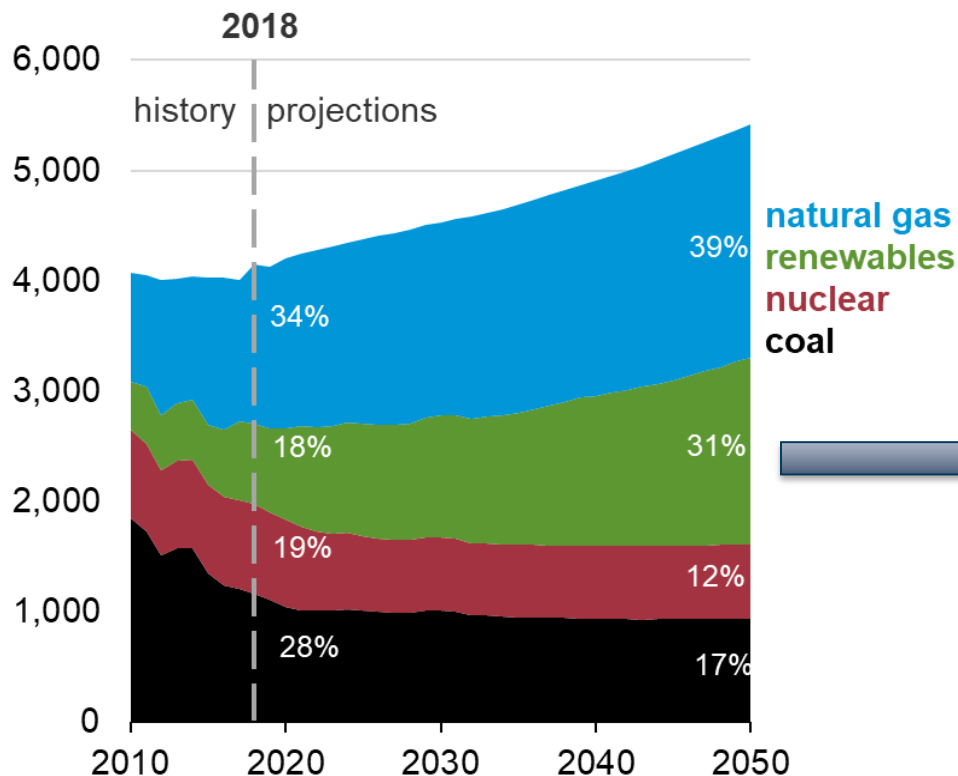
Sub-Regional

Sources: FERC (2019), SERC RRS Annual Report (2018)

NATIONALLY: Electricity generation from natural gas and renewables increases, and the shares of nuclear and coal generation decrease

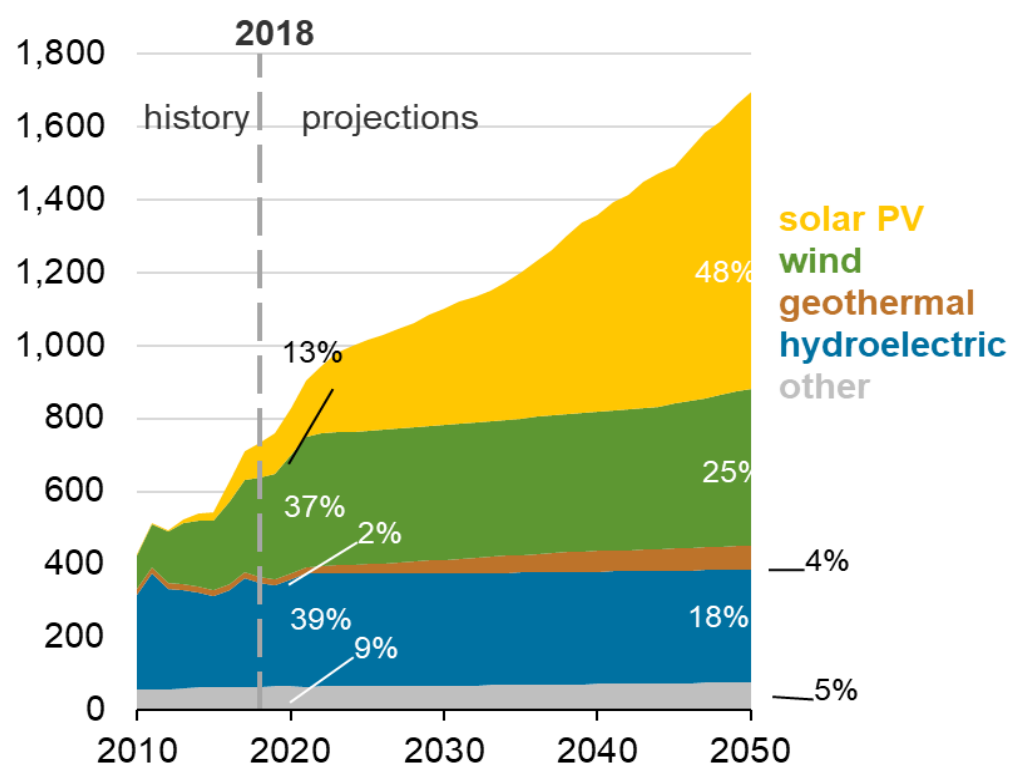
Electricity generation from selected fuels
(Reference case)

billion kilowatthours



Renewable electricity generation, including
end-use (Reference case)

