

## Background

There are three key factors that are creating gaps in the Electric and Natural Gas Utility workforce pipeline – an aging work force; skill gaps in the talent pool; and changing energy technology. The third CEWD Gaps in the Energy Workforce Pipeline Survey included questions to further refine existing projections on the retirement gap and to gain new insights into the impact of skill gaps and new technology.

The utility industry across the country is facing workforce shortages as aging skilled workers approach retirement and fewer qualified candidates are available to replace them. In both 2007 and 2008, CEWD surveyed electric and natural gas utilities on the age and years of service of employees in critical skilled utility technician jobs and in engineering and forecasted the possibility of retirements and attrition based on the results. Since the release of the initial survey in 2007, several factors have changed. Foremost, the U.S. economy weakened dramatically, delaying retirements among those reaching eligibility and impacting utilities' capital expenditures.

The 2009 CEWD Gaps in the Energy Workforce Pipeline Survey predicts that by 2015, 46% of the existing skilled technician workforce may need to be replaced due to potential retirement or attrition and 51% of the engineering workforce. The 2009 CEWD

survey validates that with the economic downturn some retirements have been delayed and hiring has been postponed, but the potential for retirement stays the same. In effect, the impact of the economic downturn has just delayed the timing of retirements and has not lessened the need for future replacements.

In previous years, the survey gathered data on age and years of service of current employees and made projections for retirements within the next five years. The analysis compared these data with the number of employees

currently in the pipeline in order to identify where gaps could potentially occur. Those results were used to assist utilities in better targeting their efforts to recruit and train potential job candidates to fill those gaps. Identifying where and when new employees will be needed is the first critical element in balancing the demand for employees with the supply of trained applicants.

This year's survey took the next step and began to examine trends in hiring and training since workforce gaps had been identified. The survey also focused on where "skills gaps" occur – that is, where candidates fall short in terms of skills needed to qualify for the jobs companies are trying to fill. These data should further assist utilities in identifying those education programs that best meet the needs of the industry in preparing students with the competencies they will need to be successful in energy careers.

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## 2009 Survey Findings

### Industry Demand

In spite of a weakened economy, utilities continued to hire in 2009, albeit at a slower-than-normal pace. Hiring increased at utilities from 2006-2008, then slowed in 2009, dropping by 56 percent, with the biggest reductions in hiring for technician and engineering jobs. Though 88 percent of companies reported a slowdown in hiring, the vast majority of utilities (84 percent) reported they had not instituted hiring freezes and less than one third reported any downsizing.

Likely due to the still-struggling economy, the 2009 survey showed that employees continued to postpone retirement, with most now retiring after age 58 with 25 years of service. Although earlier than the traditional retirement age of 65, some employees in these positions may opt for positions in other areas of the company or begin second careers as many of these positions are physically demanding.

There are approximately 535,000 employees in the electric and natural gas utilities and almost one-third (approximately 172,000) fall into four key job categories – lineworkers, plant / field operators, technicians, and pipefitters / pipelayers / welders. There is a potential to lose 46%, or almost 80,000, of these skilled trade employees by 2015. This is an increase over previous forecasts, reflecting retirements by those who have delayed leaving, in addition to employees who will reach the critical age category in the coming five years.

In addition, over half of the engineers employed by utilities will have the potential to retire.

### Skills Gap

Surveyed companies reported difficulties in finding qualified applicants to fill all of the skilled craft positions. Overall, utilities reported that between 30-50% of applicants (those that met the minimum requirements for a position) were not able to pass the pre-employment aptitude tests. Additional applicants fall out of the process with background and drug screening. On average, companies needed to interview 30 applicants for every hire. Lineworkers appeared to be the most difficult to find, with an average of 50 applicants interviewed for every successful hire. Those companies that work with secondary and postsecondary institutions to develop programs tailored to the industry, such as energy career academies at the high school level, “boot camps” prior to apprenticeships, and community college programs aligned to the specific skill requirements report significant increases in the pass rate for pre-employment tests.

Utilities have also been particularly challenged in filling engineering jobs with appropriately skilled applicants. To make up the shortfall, many have been willing to hire engineers who lacked electrical engineering degrees; in those cases, they’ve bridged the skills gap by providing company-sponsored training to new hires. In the future, the companies report that they will begin requiring an electrical engineering degree, or relevant coursework, for electrical engineer positions. Approximately 23% of the engineer applicants did not have the relevant education or experience when they applied for positions. However, half of those utilities surveyed said they would help pay for employees to obtain an appropriate degree through tuition reimbursement plans.

