

# CEWD 2018 Game Changers

National Strategic Workforce Plan



## **Energy Industry Game Changers** with Implications for Workforce





Infrastructure Modernization Energy Generation Transformation Regulation / Policy Changes Physical / Cyber Security Customer Expectations

**Enabling Technologies** 

Transitioning Workforce Business / Work Restructuring Strategic Workforce Focus Affordability

#### Pace and Timing

#### Game Changer Summary

Industry Game Changers have been part of CEWD's lexicon for many years and represent the potential for significant shifts in size, skills, and knowledge requirements of the current and future energy workforce. All of these changes can impact a company's ability to create and maintain a talent pipeline of qualified and diverse workers and to deliver on the company's business plan. Companies that are in the midst of infrastructure changes, building or closing plants, or implementing new technologies may have pressing current workforce needs. Others may be planning changes that will not be fully implemented for 5 to 10 years but will have tremendous impact on skill requirements. At a company level, addressing the workforce impact of these Game Changers in many cases means changing the work before changing the workforce.

The CEWD 2018 Game Changers show significant differences from the last edition in 2016. The changes are noted in red above. Both the External and Internal Game Changers indicate a shift to an industry that is more rapidly transforming, with technology playing an increasingly important role. The energy workforce is also changing with a younger and more diverse workforce that is increasingly digitally literate. This transitioning workforce, along with advances in education technology, can position the industry to meet the challenges of the future.

The continued move to a more digitized electric and natural gas infrastructure is at the heart of this change. With more smart technology installed, system and customer data are being produced at a rate never before seen. Coupled with Enabling Technologies such as artificial intelligence, machine learning, and robotics, companies are developing the capability and capacity to anticipate and meet energy customers' growing expectations and needs. This interconnectivity also means energy companies must be more vigilant than ever to cyber threats and attacks.

#### Workforce Impact Summary

Just as energy companies are balancing the mix of generation and delivery of energy between centralized and distributed resources, today's energy workforce is beginning to mirror that same trend. The centralized workforce is decreasing, but the decentralized workforce appears to be growing. In the last decade, the overall number of employees in Electric and Natural Gas Utilities has declined, with the largest contributor to the overall job decline in support and corporate jobs. Key Jobs that include Lineworkers, Technicians, Plant/Field Operators, and Engineers have remained steady. However, the overall size of the energy industry is growing as contractors and suppliers that provide supplemental labor, specialized expertise, renewable and distributed generation, energy efficiency, and new technology grow to support the energy industry's emerging needs.

Because the pace and timing of change varies with companies, geography, and regulation, the industry must continue to develop a workforce with skills for traditional energy production and delivery as well as developing capabilities for the future. While the focus in the past has been more on the size of the workforce, this analysis points to a growing concern with skill gaps for both the incoming and the incumbent industry workforce.

Both new and incumbent employees must have strong foundational skills that range from academic skills like Science, Technology, Engineering, and Math (STEM) to employability and technical skills, so the impacts on internal technical training organizations must also be factored in. Competencies like problem solving, critical thinking, teamwork, collaboration, and the ability to learn are equally as important as technical skills in addressing the workforce needs.

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With the growth and speed of changes in technology,

the energy industry workforce must be able to adapt and learn new skills by building on a strong foundational knowledge. Incumbent workers in jobs that are changing have an increased need for upskilling as their work changes. Education must adapt at the same pace, with both external and internal training that maps to critical competencies and the use of technology to speed up knowledge transfer and new learning.

The 2018 CEWD Strategic Workforce Plan takes a notably broader view of impacted jobs, beyond the critical job categories of Lineworkers, Plant/Field Operators, Technicians, and Engineers explored in past Workforce Plans. In calling attention to the segments of the workforce that support and/or transition into key jobs and the growing reliance on the utility's contingent workforce, we note in this summary the impact the Game Changers have on those jobs as well.

While the impact analysis suggests significant impacts to both size and skills for engineers, support workers, and contractors, the underlying impact of the *nature* of today's workforce—younger, transitory, more tech savvy, less likely to build a career with one company—is significant for all job categories.

