Sustainable Development Law & Policy

Volume 15 | Issue 1 Article 6

The Role of Advanced Cost Recovery in Nuclear Energy Policy

Robert C. Volpe

The Role Of Advanced Cost Recovery In Nuclear Energy Policy

*by Robert C. Volpe**

Introduction: Nuclear Power and Advanced Cost Recovery

The United States, its electricity providers, policy makers, and environmental advocates, all have a goal of achieving cleaner and more efficient energy. President Barack Obama endorsed this goal,[1] Congress enacted legislation towards this goal,[2] and states have created various programs to achieve cleaner and more cost-effective energy.[3] Nuclear power offers the means to achieve that goal, but nuclear power has a maligned reputation. High-profile disasters and extreme construction cost overruns put the U.S. nuclear power industry behind other sources of electricity in terms of consideration and new development. However, perception is changing and nuclear power is beginning to be re-recognized as the energy source of the future.[4]

Lawmakers are encouraging new nuclear development. At the federal level, tax credits and loan guarantees provide incentives for nuclear power.[5] At the state level, Advanced Cost Recovery ("ACR")[6] programs have become increasingly popular.[7] ACR programs allow utility providers to recover the costs associated with the development and construction of nuclear facilities prior to the facility going into service. This ultimately lowers the cost to ratepayers by reducing carrying charges.[8] By reducing the financial risk to utility providers, ACR statutes have helped encourage development of the first new nuclear facilities in the United States in nearly thirty years.[9] Current projects are limited to a few southeastern states.[10] Georgia, Florida, and South Carolina lead the way in ACR legislation and new nuclear development.

Where ACR has been implemented, it has been challenged. Some consider ACR to be solely for the benefit of utility companies, at the expense of the ratepayers.[11] In *Southern Alliance for Clean Energy v. Graham*[12] ("*SACE v. Graham*"), SACE argued that ACR as implemented in Florida was an unconstitutional delegation of authority and the associated costs were arbitrary. These arguments have been rejected, but that does not make ACR policies infallible. State legislators and regulators using ACR to encourage new nuclear projects must create and manage ACR programs in a way that provides the largest benefit and the lowest cost to the public. To do so requires diligence, and adjustment if necessary. Without close attention to effective ACR policy, the hoped-for expansion of nuclear power could be short-lived.

Other articles have addressed nuclear cost recovery, but this is the first one to analyze the decision in *SACE v. Graham* and its effect on nuclear regulatory policy. This is also the first article to propose a change in utility ratemaking policy that could further the goals of ACR laws. The proposed change creates incentives for nuclear projects through an increased allowable rate of return on ACR costs, while protecting ratepayers through more stringent cost review.

"Modern life requires constant and reliable electricity, and in the United States, the demand for electricity is more than any other country."

Section I of this article discusses the importance of nuclear electricity generation in meeting energy needs and environmental goals. Section II provides a history of nuclear energy in the United States from its inception as an energy source through recent federal and state legislation. Additionally, Section II analyzes three ACR programs, in Florida, Georgia, and South Carolina. Section III analyzes *SACE v. Graham*, a recent decision on ACR by the Florida Supreme Court, and the effect of that case on nuclear energy policies in Florida. Section III also analyzes changes to the Florida cost recovery law and discusses potential shortcomings. Section IV suggests changes to ratemaking policy that will promote nuclear energy development around the United States.

In focusing on ACR and recent challenges to it, this article analyzes a specific area of energy policy and makes concrete suggestions for improvement. It also strives to show that while ACR has withstood legal challenges, this is not enough. Policies must adjust and improve. The suggestions made in the final section will not shake the foundations of electricity regulation; however,

*J.D. Candidate Florida State University College of Law 2015, specializing in environmental, energy, and land use law. He would like to thank Professor Hannah Wiseman for her advice and helpful comments in developing this article. The author can be reached at volpe.robert@gmail.com.

the recovery structure suggested may offer a small improvement to current policies. At their best, small improvements can create large outcomes. Advanced cost recovery has shown its value. This article aims to make it more valuable.

The Importance of Nuclear Energy

Modern life requires constant and reliable electricity, and in the United States, the demand for electricity is more than any other country.[13] Although analysts project that the U.S. will become more energy efficient in the future, overall electrical consumption is still projected to increase.[14] A net increase in electrical consumption must be met with a real increase in electricity production. Utilities and regulators consider many factors in determining which sources of electrical generation to pursue; among the most important are cost, power availability, and environmental interests. This section discusses the importance of nuclear power as a component of the energy policy needed to meet growing demand and highlights the comparative benefits offered by this source.

Economic Benefits: Cost and Reliability

Total electricity consumption in the U.S. increased 33.6% between 1990 and 2013.[15] Consumption decreased by 2.37% over the past six years since the peak of electricity use in 2007.[16] This decline could be attributable to the 2007 recession, which followed an economic boom. Even with the recent decrease, overall demand for electricity in the U.S. is predicted to increase 25% from 2012 to 2040.[17] The current economic recovery signals that energy consumption will increase in the future. To meet the increase in demand, utility companies have several options: fossil fuels, including natural gas, coal, and oil; renewables, such as wind, solar, and biofuels; and nuclear reactors. The cost and reliability of each source varies greatly.

The cost of electricity generation concerns utility providers, ratepayers, and government officials. However, sustaining energy affordability while trying to achieve the environmental goals of lower greenhouse gas emissions and carbon dioxide levels presents enormous challenges. The U.S. Energy Information Agency estimates that among new sources of electricity generation coming online by 2019, new nuclear plants would be among the least expensive on a levelized basis.[18] The estimated levelized cost of electricity is \$96.1/MWh for nuclear, a range of \$95.6/MWh to \$147.4/MWh for coal, and \$64.4/MWh to \$128.4/MWh for natural gas.[19] The estimated levelized cost for wind power is \$80.3/MWh, but the report notes that because of the low capacity factor of wind electricity generation, one should be cautioned when comparing wind power to a more reliable source.[20]

A variety of renewable sources of energy are available. Among the most popular are wind energy, solar energy, and biomass or biomass ethanol. Other sources include geothermal energy and wave and tidal energy. These sources are becoming increasingly inexpensive and more efficient, but reliability continues to be an issue. Reliability distinguishes fossil fuels and nuclear reactors from renewable resources. The reliability and efficiency of an electricity source is measured by a source's capacity factor, which is the actual power output of a plant compared to the rated nameplate capacity, represented on a percentage basis.[21] For wind turbines, the reported capacity factor ranged between 28.1% and 32.3% from January 2009 to January 2013.[22] In 2013, wind turbines operated at the highest capacity over the five-year period.[23] This suggests efficiency of wind turbines is increasing, albeit slowly. But there is a maximum achievable capacity. Wind is not constant; accordingly, wind power cannot be constant. Similar to wind power, solar photovoltaic facilities operated at a capacity factor of 19.4%.[24] Solar plants can only generate power during daylight hours, and then only in favorable conditions. In stark contrast, nuclear facilities generate the most consistent and reliable electricity of any currently available source. In the U.S., the 104 operating nuclear reactors have operated at an average capacity factor of 89.6% over the past ten years.[25] Nuclear plants operate twenty-four hours a day, 365 days a year, with only incremental interruptions for refueling. This is base-load electricity.[26] On a constantly fluctuating electrical grid, nuclear and fossil fuels offer reliability. The most popular renewable resources, wind and solar, do not. The unreliability of renewable energy sources require fossil-fuel-powered facilities — typically natural gas — to fill the gap when renewable sources cannot generate an adequate amount of energy to meet demand.[27]

> *"Although nuclear energy generation is relatively costly up front due to its capital costs, nuclear plants can be efficient over the long term, since the fuel is very inexpensive compared with fossil-fuel sources."*

Cost — mainly capital development costs and variable operational costs — also distinguishes nuclear reactors from other forms of electricity generation. Capital costs (construction and financing) account for 71.4% of overall nuclear generation costs, while capital costs are only 60.0% and 14.3% of conventional coal and natural gas generation costs, respectively.[28] Interest accrues on any capital, either debt or equity, obtained for construction of a facility. The higher construction cost and longer construction periods for nuclear facilities create higher interest and financing costs. This is where utility providers and ratepayers can benefit from ACR. By allowing the utility to recover costs during the initial phases of development, financing charges are effectively lowered and capital costs decreased.[29]

In the initial era of nuclear development (1960s through the early 1980s), cost overruns plagued the industry. Actual construction costs for plants built during this period averaged 200 percent over projected cost.[30] Given this history, ratepayers and policy makers are concerned with potential cost overruns with the new generation of nuclear facilities. But over-budget construction has not universally been the case. Construction of the V.C. Summer reactors in South Carolina is reported to be under budget.[31] It may be the case that with modern reactor designs extreme cost and timetable overruns are no longer a part of the construction of nuclear energy.[32]

Although nuclear energy generation is relatively costly up front due to its capital costs, nuclear plants can be efficient over the long term, since the fuel is very inexpensive compared with fossil-fuel sources. Variable costs (mainly fuel costs) are 11.8% of the total levelized nuclear costs, 30.3% of overall conventional coal costs, and 49.1% of overall natural gas costs.[33] This makes natural gas electricity more susceptible to market fluctuations in fuel prices. Recent discoveries and new technologies such as hydraulic fracturing have drastically reduced the price of natural gas to its lowest real price since 1999.[34] In the immediate future, this will likely keep natural gas electricity costs low, but as a long-term investment, nuclear energy is a strong competitor on price and stability due to its low comparative fuel costs.

"The primary benefit of nuclear energy over fossil fuels is that nuclear power plants do not emit any greenhouse gases ("GHGs")."