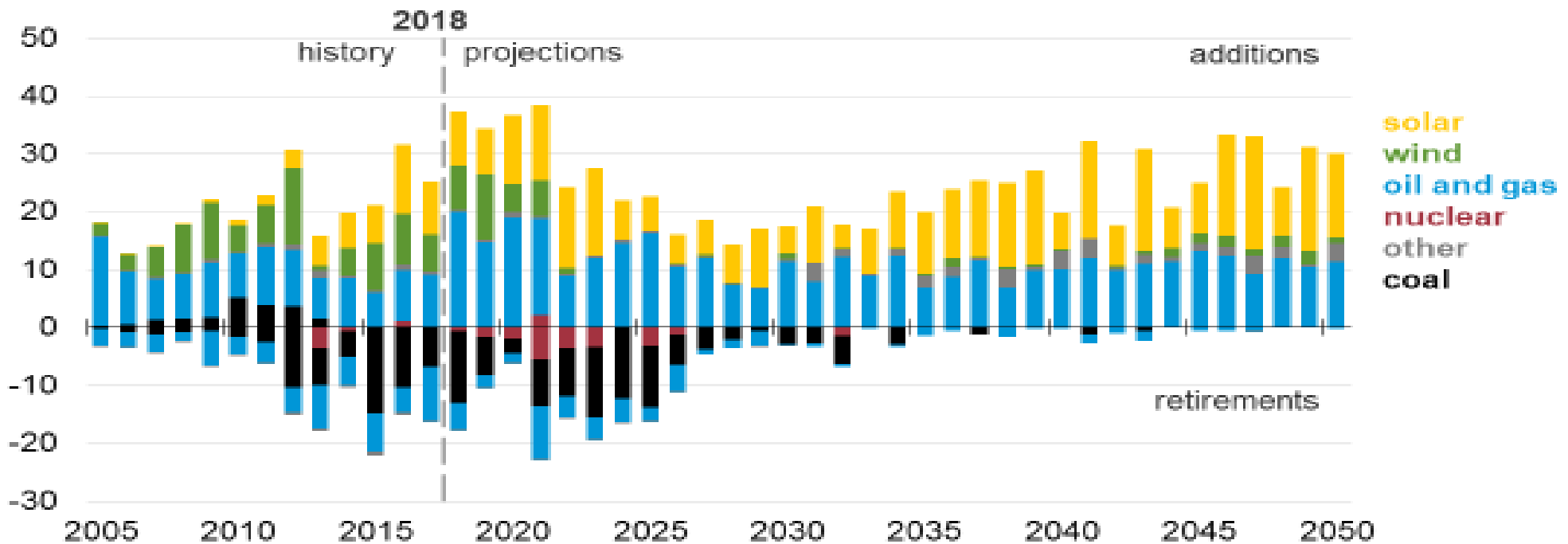
billion kilowatthours



Source: EIA, AEO 2019

Expected Requirements for New Generating Capacity will be met by Renewables and Natural Gas

Annual electricity generating capacity additions and retirements (Reference case)
gigawatts



Source: EIA, AEO 2019

SERC Southeast Sub-Region



- SERC Southeast Subregion consists of the following Planning Coordinators
 - Georgia Transmission Corp
 - Municipal Electric Authority of GA
 - PowerSouth Energy Cooperative
 - Southern Company
- SERC Reliability Review Subcommittee (RRS) Annual Report 2018