#### What are the potential implications for CEWD and its members?

First, the way we have traditionally defined the workforce in the center of CEWD's bullseye is changing and will no doubt continue to change. Our target for workforce development efforts is growing beyond Lineworkers, Technicians, Plant/Field Operators, and Engineers. When we look at the need for Lineworkers nationally, we can no longer ignore that a significant percentage of the crew stringing line isn't employed by the utilities. When we think about who is actually digging the trench to lay a mile of pipe, we realize there are support workers who must be accounted for. The more accurately we can define the demand for the jobs that drive our industry, the better able we are to build an adequate support of qualified, diverse talent for our industry.



Second, competencies are key. Workforce agility, mobility, and promotion are dependent on first mastering foundational competencies, whether they focus on employability, workplace requirements, or technical requirements. The work CEWD has done and continues to champion on building and measuring the effectiveness of workforce competencies has never been more important in today's energy workplace. Equally important is our members' recognition of those competencies in the hiring process.

Third, the interconnections between skill requirements across the key jobs, support services, and contractors shouldn't be ignored. Education, on-the-job training, and knowledge transfer are all creating a more fluid workforce, which offers greater flexibility to companies and potentially higher rewards to those who can adapt or change quickly to meet their company's needs.

Fourth, companies must either build—or ensure they have—capacity to retrain their workers and transfer knowledge. Equally important, employees who have a thirst for learning and are willing to be proactive in their learning and growth will be the winners in the race. In today's workforce, there is no room for complacency.

Finally, technology is king. The use of technology—and the changes to technology—have progressed beyond evolutionary and border on revolutionary. Even as the technology needed to do these critical jobs is changing at light speed, the industry must think about on-the-job training, just-in-time training, and knowledge transfer as necessities that can be delivered with technology.

#### Workforce Impact Analysis Methodology

It's helpful to view the workforce risks and implications of Game Changers through an "impact" lens of size and skills:

- Is the *size* of the workforce likely to increase, decrease, or stay the same?
- Are the current *skills* required for the job adequate or will new skills be needed? And, if new skills are needed, will they be provided by the company or by an education provider?



CEWD has attempted to gauge which job categories are potentially most at risk for impact at a national level. While CEWD has historically defined Key Jobs narrowly, this assessment focuses attention on a broader definition of jobs, including support services that may be impacted, and the impact to the industry contractor workforce. Examples of support services jobs include Human Resources, Customer Service, Information Technology, Operations Support, and Supply Chain. Industry contractors include those involved in construction and maintenance of electric and natural gas infrastructure and generation.

It's important to note that some Game Changers (Regulation / Policy Changes, Business / Work Restructuring, Strategic Workforce Focus, and Affordability) can't be assessed at a national level because the

impact is driven by individual company strategy, so risk assessments for those areas are not included.

For those areas where national implications can be inferred, the following paragraphs summarize the combination of size and skills impacts and provide a guide for focusing on job categories at the national level. The color coding is not intended to imply direction of impact (e.g. greater, lesser, more, fewer) but the potential for impact, which should be subject to greater analysis. Green indicates that based on what we know today, the impact appears to be low. Red indicates that there appears to be potential for high impact compared to the current state and that greater analysis needs to be done to define the type and degree of impact for these particular jobs in relationship to this Game Changer.

# **Energy Industry Game Changers**

with Implications for Workforce

### **External Game Changers**

#### Infrastructure Modernization

The modernization of the electric and natural gas infrastructure is paving the way for two-way energy flow, interconnected devices and technologies, and access to data that is transforming the industry. The structure and operation of distribution systems is changing as smarter infrastructure is built and new distributed generation technologies, including microgrids, are deployed and integrated into the electric grid. Investing in a safe and reliable power grid is critical to the deployment of new technologies and maximizing the use of renewable energy.

With these new technologies comes the growth in customer expectations, and the need for individualized customer solutions to meet the needs of this new generation of customers. The smart meter is at the center of technologies that will provide access to data to enable decisions on what assets to build and when, anticipate customer needs, and manage the supply of energy from traditional and new sources.

The growing demand for natural gas driven by low gas prices is outpacing the interstate transportation and distribution systems across the country. Safety and reliability are paramount for the natural gas industry, and an aging infrastructure is drawing attention to the need to modernize the existing infrastructure and build new infrastructure to deliver natural gas.

