



Gaps in the Energy Workforce 2019 Pipeline Survey Results

Overview

In 2019, the Center for Energy Workforce Development (CEWD) conducted the eighth “Gaps in the Energy Workforce Pipeline” survey. In the 13 years that the Center has been conducting the survey, the industry has seen considerable changes in the workforce.

Initially, the survey results showed an aging workforce and the potential for significant retirements in the 10 years following that first survey. Coupled with a lack of talent supply, these forecasts compelled the CEWD strategic mission to build talent supply pathways for critical jobs in partnership with utilities, educators, and other community entities. In the last two surveys, results show the size and age of the workforce have stabilized, and the focus is now specifically trained on the composition of the workforce in terms of skills and diversity.

As in previous surveys, CEWD focused the analysis on four key job categories: Lineworkers, Technicians, Plant/Field Operators, and Engineers. These four job categories make up 45% of the total utility workforce and are considered mission critical for the generation, transmission, and distribution of electricity and natural gas across the country. The remaining 55% is comprised of corporate services, including Human Resources, Customer Service, Finance, and Information Technology. For the first time, the 2019 survey provides information on the employee population in these corporate positions.

The survey findings are based on responses from Electric and Natural Gas Utilities across the United States. The data provided by the companies responding included information on age, years of service, hires, and attrition, along with information on the diversity and veteran composition of the workforce.

This survey represents the only national survey that focuses on the size, composition, and age of the utility workforce based on responses from the companies themselves.

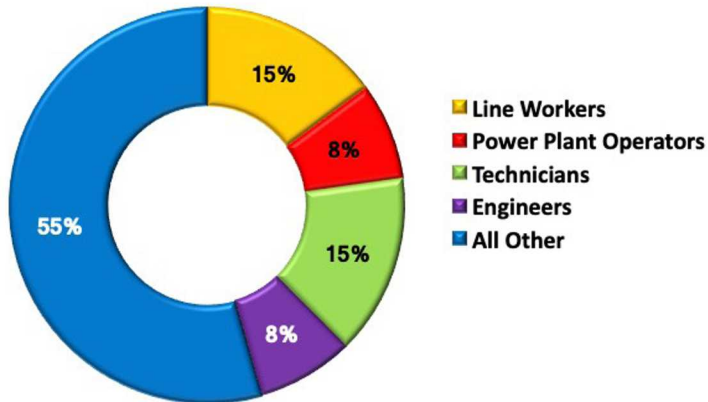
The analysis of survey results shows 5 key findings:

- The size of the utility workforce is basically unchanged since the previous survey.
- The age of the workforce has stabilized, with a younger workforce and with many older workers having already retired.
- Retirement projections are now considered normal.
- Non-retirement attrition projections have increased as younger workers leave the industry at a higher rate than their older predecessors.
- The composition of the workforce has not changed significantly in terms of job types or the makeup of the workforce.

Overall, the industry is seeing the impact of more than a decade of workforce initiatives to influence the supply, skills, and diversity of the energy workforce.

The size of the workforce is unchanged.

Although the workforce size has fluctuated both up and down over time, the 2019 survey shows almost no change from the previous survey, indicating a stabilization of the size of the utility workforce. The industry's approximately 603,000 employees are spread across the three types of utilities—Investor Owned Utilities have 71% of the total, Public Power has 16%, and Rural Electric Cooperatives have 13%. For the first time, CEWD was able to analyze differences in the workforce among the three types of utilities and sees variances that will impact the strategies and initiatives that are most appropriate for building the workforce depending on the type of utility.



The number of key jobs has also remained fairly stable and remains at 45% of the total workforce. Rural Electric Cooperatives, however, have a lower percentage of key jobs than other types of utilities, with about a third of their workforce represented by these critical jobs.

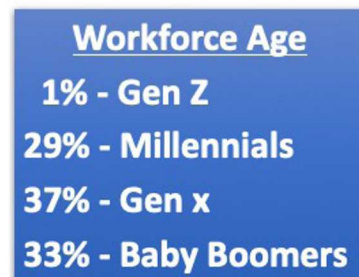
The number of Lineworkers has increased a little over 5% to roughly 77,000 workers, while Plant/Field Operators have decreased about 5% to 39,000 employees.

