12. Clean Energy Jobs and a Just Transition

Draft New York State Energy Plan

July 2025

Key Findings

- **Over 318,000 workers are employed in New York's energy sector. More than half of these workers make up one of the most mature and steadily growing clean energy workforces in the county. Energy sector jobs are expected to grow by another 13 percent over the next 15 years.** To date, public and private investments into clean energy projects and workforce training have enabled New York's clean energy workforce to grow by 27 percent since 2015.
- **Continued State investment in workforce development is essential for advancing the energy transition.** State support will be needed to bolster private sector efforts to meet the scale of workforce training needed for this rapidly changing sector. This includes attracting and upskilling workers to decarbonize the buildings and transportation sectors, expand renewable power, and develop and scale new technologies like advanced nuclear energy, battery storage, alternative fuels, and hydrogen. State investments should support employers in "upskilling" their employees through additional training, micro-credentials, and certifications; facilitate the placement of entry-level workers in jobs, apprenticeships, or paid internships; connect fossil fuel workers with opportunities to pivot to the clean energy economy; and provide wraparound services (such as childcare, transportation, and tuition assistance) to improve accessibility.
- **Enhanced workforce development program awareness and accessibility can facilitate equitable participation of workers from members of disadvantaged communities (DACs) in the clean energy workforce.** By prioritizing accessibility in workforce trainings, the State can improve DAC representation within the clean energy workforce and deliver benefits of the transition to these communities. Accessibility can be improved by partnering with trusted community organizations, providing opportunities for DAC representation amongst trainers and educators, tailoring communications campaigns to specific communities, and providing wraparound services.
- **Labor standards for energy projects are a key tool to improve the quality of life of workers who drive the transition, minimize inequality, and generate local economic benefits.** New York should continue to drive policy that promotes job quality for clean energy projects, such as by encouraging union labor, project labor agreements, prevailing wage standards, labor peace agreements, community benefits plans, workplace health and safety requirements, or buy American standards, as applicable. Further research should identify gaps and opportunities for high-quality clean energy jobs.
- **To support a just transition for fossil fuel workers and communities, it is essential to build out safety net policies for workers at risk of job loss as New York transitions to a clean energy economy.** New York created the Office of the Just Energy Transition (OJET) to guide the State's just transition programs. The State should build on this effort by expanding research on the impacts on fossil fuel workers, with consideration of the short- and mid-term workforce needs and leverage this research to consider expanding just transition policies and programs. Such policies could include a "community assurance fund" to provide financial support to displaced workers or businesses.

- **Coordination on workforce development among State agencies and industry partners is needed to optimize program design, respond to existing gaps, and publicly communicate opportunities and needs in the clean energy industry. Multiple State agencies will administer programs to help train the clean energy workforce.** These include the New York State Research and Development Authority (NYSERDA), New York State Department of Labor (DOL) and its Office of Just Energy Transition (OJET), New York State Department of Transportation (DOT), the State University of New York (SUNY), the Department of State (DOS), Empire State Development (ESD), and the New York Power Authority (NYPA). To best serve the State's energy system and drive economic growth, interagency coordination—as well partnerships with local and non-governmental workforce training providers—will be needed to ensure the effectiveness of clean energy workforce development programs. Notably, agencies must collaborate to develop clean energy outreach materials and public messaging to ensure the State clearly broadcasts clean energy career opportunities.

Key Terms

- **Clean energy worker (job)** is defined as any worker (job) that is directly involved with the research, development, production, manufacture, distribution, sales, implementation, installation, or repair of components, goods, or services related to the following sectors of the clean energy economy: renewable electric power generation; grid modernization and energy storage; building decarbonization and energy efficiency; renewable fuels; and clean and alternative fuels transportation. These workers also include supporting services such as consulting, finance, tax, and legal services related to energy.
- **Fossil fuel workers (jobs)** refers to any worker (job) that is directly involved with the research, development, production, manufacture, distribution, sales, implementation, installation, or repair of components, goods, or services related to energy derived from fossil fuels, including electric generation, delivered fuels, internal combustion vehicles, and natural gas distribution.
- **Project Labor Agreement (PLA)** Labor Law §222(1) provides that a PLA is a pre-hire collective bargaining agreement between a contractor and a bona fide building and construction trade labor organization establishing the labor organization as the collective bargaining representative for all persons who will perform work on a public work project, and which provides that only contractors and subcontractor who sign a pre-negotiated agreement with the labor organization can perform work.
- **Labor Peace Agreements (LPAs)** are agreements between employers and a union, limiting certain actions from both sides for a specified period of time. LPAs may require management to remain neutral and not interfere in any union organizing, and the union to avoid strikes or other activities that could seriously interrupt workplace operations.[1]
- **Prevailing wage** is the wage standard required by federal and state law for publicly funded or assisted projects. Prevailing wages represent the hourly wages, benefits, and overtime paid to the majority of workers in a particular area, for a particular trade, as determined by the United States Department of Labor or the New York State Department of Labor. In New York State, the Department of Labor's Bureau of Public Work & Prevailing Wage Enforcement[2] handles the enforcement of state prevailing wage rules.
- **Registered Apprenticeship programs** offer standardized training for workers to learn the skills and abilities they will need to be a fully functioning journeyworker in a specific trade/occupation. They utilize an "earn-while-you-learn" model, including a minimum of 2000 hours of paid On-the-Job training combined with Related Instruction, often provided in a classroom and/or lab setting. They can be operated by a single employer or a group of employers, and with or without the participation of a labor union. In New York State, programs must be registered with the New York State Department of Labor.[3]
- **Pre-apprenticeship programs** is a program or set of services designed to prepare individuals to enter and succeed in an apprenticeship program. By definition, a pre-apprenticeship program has a documented partnership with at least one apprenticeship program. Quality

[1] School of Industrial and Labor Relations at Cornell University, *Climate Jobs Institute*, accessed July 20, 2025, https://www.ilr.cornell.edu/climate-jobs-institute.