Incentives like tax credits and ACR were not included in the calculations of nuclear energy's levelized costs.[35] These programs drastically lower costs associated with the development of new generation sources. The numbers discussed above swing even further in favor of nuclear energy generation when taking incentives into account.

Environmental Benefits: Greenhouse Gas Emissions and Energy Sprawl

In addition to offering long-term reliability and cost savings, nuclear energy provides important environmental benefits. In electrical power generation two central factors of environmental significance are greenhouse gas emissions and use of land resources through mining, drilling, or energy sprawl.[36] Nuclear energy is relatively strong on both fronts.

The primary benefit of nuclear energy over fossil fuels is that nuclear power plants do not emit any greenhouse gases ("GHGs").[37] Although coal and natural gas are seemingly inexpensive fuels, the real cost is in the pollution through GHG emissions. The U.S. burned 925 million tons of coal and 26 billion cubic feet of natural gas in 2013.[38] Emissions from burning coal and natural gas include sulfur oxides, nitrogen oxides, and carbon oxides, all of which contribute to air pollution problems.[39] Increasing the use of nuclear power over fossil fuels can reverse that trend. In fact, generation from existing nuclear energy facilities avoided 590 million metric tons of carbon dioxide across the U.S. in 2013.[40] Because nuclear power plants do not emit GHGs, every megawatt of new nuclear will directly reduce air pollution.

This factor is even more relevant considering the Environmental Protection Agency's ("EPA") recent Clean Power Plan, a proposed rule to cut carbon emissions from existing power plants.[41] Many existing coal-fired power plants do not meet the EPA's proposed criteria. In some states, the proposed regulations would reduce the use of coal power by up to 90%.[42] To meet the proposed regulations, many states are considering more natural gas facilities. Replacing coal plants with natural gas while natural gas prices are at historic lows is a cost effective option. But complete reliance on one fuel source would leave utilities and their ratepayers vulnerable to fluctuations in fuel prices. Nuclear power facilities would meet the EPA's lower carbon emissions requirements and protect against the risk of fuel price fluctuations.

In addition to air quality considerations, generating electricity has substantial land-based impacts, which vary by generation source. Energy sprawl, a term coined by The Nature Conservancy, denotes the vast amount of land needed to produce certain types of energy.[43] Renewable energy resources such as wind, solar, and biofuel cause significant energy sprawl. Energy sprawl is measurable in terms of land use intensity, calculating how much land is required to generate an amount of electricity, measured in square kilometers per terawatt hour per year (km2/TWh/yr).[44] The Nature Conservancy determined solar photovoltaic power generation requires 36.9 km2/TWh/yr, wind generation 72.1, and biomass generation a staggering 543.4.[45] In comparison, nuclear power generation has a land use intensity of 2.4 km2/TWh/yr, the lowest of any power source. Like GHG emissions, nuclear power can reduce energy sprawl caused by land intensive types of energy.

Nuclear energy is the only reliable source of zero-emission, always-on, base-load electricity. No other source, whether renewable or fossil fuel, can provide reliable electricity with zero GHG emissions. Fossil fuels provide cheap base-load energy, but with a tradeoff in GHG emissions. Renewable sources, such as wind and solar, have no GHG emissions, but are not reliable or powerful enough to meet demand, and cause excessive energy sprawl.

Fossil fuels currently account for a significant percentage of electricity generation. With improvements in hydraulic fracturing technology and the expansion of shale gas developments in the domestic oil and gas industry, the dominance of fossil fuels is not likely to change in the near future.[46] However, the shale oil and natural gas boom will not last forever and in order to satisfy the nation's energy needs and assuage its environmental concerns over the long term, nuclear energy will need to play a more significant role.[47]

Nuclear Energy in the United States: History and Recent Developments

Nuclear energy is an important piece of a complex set of local, state, and federal programs, incentives, and laws that, together, form the U.S. energy policy. Historically, nuclear energy has experienced varying levels of public and governmental support. This section explores the history of nuclear policy and development in the U.S. and recent governmental support for nuclear energy.

On the heels of World War II and the Manhattan Project, the U.S. realized the potential for using nuclear power to generate electricity. To stay ahead of the rest of the world, Congress passed the Atomic Energy Act of 1946.[48] Under this law, the national nuclear program was under the control of the military and did not permit private involvement.[49] Less than ten years later, the Atomic Energy Act of 1954 allowed for private investment in the development of commercial nuclear energy.[50] Policy makers proclaimed that, "electricity generated by nuclear power would be 'too cheap to meter.'"[51] However, exposure to liability associated with nuclear energy was an initial barrier to private development.[52] To alleviate these risks, Congress passed the Price-Anderson Act of 1957, which gave utility providers limited liability for a catastrophic accident.[53] As a result of the Atomic Energy Act and the Price-Anderson Act, development of nuclear power plants boomed through the mid-1970s.[54]

"In the wake of the Fukushima disaster, Japan completely shut down all reactors in the country."

The so-called "Great Band Wagon Market" ended in 1978, and for a period of thirty years, no new combined licenses ("COLs") were approved.[55] This dark period for nuclear development resulted from a combination of the partial meltdown at the Three Mile Island plant in Pennsylvania, the Arab oil embargo,[56] and increased interest rates in the late 1970s that led to large cost overruns in construction.[57] The 1980s saw massive inflation in the cost of construction materials and labor along with double-digit financing rates, exaggerating cost overruns in coal and nuclear plants that were under construction.[58] Safety was also a question after the Three Mile Island incident. The Nuclear Regulatory Commission ("NRC") responded to safety concerns by extending the scope and breadth of its regulation and oversight, which fundamentally changed the way the nuclear industry operates.[59]

The timing of the Three Mile Island incident could not have been more detrimental to the nuclear power industry. Excessive cost overruns in construction of new nuclear facilities and decreasing costs of other energy resources such as oil, natural gas, and renewables compounded the devastating effects of the Three Mile Island event.[60]

The "Nuclear Renaissance" and National Nuclear Energy Policy

A resurgence of interest in nuclear power has followed this dark period in nuclear policy, starting with congressional passage of the Energy Policy Act in 2005.[61] This act provided significant tax credit incentives for nuclear generation facilities as well as federal loan guarantees and risk insurance assistance.[62] As a result, sixteen applications to the NRC were filed between 2005 and 2008. The resurgence has earned the nickname "Nuclear Renaissance."[63]

The Energy Policy Act of 2005 included a provision offering utilities production tax credits to encourage development of certain electricity sources, including nuclear.[64] The addition to the Internal Revenue Code titled "The Credit for Production from Advanced Nuclear Power Facilities" allows utilities to be eligible for a tax credit of up to 1.8 cents per kWh for the development of new nuclear energy plants.[65] The tax credit provision includes several limitations. To be eligible for this credit, a facility must be placed into operation prior to January 1, 2021.[66] The IRS set additional application and construction limits not included in the statute: a facility had to obtain its construction and operating license by December 31, 2008, and had to begin construction by January 1, 2014.[67]

Aside from the timeline limitations, the statute limits the tax credits as follows: credits are only available for the first eight years of production at each facility;[68] the tax is distributed based on a ratio of the facility's nameplate capacity to the aggregate national limitation of 6,000 megawatts;[69] annually, the per facility credit is limited to $125 million per 1,000 MWe capacity;[70] and the credit phases out each year.[71]

While the tax credit spurred immediate interest in new nuclear construction, the law's time limitations have barred any additional utilities from taking advantage of the program. A total of five new reactors at three locations met the application and construction time limitations to qualify for the credits.[72] Even for those facilities, delays in construction could cause failure to meet the strict timeline requirement to be operational by January 1, 2021, and thus not be eligible for the tax credit. This presents a risk to investors relying on the tax credit in their financial calculations.[73] The other limitations discussed above present risk and uncertainty to investors and utilities.

The Energy Policy Act of 2005 provided a loan guarantee program through the Department of Energy ("DOE").[74] This program provides federal government backing to loans for advanced nuclear generation facilities. Titled "Incentives for Innovative Technologies," the program requires that guarantees be given to "employ new or significantly improved technologies as compared to commercial technologies in service in the U.S. at the time the guarantee is issued."[75] The secretary of the DOE has broad discretion in the approval of guarantees and reasonable interest rates.[76] If a borrower defaults on loan obligations, the DOE will pay the obligations. In return, the DOE subrogates the rights to any property acquired pursuant to the guarantee.[77] The U.S. attorney general will attempt to recover for unpaid debts.[78]

These loan guarantees provide stability and reduce risk to utilities, investors, and lenders. By reducing the risk to lenders, the borrower (the utility) pays lower interest rates, ultimately lowering utility prices to ratepayers. This is evidenced by the two projects currently utilizing loan guarantees. Recently, the DOE issued $6.5 billion in loan guarantees to Georgia Power with an additional $1.8 billion as a conditional commitment.[79]

"Currently, there has yet to be a facility prepared to accept high-level waste, and it continues to be stored on-site at power plants. Until this issue is resolved, spent fuel storage will continue to be a cloud of uncertainty over the nuclear industry."

Another element of federal encouragement for nuclear energy involves liability caps and insurance guarantees. Nuclear energy has proved to be very safe. There have only been three major nuclear reactor incidents worldwide in the sixty-year history of nuclear power.[80] Compared with other generating sources, the chance of a catastrophic event from nuclear energy is minuscule.[81] The worst nuclear incident in the U.S., Three Mile Island, did not cause a single death. In fact, there has not been a single death related to radiation in the entire history of U.S. nuclear power.[82]

However, as seen in previous disasters such as Chernobyl and Fukushima, when something goes wrong, the results can be devastating. For this reason, Congress indemnified nuclear facilities through the Price-Anderson Act.[83] Each licensed facility is required to carry a minimum amount of insurance and contribute to a pooled insurance fund.[84] If a disaster were to occur, the utility is strictly liable for damages, to be paid by insurance and the Price-Anderson fund. The federal government pays any excess liability. The Energy Policy Act of 2005 extends the protection of the Price-Anderson Act through 2025.[85] This federal backing offers security to utilities that would otherwise not be able to obtain insurance or risk the occurrence of a major event.