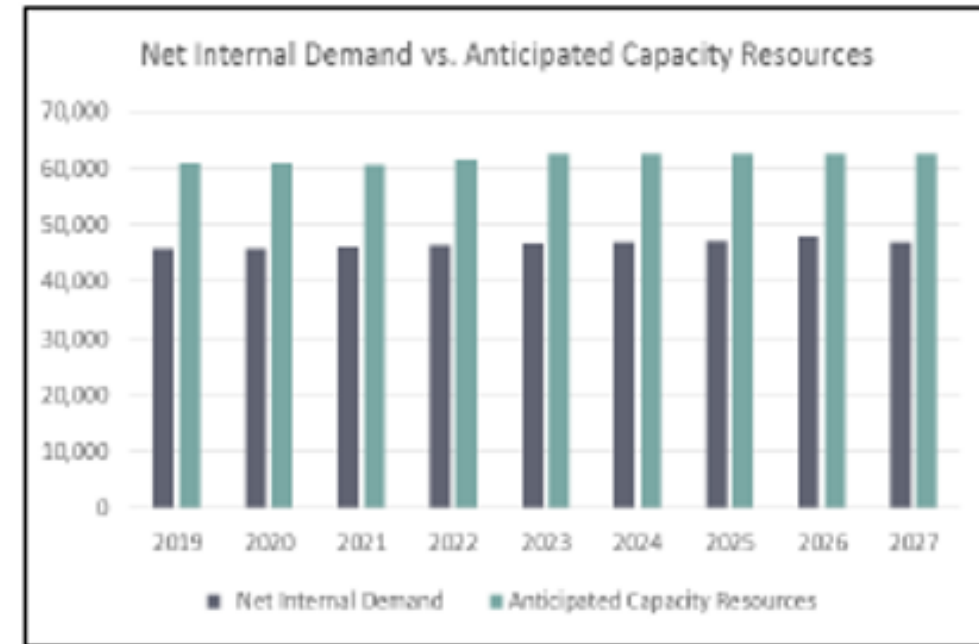
SERC RRS Annual Report 2018 Highlights

- Progress continues on Georgia Power's Vogtle nuclear expansion project (~2,200 MW).
- Despite low load growth, SERC SE entities continue to enhance and modernize the transmission system in response to the changing resource mix and system flows.

SERC SE Current Summer Peak Generation

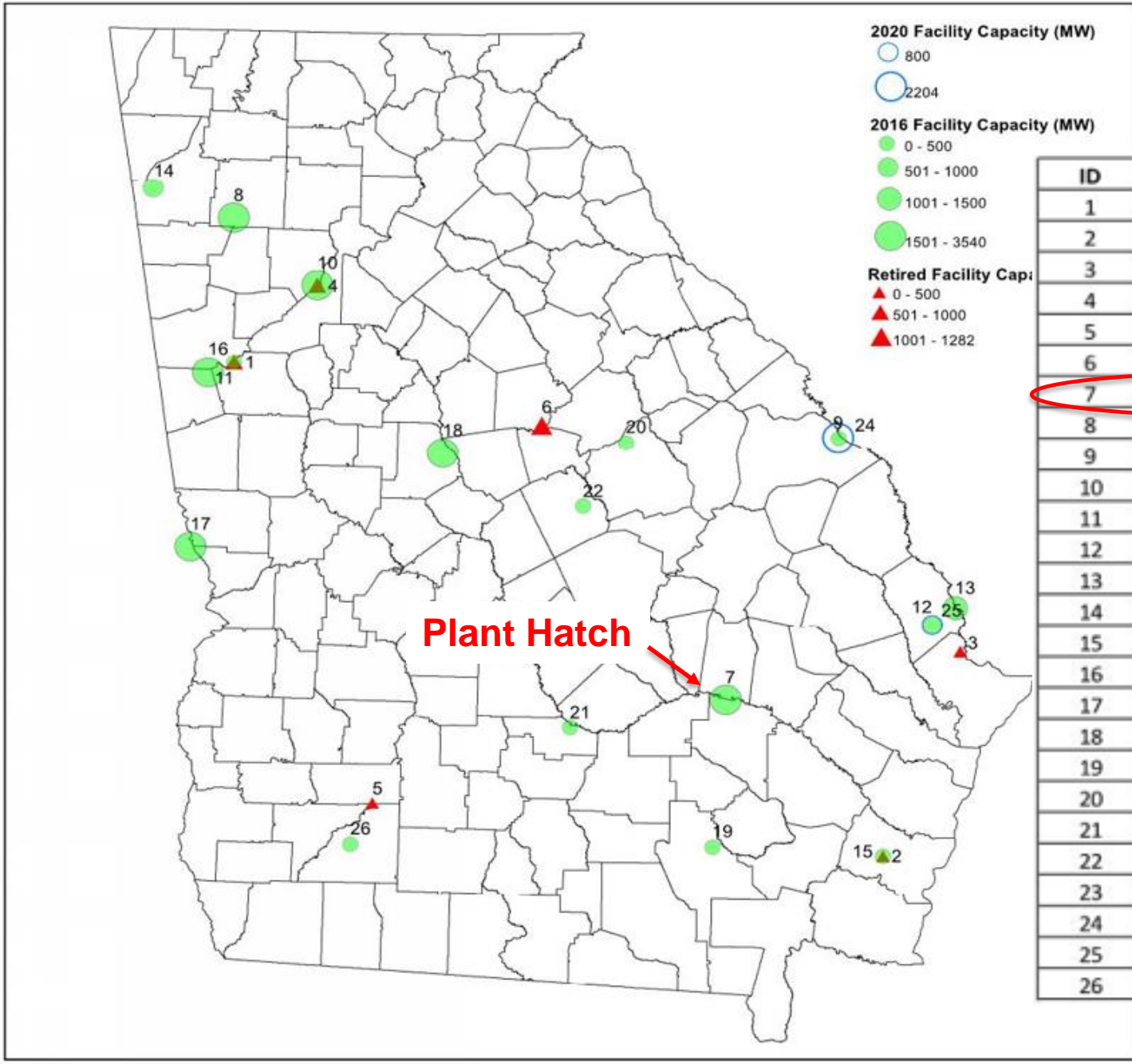
Existing On-Peak Generation (Summer)		
Generation Type	Peak Season Capacity	
	MW	Percent
Biomass	188	0.30
Coal	18,979	30.74
Gas	30,095	48.74
Hydro	3,288	5.33
Nuclear	5,818	9.42
Oil	961	1.56
Other	113	0.18
Pumped Storage	1,632	2.64
Sun	668	1.08
Wind	0	0.00