#### Workforce Impact

Infrastructure modernization impacts both the size and skills of the workforce. New digital technology in particular is impacting workforce size as a smarter grid requires a greater number to research, design, build, and protect the new technologies. Entirely new organizations are being created to handle this work. Both new and incumbent employees will need new skills and competencies to support interconnected devices and the two-way flow of electricity including telecommunications, networking, and distributed energy integration. These changes may drive the need to upskill segments of the incumbent transmission and distribution workforce, which could potentially impact existing technical training organizations. New technologies in training, like simulations and augmented and virtual reality, will support the need for continuous learning.

Infrastructure Modernization also has significant impact on workforce skills, not only for industry members but for their contractor partners. In particular, for natural gas transmission and distribution, building and repairing gas pipelines has caused a significant increase in the need for natural gas distribution contractor resources. Contractors struggle to attract enough welders, fusers, heavy equipment operators, and other workers to meet the needs of the utilities. Using contractors also impacts internal hiring needs of the utilities because utility employees manage the contracted projects.

Engineers have a significant role to play in modernizing our energy infrastructure. The need for degreed engineers to design new infrastructure is only expected to grow, and the skill requirements are changing. The need also precedes other jobs as engineers are needed to design the work before it can be built. In addition, the results of the CEWD Gaps in the Energy Workforce Pipeline Survey show a significant decrease in the number of mid-career engineers, which may reflect a knowledge loss risk as older engineers retire, and new engineers enter the workforce.

Job Category	Lineworker	T&D Technician	Generation Technician	Plant/Field Operator	Engineer	Support Services	Contractor
Size Impact							
Skills Impact							



#### **Energy Generation Transformation**

Over the past decade, the shift to cleaner sources of energy generation has dramatically changed the energy industry landscape. Advancements in renewable energy, energy efficiency, and energy storage, coupled with the implementation of smart technologies, are driving this transformation of energy generation. Customer expectations for cleaner energy sources and the ability to connect customer sited generation from remote renewable sources, both large and small, have changed the game for energy companies.

Utilities are making significant investments to transition to a cleaner energy mix by expanding the use of gas, hydro, and renewable generation sources, and by improving energy efficiency. This move to reduce the use of carbon-based fuels is driving new construction, coal plant retirements and retrofits, and reinforces the industry's commitment to provide safe, reliable, clean, and affordable energy.

While regional differences still exist, this national shift to a more distributed and decentralized energy generation model has had similar impacts on the workforce. Positions that were once exclusively inside traditional utilities may now be part of a customer workforce or part of the utilities' new supply chain (no longer only materials or labor but generation and services as well).

#### Workforce Impact

Engineers, Generation Technicians, and Plant/Field Operators are most impacted by the Energy Generation Transformation. As older plants close, and new generation facilities are built, skill requirements, workforce size, and geography must all be considered for degree of impact.

Construction of new generation will have impacts for Engineers and Contractors, as well as for Generation Technicians and Plant/Field Operators to operate and maintain the new plants. Distributed generation will also have some impact on transmission and distribution for new distribution assets to aggregate the energy.

The industry has seen a significant number of plant closings to date, and more closings of both coal and nuclear plants are planned. CEWD's survey data has shown that generation employees in particular have not retired at the same rate as other job categories. Companies are now reporting an uptick in retirements as plants close, meaning fewer employees that are displaced. Incumbent employees are being retrained and redeployed, although there may not be a direct deployment of workers to other types of generation.

The closure of nuclear power plants and the uncertainty of future closures is having an impact on the size of both the utility and contractor workforces. As skilled nuclear workers from plants that have closed move to positions at other plants, there is a cascading effect on talent pipeline initiatives.

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Size Impact							
Skills Impact							

#### **Regulation / Policy Changes**

Federal and state regulatory mandates continue to influence energy companies' priorities and the workforce plans that support them. In this century alone, federal energy policy has seen significant shifts with presidential administrations. Mandates to reduce fossil fuel emissions and increase renewable energy sources have driven workforce reductions and development of extensive retraining and severance programs as fossil plants have been shuttered. Similarly, decommissioning of nuclear plants presents workforce challenges for engineering and technician specialties. But the impacts are localized as individual companies develop their own strategies to address these shifts in policy.

