



2023 Energy Workforce Survey Results

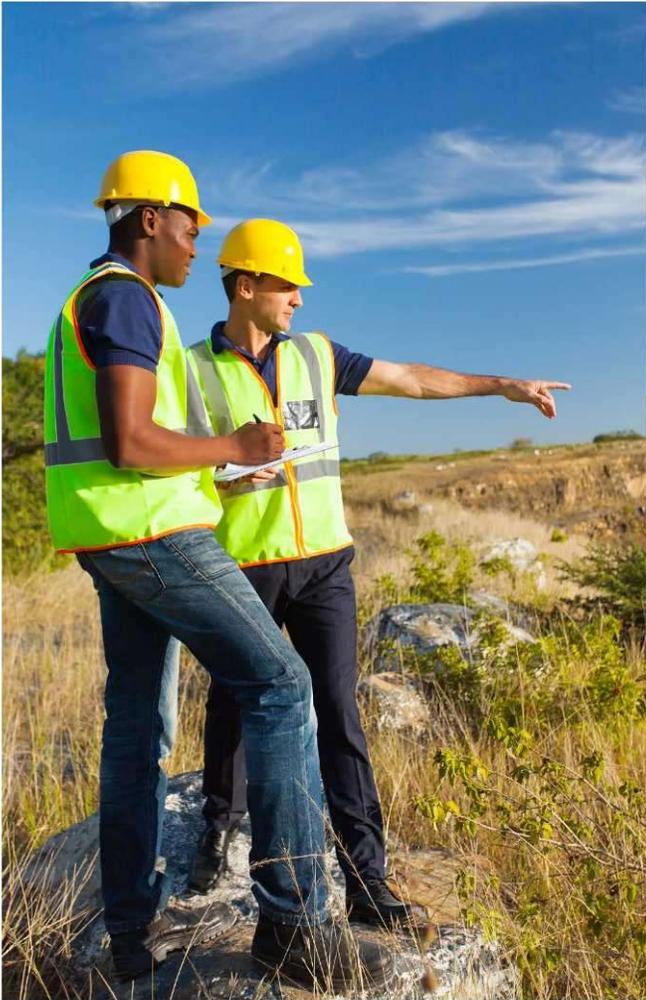
Executive Summary



Center for
Energy Workforce
Development

Developed in
partnership with:


scottmadden
MANAGEMENT CONSULTANTS



OVERVIEW

In 2023, the Center for Energy Workforce Development (CEWD) conducted the tenth Energy Workforce Survey. This survey has been conducted bi-annually since 2006 to explore trends in the size of the energy workforce, demographic composition, forecasted retirements, and attrition data to support industry companies with their strategic workforce planning.

Early cycles of the survey showed an aging workforce and the potential for significant retirements in the 10 years following that research. Coupled with a lack of younger workers and skilled labor ready to step into those roles, these forecasts compelled the CEWD strategic mission to build talent supply pathways for critical jobs in partnership with energy companies, educators, and other community entities. In the most recent surveys, results show that the workforce has stabilized, suggesting focus may now turn to the composition of the workforce in terms of skills and diversity, as well as improving retention of existing energy workers.

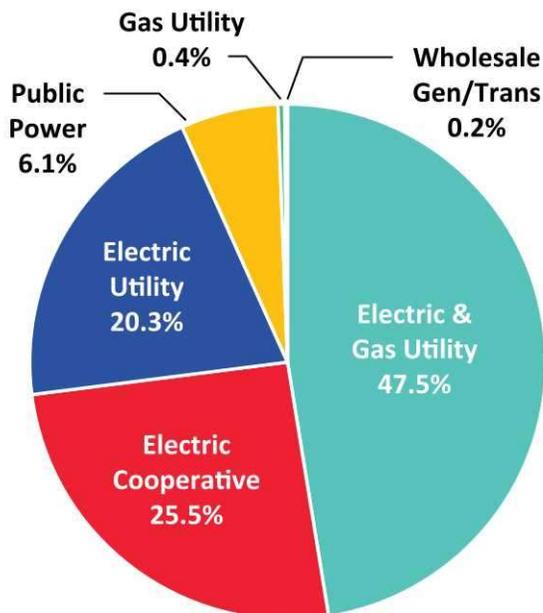
Forty-one utility companies participated in this survey cycle, representing almost 315,000 jobs, an increase of 1.1% from the 2021 survey cycle. The sample represents well over half (~56%) of all utility jobs in the U.S.¹, and the size of the sample is sufficiently large to allow for inferences and observations about the industry as a whole (while also being cautious in analyzing trends that may be a reflection of the changing make-up of survey participants). As depicted in the graphic below, the largest category represented is combination electric and gas utilities, followed by electric cooperatives and electric utilities.

