Developing a Workforce to Meet Growing Demand for Clean Energy and Decarbonization

Board Learning Topic

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Energy Trust's work to successfully acquire energy savings and develop small scale renewable energy has always relied on a skilled workforce and an engaged contractor network readily available to complete customer projects. Currently, the United States and Oregon are experiencing a tight labor market and the clean energy sector is competing for labor with other sectors. As the clean energy sector expands in response to ambitious decarbonization goals and new funding sources, the demand for a skilled clean energy workforce also grows. This paper highlights the clean energy labor market outlook, careers in clean energy, workforce equity and labor supply challenges, and what these issues mean for Energy Trust.

Workforce Development in Context

The term "*workforce*" applies to all people currently working, and all those available for work, within a given scope (country, state, community, industry, company, occupation, etc.). "*Workforce development*" describes the wide range of activities, policies, programs and initiatives intended to recruit, train and retain a viable workforce with the skills and capabilities to meet current and future needs[1,2.] Workforce development programs are supported by agencies across the nation, from federal and state government to local workforce development boards. These agencies assist communities with labor analysis, coordination between industry and educational facilities, and by developing and sustaining programs.

Labor Market Outlook in Clean Energy Sector

The World Economic Forum estimates that reaching net-zero emissions by 2050 will require 14 million new jobs and 16 million workers to move into clean energy careers by 2030.[3] The current demand for labor across all industries far exceeds the available supply. In the U.S., even if every unemployed worker were hired there would still be millions of unfilled job positions.[4] In Oregon, there are only 80,000 workers for every 100,000 job openings.[5]

Factors contributing to the labor supply shortage in Oregon include deaths due to the pandemic and a decline in immigration to the state both internationally and domestically.[6] Declining birthrates in recent decades and slower migration to Oregon, particularly from younger workers, have left the state with a wide labor gap to fill. The most significant factor is the age of the workforce. From 2019 to 2020, 3.2 million baby boomers retired nationwide, taking skills and experience with them. That is more retirements than any other year since 2011, when the oldest of the generation turned 65.[7]

Nationally, energy efficiency jobs grew three times more than jobs in the rest of the economy from 2016 to early 2020.[8] In the medium case of three scenarios prepared by Lawrence Berkely National Laboratory in 2018, energy efficiency program spending was projected to grow from $5.8 billion in 2016 to $8.6 billion in 2030. This growth will further increase job expansion within the clean energy sector, highlighting the need for skilled workers. In Oregon, Energy Trust investments in clean energy solutions are also projected to grow in the years ahead as the state's investor-owned utilities must maximize energy savings to meet state mandated decarbonization goals.

Clean Energy Sector Careers

Clean energy sector careers include roles that are not energy-specific but essential for energy programs to function. These may include workers in the construction trades, engineers, administrative staff like accountants, human resources and information technology professionals. The clean energy sector is continuously competing with other s to meet demand, driving the need for higher wages and better working conditions to attract workers from other job sectors.[2]

Historically, Energy Trust programs have focused on engagement and development opportunities for business owners and managers within a network of trade ally contractors.[9] However, workforce

[1] Key Activities Summary Blueprint 6: Workforce Development, energy.gov
[2] Policy Brief: Local Energy Perspectives on Workforce and Supply Chain, oregon.gov
[3] This map reveals clean energy jobs now outnumber fossil-fuel ones, weforum.org
[4] Understanding America's Labor Shortage: The Most Impacted Industries, uschamber.com
[5] Oregon Economic and Revenue Forecast, Oregon Office of Economic Analysis
[6] Cyclical Labor Shortage is Gone, Structural Remains, Oregon Office of Economic Analysis
[7] The pace of Boomer retirements has accelerated in the past year, Pew Research Center
[8] Growing the Green Buildings Workforce, energy.gov
[9] Energy Trust trade allies are independent contractors and businesses that use their knowledge of program standards and incentives to help customers leverage Energy Trust offers to reduce the cost of clean energy installation projects.

development efforts would typically go well beyond business ownership and business opportunity to directly impact workers and their ability to access jobs or careers. Listed below are occupations that have significant potential to expand Energy Trust's role in developing a clean energy workforce in addition to its trade and design ally network.

