

Oct. 27–Nov. 2, 2017

A report to members of the
Nuclear Energy Institute

NUCLEAR ENERGY Overview

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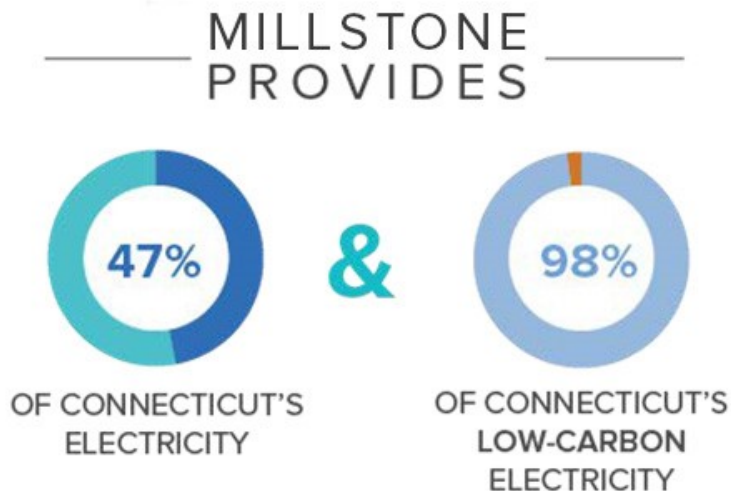
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Pro-Nuclear Drumbeat Grows as Connecticut OKs Market Reform Bill

- **Connecticut bill allows Millstone plant to enter zero-carbon auction**
- **Pennsylvania passes resolution supporting DOE's FERC rulemaking**
- **Ohio General Assembly holds hearings on ZEN program**

Oct. 2, 2017—As the nuclear industry pushes to improve flawed electricity markets, positive developments in Connecticut, Pennsylvania and Ohio are providing reasons for optimism.

This week, Connecticut Gov. Dannel [Malloy signed Senate Bill 1501](#), which properly values zero-carbon electricity generation like nuclear, after it passed the state's House of Representatives with a 75-66 vote last week. The measure levels the playing field for Dominion Energy's Millstone Power Station by allowing it to bid into markets with other zero-carbon energy sources like wind, solar and hydropower.



[Graphic: Dominion Energy]



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Connecticut is the third state, following New York and Illinois, to take action to properly reward nuclear plants for benefits like resiliency that electricity markets in those states failed to recognize.

NEW LOOK, SAME NUCLEAR MATTERS

NUCLEAR MATTERS

Nuclear Matters has launched a new website designed to be a better vehicle for encouraging advocacy engagement.

The website enhances efforts to promote action in support of nuclear energy, create custom user experiences, encourage advocates to sign up for action alerts and email updates, and support social sharing of infographics, fact sheets and webpages.

Users can [log in with their social media or email accounts](#) and find ways to take action on supporting nuclear energy. [Quick and easy facts](#) are available on the impact of nuclear energy in users' states, as is general information about nuclear and jobs, security, climate and safety.

Check out the site at www.nuclearmatters.com.

NEI President and Chief Executive Officer Maria Korsnick [lauded](#) the effort to preserve the value that Millstone provides.

"Gov. Malloy and the state legislature deserve praise for their decision to support Dominion's Millstone Power Station and the 1,500 Connecticut residents who work there," she said.

"By opening the door to Millstone having equal access to auctions open to other non-emitting sources of electricity, the state will help preserve \$1.5 billion in economic activity, grid resiliency and reliability, and clean air that all residents of the state can enjoy."

Millstone's two reactors provide 98 percent of Connecticut's emissions-free electricity and [prevent the release of 8.3 million metric tons of carbon dioxide annually](#). The plant supports 7,300 jobs in New England and generates an average annual economic benefit of more than \$1.3 billion for the region.



[Graphic: Dominion Energy]

"The importance of this asset to both the state and the region cannot be overstated," Malloy said in a press release.

Dominion Chairman, President and Chief Executive Officer Tom Farrell thanked the governor for his support for the measure.

"We are grateful to the Malloy administration for its work in negotiating the current form of the legislation. It provides a path forward to retain 1,500 well-paying jobs and Millstone's substantial environmental, energy, and economic benefits for Connecticut," Farrell said.

PENNSYLVANIA, OHIO ROUND OUT BUSY OCTOBER FOR NUCLEAR ENERGY

The last week of October brought more state-level action in support of nuclear energy as well. The Pennsylvania General Assembly passed two resolutions Oct. 25 in both the [House](#) and [Senate](#) that encourage the Federal Energy Regulatory Commission (FERC) to enact market reforms to ensure baseload electricity generation.



