CENTER FOR ENERGY WORKFORCE DEVELOPMENT

Gaps in the Energy Workforce Pipeline
2017 CEWD Survey Results

Overview

In 2017, CEWD conducted the seventh "Gaps in the Energy Workforce Pipeline" survey. The findings are based on responses from Electric and Natural Gas Utilities across the United States. The survey results continue to show progress in building a talent pipeline to fill critical jobs in the industry.

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 44% 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 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.

For the first time, CEWD was able to analyze the full impact of public power employees in key jobs through the support of the American Public Power Association. As a result, CEWD is now able to include public power in the analysis of key job forecasts for hiring and attrition and has established a baseline to be able to make historical comparisons in the future.

Workforce Size

Total number of jobs down 2.7%

Although the workforce size has fluctuated over time, the 2017 survey shows the most significant change since CEWD began surveying in 2006. The overall size of the workforce has decreased by 2.7%. The number of key jobs remained fairly stable, with the decreases showing up in corporate support and other types of jobs. The industry continues to support full-time positions with third-party contractors working directly for the industry.

The composition of the workforce is changing as well. For investor owned utilities (IOUs), veterans make up about 11% of respondents' current workforce, which is an increase from 8% in 2014, the first year CEWD surveyed participants on veterans. Similarly, female minorities have increased from 7.3% to 9% of the population for respondents, and the number of male minorities has increased from 15% to 17%.

Workforce Composition

- 44% Key Jobs
- 11% Veterans
- 22.5% Veterans in Nuclear
- 9% Female Minorities
- 17% Male Minorities

The workforce continues to grow younger, with 19% of the workforce now under the age of 32. Although retirements have been a major game changer for the energy workforce in the past, the current survey shows about 12% of the workforce is ready to retire at any point and overall retirements are forecast at a little over 2% a year for the next 10 years. That is below the percentage of employees who will leave for other reasons and shows the trend toward "normal" retirement for the industry.

Overall, the industry is seeing the impact of more than a decade of workforce initiatives.

2017 Survey Findings

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.

Workforce Age

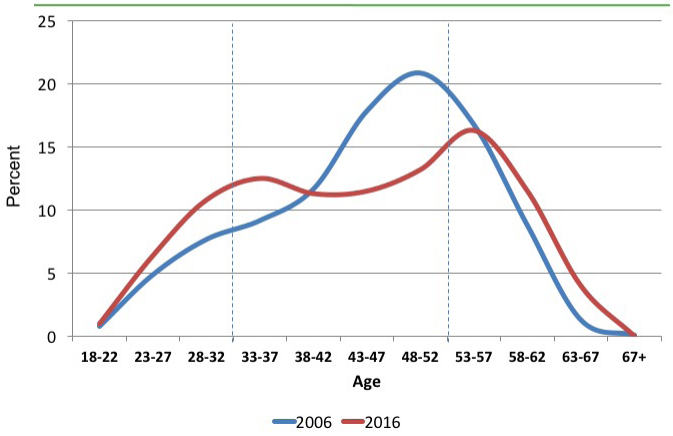
19% under age 32
49% under age 52
33% over age 53

As a whole, the age curve for the industry has flattened, as older workers have retired and younger workers have been hired. Electric cooperatives have the youngest workforce, with only 25% of their workforce over the age of 53. IOUs have the oldest, with 35% over age 53. Public power, on the other hand, reports only 12% of their workforce under the age of 32.

When looking at just the key job categories, the percentage of Engineers and Lineworkers under age 32 continues to increase at 29% and 30% respectively, reflecting the focus on hiring in these categories.

Plant Operators and Skilled Technicians in both electric and gas transmission, distribution, and generation remain the oldest of the key jobs and will continue to need focus from a talent pipeline perspective.

Age Distribution Comparison
Total Company



Survey respondents report that hiring for the industry has increased significantly since the last survey. The overall percentage of hires into key jobs increased from 5% in 2014 to 9% in 2015 and then to 7% in 2016. In both years, the percentage of hires was greater than attrition and survey respondents forecast hiring at or above attrition, indicating growth for the first time since 2008.

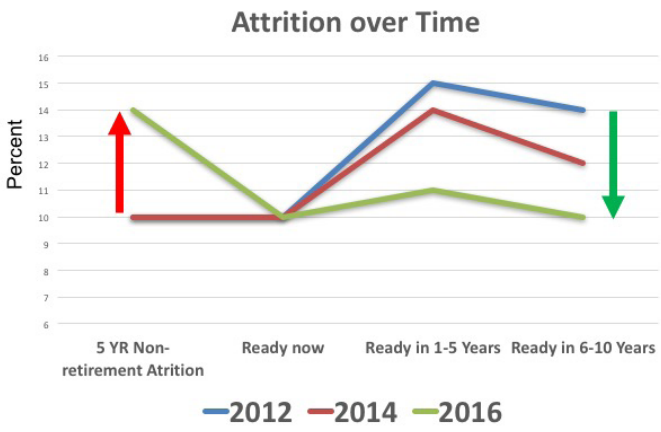
As a percentage of the total hires, other company jobs increased from half of hires in the last survey to almost two-thirds, indicting increased hiring in corporate and other jobs.

RETIREMENTS ARE DECREASING FOR THE INDUSTRY AS A WHOLE AND FOR KEY JOBS

Forecasted retirement rates are down for all jobs from the previous survey, with rates averaging between 2% and 2.3% depending on job category. The most significant decrease is in the key job retirement forecast for years 2017–2022, where overall retirement forecasts dropped from 14% to 11%. That forecast for key jobs is almost even with the future years percentage, indicating a flattening of the retirement curve over time. The forecast for those in key jobs who can retire at any time has remained steady at 10% but increased from 9% to 12% for total industry jobs.

