

The Southeast: Reading a Regional Energy System

How It Works or Fails · The Southeast · Grades 11–12 / First-Year College

Name _____ Date _____ Class _____

How to use this sheet. A ride-alongside worksheet: keep the interactive Southeast map open beside you (AL, AR, FL, GA, MS, NC, SC, TN). This guide is about reading a region's whole energy system — its lenses, emissions app, vulnerability cards, and scenarios — not tracing one fuel. The thesis underneath every part: a region's energy system is a set of bets — and the Southeast's bet is that a fast-growing region can make its own power (new nuclear, coal, gas, and fast-growing solar) while importing nearly all of its fuel, because it barely refines any.

The map	Open the Southeast Fuel Flow Map full-screen — the refined-product distribution and power system (PADD 1C) across AL, AR, FL, GA, MS, NC, SC and TN.
Lens row	Sweep the views — refined products (the pipelines and ports), natural gas, nuclear, coal, and growing solar. The region imports fuel and generates power.
State filter	Switch between Georgia, Florida, Tennessee, the Carolinas, and Alabama / Mississippi to isolate one piece of the system.
Emissions	The button opens the emissions app — AIR QUALITY / FUEL CO ₂ / GHG / SINKS, on EPA/EIA data.
Vulnerability	Press VULNERABILITY and open a card. It holds the evidence behind the risk — what the asset depends on and what could take it down. Read it as a judgment that can move, not a fixed grade.
Scenarios	The story-row buttons run a real event — the Colonial ransomware, Hurricane Irma, Winter Storm Elliott, a Tennessee-Valley heat wave, a New Madrid quake — on today's infrastructure. The supply×demand (CURVES) windows sit in the crude and gas lenses, and some shocks move them.

Part 1 · The mix — makes its power, imports its fuel

Sweep the views, then use the state filter. This region generates its own power — nuclear, coal, gas, and growing solar — but imports nearly all of its liquid fuel, because it barely refines any. The thesis starts here: a region's energy system is a set of bets, and the Southeast's bet is make-power, import-fuel.

Pick ONE state or zone to characterize (different groups take different ones):

- Georgia — Vogtle's new reactors, Plant Bowen coal, and Atlanta as the pipeline hub
- Florida — the peninsula: fuel by sea (no pipeline), gas power, and fast-growing solar
- Tennessee — TVA: nuclear, coal, and hydro, plus the Memphis fuel island
- The Carolinas — Duke's nuclear and coal, growing solar, and the V.C. Summer cancellation
- Alabama / Mississippi — the coal, the few refineries, and the Gulf-edge gas storage

1.1 For your state or zone, sweep the views and name what runs it and where its fuel comes from — with one number or fact from the map.

1.2 What does the map show is bringing the region's gasoline, diesel, and jet in — and why does 'imported fuel' define the region?

1.3 Pick TWO sources on the map and name what each is genuinely good at here, and note which are firm (run day and night) versus intermittent.

Part 2 · The tradeoff — what it costs and what it buys

Open the emissions app (AIR QUALITY / FUEL CO2 / GHG / SINKS). Emissions are the cost; what they buy is fuel in a form the plants can turn into power on demand.

2.1 Open GHG and read the sectors, then open FUEL CO2 and read its Electric Power row. Which sector produces the largest share of the region's emissions — and inside electricity, which fuels produce it?

2.2 Open AIR QUALITY. Read the power rows (Coal, Gas, Oil, Biomass) first under sulfur dioxide, then under PM2.5 (fine particles), and step the years. How big is the power fleet's share of each, and where does that share end up by the latest year?

2.3 Open SINKS. What do the region's land pools do to its carbon total — and what does the Settlements pool show that Forest Land does not?

Part 3 · The weak point — a vulnerability judgment that can move

Press VULNERABILITY and open a card. A score here is not a fixed grade — it is a judgment about how this asset can fail, built from the evidence on the card, and it moves: a changed condition, or new research, can legitimately raise or lower it.

Pick ONE asset to read (different groups take different assets):

- Colonial Pipeline — the single dominant products artery from the Gulf
- Florida Gas Transmission — the gas lifeline to the Florida peninsula
- Vogtle 3 & 4 — the new-nuclear bet that nearly became a cancellation
- Plant Bowen — the biggest coal plant on the map, in a shrinking fleet
- Valero Memphis — a market on one supply line, with no second
- Elba Island LNG — the import terminal that flipped to export
- Kingston — where the ash pond failed and the plant kept running

3.1 Open your asset's card and read its evidence — what it depends on, what has already happened to it, what its failure would take down. In your own words, what is this asset's real vulnerability: where and how does it fail? Cite the card.

3.2 A rating is a snapshot of today's conditions. Name one specific change that would make your asset MORE vulnerable and one that would make it LESS — and say why.

3.3 (Optional — needs outside research.) Now judge the map's rating for your asset: is it well-supported, understated, or overstated? Take a position and back it with evidence beyond the card — a Colonial cyber update, a FERC pipeline filing, an NRC or utility report on Vogtle, a coal-retirement plan, a hurricane-season outlook. A vulnerability rating is only as current as the evidence behind it.

Part 4 · The shock — run a scenario

Each scenario runs a real event on today's infrastructure. The supply×demand (CURVES) windows sit in the crude and gas lenses, and some shocks move them. The Southeast theme: a region that imports its fuel and is switching its power, exposed to hurricanes, cold snaps, summer heat, and the single arteries that feed it.

Pick ONE scenario to run (different groups take different shocks):

- Colonial Ransomware — the pipe stops and the Southeast runs dry (May 2021)
- Hurricane Irma — the storm closes the ports and Florida's fuel-by-sea stops (Sep 2017)
- Winter Storm Elliott — TVA and Duke's first-ever rolling blackouts (Dec 2022)
- River Temperature — a Tennessee-Valley heat wave throttles the nuclear fleet
- New Madrid — a great quake on the seismic zone, modeled on today's system

4.1 Run your scenario. What does it hit FIRST, and — because the region imports its fuel and leans on a few big plants — what has no easy backup? Name the cascade.

4.2 Run Colonial Ransomware and watch the crude supply×demand (CURVES) window. Which curve moves, and what happens to price and quantity? What is the signature (most telling feature) of this shock?

4.3 Now run another Southeast scenario. What do the two shocks have in common — and how does each one hit the region differently?

Part 5 · Judgment — defend a claim

Use evidence from at least two earlier parts. There is no single right answer — the argument is graded, not the side.

5.1 The Southeast's power supply is getting cleaner and more diverse at the same time as its fuel keeps arriving on a few arteries and by sea. Which of those two facts decides how secure the region actually is? Take a position and defend it with specific evidence from at least two earlier parts — your state or zone from Part 1, an emissions reading, a vulnerability judgment, or a result from a scenario you ran.

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