As in previous surveys, CEWD focused the 2023 analysis on four key job categories: Lineworkers, Technicians, Plant/Field Operators, and Engineers. In addition, we continued to track Emerging Technology jobs (which now includes data scientists, as well as solar, wind, storage, and electric vehicle (EV) engineers and technicians) as a separate category that was added in 2021.

The five key job categories included in the data analysis, now comprise 40% of the total utility workforce, up from 32% in 2021, and are critical for the generation, transmission and distribution of electricity and natural gas across the country. Of the remaining 60% non-key jobs, 37% are corporate services jobs, including Human Resources, Customer Service, Finance, Information Technology, as well as other occupations essential for the sector. The remaining 23% of all jobs are not allocated to the corporate services categories, and they are not included in the key jobs as defined by the survey.

The survey findings are based on the responses from electric and natural gas energy companies. The data provided by participating companies included information on age, years of service, hires and attrition, along with information on the diversity and veteran composition of the workforce. See the end of this report for additional information on the Survey Methodology and survey process improvement efforts.

Survey Sample Composition by Industry Sector



KEY FINDINGS SUMMARY

The analysis of the survey results shows 4 key findings, which are highlighted below.

Emerging Technology Jobs Show Significant Growth

While still a relatively small portion of the overall workforce, emerging technology jobs show significant growth, potentially requiring recruitment and retraining.

New Challenge of Developing a Younger Workforce

The aging workforce "gap" of years past has largely been addressed and replaced with a new challenge of developing a younger workforce.

