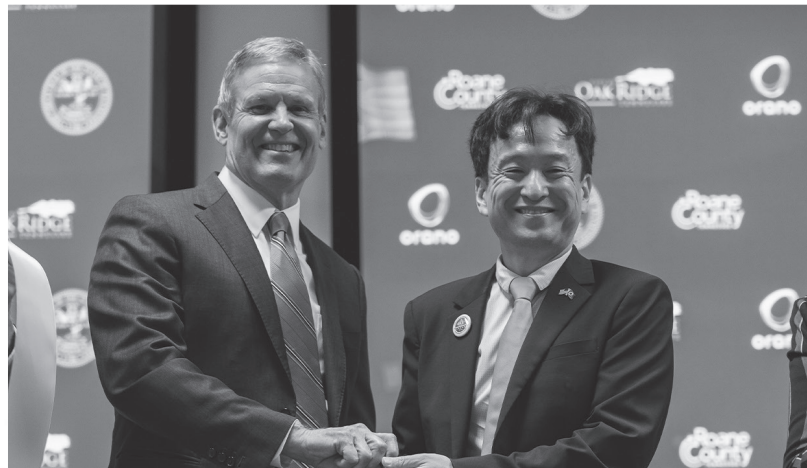
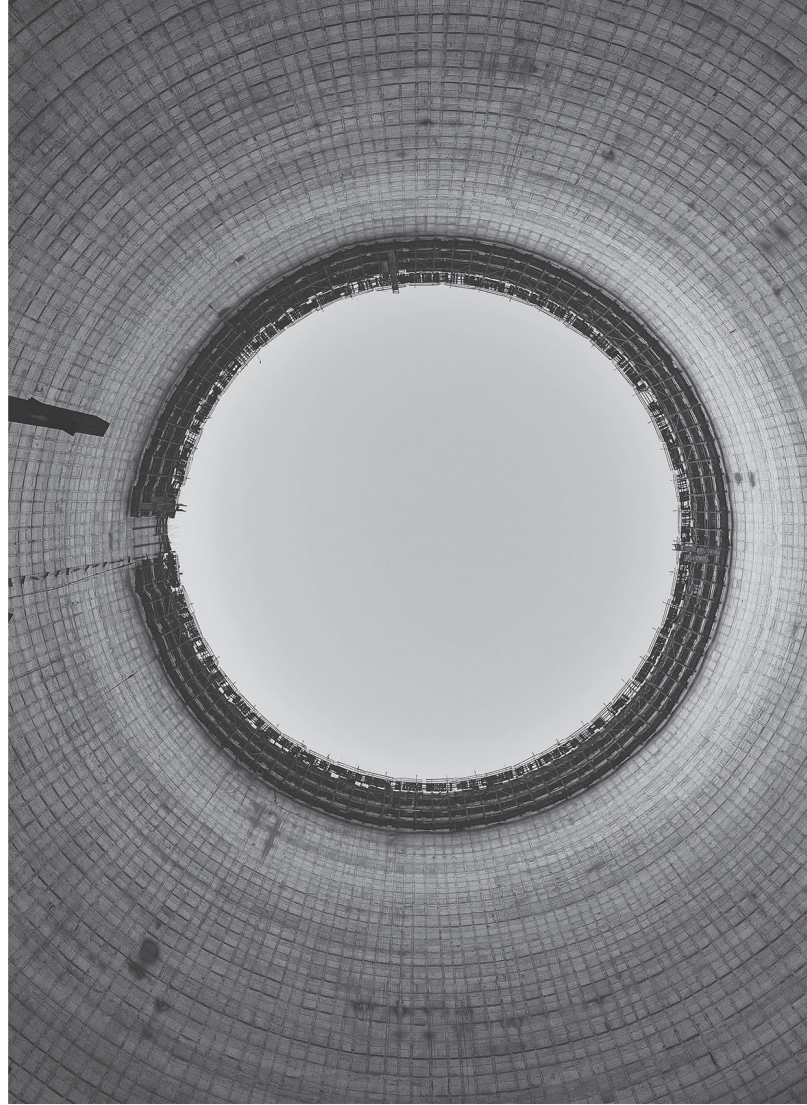


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# NUCLEAR ENERGY



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## INTRODUCTION

The nuclear industry plays a vital role in the energy system and economy around the world. Electricity demand has been growing roughly twice as fast as overall energy demand, increasing the drive for nuclear energy to help meet future electricity needs.<sup>1</sup> Urbanization, a rising global population, data centers, and Artificial Intelligence (AI) have been some of the primary causes of rapid increases in demand.<sup>2,3</sup> Nuclear energy could play a significant role in sustaining these demands because of its ability to produce scalable, reliable, and around-the-clock energy at a large capacity, with 94 reactors currently operable in the U.S. and 440 operable worldwide.<sup>4</sup> It is also considered an important source of clean energy because nuclear reactors do not produce air pollution or carbon dioxide during the production process, unlike fossil fuels.<sup>5</sup> Over the last 50 years, nuclear energy has helped prevent approximately 70 gigatons of global carbon emissions and continues to avert around one gigaton each year.<sup>6</sup>

In addition to its established role in clean electric generation, researchers are constantly seeking new ways to enhance and expand nuclear technology.<sup>7</sup> The Southeast United States has historically been a frontrunner in this movement on a global scale.<sup>8</sup> Notably, the state of Tennessee is an epicenter for nuclear innovation in the U.S., and it holds a permanent and fundamental place in the history of nuclear discovery. The Oak Ridge National Laboratory (ORNL)—located in Oak Ridge, Tennessee—is a federally-owned laboratory that is run by the U.S. Department of Energy (DOE). ORNL is the largest multi-disciplinary laboratory operated by the DOE and has been one of the most important producers of nuclear research in the world.<sup>9</sup> Construction at ORNL began in 1943, the same year its first nuclear reactor was built. By 1948, ORNL scientists manufactured the first instance of nuclear power being harnessed as electricity.<sup>10</sup> Since then, nuclear energy has become a vital source of electricity worldwide, especially for Tennessee. As generation levels are on a path to hit record highs in 2025, Tennessee is preparing its nuclear energy sector for a future that some are calling a “nuclear renaissance.”<sup>11</sup>

## INDUSTRY OVERVIEW

Tennessee has well-established ties with the nuclear industry and has made long-term investments towards its expansion. Investing in nuclear energy is an important pursuit for Tennessee state officials.<sup>12</sup> The state’s principal economic specialties, including logistics, tourism, and advanced manufacturing, require large amounts of energy inputs, which has led Tennessee to be a net importer of energy and rank among the top one-third of states in total energy consumption.<sup>13</sup> The nuclear sector has sustained the population’s daily energy needs while supporting the state’s primary economic drivers. Exhibit 1 illustrates Tennessee’s strong connection to nuclear energy, as reflected in its share of nuclear electricity generation relative to the rest of the United States.

