


Status of Potential New Commercial Nuclear Reactors in the United States

Release Date: February 19, 2009
 Next Release Date: May 2010

(entire report also available in
[printer-friendly format](#) )

Introduction: In July 2007, the first application in over three decades was filed to build and operate a commercial nuclear reactor. By the end of the year, a total of 5 combined license (COL) applications were on file with the Nuclear Regulatory Commission (NRC). In 2008, the number of COL applications doubled. Media attention, the filing of several early site permit (ESP) applications with the NRC, and provisions of the Energy Policy Act of 2005 favorable to nuclear generation have been cited as indicators of a 'nuclear renaissance' in the United States. But the clearest indicator of the depth and scope of such a renaissance will be the number and capacity of new reactors going on line. Submitting an application does not ensure a reactor will be built (or even started). But the significant number of applications, and the significant expense involved in gathering required data for each may presage future commitments by the industry to increase capacity.

Table 1 of this feature lists projects in which the applicant has met all of the following criteria: 1) publicly notified the NRC of interest in applying for a COL; 2) issued one or more press releases or initiated a pre-application meeting at the NRC; 3) selected a specific site for the reactor; and 4) selected a specific reactor design for the project. Projects which do not meet these criteria are excluded. There is no assurance that any of these plants will ultimately be built or operate commercially. The Energy Information Administration's (EIA) latest reference case projection for U.S. nuclear capacity additions is provided in the [Annual Energy Outlook](#) (AEO), which projects a net increase of approximately 12 gigawatts of nuclear capacity coming on line through 2030.

Including the 17 COL applications already filed, a total of 20 projects meet these criteria. One of the 20, Tennessee Valley Authority's (TVA) Watts Bar 2, has already received a construction permit. The permit was issued on 23 January 1973, several decades prior to the NRC's streamlining of the licensing process. If the reactor goes on line, it will be the last U.S. reactor for which the construction permit and license were applied for separately. Excluded from the table is a proposed second unit at Exelon's Clinton plant in Illinois. An Early Site Permit (ESP) for unit 2 was approved by the NRC, but the company has not yet indicated whether it will pursue a COL.

Many of the firms that are considering nuclear construction are bound by State requirements that they be 'prudent investors.' Therefore, COL filings often include a goal to "keep the nuclear option open" rather than a full commitment. Quite possibly, final commitment for some projects will only be announced shortly before actual construction begins. Since the last release of this report in October 2008, an application to build an EPR reactor at Bell Bend, Pennsylvania, was submitted to the NRC. Also, since the last update of this feature, three applicants have announced that they are reconsidering their selection of reactor(s).

Table 1. License Applications for Commercial Nuclear Reactors in the United States
 Status as of September 30, 2008

Site	Sponsoring Firms	Reactor Design ¹	No. of Units	Capacity MW(e)	Application Submitted	Application Status
Bell Bend , PA	Pennsylvania Power and Light	EPR	1	1,600	10/20/2008	Under Review
Bellefonte , AL	NuStart; Energy, TVA	AP 1000	2	2,234	10/30/2007	Under Review
Bruneau , ID	Alternate Energy Holding, Inc	EPR	1	1,600	Anticipated	Na
Callaway , MO	Ameren UE, UniStar Nuclear, LLC	EPR	1	1,600	7/24/2008	Under Review
Calvert Cliffs , MD	UniStar, Nuclear, LLC, Constellation	EPR	1	1,600	7/13/2007	Under Review
Comanche Peak , TX	Energy Future Holdings [Luminant]	US-APWR	2	3,400	9/19/2008	Under Review


