

The Intersection of Public Policy & Nuclear Construction

Christopher Vachovetz - August 23, 2017



The Alvin W. Vogtle Electric Generating Plant, must be consider a single asset.

The two operating units are indivisible from the construction project.

Therefore it is a “negative stranded asset”.

Exempt Wholesale Generator status would bring private investment to the facility.

It would make in necessary under established regulation for utilities to sell interest to the facility.

Strategic, asset privatization has been successful, in New Jersey, New York and Connecticut particularly in regard to nuclear assets.

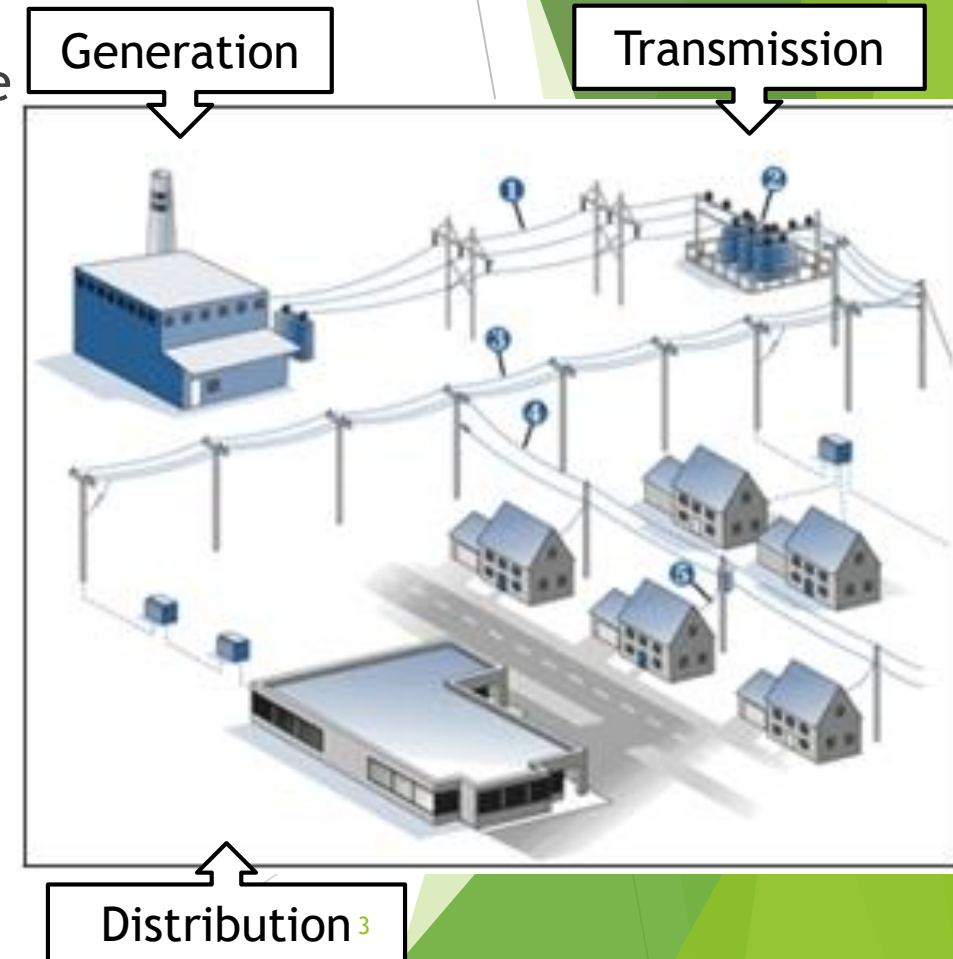
This delates the “asset bubble”, created by government subsidies.

“Millions of individuals making their own decisions in the marketplace will always allocate resources better than any centralized government planning process.” - Ronald Reagan

