

TECHNICAL & CAREER – CLEAN ENERGY EDUCATION

WHAT IS A CLEAN ENERGY JOB?

Effective planning for future workforce training relies on the ability to predict and meet the needs of industry. Contemplating workforce needs of the future *clean energy economy* has proven notoriously tricky. A precise definition of *clean energy* is a moving target, one that shifts with fast developing technologies, industry needs and governmental priorities. REAP's definition of *clean energy* is broad and straightforward: renewable energy and energy efficiency. Organizations like the Brookings Institute and the Pew Charitable Trust are more expansive in their definition of the *clean energy economy*: a sector that “generates jobs, businesses and investments while expanding clean energy production, increasing energy efficiency, reducing greenhouse gas emissions, waste and pollution, and conserving water and other natural resources.”¹⁴ The ambiguity here is intentional and understandable, but the utility of this definition suffers when nearly every occupation under the sun can be construed as “clean”. Certainly, an Aleut gardener working in a shipping container retrofitted with LED lights and an air-source heat pump is a clean energy worker. But, is the conscientious Haul Road truck driver who never idles the rig for more than five minutes really a member of the “clean” or “green” workforce? A young Alaskan contemplating training for a career in the clean energy economy is right to wonder, *What exactly does a clean energy occupation look like?*

Renewable Careers and Training

Alaska has a well-deserved reputation as a world leading laboratory for renewable energy innovation, but its renewable energy workforce (<700 jobs) represents approximately .2% of the 331,358 workers in Alaska – the smallest such workforce in the nation.¹⁵ An April 2018 study by the University of Alaska's Center for Economic Development, estimates the number of renewable energy businesses in the state to be about 100; the majority of which deliver consultation and technical services.¹⁶ Wind technicians, solar PV installers and hydroelectric plant operators are among the renewable energy careers most often singled out as occupations with high potential for future growth on a global and national scale. And while, renewable energy training needs do exist in the state, as is so often the case, things scale differently in Alaska.

Department of Energy estimates from 2016 counted 98 solar workers, 37 wind technicians and 469 hydropower workers in Alaska.¹⁷ A single, full time, certified wind technician can responsibly manage approximately twenty turbines. Kodiak Electric Association, Golden Valley's Eva Creek Wind Farm near Fairbanks and CIRI's Fire Island Wind in Anchorage, represent the three largest wind farms in Alaska and combine for a total of 29 turbines. Warrantied, utility scale turbines like those in Kodiak are typically monitored remotely, then serviced and repaired by the manufacturer, not by on-site wind technicians. Alaskans who work

¹⁴ [*Clean Energy Economy, Repowering Jobs, Businesses and Investments Across America*](#)

¹⁵ [Alaska Occupational Forecast 2016-2026](#)

¹⁶ [Renewable Energy – Growth and Obstacles in the Renewable Energy Sector in Alaska](#)

¹⁷ [US Energy and Jobs Report State Charts, Alaska](#)

on smaller wind farms are typically diesel operators with limited training and charged with a scope of turbine/tower work that does not usually exceed basic preventative maintenance.

Fiscal rationality suggests that Alaska not establish a wind training program in order to ready new fleets of certified wind operators and technicians, even as scores of small wind projects develop throughout the state. Similarly, residential solar in Alaska is surging in popularity, and yet the scalability of a dedicated PV installer workforce is extremely limited. On average, more than twenty percent of Alaska's electric energy is generated by hydropower, but the state's hydroelectric workforce is largely comprised of traditional utility trained diesel genset operators with some site specific, in-house training. There are simply not enough renewable energy jobs in Alaska to sustain stand-alone; wind, solar, geothermal or hydro training programs. Interested and determined Alaskans may find occasional in-state trainings within these categories that will enable them to join the ranks of renewable energy workers – but for the foreseeable future they will be infrequent, limited in scope and not accredited.

Renewable energy technologies and occupations hold an allure today that might bear comparison to previous generations' fascination with the aerospace industry. Few dreamers in the space age became astronauts, but the overarching spirit of innovation paved the way for new technologies and career paths that transformed the world. Renewable energy occupations have the potential to play a similar outsized role in expanding the impact of clean energy, and preserving the climate for future generations. Alaskans should be made aware, and proud of the myriad renewable technologies being deployed and tested throughout the state – especially in conjunction with microgrid technologies. Interested Alaskans should be made aware of the many discrete, accredited renewable energy training programs in the Lower 48 and the varied careers where these programs might lead.

Energy Efficiency Careers and Legacy Training

Where renewable occupations and technologies represent the glamour of the clean energy economy, the workaday world belongs to those working in some direct capacity to create greater energy efficiencies. In Alaska that translates to 4,421 workers or 1.3% of the state's total workforce.¹⁸ This is again a comparatively small workforce and in terms of creating sustainable training programs – clean, green or otherwise – training needs to be meaningfully linked to jobs that exist, not jobs we wish existed. In 2011, the Alaska State Energy Sector Partnership (ASESP)¹⁹ and Alaska Workforce Investment Board (AWIB) created an inventory of Alaskan 'green job' pathways (where employers pursue environmentally sustainable practices) and a workforce development plan to fill jobs being created in the renewable energy and energy efficiency sectors. The ASESP inventory of University of Alaska's 'green' vocational career pathways totaled 77 discrete training programs, ranging from occupational certificates in welding to an Associate of Arts degree in Renewable Energy Resources.²⁰ It might come as a pleasant surprise to a welder working today on the North Slope that she is part of the 'clean energy' workforce. It will come as less of a surprise to a UA Mat-Su College Sustainable Energy

¹⁸ [Alaska Occupational Forecast 2016-2026](#)

¹⁹ [ASESP Workforce Development Plan](#)

²⁰ ASESP Energy Inventory 5.27.11

Program holder that their Occupational Endorsement Certificate program no longer exists because it did not seem to connect to any coherent career pathway.