At the national level, administrative action to drive change in workforce policy appears to be gaining momentum. In 2018, the administration issued a report on national apprenticeship expansion and created the National Council for the American Worker, which is intended to ensure that American students and workers have access to affordable, relevant, and innovative education and job training. Additionally, in 2018 the administration reauthorized the Carl D. Perkins Career and Technical Education

Act of 2006 through fiscal year 2023 under a new title, *Strengthening Career and Technical Education for the 21<sup>st</sup> Century Act (Perkins V).* 

The Perkins Act is particularly important in aiding states' abilities to support low-income students from 8<sup>th</sup> grade through postsecondary education, in part through better alignment with other state programs, including the Workforce Innovation and Opportunity Act (WIOA) and Every Student Succeeds Act (ESSA).

While the implications for energy companies of these federally driven efforts aren't fully known at this point, other workforce policy issues are becoming part of the state-level workforce conversation for electric and natural gas utilities and their contractors.



Career Pathways: Although energy is not a national career cluster,

some states have moved to create their own 17<sup>th</sup> career cluster in energy. In some states without a 17<sup>th</sup> career cluster, companies and their education partners are working with state leaders to implement energy career pathways. In those states, students in K–12 and postsecondary education, as well as individuals re-entering the workforce, are finding greater job-specific training opportunities with more direct entry options into electric and gas jobs.

**Sector Partnerships:** Sector partnerships, which convene multiple employers with education, training, labor, and community-based organizations to address the local skill needs of a particular industry, are a proven strategy for helping workers prepare for jobs and helping employers find skilled workers. The number of states with sector partnership policies has increased as states implement WIOA, which requires sector partnerships as a local workforce activity, and requires states to support those local efforts.

**Employment of individuals with criminal records:** According to a recent report by the Council of State Governments, an estimated 70 million people in America have a criminal record. Understanding and addressing these challenges requires the collaboration of employers, workforce development officials, and policy makers at every level of government. While a focus has emerged in many states to protect individuals with criminal records from discriminatory hiring practices, it's unclear whether the industry will take a proactive stance toward hiring individuals with criminal records, given federal security requirements and other regulatory issues.



**Employment of veterans:** According to a 2018 report by the Bureau of Labor Statistics, the unemployment rate for veterans who served on active duty in the U.S. Armed Forces at any time since September 2001 had edged down to 4.5 percent in 2017. Veterans remain a much sought-after demographic for the energy industry because military skills often align well to the requirements of our critical jobs. Increasing competition for qualified veterans across multiple industries is driving better state-level workforce planning and heightened outreach to veteran organizations, bases, and individual veterans.

**Employment of individuals with disabilities:** CEWD is seeing examples at the company level of successful recruiting and hiring of individuals with disabilities. One of the most important steps is to address the barriers to employment and recognize, first, the capabilities and qualifications the person brings to the organization, rather than the disability. Much work is underway at the state level to develop new ways to attract and engage this important population.

The impacts and timing of these more local policy issues will vary by state and sector, but each bear watching for workforce implications. Strategic workforce planning can significantly mitigate the financial, knowledge, safety, and timing risks of this and other less predictable Game Changers.

#### Physical / Cyber Security

Securing the nation's energy infrastructure has grown increasingly more complex and critical as physical attacks and cyberattacks have increased globally. The increasing use of intelligent systems and infrastructure has subjected the industry to complex cybersecurity risks. Interconnected devices increase responsiveness, efficiency, performance, and energy management but also increase cyberattack risk.

While it's unlikely that a large number of physical security and cybersecurity jobs are going to be created by the industry, the issue is less about numbers and more about the need for a unique blend of security knowledge and industry-specific expertise. The numbers are small but critical, and include jobs such as Cyber Security Engineers, Analysts, Architects, and Threat Analysts.

Cybersecurity competencies are becoming embedded in jobs from the bottom to the top of the organization. All employees should have some form of IT cybersecurity training, and the level of training on cyber system capabilities increases in positions associated with the generation, transmission, and distribution of energy. This layering of knowledge in every job is much like the layering of cyber defenses in electric and natural gas energy systems and structures.

#### Workforce Impact

Companies may upgrade the skills of some jobs to protect infrastructure or engage external resources. However, the external resources are more likely to be skilled consultants who are focused primarily on security than core utility contractors. Companies are segmenting Information Technology (IT) and Operational Technology (OT) since OT requires different skill sets. Industrial Control Systems, including supervisory control and data acquisition (SCADA) systems, are at the heart of infrastructure modernization and will require increasingly energy-specific skills to keep both the electric and gas infrastructure safe.