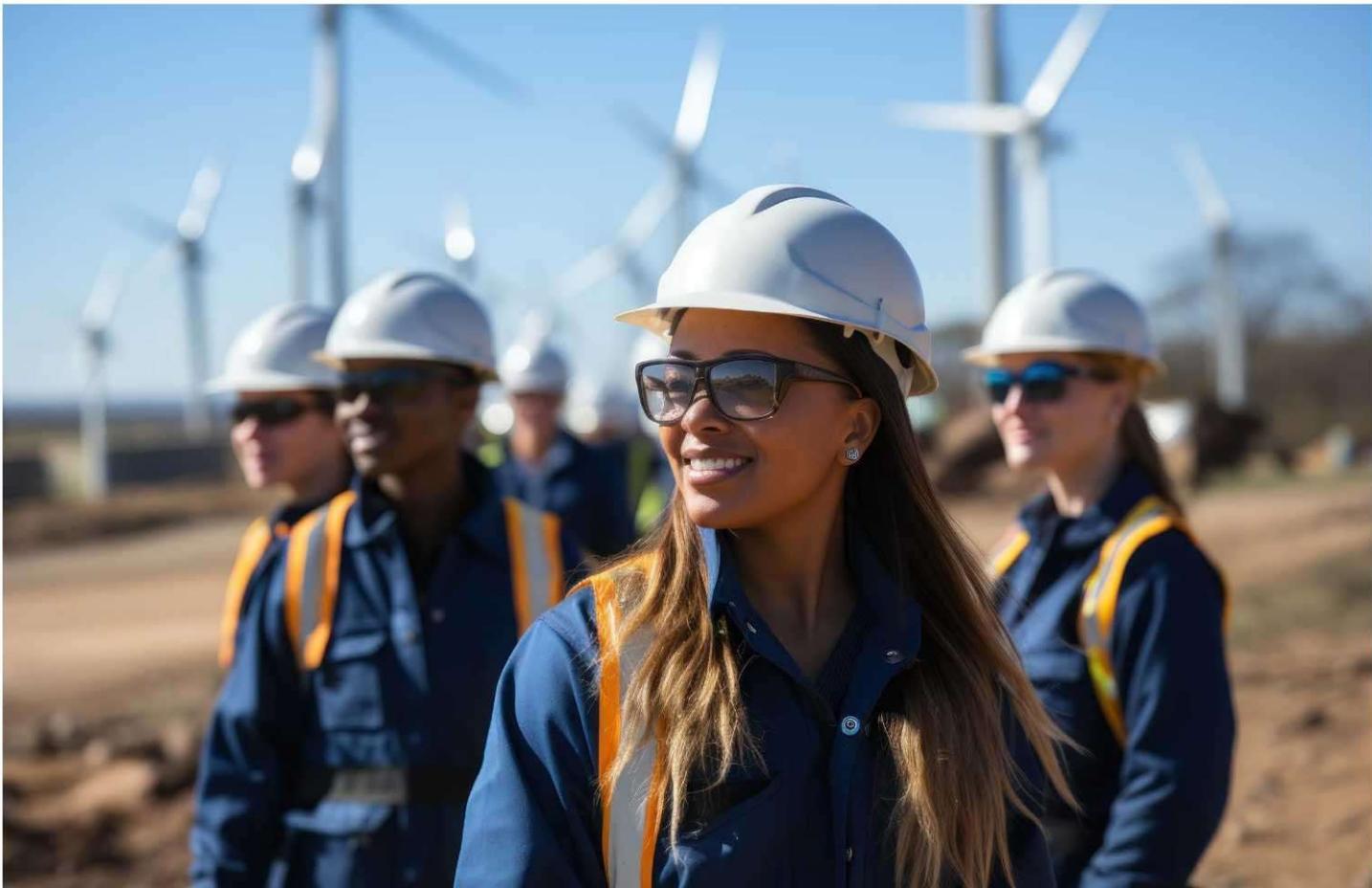


Non-retirement Attrition is Higher Post-COVID

Most recent data suggests a "new normal" post-COVID in which non-retirement attrition is higher.

Relatively High Adoption of DE&I Practices

Participants showed relatively high adoption of DE&I practices. This year's survey provides a baseline of diversity data.