SERC SE Projected Annual Generation and Capacity



Power Generating Facilities in Georgia

(2017 Regional
Water Plan Update)



ID	Plant Name
1	Plant Yates
2	Plant McManus
3	Plant Wentworth (Kraft)
4	Plant McDonough
5	Plant Mitchell
6	Plant Harlee Branch
7	Plant Hatch
8	Plant Bowen
9	Plant Vogtle
10	Plant McDonough
11	Plant Yates
12	Effingham County Power Project
13	Plant McIntosh
14	Plant Hammond
15	Plant McManus
16	Plant Wansley
17	Plant Franklin (in AL)
18	Plant Scherer
19	Georgia Biomass
20	AL Sandersville
21	Washington County Power
22	Blue Ridge Energy Development
23	Crisp County Power Comm
24	Plant Vogtle
25	Effingham County Power Project
26	Gum Power Plant

EPD Georgia Power Generation Forecast

■ 2009 Forecast

- 2007 EIA & EPD data
- 2008 Population projections
- 2007 EIA & SERC Outlook

■ 2016 Forecast

- 2015 EIA & EPD data
- 2015 Population projections
- 2015 EIA & SERC Outlook

Step 1. Estimate future power need from population projections

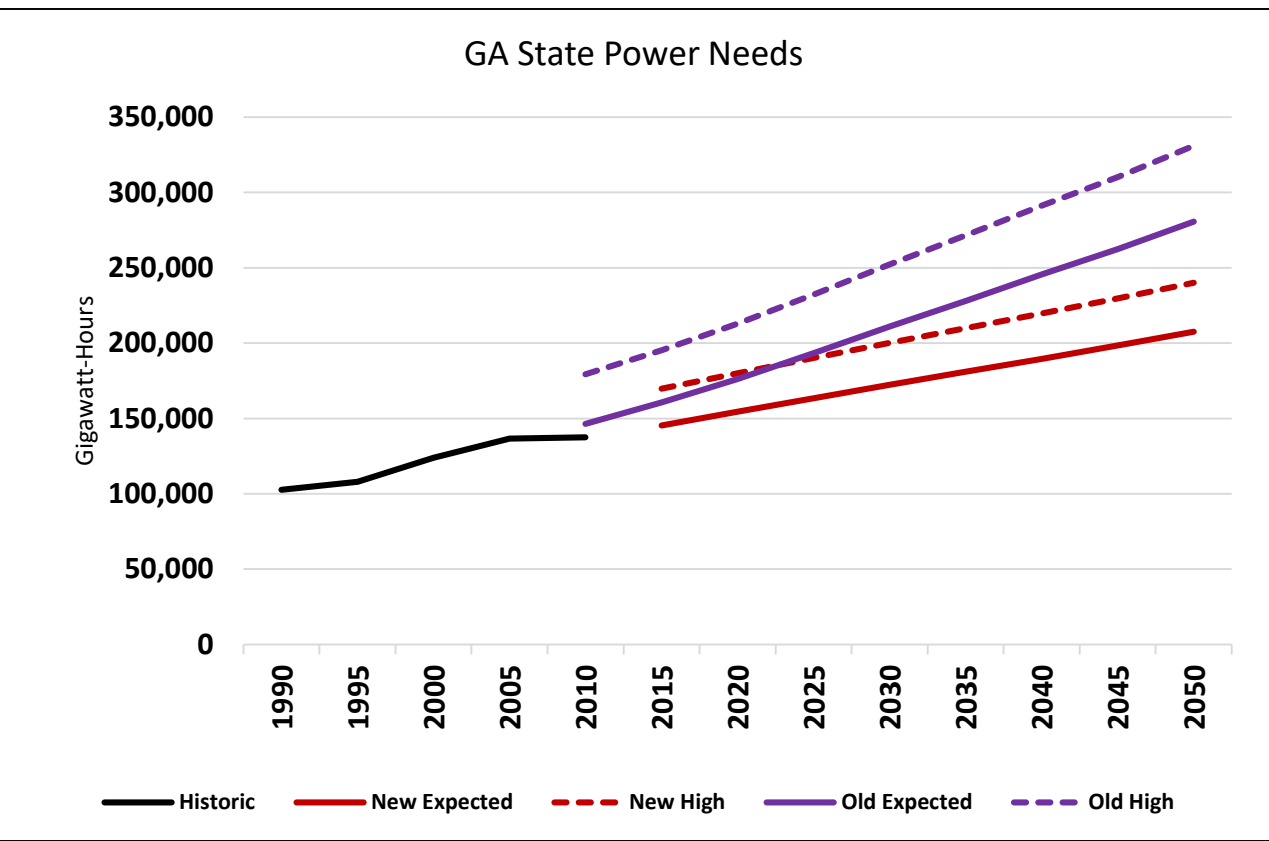
Step 2. Inventory current generation capacity by generating configuration