The Nuclear Powers Pennsylvania coalition has officially launched.

The statewide advocacy group works to educate all Pennsylvanians about the economic and environmental benefits of nuclear energy and the industry's positive impact on local communities. The new coalition will be instrumental in organizing grass-roots advocacy in this key state.

[The coalition's website](#) features quick facts and graphics about the history of nuclear in the Keystone State, as well as an action center where users can get involved. Visitors to the site can sign up to receive updates and educational materials through email.

You can follow @NuclearPowersPA on Twitter and like the [Facebook Page](#) to stay updated.

Exelon Corp. [praised](#) the overwhelming support that the state legislature offered.

"We commend members of the Pennsylvania General Assembly for recognizing the need for wholesale market reforms that fairly value baseload power generators that provide reliable, 24/7 electricity such as nuclear power plants," the company said.

Finally, the Ohio Senate's Public Utilities Committee held the first in a series of hearings on a revised [Clean Jobs bill](#), a zero-emissions nuclear resource (ZEN) program that mirrors measures [passed in Illinois and New York last year](#).

Korsnick applauded the growing momentum in these key states, urging FERC to pursue [the U.S. Department of Energy's directive](#) in tandem with these developments.

"Connecticut is the third state to rebalance its electricity marketplace, joining New York and Illinois, which took their own legislative paths to preserving nuclear power plants in 2016. Now attention should turn to Columbus, where leaders in Ohio are considering another legislative remedy to keep nuclear plants operating and the communities they call home thriving," Korsnick said.

"These are just the sort of state-specific solutions that the Federal Energy Regulatory Commission needs to respect as it considers Energy Secretary Rick Perry's directive to develop and implement reforms to fully compensate generation resources necessary to maintain grid reliability and resiliency." << Robbie Hayunga, rah@nei.org

Tax Reform Bill Includes Revised Nuclear Production Tax Credit

- **Bill removes 2020 deadline for nuclear plants to claim the credit**
- **Change critical to Vogtle AP1000 build**
- **Also creates opening for future small and advanced reactor projects**

Oct. 2, 2017—NEI has praised the inclusion of a nuclear production tax credit (PTC) provision in a long-anticipated tax reform bill introduced in the U.S. House of Representatives [Ways and Means Committee](#) this week.

"We commend Committee Chairman [Rep. Kevin Brady](#) (R-Texas) on his leadership and look forward to working with both the House and Senate to ensure the language is included in any final tax package," NEI Vice President of Governmental Affairs Beverly Marshall said.

The [2005 Energy Policy Act](#) provided a tax credit of 1.8 cents per kilowatt-hour for electricity produced from new reactors, but set a deadline of 2020 for the plants to be in service. The new bill removes that deadline, which would ensure that the [two Westinghouse AP1000 reactors being built at Southern Nuclear Operating Co.'s Vogtle site in Georgia](#) could benefit from the credit. It would do so without adding significant cost since the PTC already has been accounted for in the baseline budget.

"This legislative language is a vital component for completing the reactors under construction in Georgia which will show the world that America stands ready to build the reactors of today, and those of tomorrow," Marshall said.



Removing the nuclear PTC deadline would ensure the Westinghouse AP1000 reactors being built at Southern Nuclear Operating Co.'s Vogtle site in Georgia benefit from the tax credit. Construction on Vogtle 3 and 4 currently employs more than 6,000 workers. [Photo: Georgia Power]