## Exhibit 1: Utility Scale Net Electricity Generation by Fuel Type (All Sectors 2023)

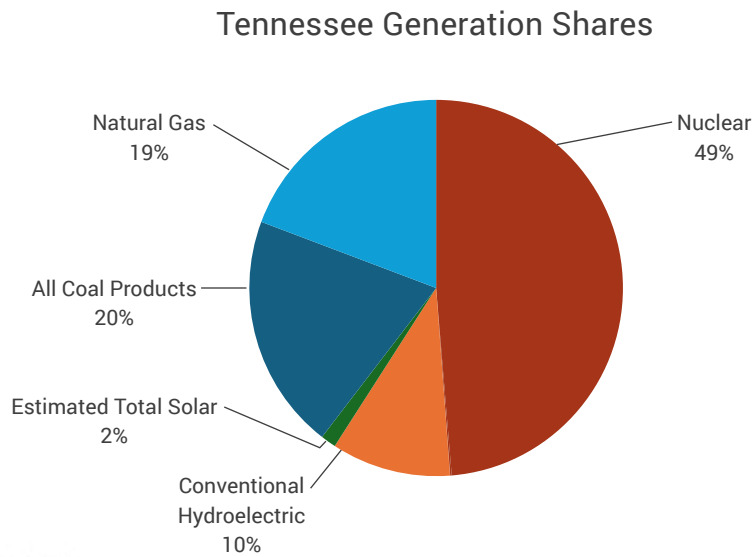
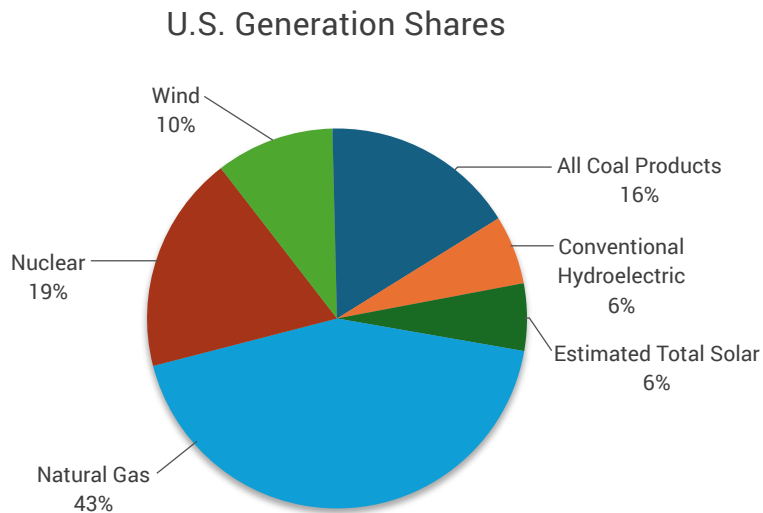


Exhibit 1 displays the difference in energy shares between Tennessee and the United States, particularly with nuclear energy. Nuclear makes up a clear majority of electricity generation shares in Tennessee, while the U.S. shares were dominated by natural gas.

Image: TNECD (2025)

Source: US Energy Information Administration (2023)

In 2023, nuclear energy was responsible for providing around 49% of total net generation in the state.<sup>14</sup> Tennessee has four operable nuclear reactors across two power plant sites. They were built and have been operated by the Tennessee Valley Authority (TVA) for decades. TVA oversees more than 90% of Tennessee's overall electric generating capacity, and it is essential for providing enough power to match the economy's high volume energy consumption.<sup>15</sup> In order to meet the demand and lead the national movement toward nuclear utilities, TVA, alongside developers, the state, and other major nuclear stakeholders, is planning a fifth nuclear reactor. This reactor is being built as part of an overarching strategy to launch a new era of nuclear energy and invest in emerging nuclear technology.<sup>16</sup> TVA launched its "New Nuclear Program" in 2022, committing to build a small modular reactor at the Clinch River Site near Oak Ridge, the first of its kind.

Additionally, the State of Tennessee created the Nuclear Energy & Supply Chain Investment Fund, which allocated \$50 million in the state's fiscal year 2023-2024 budget to support nuclear-related programs. Designed to strengthen Tennessee's nuclear development and manufacturing ecosystem, the fund provides grants and resources to advance nuclear power-related businesses and educational programs across the state. In the most recent budget for fiscal year 2025-2026, more nuclear-related funds were allocated, including another \$10 million to the nuclear fund and \$50 million to support match requirements for TVA's small modular reactor plans.<sup>18</sup> These investments are intended to foster economic growth and position Tennessee as a leader in next-generation nuclear energy innovation.

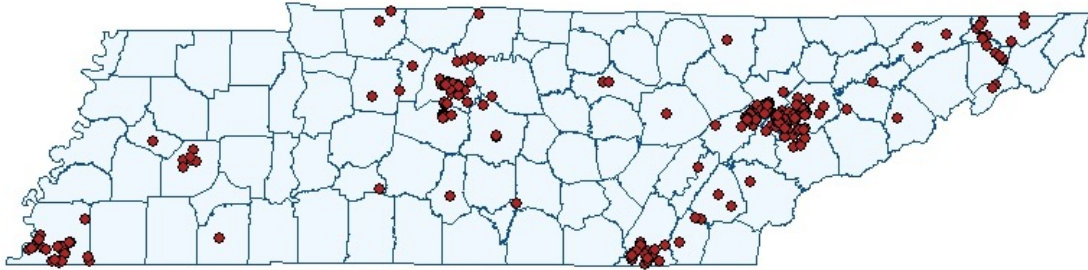
The focus on nuclear business development has so far incentivized reputable companies like X-Energy, Type One Energy, BWXT Technologies, and Orano to expand their operations in Tennessee. The substantial investment in nuclear energy underscores the importance of the industry in the state. Tennessee is working to strengthen its energy independence and contribute to a cleaner, more sustainable energy future by backing advanced nuclear projects and developing its supply chain.

## **NUCLEAR JOBS AND ECONOMIC ANALYSIS**

The nuclear energy industry has a far-reaching impact on many different sectors of the economy, and its economic influence is predicted to become increasingly important over time. The career opportunities and earnings of this industry extend beyond the four reactors owned by the TVA. Many different employers are involved with the nuclear industry, even if not directly classified under this sector. To operate successfully, nuclear power plants rely on an array of outside industries such as financial institutions, manufacturers, security companies, and many others. The East Tennessee Economic Council (ETEC) collaborated with E4Carolinas and ORNL to create a list of all companies involved in the "Nuclear Industry Value Chain" and the lifecycle of a nuclear power plant. In total, they found 229 companies in Tennessee involved in this process as of 2023.<sup>21</sup> This translates to over 350 locations across the state, that are mapped in Exhibit 2.

<sup>A</sup>The "Nuclear Industry Value Chain" is defined in The Economic Impact of the Nuclear Industry in the Southeast United States, a report by the E4 Carolinas in 2024. It includes "inputs, components & subsystems, systems integration, end-users, post-sales services, and end-of-life activities."