Step 3. Estimate future generation capacity needed to meet future power need by generating configuration

Step 4. Estimate future water withdrawal and consumption by generating configuration

Step 5. Geographically distribute future water demand to rivers and streams by facility location and generating configuration

Forecasting Power Need



POWER GENERATION COMBINATION

MAXIMUM CAPACITY

Fossil Fuel/Biomass, Steam Turbine, Once-Through Cooling

85%

Fossil Fuel/Biomass, Steam Turbine, Cooling Tower

85%

Fossil Fuel/Biomass, Gas (Combustion) Turbine

15%

Natural Gas, Combined-Cycle, Cooling Tower

50%

Nuclear, Steam Turbine, Cooling Tower

93%

Statewide Forecast: Withdrawals in MGD

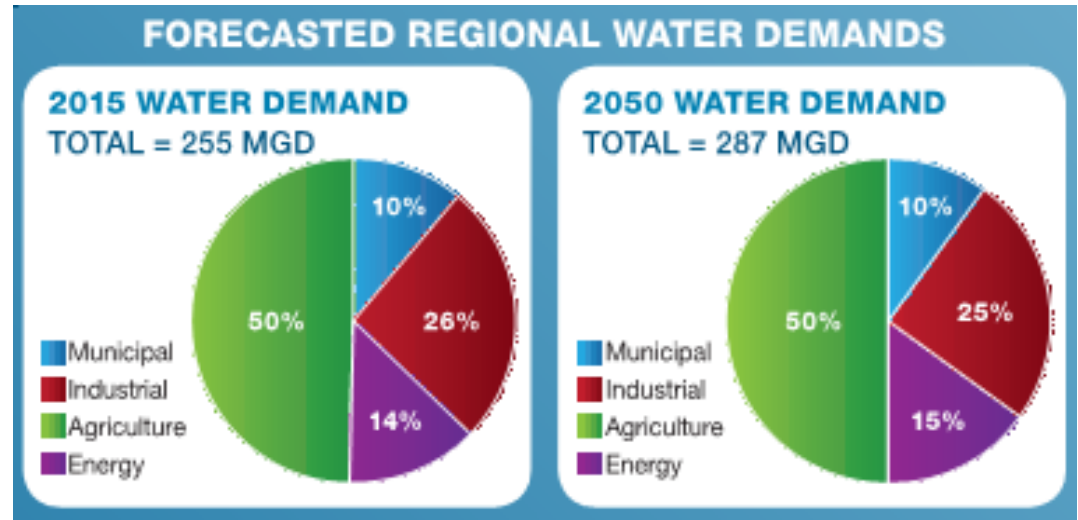
Power Generation Combination	2015	2020	2025	2030	2035	2040	2045	2050
Fossil Fuel/Biomass, Steam Turbine, Once-Through Cooling	1,529	380	420	438	456	478	490	490
Fossil Fuel/Biomass, Steam Turbine, Cooling Tower	124	192	192	195	205	215	226	243
Fossil Fuel/Biomass, Gas (Combustion) Turbine	0	0	0	0	0	0	0	0
Natural Gas, Combined-Cycle, Cooling Tower	17	20	22	23	24	25	26	28
Nuclear, Steam Turbine, Cooling Tower	124	192	192	195	205	215	226	243
Hydropower	119,609	119,609	119,609	119,609	119,609	119,609	119,609	119,609
Added Capacity	0	0	0	8	8	8	13	17
TOTAL	121,428	120,337	120,393	120,430	120,466	120,507	120,540	120,562
Without Hydropower	1,819	728	784	820	856	898	931	953

Statewide Forecast: Consumption in MGD

Power Generation Combination	2015	2020	2025	2030	2035	2040	2045	2050
Fossil Fuel/Biomass, Steam Turbine, Once-Through Cooling	0	0	0	0	0	0	0	0
Fossil Fuel/Biomass, Steam Turbine, Cooling Tower	73	67	74	77	80	84	86	86
Fossil Fuel/Biomass, Gas (Combustion) Turbine	0	0	0	0	0	0	0	0
Natural Gas, Combined-Cycle, Cooling Tower	15	17	19	20	21	22	23	24
Nuclear, Steam Turbine, Cooling Tower	80	123	123	126	133	139	147	158
Hydropower	0	0	0	0	0	0	0	0
Added Capacity	0	0	0	4	4	5	7	9
TOTAL	168	207	216	227	239	250	263	278