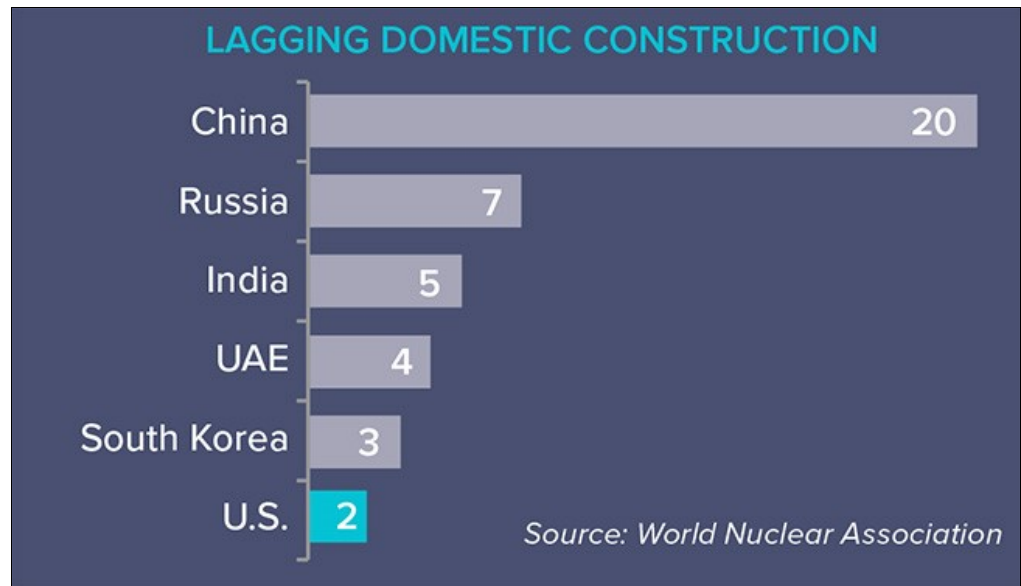
The nuclear PTC language is part of a much larger piece of legislation that seeks to reform the country's tax code. The bill must now be marked up, voted on and reported out of the Ways and Means Committee before going to the floor of the House for a final vote. The Senate must then pass the legislation so the bill can be signed into law by the president.

The tax credit is applicable to the first 6,000 megawatts of new nuclear capacity that come online. The completion of Vogtle 3 and 4 will leave a significant amount of remaining capacity that future small modular or advanced reactor projects will be able to access.

The small modular reactor design closest to construction is from [NuScale Power LLC](#), which in January became the first to submit a design certification application to the U.S. Nuclear Regulatory Commission. NuScale plans to build a first commercial power plant at the U.S. Department of Energy's Idaho National Laboratory, owned by Utah Associated Municipal Power Systems and operated by Washington state-based utility Energy Northwest. It is expected to begin commercial operations by 2026.

The House tax reform bill includes language from [HR 1551](#), [which passed the House](#) in June. A companion bill in the Senate ([S 666](#)) was introduced by Sens. [Tim Scott](#) (R-S.C.) and [Johnny Isakson](#) (R-Ga.). With momentum now behind tax reform in both chambers, there is hope that the Senate will also include the nuclear PTC language in their version of tax reform legislation.

"A robust civilian nuclear sector is critical to America's economy and produces nearly 60 percent of our nation's clean air energy," Marshall said. "Further, maintaining our global leadership in nuclear energy is essential to our national security."



Russia and China are constructing nearly 30 nuclear reactors. The reactors being constructed at the Vogtle project are the only reactors under construction in the United States.

NEI has a [one-page fact sheet](#) on the importance of the nuclear PTC from an economic and national security point of view. << Thaddeus Swanek, tjs@nei.org

Czech Trade Delegation Reveals New Nuclear Build Plans

- **Delegation discussed national plan for two new reactors by 2035**
- **Wider goal is to increase Czech nuclear share to 50 percent**
- **American suppliers interested in participating**

Nov. 2, 2017—The Nuclear Energy Institute last week hosted a senior Czech nuclear energy delegation to the United States for a meeting with a large group of U.S. nuclear suppliers. The Czech contingent was led by [Lenka Kovačovská](#), deputy minister of industry and trade, and [Ján Štuller](#), the ministry's special nuclear envoy.

The Czech government is preparing to act on its 2015 “national action plan” to build new nuclear plants in the Czech Republic, both to replace existing coal and nuclear power plants as well as to expand the country’s portfolio of clean baseload energy resources to help meet its national carbon reduction commitments.

“We believe we cannot decarbonize our energy sector without nuclear,” Kovačovská stated. Support for nuclear energy is strong in the country, both among the public and all but one of the nine political parties, she noted.

Štuller added that unlike neighboring Austria with its ample hydroelectric resources and Germany with its large investment in wind, “we have no such choices, which leads us to nuclear.”



As the Czech Republic prepares to build up to four new nuclear reactors, NEI last week hosted a senior delegation from that country on a nuclear trade visit to the United States. [Photo: NEI]

Six Russian-design pressurized water reactors provide the Czech Republic with more than 30 percent of its electricity. Four 440-megawatt VVERs at Dukovany have been operating since the late 1980s, and two 1000-megawatt VVERs at Temelin came online in 2000 and 2003. The utility CEZ Group, which owns and operates both the Dukovany and Temelin plants, is 70 percent government-owned.

