Clean Energy Workforce Training Gaps Summary/2022

The following energy workforce training gaps analysis includes a culmination of one-on-one interviews with industry, and feedback from events, such as the *Washington Workforce Energy Convening Summit* - hosted by CleanTech Alliance, the PNW Center of Excellence for Clean Energy, and PNNL (June 30, 2022*). The following comments are made by industry representatives working throughout the state of Washington.

PRIORITIES & TIMELINES Utilities are rapidly adjusting to new goals, finding a new equilibrium in meeting state/federal initiatives, maintaining compliance with federal requirements, recruiting and developing a diverse workforce – while keeping electricity affordable, reliable and sustainable.

- Industry finds itself striving to accomplish more with less capacity (fewer employees/same budgets), which can cause a level of burnout.
- Budget shifting to cover increased equipment and capital expenses to meet initiatives. Some are hiring critical staff only.
- Structures are getting old. Dams will need to be repaired. Controls need to be updated. Safety is important.
- Initiatives to de-carbonize hard to reach sectors outlined in the Clean Energy Transformation Act and the Clean Buildings Act – leads to increasing demand of clean energy, while decreasing supply of energy generation.
    - 2023 update: the price of purchasing renewable energy has doubled in the last year making it more expensive for clean-energy start-ups. Competition within the state and California is driving the cost of renewable power higher.
    - Changing dynamics of carbon and fossil fuels. What does the workforce look like as some utilities work and serve customers inside and outside of Washington? There are different regulations/initiatives in each state.
- Clean energy is a platform that clean technology entities build upon. What is the impact of our utility business model as the grid evolves to include EV, smart grids, microgrids, more electrification? How does that shift the workforce? Look at it as a role of an enabler instead of a conduit.

RE-DISTRIBUTION OF THE WORKFORCE This sector is experiencing higher than usual attrition for a variety of reasons: higher pay elsewhere, remote work options, early retirement, early burnouts due to increased workloads, and spouse promotion/relocation.

- Retention is a multi-faceted space. One dimension is competition within industry. Mostly unregulated as to who can pay higher wages.
- The landscape is a lot more competitive with a lot more companies, and there's an increase in volume both regionally and nationally. All utilities are hiring similar positions.
- Outside of craft positions, new roles continue to evolve.
- Workforce priority shifts - to increase work-life balance.
    - Apprenticeship/pre-apprenticeship program: Used to get well over 500 applicants. Would test 150-200 with an 80% pass rate. Interview around 100 people. This last round, we had 130 applicants; tested 40. People weren't taking it seriously. Five no-shows. Final list of 29. It has been a challenge to get people interested. People are pickier now, don't want to move for opportunities.

* *Washington Workforce Energy Convening Summit Full recording: June 30, 2022- Energy Workforce Event Recording on Vimeo).*

CHRONIC SKILLED LABOR SHORTAGE in some occupations. Examples:

- Experienced lineman applicant pool - utilities frequently hire from other utilities vs. from a pool of available experienced applicants – which is difficult for smaller utilities and smaller budgets.
- Computer and cybersecurity technicians - utilities compete with large technology companies for highly qualified candidates. Companies such as Microsoft and Amazon pay higher wages.
- Same is true for accountants, data analytics, HR representatives and other roles found in big businesses – there seems to be a shortage of qualified applicants due to increased competition.
- More needs than apprenticeships to fill them. Utilities cannot extend staff to train more than one apprentice at a time. Some positions require years of training.
- Utilities have had problems with more technical positions in all engineering fields; and getting people to understand dams and how they react to seismic loads and water movement through structures (civil engineering).
- **Forecasted positions needed in five years**: Integrating and providing mapping/reporting outages. GIS analyst with IT background; Cybersecurity Operation Technician; data management/science, distribution planning, and grid management at large. Transmission and distribution planners/engineers. Grid products and services; high-level outreach customer service (community outreach has not been prioritized); automation and digitization of our systems – need to have a workforce to support it.
- Engineers of tomorrow are different and will need different skills than the engineers of yesterday.