Forecast of Energy Water Demand: Altamaha

Altamaha	2015	2020	2025	2030	2035	2040	2045	2050
Withdrawals MGD	54	54	54	55	57	60	63	68
Consumption MGD	35	34	34	35	37	39	41	44

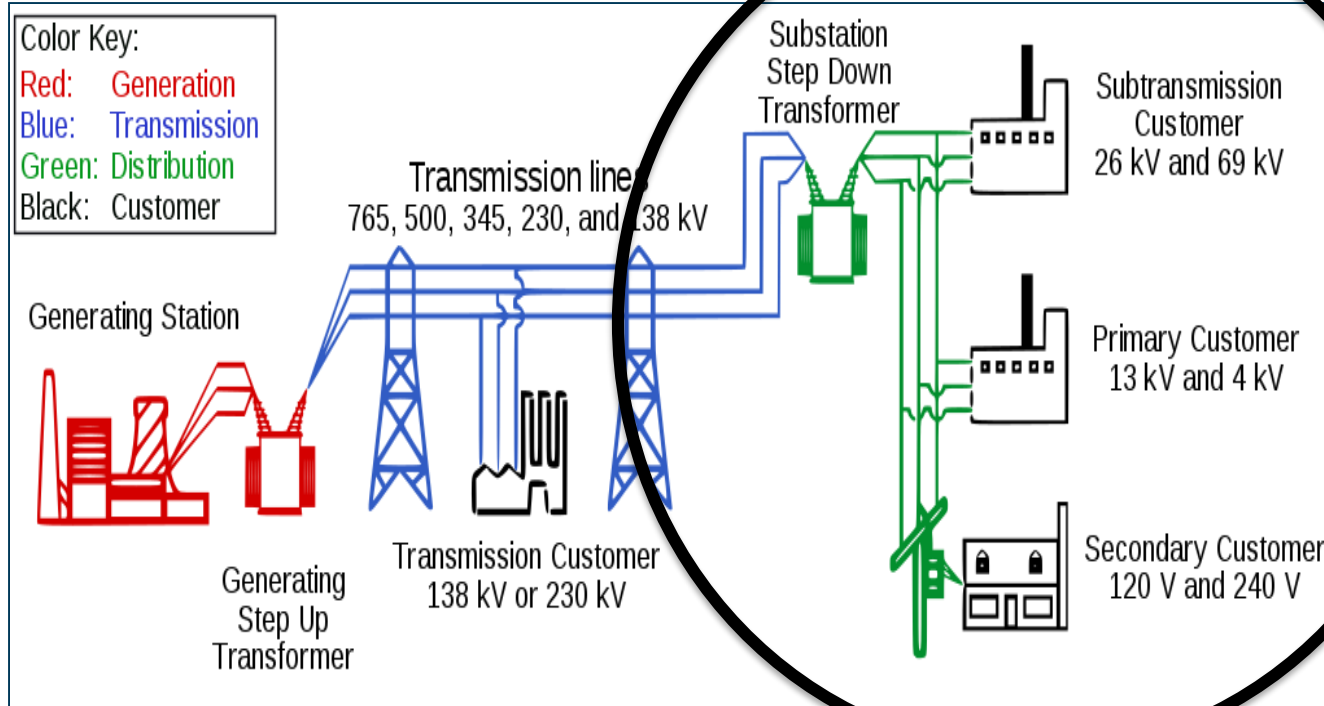




Georgia's State Water Plan

The Local Energy/Water Nexus

How Power Gets to You from the Grid



Local power utilities:


- Take power from the Grid
- Step it down to safe and usable voltage
- Distribute power to customers

<http://www.ferc.gov/industries/electric/indus-act/reliability/blackout/ch1-3.pdf>

<https://commons.wikimedia.org/w/index.php?curid=5577847>

Energy Management Corporations (EMCs)

- Move power from the Grid to End User
- Provide Customer Service
- Maintain Local Infrastructure
- Customer Billing
- Promote Energy Conservation
 - Energy Efficiency
 - Energy Savings
 - Water Savings

 OglethorpePower

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EMCs OF GEORGIA

Altamaha EMC	GreyStone Power Corporation	Rayle EMC
Amicalola EMC	Habersham EMC	Satilla REMC
Canoochee EMC	Hart EMC	Sawnee EMC
Carroll EMC	Irwin EMC	Slash Pine EMC
Central Georgia EMC	Jackson EMC	Snapping Shoals EMC
Coastal Electric Cooperative	Jefferson Energy Cooperative	Southern Rivers Energy
Cobb EMC	Little Ocmulgee EMC	Sumter EMC
Colquitt EMC	Middle Georgia EMC	Three Notch EMC
Coweta-Fayette EMC	Mitchell EMC	Tri-County EMC
Diverse Power	Ocmulgee EMC	Upton EMC
Excelsior EMC	Oconee EMC	Walton EMC
Flint Energies	Okefenoke REMC	Washington EMC
Grady EMC	Planters EMC	