Fermi, MI	Detroit Edison Company	ESBWR	1	1,520	9/13/2008	Under Review
Grand Gulf, MS	NuStart Energy, Entergy	ESBWR	1	1,520	2/27/2008	Under Review
Levy County, FL	Progress Energy	AP 1000	2	2,234	7/30/2008	Under Review
Nine Mile Point, NY	UniStar Nuclear, Constellation	EPR	1	1,600	9/30/2008	Under Review
North Anna, VA	Dominion	ESBWR	1	1,520	11/27/2007*	Under Review
River Bend, LA	Entergy	ESBWR	1	1,520	9/30/2008	Under Review
Shearon Harris, NC	Progress Energy	AP 1000	2	2,234	2/19/2008	Under Review
South Texas Project, TX	NRG Energy, South Texas Project Nuclear Operating Company	ABWR	2	2,700	9/20/2007	Under Review
Victoria County, TX	Exelon Nuclear	ESBWR	2	3,040	9/2/2008	Under Review
Turkey Point, FL	Florida Power & Light	AP 1000	2	2,234	Anticipated	Na
Virgil C. Summer, SC	Scana [South Carolina Electric and Gas], Santee Cooper	AP 1000	2	2,234	3/31/2008	Under Review*
Vogtle, GA	Southern Company [Georgia Power], Oglethorpe Power, Municipal Electric Authority of Georgia, City of Dalton	AP 1000	2	2,234	3/31/2008	Under Review
Watts Bar, TN²	TVA	PWR	1	1,167	Anticipated	Na
William States Lee III, SC	Duke Energy	AP 1000	2	2,234	12/13/2007	Under Review

¹ ABWR, Advanced Boiling Water Reactor; AP 1000, Advanced Passive 1000 reactor; EPR, European Power Reactor (only the acronym is used for the U.S. version); ESBWR, is interpreted as either European Simplified Boiling Reactor or, for U.S. version, Economic Simplified Boiling Water Reactor, and US-APWR, U.S. Advanced Pressurized Water Reactor

² Watts Bar was issued a construction Permit on 23 January 1973.

* An Early Site Permit (ESP) has also been filed. ESPs were approved by the Nuclear Regulatory Commission for Grand Gulf (on 4/5/2007) and North Anna (on 11/27/2007). Vogtle is under review. Na= non-applicable.

Potential Reactor Sites

Following are more details concerning each of the projects appearing in Table 1. To navigate this page use arrow 

Bell Bend¹, Pennsylvania (Pennsylvania Power and Light [PPL])

The COL Application was submitted to NRC On 20 October 2008.

In June 2007, PPL publicly announced a plan to construct a new reactor at a property adjacent to the site of its present two-unit Susquehanna plant. At the time PPL announced that any project would most likely involve other participants. Subsequent announcements indicate the involvement of UniStar Nuclear in the project and the selection of AREVA NP's EPR design. PPL plans to apply for a COL by the end of 2008.

Bellefonte, Alabama (NuStart Energy, Tennessee Valley Authority)

The COL Application was submitted to NRC on 30 October 2007.

The Tennessee Valley Authority (TVA) and the multi-utility consortium NuStart Energy submitted an application for a COL at TVA's Bellefonte site near Hollywood, Alabama. TVA's evaluation of the project indicates a desire to meet base load power needs in its service territory. The Bellefonte COL application could serve as a reference COL application for other Advanced Passive (AP) 1000 reactor design applications by other firms. In 2006, TVA cancelled construction of two pressurized water reactors (PWR), Bellefonte 1 and 2. Unit 1 was 88 percent completed and Unit 2 was over 50 percent complete when construction was terminated. The COL application is for building Bellefonte 3 and Bellefonte 4, two AP 1000 reactors at this site. If TVA opts to complete Watts Bar 2 first, that decision could delay this project.



Bruneau, Idaho (Alternate Energy Holding, Inc.)

As of 30 September 2008, the project has not yet filed a COL application.

The Lynchburg, Virginia firm, Alternate Energy Holdings, Inc. (AEHI) announced in December 2006 that it intended to apply for a COL in 2008 for a nuclear power plant near Bruneau, Idaho. AEHI has subsequently announced that it was partnering with UniStar Nuclear to build an Evolutionary Power Reactor (EPR) design on the site. The proposed nuclear plant will share a site with associated industrial facilities, including an ethanol plant. Collectively, the facilities will be known as the Idaho Energy Complex. On 4 April 2008, the Idaho Energy Complex announced that it was moving the site 15 miles to a 1,400-acre location north of the Snake River. The new site, although less than half the size of the original site, offers some significant advantages. The original site had some underground faults (although not serious or extensive enough to be a hazard) and the land is less expensive in the new location. On 8 July 2008, AEHI and the Powered Corporation based in Houston, Texas, agreed to form a new company to jointly develop reactors worldwide, including the EPR at Bruneau. AEHI contributes management and nuclear expertise, Powered contributes international contacts and initial funding.²



Callaway, Missouri (Ameren UE, UniStar³ Nuclear, LLC*)

The COL Application was submitted to NRC on 24 July 2008.