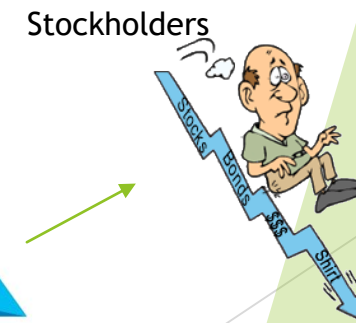
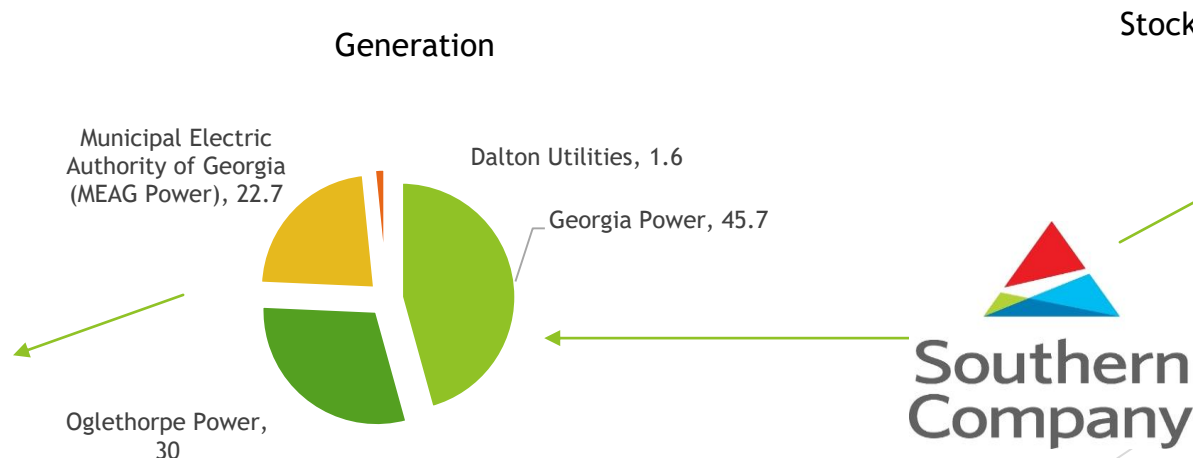
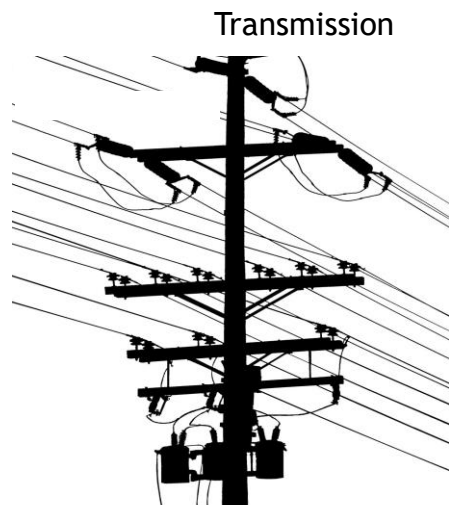


Historically a private utility had three major functions associated with electricity:

- ▶ Generation: creating electric power from another source (coal, natural gas, nuclear, hydro, bio-mass, solar or wind)
- ▶ Transmission: high-voltage movement of power from generators to distributors, regulated by the Federal Energy Regulatory Commission
- ▶ Distribution: low-voltage movement of power from distributors to consumers, regulated by state Public Service Commission



- ▶ Private Utilities:
 - ▶ Georgia Power Company and Savannah Electric and Power
 - ▶ subsidiaries of Southern Company
- ▶ Wholesale Distributors:
 - ▶ Oglethorpe Power Corporation, Electric Power Cooperative, nonprofit owned by municipal investment
 - ▶ Municipal Electric Authority of Georgia, nonprofit public corporation (investor-owned)
- ▶ Southern Company: gas and electric utility holding company (Publicly - Traded)
 - ▶ allows the reduction of risk for the owners
 - ▶ allows the ownership and control of many different companies



- ▶ There is risk in Georgia Power's obligations exceeding its revenue, this risk is mitigated by regulation.
- ▶ Oglethorpe Power and MEAG have a much greater risk of damaging their ability to obtain credit.
- ▶ MEAG issued bonds for its 22.7% interest in the Vogtle project. S&P have given these bonds a **negative** outlook.
- ▶ In the absence of credit, the state would be forced to allow rate increases to cover operating costs.

The New York Times

BUSINESS DAY

Bankruptcy Filing of California Utility Tests the Limits of the Court

By LAURA M. HOLSON APRIL 9, 2001

When the Pacific Gas and Electric Company filed for bankruptcy protection Friday, a shudder swept through corporate suites as California's largest utility directly or indirectly owned by ratepayers to set retail rates.

PG&E Files for Bankruptcy / \$9 billion in debt, firm abandons bailout talks with state

David Lazarus, Chronicle Staff Writer Published 4:00 am, Saturday, April 7, 2001

After 11 of the bankruptcy code because the utility's lawyers said.

PG&E filed for bankruptcy protection Friday with \$9 billion in debt and, after months of fighting with politicians and regulators, no way of recovering that money from consumers. If the outcome is that the utility can raise retail rates to cover its total energy costs -- something it has not been able to do under California law -- ratepayers could be forced to pay more.