Skilled Utility Technicians remain unchanged at 75,000 workers, and the Engineering category is unchanged at 39,000 workers.

For the first time, the survey included estimates of some critical job categories in corporate support and other types of operational jobs. This new breakdown was driven by the analysis in the 2018 Game Changers: National Strategic Workforce Plan that identified corporate jobs as the highest risk for changes from technology. These baseline figures will be used in the future to track changes and monitor trends.

The workforce continues to grow younger.

Since 2006, when CEWD first began to measure workforce age, the industry has seen a consistent progression toward a younger workforce. With a focus on the creation of energy education pathways in high schools, community colleges, and universities, companies have seen an increase in the talent pool for recruiting and hiring into high-skill positions. Jobs such as Lineworkers, Skilled Technicians, and Plant Operators require some level of postsecondary education prior to hire, and companies have made significant progress in partnering to develop education that leads to the competencies needed for these high-skill, high-pay careers.



As a whole, the age curve for the industry has flattened, as older workers have retired and younger workers have been hired into a variety of jobs. Electric Cooperatives have the youngest workforce, with 24% under the age of 32 and only 25% of their workforce over the age of 53. Public Power has the oldest workforce, reporting only 12% of their workforce under the age of 32.

When looking at just the key job categories, the percentage of Engineers under age 32 continues to increase, with Gas T&D Engineers at 45% and Non-nuclear Generation Engineers at 32%, reflecting the focus on hiring in these categories. The percentage of Electric T&D Engineers and Lineworkers under the age of 32 is also high, at 30% each.

Plant Operators and Skilled Technicians in both Electric and Gas Transmission and Distribution and Generation remain the oldest population in the key jobs and will continue to need focus from a talent pipeline perspective, with Non-nuclear Generation Technicians having 36% over the age of 53.

Survey respondents report that hiring for the industry has increased significantly since the last survey. Responding companies forecast hiring for 2019 through 2023 between 6% and 7%, which is greater than attrition forecasts.

Hires for key jobs since 2016 have remained fairly stable based on the respondents, but survey respondents indicate increased hiring in corporate and other jobs.

Retirements are decreasing for the industry as a whole and for key jobs.

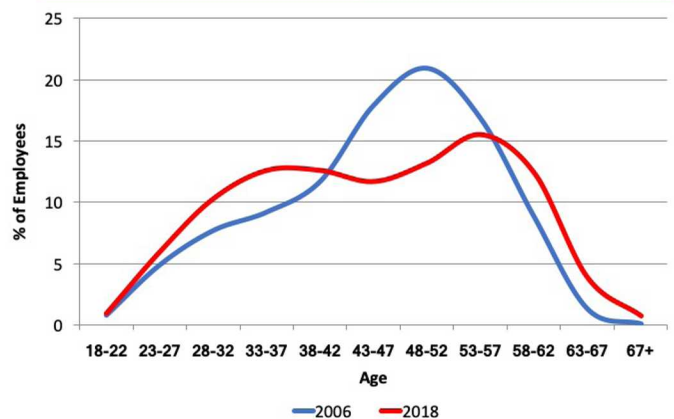
Retirement forecasts are a combination of age and years of service and the low non-retirement attrition of the past contributed to the retirement bubble in the past. Although retirements have been a major game changer for the energy workforce in the past, overall retirements are now forecast at a little over 2.4% a year for the next 10 years. There is an additional 13% estimated who could retire at any time, which is lower than in previous years. The overall retirement forecast percentage is now below the estimate of employees who will leave for other reasons and shows the trend toward “normal” retirement for the industry.

Forecasted retirement rates are down for all key jobs from the previous survey, with rates averaging between 2% and 2.3% depending on job category. Ten percent of the key jobs are eligible to retire at any time, which is unchanged from the last survey. The key job retirement forecast for years 2019–2023 has increased slightly from the last survey, moving from 11% to 12%. That forecast for key jobs is almost even with the future year’s percentage, indicating a flattening of the retirement curve over time.

Overall, Lineworkers show the lowest percentage of potential retirements over the next 10 years (26%) and the lowest percentage of employees who are ready to retire at any time (7%). Ten-year retirement forecasts have stayed the same overall since the last survey.