DIVERSITY This sector's demographics continue to be overwhelmingly white and male. While there have been some gains in diversity in specific occupations; overall, the industry needs to continue diversifying across the spectrum and at every level (it may take up to five years to see the impact).

- Increase in competition/decrease in energy experience. As more clean tech businesses rise to meet the de-carbonization initiatives, so does competition for similar positions, such as engineers and technicians.
- **Increasing women's participation** in the clean energy workforce has been notoriously difficult. Both training programs and employers have a role to play. Training program coordinators have reported efforts to attract more students from target populations. However, they have long waitlists, which is a higher barrier to those same target populations.
- **New vs Old Generations**: The world and its generations continue to change. There is no right or wrong in the way generations behave. The younger generation prioritizes the things the older generation wanted in life; e.g., work-life balance. We need these groups to work together.
  - Knowledge transfer needs to happen. Older generation thinks younger generation may/may not need information which is vital to learn, succeed and grow. Older generation may find it offensive that younger generation wants to leave at 5 pm, before the job is done. Knowledge transfer of intrinsic knowledge need to be passed along.
  - Gen Z - Different approach to purpose. We do this as our job but want to make a difference in the world. Making the world a better place vs business making a profit. Clean energy is a piece that drives making the world a better place.
  - There is a need to teach students employability skills. What is work? What does it mean to work? What is its value? Establishing self-esteem is becoming part of in-house training programs that hasn't been needed before.
  - There is a lack of drive, work experience, and a willingness to move onto a new job without mastering the old first.
  - The gray wave of retirements will remove many that have multi-year experience and are good problem solvers. New engineers are "school" capable, but few have electric utility "field" experience.

TRAINING The rush to renewables will out-pace the ability to build a workforce.

- N**eed to be sensitive and mindful for lack of training – for years to come**. Due to the pandemic, the workforce is two years behind in hands-on experience. Apprentices were working remote. Highly technical positions are missing skills.
- The workforce will drop from an average of 15 years of experience to 10 years. This may produce some new innovations, but will likely cause several growing pains.
- It's important to regulate this transition to prevent injury in a dangerous environment.
- There are multiple pathways for many of the occupations, including shorter-term training. These shorter-term training programs can be supported with on-ramp programs and wrap-around services for individuals who have been unemployed for six months or longer or face other barriers.
- **Training time is needed and required.** Due to increased attrition, utilities have had to increase the capacity of their training pipeline; but safety requires them to not accelerate the timeline. This leads to putting more responsibility onto fewer individuals which then can lessen the quality of the training program.
  - Relay technicians are finding themselves in similar but worse positions where the technical requirements of the position elevate to a college level of academia, but technical colleges have not been advanced in our culture enough to build a strong technical workforce, so we find ourselves training from within – which can take up to eight years.
  - Substation wireman work requires a much better understanding of controls, alarms and communications than a typical electrician.
  - Entry level customer service- 8 to 12 weeks of training. Dispatchers- 2.5 years of training. Energy real time traders- process involves a year of training for entry level hires.
  - This sector's electrical and civil workforce is very young and is required to make decisions with a lack of very few advanced engineers- new engineers must learn with very few mentor hours.
  - Evolving workforce education programs to keep pace with the evolution of the industry. Engineers of tomorrow are different and will need different skills then the engineers of yesterday.
- Essential/soft skills- communication, collaboration, teamwork, writing. We need people to have those skillsets early in their career.
- There are gaps in technical training and programming skills for new and evolving positions in the grid management space. Smart meters with electrical components are little computers themselves. Transmission needs. Virtual powerplant space (engineering, IT, software, data management skills are needed). Lack of data science and analysis. Cloud computing skills.
- Aggregation and disturbing management systems that are evolving. Existing workforce will need to learn (light) programming.
- **Industry specific skills**. Components are becoming so specialized that it can be difficult to bring the work in house without significant training. Budgets for training are a constant battle. Being able to learn from internet resources is a requirement of the job.
- **Safety training and certifications**: OSHA 20 and handling hazardous materials; system certificates such as CDL – Class A, forklift, crane operations, electrical, flagging, fleet mechanic Reading, math, basic stuff.
- **Transferable skills**: Frequently hire outside of industry – engineers of pipes/sewers know state rules and have GIS and contract experience. Utilities can teach electrical.
- **Development** –Safety protocol, CyberOT and engineering cross training. Technical analysis. Recruit manufacturers to help with training new technology. Gatekeeper items will slow it down. We're not ready for commercialization (3-5 years away), yet we need to start training now.