Potential Replacements 2009 - 2015		
Job Category	Potential Attrition & Retirement %	Estimated Number of Replacements
Technicians	50.7	27,800
Non-Nuclear Plant Operators	49.2	12,300
Pipefitters / Pipelayers	46.1	8,900
Lineworkers	42.1	30,800
Engineers	51.1	16,400



## Education and Training

Energy companies are looking for ways to reduce the cost of training and recruiting new employees. More than 80 percent said they had partnered with one or more community colleges or vocational programs to find job applicants and 76 percent credited those programs with cost reductions and other quantifiable benefits, such as reducing the time and cost of recruiting and qualifying new hires.

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Companies use a variety of education programs to train future skilled trade workers, including high school career academies, postsecondary certificate programs, pre-apprenticeship training, and associate degree programs. Over 80% of respondents said they required a two-year degree for technician positions.

The survey also looked closely at internal company training and apprenticeship programs. Lineworkers by far were most often required to complete an apprenticeship program, with more than 80 percent of utilities reporting this requirement. Technicians were required to complete apprenticeships at roughly 60 percent of utilities surveyed and plant/field operators were required to do so at roughly half of utilities. Pipefitters/pipelayers /welders were least likely to be required to complete apprenticeships; only 40 percent of utilities

reported such a program for these employees.

Most of the companies (about 85 percent) reported that they conduct lineworker training and apprenticeships internally within the company. Less than 25 percent of the respondents rely on technical / community colleges or other training providers to support their lineworker training.

Notably, of those apprenticeship programs, the vast majority – nearly 60 percent for lineworkers and 45 percent for technicians – were registered with the Department of Labor or with their state. This indicates that utilities are moving closer to a system of transportable credentials that reflect a high industry standard.

## Impact of Emerging Technologies

The survey specifically asked questions about current positions in renewable generation, energy efficiency, and the Smart Grid. Although only a small percentage of respondents overall reported having dedicated positions in any of these technologies, it was clear that most of the positions were in management, analyst or consulting within the companies.

In terms of renewable generation technologies, no positions were shown for biofuels and ethanol, and almost no positions were noted for solar generation. Only 13 respondents reported having dedicated wind positions, with only four showing more than one or two positions. The majority of those were management positions; only one company reported having wind technicians. A similar number of respondents reported having positions in Smart Grid but the number of positions was higher, almost 400, with most of those in management and engineering. The job titles listed, however, included traditional titles such as Distribution Engineer or Project Manager, indicating that these are not likely to be unique positions, but additional responsibilities for existing positions. By far, the largest number of emerging technology positions was in energy efficiency, around 1,100. This is not surprising since most utilities have had energy efficiency or demand side management programs in effect for decades. Again, many of the positions were in management, but this job category also showed multiple positions such as analyst, coordinators, or consultants.

Because not everyone reported having dedicated positions in these emerging areas, it is difficult to extrapolate the number of future jobs. What can be learned from the results is that most of the positions are not discrete new jobs, but rather existing positions with additional or new skills. In addition, since most of the positions named are consulting, engineer, analyst or management positions, it is likely that the positions will require a four-year or advanced degree.



## Conclusions and Recommendations

Energy companies have made significant strides since the first CEWD survey to address the skilled worker gap – through both internal training programs and external partnerships. Although efforts have been somewhat stymied by a stagnant economy, the industry has gained significant knowledge in identifying the types of education programs that will bridge the gap for the future.

Specific recommendations for building the future energy workforce pipeline include:

- Support existing efforts to balance the supply and demand for workers by developing programs that can be scaled as demand increases and decreases.
- Continue to build partnerships with those in the education, labor and government sectors to develop secondary and postsecondary programs specific to energy skilled trades positions.
- Use the Energy Industry Competency Model developed by the industry for the skilled trades to create programs that will reduce the skill gaps in applicants and provide quantifiable benefits to the companies.
- Create industry recognized credentials that will allow students to demonstrate the skill level attained.

## 2009 Survey Methodology

The 2009 survey was conducted in June, 2009 and includes data from 31 companies representing 44 percent of all electric and natural gas utility employees in 46 states, with investor-owned utilities making up the majority of respondents. The results are for non-nuclear generation, transmission and distribution and included specific questions on four skilled trades positions – lineworker, plant / field operator, technician, and pipefitter/ pipelayer/ welder – in addition to questions on engineering. The survey does not include data on positions in nuclear as the Nuclear Energy Institute conducts a similar survey for nuclear generation employees.

Members of CEWD may view survey details at [www.cewd.org](http://www.cewd.org)

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