Energy companies are also making organization changes that reflect this heightened focus on cybersecurity and physical security by combining organizations.

The impact of physical security and cybersecurity needs is expected to be highest for Engineers and positions in System Operations and Information Technology.

Job Category	Lineworker	T&D Technician	Generation Technician	Plant/Field Operator	Engineer	Support Services	Contractor
Size Impact							
Skills Impact							

#### **Customer Expectations**

The expectations of energy consumers are changing at the speed of technology. As two-way communication between homes, businesses, and energy systems become the norm, customers and their needs are playing a greater role in the design and implementation of everything, from new ways to generate and distribute energy to the way we interact, communicate, and manage the business. The modernization of the electric grid and natural gas infrastructure and implementation of smart metering have led the way to new possibilities for energy companies to bring energy solutions that meet the growing demands of customers who expect access to new services, energy choices, and the ability to manage energy use.

A better definition for customers might be "prosumers," a term used to describe a prospective consumer who is involved in the design, manufacture, or development of a product or service. The customer experience must play a key role as the customer is inserted earlier and earlier into energy processes and decisions. Putting customer needs at the center before, during, and after decisions, or becoming customer-centric, has become a business imperative for energy companies to stay viable in today's changing world.

Not all customers are the same and their needs reflect that, so the need for a diverse workforce is felt here as well. It takes a diversity of experience, background, and demographics to anticipate and understand the diverse needs of today's customers.

#### Workforce Impact

The workforce impact is expected to be felt most in engineering and the management of distributed energy resources, system planning, information technology, marketing, and customer support organizations. For all who engage with customers, there will be a need to increase their understanding of industry energy system fundamentals and the use of advanced technologies.

As an example, the role of the traditional customer service organization moves from transactions and response to customer inquiries, to energy advice and education as customers take on more responsibility for managing their own energy use and have access to the data and apps that help them do it. Artificial intelligence, robotics process automation, and the use of chatbots will help to change the work flow for customer service representatives (CSRs) and will increase the need for analytical skills that can't be programmed. This will, in turn, increase the need for foundational skills like problem solving, critical thinking, and interpersonal communications as routine tasks become automated and more crucial, customer-focused tasks remain.

The workforce impact on Engineers and information technology would appear to mirror the changes reflected with Infrastructure Modernization and Enabling Technologies. The impact on external resources is more likely to be for companies providing skilled consultants (data analysis, data mining, predictive analytics) than for core utility contractors. With customer-facing technology evolving at such a rapid pace, the workforce impact is predicted to be high but specific implications are yet to be seen.

Job Category	Lineworker	T&D Technician	Generation Technician	Plant/Field Operator	Engineer	Support Services	Contractor
Size Impact							
Skills Impact							

#### **Enabling Technologies**

For workforce planning purposes, CEWD defines Enabling Technologies as those that significantly change work flow or processes. Technology is changing at an exponential rate but for some technologies, like upgrades in computer systems and communication devices, the impact is felt as productivity improvements or efficiencies and not as a significant impact on our work and jobs. The speed of technology adoption is driven by leadership and some companies are moving much more aggressively than others.

Enabling technologies can include hardware and equipment, like robots and drones, or software, like artificial intelligence and machine learning, chatbots, robotic process automation (RPA), and blockchain. The challenge is connecting the information gleaned from sources like smart meters, smart sensors, drones, and the connection of distributed energy resources to intelligence that can be used by both equipment and humans in meeting business and customer needs, multiplying the overall impact.

Efficiency and safety are two of the greatest advantages from using drones, and both electric and gas transmission and distribution are seeing benefits. On the electric side, drones are already being used to inspect power lines and substations, shortening outage times and limiting hazardous exposure for Lineworkers, Technicians, and Engineers. On the gas side, drones can be equipped with sophisticated methane sensors to detect gas leaks. Aerial photography by drones can also aid in technical training by providing views of plants, substations, and other equipment not previously available. Drones will become another "tool in the toolbox," reminiscent of adding tablets for planners, technicians, and lineworkers.

Artificial intelligence (AI) and machine learning are the two technologies being used to leverage information coming out of microgrids and distributed generation. Many see AI as an essential component of grid modernization and management moving forward and will significantly enhance the ability to predict outages and to safeguard the grid, ultimately making all the work like this more efficient and workers more effective.