## Exhibit 2: Nuclear-Related Company Locations in Tennessee



Nuclear companies are most densely populated in the Oak Ridge and Knoxville areas. These two cities are located within 30 miles of each other, and they have formed a synergetic relationship that has significantly improved the nuclear energy sector in East Tennessee. The combination of Oak Ridge's history with nuclear energy and Knoxville's additional supply of academic institutions, consulting firms, and other relevant industries makes this area the most concentrated nuclear hub in the state.<sup>22</sup> Other nuclear-related companies are typically centered around major cities across the state such as Memphis, Nashville, or Chattanooga.

The map in Exhibit 2 illustrates the nuclear sector's value of industry clustering. A recent survey of nuclear companies by the Tennessee Nuclear Energy Advisory Council revealed that 72% of respondents considered proximity to other nuclear companies a key factor in site selection decisions, and that clustering enhanced opportunities for collaboration and efficiency.<sup>23</sup> The proliferation of nuclear companies in the state has been developed through the efforts of Tennessee's industry and government leaders to find ways to offer pro-business incentives for nuclear-related companies. These initiatives allow companies to expand in the state at a greater level so that the surrounding industries and local economies can grow in tandem.

### Nuclear Job Titles

The nuclear sector spans across many occupational groups as well. The Bureau of Labor Statistics (BLS) classifies all job titles into around 830 unique occupation categories under its Occupational Employment and Wage Statistics (OEWS) program.<sup>24</sup> For each industry,<sup>b</sup> the BLS identifies the percentage of employment represented by each occupational group, since a single occupation can be found across a wide range of career fields. These occupations are displayed in Exhibit 3, along with their corresponding broad occupational categories. To highlight the most relevant roles in the industry, each detailed occupation shown accounts for at least 1% of the U.S. Nuclear Power Generation workforce. Exhibit 3 also includes employment figures and median hourly wages at both the state and national levels.<sup>c</sup>

<sup>b</sup> Industry definitions used by the BLS are provided by the North American Industry Classification System (NAICS) from the U.S. Census Bureau. In this case, NAICS code 221113 was used.

<sup>c</sup> The employment and wage estimates in Table 2 are not specific to NAICS 221113 because this data is suppressed at the state level. The data in those columns is representative of the occupation estimates across all NAICS codes for both the state and the U.S.

### Exhibit 3: Nuclear-Related Occupations and Wages

SOC Code	SOC Description	Tennessee		United States		
		Employment	Median Hourly Wage	Employment	Median Hourly Wage	% of Total Ind. Emp.
<b>MANAGEMENT OPTIONS</b>						
11-3051	Industrial Production Managers	5,310	\$49.18	222,890	\$56.24	1.22
11-9041	Architectural and Engineering Managers	2,840	\$67.79	207,800	\$79.50	1.54
<b>BUSINESS AND FINANCIAL OPERATIONS OCCUPATIONS</b>						
13-1082	Project Management Specialists	16,980	\$39.02	947,630	\$47.39	1.21
13-1151	Training and Development Specialists	8,360	\$26.86	403,480	\$30.94	2.70
13-1199	Business Operations Specialists, All Other	12,610	\$30.95	1,103,440	\$38.26	1.87
<b>ARCHITECTURE AND ENGINEERING OCCUPATIONS</b>						
17-2071	Electrical Engineers	1,980	\$49.60	185,430	\$51.42	3.11
17-2112	Industrial Engineers	6,710	\$44.63	332,870	\$47.78	1.30
17-2161	Nuclear Engineers	280	\$63.61	12,710	\$60.32	11.21
<b>LIFE, PHYSICAL, AND SOCIAL SCIENCE OCCUPATIONS</b>						
19-4051	Nuclear Technicians	80	\$42.09	5,400	\$48.92	8.25
<b>PROTECTIVE SERVICE OCCUPATIONS</b>						
33-9032	Security Guards	26,840	\$16.33	1,202,940	\$17.82	9.77
<b>OFFICE AND ADMINISTRATIVE SUPPORT OCCUPATIONS</b>						
43-5061	Production, Planning, and Expediting Clerks	14,030	\$22.80	393,980	\$25.91	1.06
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	35,600	\$19.28	1,785,430	\$21.29	1.09
<b>CONSTRUCTION AND EXTRACTION OCCUPATIONS</b>						
47-2111	Electricians	17,200	\$26.62	712,580	\$29.61	1.54
<b>INSTALLATION, MAINTENANCE, AND REPAIR OCCUPATIONS</b>						
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	12,200	\$33.65	589,880	\$36.45	3.00
49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	510	\$45.34	24,790	\$46.44	3.68
49-9041	Industrial Machinery Mechanics	8,890	\$29.05	412,650	\$29.53	2.93

### Exhibit 3: Nuclear-Related Occupations and Wages (Cont.)

SOC Code	SOC Description	Tennessee		United States		
		Employment	Median Hourly Wage	Employment	Median Hourly Wage	% of Total Ind. Emp.
<b>PRODUCTION OCCUPATIONS</b>						
51-1011	First-Line Supervisors of Production and Operating Workers	18,430	\$29.64	671,160	\$31.70	5.11
51-8011	Nuclear Power Reactor Operators	300	\$51.20	5,760	\$57.86	11.54
51-8013	Power Plant Operators	550	\$49.87	31,490	\$46.64	1.00

### Local Economic Impact of the Nuclear Industry

Growth in the nuclear energy sector can produce positive ripple effects across the industries that surround it. Creating new jobs often generates an economic stimulus that directly and indirectly increases employment and earnings throughout the local economy. The effect on other industries can vary depending on business climate and quality of jobs being created. This effect is commonly measured with an economic multiplier, where for every one job created (or one dollar increase in earnings), additional jobs (or earnings) are created in the area as a result of the initial increase.

The nuclear energy industry’s sustainable employment levels and lucrative jobs result in a large multiplier, even compared to similar energy industries.<sup>25</sup> Tennessee’s pro-business climate maintains a significant multiplier effect for the nuclear generation industry, as it is among the highest multipliers for this industry in the Southeast for 2024.<sup>26</sup> The multiplier for jobs is modeled to be 7.92 in 2024, meaning if 100 jobs were added to the nuclear energy sector in Tennessee, approximately 792 total jobs would be created in the state.<sup>27</sup> In this case, the jobs multiplier and earnings multiplier are used to find the total change in jobs and earnings that resulted from the increase in industry employment between 2022 and 2023. The methodology used to estimate the direct number of jobs in the nuclear industry is derived from an impact report done by E4 Carolinas in 2024.<sup>D, 28</sup>

The total change in jobs and earnings represents the combination of the direct and indirect impact of adding jobs to the Tennessee nuclear energy sector in 2023. The estimates and multipliers are displayed in Exhibit 4. There were approximately 64 jobs and \$16.1 million in earnings added to the nuclear industry in 2023, which led to a total estimated increase of 482 jobs and over \$42.5 million in earnings for Tennessee overall. This small initial increase in jobs leads to a major increase in employment and earnings statewide and demonstrates the significant impact that nuclear energy jobs can have on the broader economy.