Recent Setbacks and Advances in New Nuclear Power

Two major events in the past five years have dramatically affected nuclear energy development: (1) a tsunami in 2011 caused major damage and radiation containment problems at the Fukushima nuclear plant in Japan; (2) litigation and political controversy surrounding the Yucca Mountain nuclear waste repository have halted progress in creating a national high-level nuclear waste storage facility for the foreseeable future.

In 2011, an earthquake off the eastern cost of Japan caused a massive tsunami that swept into the Tōhoku region of Japan. This tragic event caused thousands of deaths and billions of dollars in damage. The tsunami flooded the Fukushima Nuclear Power Plant causing power failures to the main and back-up systems. In the wake of the Fukushima disaster, Japan completely shut down all reactors in the country. Other countries scaled backed or cancelled their nuclear power programs.[86] On the other hand, the nuclear regulators of the world have responded to this event with increased safety programs and cooperation.[87] The United States NRC drastically enhanced and reconsidered safety standards for U.S. nuclear facilities after the Fukushima disaster.[88] The damage from the Fukushima disaster will be long lasting, but the nuclear industry may be stronger for it in the end.[89]

High-level nuclear waste, which refers to the spent fuel rods from the generation of nuclear power, is currently stored onsite at power plants around the country. The Nuclear Waste Policy Act of 1982 ("NWPA") intended to create a national waste repository for permanent storage.[90] The DOE was charged with selecting a site and building a repository for spent nuclear fuel.[91] The law designates that the DOE consider the Yucca Mountain in Nevada as the location.[92] But due to delays, political battles, and litigation, the repository has not been created. The DOE submitted an application to the NRC for construction of the repository at Yucca Mountain, but it has yet to be reviewed or approved. In the most recent litigation, the D.C. Court of Appeals ordered the NRC to follow its statutory mandate and review the petition for Yucca Mountain.[93] Currently, there has yet to be a facility prepared to accept high-level waste, and it continues to be stored on-site at power plants. Until this issue is resolved, spent fuel storage will continue to be a cloud of uncertainty over the nuclear industry.[94]

Although struggles to identify an acceptable repository for nuclear waste continue, nuclear reactor technology is becoming ever more efficient and safe. The Westinghouse AP1000 reactors being constructed at Vogtle and V.C. Summer are significantly improved from older generation reactors.[95] Even more significant are the next generation of reactors. Currently the NRC is reviewing five different designs for Generation IV reactors and Small Modular Reactors.[96] Those reactors are smaller, cheaper, more efficient, and create less waste. "Small reactors can't address all the problems standing in the way of more nuclear investment, but they can address the biggest barriers — the economic ones."[97] The proposed designs minimize high-level nuclear waste through recycling and more efficient use.[98] Some designs even burn the nuclear waste that is sitting dormant at facilities across the U.S.[99] Despite the hurdles for the nuclear industry, technological advances are pushing the industry into the future.

To complement this section's discussion of federal policy encouraging the development of nuclear power and recent events that have had an effect on a national level, the following section addresses state policy. Nuclear power regulation operates as a joint federalism scheme. At the federal level, reactor designs and facility plans are approved, while state lawmakers and regulators mandate how utilities operate. The following section looks at states that are successfully developing nuclear power and the regulations that make such development possible.

Development of Nuclear Facilities and Advanced Cost Recovery Policy in Southern States

In addition to the federal tax incentives and loan guarantees discussed above, several states recently passed statutes to encourage new nuclear development.[100] Since 2005, at least twenty-two states have enacted some form of legislation or regulation that supports nuclear electricity generation.[101] ACR (also referred to as construction work in progress or CWIP) is among the most popular.[102] Some scholars believe that ACR is essential for new nuclear power plants to be economically feasible,[103] although other scholars believe there are alternative financing mechanisms to achieve the same goals as ACR.[104] Notable states on the forefront of ACR or CWIP include South Carolina, where South Carolina Electric and Gas Company has received a COL for two new reactors from the NRC;[105] Georgia, where two new reactors are under construction at the Georgia Power's Vogtle Electric Generating Plant;[106] and Florida, where Florida Power and Light ("FPL") is under review for the approval and pre-construction phase for two new nuclear reactors.[107]

Prior to allowing CWIP in the rate base, the traditional approach was to account for construction costs and recover those costs in the base rate once the facility was in service. This is called allowance for funds used during construction ("AFUDC").[108] Allowing utilities to recover construction and pre-construction costs while in that phase of development rather than carrying those costs over the entire process lowers the total costs to ratepayers and the perceived risk of investment in the project.[109] Lowering the risk and total cost to increase investment is at the core of ACR.

The majority of new applications for nuclear reactors in the country are in southeastern states.[110] This section focuses on three of them: Georgia, South Carolina, and Florida. For an analysis of state regulatory structures that affect the development of nuclear electricity generation, these three states are ideal. Facilities are currently under construction in both Georgia and South Carolina — the first new nuclear plants in the U.S. in nearly thirty years. Furthermore, litigation over Florida's highly controversial ACR program offers ample opportunity to analyze challenges to such legislation. This section discusses each state's current nuclear electricity projects and respective ACR or CWIP laws.

Georgia

Georgia leads the charge in the development of new nuclear facilities in the U.S. Georgia Power's Vogtle Units 3 and 4, two Westinghouse AP1000 reactors, are currently under construction.[111] Barring a major delay, the new facilities will be operational by the end of 2018.[112] These reactors will generate 1,100 MWe each, and are the first new reactors in the U.S. in nearly thirty years.[113] Georgia's pro-nuclear cost recovery laws are among the many financing tools the utility took advantage of for this project.

In 2009, the Georgia legislature passed the Georgia Nuclear Energy Financing Act, which was intended "to provide for a utility to recover from its customers the costs of financing associated with the construction of a nuclear generating plant."[114] It does just that, and with a straightforward approach to cost recovery — the utility will recover "costs of financing associated with the construction of a nuclear generating plant" so long as the costs are approved by the Georgia Public Service Commission ("GPSC").[115] Financing changes are recoverable through CWIP, and are based on the actual costs of debt and the authorized cost of equity.[116] All costs are to be recovered from each customer on an equal percentage basis. [117]

The Georgia law gives the GPSC the power to authorize accounting treatment for the recovered costs.[118] This provision is unique to the Georgia CWIP law. It has been suggested that this language allows the GPSC to consider the utilities entire balance sheet and gives the GPSC the power to require profits from projects other than the nuclear facility to offset costs of the current project before the utility is reimbursed for costs.[119]

Georgia's CWIP provision excludes a requirement for costs to be "prudent" as found in the Florida and South Carolina laws. The original bill included this language, but it was removed by the first floor amendment.[120] This language may not carry any significant weight in application. As seen in the case study below, public service commissions of all three states are lenient in determining costs that may be recovered through CWIP. Without a floor determination of what is not a prudent cost, it is difficult to know whether the prudence review has any real meaning.

Georgia allows costs for cancelled projects, but not within the CWIP statute. The law allows a utility to recover actual investment costs, along with carrying costs of a cancelled project.[121]

South Carolina

South Carolina is moving forward with nuclear power development of its own. South Carolina Electric & Gas Company obtained a COL from the NRC in 2012 for two reactors at the V.C. Summer Nuclear Station.[122] The NRC issued the COL for the V.C. Summer reactors one month after issuing the permit for the Vogtle project in Georgia.[123] Construction on V.C. Summer Units 2 and 3 began in March of 2013.[124]

The Base Load Review Act, passed in 2007, encourages new nuclear development.[125] It unambiguously states that the purpose of the law "is to provide for the recovery of the prudently incurred costs associated with new base load plants . . . while at the same time protecting customers of investor-owned electrical utilities from responsibility for imprudent financial obligations or costs."[126]

The Base Load Recovery Act includes a prudency review of pre-construction costs.[127] Additionally, the law includes a provision for review of costs in the event that the utility decides to abandon the project after a prudency review.[128] In the event of an abandoned project, the utility may be able to recover for pre-construction costs through AFUDC included in the base rate. However, the utility has the burden of proving by a preponderance of the evidence that the decision was prudent.[129] The "recovery of capital costs and the utility's cost of capital associated with them may be disallowed only to the extent that the failure by the utility to anticipate or avoid the allegedly imprudent costs, or to minimize the magnitude of the costs, was imprudent considering the information available at the time that the utility could have acted to avoid or minimize the costs."[130] This provision greatly increases the risk to a utility for abandoning a project. It may also incentivize a utility to consider the prudency of costs prior to incurring them. This is slightly different from the Georgia cancellation provision that does not affirmatively set a preponderance of the evidence standard for demonstrating that costs were prudently incurred.