Engineers and Skilled Technicians in generation, transmission, and distribution show an overall decline of the 10-year forecasted retirement from 2016 at 2%.

Age Distribution Comparison
Total Company



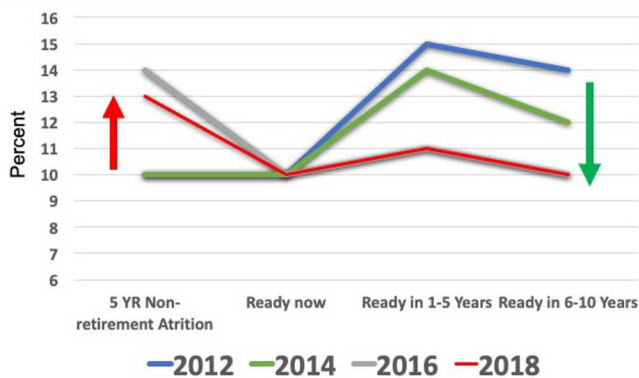
Plant and Field Operators have decreased their 10-year retirement forecast by 1% over 2016. Along with Skilled Technicians and Engineers, they show 11% of employees have the ability to retire at any time. On the whole, retirement forecasts have still decreased by 4% since the last survey.

In Nuclear, the five-year projection for both retirement and non-retirement attrition is significantly higher than in other key jobs, with rates averaging between 21% and 26% overall. The retirement rates have decreased since the previous survey by 1% while non-retirement attrition has increased by 10%.

Non-retirement attrition forecasts have increased.

Although utilities historically have among the lowest attrition rates in comparison to other industries, non-retirement attrition has been rising in key jobs since 2012. The five-year non-retirement attrition averages about 13% among the key jobs. Although that is a decrease of 1% overall since the last survey, CEWD member companies are paying particular attention to this trend and are focusing on retention strategies based on demographics, age, and phase of career.

Electric & Natural Gas Utilities Attrition Over Time – Key Jobs



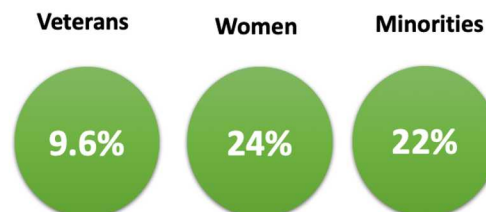
Survey respondents have indicated that 60% of the Total Company non-retirement attrition occurs within the first 5 years of employment. The percentage varies slightly between job categories, but it is significant enough to warrant increased scrutiny on retention strategies for new hires across the board. Among age groups, the 23–37 age group has the highest percentage of non-retirement attrition within the first five years, at 57%. When looking at the cost of hire and training expenses, this level of departure at early stages can be very expensive for a company

and reduce the return on investment in building the talent pipeline.

Composition

When building the talent pipeline, utilities are focusing on not only the numbers in talent supply, but the skills and diversity of the pipeline as well. The age of the employee population is getting younger, and companies are implementing strategies to change the diversity of the employee population as well. Utility companies have made a concerted effort to attract, hire, and retain military veterans through initiatives such as Troops to Energy Jobs and Veterans in Energy (VIE). Seven years ago, the industry launched the Troops to Energy Jobs initiative to match exiting military and veterans from all branches to our demand for the future.

Electric & Natural Gas Utilities Workforce Composition



An offshoot of that initiative was the creation of VIE, a national Employee Resource Group (ERG). VIE's mission is to provide transition, retention, and professional development support to military veterans working in energy. VIE will provide opportunities for outreach, networking, and mentoring to support the needs of the growing population of veterans who have chosen energy careers. The percentage of veterans in the employee population can vary greatly from company to company, but the 2019 survey shows that veterans make up about 9.6% of respondents' current workforce. Companies from across the industry are reaching out to veterans for their training, leadership, and service mentality to fill these critical positions.