Utility's bankruptcy prompts consumer worries in Texas

Consumer advocates are concerned over the effect on the state's electricity market

By Ryan Healeywell | April 29, 2014 | Updated: April 29, 2014 11:06pm

BONDS NEWS | Thu Mar 30, 2017 | 6:20pm EDT

Investors bottom fish municipal bonds tied to Westinghouse bankruptcy

By Daniel Bases | NEW YORK, MARCH 30

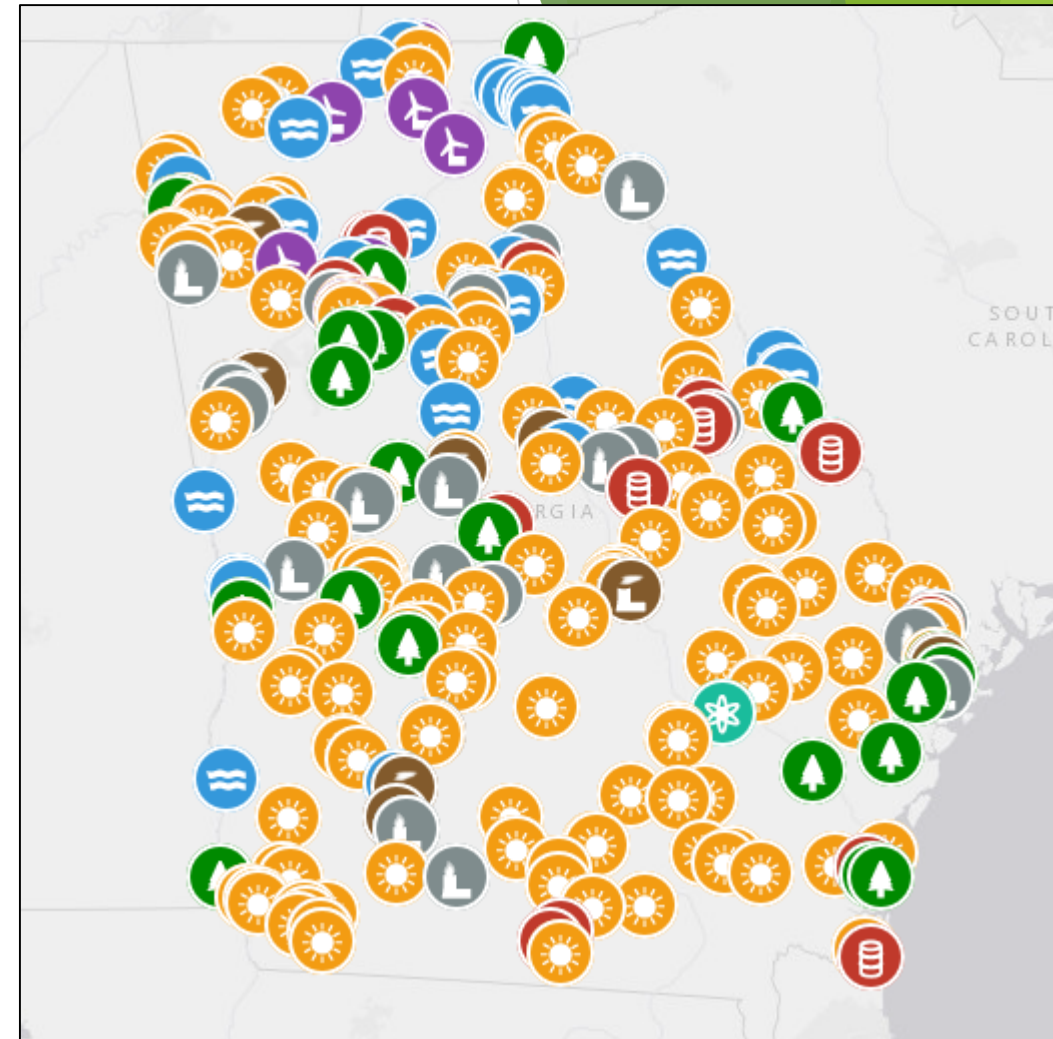
The sell-off of municipal bonds tied to the bankruptcy filing of Westinghouse Electric paused on Thursday as investors reconsidered concerns on the likelihood that construction of four U.S. nuclear power plants hit by billions in cost overruns will be completed.

Massive Bankruptcy Tests Texas Utility Regulators

In coming months, the Public Utility Commission is expected to weigh in on an unprecedented plan to help Texas' largest power company emerge from bankruptcy, with huge implications for the electric grid and Texas ratepayers. Along with the financial world, consumer advocates will be watching closely.

