



Union of
Concerned
Scientists

Citizens and Scientists for Environmental Solutions

Vogtle Nuclear Plant Expansion: Big Risks and Even Bigger Costs for Georgia's Residents

FACT SHEET

JANUARY 2012

Expert analysis concludes that a plan by Georgia utilities to add two new reactors to the existing Vogtle nuclear power plant near Augusta carries major risks of cost overruns and delays, lacks transparency, and ignores cleaner, cheaper, and less risky alternatives.

It has been nearly three decades since a new nuclear power plant has been built in the United States. In the early 1980s, an industry that was once hailed as the solution to ever-diminishing reserves of fossil fuels lost momentum under the weight of huge construction delays and cost overruns, combined with mounting safety concerns. But in recent years, nuclear plant developers have begun pushing for approval to construct a new generation of reactors. Eighteen applications for new or expanded plants are now before the U.S. Nuclear Regulatory Commission (NRC).

But is nuclear power any more economically viable today than it was 30 years ago? Will the industry

be able to build and run safe nuclear plants without calling on taxpayers and ratepayers to cover hundreds of billions of dollars in cost overruns, as it has in the past?

A study conducted for the Union of Concerned Scientists by Synapse Energy Economics, Inc. (a research and consulting firm that specializes in energy, economic, and environmental topics) takes a close look at proposed nuclear plant construction projects in two states, Georgia and Florida, and compares them with several alternatives available to meet energy demand in those states.¹ In Georgia, Synapse researchers focus on the proposed expansion of the Vogtle nuclear power plant in Burke County,

The Vogtle nuclear power plant expansion is not the best way to meet Georgia's energy needs:

- It will be more expensive than other readily available alternatives, including energy efficiency, renewable energy, and natural gas.
- If built, the plant would raise the average residential customer's electric bill by at least \$120 per year by 2018 (and new cost projections suggest customers could pay much more).
- Energy efficiency, combined with a greater reliance on natural gas and renewable energy, could provide cheaper electricity to Georgia residents at much less risk, while also reducing global warming pollution.

where Georgia Power (a subsidiary of Southern Company) and local cooperative and municipal electric utilities have already begun site preparation for two new 1,100-megawatt (MW) nuclear reactors known as Vogtle 3 and 4, which are projected to come online in 2016–2017.

A RISKY INVESTMENT

The Synapse analysis identifies major problems associated with the construction of the two new Vogtle reactors, including:

Unproven reactor technology. The reactors chosen for the Vogtle expansion are of a new design—AP1000s by Westinghouse—that has never



© Wikimedia Commons/Milfred Pierce

Ratepayers in Augusta (above) and nearby communities are already having to pay for the Vogtle expansion (marked on the inset map), and will face much higher electricity costs if it is completed.



Site preparation already has begun for Vogtle 3 and 4, as shown above. Fortunately, investing in renewable energy and energy efficiency would eliminate the need for this high-cost, high-risk generation project.

been built in the United States (not surprising, given that the most recently used U.S. design was deployed in the 1970s) or completed anywhere else in the world. Indeed, the NRC only approved the AP1000 design in December 2011. That means the reactors have never been tested under actual working conditions. Nuclear power construction has always been, and remains to this day, a complicated and exceedingly high-stakes process that has often led to major cost increases and construction and regulatory delays.²

Secrecy Instead of Transparency.

Vogtle 1 and 2 (the reactors currently in operation) were initially projected to cost \$660 million; by the time they were completed in 1989 the price tag had ballooned to \$8.87 billion—a 1,200 percent increase. Unfortunately, Vogtle’s developers have revealed little about the new project’s real costs and risks: Georgia Power has redacted cost and schedule data from the information it has made public, which not only undermines the public’s confidence

Georgia Power continues to rely on outdated assumptions in its cost projections, despite the Vogtle plant’s prior history of large cost overruns.

in the utility to keep cost and safety issues under control—an understandable concern considering that customers are being asked to pay for the project well in advance of its operation—but also makes it difficult for independent analysts to verify the company’s cost projections and timeline estimates. Exacerbating these concerns is the fact that Georgia Power continues to rely on old assumptions in its cost projections for the Vogtle expansion, despite the plant’s prior history of large cost overruns as well as major changes in economic and regulatory conditions since the project was first announced in 2008.³ This lack of transparent, verifiable information puts Georgia’s

ratepayers at significant risk for major price hikes in the coming years if current plant construction cost estimates prove unrealistic.