Ameren UE's interest in licensing a new reactor at its single-unit Callaway plant was first indicated in late 2005 through filings with Missouri utility regulators. Formal announcement of the project came in April 2007, when Ameren announced selection of the EPR design in cooperation with UniStar Nuclear. The Callaway site was of strong interest long before the public announcement in July 2007. Ameren also announced that it has ordered long lead-time components for the potential new reactor through AREVA NP.



Calvert Cliffs, Maryland (UniStar⁴ Nuclear, LLC, Constellation)

The COL Application was submitted to NRC on 13 July 2007.

UniStar Nuclear Energy, LLC, announced on 27 October 2005 that it would file COL applications with the NRC for several nuclear power plants including Calvert Cliffs, Maryland. Calvert County granted tax concessions for the first potential new reactor at Calvert Cliffs in August 2006. UniStar ordered forgings and other long lead-time reactor components for the Calvert Cliffs reactor in 2006 and 2007. Formal site selection of Calvert Cliffs for the first UniStar reactor site was not announced until April 2007. The French utility, Electricite de France (EdF), has now joined UniStar Nuclear in project aspects related to reactor operation. Only one reactor is being considered for Calvert Cliffs in the short term. The reactor design would be AREVA NP's EPR reactor. The environmental component of the Calvert Cliffs COL was filed on 13 July 2007. In January 2008, UniStar announced that a final decision would be made "in the next 12-18 months on whether to proceed with a third reactor..." Part 2 of UniStar's application for Calvert Cliffs was received by the NRC in March 2008 and is undergoing review. .



Comanche Peak, Texas (Energy Future Holdings [Luminant])

The COL application was submitted to the NRC on 19 September 2008.

Although TXU Corporation initially announced that it might build at as many as three sites, it subsequently announced that plans were limited to construction of two reactors at Comanche Peak, southwest of Fort Worth, Texas. TXU favored the Mitsubishi Heavy Industries 1,700 MWe US-APWR design for this site. The Comanche Peak COL application could serve as a reference COL for any future US-APWR COL filings. TXU was acquired by a private investor group on 10 October 2007, and re-named Energy Future Holdings, with the generating component changing its name to Luminant. The new owners intend to proceed with the Comanche Peak nuclear licensing though not the other unnamed sites.



(Enrico) Fermi, Michigan (Detroit Edison Company)

The COL application was submitted to the NRC on September 13, 2008.

The Fermi site has one fully licensed reactor currently in service, Fermi 2. Fermi 1, the world's first experimental liquid-metal-cooled, fast breeder reactor was shut down in 1972 and is now in Safe Storage. Fermi 3, the subject of Detroit Edison's latest application, is an ESBWR. The acronym is defined as Economic Simplified Boiling Water Reactor in the United States, and European Simplified Boiling Water Reactor overseas. Even the name of the reactor might cause confusion. This is the second application for a license for Fermi 3. The original Fermi 3 would have been identical to Fermi 2, but the application was cancelled in 1974.



Grand Gulf, Mississippi (NuStart Energy, Entergy)

The COL application was submitted to the NRC on 27 February 2008. NRC review suspended at request of applicant. Entergy filed for an ESP in October 2003 for an ESBWR design reactor at its Grand Gulf site. The Grand Gulf site is owned by Entergy, which operates a single existing reactor there. The permit was issued during April 2007. NuStart Energy, a multi-utility consortium, announced on 22 September 2005 that it would assist in the preparation of the Grand Gulf COL. It was originally planned for the Grand Gulf COL to serve, along with Dominion's North Anna application, as the reference COL for subsequent ESBWR applications to the NRC. Entergy, however, has experienced difficulties in its negotiations with Hitachi and has requested the NRC to halt its review while the reactor choice is being reconsidered.