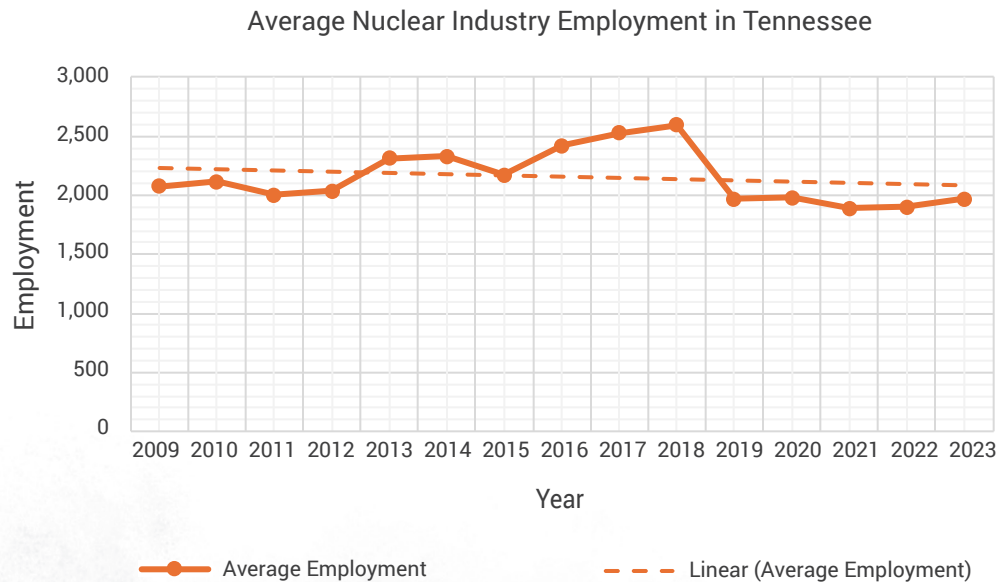
<sup>D</sup> To estimate Tennessee’s nuclear employment, E4 Carolinas applied South Carolina’s publicly available nuclear employment-to-generation ratio—based on EIA and BLS data—to Tennessee’s 2021 generation levels. The same method was used to estimate employment in 2022 and 2023. Changes in employment over those years were then used to model broader job and earnings impacts using Lightcast multipliers. Because Tennessee lacks publicly available nuclear employment data, South Carolina’s ratio serves as the best available approximation. South Carolina is one of the few states, and the only one in the Southeast, with accessible data. However, this ratio does not account for potential industry differences between the states, and all Tennessee figures should be considered estimates.

## Exhibit 4: Nuclear Energy Economic Impact

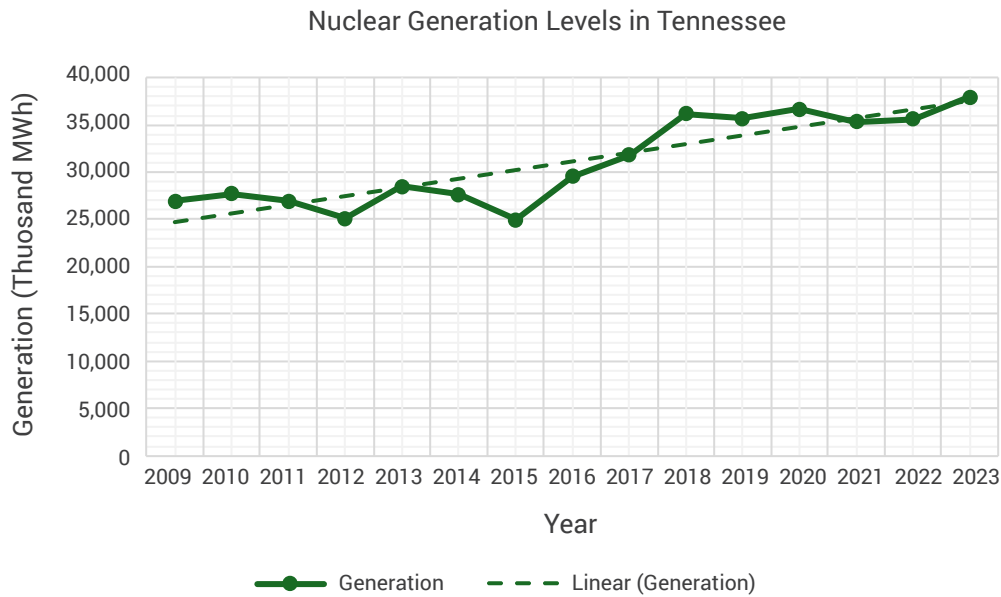
2022 Industry Employment	2023 Industry Employment	2023 Jobs Multiplier	2023 Earnings Multiplier	Initial Change in Jobs	Initial Change in Earnings	Total Change in Jobs	Total Change in Earnings
1,901	1,965	7.54	2.64	65	\$1,635,659	490	\$43,202,262

Although job growth appeared strong in 2023, year-over-year employment estimates have shown inconsistency. Applying the same methodology to Tennessee’s nuclear generation in earlier years reveals employment patterns that may signal challenges in the labor market. Using the same employment and net nuclear generation data sources as above, direct industry employment levels were estimated for the 15-year period between 2009 and 2023.<sup>E</sup> Tennessee’s annual nuclear generation levels were also collected for the same time period. Using a simple linear regression model, nuclear generation levels and employment levels were investigated to see if any significant trends were displayed over this period, and results from this investigation are displayed in Exhibit 5.

## Exhibit 5: Nuclear Electricity Generation vs. Nuclear Industry Employment since 2009



<sup>E</sup> Data for this section is located in Appendix Table 1.



Nuclear generation levels showed highly significant increases over time.<sup>F</sup> On average, annual net generation increased by 922,000 MWh each year since 2009. Although employment appears to show a slight downward trend—declining by nearly 11 jobs per year—the trend is not statistically significant<sup>G</sup> and, as a result, no conclusions can be drawn from this estimate. Due to the lack of publicly available data for nuclear industry employment in Tennessee, employment estimates have been drawn using a combination of data from Tennessee and South Carolina over a long period of time, and many factors can impact these estimates. Further in-depth analysis needs to be completed to gain a better understanding of employment trends in this industry. Meanwhile, nuclear generation levels in Tennessee are increasing at a significant rate, and increases in nuclear jobs and earnings tend to have a strong ripple effect across Tennessee’s economy. As a result, investing in nuclear workforce development, business operations, and infrastructure is likely to drive significant economic growth that benefits residents statewide.

## DIRECT VS. INDIRECT INVESTMENTS

While the nuclear industry improves the local economy, offers high-paying jobs, and delivers cleaner energy compared to fossil fuels, it still encounters significant challenges in developing new facilities. High upfront investment costs, long construction times, and excess liabilities make it difficult for private companies to invest in nuclear energy. The government helps the private sector by directly investing in the nuclear industry and with indirect investments in the form of tax credits and special allowances.

<sup>F</sup> The P-value resulting from the linear regression is 1.22e-05.

<sup>G</sup> The P-value resulting from the linear regression is 0.464.