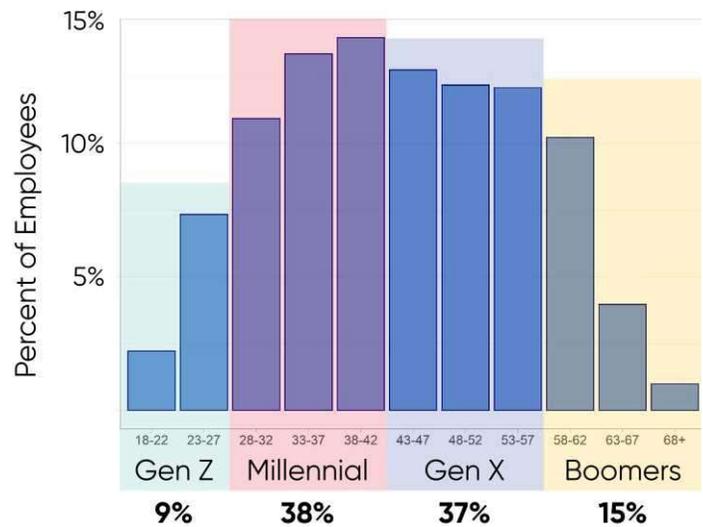


KEY FINDING #1: AGING WORKFORCE AND RETIREMENTS

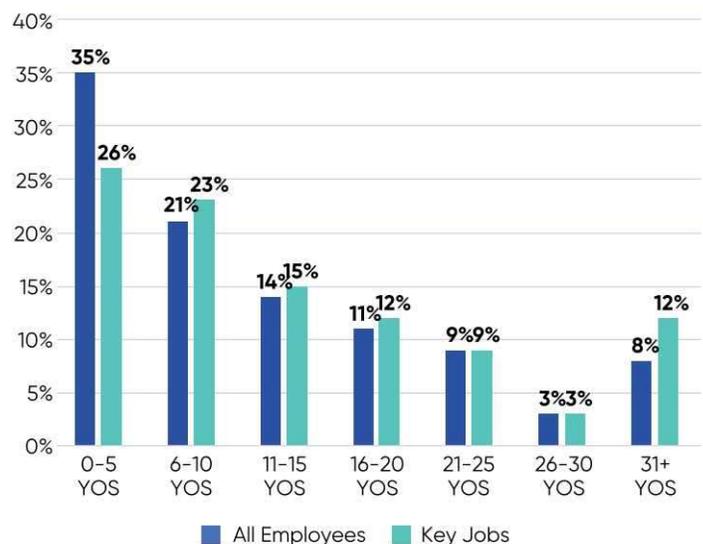
Since 2006, when CEWD first began to measure workforce age, the industry has seen a consistent progression towards a younger workforce. Efforts the industry has undertaken related to energy education pathways in high schools, community colleges and universities, appear to have had an impact on increasing the talent pool for these high-skill positions. Indeed, the “gap” in the workforce that was once the namesake of this report (i.e., the lack of younger employees prepared to backfill for an expected surge in retirees) has largely been filled. Today, Millennials represent the largest category of current industry employment by generation.

However, this dramatic transformation of the make-up of the workforce may present its own challenges, including higher percentages of younger and less experienced employees. Survey data shows that 56% of workers overall have less than 10 years of service. This number is even higher in certain key job categories. Engineers and line workers were both above 60%. **To address this trend, the industry will need to redirect some of its focus from recruitment to training, mentorship, and other programs to develop its younger, less experienced workforce.**

Percent of All Employees by Age Group



Percent of Employees by Years of Service



IMPLICATIONS FOR WORKFORCE PLANNING

- 56% of workers have fewer than 10 years of service, suggesting that many aging workers with lengthy experience have already been replaced by newer workers
- Workforce planning efforts may need to include recruitment, as well as training and mentorship going forward



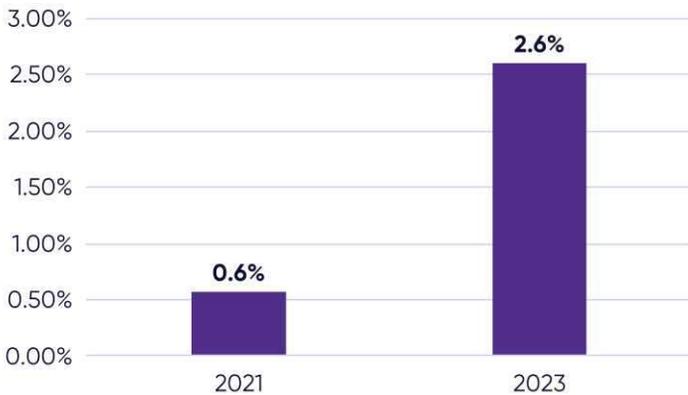
KEY FINDING #2: GROWTH IN EMERGING TECHNOLOGY JOBS

The 2023 Survey was the second cycle where we collected data on Emerging Technology jobs and early trends suggest it is a significant growth area. The survey defines Emerging Technology jobs as positions involved in the generation and distribution of electrical energy generated by renewable means, advanced metering, advanced utility or utility of the future, the development of advanced statistical models, machine learning models, artificial intelligence applications, and electric vehicle fleet management and maintenance.

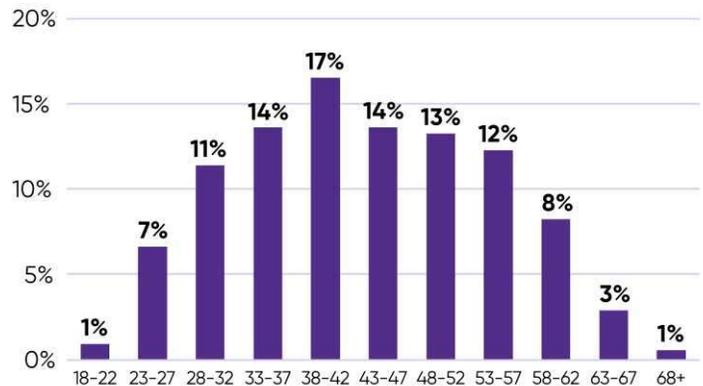
Though the overall number of these jobs is still a relatively small percentage of the total (2.6%), it has increased sharply, growing ~4x from 2021 to 2023.