Levy County, Florida (Progress Energy)

The COL application was submitted to the NRC on 30 July 2008. Progress Energy's intention to seek a COL for new reactors in its Florida marketing area was announced in August 2005, when Progress also announced plans to investigate expanding its Shearon Harris site in North Carolina. Although the Levy site is about 10 miles northeast of the Crystal River 3 nuclear plant, there are no reactors currently located here. In May 2007, two Westinghouse AP 1000 units were announced. Subsequently, initial clearance for the project has been obtained from Levy County officials. On 5 June 2008, the NRC held a public meeting on the Levy application.⁵ If construction is approved, the work would begin in 2016 or later.



Nine Mile Point, New York (UniStar Nuclear, Constellation)

On September 30, 2008, UniStar filed a COL Application with the NRC. UniStar Nuclear (A joint venture of Constellation and AREVA NP, formed by Electricite de France (EDF)) announced on 27 October 2005 its intent to file a COL with the NRC for several nuclear power plants. Sites under consideration included Constellation's existing nuclear power site at Nine Mile Point, New York. According to an EDF communiqué de presse, a COL application has been filed but a final decision on whether to proceed with construction upon approval has not been made. The New York State Department of Environmental Conservation and Public Service Commission and the U.S. Army Corps of Engineers will be invited to participate in reviewing the project. As of this posting, the application was not yet available for on-line review by the public.



North Anna, Virginia (Dominion)

The COL Application was submitted to NRC on 27 November 2007. Dominion Power's Early Site Permit (ESP) application for the North Anna Station was approved on 20 November 2007. Seven days after approval of the ESP, the company submitted a COL for one General Electric-Hitachi ESBWR reactor at the site. Dominion shares COL development information related to the ESBWR design with Entergy and NuStart Energy, which are licensing the same design at Grand Gulf. Entergy has recently delayed filing a COL application for Grand Gulf, leaving the North Anna application as the reference filing for subsequent ESBWR applications with the NRC. Dominion announced on 1 May 2007 that it had signed contracts with GE for "long-lead nuclear components" for the North Anna plant.



River Bend, Louisiana (Entergy)

The COL application was submitted to the NRC on 30 September 2008. Entergy announced on 22 September 2005 that it would seek a COL for a new reactor at River Bend, Louisiana. The reactor design selected is General Electric-Hitachi's ESBWR. According to Gary J. Taylor, Entergy CEO, this design has fewer pipes, valves, cables, and motors than older models reactors.⁶ Entergy has ordered long lead-time components for one of its two potential new reactor sites, either Grand Gulf or River Bend. Entergy, however, has experienced difficulties in its negotiations with Hitachi and has requested the NRC to halt its review while the reactor choice is being reconsidered.



Shearon Harris, North Carolina (Progress Energy)

The COL application was submitted to the NRC on 19 February 2008. Progress Energy informed the Nuclear Regulatory Commission (NRC) in August 2005 that it intended to submit a COL application for two reactors in its North and South Carolina service area. Plans were based on anticipated base load electricity demand growth in the region. Selection of the Harris site was announced on 23 January 2006.

The reactor design will be Westinghouse's AP 1000. The site is already the location of one Progress-operated reactor and had originally been designed for as many as four reactors. According to Progress, commercial operations would begin no earlier than 2018. Progress will have to obtain a certificate of public convenience from the North Carolina Utilities Commission to build on the site.



South Texas Project, Texas (NRG Energy, South Texas Project)

The COL Application was submitted to NRC on 20 September 2007.

NRG Energy submitted a COL application for two new reactors at the existing, two-unit South Texas Project site on the Texas coast, south of Houston. The ABWR design of General Electric-Hitachi was chosen. However, agreements for building the reactor were subsequently signed with Toshiba, which also owns international rights to the ABWR design. In contrast to the reactors selected for other potential reactor sites, ABWR units have been built and operated elsewhere in the world. NRG targets construction to begin as early as 2009 under limited work authorizations (LWA) from the NRC. The first South Texas unit is targeted for completion in 2014. NRG is 44 percent owner of the two existing South Texas reactors. The two other owners, CPS Energy (40 percent) and Austin Energy (16 percent), have been offered shares in the new project.