BY JIM MALEWITZ AUG. 28, 2015 6 AM

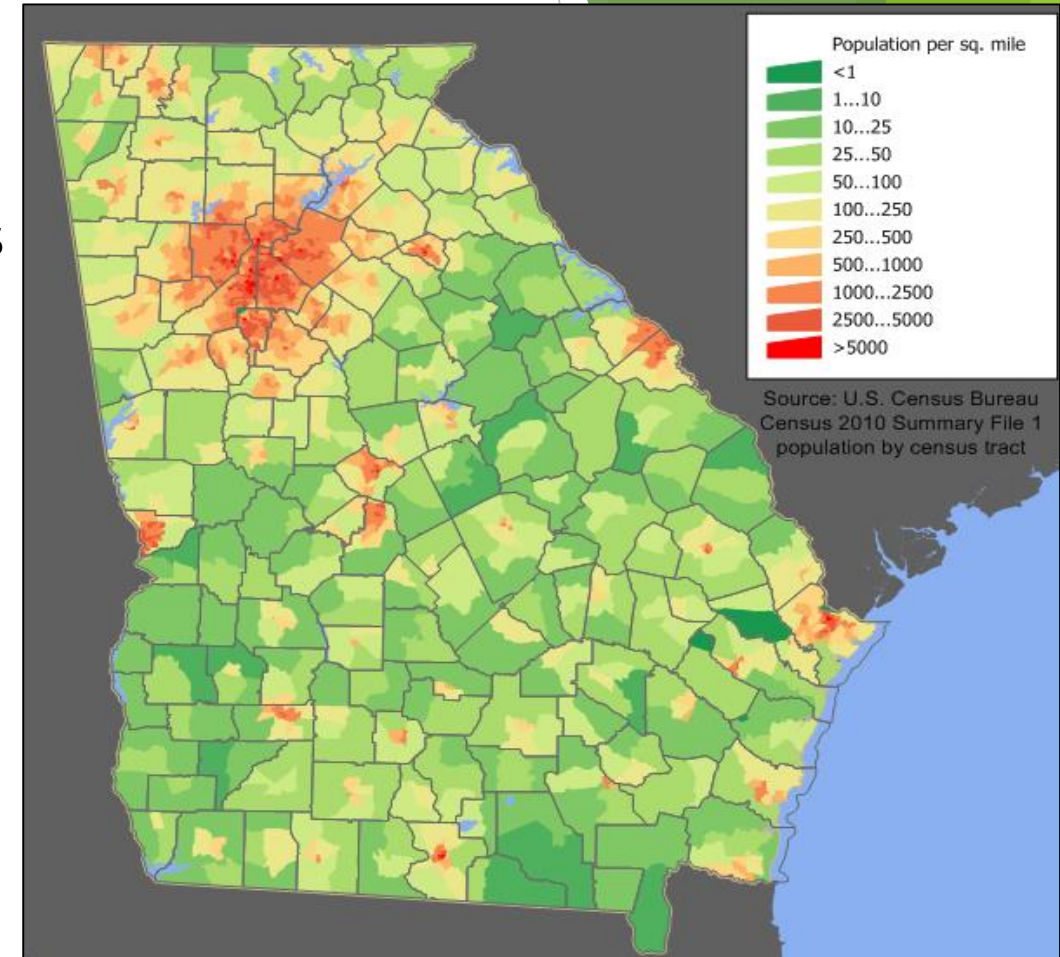
- ▶ In a deregulated market, generation assets are sold, and only transition and distribution remain regulated and owned by utilities.
 - ▶ deregulation of all generation assets lead to utility bankruptcies in California and Texas.
 - ▶ This is based on an “Asset Bubble”, a new asset enters the market, the price inflates. This creates a condition where low interest rates cause over-expansion.
- ▶ Georgia never deregulated, yet has an “Asset Bubble”
- ▶ State and Federal subsidy (low interest loans) favored one asset class (Nuclear Construction).
- ▶ At the same time “exempt wholesale generators”, thrive and have diversified in the state.