Florida

Florida has four operating nuclear reactors. Two are located at the St. Lucie facility in St. Lucie County, and two are located at the Turkey Point facility in Miami Dade County. Both facilities are owned by FPL.[131] A fifth reactor in Crystal River, owned by Duke Energy Florida ("DEF"), temporarily ceased operation in 2009 for repairs. Due to damage to the containment structure during repairs, DEF announced the plant will not reopen.[132] Between 2009 and 2011, nuclear power accounted for an average of 11.24% of the total electrical generation in Florida.[133]

Applications for four new nuclear generating facilities in Florida have been submitted to the NRC during the past five years. FPL applied for a COL from the NRC for two new reactors at its Turkey Point facility in 2009, Turkey Point Units 6 and 7.[134] The license application is currently under review.[135] Progress Energy (now DEF) also applied for a COL from the NRC in 2008 to build two reactors in Levy County.[136] Although there have been delays in the licensing process, and construction plans have been cancelled, DEF continues to seek the COL for the Levy facility.[137]

Advanced Cost Recovery in Florida: Original 2006 Legislation

Following passage of the Energy Policy Act of 2005, Florida, along with several other states previously discussed, enacted legislation to incentivize the development of nuclear electricity generation. Section 366.93 of the Florida Statute provides for recovery of costs prudently incurred in the siting, design, licensing, and construction of new nuclear power plants.[138] The goal of the cost recovery statute is to "promote utility investment in nuclear . . . power plants."[139] The Florida Public Service Commission was charged with establishing rules and mechanisms to achieve this goal.[140] The rule established under this authority is Rule 25-6.0423, Florida Administrative Code, known as the Capacity Cost Recovery Clause ("CCRC").[141] Requirements for the CCRC include annual review for the "reasonableness" of projected pre-construction costs and "prudence" of actual pre-construction expenditures.[142] To provide incentives for investment and certainty, carrying costs were to equal the utility's AFUDC.[143] Once in service, ongoing costs are recovered through the increases to the base rate.[144] In the event that the facility was not completed, the statute allowed for the recovery of costs incurred in the pre-construction and construction phases.[145] The legislation was updated in 2008 to include "uprate" projects that increase the generating capacity of existing nuclear plants and expanded or relocated electrical transmission lines.[146]

Since its inception in 2006, § 366.93 Fla. Stat. has been subjected to several legal challenges. Cost recovery statutes in Georgia and South Carolina have also been challenged, but the courts have upheld the laws in each case.[147] The following section of this article analyzes one challenge in Florida, *Southern Alliance for Clean Energy v. Graham*, and the subsequent amendments to the Florida ACR law and administrative rules triggered by the case.

Advanced Nuclear Cost Recovery Case Study: *Southern Alliance for Clean Energy v. Graham* (and Subsequent Legislative Amendments)

In many areas of the law, it is only through litigation and judicial interpretation that the effects of legislation are seen. And on occasion, legislation will be modified based on the interpretation of the courts. This is no different with electricity regulation. Florida Statutes § 366.93 was litigated and subsequently amended. The following section analyzes the pertinent case and its effect on current cost recovery legislation in Florida.

Southern Alliance for Clean Energy v. Graham

In 2008 the Florida Public Service Commission ("FPSC") granted approval to FPL and DEF for cost recovery for the site selection and pre-construction cost of nuclear power facilities at Turkey Point and Levy.[148] The FPSC authorized recovery amounts for FPL and DEF of $196,088,824 and $85,951,036, respectively.[149] These amounts included pre-construction costs for the proposed nuclear generation facilities as well as "uprate" projects at existing facilities. Southern Alliance for Clean Energy ("SACE"), an advocacy group that had been at the forefront of the anti-nuclear campaign, opposed the pre-construction cost recovery allotments, but did not oppose the "uprate" projects.[150] In their complaint, SACE argued that the order was arbitrary and unsupported by substantial evidence, and that § 366.93 is unconstitutional as a violation of the separation of powers.[151] The Florida Supreme Court rejected SACE's arguments and upheld the FPSC's decision.[152]

Separation of Powers Argument

SACE argued that the statute was unconstitutionally broad in its delegation of power to the FPSC — more specifically, that the FPSC's ability to create a rule and mechanism for deciding cost recovery imparted a legislative power. The basis for this argument was that § 366.93 did not set any standards for the FPSC to implement the goal of promoting investment in nuclear electricity generation, and that the language for establishing a mechanism — "include, but not be limited to" — was too broad.[153] SACE added that the "prudently incurred costs" language in the statute did not give guidance to or put restrictions on the FPSC.[154] The court, however, reasoned that it was proper to give the FPSC rulemaking authority, and that other language in the statute gave proper guidance to the FPSC in creating and enforcing rules.[155] The court found that "prudently incurred costs" were defined by a standard of "what a reasonable utility manager would have done, in light of the conditions and circumstances that were known, or should have been known at the time the decision was made."[156]

"Intent to Build" Argument

The second argument proffered by SACE claimed that neither FPL nor DEF demonstrated an "intent to build" as required by § 366.93. Rather, the pre-construction activities only established an "option to build" the nuclear facilities.[157] SACE claimed that the statute required a utility to engage in plant siting, design, licensing, and construction simultaneously to show "intent to build."[158] The FPSC had a different interpretation of the statute: that the siting, design, licensing, and construction phases were not required to occur simultaneously, and in fact could not occur simultaneously.[159]

The FPSC's interpretation of the statute led the court to conclude that "preconstruction activities creating an option to build can demonstrate a utility company's intent to build, and thus its eligibility to recover associated costs under the statute."[160] SACE argued that this interpretation was arbitrary and unsupported by competent substantial evidence,[161] and that the "option to build" did not create an "intent to build" because "neither utility has made a final decision as to whether or not it will actually build these proposed new reactors."[162] The court dismissed this argument by giving a high degree of deference to the FPSC's interpretation of the statute.[163]

The court concluded that the statute did not require a final decision on the actual construction. Based on § 366.93(6), which allows a utility to recover prudently incurred costs even when that utility elects not to complete the construction of the nuclear facility, it was not the intent of the statute to require a final decision in order to recover prudently incurred pre-construction costs.[164] Even with the potential pitfalls of the "option to build" approach, the court reasoned that the PSC's interpretation indicated that an option to build could demonstrate an intent to build and fulfill the requirements of the statute.[165]

Problem With the "Intent to Build" Interpretation

The court thoroughly discusses "intent to build" in *SACE v. Graham*.[166] The same language was relied on heavily by SACE in their brief and oral argument.[167] But the phrase "intent to build" did not appear at all in Rule 25-60423, Florida Administrative Code, nor in § 366.93, Florida Statutes, prior to the case. The question of "intent to build" versus "option to build" originally came from the FPSC order approving ACR for FPL and DEF.[168] The court likely addressed this issue with the anticipation of setting precedent in this area. By following the FPSC interpretation of the statute and recognizing an intent to build requirement, the court essentially added that requirement to the law. The language is not within the text of the statute, and to impute such language may have been an overreach by the FPSC and the court. As discussed in the next section, the Florida legislature amended § 366.93 and limited the use of "intent to build."

Changes to § 366.93 after SACE v. Graham

After the decision in *SACE v. Graham*, the Florida legislature passed a bill that amended the cost recovery statute.[169] The amended version of § 366.93 elaborated and clarified the requirements for ACR, including the addition of "intent to build" language. Four distinct phases of development and recovery were defined by the statute: (1) licensing and certification; (2) pre-construction phase; (3) construction phase; and (4) commercial in service phase. The amended version of the statute retained an allowance for cost recovery in the event that a utility did not complete construction.[170]

Prior to obtaining a COL from the NRC, a utility provider may recover costs "related to, or necessary for" obtaining that licensing and certification.[171] After obtaining the COL, the cost recovery statute and capacity cost recovery clause together allow utility providers to recover site selection and pre-construction costs.[172] As defined in the rule, site selection and pre-construction costs:

> include, but are not limited to: any and all costs associated with preparing, reviewing and defending a Combined Operating License (COL) application for a nuclear power plant; costs associated with site and technology selection; costs of engineering, designing, and permitting the nuclear . . . power plant; costs of clearing, grading, and excavation; and costs of on-site construction facilities.[173]

The utility must undergo an annual Nuclear Cost Recovery Clause proceeding for approval of pre-construction costs. In this review, the FPSC makes a determination of feasibility of the plant and reasonability of the projected costs in order to approve pre-construction costs.[174] The standard of review is "reasonable" and "feasible" and does not include an "intent to build" requirement.[175] The Florida legislature chose not to adopt the "intent to build" standard for normally incurred costs.

In addition to clarifying the phases of development for which cost recovery may be used, the amended 2013 cost recovery statute placed two time restrictions on recovery of pre-construction costs if the utility has not begun construction of the plant.[176] First, ten years after the date the utility receives a COL, it must petition the FPSC for cost recovery. The FPSC then must determine "whether the utility remains intent on building the plant."[177] In this situation, the legislature included the "intent to build" language from the decision in *SACE v. Graham*. "Intent to build" is further defined in the statute by a showing that "the utility proves by a preponderance of the evidence that it has committed sufficient, meaningful, and available resources to enable the project to be completed and that its intent is realistic and practical."[178] This section specifies that it is for cost recovery "under this paragraph," meaning under § 366.93(3)(f).[179] After twenty years from the receipt of the COL, if construction has not begun on the plant, the utility may not receive future costs relating to the plant.[180]

The FPSC has the power to review the project prior to construction in order to approve proceeding with the project.[181] The requirements for the approval of the recovery of construction costs are feasibility of the project and reasonable projected costs, the same requirements as pre-construction costs.[182]

Often, an administrative agency or judicial body will give specific meaning to a statute or other legislation through interpretation. The legislature is given the responsibility to affirm or deny this interpretation by amending the legislation. This process was followed in *SACE v. Graham* and in the order by the FPSC. As discussed above, the FPSC order inserted the idea of "intent to build" into § 366.93 and the Rule 25-6.0423 annual reporting requirement.[183] The Florida Supreme Court, giving a high degree of deference to the FPSC's interpretation, confirmed the "intent to build" requirement.[184]

The Florida legislature, seemingly in reaction to *SACE v. Graham*, enacted an amendment to §366.93 in 2013. This amendment adopted the FPSC's idea of an "intent to build" requirement; however, it was only included in § 366.93(3)(f), which is specific to a situation where the utility has not begun construction of a plant within ten years of receiving the COL.[185] "Intent to build" is not a requirement for pre-construction or construction phase cost recovery under § 366.93(3)(c) or (e). The 2013 amendment separated the requirements for each phase, and specifically stated, that for the pre-construction and construction phases, the requirements for cost recovery are that the plant remains "feasible" and the projected costs are "reasonable."[186] Essentially, the legislature accepted the "intent to build" requirement but narrowed it to certain situations where the project is stalled in the pre-construction phase.