Chatbots and RPA are being used in support services like Human Resources and Customer Service to automate repetitive transactions. Automating the simpler, repetitive tasks frees employees to solve more difficult tasks, which may require additional training.

#### Workforce Impact

For software and devices, the impact is less about workforce reductions and more about workforce reskilling and upskilling. Additionally, the lifespan of new technology is getting shorter and shorter and will require continuous learning capabilities and strong knowledge capture and transfer processes. The workforce impact is primarily on support services including Finance, Information Technology, and Operations Technology, particularly in Demand Management, Infrastructure Management, and Renewable Management. And, again, the external resources are more likely to come from specialized IT consulting firms and supplemental contractors than from core utility contractors.

Higher level technical skill requirements will change based on the technology employed, but foundational competencies like critical thinking, problem solving, and the ability to learn become more important as the implementation increases. Overall, the jobs that appear to be most affected by enabling technologies like robots, chatbots, and drones are in customer service, corporate support services, system operations, and technicians (lineworker, other T&D). These advances in technology will favor workers who are tech-savvy, willing and able to learn new systems, and comfortable with the demands of data management. The younger generation is at a distinct advantage as they have never really known a world without technology.

Job Category	Lineworker	T&D Technician	Generation Technician	Plant/Field Operator	Engineer	Support Services	Contractor
Size Impact							
Skills Impact							

#### **Internal Game Changers**

#### **Transitioning Workforce**

The Electric and Natural Gas Utility industry workforce has changed significantly over the last decade but is benefiting from more than a decade of workforce initiatives to develop and hire workers into critical jobs. As industry hiring has increased and retirements have begun to stabilize, a younger and more diverse workforce is facing the need for a higher level of skills than ever before. This transformation will drive strategic change in everything from education to recruiting, hiring, and retention.

Although retirements have been a major Game Changer for the energy workforce in the past, CEWD's 2017 Gaps in the Energy Workforce 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 validates the trend toward "normal" retirement rates for the industry.

"Millennials make up almost 30% of the overall utility workforce and 40% of the engineering and lineworker positions." Millennials make up almost 30% of the overall utility workforce and 40% of the engineering and lineworker positions. A key change believed to be driven by this younger workforce is the increase in non-retirement attrition, particularly among those with fewer than five years of service. Studies of millennials in the workplace indicate they are less hesitant to change jobs than their older counterparts. In an industry where it takes years to become fully competent in highly skilled jobs, and in a country where the current unemployment rate is below

4%, companies must rethink their employment value propositions in order to attract and retain new employees and effectively transfer the knowledge of those who leave. Coupled with employee retention efforts, companies will need to use both policy and technology solutions to capture and provide access to critical knowledge when needed.

The energy workforce is also becoming increasingly diverse. Veterans make up about 11% of survey respondents' current workforce, which is an increase from 8% in 2014, the first year CEWD surveyed participants on veterans. Similarly, minorities have increased from 22 to 26% of the workforce, reflecting an increased focus on diversity and inclusion efforts. However, the percentage of women in the utility workforce has shown only a slight increase from previous surveys and, at 24%, reflects half of the national percentage of women in the U.S. workforce.

#### Workforce Impact

CEWD's 2017 Gaps in the Energy Workforce Survey shows the overall size of the utilities workforce has decreased since the last survey, with the number of key jobs remaining fairly stable. The decreases can be accounted for in corporate support and other types of jobs. When viewing the energy workforce as a whole, however, there are indications that the utility contractor workforce is growing. The contractors who supply supplemental labor for the industry are an integral part of the energy workforce, particularly for key jobs. More work must be done to fully quantify the impact of the contractor workforce on the demand for key jobs.

The potential loss of knowledge through attrition, as well as the need for retraining, upskilling, and continuous learning, impacts all jobs categories. Internal training and technical training organizations will need to expand the use of technology to train employees on subjects from cybersecurity to automation and developing customer solutions.

Job Category	Lineworker	T&D Technician	Generation Technician	Plant/Field Operator	Engineer	Support Services	Contractor
Size Impact							
Skills Impact							

#### **Business / Work Restructuring**

Mergers among energy companies and acquisitions of businesses that complement or broaden an energy company's portfolio continue to drive significant changes internally. If the merger or acquisition includes expansion of geographic service territory, workforce impacts may be larger for corporate functions than for Key Jobs.