We broke this segment down further to look at the age distribution of employees and the most common job titles. The age distribution in these jobs – with a significant portion in mid- to late-career age ranges – suggests that people with experience are moving into these emerging tech roles and they are not just being filled by younger workers. As illustrated in the graphic below, the highest percentage of emerging tech employees is found in the 38-42 age category.

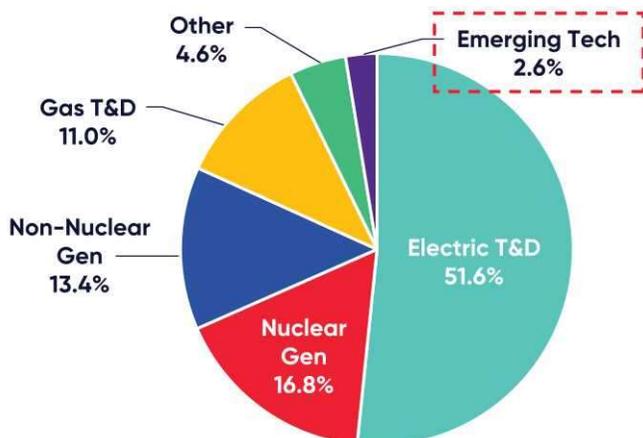
Emerging Tech Jobs - 2021 vs. 2023



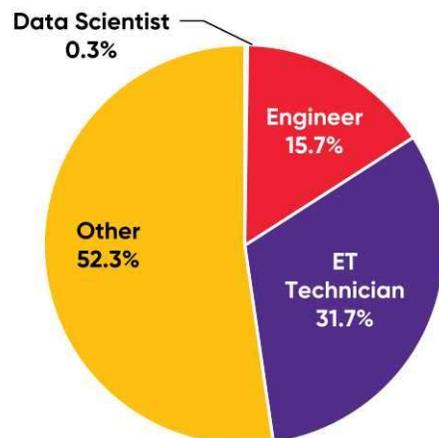
Percent of Emerging Technology Employees by Age



Emerging Tech vs. Other Areas



Emerging Technology Jobs





What are the implications for workforce planning? The changing generation mix and decarbonization trends will very likely result in a continued decline in existing generation jobs. Some of these jobs may be repurposed as retiring coal plants are converted to natural gas or other purposes (e.g., solar plus storage, small modular nuclear reactors).

At the same time, the energy transition is expected to require a significant number of new Emerging Technology jobs, which could more than offset declines elsewhere. Examples of projects requiring these new jobs include:

- Construction and operations of utility scale solar and wind projects
- Electric vehicle infrastructure development and construction
- Building and refining novel analyses of Automated Meter Infrastructure (AMI) data

To the extent utilities choose to build these capabilities in-house, this transition will require careful management of the workforce changes and a focus on programs to retrain and reskill displaced workers to be able to perform new energy jobs. Retraining will be key given competition for these workers from non-utilities and broader workforce shortages.

IMPLICATIONS FOR WORKFORCE PLANNING

- Energy Transition and decarbonization trends will result in the loss of fossil fuel jobs
- It will also create many new jobs in renewable energy
- The net effect of these trends looks positive, but new roles may lag behind and will require workforce management
- Various studies have highlighted the opportunity to retrain and reskill displaced workers for future energy jobs (e.g., coal-to-small modular nuclear reactor transitions)

KEY FINDING #3: NEW NORMAL POST-COVID

The 2023 survey is the second to be conducted since the start of the COVID-19 pandemic and the first opportunity to analyze its potential lasting impacts on the energy workforce.