"Even with the addition of "intent to build" in the statute, utility providers have a very low level of liability for canceling a project, and therefore advanced nuclear cost recovery is not meeting the legislative intent of promoting investment in nuclear electricity generation."

Florida Public Service Commission Rulemakings

Since the FPSC is charged with issuing rules to uphold the purpose of the cost recovery statute, it was required to address the 2013 amendment.[187] Based on the decision in *SACE v. Graham* and the 2013 amendment to § 366.93, the FPSC has issued a proposed rule to "implement changes to Section 366.93, F.S., enacted by the 2013 Legislature."[188] In this proposed amendment to Rule 25-6.0423, the PSC added a requirement of "intent to build" to the annual report and application for cost recovery.[189] This mirrors the language of FPSC Order No. PSC-11-0547-FOF-EI and the language of *SACE v. Graham*.[190] This expands beyond § 366.93, however, which requires only a showing of "intent to build" for a facility that has been in the pre-construction phase for more than ten years.[191] The FPSC's proposed requirement is a showing of intent to build for every year regardless of the amount of time the utility has had a license.[192]

Florida Public Service Commission Levy Facility Decision

Despite recent clarification of standards through court decisions, legislation, and administrative rules, nuclear cost recovery is not achieving its goals entirely, as evidenced by the controversy over the Levy nuclear generating facility.[193] The FPSC confirmed that in the event the reactor construction is cancelled, a utility can still recover the planning and licensing costs as stipulated in the statute.[194] Even with the addition of "intent to build" in the statute, utility providers have a very low level of liability for canceling a project, and therefore advanced nuclear cost recovery is not meeting the legislative intent of promoting investment in nuclear electricity generation. The following section of this article proposes a change in the administration of ACR or CWIP schemes that uses the rate of return to the utility to meet the goal of investment in new nuclear generating plants.

Several legislators in Florida are attempting to repeal the Florida cost recovery statute. In the 2014 session, House Bill No. 4001 proposed to repeal the program entirely.[195] The bill died in the Energy and Utility Subcommittee. Given the controversy surrounding the Levy County facility abandonment, future attempts to repeal the statute and dismantle ACR in Florida are possible.

Advanced cost recovery has been thoroughly discussed and analyzed in this article. The following section attempts to take the lessons learned from this analysis and offers a suggestion to improve the outcome of and participation in ACR programs.

Proposed Change to Advanced Cost Recovery Regulation

State governments across the country have taken an affirmative step to incentivize development of nuclear electricity generation through ACR legislation. As discussed above, there have been challenges and flaws found in ACR laws. Fortunately, however, they can be improved. By adding incentive to the rate of return on the rate base ("ROR")[196] or implementing a tiered rate of return ("Tiered Rate") utilities could be further encouraged to continue nuclear development and utilize ACR. This section will use the Florida ACR law as a guide, but the suggestions could be applied to any ACR or CWIP scheme.

Cost recovery should be more purposeful in the encouragement of new nuclear development, especially in the early stages of development and construction of a nuclear facility. Currently, ACR costs are recovered at the approved AFUDC rate.[197] This applies to all costs in the pre-construction and construction phases.[198] In a typical FPSC ratemaking case, the ROR is calculated based on the utilities actual costs and an allowed rate or return. The FPSC looks at tolerance for risk associated with other utilities and the specific utility making the application. It then considers other investments with similar risk and bases the rate of return accordingly. In this process, the FPSC considers the utility as a whole, with the entire mix of generating sources.[199] No one plant is given a rate of return. This process could be amended for pre-construction and construction costs under ACR.

In the ratemaking case, costs associated with ACR are isolated and analyzed separately from other costs. As seen in *SACE v. Graham*, CWIP costs are securitized as "prudent" and cannot be included in the rate base unless the utility makes an affirmative showing that the project is feasible and the costs are reasonably incurred.[200] A similar analysis of costs occurs in other states. Once costs approved under ACR are included in the rate base, the utility still itemizes the costs on each customer's individual utility bill. Typically, the portion of the bill associated with ACR is a separate line item, like fees and taxes. Since the FPSC already separates these costs for purposes of ratemaking, it would be possible to do likewise with the allowable ROR on these costs.

Regulators have used ROR incentives in the past to encourage behavior by utility companies. One example of this type of incentive is a rate increase for environmental compliance. Where a utility took measures to be more environmentally compliant, they were rewarded with an increase in the allowable rate. This same process could work to encourage participation in ACR. When a utility embarks on the process of developing new nuclear power, the associated costs could be given a higher ROR.

> *"Where a utility took measures to be more environmentally compliant, they were rewarded with an increase in the allowable rate."*

Under this proposed program, lawmakers run the risk that increasing the ROR would have a disincentive effect, referred to as the Averch-Johnson effect, essentially encouraging utilities to increase their costs in order to gain a higher return. Alternatively, utilities may simply be careless with costs where a higher return is possible. The prudency review can prevent this outcome. PSCs can deny the recovery of costs where wasteful or irresponsible spending occurs. Lawmakers and regulators can facilitate a balance by increasing the incentive to use ACR to gain a higher ROR on associated costs, but simultaneously controlling costs through a prudency review.

A tiered rate, with separated ROR for costs incurred in each stage of the project, could also serve to further the purposes of the ACR statute. Cost recovery would be more effective if incentives were higher in the construction phase and lower in situations where, for example, the project is delayed or postponed, which happened with the DEF Levy facility.[201]

Under current legislation, a utility would recover all costs at a set AFUDC rate. ACR merely allows the utility to recover costs earlier than otherwise possible. But under a tiered rate scheme, the profit margins for the pre-construction phase would be greater than the AFUDC. This would incentivize the utility to pursue nuclear power projects. Costs associated with the construction phase, which historically have been the biggest hurdle for development, would have an even higher profit margin. Once the facility is online, the profit margin would be readjusted to a typical ROR. In a case of recovering costs for a facility that is not completed, or canceled, like the Levy project, the set recovery rate could be below the AFUDC to discourage cancellation of a project. To balance the risks, utility providers could recover the costs involved, but with lower profit.

There are some potential downsides to this plan. For instance, the increased incentive in the pre-construction phase could cause the utility to cancel the project early and recover the costs at the higher margin. Or, the utility could bundle its costs in the construction phase in order to recover a higher profit margin on more costs. One solution to this problem is accountability through regular reporting, based on a more stringent "reasonable and feasible" standard. Public Service Commissions should move away from the "intent to build" standard while making more stringent decisions on what is reasonable and feasible. Either the proposed tiered rate ACR or the simpler incentive rate would be a step toward achieving the goal of improved ACR laws.

Conclusion

Nuclear power has emerged from a dark age of unpopularity and neglect and is experiencing a renaissance. Indeed, given nuclear energy's dramatic environmental and reliability advantages over other sources of electricity, it is surprising the resurgence has not been greater. But costs and financial risk still present daunting obstacles. The federal government has shown support for nuclear through loan guarantees, tax incentives, and risk mitigation, while several states have attempted to encourage nuclear power through ACR legislation. The Vogtle, V.C. Summer, and Turkey Point projects are directly attributable to ACR.

The analysis of *SACE v. Graham* and the three state statutes revealed strengths of ACR and weaknesses that can be improved. Adjusting the rate of return is only one possibility. Nuclear power can help achieve a stronger energy future; ACR is a vehicle to make that happen.

Endnotes: The Role Of Advanced Cost Recovery In Nuclear Energy Policy

1 Exec. Order No. 13514, 74 C.F.R. 52117 (2009).

2 Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594 (2005).

3 *Measuring Progress at the State Level–Advancing the Vision for 2025 Implementation Goals and Policy Steps*, U.S. Envtl. Prot. Agency, http://www.epa.gov/cleanenergy/energy-programs/suca/figure2-1.html (last updated Oct. 17, 2012).

4 Energy Policy Act of 2005, *supra* note 2.

5 *Id.*; I.R.C. § 45J (2013).

6 Advanced cost recovery is also referred to as construction work in progress ("CWIP"). This article uses the terms interchangeably, as various state regulatory programs use the two terms to describe the same process.

7 *See* Nuclear Energy Inst., State Legislation and Regulations Supporting Nuclear Energy (2014), *available at* http://www.nei.org/CorporateSite/media/filefolder/Policy/Papers/statelegislationregulation.pdf?ext=.pdf [hereinafter NEI State Laws].

8 "Carrying charges" refers to cost associated with holding a financial instrument over a defined period of time. Carrying charges include insurance, interest charges on borrowed funds, and other related costs. *See Carrying Charge*, Investopedia, http://www.investopedia.com/terms/c/carryingcharge.asp (last visited Dec. 16, 2014).

9 *See Building New Nuclear Facilities*, Nuclear Energy Inst., http://www.nei.org/Issues-Policy/New-Nuclear-Energy-Facilities/Building-New-Nuclear-Facilities (last visited Dec. 16, 2014).

10 This article focuses solely on the state ACR policies of Florida, Georgia, and South Carolina. For all state laws supporting nuclear energy, *see* NEI State Laws, *supra* note 7.

11 *See* Mark Cooper, Public Risk, Private Profit, Ratepayer Cost, Utility Imprudence vii (March 2013) (unpublished report) (on file with Southern Alliance for Clean Energy), *available at* http://216.30.191.148/vlsreport/Public%20Risk,%20Private%20Profit.pdf.