Rising electricity rates Skyrocketing nuclear plant construction costs will translate into higher electricity costs for ratepayers. By 2018, Georgia Power estimates the Vogtle expansion will add at least \$120 per year to the bill of a residential customer using 1,000 kilowatt-hours (kWh) per month. Given that the average Georgia Power residential customer currently uses 1,132 kWh per month (according to the U.S. Department of Energy), the yearly increase would be closer to \$132. And if expansion costs rise above the projected \$14 billion, as most industry analysts expect, those extra costs will be passed onto Georgia Power’s electricity customers, too.

RATEPAYERS ARE ALREADY STUCK WITH THE BILL

The U.S. nuclear industry has been able to promote nuclear power as a cost-effective solution to the nation’s energy needs by obscuring the real costs of planning, construction, operation, and waste disposal—primarily through corporate tax breaks and liability protection policies. These hidden costs are ultimately borne by ratepayers and taxpayers. Indeed, Georgia Power ratepayers are already being forced to pay for Vogtle’s financing costs long before the reactors generate a single kilowatt of electricity—and even if they never get built at all.

Georgia Power and its partners on the Vogtle expansion—Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and Dalton Utilities⁴—have been awarded an \$8.33 billion

federal loan guarantee by the Department of Energy, final approval of which is contingent on receiving NRC approval for the project as well as meeting other financing requirements. It is worth noting that the federal loan program was created in 2005 precisely because private lenders were unwilling to take on the financial risk of lending for nuclear power plant construction, which is not surprising given the industry's long history of default, cancellations, and cost overruns. As some critics have put it, the federal loan program amounts to "socializing the risk and privatizing the profits for big power companies."⁵ Indeed, the federal guarantee will relieve Georgia Power and its partners of considerable financial risk by putting *all* U.S. taxpayers (not just the state's ratepayers) on the hook to pay back the loan if these companies are unable to repay their debts.

Georgia Power ratepayers are forced to pay for the Vogtle expansion long before the reactors generate a single kilowatt of electricity—and even if they never get built at all.

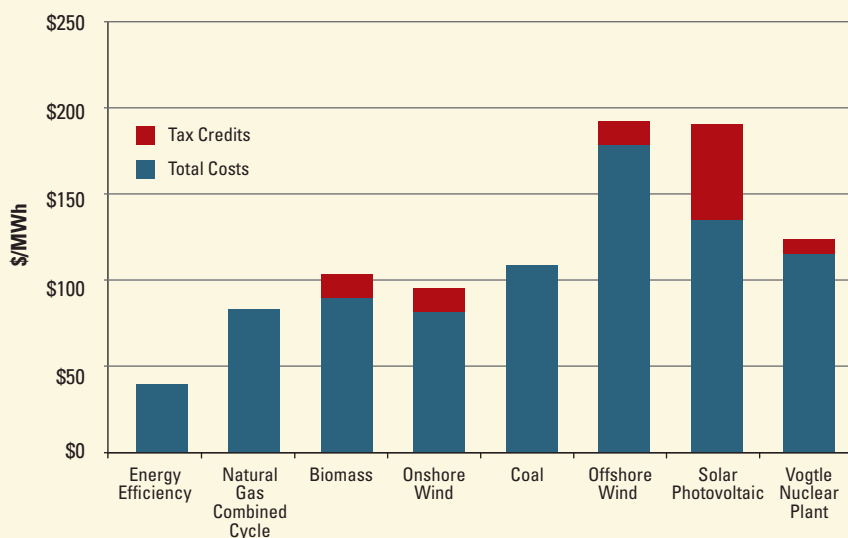
In addition to the federal loan guarantee, Georgia Power will also enjoy a federal production tax credit that could be worth hundreds of millions of dollars, also courtesy of U.S. taxpayers. Provided the project comes online before 2021, the tax credit would give Georgia Power up to \$125 million per year per 1,000 MW of new nuclear capacity (Vogtle 3 and 4 will have a combined total capacity of 2,200 MW) for the first eight years of electricity production.