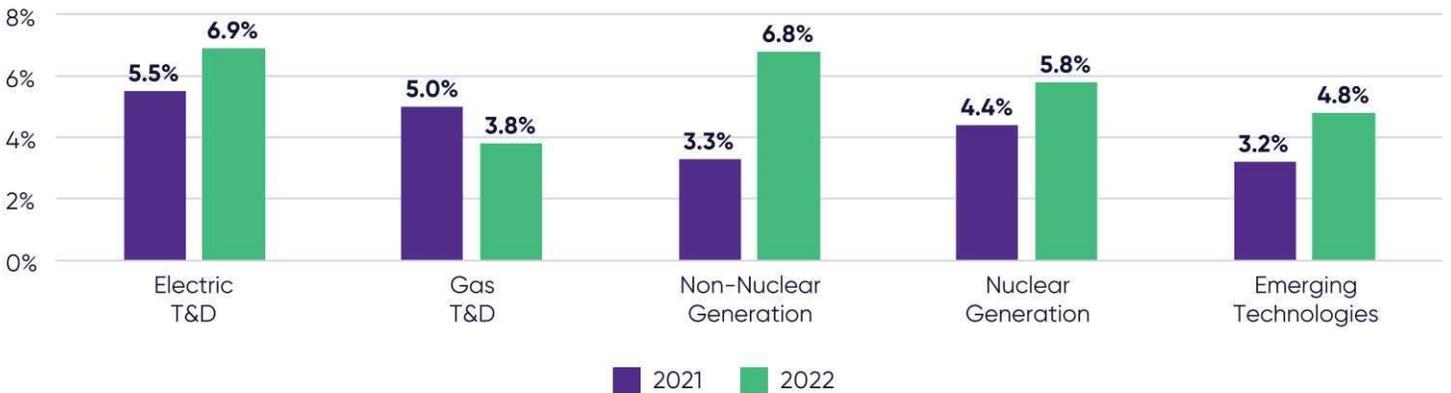
The graphic below shows both retirement (in red) and non-retirement attrition (in blue) along with total hires (represented by the line) dating back to 2008. This data shows that both non-retirement attrition and total attrition have increased significantly the last two years and in 2022 hit their highest levels since the survey began. Hires to replace those workers are also at an all-time high. This follows a dip in these metrics in 2020 in the midst of the pandemic and the uncertainty it brought.

Total Attrition vs. Total Hires - All Companies



The chart below breaks down non-retirement attrition by function. Non-nuclear generation was the function with the sharpest increase from 2021 to 2022. Apart from Gas T&D, all other functions experienced an increase in 2022.

Non-Retirement Attrition by Function



We will continue to monitor this data in future cycles. It is too early to determine if these elevated levels of attrition reflect a new normal post-COVID or if they indicate some natural adjustments after a period of very low turnover during the height of COVID. **If this turns out to be a lasting trend, the industry will need to further increase focus on or improve retention efforts and programs to encourage workers to build long-term careers in energy.**

IMPLICATIONS FOR WORKFORCE PLANNING

- Training is becoming a vital tool for utilities to fill gaps in skills
- New ways of working may enable recruiting talent outside of geographical market
- Some degree of flexibility may need to be offered in order to attract and retain talent
- Employee expectations may require that utilities place more emphasis on health and wellness



KEY FINDING #4: TRENDS IN DIVERSITY, EQUITY & INCLUSION

The 2023 Survey represents the first effort to collect and analyze demographic data and information on DE&I policy adoption, and this additional scope was incorporated to inform CEWD's DE&I Roadmap for Change². Participating companies were asked to report their adoption of 13 different DE&I practices with four choices ranging from "currently in place" to "no plans to implement." As depicted in the graphic below, we saw favorable adoption with nine of these practices currently in place at 75% or more of participating organizations. The areas with the highest adoption relate to having established strategies and goals as well as programs for attracting diverse talent. Areas with lowest adoption relate to board training and incorporating DE&I goals into performance evaluations and executive pay plans.



We also looked at differences across types of organizations, and adoption of DE&I practices is generally higher among:

- Larger companies (having more than 2,500 employees)
- Those companies with nuclear operations vs. those without, and
- Companies that reported having an established DE&I leader