12 S. Alliance for Clean Energy v. Graham, 113 So. 3d 742, 745 (Fla. 2013).

13 *The World Factbook, Electricity Consumption*, U.S. Cent. Intelligence agency, https://www.cia.gov/library/publications/the-world-factbook/rankorder/2233rank.html (last visited Dec. 16, 2014). *See also Electric Power Consumption (Kwh Per Capita)*, The World Bank, http://data.worldbank.org/indicator/EG.USE.ELEC.KH.PC (last visited Dec. 16, 2014).

14 U.S. Energy Info. Admin., Annual Energy Outlook 2014, DOE/EIA-0383(2014) MT-5 (2014). Energy conservation is a significant factor in overall energy policy. While energy conservation can decrease the projected increase in overall energy consumption, it is generally settled that our appetite for energy will continue to grow, even as we become more efficient with energy use overall. For a detailed discussion on demand projections and how energy conservation factors into forecasting, *see* Robert Bryce, Power Hungry: The Myths of "Green" Energy and the Real Fuels of the Future (2010).

15 U.S. Energy Info. Admin., November 2014 Monthly Energy Review 95 (2014), *available at* http://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf (referencing Table 7.2a: Electricity Net Generation: Total (All Sectors)).

16 *Id.*

17 U.S. Energy Info. Admin., *supra* note 14, at MT-16.

18 The levelized basis for cost calculation purposes is the "per-kilowatthour cost (in real dollars) of building and operating a generating plant over an assumed financial life and duty cycle." *See* U.S. Energy Info. Admin., Levelized Cost and Levelized Avoided Cost of New Generation Resources in the Annual Energy Outlook 2014 1 (2014), *available at* http://www.eia.gov/forecasts/aeo/pdf/electricity_generation.pdf [hereinafter Levelized Cost of New Generation Resources].

19 *Id.* at 6.

20 *Id.*

21 Capacity factor: "The ratio of the electrical energy produced by a generating unit for the period of time considered to the electrical energy that could have been produced at continuous full power operation during the same period." *Glossary*, U.S. Energy Info. Admin., http://www.eia.gov/tools/glossary/ (last visited Dec. 16, 2014) [hereinafter *Glossary*].

Generator nameplate capacity (installed): "The maximum rated output of a generator, prime mover, or other electric power production equipment under specific conditions designated by the manufacturer. Installed generator nameplate capacity is commonly expressed in megawatts (MW) and is usually indicated on a nameplate physically attached to the generator." *Id.*

22 U.S. Energy Info. Admin., Electric Power Monthly with Data for June 2014 Table 6.7.B (2014) *available at* http://www.eia.gov/electricity/monthly/current_year/august2014.pdf.

23 *Id.*

24 *Id.*

25 *U.S. Nuclear Generating Statistics*, Nuclear Energy Inst., http://www.nei.org/Knowledge-Center/Nuclear-Statistics/US-Nuclear-Power-Plants/

continued on page 59

Endnotes: The Quest for Sustainable Energy: Germany's Nuclear Scrutiny vs. "All of the Above"

continued from page 27

[25] *See, e.g., Environmental Emissions: Prevented*, Nuclear Energy Inst., http://www.nei.org/Knowledge-Center/Nuclear-Statistics/Environment-Emissions-Prevented (last visited Nov. 26, 2014).

[26] European Commission, Calculating the Environmental Cost of Uranium Mining (May 29, 2008), *available at* http://ec.europa.eu/environment/integration/research/newsalert/pdf/109na4_en.pdf.

[27] *Id.*; Benjamin K. Sovacool & Christopher Cooper, *Nuclear Nonsense: Why Nuclear Power Is No Answer to Climate Change and the World's Post-Kyoto Energy Challenges*, 33 Wm. & Mary Envtl. L. & Pol'y Rev. 1, 46 (2008).

[28] *See* John Deutch et al., The Future of Nuclear Power: an Interdisciplinary mit study, 53 (2003), *available at* http://web.mit.edu/nuclearpower/pdf/nuclearpower-full.pdf.

[29] *See Third Way: Nuclear a Highly Cost-Effective Climate Strategy*, Nuclear Energy Institute, http://www.nei.org/News-Media/News/News-Archives/Third-Way-Nuclear-a-Highly-Cost-Effective-Climate (last visited Nov. 26, 2014).

[30] *See generally* David Schlissel and Bruce Biewald, *Nuclear Power Plant Construction Costs* 2 (July, 2008), http://www.synapse-energy.com/sites/default/files/ SynapsePaper.2008-07.0.Nuclear-Plant-Construction-Costs.A0022_0.pdf (stating that nuclear plants cost billions of dollars to construct and require significant public funding, and that, both historically and foreseeably, plant costs are unpredictable and tend to greatly exceed estimates).

[31] Miguel Mendonga et al., Powering The Green Economy: The Feed-In Tariff Handbook 137-138 (2010).

[32] *See* Amy J. Wildermuth, *The Next Step: The Integration of Energy Law and Environmental Law*, 31 Utah Envtl. L. Rev. 369, 371 (2011); Justin Gundlach, *What's the Cost of A New Nuclear Power Plant? The Answer's Gonna Cost You: A Risk-Based Approach to Estimating the Cost of New Nuclear Plants*, 18 N.Y.U. Envtl. L.J. 600, 636-38 (2011).

[33] Martin Nicholson, *Nuclear Has One of the Smallest Footprints*, The Breakthrough (Sept. 20, 2013), http://thebreakthrough.org/index.php/programs/energy-and-climate/nuclear-has-one-of-the-smallest-footprints/.

[34] *See generally* European Commission, *supra* note 26; *see also* Wildermuth, *supra* note 33, at 371; Sovacool & Collins, *supra* note 27, 6-11.

[35] *See generally* U.S. Envtl. Prot. Agency, Handbook on Siting Renewable Energy Project While Addressing Environmental Issues, 3-6 (April 20, 2012), *available at* http://www.epa.gov/oswercpa/docs/handbook_siting_repowering_projects.pdf.

[36] *See* Gundlach, *supra* note 32, at 636-38; *see also* Wildermuth, *supra* note 32, at 371.

[37] *See* Heinrich Böll Stiftung, Energy Transition, *supra* note 4, at 28-29.

[38] *See, e.g.*, Irma S. Russell, *The Sustainability Principle in Sustainable Energy*, 44 Tulsa L. Rev. 121, 121 (2008).

[39] *See generally* Heinrich Böll Stiftung, Energy Transition, *supra* note 4.

[40] *Id.* at 33.

[41] *See* Bernell K. Stone, *Using Fair Return Prices to Assess the Value and Cost of Financial Guarantees for New Nuclear Power Plants*, 6 B.Y.U. Int'l L. & Mgmt. Rev. 83, 104-105 (2009); *10 Reasons Not to Invest in Nuclear Energy*, Center for American Progress (July 8, 2008), https://www.americanprogress.org/issues/green/news/2008/07/08/4735/10-reasons-not-to-invest-in-nuclear-energy/.

[42] *See, e.g.,* Hossein Haeri, *Efficiency Beyond the Low Fruit*, Pub. Util. Fort. 34, 36-37 (Oct. 1, 2012).

[43] U.S. Envtl. Prot. Agency, Assessing the Multiple Benefits of Clean Energy: A Resource for States, 5-8 (Sept. 2011), *available at* http://www.epa.gov/statelocalclimate/documents/pdf/epa_assessing_benefits.pdf; *Opportunities to Tackle Growth and Climate Challenges, Will Climate Action Cost Jobs?*, The New Climate Economy: The Global Commission on the Economy and Climate, http://newclimateeconomy.report/overview/ (last visited Nov. 26, 2014).

Endnotes: The Role of Advanced Cost Recovery in Nuclear Energy Policy

continued from page 38

US-Nuclear-Generating-Statistics. Last year nuclear reactors operated at a capacity factor of 90.1%. U.S. Energy Info. Admin., *supra* note 22, at Table 6.7B..

[26] Base load plant: "A plant, usually housing high-efficiency steam-electric units, which is normally operated to take all or part of the minimum load of a system, and which consequently produces electricity at an essentially constant rate and runs continuously. These units are operated to maximize system mechanical and thermal efficiency and minimize system operating costs." *Glossary*, *supra* note 21.

[27] *See* Robert Bryce, *supra* note 14, at 98–99.

[28] Levelized Cost Of New Generation Resources, *supra* note 18, at 6 (referencing Table 1).

[29] The largest single carrying charge for development of a nuclear power plant is interest on borrowed funds. For an in-depth discussion of the economics of nuclear power, *see The Economics of Nuclear Power,* World Nuclear Ass'n, http://www.world-nuclear.org/info/Economic-Aspects/Economics-of-Nuclear-Power/ (last updated Sept. 2014).

[30] Congressional Budget Office, Nuclear Power's Role in Generating Electricity 16 (2008), *available at* http://www.cbo.gov/sites/default/files/05-02-nuclear.pdf.

[31] V.C. Summer Nuclear Station Units 2 & 3, Quarterly Report to the South Carolina Office of Regulatory Staff Submitted by South Carolina Electric & Gas Company Pursuant to Public Service Commission Order No. 2009-104(A) 4 (2014), *available at* http://www.scana.com/NR/rdonlyres/CC6965BC-FFE3-4080-914C-1BFFE858EFE7/0/BLRA3Q2014.pdf. ("Spending through December 31, 2014, in current dollars is forecasted to be approximately $861 million less than the capital cost schedule approved in Order No. 2012-884.").

[32] "The combined attributes of passive safety, simplified design, modular construction and accelerated construction, all lead to reduced capital cost and minimized environmental risk." William J. Nuttall, Nuclear Renaissance: Technologies and Policies for the Future of Nuclear Power 128 (2005).