MANAGEMENT SOLUTIONS provided by partnering utilities.

Hiring - Know which positions will retire. Bring in trainees earlier to cross train.

- Entry level points. Too high of a gap between high school and entry level jobs. Need to create internal training or skill bridge programs (partner with community and technical colleges).
- Hiring manager expectations are higher than what's coming in. Need to re-evaluate who's working in the positions and the qualifications needed to fill those positions (at times, a master's degree is included within the job description when those working in the position hold a bachelor's degree)
- New vs Old Generations: It's helpful to appoint or hire someone whom can communicate with both groups to act as an intermediary.

Retention - Are utilities building internal cultures to attract and retain employees?

- Employees want to make a difference and be innovative. If our organization is too rigid, innovations will not be embraced (middle management is stopping innovation).
- One utility shifted people internally to fill some positions because it was very challenging filling so many vacant positions. They mixed relevant experience and straight out of school hires; first few months in internship/training. Investing several months/years to get relative experience.
- Increase training portfolio. As technology rapidly increases and our workforce is rapidly becoming younger, one utility is looking to build a training program to catch up. They are bringing technical experts onsite and enrolling more employees into hands-on classes.
- Strengthen employee development. Identifying technical and leadership skills that our company needs. Look at specific business areas that need to be upskilled in defined and specific needs. Internal and LinkedIn as well as outside training organizations offer seminars, workshops, and leadership development.
- The divide between electrician and substation wireman is so large that taking on an inhouse untrained employee with a verified learning personality is better workforce development plan than bringing on outside help that has some electrical experience.

Partnerships - Sector partnerships need to increase and be stronger

- Build allocated internal resources to find and support partnerships with colleges, community partnerships and high schools. Add an internal contact to nurture those partnerships.
- Community job training partners. Building capacity with those organizations to do the work for our sector. We assume the org's have funding, staff, resources. They need funding, relevant equipment for training and adjunct faculty (experienced in their fields).
- Partnerships with private utility stakeholders. What are we doing to work together? We assume that if we're investing together, that the talent will move to the other companies. Glass half empty. We need a growth mindset. Build the supply. We need to market and build culture to attract employees.

CAREER AWARENESS needs to increase across this sector. What is a clean energy career? Unlike being a firefighter, a doctor or a welder – positions that have an identity – this sector and its partners need to build and increase awareness by visiting classrooms, hosting learning activities, and building internships.

- **Start promoting careers earlier**. Reach into schools at grades 6 and 8.
- **8th-12th grade**. Students are hearing about EVs and renewables and not understanding the opportunities. A lot of awareness needs to be built every day. When will the curriculum be ready?

RESOURCES CleanTech Alliance and the Pacific Northwest Center of Excellence for Clean Energy are Washington state's Clean Technology/Clean Energy Sector Leaders.

- **Career Connect Washington** offers examples of Career Explore, Career Prep and Career Launch. Partners of larger utilities offer examples of how to increase outreach. https://careerconnectwa.org/

- **Center for Energy Workforce Development (CEWD)**. National career awareness resources and free interactive online education: Energy Fundamentals 2.0. https://cewd.org/
- **CleanTech Alliance** represents over 1,000 member organizations spanning 17 U.S. states and four Canadian provinces. The Alliance facilitates the generation and growth of cleantech companies and jobs through a variety of educational programs, research, products and services. https://www.cleantechalliance.org/
- **PNW Center of Excellence for Clean Energy** A resource of career pathways, education and apprenticeship programs, K-12 activities, career awareness. https://www.cleanenergyexcellence.org/

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