Biomass boiler operators, weatherization technicians, building energy retrofit technicians, energy managers, greenhouse operators and heat pump installers are occupations that do require specialized training and skills. But these, and the majority of clean energy career pathways in Alaska, once again, do not require stand alone or the establishment of niche training programs. Instead, clean energy training has proven most effective when located within well-established training programs belonging to traditional occupations and trade apprenticeships. These ‘legacy’ or ‘core’ training programs are increasingly adopting clean energy modules when there is a defined need for the training. The scope of work and skill sets demanded of builders, plumbers, electricians, sheet metal workers and boilermakers are rapidly expanding, transforming, and in some instances, being reimagined because of a greater focus on efficiencies, clean energy technologies and best practices. Germany, a world leader in developing a clean energy workforce, has “moved past the glitz of niche renewable energy training programs and has realized that the skills and knowledge needed to be successful in the renewable energy field are largely transferable from other industries such as electrical, industrial maintenance, and engineering.”²¹ This appears to be the global trend.

The clean energy transformation is under way. Renewable energy generation has doubled in the United States over the last ten years and is now responsible for 17% of the nation’s power generation.²² Nationwide “construction firms involved in the Energy Efficiency sector continued to experience an increase in the number of their workers who spend at least 50 percent of their time on *Energy Efficiency*-related work, rising from approximately 797,500 in 2015 to 1.017 million in 2016 and now to nearly 1.024 million in 2017.”²³ Alaska’s future clean energy infrastructure will be built and maintained by the same broad categories of workers who can proudly claim to have built the state’s original infrastructure.

There are 11,901 Alaskans currently working in some capacity to maintain and heat some of the oldest building stock in the country. There are 14,859 Alaskan workers involved in raising new buildings, installing boilers, wiring and plumbing homes, insulating walls, fabricating HVAC systems, programming building controls and performing various other jobs in the construction industry. Among the 1,579 Alaskans working in power generation, there are more than a thousand managers and clerks, 460 power plant operators, 366 linemen and 47 dispatchers working for rural, Railbelt and remote Alaska utilities to keep the lights on and costs low.²⁴ There are hundreds of politicians, managers, public works directors and school principals in cities, boroughs and villages across the state who are charged with energy related projects and responsibilities. Given the opportunity, these are the Alaskan workers poised to make the most substantial impact on Alaska’s *clean energy economy* and most will do so through a greater

²¹ [Renewable Energy Technician Education: Lessons from the German Energiewende](#)

²² [US Energy Information Administration](#)

²³ 2018 US Energy and Employment Report

²⁴ [Preliminary Second Quarter Employment and Wages April - June 2018](#) and [Alaska Occupational Forecast 2016-2026](#)

energy literacy and an understanding of how energy efficiency measures can best be implemented.

Notes on Alaska's Future Workforce

Alaska has the highest unemployment rate in the nation at 6.7 percent²⁵ and yet Alaskan industries struggle to find workers. This incongruity points to an often-understated aspect of Alaska's total workforce picture. There are numerous well-paying jobs to be had – the more acute problem is a skills shortage amongst Alaskan workers. Alaska's construction, Oil and Gas, Maritime, Mining and Healthcare industries, have for years been unable to find enough qualified Alaskan workers to meet demand.²⁶ State economist Karinne Wiebold points out that more than 20 percent of nonresident workers make up the state's construction sector and the Oil and Gas sector has had outsiders totaling nearly 30 percent of the workforce.²⁷ The previous state Labor Commissioner Heidi Dreygas states the case plainly, "We have to invest in young Alaskans and in training, ensuring that we have Alaskans first in line to work in these jobs."

Math Skills

A shocking 86 percent of Alaskan high school sophomores are non-proficient at the Algebra I/Advanced Arithmetic level²⁸. A recently completed ten-year study of University of Alaska's entering freshmen shows that 60.8 percent require remedial math or English courses before they can move on to degree-credit coursework.²⁹ Careers pathways are frustrated and delayed across the board when degree seekers realize basic deficiencies will prevent them from enrolling in intended courses of study.

Soft Skills – Get Up and Show Up

A fundamental problem has carried through the Alaskan school system and into the workforce that goes beyond math skills. *Soft skills* are "personable attributes that allow for effective interaction"; a good work ethic, communication, organization and cooperation are usually enumerated among the soft skills. The employer in search of good workers puts it more bluntly, *Can you get up and show up?* Incredibly, one in four Alaskan students are chronically absent – the third highest truancy percentage in the nation.³⁰ Soft skills also include, basic computer proficiency, ability to be drug-free, safety awareness and ability to handle stress. Recognizing these skills as fundamental, Alaska's Career and Technical Education (CTE) plan includes a softskills curriculum, *Skills to Pay the Bills*³¹, designed to redress what has proven a chronic weak spot in Alaska's workforce.

²⁵ [Alaska Department of Labor and Workforce Development](#)

²⁶ [Cross Industry Workforce Development Priorities – McDowell, April 2016](#)

²⁷ [Alaska Journal of Commerce, 10/31/18](#)

²⁸ [2017 Performance Evaluation for Alaskan Schools](#)

²⁹ [University of Alaska Transcript Study](#)

³⁰ [Alaska Rates of Chronic Absenteeism](#)

³¹ [Skills to Pay the Bills, from Alaska's CTE Plan](#)