The composition of the workforce is changing as well. Women make up 24% of the workforce and minorities compose 22% of the workforce. The industry has a particular focus on increasing the diversity of the workforce through overarching diversity and inclusion initiatives that range from programs in elementary school to attract girls to engineering, to specialized bootcamps in underrepresented communities for entry into lineworker apprenticeships. These strategies are specifically focused on increasing the diversity of education pathways, hiring, and retention of diverse populations to ensure that our employee populations more closely reflect the communities we serve.

Industry Demand

In 2019, the number of potential replacements for retirement and non-retirement attrition increased for key jobs for non-nuclear generation, transmission, and distribution, forecasting about 88,000 employees that may need to be replaced over the next five years for retirements and non-retirement attrition. Over the same period, the number of critical nuclear jobs that may need to be replaced has increased, with an additional 27,000 identified. Skilled Technicians are not the only area where

utilities will be replacing employees, however. The forecast for workers in corporate and other field positions is estimated at 101,000. This includes, among other positions, Human Resources, Information Technology, Customer Service, Management, and Physical and Cyber Security. CEWD continues to expand the focus on these positions with particular consideration of the impact of technology and skill changes.

This demand for employees will be filled from a variety of sources. Many of the positions will be filled by students graduating from schools in the National Energy Education Network (NEEN). NEEN is a consortium of high schools, community colleges, and universities that have partnered with CEWD members to build education pathways that lead to the skills and competencies needed for the future. Other positions will be filled by military veterans, transitioning workers from other industries, or the internal pipeline of employees as they transition into jobs with new technology and sources of generation.

Potential Replacements by 2023	
Lineworkers	29,000
Technicians	31,000
Plant / Field Operators	15,000
Engineers	12,000
Nuclear	27,000
Other Corporate and Field Positions	101,000

Our industry is undergoing a significant transition with the game-changing impact of technology, infrastructure modernization, changing customer demands, and the move toward a cleaner energy mix. These changes also drive the need for innovation, adaptability, and new skills in the workforce, and the energy industry is working together through CEWD to meet the workforce needs of today and of the future.

Recommendations

Specific recommendations for building sustainable energy workforce pipelines include:

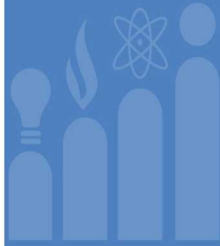
- Implement company-specific and statewide Workforce Development strategies, utilizing the CEWD Essential Elements of Strategic Workforce Planning Model.
- Support existing efforts to balance the supply and demand for workers by developing programs that can be replicated and scaled as demand increases and decreases.
- Build diversity and inclusion into the pathways at every step.
- Expand Get Into Energy Career Awareness initiatives to build awareness of energy careers among Youth, Low Income Students, Women, Military, and Transitioning Workers.
- Support the work of State Energy Workforce Consortia to build partnerships with those in the education, labor, and government sectors and to develop secondary and postsecondary programs specific to skilled energy positions.
- Use the Energy Industry Competency Model and Get Into Energy Career Pathway Model developed for generation, transmission, and distribution careers to implement programs that incorporate foundational, employability academic and technical competencies that reduce the skill gaps in applicants and provide quantifiable benefits to employers.

Survey Methodology

The Gaps in the Energy Workforce Pipeline Survey was sent to CEWD, Edison Electric Institute, Nuclear Energy Institute, American Public Power Association, and American Gas Association utility members, asking them to provide data on actual and forecasted hires and attrition (both retirement and other attrition), age and years of service of the current workforce, number of employees in specific positions (Lineworkers, Technicians, Plant Operators, and Engineers), and total number of employees. Nuclear contractors were also asked to complete the survey. The survey was administered by CEWD and all company data is confidential.

Electric and natural gas utilities from across the country responded to the survey. Information on electric cooperatives was provided by the National Rural Electric Cooperative Association. The companies who responded to the survey collectively represent approximately three-fourths of the total electric and natural gas utility workforce and 100% of the industry's nuclear utilities.

Members of CEWD may view additional survey details at www.cewd.org.



Formed in March 2006, the Center for Energy Workforce Development (CEWD) is a non-profit consortium of electric, natural gas, and nuclear utilities, contractors and their associations—Edison Electric Institute, American Gas Association, American Public Power Association, Nuclear Energy Institute, National Rural Electric Cooperative Association, and Distribution Contractors Association.

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