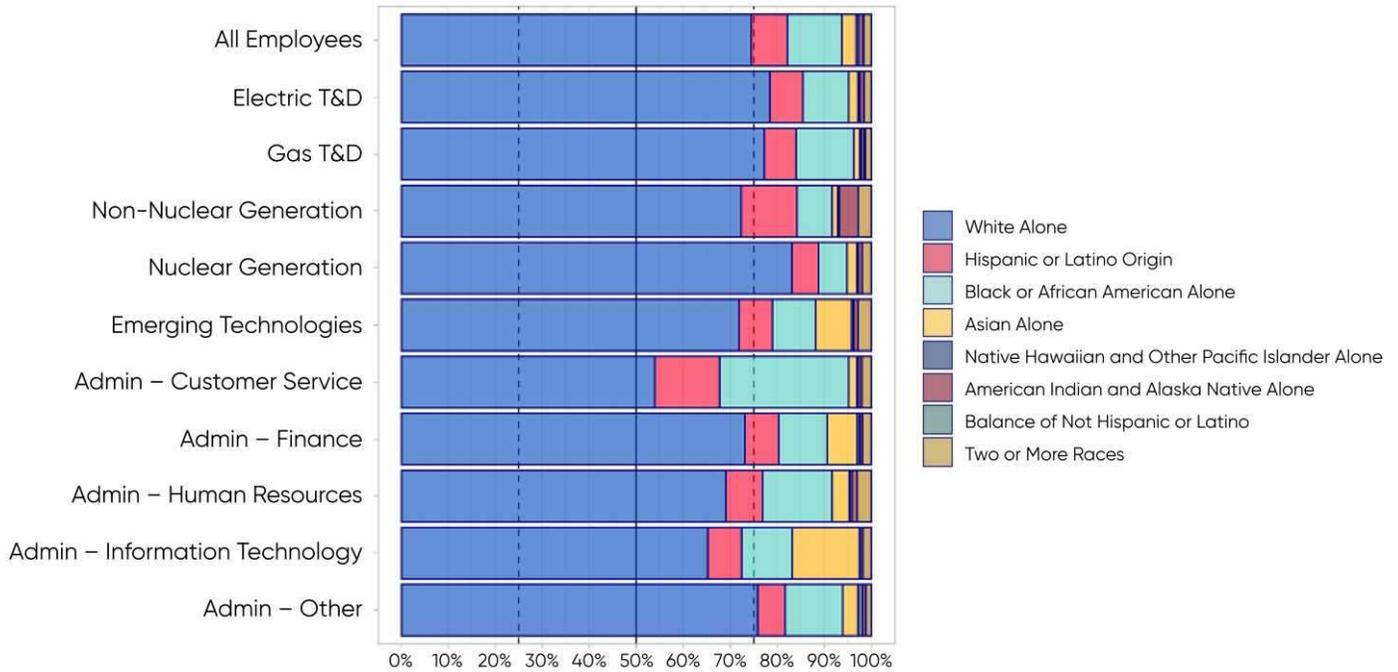
We observed some trends in the diversity of the workforce in the 2023 Survey:

- 25% of the workforce is female, up from 22% in 2021, when we had seen a significant dip (likely due in large part to the pandemic)
- 23% of the workforce identifies as a racial and/or ethnic identity, down slightly from 24% in 2021
- Veterans represent 11% of the workforce in 2023, up from 8% in the 2021 study

Data was collected on employees with differing abilities for the first time in the 2023 Survey. They represent 5% of the workforce in 2023, and this data will be tracked for trending going forward.

The graphic below depicts the overall view of ethnicity by functional area, where we saw a lot of variation in diversity by function and company type. Customer service had by far the most non-white employees (almost 50%), followed by Information Technology, Human Resources and Emerging Technologies. Nuclear had the least diverse workforce followed by Electric T&D, Gas T&D, and Admin – Other (all of which were less than 25% non-white employees).