The Georgia Nuclear Energy Financing Act, adopted in 2009, allows Georgia utilities to pass onto

their current customers the costs of financing the construction of nuclear power plants.⁶ Georgia Power's portion of the construction financing costs is estimated to be \$1.6 billion, and the utility began passing these costs onto its residential ratepayers in 2011 via a per-kWh surcharge on their bills. The average residential customer now pays about \$3.73 per month, or \$44 per year, to finance the reactors (based on the utility's usage estimate of 1,000 kWh per month, which is about 10 percent lower than current usage rates). As construction continues, the surcharge will increase; as noted above, by 2018 the average residential customer will pay an additional \$10 per month (or \$120 per year).

If the new Vogtle reactors *do* get built, Georgians will pay top dollar for the electricity. Synapse calculated the "levelized cost" of the project, accounting both for construction and operating costs. Taking into account available information and a number of variables (including the industry's history of cost overruns), Synapse developed a low-, mid-, and high-range cost estimate for the two proposed Vogtle reactors to compare against other energy sources. The study's mid-range cost estimate for the Vogtle expansion, \$115 per megawatt-hour (MWh), was higher than that of most other energy solutions, including improved energy efficiency to reduce electricity use, natural gas, biomass, land-based wind, and even coal (see the chart at left). The only energy sources in the analysis that proved more expensive than the Vogtle expansion were offshore wind and solar photovoltaic, the costs of which are expected to fall over time.

Levelized Costs for Vogtle Plant Compared with Other Energy Resources



Note: Total costs are based on mid-range estimates for all technologies and include capital costs; operation, maintenance, and fuel costs; and costs associated with the projected regulation of carbon dioxide and toxic air emissions. The impact of available tax credits for each technology is also shown.

Data source: Synapse Energy Economics, Inc.



Energy efficiency initiatives can help consumers save money and reduce the need for new generating capacity. Unfortunately, Georgia spends only \$2.18 per person on these programs, less than one-sixth the national average.

BETTER ENERGY CHOICES ARE AVAILABLE IN GEORGIA

The nuclear power industry works hard to portray its product as inexpensive. But as the Synapse analysis demonstrates, building new nuclear reactors is one of the most expensive ways to address Georgia’s future energy needs. The state has energy solutions that are clearly superior to the Vogtle expansion—solutions that are proven to work, have more predictable costs, and involve far fewer safety considerations.

The most cost-effective way to meet Georgia’s energy demands now and in the future is to improve energy efficiency. At \$40 per MWh (according to the Synapse study), that approach would amount to just one-third of the levelized cost of the Vogtle plant. Increasing the state’s reliance on wind, natural gas, and biomass as a source for electricity would also be less expensive than the Vogtle expansion, with mid-range levelized costs (per MWh) of \$82, \$83, and \$90, respectively. These

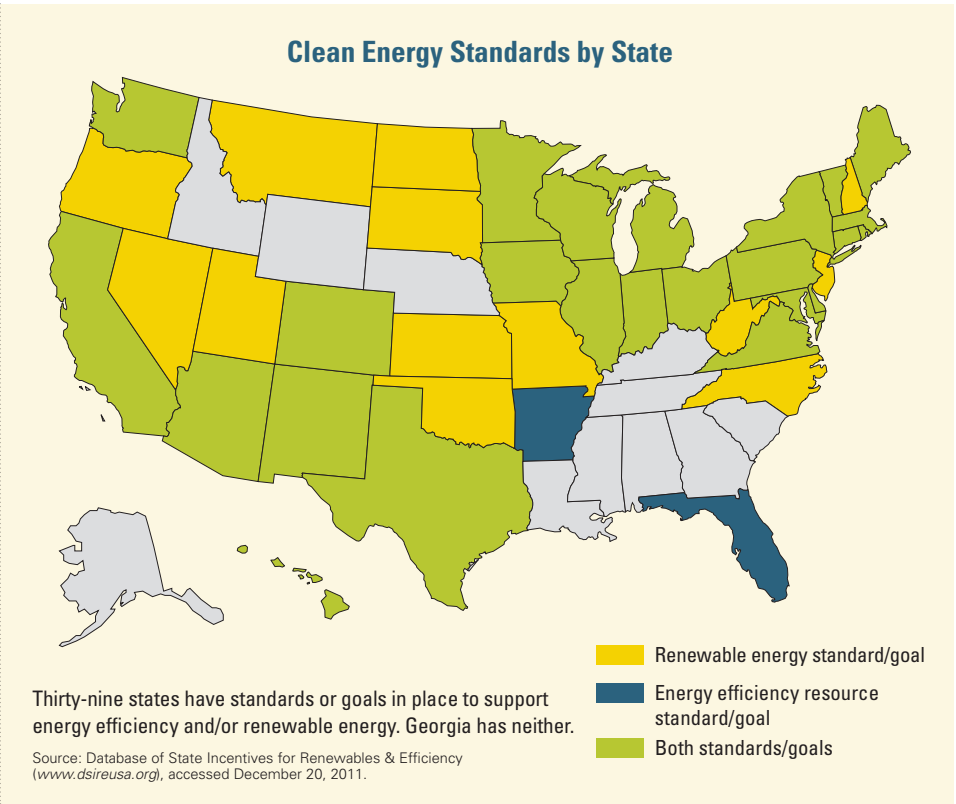
energy alternatives are described in more detail below.