Turkey Point, Florida (Florida Power & Light)

As of 31 December 2008, the project has not yet filed a COL application.

Two AP 1000 reactors are contemplated for the existing Turkey Point Nuclear Plant in Florida. On 19 March 2008, Florida's Public Service Commission approved the planned expansion at Turkey Point but the utility anticipates many discussions with State and Federal agencies will precede the final decision on whether to build any new reactors. ⁷ Florida Power & Light (FPL) notified the NRC that it plans to file a COL application in 2009.



Victoria County, Texas (Exelon Nuclear)

The COL application was submitted to the NRC on 2 September 2008. NRC review suspended at the request of the applicant.

In December 2007, Exelon officials announced they would apply to the NRC for a COL for this 11,500-acre site. ⁸ Exelon owns the most nuclear capacity of any U.S. company, including 10 of the 11 reactors in its base of operations, Illinois, plus the Nation's longest-operating plant (Oyster Creek) in New Jersey, and 5 reactors in Pennsylvania. But the Victoria project, if completed, would be the first Exelon commercial nuclear plant in a southern State. ⁹ The site is about 40 miles from the South Texas Project, which has already submitted a COL application. This might lead to some competition for resources. Exelon selected the ESBWR for its Victoria County project. But like Entergy, it has experienced difficulties in its negotiations with Hitachi and has requested the NRC to halt its review while the reactor choice is being reconsidered.



Virgil C. Summer, South Carolina (Scana [South Carolina Electric and Gas], Santee Cooper)

The COL application was submitted to the NRC on 31 March 2008.

South Carolina Electric & Gas Company (a unit of Scana) and South Carolina State-owned electric and water utility, Santee Cooper, notified the NRC in December 2005 that they intended to apply for a COL for two new reactors to be built in South Carolina. The firms announced on 10 February 2006 that they had selected the Summer site for potential new nuclear construction. Announced plans would involve two Westinghouse AP 1000 reactors. The goal is for any new reactors to be completed in time to meet anticipated base load electricity demand growth by the mid-2010s. Scana owns 66.7 percent of the existing Summer reactor and Santee Cooper the remainder. On 31 March 2008, South Carolina Electric and Gas Company (SCE&G) and Santee Cooper filed a COL application for two new reactors at this location. Several months later, on 27 May 2008, Westinghouse Electric Company announced ¹⁰ an engineering, procurement, and construction contract to provide two AP 1000 reactors to SCE&G for this site. According to Westinghouse, commercial operation is expected to begin in 2016.



Vogtle, Georgia (Southern Company [Georgia Power], Oglethorpe Power, Municipal Electric Authority of Georgia, City of Dalton)

The COL Application was submitted to NRC on 31 March 2008.

Southern Nuclear Operating Company announced on 27 January 2006 that it had selected Westinghouse's AP 1000 design for its plan to expand the Vogtle plant, and anticipated applying for a COL during March 2008. The sponsors filed for an [ESP](#) during August 2006, with the goal of meeting anticipated increased base load power needs in the Georgia electricity market. Southern anticipates that one of the reactors could be completed as early as 2016. Among the permits that the plant would require would be a certificate of need issued by the Georgia Public Service Commission. The Georgia Public Service Commission on 20 June 2006 allowed some planning and licensing costs at Vogtle to be charged to utility customers. The existing reactors at Vogtle are co-owned by Oglethorpe Power, the Municipal Electric Authority of Georgia, and the City of Dalton, Georgia. These organizations are involved in potential construction plans at the site.

Watts Bar 2, Tennessee (Tennessee Valley Authority)

The construction permit was issued on 23 January 1973.