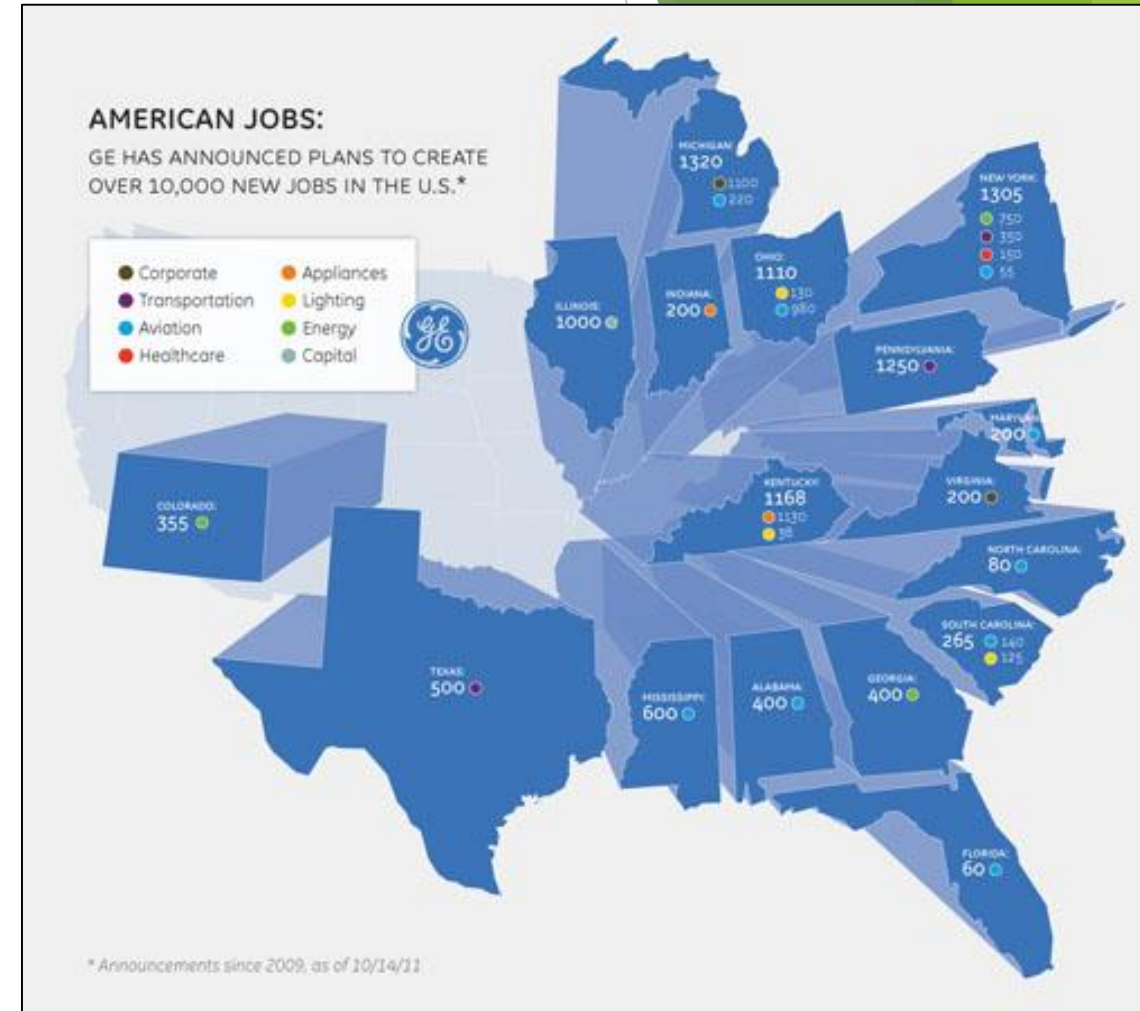
Generation Facility by Class Georgia

Free markets favor privatized, low capital production (exempt wholesale generators)

- In a postindustrial society, both businesses and families are independent of a fixed location.
- It becomes less likely that one's heirs will benefit from any single asset in a fixed geographic location, over decades.
- The intent was to build large generators, that would move business to a lesser developed part of the state.
- Lack of market pressure on this investment, lead to less agile decision making.



- ▶ Major corporations may have multiple headquarters throughout the country. If one geographic location becomes more favorable, resources can be moved.
- ▶ Georgia has economic growth in Professional Services, Information Technology and declines in Manufacturing and Agriculture.
- ▶ A service economy benefits from low electric rates.
- ▶ The annual “Nuclear Tax” of \$100 subsidizes an asset that is misaligned with the market.



