

## Overview

The nuclear power industry has been around for more than five decades, but in recent years has faced increased competition from newer energy alternatives such as wind and solar power, as well as other market players including natural gas and nonrenewable sources such as coal and oil. Uranium, a naturally occurring element in the earth's crust, wasn't used until World War II, when nuclear research properly began with the development of defense weapons. Since 1945, attention has shifted to harnessing energy in a controlled fashion for the production of electricity. The first global generation of reactors was eventually developed in the 1950-60's, with the last one shutting down in the UK in 2015. Today, Congress is tasked with modernizing our nation's energy policies in order to maintain and improve the benefits of nuclear energy for future generations.

## What are the benefits?

According to the World Nuclear Association, one of the primary benefits of nuclear energy is its low greenhouse gas emissions, which consists of reduced amounts of carbon dioxide (CO<sub>2</sub>) and methane. The production of energy from nuclear plants contributes approximately 70 times less greenhouse gas emissions compared to coal fired power plants and 42 times less when compared to natural gas, making it the largest source of clean energy in the country. The lifespan of a nuclear plant is between 40-60 years and, while the installation of the plant is relatively expensive, the cost of operation is low. The only units currently under construction in the U.S. are Units 3 and 4 of the Alvin W. Vogtle Plant in Georgia. Owned by Southern Power Company and Oglethorpe Power Cooperative, they are estimated to be completed by 2021 (Unit 3) and 2022 (Unit 4), and will cost \$14 billion to install. Unlike solar and wind power, nuclear power plants can run uninterrupted, making it a considerably more reliable and sustainable energy source.

## So, what is the issue?

From an environmental perspective, nuclear energy is not always viewed positively. The process of nuclear fission, the chain reaction to which uranium is subjected, produces large amounts of radioactive waste which must be disposed of safely to eliminate the risk of a nuclear accident. To date, the United States does not have a comprehensive nuclear waste storage or disposal program in place. This was the case in the 1986 Chernobyl disaster in Ukraine where technicians conducting a test inadvertently caused a reactor to explode. The explosion killed 2 on-site workers, and 28 others subsequently died from acute radiation poisoning.

## Center Forward Basics

Center Forward brings together members of Congress, not-for profits, academic experts, trade associations, corporations and unions to find common ground. Our mission: to give centrist allies the information they need to craft common sense solutions, and provide those allies the support they need to turn those ideas into results.

In order to meet our challenges we need to put aside the partisan bickering that has gridlocked Washington and come together to find common sense solutions.

For more information, please visit [www.center-forward.org](http://www.center-forward.org)

## Key Statistics

- It is estimated that if the consumption of Uranium continues at its current rate we will have enough uranium to last for another 70-80 years
- Every year, nuclear energy saves our atmosphere from 555 million metric tons of CO<sub>2</sub> emissions- the equivalent of taking **117 million passenger vehicles** off the road worldwide
- There are 99 operating nuclear reactors across the US which, in 2017, generated **20% of the country's electricity**

The main issue, however, is that nuclear plants are struggling to compete with other suppliers in the market. A report by Bloomberg New Energy Finance in May of 2018 stated that, due to a lack of subsidies, a quarter of America's 99 nuclear power reactors are at risk of early closure in the next few years. Over 6% of the Nation's energy is generated from these 24 at-risk reactors, approximately equivalent to the electricity consumed in Michigan and Illinois combined (a total of 14 million people). The potential shut-down of these plants, which have high capacity factors and low generating costs, will have long-term economic consequences with lost electricity generation, fewer jobs, and more pollution.

## What is the Nuclear Production Tax Credit?

Nuclear production tax credits were established under the 2005 Energy Policy Act with the aim of providing federal support to advance nuclear projects entering commercial operation by the end of 2020. The current product tax credits (PTCs) were set at 1.8 cents/kWh of electricity, limited to the first 6,000 MW of new capacity. The Bipartisan Budget Act of 2018, HR 1892, which was passed by Congress and signed into law on February 9, 2018, modifies the tax credits. Section 40501 of the new law enables reactors entering service after December 31, 2020 to qualify for the tax credits, this new deadline makes the Vogtle Plant eligible to benefit from the credit.

## 2018 Outlook

The development and use of atomic energy is just as important today as it was when Congress first authorized its commercial application in 1954. The focus now is to develop newer and more advanced reactors, which are cheaper and safer. Efforts are already underway with the first small modular reactor (SMR), designed by NuScale, completing the first and most intensive phase of review by the Nuclear Regulatory Commission (NRC). These small reactors (less than 300 MW compared to 1,000 MW in a typical nuclear plant) can be built inexpensively at a factory and shipped to the site, allowing better quality control and increased safety. Once the SMR design is certified by the NRC, planning will start on a 12-module SMR plant in Idaho under Utah Associated Municipal Power Systems, estimated to be in operation by mid-2020s.

In June 2018, the Senate passed an appropriations bill that provides \$1.2 billion for the U.S. Department of Energy's nuclear energy programs. This bill offers a targeted solution for the struggling nuclear industry as it continues to provide clean and affordable power.

While nuclear energy's future often shifts with the political winds, one thing is certain: It will continue to play a critical role in the United States' energy sector for decades to come as a source of affordable, low-emissions energy.

- The US is currently the largest producer of nuclear energy across the globe, accounting for **30%** of worldwide nuclear power generation. However, this could change:
  - **Russia and China** are currently constructing nearly **27** nuclear units compared to **2 in the US**
  - **China** has announced nuclear deals with Sudan, South Africa, Kenya, Egypt, Argentina and Great Britain
- The cost to plug the revenue gap of the 24 struggling nuclear sites in the US is estimated at **\$1.3 billion a year**
- The Vogtle plant in Georgia currently employs over **6,000 workers** and will secure **800 jobs** after completion in 2022

## Links to Other Resources

- Bloomberg — One Fourth of US Nuclear Plants Are at Risk of Early Retirement  
<https://www.bloomberg.com/news/articles/2018-05-15/one-fourth-of-u-s-nuclear-fleet-is-at-risk-of-early-retirement>
- Energy for Humanity — Life Cycle Carbon Emission for Electricity Generation Sources  
<http://energyforhumanity.org/en/briefings/carbon-emissions/lifecycle-carbon-emissions-of-electricity-generation-sources/>
- House Committee on Energy and Commerce — SubEnergy Explores Legislation to Modernize DOE’s Nuclear Energy Technologies  
<https://energycommerce.house.gov/news/press-release/subenergy-explores-legislation-to-modernize-does-nuclear-energy-technologies/>
- Nuclear Energy Institute — Senate Shows Bipartisan Support for Nuclear Energy in 2019 Budget  
<https://www.nei.org/news/2018/senate-bipartisan-support-nuclear-energy-budget>
- Nuclear Energy Institute — The Nuclear Production Tax  
<https://www.nei.org/advocacy/build-new-reactors/nuclear-production-tax-credit>
- NuScale Power — Small Modular Reactors (SMRs)  
<http://www.nuscalepower.com/smr-benefits/small>
- NuScale Power — Utah Associated Municipal Power Systems (UAMPS) Carbon Free Power Project (CFPP) Progresses  
<http://www.nuscalepower.com/our-technology/technology-validation/program-win/uamps>
- World Nuclear Association — Chernobyl Accident 1986  
<http://www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/chernobyl-accident.aspx>
- World Nuclear Association — Economics of Nuclear Power  
<http://www.world-nuclear.org/information-library/economic-aspects/economics-of-nuclear-power.aspx>