According to the national energy plan, decommissioning the Dukovany reactors will begin by 2035, by which time about 2,500 megawatts of new nuclear capacity should be built at the site, Štuller explained. The wider goal is to replace half the country's aging coal and nuclear capacity with new nuclear build by 2040, which would require at least four new 1,000 megawatt-size reactors. An environmental impact analysis for Dukovany began in July 2016 and should be completed next year, Štuller added. Construction of Dukovany 5 and 6 is planned to begin in 2027.

CEZ published a request for information from 10 reactor vendors in July 2016. Among the companies that have "responded positively" since then are the Areva Inc.-Mitsubishi Heavy Industries Ltd. joint venture Atmea, China General Nuclear Power Corp., EDF, Korea Hydro & Nuclear Power, Rosatom and Westinghouse Electric Co.

Financing the projects remains a question, Štuller said. The energy ministry is discussing whether the government should provide CEZ with 100 percent financing.

The country's Oct. 21 general election resulted in billionaire Andrej Babiš likely to lead a minority coalition government.

While Babiš has said he favors CEZ financing the project without direct foreign investment and bringing the company under more direct government control, Kovačová said her ministry would provide the new government with different funding and business case scenarios to be used as guidance. "Right now we're not excluding any options," she said.

Kovačovská said she appreciated the candor and openness of the discussions the Czech delegation had experienced during their U.S. visit, including the ongoing policy discussions in Washington on issues that resonated with the Czech case, such as the importance of baseload power, resilience and market pricing of these attributes.

“It is extremely important that these discussions are heard internationally,” she said.
<< Chris Charles, cic@nei.org

Milestones

Saudi Arabia Issues RFI for Two Nuclear Reactors

Saudi Arabia has issued a request for information (RFI) from international suppliers to build two nuclear power plants, according to several sources. The request for information entails nuclear vendors submitting non-binding offers to build large light water reactors and is considered a first step toward the issuance of formal tenders. Industry sources said the RFI was extended to suppliers from China, France, Japan, Russia, South Korea and the United States.

Saudi Arabia is considering building up to 17.6 gigawatts of nuclear capacity by 2032. The kingdom’s most recent plans stem from economic reforms launched in 2016 by the incoming Crown Prince Mohammed bin Salman, who is interested in reducing his country’s dependence on oil for its domestic electricity supply.

If plans proceed, Saudi Arabia would become the second Gulf Arab state to turn to nuclear power after the United Arab Emirates, which is building four South Korean-designed reactors, the first of which is due to start operations next year. Saudi Arabia has signed memorandums of understanding with South Korea to possibly build two of Korea Atomic Energy Research Institute’s SMART small modular reactors in the kingdom, and with China in the development of a high-temperature gas-cooled advanced reactor design.

IAEA Names UAE’s Khalifa University a ‘Collaborating Center’

The International Atomic Energy Agency has agreed to establish a “collaborating center” at the Khalifa University of Science and Technology in Abu Dhabi, United Arab Emirates. The agreement was signed Oct. 31 at the International Ministerial Conference on Nuclear Power in the 21st Century in Abu Dhabi. Under the four-year agreement, the center will aim to support IAEA activities to improve member states’ capabilities in building and assessing the infrastructure required for a nuclear power program, and develop the competencies needed for infrastructure development.

[IAEA collaborating centers](#) promote the practical use of nuclear technology worldwide and help reach the United Nations’ sustainable development goals.

Posiva Makes Progress on Finnish Final Repository

Finnish nuclear waste management company Posiva Oy has completed excavations for the encapsulation plant at the final deep geologic disposal facility under construction at Olkiluoto, Posiva’s owner Teollisuuden Voima Oyj (TVO) said in a statement.

Posiva has also made progress with excavation work for the vehicle access tunnels leading to the final disposal facility. The first phase of excavations for the final disposal facility is estimated to take two and a half years, TVO said. In December 2016, Posiva was given regulatory approval to begin construction of a deep geologic repository at Olkiluoto on the country's southwest coast—the first final repository in the world to enter the construction phase. << Chris Charles, cic@nei.org

Contracts

Centrus, ORNL to Continue Uranium Centrifuge Work

Centrus Energy Corp. has signed a \$16-million contract with UT-Battelle LLC to continue advancing the AC100 gas centrifuge uranium enrichment technology at the company's facilities in Oak Ridge, Tennessee. Battelle is operator of the U.S. Department of Energy's Oak Ridge National Laboratory (ORNL). Payments on the contract, which runs through Sept. 30, 2018, are to be made on completion of certain defined milestones.