As technology is implemented, work process, organization design, as well as work policies and practices must be analyzed as well. These changes will have an impact not only on Key Jobs but on support workers as well.

#### Strategic Workforce Focus

Strategic business decisions may have profound changes on a company's workforce size, demographic makeup, skill sets, and knowledge requirements. Those decisions can encompass a focus on increased diversity, veteran hiring, insourcing previously outsourced talent, centralizing, de-centralizing, combining organization functions, or improving efficiency.

At the national level, the industry's commitment to train, hire, and retain military veterans (Troops to Energy Jobs) is having a real impact on company practices. In addition, the national industry focus on improving diversity and inclusion is driving education and workforce decisions.

Some Strategic Workforce decisions, like outsourcing or insourcing a particular job category, may have an impact on the size and the source of the workforce. But more than likely, they will impact the demographics or distribution of the workforce (for example, awarding work previously done internally to a supplemental labor contractor or hiring military veterans rather than community college graduates).



#### Affordability

Balancing workforce needs with reductions in labor budgets is a critical issue for companies as both internal and external cost pressures continue in the industry. External drivers, like those already mentioned, drive company priorities and, subsequently, budgets. Each company must determine what it can afford in the way of workforce strategy. The issue of affordability is apparent when companies make "build, buy, or borrow" decisions and, more recently, technology solution decisions in addressing workforce needs.

Affordability goes hand-in-hand with Strategic Workforce Focus as energy companies find ways to perform work more efficiently. As an example, individual municipal utilities may not have the resources to hire full-time talent in some areas, so groups of public power utilities have formed Joint Action Agencies to share workers between companies, or to provide specialized services. The agencies function less like contractors and more like centralized corporate services departments in larger energy companies.



Job Category	Lineworker	T&D Technician	Generation Technician	Plant/Field Operator	Engineer	Support Services	Contractor				
	Infrastructure Modernization										
Size Impact											
Skills Impact											
Energy Generation Transformation											
Size Impact											
Skills Impact											
	Physical / Cyber Security										
Size Impact											
Skills Impact											
			Customer E	xpectations							
Size Impact											
Skills Impact											
			Enabling 1	echnology							
Size Impact											
Skills Impact											
			Transitionin	g Workforce							
Size Impact											
Skills Impact											

#### The Industry Response

Over the past 12 years, the Electric and Natural Gas Utility Industry has been actively engaged in the development of critical talent pipelines to address the transforming demographics and business needs of the industry. In 2006, the industry united to form the Center for Energy Workforce Development (CEWD), whose members now include all five major utility trade associations (Edison Electric Institute, American Gas Association, Nuclear Energy Institute, National Rural Electric Cooperative Association, and American Public Power Association) and the Distribution Contractors Association; most of the electric and natural gas utilities across the country; supplemental labor contractors; unions (IBEW and UWUA); and partners in the effort, including educational institutions and government entities.

Up to this point, the industry has focused on four key talent pipelines—Lineworkers, Technicians, Plant/ Field Operators, and Engineers—and has built partnerships at the local, state, and national level to implement these pipelines. Each of these talent pipelines has different educational requirements but are built on a common process. The process starts with the definition of talent needs, including workforce demand and competencies, and then moves to career awareness and navigation, defined educational pathways and supply channels, and the development of partnerships for each step. Most recently, with the focus on supplemental labor contractors, CEWD has begun to adapt these processes to meet the needs of energy contractors.

A sustainable talent pipeline must be flexible to workforce demands, adaptable to changing skill

needs, and nimble enough to reflect the pace of business change regardless of location, demographics, or policy. The key to building these sustainable pipelines is partnership, and the partnerships must include energy companies, educators, government entities, unions, contractors, and policy makers. Through CEWD, the industry has built State Energy Workforce Consortia across the country to identify the specific needs within their state and region, partner with educational providers from elementary to university levels, and to develop diverse, qualified talent pools that meet the needs of utilities across the state.