<https://opc.com/emc-relationships/>

The Energy/Water Nexus

- It Takes Water to Produce Energy
- It Takes Energy to Treat and Deliver Water

“An average kWh of electricity in the U.S. used or consumed 41.6 gallons of water in 2009.” *Burning Our Rivers: The Water Footprint of Electricity, 2009.*

“At least 520 million Megawatt hours (MWh) of electricity per year is required to move, treat and heat water each year in the United States—comparable to 13% of total U.S. electricity consumption.” *The Carbon Footprint of Water, 2009.*

- Using Energy Efficiently Saves Water
- Using Water Efficiently Saves Energy



Georgia's State Water Plan

Water Conservation and Sustainability Practices at Plant Hatch



Lunch



Georgia's State Water Plan

Council Business

Council Business

- Approve meeting summary from January 31, 2019 Council Meeting
- Regional Council Website Updates
- Survey for Potential Topics of Interest
- EPD Seed Grant Announcement
- Outreach Opportunities


Georgia Water Planning

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Altamaha Water Planning Region




REGIONAL WATER PLAN



Regional Highlights



Technical Information




Get Regional Email Updates

Counties Included

The following counties are considered part of the Altamaha Region:

- Appling
- Bleckley
- Candler
- Dodge
- Emanuel
- Evans
- Jeff Davis
- Johnson
- Montgomery
- Tattnall
- Telfair
- Wilcox



Counties: Appling, Bleckley, Candler, Dodge, Emanuel, Evans, Jeff Davis, Johnson, Montgomery, Tattnall, Telfair, Wilcox

Upcoming Meetings

Next Council Meeting

The next council meeting will be held on Tuesday September 10, 2019 at Hatch Energy Education Center Edwin I. Hatch Nuclear Plant.

All Upcoming Council Meetings

Details on all upcoming Council meetings.

Past Meetings

Last Altamaha Meeting

Notes and details from March 21, 2019 Outreach Meeting.

All Meeting Notes

Notes from past Altamaha meetings.

About the Altamaha Region

- Water Planning Council
- Vision & Goals
- Implementation
- Learn About Regional Water Planning

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waterplanning.georgia.gov/altamaha-water-planning-region

Water Planning Regions

▼ Altamaha

Regional Water Plan

Regional Highlights

Implementation

Technical Information

Council

Vision and Goals

► Coastal Georgia

► Coosa-North Georgia

► Lower Flint-Ochlockonee

Metro Water District

► Middle Chattahoochee

► Middle Ocmulgee

► Savannah-Upper Ogeechee
Region

► Suwannee-Satilla

► Upper Flint

► Upper Oconee

[Home](#) » [Water Planning Regions](#) » [Altamaha](#) » Altamaha Implementation

Altamaha Implementation


Implementation of the Altamaha Regional Water Plan is carried out largely by the various water users and wastewater utilities in the region. Effective implementation of the Plan will require the availability of sufficient funding in the form of loans and grants. In addition, ongoing coordination and collaboration among stakeholders is crucial for successful implementation. The following provides an overview of some key implementation projects and funding sources within the Altamaha Region:

GEFA Funding Projects

The Georgia Environmental Finance Authority (GEFA) provides loans and grants in the region to support wastewater and drinking water related projects. In total \$12.8 million in loans have been provided toward clean water programs since 2015; \$8.7 million for drinking water programs since 2014, and \$4 million for the Georgia Fund since 2014.

319(h) Grant Funding

These grant funds are provided via the Clean Water Act to implement nonpoint source management programs. Watershed Management Plans were completed in September 2018 for the Lower Oconee River and Ochwalkee Creek utilizing this funding source.


 [Lower Oconee WMP FINAL.PDF](#) (2.88 MB) [Ochwalkee Creek WMP FINAL.PDF](#) (3.56 MB)

Conservation Funds

Loans to the Conservation Fund have been utilized for land acquisitions in the region allowing for the acquisition of the Sansavilla Wildlife Management Area (19,577 acres) and the Bullard Wildlife Management Area (11,000 acres).

Jaycee Landing Project

A strategic vision has been created for development of the Jaycee Landing and bluff area along the Altamaha River in Wayne county. The vision includes additional facilities at the landing as well as an associated Altamaha Nature and History Center.

 [Jaycee-Landing-Strategic-Vision.pdf](#) (20.22 MB)

Seed Grants

Regional Water Plan Seed Grants provide competitive funding annually to support and incentivize local governments and other water users as they undertake implementation of the Regional Water Plan. See [REGIONAL HIGHLIGHTS](#) for more information.