Energy Efficiency. Georgia has done little to invest in energy efficiency and has established no statewide energy efficiency targets, a step that 26 other states have taken (see the

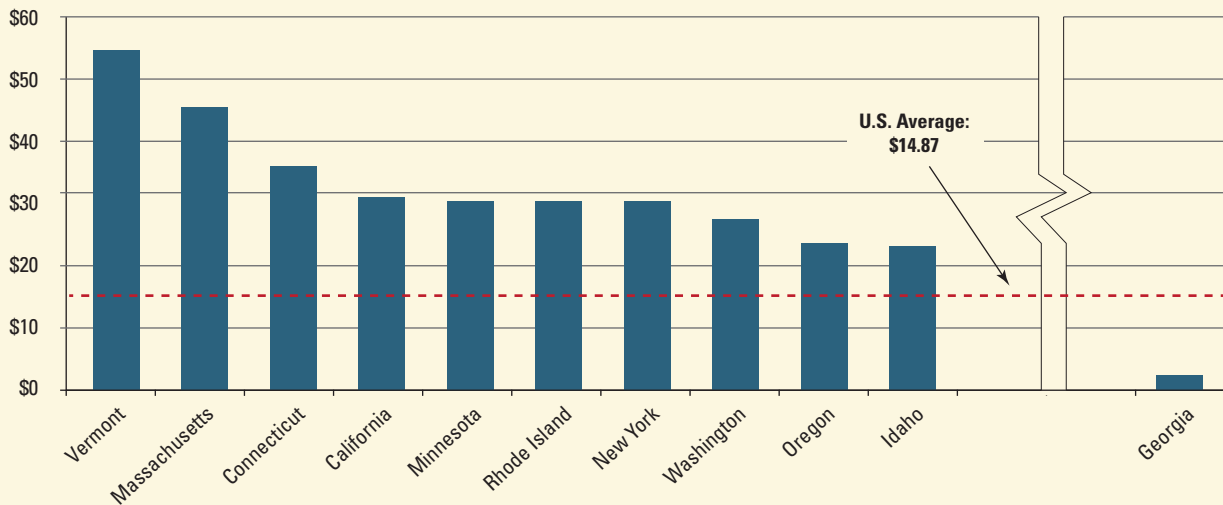
When combined with energy efficiency, renewable energy could significantly reduce—or even eliminate—the need to build high-risk generation projects like the Vogtle expansion.

map below). Such standards require utilities to help their customers reduce their energy consumption through a variety of measures including rebates for energy efficient appliances, energy audits to identify wasteful energy practices in homes and businesses, and other programs. These energy savings ultimately lead to lower electricity bills for customers and reduce the utility’s need to build new generating capacity.

Improved energy efficiency is well within Georgia’s reach. A 2005 study by the consulting



Per Capita Spending on Energy Efficiency Programs by State, 2010



Georgia lags far behind most other states (and Washington, DC) in energy efficiency; the state ranks 36th for overall progress on energy efficiency programs, and 45th on per capita efficiency spending.