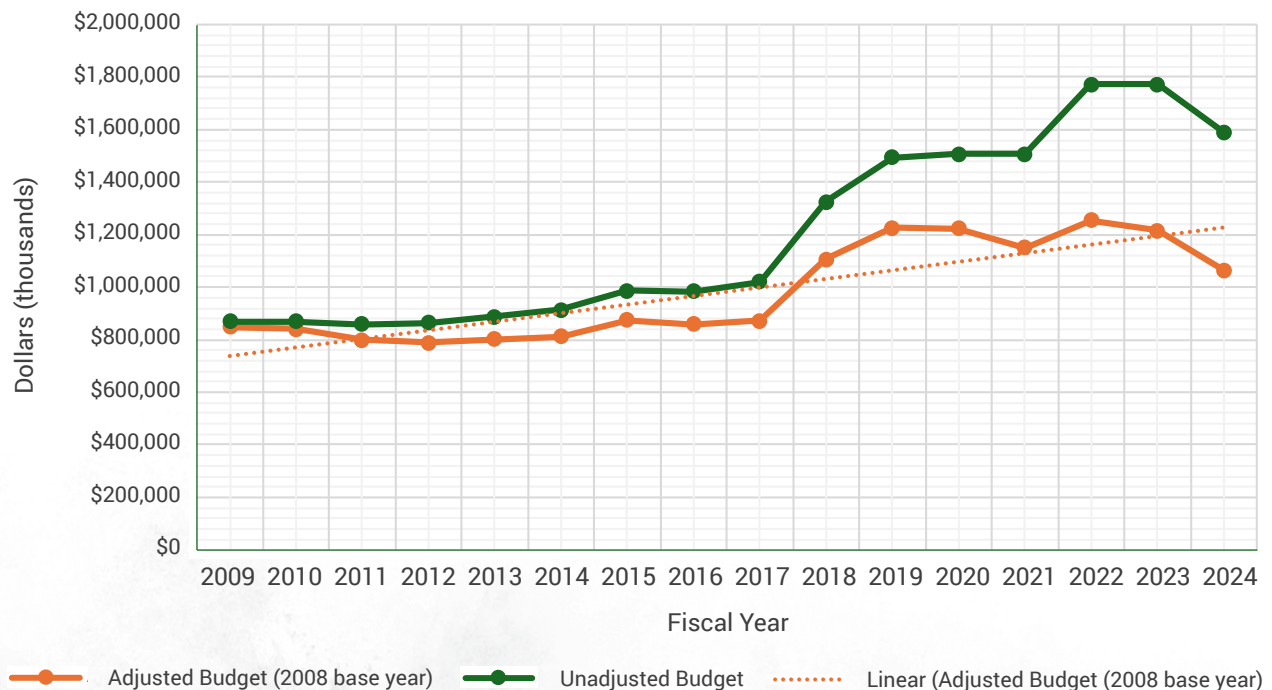
## DIRECT INVESTMENTS - DEPARTMENT OF ENERGY

The federal government directly invests in nuclear energy through the Department of Energy (DOE). DOE spending details are available in the budget justification, which outlines funding requests to Congress and reports the amount appropriated in the previous year.<sup>29</sup> The funds were compiled for every fiscal year since 2009 and then were deflated to 2008 dollars so that the real value could be compared across the series. A deflation calculation was done with 2008 dollars as the base:

$$\text{Dollars(deflated)} = \text{Dollarsyear}x \cdot \left( \frac{2008\text{CPI}}{\text{Year}x\text{CPI}} \right)$$

The zero-interest rate policy and the quantitative easing following the Great Recession led to volatile changes in the value of the dollar starting in 2009.<sup>30</sup> Starting at 2008 provides a fair evaluation of the given dollar amount year-over-year.<sup>31</sup> After establishing the deflated dollar amount for each year, a linear regression was used to find the average change in deflated dollars awarded per year and whether the change is significant over time. This method was used to explore trends in the total DOE nuclear energy budget, Nuclear Energy University Program funding, and Oak Ridge National Laboratory funding. Exhibit 6 shows the unadjusted amount allocated by the DOE for nuclear energy every year, the deflated amount allocated, and the average change in deflated dollar amount year-over-year.

Exhibit 6: Total DOE Nuclear Energy Budget



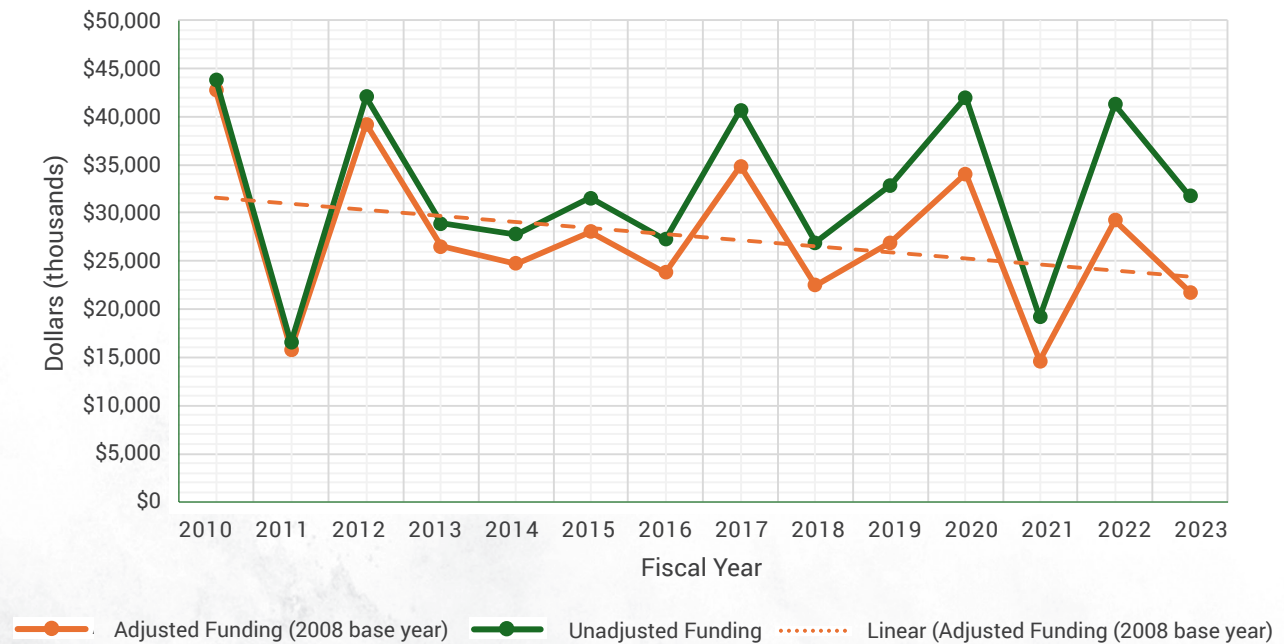
<sup>31</sup> The CPI index was used as a reliable measure of inflation, specifically the CPI-U for urban consumers, non-seasonally adjusted, for the month in which the budget was passed. The inflation-adjusted amount was calculated by multiplying the dollars from x year by the CPI ratio.