Energy Trust's Historical Focus	Additional Clean Energy Career Paths
• Contractor business owners • Engineers • Architects	• Contractor business owners • Engineers • Architects • Trades workers (non-business owners such as electricians, plumbers, construction, etc.) • Facilities managers • Home energy assessors • Educators and training providers • Community based organization workers • Administrative, operations and support staff

Workforce Equity in the Clean Energy Sector

Each successive generation in the U.S. since the baby boomers has been more racially and ethnically diverse, and nearly half of post-millennials are racial or ethnic minorities.[10] As the labor market is further constrained, extending clean energy employment opportunities to marginalized communities and building equitable career pipelines into highly skilled jobs can help expand the clean energy sector in a viable and sustainable way. Increasing the number of women and people of color in the skilled trades, by supporting pre-apprenticeship programs and apprenticeship training programs, provides families with opportunities to build generational wealth without taking on college debt. This not only ensures that economic opportunities are accessible to a diverse population but also provides an opportunity for the broader economy to benefit from their inclusion.

There has historically been a gap in support for pre-apprenticeship and apprenticeship training programs that focus on increasing diversity in the trades and that include clean energy concepts and grid interactive technology in their curriculum. Recent reports from University of Oregon and The Solar Foundation highlight disparities in the number of women and workers of color within both energy efficiency and renewable energy construction.

Table 1 – The Solar Foundation Oregon and Washington Solar Workforce Diversity Report 2019: Ethnic and racial demographic results from interviews compared to national solar companies and other statewide industries.[11]

	National Solar	OR & WA Solar	OR & WA Overall	OR & WA Construction	OR & WA Manufacturing	OR & WA Oil and Gas Extraction	OR & WA Information Services
Latinx	16.9%	4.8%	11.1%	12.5%	12.9%	6.4%	6.0%
Asian	8.5%	3.0%	8.0%	2.7%	10.8%	1.1%	18.5%
Black or African American	7.6%	2.1%	3.9%	2.5%	2.9%	0.7%	2.9%
White	73.3%	89.2%	82.6%	89.8%	81.5%	94.6%	74.6%
Native Hawaiian or Other Pacific Islander	1.2%	.3%	0.6%	0.5%	0.7%	0.2%	0.3%
American Indian or Alaska Native	1.1%	.6%	1.5%	1.6%	1.3%	1.5%	0.6%

[10] Early Benchmarks Show 'Post-Millennials' on Track to Be Most Diverse, Best-Educated Generation Yet, Pew Research Center
[11] OREGON AND WASHINGTON SOLAR WORKFORCE DIVERSITY REPORT, The Solar Foundation

More than one race	8.3%	0.0%	3.4%	2.9%	2.7%	1.9%	3.1%

Table 2 – University of Oregon Labor Education and Research Center: Portland Metro Apprentices in union and non-union programs between 2011 – 2020 by gender and race/ethnicity[12]

Sex and Racial/Ethnic Group	Non-Union	% of Non-Union	Union	% of Non-Union	Total	% of Grand Total
White Men	3,755	75%	8,338	64%	12,093	67%
Men of Color	1,006	20%	3,351	26%	4,357	24%
White Women	199	4%	915	7%	1,114	6%
Women of Color	74	1%	324	3%	398	2%
White Non-binary	0	0%	2	0%	2	0%
Non-binary People of Color	0	0%	0	0%	0	0%
Total	5,034	100%	12,930	100%	17,964	100%

Labor Supply Challenges in the Trades

A lack of career and technical education (CTE) in public schools has contributed to a considerable strain in the pipeline of workers entering the trades. Many high schoolers are motivated to pursue college degrees and overlook trades as a viable career option, while funding for vocational education in public schools is declining in many states. Oregon is one of the states reducing CTE funding, which stands at less than $62 million per year, or $370 per student. By comparison, the state of Washington spends more than 10 times that amount on CTE annually, and their participating students receive $4,057.[13].

Many of Oregon's community colleges partner with Oregon Apprenticeships to offer Associates of Applied Science (AAS or SAAS) or Statewide Certificate of Completion (SCPC or SCC) degree programs. These programs are completed in lieu of an apprenticeship and program graduates earn their journey level card. Some colleges have a clear focus on getting students ready for clean energy and construction trades careers. For example, Lane Community College's Northwest Water and Energy Education Institute offers energy management education and Columbia Gorge Community College's Treaty Oak Regional Skills Center offers construction trades education. However, some colleges have dismantled their trades education programs. Southwestern Oregon Community College turned its "shops" building into a computer lab in 1994, and then into their Health and Sciences center in 2018, highlighting their new focus on science, technology, engineering and mathematics careers.

Oregon apprenticeship programs are also limited by the apprentice ratios set by Oregon Bureau of Labor and Industries For most construction trades, there must be at least one journey level worker for every apprentice level worker on a job site.