Source: ACEEE 2011

firm ICF, commissioned by the Georgia Environmental Finance Authority, found that Georgia could reduce electricity consumption by 3,339 gigawatt-hours (GWh), or 2.3 percent of electricity sales, by 2010 under a minimally aggressive energy efficiency scenario. Under a very aggressive scenario, the reduction would more than triple, to 12,515 GWh. In a more recent study, the research firm Chandler and Brown concluded that Georgia could achieve electricity savings ranging from 11 to 27 percent of projected energy consumption under the maximum achievable scenarios they modeled.⁷ Yet, data from the

A suite of energy options are available to help Georgia meet its electricity needs and address global warming pollution in a cost-effective way.

Energy Information Administration show that in 2008 Georgia achieved just 62 GWh of savings through energy efficiency.⁸

Despite the potential for energy savings, Georgia Power has worked to discourage energy efficiency programs. In 2007, the company commissioned Nexant (a consulting firm) to conduct a follow-up to the 2005 ICF report.⁹ Consistent with its generally secretive approach to the Vogtle construction, the utility redacted detailed findings from the final report. In particular, it omitted Nexant's finding that energy efficiency measures could save ratepayers a net total of approximately \$800 million to \$3.1 billion. Instead, the utility focused on the results of a deeply flawed evaluation of cost-effectiveness that measured the impact on electricity rates but ignored the substantially lower *costs* participants would realize from using less electricity. Focusing on rates alone, the report gave the misleading impression that energy efficiency

programs would come at “a substantial cost to ratepayers.”

Overall, Georgia ranks thirty-sixth in the nation for energy efficiency, according to the American Council for an Energy-Efficient Economy's (ACEEE) 2011 State Energy Efficiency Scorecard. ACEEE also calculated that Georgia spent only \$2.18 per person on energy efficiency programs, well below the national average of \$14.87. The five top states invested between \$30.28 and \$54.62 per person (see the chart above).

Renewable Energy. Another area where Georgia is not leading, and indeed is barely following, is the development of renewable energy sources. As of December 2011, 29 states and the District of Columbia have passed or implemented policies that require utilities to tap renewable sources for a minimum percentage of the electricity they provide to customers (see the map). Eight states have established nonbinding goals. Georgia has taken neither step.

This is a lost opportunity for the state. A 2009 report by the Southern Alliance for Clean Energy calculated that Georgia has the potential to generate 47,021 GWh of electricity from land-based renewable energy sources by 2025, approximately 35 percent of 2008 retail electricity sales; offshore wind would generate an additional 52,788 GWh¹⁰ (see the table at right). Even Georgia Power recognizes the potential for renewable energy development in the state; in 2010 it asserted that “The state of Georgia and the Southeast have an abundance of forestry and woody biomass resources available for energy use.” When combined with energy efficiency, renewable energy could completely eliminate the need to build large, high-risk generation projects like the Vogtle expansion.

CHEAPER, SAFER CLIMATE SOLUTIONS

Renewed interest in nuclear power in recent years has been largely driven by the need to reduce the energy industry’s carbon footprint. However, Georgia has much better ways to accomplish that goal than adding nuclear reactors.

A suite of energy options are available to help Georgia meet its electricity needs and address global warming pollution in a cost-effective way. The Synapse study concluded that a combination of lower-carbon strategies—investing in energy efficiency, increasing reliance on natural gas, and deploying renewable energy technologies—would be less expensive, and much less risky,

Technical Potential for Renewable Electricity Generation in Georgia by 2025	
Resource	GWh
Onshore wind	3,635
Offshore wind	52,788
Biomass	22,703
Hydroelectric	2,015
Solar	18,668
Total potential (renewable energy)	99,809
Vogtle 3 and 4 potential	16,381

Technical potential for Vogtle reactors assumes an 85 percent capacity factor.

Source: SACE 2009.

than expanding the state’s reliance on nuclear energy.

Several states have adopted policies that set targets for reducing heat-trapping emissions. Georgia has not established such a goal. Setting strong emissions reduction targets would provide needed support for, and investment in, smarter energy options and put Georgia on a lower-carbon pathway at a much lower cost than investing in new nuclear reactors.