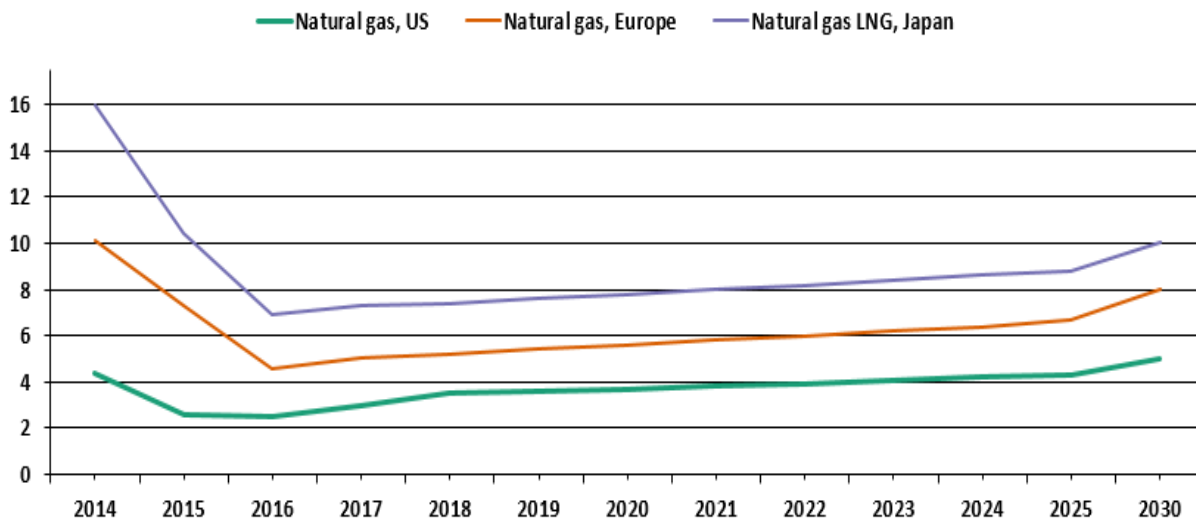


The Elba Island, Georgia, liquefied natural gas (LNG) receiving terminal can regasify up to 1.8 billion cubic feet of natural gas per day, and has storage capacity for 11.5 billion cubic feet of LNG.

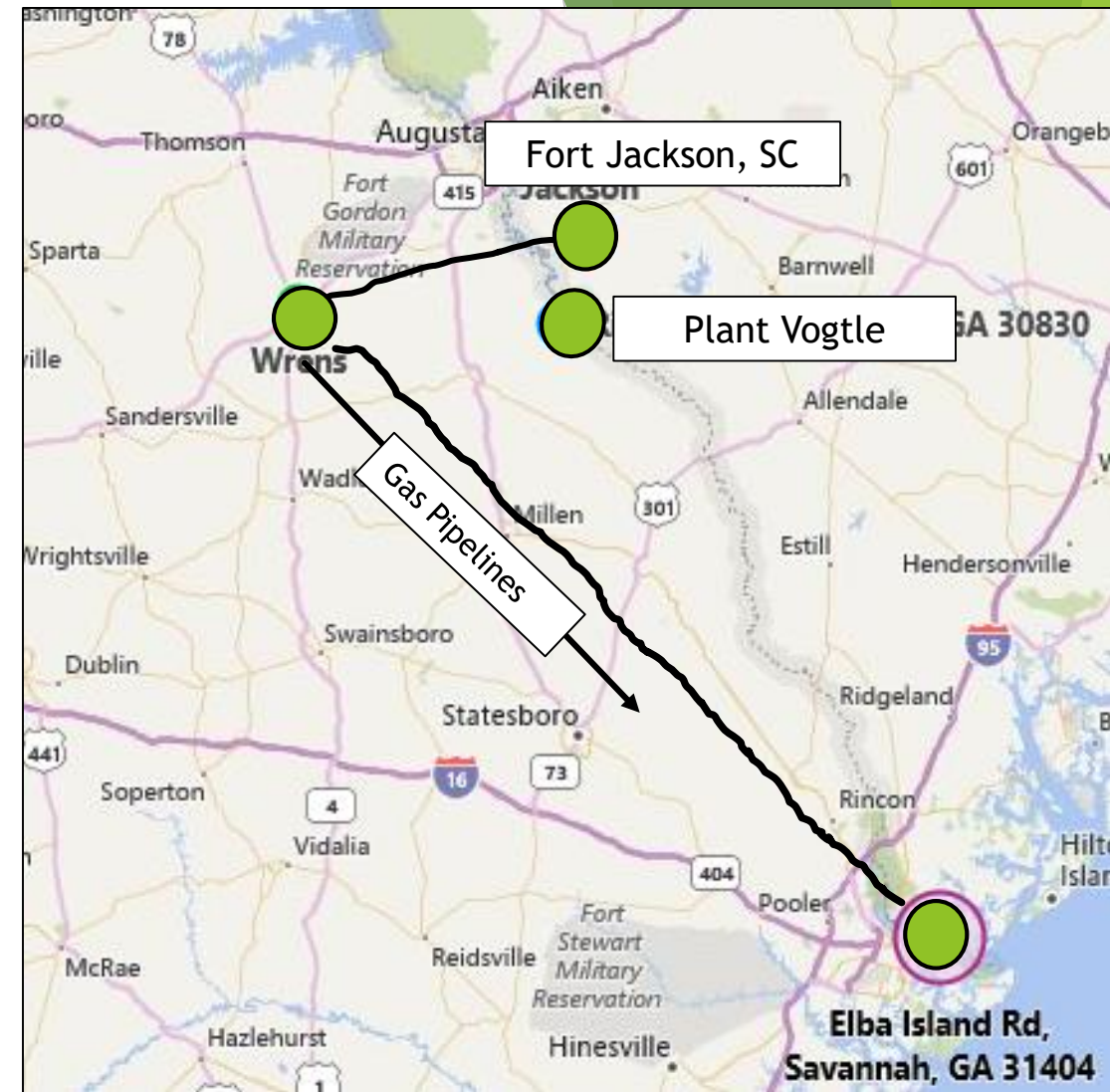
The Federal Energy Regulatory Commission has approved additional facilities to export up to 350 million cubic feet per day of natural gas as LNG.