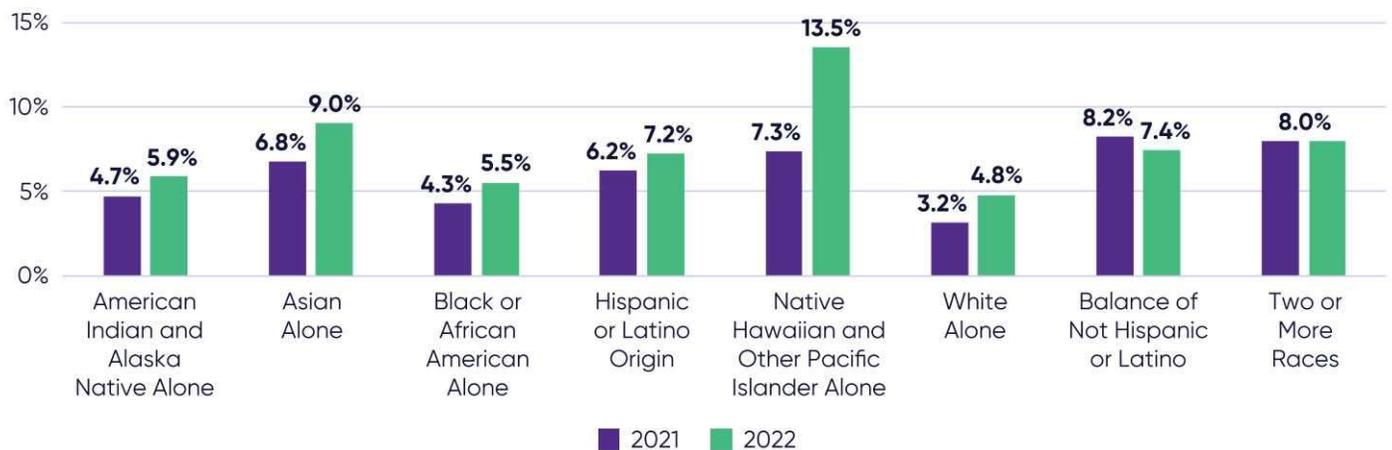
Ethnicity Breakdown by Org - All Companies



Non-white employees make up a higher percentage of both younger age groups (i.e., more than 25% of all age groups 52 and younger) and groups with fewer years of service. This could reflect the effects of recent diversity recruiting efforts.

We also examined retention to see if it may be a contributing factor in any of these observations, and we do see some evidence that non-retirement attrition is higher among non-white ethnicities. As depicted in the graphic below, white alone and black ethnicities had the lowest non-retirement attrition while other ethnicities were higher.

Non-Retirement Attrition by Ethnicity



So, while diverse hiring practices seem to be making an impact, this data highlights the potential need for programs and concerted organizational effort focused on retention. A combined focus on hiring and retention shows promise for creating a more diverse workforce that better represents the communities that utilities serve.

As this is the first year of tracking DE&I information, this data provides a baseline for future measurement. Subsequent surveys will allow for further trending analysis and observations on how well the industry is achieving its DE&I objectives.



SURVEY METHODOLOGY

In 2022, CEWD engaged ScottMadden, Inc. (ScottMadden) to administer the survey for the next three survey cycles and to update and improve the data collection process. The new process was rolled out to all participants in 2023. Unlike prior years, when participants were required fill out a complex Excel model, categorizing and counting their positions, hires, and attrition to align with the CEWD job categories, the new process is much simpler for participants and less prone to errors. Participants provided an extract of all company positions from the Human Resource Information Systems (HRIS), with all sensitive personally identifiable data removed, and to fill out a file that mapped their business units and jobs to the CEWD business units and job categories.

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 (NRECA). Nuclear companies outside of CEWD were also invited to complete the survey, thanks to support from the Nuclear Energy Institute (NEI).

The survey was administered by CEWD and ScottMadden, and all individual company data is confidential.

The new streamlined process has many benefits, including enhanced data quality, faster turnaround, and significantly reduced effort on the part of participants. Participating companies were pleased with the new process in 2023, and we are optimistic that the reduced effort in particular will help with recruitment and participation in future cycles.

WORKS CITED

1. Sample size of ~315K jobs in 2023 captured in the survey compared to ~570K total utility jobs in the U.S. per the most recent U.S. Energy and Employment Jobs Report (USEER) from the U.S. Department of Energy
2. More information on CEWD's DE&I Roadmap for Change can be found on CEWD's website at the following address: <https://cewd.org/dei-roadmap-for-change/>



@Center for Energy Workforce Development (CEWD)

The Center for Energy Workforce Development (CEWD) is a non-profit consortium of energy companies, contractors, associations, unions, educators, and business partners working together to ensure a skilled, diverse workforce pipeline to meet future industry needs.

CEWD is grateful for the engagement of its national association partners including the American Gas Association, American Public Gas Association, American Public Power Association, Association of Energy Service Providers, Distribution Contractors Association, Edison Electric Institute, Electric Power Research Institute, National Rural Electric Cooperative Association, and the Nuclear Energy Institute.

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