Since 2008, the average annual allocation for nuclear energy has been around \$1 billion. On average, the DOE budget increased by approximately \$20.4 million per year, adjusted to 2008 dollars.<sup>1</sup> Economic conditions can influence the allocation to nuclear energy. The 2008 recession likely resulted in reduced investment, but once the economy stabilized, the budget began to rise again. Following the Great Recession, a global “Green Stimulus” movement emerged, driven by the growing popularity of energy-efficient policies.<sup>31</sup> Combined with the American Recovery and Reinvestment Act, this helped increase DOE budgets overall and likely influenced the trend shown in Figure 4.<sup>32</sup>

## Direct Investments – Nuclear Energy University Program

Some of the funds that the DOE allocates for nuclear energy goes towards funding research. The DOE consolidated all its university support under one program in 2009.<sup>33</sup> This led to the creation of the Nuclear Energy University Program (NEUP), which oversees the funding of research and equipment for U.S. colleges and universities. The NEUP supports national nuclear research by funding laboratories and providing scholarships for undergraduate and graduate students pursuing careers in the field. As of 2025, the Nuclear Energy University Program has funded initiatives at more than 139 colleges and minority-serving institutions, awarding over \$1.07 billion. The NEUP lists the awards that are given every year on their website.<sup>34</sup> The funding amounts (adjusted and unadjusted) awarded since the program’s inception per fiscal year are shown in Exhibit 7 along with the average change in deflated funding per year.

Exhibit 7: DOE Nuclear Energy University Program Funding



<sup>1</sup> The P-value resulting from the linear regression is 0.0300, making this a significant trend. The average change per year was calculated using only the adjusted deflated budget in terms of 2008 dollars and does not reflect trends from the unadjusted year-over-year budget.

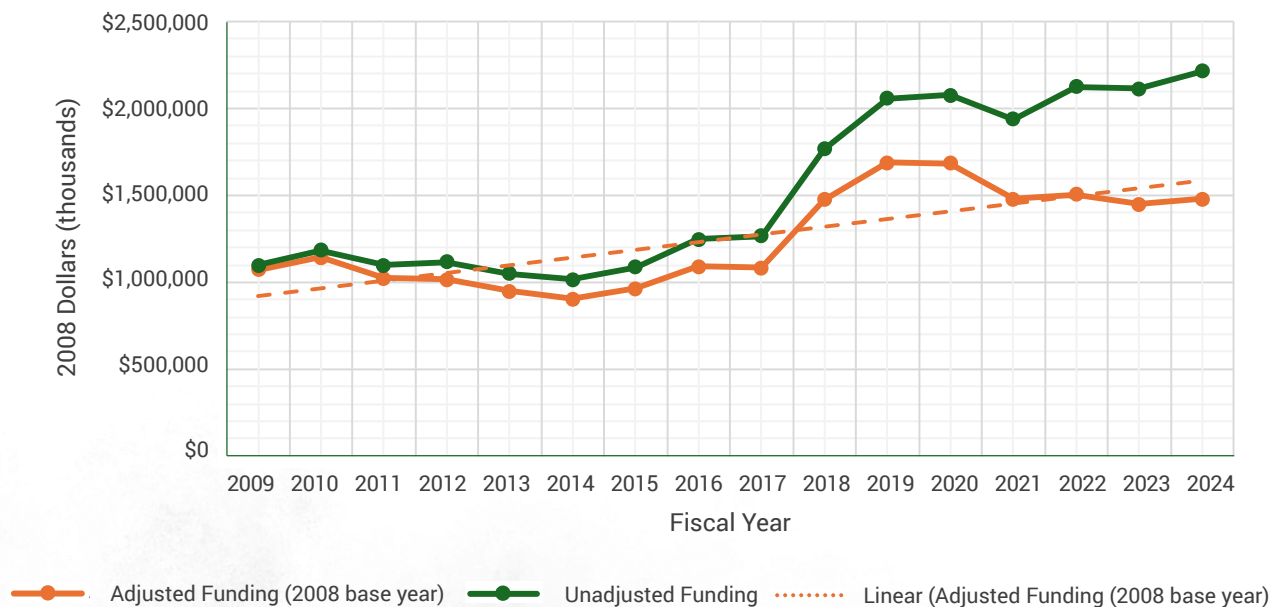
The funding for these university programs is trending downward (decreasing by an average of \$775,100 each year in terms of 2008 dollars), but the trend is not statistically significant.<sup>4</sup> Funding from the DOE towards the NEUP have varied greatly year-over-year, and therefore no significant trends can be concluded from this scenario.

## Direct Investments – Oak Ridge National Laboratory

The DOE directly sponsors several laboratories across the country. The Oak Ridge National Laboratory (ORNL), based out of Oak Ridge, Tennessee, has ongoing research into various fields including chemistry, materials science, cybersecurity, computer science, energy science, and nuclear science and engineering.

The nuclear program at ORNL is split into researching nuclear fusion and nuclear fission. For nuclear fusion, ORNL has the ongoing Material Plasma Exposure Experiment (MPEX), where plasma is exposed to various materials. This project will provide data for future nuclear fusion reactor materials. For nuclear fission, ORNL has several ongoing projects to create new advanced reactors and the next generation of nuclear fuels. The compiled data for adjusted and unadjusted funding amounts as well as the linear trend for the change in DOE spending is displayed in Exhibit 8.<sup>35</sup>

Exhibit 8: Oak Ridge National Laboratory Fund



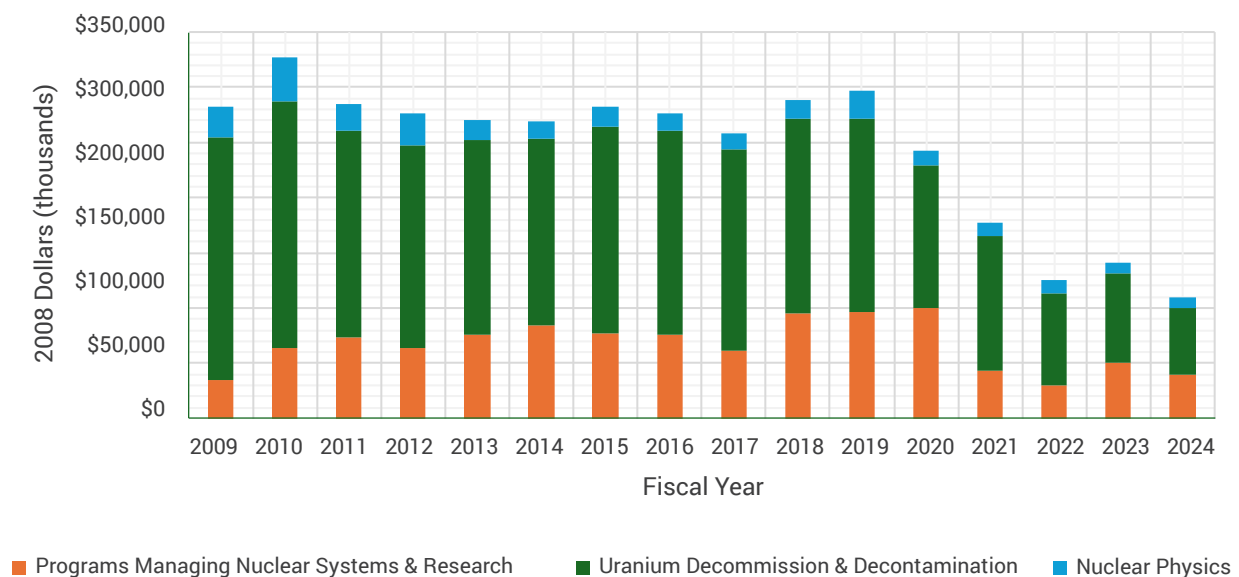
<sup>4</sup> The P-value from the linear regression in Figure 5 is 0.1186, resulting in a trend that is not significant. The average change per year was calculated using only the adjusted deflated funding in terms of 2008 dollars and does not reflect trends from the unadjusted year-over-year funding.