THE VOGTLE PLANT: NO RETURN ON INVESTMENT FOR CONSUMERS

Georgia does not need to expand the Vogtle nuclear power plant, and Georgia taxpayers and ratepayers should not be unfairly burdened with the financial risks that the project will impose. Instead, the state should increase its energy efficiency targets for Georgia Power and other utilities to levels more consistent with the leading states, and more aggressively

pursue renewable sources of energy. Doing so will not only allow Georgia Power to discontinue the Vogtle expansion project, but also allow the utility to accelerate the retirement of some of its older, dirtier, and more expensive generating plants—a win-win for consumers and the environment.

Endnotes

- ¹ Chang, M., D. White, E. Hausman, N. Hughes, and B. Biewald. 2011. *Big risks, better alternatives*. Prepared for the Union of Concerned Scientists. Cambridge, MA: Synapse Energy Economics, Inc. October 6. Online at <http://www.synapse-energy.com/Downloads/SynapseReport.2011-10.UCS.Big-Risks-Better-Alternatives.10-037.pdf>.
- ² Schlissel, D., M. Mullett, and R. Alvarez. *Nuclear loan guarantees: Another taxpayer bailout ahead?* Cambridge, MA: Union of Concerned Scientists. Online at http://www.ucsusa.org/assets/documents/nuclear_power/nuclear-loan-guarantees.pdf.
- ³ For example, the proposed Levy nuclear plant in Florida, which also comprises two AP1000 units, is currently projected to cost at least \$22.5 billion if it is completed on time and on budget by 2021–2022.
- ⁴ In addition to Georgia Power, a Southern Company subsidiary that owns 45.7% of the plant, other owners include Oglethorpe Power Corporation (30%), Municipal Electric Authority of Georgia (22.7%), and Dalton Utilities (1.6%).
- ⁵ Koplow, D. *Nuclear power: Still not viable without subsidies*. Cambridge, MA: Union of Concerned Scientists. Online at http://www.ucsusa.org/assets/documents/nuclear_power/nuclear_subsidies_report.pdf.
- ⁶ The full text of the Georgia Nuclear Energy Financing Act can be found online at http://www1.legis.ga.gov/legis/2009_10/fulltext/sb31.htm.
- ⁷ Chandler, S., and M. Brown. 2009. Meta-review of efficiency potential studies and their implications for the South. Georgia Tech/Ivan Allen School of Public Policy, Working Paper #51. August. Online at <http://www.spp.gatech.edu/faculty/workingpapers/wp51.pdf>.
- ⁸ Energy Information Administration. Form EIA-861 Final Data File for 2010. Online at <http://38.96.246.204/cneaf/electricity/page/eia861.html>. Data analyzed by American Council for an Energy-Efficient Economy.
- ⁹ Nexant. 2007. Achievable energy efficiency potential assessment: Final study for Georgia Power. Public Disclosure. March. Online at http://www.seealliance.org/pdf/GAIRP_TechGAPower_PotentialStudy_052007.pdf.
- ¹⁰ Southern Alliance for Clean Energy. 2009. Yes we can: Southern solutions for a national renewable energy standard. February 23. Online at <http://www.cleanenergy.org/images/files/SERenewables022309rev.pdf>.

This fact sheet is also available on the UCS website at www.ucsusa.org/nuclear_power.

The Union of Concerned Scientists is the leading science-based nonprofit working for a healthy environment and a safer world.



**Union of
Concerned
Scientists**

Citizens and Scientists for Environmental Solutions

National Headquarters
Two Brattle Square
Cambridge, MA 02138-3780
Phone: (617) 547-5552
Fax: (617) 864-9405

Washington, DC, Office
1825 K St. NW, Ste. 800
Washington, DC 20006-1232
Phone: (202) 223-6133
Fax: (202) 223-6162

West Coast Office
2397 Shattuck Ave., Ste. 203
Berkeley, CA 94704-1567
Phone: (510) 843-1872
Fax: (510) 843-3785

Midwest Office
One N. LaSalle St., Ste. 1904
Chicago, IL 60602-4064
Phone: (312) 578-1750
Fax: (312) 578-1751