- Southern LNG Company owns the majority share in Elba Liquification Company.
- Southern Natural Gas owns the pipelines.
- A major artery runs ~10 miles from plant Vogtle (on its way to Elba Island and International Export).

Natural Gas Prices Forecast: Long Term 2017 to 2030



Courtesy of KNOEMA



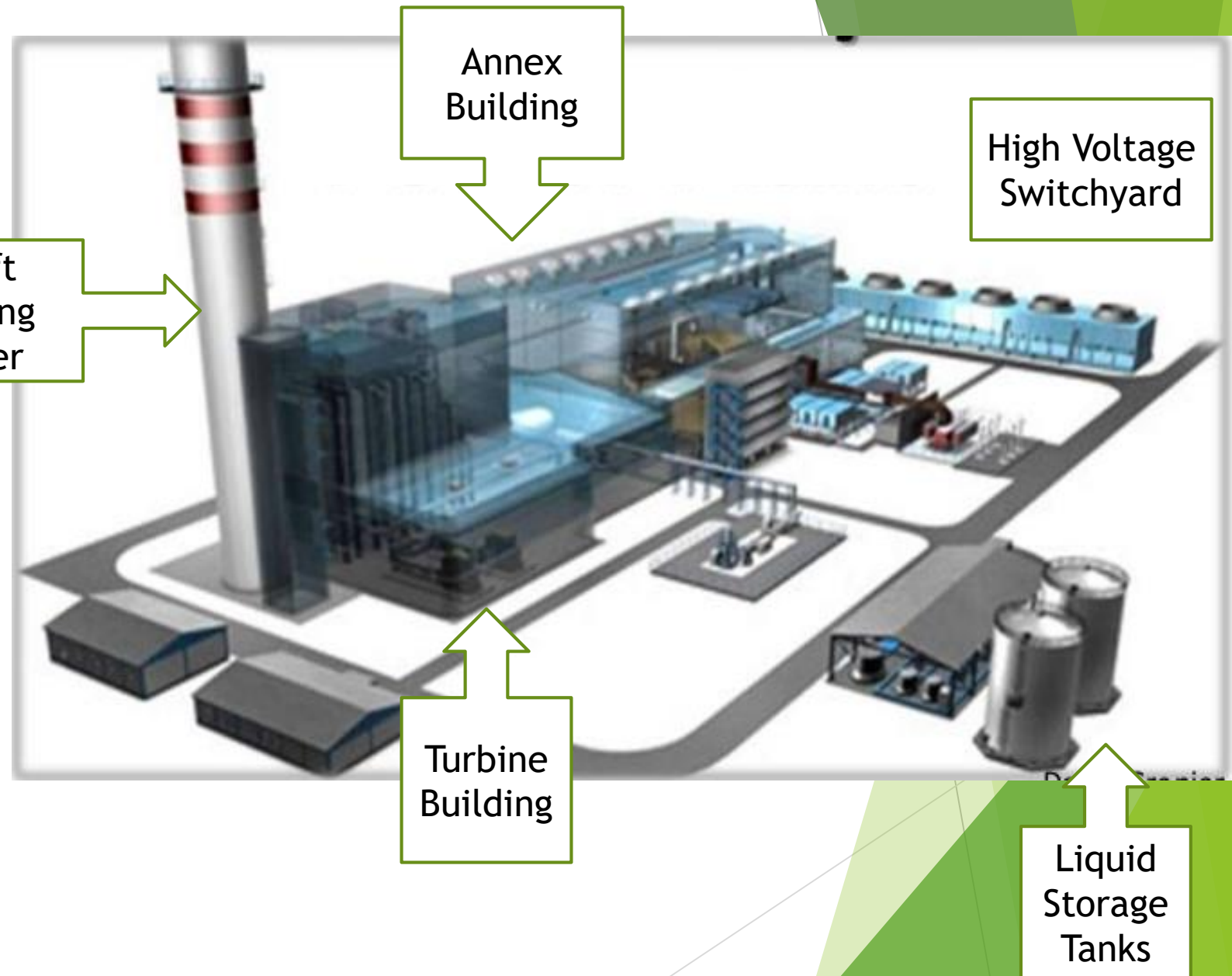
Completed Structure of Vogtle Project:

- Draft Cooling Towers (2)
- High Voltage Switchyard
- Turbine buildings (2)
- An Annex Building
- Seismically tested liquid storage tanks



The infrastructure of a combined cycle natural gas plant has similar structures

GE Power Generation builds Combined Cycle Gas Turbine Power Plants and has a Center of Excellence in Chamblee, GA



Power Plants: Costs and Characteristics

Report to Congress 2008

► Construction Costs

- Natural Gas Combined Cycle Plant \$1,200 per kW
- Nuclear, \$3,000 per kW

Operating Costs:

Technology	Government Incentives in the Base Case	Annualized Cost per Mwh in Base Case	Additional Government Incentives	Annualized Cost Per Mwh With Additional Incentives	Percent Difference	Capacity Factor
NG: Combined Cycle	None	\$61.77	None	\$61.77	0%	90%
Nuclear	production tax credit	\$83.22	Loan guarantee; construction work in progress in rates.	\$63.77	-23%	90%

Southern Company and Federal Subsidies

Courtesy: Nuclear News

Energy utility Southern Co calls on Trump for help, as it takes over Vogtle nuclear station construction



Southern to Take Over Westinghouse Georgia Nuclear Project <https://www.bloomberg.com/news/articles/2017-05-13/southern-to-take-over-georgia-reactor-projects-from-westinghouse> by

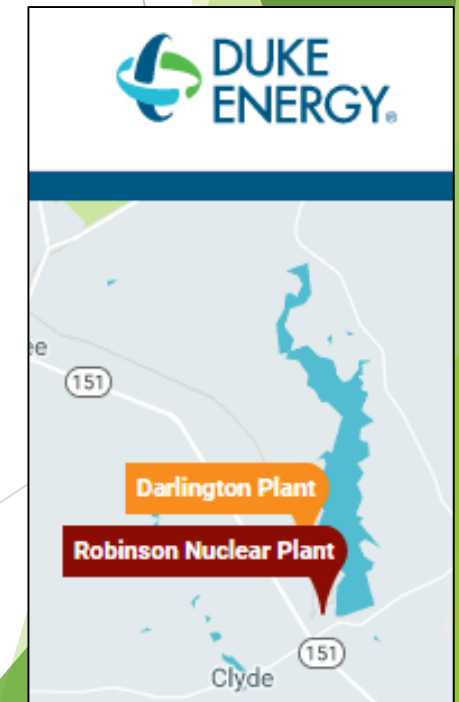
Stephen Cunningham and Tiffany Kary May 14, 2017,

Westinghouse bankruptcy threw fate of reactors into question
Southern has appealed to Trump administration for help

Utility owner **Southern Co.** has agreed to take the lead on building two nuclear reactors at its Vogtle power plant in Georgia from bankrupt contractor **Westinghouse Electric Co.** as soon as next month.

1. The Energy Policy Act of 2005 extends the **Price-Anderson Nuclear Industries Indemnity Act** (compensates the nuclear industry against liability claims arising from nuclear incidents) only for reactors **in operation by 2025**.
2. There is a fortune to be made in exporting Natural Gas to Europe & Asia.
3. Excess generation can be sold out of state in an open market.
4. Smart-Grid and Energy Storage will allow long distance transmission.
5. There are enormous, Licensing and Training costs associated with Vogtle.
6. Southern Nuclear is the guaranteed operating company.

- ▶ For an Exempt Wholesale Generator, the “Asset Bubble”, reverses, a new asset enters the market, the price inflates.
- ▶ Vogtle 1&2, asset, fuel & decommissioning fund, has a market value of ~\$1.2B.
 - ▶ Generates ~2, 400 MWe
- ▶ Florida Electric markets are 11% higher than Georgia.
- ▶ Southern Company typically, seeks a partner for its profit ventures.
- ▶ There are investors of interest;
 - ▶ Duke Energy operates nuclear and natural gas facilities.
 - ▶ GE Power, has invested in natural gas facilities.
- ▶ Georgia can create an environment were investors can profit.
- ▶ Subsidies created,
 - ▶ low interest high dollar debt
 - ▶ limited asset class and design (AP-1000)



► A Successful Future for: Georgia

Alvin W. Vogtle Energy Center

- Two Pressurized Water Reactors
- A Combined Cycle Natural Gas Facility
- Four Small Modular Reactors
- **Funded by Private Investment**