[33] Levelized Cost Of New Generation Resources *supra* note 18, at 6.

[34] *U.S. Natural Gas Wellhead Price*, U.S. Energy Info. Admin., http://www.eia.gov/dnav/ng/hist/n9190us3a.htm (last updated Nov. 28, 2014).

[35] Levelized Cost of New Generation Resources, *supra* note 18, at 3, 6.

[36] "Energy Sprawl" is a term for the large amounts of land necessary to certain types of energy production. *See* Robert I. McDonald et al., *Energy Sprawl or Energy Efficiency: Climate Policy Impacts on Natural Habitat for the United States of America*, 4(8) PLoS ONE (2009), http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2728545/.

[37] *Environment: Emissions Prevented*, Nuclear Energy Inst., http://www.nei.org/Knowledge-Center/Nuclear-Statistics/Environment-Emissions-Prevented (last visited Dec. 16, 2014).

[38] U.S. Energy Info. Admin., *supra* note 15, at 84, 68 (referencing Table 6.2 Coal Consumption by Sector and Figure 4.1 Natural Gas Overview).

[39] Seth P. Cox, *The Nuclear Option: Promotion of Advanced Nuclear Generation As A Matter of Public Policy*, 5 Appalachian Nat. Resources L.J. 25, 32 (2011).

[40] Nuclear Energy Institute, *supra* note 37.

[41] Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 79 Fed. Reg. 34830 (proposed June 18, 2014).

[42] *Id.*

[43] *See* Robert I. McDonald et al., *supra* note 36, at 1.

[44] *Id.*

[45] *Id.* at 4 (referencing *Figure 3, Land-Use Intensity For Energy Production/Conservation Techniques*).

[46] *See U.S. Expected To Be Largest Producer of Petroleum and Natural Gas Hydrocarbons in 2013*, U.S. Energy Info. Admin. (Oct. 4, 2013), http://www.eia.gov/todayinenergy/detail.cfm?id=13251.

[47] International Energy Agency, World Energy Investment Outlook 60 (2014), *available at* http://www.iea.org/publications/freepublications/publication/WEIO2014.pdf (discussing investment trends in oil and gas).
[48] Atomic Energy Act of 1946, Pub. L. No. 79-585, 60 Stat. 755 (1946).
[49] Joseph P. Tomain, *Nuclear Futures*, 15 Duke Envtl. L. & Pol'y F. 221, 227 (2005).
[50] *Id.*
[51] *Id.*
[52] *Id.*
[53] Price-Anderson Act of 1957, Pub. L. No. 85-256, 71 Stat. 576 (1957).
[54] Tomain, *supra* note 49, at 228 (citing U.S. Dep't of Energy, U.S. Commercial Nuclear Power: Historical Perspective, Current Statute, and Outlook 6 (1982)).
[55] Maxwell S. Bayman, *Subsidizing Advanced Nuclear Energy*, 9 Okla. J.L. & Tech. 62 (2013). Combined License (COL): An NRC-issued license that authorizes a licensee to construct and (with certain specified conditions) operate a nuclear power plant at a specific site, in accordance with established laws and regulations. A COL is valid for 40 years (with the possibility of a 20-year renewal). *Glossary,* U.S. Nuclear Regulatory Comm'n, http://www.nrc.gov/reading-rm/basic-ref/glossary.html (last updated Nov. 20, 2014).
[56] *See* Duquesne Light Co. v. Barasch, 488 U.S. 299, 302 (1989).
[57] Congressional Budget Office, *supra* note 30, at 16-17.
[58] Dr. Karl McDermott, Edison Electric Institute (EEI), Cost of Service Regulation in the Investor-Owned Electric Utility Industry, A History of Adaptation 24 (2012), *available at* http://www.eei.org/issuesandpolicy/stateregulation/Documents/COSR_history_final.pdf.
[59] *Id.* For more details on specific changes by the NRC after Three Mile Island, *see Backgrounder on the Three Mile Island Accident*, U.S. Nuclear Regulatory Comm'n, http://www.nrc.gov/reading-rm/doc-collections/factsheets/3mile-isle.html (last updated Dec. 12, 2014).
[60] Bayman*, supra* note 55.
[61] *Id. See also* Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594 (2005).
[62] *Id.*
[63] Ronald M. Frye Jr., *The Current Nuclear Renaissance in the United States*, 29 Energy L.J. 279, 281 (2008).
[64] I.R.C. § 45J.
[65] *Id.* § 45J(a).
[66] *Id.* § 45J(d).
[67] Bayman, *supra* note 55.
[68] I.R.C. § 45J(a)(2)(a).
[69] *Id.* § 45J(b)(2).
[70] *Id.* § 45J(c).
[71] *Id.* § 45J(c)(2). For an in-depth analysis of the tax credits from the Energy Policy Act of 2005, see Bayman, *supra* note 55..
[72] The restart of construction of Watts Bar 2 in Tennessee, the new construction of Vogtle 3 and 4 in Georgia, and the new construction of V.C. Summer 2 and 3 in South Carolina all qualify for the federal tax credit. *See Nuclear Power in the USA*, World Nuclear Ass'n, http://www.world-nuclear.org/info/Country-Profiles/Countries-T-Z/USA—Nuclear-Power/ (last updated Nov. 2014).
[73] *Id.*
[74] Energy Policy Act of 2005, Pub. L. No. 109-58, § 1703(a)(2), 119 Stat. 594 (2005).
[75] *Id.* § 1703(b).
[76] *Id.*
[77] *Id.* § 1702(g).
[78] *Id.*
[79] Issuance of Loan Guarantees to Various Applicants for the Vogtle Electric Generating Plant, 79 Fed. Reg. 10510 (Feb. 25, 2014).
[80] *Safety of Nuclear Power Reactors*, World Nuclear Ass'n, http://www.world-nuclear.org/info/Safety-and-Security/Safety-of-Plants/Safety-of-Nuclear-Power-Reactors/ (updated Dec. 2014).
[81] Stefan Hirschberg, et al., *Severe Accidents in the Energy Sector: Comparative Perspective*, 111 J. Hazardous Materials 57, 542 (2004) (describing numbers and fatalities of severe accidents across different energy chains).
[82] Benjamin K. Sovacool, *The Cost of Failure: A Preliminary Assessment of Major Energy Accidents, 1907-2007*, 36 Energy Policy 1802, 1810-19 (2008) (outlining major global energy accidents).
[83] Price-Anderson § 170, as added by Pub. L. No. 85-256, § 4, 71 Stat. 576 (1957).
[84] 42 U.S.C. § 2210 (2014).
[85] Energy Policy Act of 2005, Pub. L. No. 109-58, §§ 602–10, 119 Stat. 594 (2005).
[86] Eban Harrell, *Germany Bans Nuclear Power,* TIME, May 2011, *available at* http://science.time.com/2011/05/31/germany-bans-nuclear-power/.
[87] *See* Stephen G. Burns, *The Fukushima Daiichi Accident: The International Community Responds*, 11 Wash. U. Global Stud. L. Rev. 739, 750 (2012).
[88] *Japan Lessons Learned*, U.S. Nuclear Regulatory Comm'n, http://www.nrc.gov/reactors/operating/ops-experience/japan-dashboard.html (last updated Oct. 29, 2014).
[89] For more information on the Fukushima Nuclear Power Plant disaster *see* The American Nuclear Soc'y Special Comm. on Fukushima, American Nuclear Soc'y, Fukushima Daiichi: ANA Comm. Report 1 (June 2012); *Nuclear Power in Japan*, World Nuclear Ass'n, http://www.world-nuclear.org/info/Country-Profiles/Countries-G-N/Japan/ (last updated Dec. 2014).
[90] 42 U.S.C. § 10101 et. seq. (2014).
[91] *Id.*
[92] *Id.* § 10132(b)(1)(B).
[93] *In re* Aiken County, 725 F.3d 255, 266 (D.C. Cir. 2013)
[94] For a detailed discussion of nuclear waste storage see *U.S. Nuclear Policy*, World Nuclear Ass'n, http://www.world-nuclear.org/info/Country-Profiles/Countries-T-Z/USA—Nuclear-Power-Policy/ (last updated Dec. 2014).
[95] The Westinghouse AP1000 reactor design is part of the 3rd generation advanced reactors. Generation III reactors have improved safety and efficiency measures over previous designs. The first generation III reactor went into operation in Japan in 1996. *Advanced Nuclear Power Reactors,* World Nuclear Ass'n, http://www.world-nuclear.org/info/Nuclear-Fuel-Cycle/Power-Reactors/Advanced-Nuclear-Power-Reactors/ (last updated Dec. 2014). "The AP1000 standard design includes many features that are not found in the designs of currently operating reactors. For example, a variety of engineering and operational improvements provides additional safety margins and addresses Commission policy statements regarding severe accidents, safety goals, and standardization. The most significant improvement to the design is the use of safety systems for accident prevention and mitigation that rely on passive means, such as gravity, natural circulation, condensation and evaporation, and stored energy." U.S. Nuclear Regulatory Comm'n, Final Safety Evaluation Report Related to Certification of the AP1000 Standard Plant Design, Docket No. 52-006, NUREG-1793 Supplement 2 1-3 (. 2011), *available at* http://pbadupws.nrc.gov/docs/ML1120/ML112061231.pdf.
[96] *Advanced Reactors and Small Modular Reactors*, Nuclear Regulatory Comm'n, http://www.nrc.gov/reactors/advanced.html (last updated Sept. 10, 2014).
[97] Chris Carroll, *Small Town Nukes*, Nat'l Geographic Mag., Feb. 2010, *available at* http://ngm.nationalgeographic.com/big-idea/08/mini-nukes (quoting Richard Lester).
[98] *Generation IV Nuclear Reactors*, World Nuclear Ass'n, http://www.world-nuclear.org/info/Nuclear-Fuel-Cycle/Power-Reactors/Generation-IV-Nuclear-Reactors/ (last updated Aug. 2014).
[99] *Id.*
[100] Sony Ben-Moshe et al., *Financing the Nuclear Renaissance: The Benefits and Potential Pitfalls of Federal & State Government Subsidies and the Future of Nuclear Power in California*, 30 Energy L.J. 497, 534 (2009); *see also* NEI State Laws, *supra* note 7.
[101] NEI State Laws, *supra* note 7.
[102] *Id.*
[103] *See* Frye, *supra* note 63, at 352 (2008).
[104] *See* Ben-Moshe *supra* note 100, at 534-42.
[105] *Combined License Applications for New Reactors*, Nuclear Regulatory Comm'n, http://www.nrc.gov/reactors/new-reactors/col.html (last updated July 1, 2014) [hereinafter NRC COLs].
[106] *Issued Combined Licenses and Limited Work Authorizations for Vogtle, Units 3 and 4,* Nuclear Regulatory Comm'n, http://www.nrc.gov/reactors/new-reactors/col/vogtle.html (last updated Feb. 25, 2014).
[107] NRC COLs, *supra* note 105.
[108] McDermott *supra* note 58, at 10.
[109] Michael Stern & Margaret Stern, *Does Nuclear Have a Future?*, 32 Utah Envtl. L. Rev. 431, 445 (2012).
[110] *Location of Projected New Nuclear Power Reactors*, U.S. Nuclear Regulatory Comm'n, http://www.nrc.gov/reactors/new-reactors/col/new-reactor-map.html (last updated July 28, 2014).
[111] *See* World Nuclear Ass'n, *supra* note 72.