Funding from the DOE towards ORNL is more stable than the university fund and shows a positive increase year-over-year. In terms of 2008 dollars, the average yearly increase in funding for ORNL is approximately \$40.5 million.<sup>k</sup> This is a highly significant trend overall, and the generous increases in funding indicate the value that the DOE places on ORNL’s research in the nuclear sector.

## DIRECT INVESTMENTS - STATE OF TENNESSEE FUNDING

The State of Tennessee receives DOE funding annually for nuclear energy–related research and development. These funds support research on the nuclear fuel cycle, nuclear hydrogen, and fourth-generation nuclear energy systems. The state also receives DOE funding each year for both decontaminating and decommissioning nuclear-related waste, as well as advancing nuclear physics research. The same CPI ratio was used to adjust the dollar amounts awarded in these categories to 2008 dollars. The deflated annual expenditures on these nuclear-related funds are compiled in Exhibit 9 below.<sup>l</sup>

Exhibit 9: DOE Program Funding for Nuclear Energy in Tennessee



Although the State of Tennessee is receiving fewer funds from the federal government for nuclear energy, the state has started its own nuclear fund. Proposed by Governor Lee in 2023, the Nuclear Energy Supply Chain Investment Fund aims to spur investment and education in the nuclear industry through this fund totaling \$50 million. As of 2025, the fund has seven announced projects. The nuclear companies awarded grants from this fund have committed to investing over \$4.7 billion and creating nearly 700 new jobs in Tennessee.

<sup>k</sup> The P-value from the linear regression in Figure 6 is 0.000424, resulting in a trend that is highly significant. The average change per year was calculated using only the adjusted deflated funding in terms of 2008 dollars and does not reflect trends from the unadjusted year-over-year funding.

<sup>l</sup> Funds for Programs Managing Nuclear Systems and Research includes funding for the following initiatives from the DOE Budget: Gen 4 Nuclear Energy Systems, Fuel Cycle R&D, Radiological Facilities Management, Program Direction N.E., Nuclear Energy Enabling Technologies, Reactors Concepts RD&D, and International Nuclear Energy Cooperation.

## Exhibit 10: Nuclear Energy Supply Chain Investment Fund Projects

Organization	Announced Date	City	County	Grant Amount	Project Description
BWXT Enrichment Operations, LLC	4/15/2025	Oak Ridge	Roane	\$715,000	Company plans to establish a facility for the manufacturing of centrifuge assemblies in Oak Ridge. As part of the project, they plan to create at least 60 new jobs and invest at least \$45 million. The site is part of a long-term plan to support fuel production for the National Nuclear Security Administration's (NNSA) defense program mission.
Tennessee Tech University	10/15/24	Cookeville	Putnam	\$1,083,444	Supports the start-up of a new Bachelor of Science in Nuclear Engineering program in their College of Engineering by funding 2-years of costs for three critical personnel.
Orano USA LLC	9/4/24	Oak Ridge	Roane	\$6,000,000	Company will construct a new, multi-billion-dollar, state-of-the-art centrifuge uranium enrichment facility and create more than 300 new direct jobs and \$4.5 billion of capital investment.
Oak Ridge / Roane County	9/4/24	Oak Ridge	Roane	\$5,000,000	Infrastructure improvements at the SSP-2 site. This funding is contingent on the successful land transfer from the Department of Energy and Orano USA receiving licensing approval from the Nuclear Regulatory Commission for operation on the site.
University of Tennessee, Knoxville	4/22/24	Knoxville	Knox	\$1,500,000	Supports the establishment of a nuclear engineering minor program and for nuclear technical training and assistance for teachers and faculty across the state.
Roane State Community College	4/22/24	Harriman	Roane	\$462,000	Equipment purchases for education and training for the college's inaugural nuclear technology career pathway program.
Type One Energy Group, Inc.	2/21/24	Clinton	Anderson	\$4,500,000	Company commits to creating 330 new jobs and making a capital investment of \$223.5 million.

## INDIRECT INVESTMENTS

Although the direct spending helps with continuing projects and research in the nuclear industry, indirect funding is used to start new projects. Special tax credits and funds are available for the nuclear energy sector to help the industry grow. Launched in 2022, the Zero Emission Nuclear Power Production Credit offers 0.3 cents per kWh for nuclear electricity sold to others.<sup>36</sup> Nuclear plant owners can also use tax-free Decommissioning Reserve Funds for future cleanup costs.<sup>37</sup> Additionally, uranium miners qualify for the Advanced Manufacturing Production Credit, since uranium is considered a critical mineral.<sup>38</sup>

## CONCLUSION

The demand for energy will likely grow significantly as new technologies are implemented and the world population continues to rise. Data centers, AI, electric vehicles, and other major technological industries are rapidly increasing energy consumption. This can put a strain on the electric power grids that businesses and communities rely on daily.<sup>39</sup> Nuclear energy is a dependable, carbon-neutral source of electricity that can withstand rising demand. It is capable of supporting the needs of emerging technological industries and the neighborhoods that surround them as well.<sup>40</sup> Pro-nuclear states, like Tennessee, have been proactively investing in nuclear electricity generation to prepare for future increases in demand and incentivize positive economic outcomes in the long term.

In addition to its large energy capacity, the nuclear industry attracts high-paying, quality jobs to communities. When nuclear employment opportunities increase, the surrounding workforce benefits from direct industry employment and positive spillover effects in related industries. Tennessee's nuclear energy sector did not exhibit significant trends in direct employment levels in this study, however, the impacts of creating new jobs in this sector are likely to have net positive effects on job openings and earnings for the surrounding labor force.

Current estimates of Tennessee's nuclear generation levels indicate strong and consistent growth in nuclear energy usage over time. These developments signify a need to ensure that the state has a highly skilled workforce to meet the needs of this advanced industry. Direct investments from the DOE have been important for ORNL's ability to employ innovative staff members, support small business efforts, and host educational programs for the next generation of nuclear researchers. Funding from other DOE programs, like the Nuclear Energy University Program (NEUP), contribute to developing skills in the nuclear workforce as well. Despite its value, federal funding can fluctuate year to year, and in the case of the NEUP, even decrease over time. The state's own commitment to advancing its nuclear energy resources helps diversify funding sources and keep up with changes in federal budgets. For example, the Nuclear Energy Supply Chain Investment Fund is a key driver for enhancing Tennessee's nuclear workforce and attracting private investment from major nuclear-related companies such as Orano and Type One Energy Group. Initiatives like this incentivize new industry growth for the state by directly funding post-secondary nuclear programs and adding to the state's existing nuclear faculties. Maintaining industry investments from state, private, and federal funds will continue to be an important pursuit. Through these efforts, Tennessee will support enhancements to its electric capacity and provide long-term economic development for its constituents as the world moves toward a new era of nuclear energy.