Although utilities historically have among the lowest attrition rates in comparison to other industries, non-retirement attrition is rising in key jobs based on survey responses. Non-retirement attrition varies from a 5-year average of 13% to 15% among the key jobs with an overall average of 14%, but is significant in that the percentage has increased by 4% 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.

Retirement forecasts for Key Jobs have decreased, while forecasts for other attrition have increased



Overall, Lineworkers show the lowest percentage of potential retirements for 2017 to 2026 and the lowest percentage of employees who are ready to retire at any time (7%). Ten-year retirement forecasts have decreased by 5% overall since the last survey.

Engineers show the largest decrease in overall forecasted retirements (6%).

Skilled Technicians in generation, transmission, and distribution show an overall decline of 5% in forecasted retirements as well, but have the highest percentage of employees who can retire at any time (13%).

Plant and Field Operators have the highest potential retirement forecast and show a quarter of employees in this category with the ability to retire in the next 5 years. On the whole, retirement forecasts have still decreased by 4% since the last survey.

In Nuclear, the 5-year projection for both retirement and non-retirement attrition is significantly higher than in other key jobs, with rates averaging between 36% and 41% overall. The retirement rates have actually increased since the previous survey.

It is important to note that hiring has increased for the industry, and actual hires for 2015 and 2016 are greater than attrition. Companies are replacing more employees than are leaving for the first time since the recession in 2008. Forecasts for hires show this continued level of replacement and growth.

INDUSTRY DEMAND

As in the previous survey, the actual number of potential replacements for retirement and non-retirement attrition has decreased for key jobs for non-nuclear generation, transmission, and distribution. About 59,000 employees may need to be replaced over the next 10 years for retirements, with an additional 30,000 potential replacements over the next 5 years for non-retirement attrition. Over the next 5 years, the number of critical nuclear jobs that may need to be replaced has actually increased, with an additional 11,800 that may need to be replaced.

This demand for skilled talent will be filled from a variety of sources, including students graduating from schools in the National Energy Education Network (NEEN). NEEN is a consortium of high schools, community colleges, and universities that partner with CEWD members to build relevant and needed education pathways.

Other positions will be filled by military veterans. Five 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. Veterans now make up 11% of our workforce, and in Nuclear Operations that number is 22.5%. Companies from across the industry are reaching out to veterans for their training, leadership, and service mentality to fill these critical positions.

The industry has also launched a strategic initiative to increase the diversity of education pathways, hiring, and retention of diverse populations to ensure that our employee populations more closely reflect the communities we serve.

The potential replacements shown are a reflection of retirement and attrition projections only and do not reflect the impact of other industry game changers. The business environment for nuclear, in particular, has changed substantially since the end of 2016 and the projected data may be impacted by recent plant decisions.

Potential Replacements by 2026 for Key Jobs (Includes Public Power and Excludes Nuclear)

Job Category	Potential Non-Retirement Attrition 2017- 2021		Potential Retirements includes Ready Now 2017- 2021		Potential Retirements 2022 - 2026	
Lineworkers	15%	11,000	17%	12,000	9%	7,000
Technicians	14%	10,000	25%	18,000	11%	9,000
Plant Operators	13%	5,000	24%	9,000	10%	4,000
Engineers	14%	4,000	21%	6,000	10%	3,000
Total Key Jobs	**14%**	**30,000**	**21%**	**34,000**	**10%**	**25,000**

Potential Replacements by 2021 for Key Jobs in Nuclear Business Areas

	Potential Replacements 2017- 2021	
Job Category	Potential Attrition & Retirement	Estimated Number of Replacements
Operations	36%	3,700
Maintenance	43%	4,800
Engineering	41%	3,300
Total Nuclear Jobs	40%	23,000

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 drive the need for innovation, adaptability, and new skills in the workforce, as well as stronger collaboration with the industry's contractor partners, to fully understand the complete workforce demand in the industry. 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:

- Support existing efforts to balance the supply and demand for workers by developing programs that can be scaled as demand increases and decreases.
- Support the work of State Energy Workforce Consortia to build partnerships with those in the education, labor, contractor, 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 Pathways Model developed for generation, transmission, and distribution careers to implement programs that will reduce the skill gaps in applicants and provide quantifiable benefits to the companies.
- Implement sustainable workforce planning strategies, utilizing the CEWD Essential Elements of Strategic Workforce Planning Model.

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 survey details at www.cewd.org.

About CEWD

The Center for Energy Workforce Development (CEWD) is a non-profit consortium of electric, natural gas, and nuclear utilities; their associations—the Edison Electric Institute (EEI), American Gas Association (AGA), American Public Power Association (APPA), Nuclear Energy Institute (NEI), National Rural Electric Cooperative Association (NRECA), and Distribution Contractors Association (DCA); and their unions—the International Brotherhood of Electrical Workers (IBEW) and the Utility Workers Union of America, AFL-CIO (UWUA).

CEWD was formed to help utilities work together to develop solutions to the skilled workforce shortage in the utility industry. It is the first partnership among utilities, their associations, contractors, and unions to focus on the need to build a skilled workforce pipeline that will meet future energy needs.

To learn more about CEWD, please visit www.cewd.org or www.getintoenergy.com.

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