Marginalized groups, particularly women of color, face significant systemic and financial barriers that reduce the number of workers entering and remaining within the trades. Financial barriers can include lack of transportation, expensive tools and lengthy, often unpaid training with no guarantee of work when completed. Workers transitioning into the trades may need to do training in addition to a full-time job. Systemic barriers include hostile work environments (especially for women), bias in choosing apprentices and not having network connections within the industry to facilitate employment opportunities. Workers

[12] CONSTRUCTING A DIVERSE WORKFORCE: Examining union and non-union construction apprenticeship programs and their outcomes for women and workers of color, LARISSA PETRUCCI, PHD, University of Oregon Labor Education and Research Center

[13] Meeting the Future: Career Connected Learning, Career and Technical Education, Future Ready, and High School Success, Scott Nine, Assistant Superintendent, Oregon Department of Education

trying to get into the skilled trades also face barriers from lack of universal certifications and licensing, union and other application forms, degree requirements and language innaccessability.

Oregon Department of Energy's Biennial Energy Report highlighted that while all areas of Oregon are affected by a shortage of qualified workers who can complete clean energy projects, the issue is pronounced in rural areas. The report shows that finding local contractors in rural communities and securing workers for large scale renewable energy projects is very difficult. Labor representatives highlighted that smaller rural communities simply do not have the population density to support large-scale electrical contractors and workers on an ongoing basis. Sustainable Northwest spoke to a shortage of energy auditors and energy efficiency contractors in rural Oregon.[14]

The shortage of electricians available to serve customers in rural areas has been a persistent challenge for Energy Trust, limiting our ability to keep energy investments within communities by using local contractors. For example, Energy Trust's Business Lighting Program needed to allocate funding for travel to bring Portland Metro- and Willamette Valley-based contractors to Southern Oregon to meet installation demands. Klamath and Lake Counties are especially impacted by low contractor availability. Local community partners, like Lake County Resources Initiatives, have had to focus recruitment efforts on both Klamath Falls and Bend to ensure contractor availability. Lack of local contractor availability can cause delays in lighting project installations, increase program delivery costs and lower customer satisfaction.

Lack of electrician availability also impacts capacity to install solar projects. In Oregon, solar installation is a licensed trade requiring installers to complete an apprenticeship program to become either a licensed electrician or a licensed limited renewable energy technician. It takes four years to become a Journey Level Electrician. The Limited Renewable License (LRT) only requires two years but it limits installations to 50kW, which are typically residential and small commercial projects.

What this means for Energy Trust

Energy Trust's work to successfully acquire energy savings and develop small scale renewable energy has always relied on a skilled workforce and an established contractor network readily available to complete customer projects. In recent years, contractor and labor availability has emerged as a significant barrier experienced by most customers seeking to complete energy projects. This is a persistent challenge in rural areas, and of particular concern for Energy Trust because most customer projects supported by incentives are delivered by independent contractors working in individual homes.

However, unlike commercial and public construction projects that interact with unions, trade member organizations and state agencies like the Certification Office of Business Inclusion and Diversity (COBID), residential sector contractors have fewer resources for filling their pipeline of future workers and preparing for future business opportunities. As the clean energy sector expands with new federal funding, and policymakers increasingly prioritize equity and environmental justice in clean energy investments, contractors and other delivery partners are finding it harder to recruit and retain the workforce needed to accomplish these important objectives.

In order to meet ambitious savings and generation goals and ensure equitable access to contractors, Energy Trust is assessing a range of potential activities related to workforce development:

- Continuing to offer training programs for our trade ally network to support their capacity
- Supporting training on installation best practices, including for equipment, duct sizing and insulation
- Providing training for contractors in rural Oregon, especially for courses that qualify for continuing education credits and those delivered in Spanish

[14] Policy Brief: Local Energy Perspectives on Workforce and Supply Chain, Oregon.gov

- Exploring other additional financial incentives and/or support for contractors to offset additional costs they incur associated with marketing and delivery of energy efficiency upgrades to customers in rural communities where travel and equipment costs can be barriers
- Working more closely with labor unions, such as the International Brotherhood of Electrical Workers (IBEW), to help better integrate energy efficiency curriculum into apprenticeship programs
- Designing and implementing programs that create a more compelling business case for contractors that belong to unions to participate as trade allies
- Investing in and helping scale existing pre-apprenticeship and apprenticeship programs for clean energy careers paths
- Expanding awareness among primary and secondary education students about the opportunities and benefits of entering the trades as a career
- Supporting direct pathways for students from high school into clean energy jobs
- Convening key players in Oregon's clean energy industry to highlight the needs of employers, workers, future workers, and communities in ways that will help us accomplish future goals for benefitting customers we have underserved in the past