Appendix Table 1: Nuclear Generation and Employment Data

Year	South Carolina Nuclear Employment	South Carolina Nuclear Generation	Employment to Generation Ratio	Tennessee Nuclear Generation (MWh)	Tennessee Nuclear Employment
2009	4,012	52,149,734	7.69243E-05	26,962,001	2,074
2010	3,960	51,988,079	7.61681E-05	27,739,221	2,113
2011	3,932	52,902,576	7.43238E-05	26,919,177	2,001
2012	4,152	51,145,302	8.11772E-05	25,102,101	2,038
2013	4,409	54,251,968	8.12597E-05	28,493,814	2,315
2014	4,411	52,418,553	8.41591E-05	27,670,006	2,329
2015	4,622	53,156,320	8.69433E-05	24,960,472	2,170
2016	4,568	55,825,916	8.18168E-05	29,578,086	2,420
2017	4,313	54,344,554	7.93701E-05	31,817,502	2,525
2018	3,783	52,716,469	7.1766E-05	36,176,382	2,596
2019	3,094	56,103,043	5.51411E-05	35,720,405	1,970
2020	2,954	54,751,088	5.39594E-05	36,688,195	1,980
2021	2,880	53,771,428	5.35523E-05	35,330,407	1,892
2022	2,901	54,369,751	5.33615E-05	35,635,400	1,902
2023	2,882	55,622,340	5.18212E-05	37,937,437	1,966

Note: This table includes the data and calculated ratios used in Exhibits 4 and 5. Because South Carolina provides a public estimate of nuclear industry employment, an employment-to-generation ratio was calculated using that data. This ratio was then applied to Tennessee's nuclear generation to estimate its industry employment. South Carolina's employment data was sourced via Lightcast from the Bureau of Labor Statistics' Quarterly Census of Employment and Wages. Nuclear generation data was obtained from the U.S. Energy Information Administration. All data was collected in March 2025.

## REFERENCES

- <sup>1</sup> World Nuclear Association, “World Energy Needs and Nuclear Power”
- <sup>2</sup> Ibid.
- <sup>3</sup> U.S. Department of Energy, Electricity Demand Growth Resource Hub, “Understanding Electricity Demand Growth and Available Solutions”
- <sup>4</sup> World Nuclear Association, “Nuclear Power in the World Today”, March 21, 2025
- <sup>5</sup> U.S. Energy Information Administration, “Nuclear Explained – Nuclear Power and the Environment”, November 7, 2022
- <sup>6</sup> International Atomic Energy Agency, IAEA Office of Public Information and Communication, Emma Atuhaire, “Nuclear Energy in the Clean Energy Transition”, January, 24, 2025
- <sup>7</sup> International Energy Agency, “A new era for nuclear energy beckons as projects, policies and investments increase”, January 16, 2025,
- <sup>8</sup> E4 Carolinas, “The Economic Impact of the Nuclear Industry in the Southeast United States”, February, 2024, p.7
- <sup>9</sup> Oak Ridge National Laboratory, Oak Ridge National Laboratory – Science and Discovery
- <sup>10</sup> Oak Ridge National Laboratory, Oak Ridge National Laboratory – 80 Years of Great Science: 1943–2023
- <sup>11</sup> American Public Power Association, Susan Partain, “Nuclear Renaissance”, May 16, 2024
- <sup>12</sup> State of Tennessee Executive Order by the Governor No. 101, “An Order to Establish the Tennessee Nuclear Energy Advisory Council”, May 16, 2023
- <sup>13</sup> U.S. Energy Information Administration, “Tennessee State Energy Profile”, October 17, 2024
- <sup>14</sup> Ibid.
- <sup>15</sup> Ibid.
- <sup>16</sup> Tennessee Valley Authority, “TVA, State and Industry Leaders Unite to Accelerate SMR Deployment”, January 17, 2025
- <sup>17</sup> Tennessee Department of Finance and Administration, “The Budget, Fiscal Year 2023-2024”, 2023, Budget Volume 1.24
- <sup>18</sup> Tennessee Department of Finance and Administration, “The Budget, Fiscal Year 2025-2026”, 2025, Budget Volume 1.25
- <sup>19</sup> TN Department of Environment and Conservation, Nuclear Energy Advisory Council, “Final Report and Recommendations”, October 31, 2024
- <sup>20</sup> Tennessee Department of Economic and Community Development, April, 2025
- <sup>21</sup> East Tennessee Economic Council, “2023 - TN Nuclear Company Density”, 2023
- <sup>22</sup> East Tennessee Economic Council, Nuclear Resources – State of Tennessee Support
- <sup>23</sup> TN Department of Environment and Conservation, Nuclear Energy Advisory Council, “Nuclear Business and Regulatory Survey”, August, 2024
- <sup>24</sup> Bureau of Labor Statistics, Occupational Employment and Wage Statistics, 2025
- <sup>25</sup> IAEA Department of Nuclear Energy, “Towards a Just Energy Transition: Nuclear Power Boasts Best Paid Jobs in Clean Energy Sector”, April 14, 2022
- <sup>26</sup> Lightcast (2024)
- <sup>27</sup> Ibid.
- <sup>28</sup> E4 Carolinas, “The Economic Impact of the Nuclear Industry in the Southeast United States”, February, 2024, p.21
- <sup>29</sup> DOE Congressional Budget Requests, Fiscal Years 2010 – 2025

## REFERENCES (CONT.)

<sup>30</sup> The Federal Reserve's Policy Actions during the Financial Crisis and Lessons for the Future

<sup>31</sup> World Resources Institute, "Lessons Learned on Green Stimulus", 2020

<sup>32</sup> US Department of Energy, "American Recovery and Reinvestment Act", Accessed April, 2025

<sup>33</sup> U.S. Department of Energy, Nuclear Energy University Programs (NEUP)

<sup>34</sup> Nuclear Energy University Programs Funded Projects, 2009 – 2024

<sup>35</sup> DOE Congressional Budget Requests, Laboratory Tables, Fiscal Years 2010 - 2025

<sup>36</sup> IRS.gov, Zero Emission Nuclear Power Production Credit

<sup>37</sup> USCode.house.gov, Internal Revenue Code, Special Rules for Nuclear Decommissioning Costs

<sup>38</sup> IRS.gov, Advanced Manufacturing Production Credit

<sup>39</sup> RMI, "How Data Centers Can Set the Stage for Larger Loads to Come", May 3, 2025

<sup>40</sup> Goldman Sachs, "Is nuclear energy the answer to AI data centers' power consumption?", January 23, 2025