In addition, CEWD has built an arsenal of tools, templates, and processes to enable member companies and state consortia to save time and money in the development, implementation, and sustainment of talent pipelines. The CEWD national network of employers, educators, and alliances learn from each other and from "A sustainable talent pipeline must be flexible to workforce demands, adaptable to changing skill needs, and nimble enough to reflect the pace of business change regardless of location, demographics, or policy."

the best practices in the industry. Some of the resources available include:

- A Strategic Workforce Planning Process to define needs and to balance supply and demand requirements.
- Get Into Energy: A common career awareness brand and campaign that covers five specific demographics—youth, engineers, military, women, and transitioning workers—and career pathways models that define the path from awareness to employment.
- Troops to Energy Jobs: A roadmap for military veterans and a national template for attracting, hiring, and retaining veterans in the energy industry.
- Competency models that define skills, knowledge, and abilities for each of the talent pipelines, curriculum, and the National Energy Education Network of partnered educational institutions.
- Diversity and Inclusion resources that include a playbook on implementation strategies, assessments, and best practices.
- Staff and consultant support for individual company and consortia workforce development efforts.
- Web resources, convenings, communication channels, research and data, and communities of practice.

## We All Have a Role: Companies, Educators, Associations, and CEWD

#### What Companies Can Do:

- Make it easier for students and jobseekers to find us, understand our jobs, and learn what education pathways in your region will lead to an energy job.
- Signal to students, jobseekers, and educators which credentials are required, preferred, and recognized by employers in your state, and are being used in hiring decisions.
- Develop partnerships with other employers and educators to engage students from interest through employment.



#### What Educators Can Do:

- Organize and educate within your company to communicate strategies, initiatives, policies, and funding and align company personnel, systems, policies, and practices to support the needs of diverse, qualified applicants.
- Provide data on the timing and demand for jobs in your company and feedback to educators and pipeline organizations on the quality of hires from their organizations.
- Conduct bootcamps at every stage of the pathway for concentrated skill development.
- Accelerate the time it takes a student to earn his/her credential by recognizing prior training.
- Focus on the common denominator, by organizing programs of study around core essentials first and then technical competencies.
- Bundle curriculum with transferable certificates and stackable credentials that integrate industryrecognized credentials into energy programs of study.
- Provide industry partners with supply data on students in the pipeline.

#### What State Energy Workforce Consortia Can Do:

- Develop and maintain a state energy workforce plan to steer industry-led workforce efforts.
- Build state awareness of the need for a skilled energy workforce and awareness of energy careers among targeted populations.
- Implement core curriculum across schools to enable easier transfer of credits and faster graduation of students with needed skills.
- Focus on shared initiatives and education solutions that meet the common needs of consortia members rather than individual companies. Examples include boot camps, career awareness, and data collection.
- Assess the impact of energy workforce needs on the state's workforce and education policy and communicate to consortium members and partners.
- Create mutually beneficial alliances with organizations that support and advance the consortium's initiatives.
- Maintain the consortium as a self-sustaining operating structure that includes governance, management, and financial processes.

#### What CEWD Member Associations Can Do:

- Convene: Use member convenings to engage associated organizations and ensure there is alignment, integration, and a shared understanding of industry workforce issues and what is needed to address them.
- Advocate: Be advocates for industry workforce efforts and policy issues at both the company and the national government level.
- Communicate: Ensure a vocal presence in the Nation's Capital for energy industry workforce issues; share workforce successes within the industry; create integrated teams of legislative and communications representatives.
- Provide heightened focus on employee processes and systems that are most critical to workforce development and knowledge transfer, including human resources policy, compensation and benefits practices, and succession planning.

#### What CEWD Will Continue to Do:

Build the alliances, processes, and tools to:

- Ensure companies and state energy workforce consortia are equipped to develop sustainable workforce plans that balance the supply and demand for a qualified and diverse energy workforce.
- Create awareness among students, parents, educators, and non-traditional workers of the critical need for a skilled energy workforce and the opportunities for education that can lead to entry-level employment.
- Implement clearly defined education solutions that link industry-recognized competencies and credentials to employment opportunities and advancement in the energy industry.
- Organize the energy industry workforce development efforts to maximize the effectiveness of national, state, and individual company initiatives.

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.

701 Pennsylvania Ave., NW, Washington, DC 20004-2696 • 202-638-5802
<u>www.cewd.org</u> <u>www.getintoenergy.com</u>
For information, please contact us at staff@cewd.org.



October 2018