Under the contract, Centrus' scientists, engineers and operators will test improvements developed by the company for the AC100 centrifuge machine in specialized facilities in Oak Ridge. Centrus has worked under contract with ORNL since 2014 to improve the AC100 gas centrifuge technology to support national security and energy security needs.

Energoatom, Toshiba Sign Turbine Modernization Agreement

Ukraine's state-owned nuclear power operator Energoatom has signed a memorandum of understanding with Toshiba Energy Systems and Solutions Corp. on a project to modernize turbine-generator sets at Ukraine's nuclear power plants. Under the project, Toshiba will help Ukraine increase the power generating capacity, efficiency and safety of its nuclear reactors.

The joint work also will "provide an additional impetus for the development of domestic technologies for nuclear power plants," Energoatom President Yuriy Nedashkovskiy said on the company's website.

Energoatom has a similar cooperation deal with Westinghouse Electric Co., which is working with Ukrainian turbine manufacturer Turboatom to boost the power of Ukraine's 13 VVER-1000 reactors.

Barakah Project Brought \$3.3 Billion in Economic Benefit to UAE

More than 1,400 local companies have been contracted in the development of the United Arab Emirates' first nuclear power station project at Barakah, Mohamed Al-Hammadi, chief executive officer of the Emirates Nuclear Energy Corp. (ENEC), told the International Atomic Energy Agency's ministerial conference on nuclear power in Abu Dhabi.

Al-Hammadi said the Barakah construction project has brought more than \$3.3 billion worth of contracts to UAE-based companies. ENEC signed a contract with Korea Electric Power Corp. in 2009 to build four APR-1400 reactors at Barakah, and construction began in 2012. ENEC said that Barakah 1 is now more than 96 percent

complete, Barakah 2 more than 87 percent, Barakah 3 more than 78 percent and Barakah 4 more than 58 percent. Overall, construction of the four reactors is more than 84 percent complete.

Meanwhile Suhail Al Mazrouei, the UAE's minister of energy, said at the meeting that the country would consider building more reactors once the last of the Barakah reactors comes online in 2021.

William Magwood, director general of the Organization for Economic Co-operation and Development's Nuclear Energy Agency, said the Barakah project shows that "when the right pieces are in place, when the right management expertise can be brought to bear, when the right supply chain is available, nuclear power can be built on cost, on schedule and be competitive."

UK to Invest More than \$600 Million in Nuclear Energy

The British government has put forward key proposals to decarbonize all sectors of the country's economy through the 2020s, including investing \$611 million in the nuclear energy sector to support work in future nuclear fuels, new nuclear manufacturing techniques, recycling and reprocessing, and advanced reactor design.

The government's Clean Growth Strategy, which explains how low-carbon opportunities can help meet climate change commitments, says the costs of nuclear power need to be brought down through developing new materials and manufacturing processes and exploring new fuels and reactor designs. << Chris Charles, cic@nei.org

Transitions

Industry

SCANA Corp. and its principal subsidiary South Carolina Electric & Gas Co. (SCE&G) have announced the retirement of **Kevin Marsh** as chairman and chief executive officer of both companies, and of **Stephen Byrne** as SCANA's senior vice president and chief operating officer (COO) and SCE&G's president for generation and transmission. **Jimmy Addison** will become CEO, **Keller Kissam** will become president and COO of SCE&G, **Iris Griffin** will become chief financial officer, and **Maybank Hagood** will become non-executive chairman of the board of directors. The changes will take effect Jan. 1.

Pacific Gas and Electric Co. has appointed **James Welsch** to be the utility's new chief nuclear officer and named **Jon Franke** as its vice president for power generation, both effective Nov. 1. Welsch, currently PG&E's vice president for nuclear generation, will be responsible for the operation of the 2,394-megawatt Diablo Canyon Power Plant in California, and will serve as the company's lead contact with the U.S. Nuclear Regulatory Commission and the Institute of Nuclear Power Operations. Franke, who currently is PG&E's vice president of generation technical services, will be in charge of activities related to plant decommissioning and be responsible for the company's non-nuclear generating fleet.

International

The United Kingdom's Office for Nuclear Regulation has appointed **Mark Foy** as its new chief nuclear inspector. The appointment is for an initial fixed term of five years, with immediate effect.

Camilla Hoflund has been appointed president and chief executive officer of Swedish decommissioning company Studsvik, effective Jan. 1. Studsvik's current president and CEO is **Michael Mononen**.