112 *Id.*
113 *Id.*
114 2009 Ga. Laws Act 13 (S.B. 31) (codified at Ga. Code Ann. § 46-2-25).
115 Ga. Code Ann. § 46-2-25 (c.1)(1) (2014).
116 *Id.*
117 *Id.*
118 *Id.* § 46-2-25 (c.1)(2).
119 Suzanne N. Boyd & Sara Sorenson, *Public Utilities and Public Transportation*, 26 Ga. St. U. L. Rev. 107, 112 (2009).
120 S. B. 31, 2009 Ga. Gen. Assemb.
121 Ga. Code Ann. § 46-3A-7 (2014).
122 *Combined License Holders for New Reactors*, Nuclear Energy Institute, http://www.nrc.gov/reactors/new-reactors/col-holder.html (last updated Sept. 19, 2013).
123 *Id.*
124 *Construction officially starts at Summer*, World Nuclear News (Mar. 12, 2013), http://www.world-nuclear-news.org/NN-AP1000_construction_underway_at_Summer-1203134.html.
125 Base Load Review Act, 2007 S.C. Acts No. 16.
126 *Id.* Section 1(A).
127 S.C. Code Ann. § 58-33-225(D) (2014).
128 *Id.* § 58-33-225(G).
129 *Id.*
130 *Id.*
131 Nuclear Energy Inst., Nuclear Energy in Florida (2014) (referencing the Nuclear Energy Facilities chart).
132 *See* Ivan Penn, *Duke Energy Announces Closing of Crystal River Nuclear Power Plant*, Tampa Bay Times, Feb. 5, 2013, http://www.tampabay.com/news/business/energy/duke-energy-announces-closing-of-crystal-river-nuclear-power-plant/1273794.
133 U.S. Energy Info. Admin., Net Generation by State by Type of Producer by Energy Source (2011), *available at* http://www.eia.gov/electricity/data/state/ (referring to the excel attachment).
134 NRC COLs, *supra* note 105.
135 *Application Review Schedule for the Combined License Application for Turkey Point, Units 6 and 7*, U.S. Nuclear Regulatory Comm'n, http://www.nrc.gov/reactors/new-reactors/col/turkey-point/review-schedule.html (last updated Sept. 25, 2014).
136 NRC COLs, *supra* note 105.
137 *Id.*
138 Fla. Stat. § 366.93 (2006). The statute was amended in 2008 to allow cost recovery for integrated gasification combined cycle (IGCC) power plants, also known as "clean coal." The ramifications of this statute on IGCC facilities are not discussed in this article.
139 *Id*. § 366.93(2).
140 *Id.*
141 Fla. Admin. Code Ann. r. 25-6.0423(5)(c) (2014).
142 *Id.*
143 Fla. Stat. § 366.93(2)(b) (2006).
144 *Id.* § 366.93(3).
145 *Id.* § 366.93(6).
146 Fla. Stat. § 366.93 (2008).
147 *See* Friends of the Earth v. Pub. Serv. Comm'n of S.C., 692 S.E.2d 910 (S.C. 2010); S. Alliance for Clean Energy, Inc. v. Ga. Pub. Serv. Comm'n, 2009-CV-170648 (Sup. Ct. Fulton County May 5, 2010); Fulton Cnty. Taxpayers Found., Inc. v. Ga. Pub. Serv. Comm'n, 287 Ga. 876 (Ga. 2010).
148 *In re* Nuclear Cost Recovery Clause, No. 110009-EI, Order No. PSC-11-0547-FOF-EI (Fla. P.S.C., Nov. 23, 2011).
149 *Id.* at 73, 107.
150 *See* S. Alliance for Clean Energy v. Graham, 113 So. 3d 742, 745 n.2 (Fla. 2013).
151 *See* Initial Brief of Appellant S. Alliance for Clean Energy, S. Alliance for Clean Energy v. Graham, 113 So. 3d 742 (Fla. 2013) (No. 110009-EI).
152 S. Alliance for Clean Energy v. Graham, 113 So. 3d 742 (Fla. 2013).
153 *Id.* at 749.
154 *Id.*
155 *Id*. at 750.
156 *Id.*
157 *Id.* at 751.
158 *Id.*
159 *Id.*
160 *Id.* at 752.
161 *Id.*
162 *Id.* at 753.
163 *Id.* at 752.
164 *Id.* at 753.
165 *Id.*
166 *See id.*
167 *See* Initial Brief of Appellant S. Alliance for Clean Energy, S. Alliance for Clean Energy v. Graham, 113 So. 3d 742 (Fla. 2013) (No. 110009). *See also* Transcript of Oral Argument, S. Alliance for Clean Energy v. Graham, 113 So. 3d 742 (Fla. 2013) (No. SC11-2465).
168 *In re* Nuclear Cost Recovery Clause, No. 110009-EI, Order No. PSC-11-0095-FOF-EI, at 9 (Fla. P.S.C., Feb. 2, 2011).
169 2013 Fla. Laws 184.
170 *Fla. Stat. §366.93, amended by S.B. 1472, 2013 Leg. (2013).*
171 *Id.* § 366.93(3)(a).
172 *Id.* § 366.93; Fla. Admin. Code Ann. r. 25-6.0423(4)–(5) (2013).
173 Fla. Admin. Code Ann. r. 25-6.0423(2)(h) (2013).
174 Fla. Stat. § 366.93(3)(c) (2013).
175 *Id.*
176 *Id.* § 366.93(3)(f).
177 *Id.* § 366.93(3)(f)(1)(a).
178 *Id.* § 366.93(3)(f)(3).
179 *Id.*
180 *Id.* § 366.93(3)(f)(1)(b).
181 *Id.* § 366.93(3)(e).
182 *Id.* § 366.93(2)(c).
183 *See supra* Development of Nuclear Facilities and Advanced Cost Recovery Policy in Southern States – Georgia.
184 *See id*.
185 *See supra* Development of Nuclear Facilities and Advanced Cost Recovery Policy in Southern States – Florida.
186 Fla. Stat. § 366.93(3) (2013).
187 *Id.* § 366.93(2).
188 Fla. Admin. Code Ann. r. 25-6.0423 (2013).
189 *Id.*
190 *In re* Nuclear Cost Recovery Clause, No. 110009-EI, Order No. PSC-11-0095-FOF-EI, at (Fla. P.S.C., Feb. 2, 2011); S. Alliance for Clean Energy v. Graham, 113 So. 3d 742 (Fla. 2013).
191 Fla. Stat. § 366.93 (2013).
192 Fla. Admin. Code Ann. r. 25-6.0423 (2013).
193 Justin Bachman, *Duke Kills Florida Nuclear Project, Keeps Customers' Money*, Businessweek, Aug. 5, 2013, http://www.businessweek.com/articles/2013-08-05/duke-kills-florida-nuclear-project-keeps-customers-money.
194 Fla. Stat. § 366.93(6) (2013).
195 H.B. 4001, 2014 Leg. (Fla. 2014); *see also* S.B. 1408, 2014 Leg. (Fla. 2014).
196 Rate of return on rate base: The ratio of net operating income earned by a utility, calculated as a percentage of its rate base. U.S. Energy Info. Admin., *supra* note 21. Rate base: The value of property upon which a utility is permitted to earn a specified rate of return as established by a regulatory authority. The rate base generally represents the value of property used by the utility in providing service and may be calculated by any one or a combination of the following accounting methods: fair value, prudent investment, reproduction cost, or original cost. Depending on which method is used, the rate base includes cash, working capital, materials and supplies, deductions for accumulated provisions for depreciation, contributions in aid of construction, customer advances for construction, accumulated deferred income taxes, and accumulated deferred investment tax credits. U.S. Energy Info. Admin., *supra* note 21.
197 Fla. Stat. § 366.93(1)(f), (2)(b).
198 *Id.*
199 *Id.* § *366.93(2)*
200 S. Alliance for Clean Energy v. Graham, 113 So. 3d 742 (Fla. 2013).
201 *See* Bachman, *supra* note 193.