The last newly-built commercial reactor to go on line in the United States was Watts Bar 1 in 1996. The construction permits for units 1 and 2 were issued in January 1973. Thirty-six other reactors received construction permits after the Watts Bar reactors. All but four of these entered commercial service prior to Watts Bar 1 (two units in Washington and Bellefonte 1 and 2 in Alabama were cancelled). In September 1985, the NRC requested TVA furnish information on plans to address concerns about extensive deficiencies in operating and construction at Watts Bar and other facilities.¹¹ TVA resolved the concerns about unit 1, but TVA concluded that electricity demand would not be sufficient to merit completion of a second reactor. Since then, however, demand estimates have trended upwards and nuclear power has become more competitive in the marketplace. It is estimated that work is up to 80 percent complete on this unit. TVA concludes, however, that finishing the work will take about 5 years and cost about \$2.5 billion.¹² The TVA Board voted unanimously on 1 August 2007 in favor of completing the work. The reactor may become the first new U.S. reactor completed in the 21st century.

William States Lee III, South Carolina (Duke Energy)

The COL Application was submitted to NRC on 13 December 2007.

There are no commercial reactors presently operating at the site. Duke is interested in new construction here to meet growing base load power demand in nearby market areas. On 4 March 2005, Duke became the first public utility to notify the NRC of intention to apply for a COL. By October 2005, the AP 1000 reactor was selected by Duke, but negotiations with the site owner, Southern Company, continued for about 5 months. Duke and Southern concluded negotiations in March 2006, as Duke took possession of the Cherokee County site, near Gaffney, South Carolina. Southern initially approached this as a joint venture in which it would have the option to own 45 percent (roughly 500 megawatts) of the reactor's capacity. In June 2006, Duke announced that the plant would be named the William States Lee III Nuclear Power Plant. Southern agreed to relinquish its interests in the plant in May 2007. Duke has indicated that the earliest possible completion date would be in 2016.

¹ Bell Bend: Because of its close proximity to the Susquehanna Nuclear Power Plant, the Bell site was previously referred to in this feature as the Susquehanna site. Although PPL is both the licensee for the Susquehanna plant and the sponsor of the Bell Bend project, the Bell site is adjacent to rather than on the Susquehanna site. The Bell Bend site was originally known as Berwick.

² *AEHI and Powered Sign Participating Agreement to Form New Company to Build and Operate Electricity and Desalinization Advanced Nuclear Reactors*, News Blaze, 8 July 2008, "MarketWire."

³ UniStar was formed as a holding company under a joint venture by Constellation Energy and Electricite de France (EDF). The joint venture followed a Memorandum of Understanding announced in June 2006 for the two parent companies to work together on developing EPR-type power plants in the United States. According to a UniStar news release dated 20 July 2007, the company was formed to "develop, own, and operate new U.S. and Canadian nuclear projects."

⁴ *ibid*

⁵ NRC memo, on-line <http://www.nrc.gov/public-involve/public-meetings/index.cfm>, 14 May 2008

⁶ "Two Entergy Nuclear Sites to Apply for Construction and Operating Licenses, Entergy Press Release, 22 September 2005.

⁷ "Westinghouse, SCE&G in Agreement for Two AP 1000 Nuclear Plants," PRNewswire, 27 May 2008.

⁸ *Florida approves FPL plan for two more reactors*, World Nuclear News, 19 March 2008.

⁹ "Exelon to seek license for nuclear power plant in Victoria county," The Association Press, Valley morning Star, 19 December 2007.

¹⁰ Exelon Nuclear Texas Holdings, LLC's- COLA for Two-unit nuclear Plant will be submitted by or one 1 Sept, 2008, by Bob Meyer, submitted by NUCBIZ, on-line <http://www.nucpros.com/>, Professional Reactor Operator Society, 24 June 2008.

¹¹ "Watts Bar Unit 2 Reactivation," Nuclear Regulatory Commission, on-line: <http://www.nrc.gov/reactors/plant-specific-items/watts-bar.html>, 16 November 2006.

¹² "Watts Bar 2 is now Job 1," Knoxville News Sentinel, 2 August 2007, Knoxville, TN.

Contact:

John Moens

Phone: 202-586-1509

Email: [John Moens](mailto:John.Moens)

[Contact Us](#) • [Feedback](#) • [Privacy/Security](#) • [Careers](#) • [About EIA](#)

[Fedstats](#) • [USA.gov](#) • [Dept. of Energy](#)