Survey – Potential Topics of Interest

- Helps guide future agenda planning
- Survey Monkey link sent out on July 25, 2019

Water Management Strategies
Drought Response Planning
Population Projections
Agricultural Water Demand Forecasting
Interaction of Groundwater and Surface Water
Federal & State agency initiatives
Recreational uses and opportunities
Suggested topic

<https://www.surveymonkey.com/r/9NDWV6H>

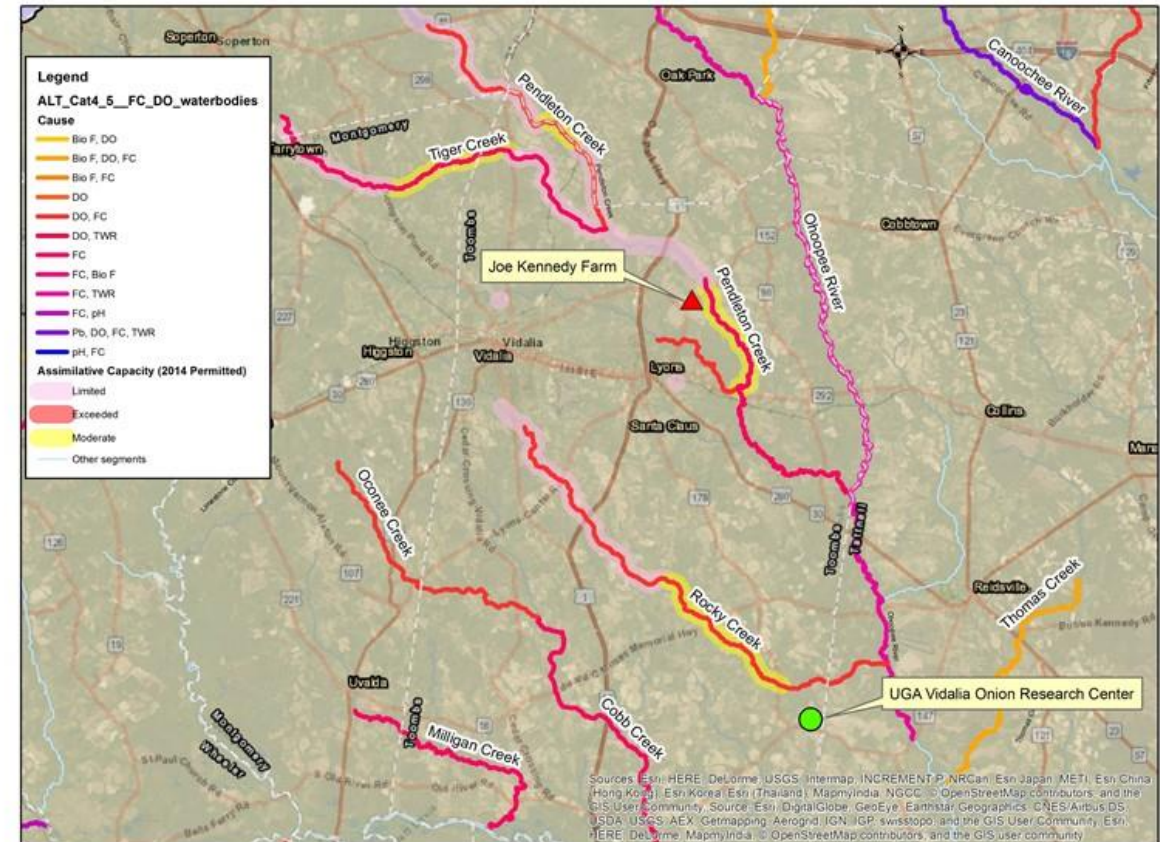
Upcoming Regional Water Plan Seed Grant Fiscal Year 2020 Grant Period

- Announcement released on July 31, 2019
- Eligible recipients of Seed Grant funds can include local, regional and State government, regional commissions, resource conservation and development councils, local schools, State college and universities, and State agencies
- Must attend a pre-application meeting by **October 17, 2019**
- Applications must be postmarked by **October 31, 2019**.

<https://epd.georgia.gov/regional-water-plan-seed-grant-funds>

Regional Water Plan Seed Grant Planning – Potential Topic

- Nonpoint source management & best management practices to address agricultural/urban runoff
 - Presence of impaired waters and segments with limited assimilative capacity
- Identifying specific growers in Toombs County area to further develop proposal
- MPs under consideration include NPSA-1, NPSA-2, NPSA-4 and TMDL-3



Continuing Support to RWP Councils

- Outreach Activities
 - Identify potential opportunities to share information regarding the updated RWP with key implementing actors in settings outside of the Council meetings
 - Continued coordination with young farmers and identification of opportunities to reach large target audience while engaging Council members: <http://gaaged.org/youngfarmers/>
 - Georgia Young Farmers Convention January 31 & February 1, 2020
 - Other outreach opportunities?

Georgia
Water

Regional Water Plan

How we got here



Regional Water Plan Video Preview



Georgia's State Water Plan

Public Comments/Local Elected Official Comments

Thank You!

Questions? Comments? Need
More Information?

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