[2] New York State Department of Labor (DOL), *Bureau of Public Work and Prevailing Wage Enforcement*, accessed July 20, 2025, https://dol.ny.gov/bureau-public-work-and-prevailing-wage-enforcement.

[3] DOL, *Registered Apprenticeship: A Different Kind of Higher Ed.*, accessed July 2, 2025, https://dol.ny.gov/apprenticeship/overview.

Key Terms

pre-apprenticeship programs are a starting point toward a successful career path for under-represented job seekers (such as disadvantaged women and men, individuals with disabilities, and others) who may not be aware of this approach to obtain good jobs with opportunities for advancement. Pre-apprenticeships help individuals meet the entry requirements for apprenticeship programs and ensure they are prepared to be successful in their apprenticeship.[4]

- **Direct Entry programs** are New York State-approved pre-apprenticeship programs that can help workers get the skills they need to meet the minimum requirements of a NYS Registered Apprenticeship program. Successful participants have a direct opportunity to interview with a sponsor of a NYS Registered Apprenticeship program. Direct Entry providers are required to have agreements with NYS Registered Apprenticeship program sponsors to ensure the availability of jobs with those sponsors. NYS Direct Entry programs cannot charge tuition.[5]
- **Apprenticeship utilization** requires that a certain percentage of labor hours for a given project be performed by Registered Apprentices.
- **Microcredentials** are flexible and compact academic credentials created to meet specific workforce needs that are taught by faculty. Often credit bearing, these empower individuals with essential skills, knowledge and practical experience in high-demand fields and are designed to be stackable and build into degrees.
- **Priority Populations** include Veterans; Individuals with disabilities; Low-income individuals, whose household's total income is below or at 60 percent of the State Median Income, or whose household has been determined eligible for or is receiving assistance through the Home Energy Assistance Program (HEAP), Temporary Assistance for Needy Families (TANF), Supplemental Nutrition Assistance Program (SNAP), or other human service benefit programs; Incumbent or unemployed fossil fuel workers; Previously incarcerated individuals; 16- to 24-year-olds who are enrolled in or have completed a comprehensive work preparedness training program such as those offered by Boards of Cooperative Education Services (BOCES), technical high schools, Conservation Corps, YouthBuild, and AmeriCorps; Homeless individuals; and Single parents.[6]
- **Disadvantaged Communities (DACs):** The Climate Act defines disadvantaged communities as communities that bear burdens of negative public health effects, environmental pollution, impacts of climate change, and possess certain socioeconomic criteria, or comprise of high-concentrations of low- and moderate-income households. DACs are identified using criteria as established by the Climate Justice Working Group.[7] On March 27, 2023, the CJWG voted to approve the DAC criteria.[8]

[4] Definition from NYSERDA Workforce Development and Training Definitions, https://www.nyserda.ny.gov/All-Programs/Clean-Energy-Workforce-Development-and-Training/Resources/Definitions.
[5] New York State Department of Labor, "Apprenticeship Direct Entry," accessed July 1, 2025, https://dol.ny.gov/direct-entry.
[6] Definition from NYSERDA Workforce Development and Training Definitions.
[7] New York State, *Environmental Conservation Law* § 75-0101(5) (2019).
[8] New York State Climate Act, *Disadvantaged Communities Criteria*, https://climate.ny.gov/Resources/Disadvantaged-Communities-Criteria.

1. Overview

New York's energy workforce is essential to the safe and reliable design, construction, and operation of our energy system. The State's energy system is also a meaningful job creator and driver of economic growth. As the system transitions, new economic opportunities will emerge: to meet its clean energy goals, New York will need to rapidly deploy new energy infrastructure, adopt new technologies, accelerate building decarbonization activities, and efficiently manage existing systems. These goals can only be met by growing and supporting a well-trained workforce to carry out transformational work across the entire energy system.

Through workforce development programming and funding, the State will play an important role in accelerating the training, upskilling, and placement of New Yorkers into the roles needed to support this work. The State's efforts to expand the clean energy workforce can also improve the quality of life of New Yorkers by prioritizing labor protections and promoting representation and job opportunities for DAC communities and Priority Populations, such as veterans, low-income individuals, and displaced fossil fuel workers.

New York's Scoping Plan commits to undertake a strategy that ensures the transition to a clean energy economy is a just transition. A just transition ensures new opportunities and targeted support for workers, businesses, and communities who rely on fossil-fuel related employment and tax revenue that may decrease because of the State's energy policies. The Plan outlines three central recommendations to ensure a just transition for workers:[9]

1. The State should require robust labor standards and worker-focused procurement standards on clean energy, resilience, and other emissions reduction and adaptation projects;
2. The State should make concerted efforts to increase clean energy workforce diversity and equity statewide through recruitment efforts, retention policies, and promotion opportunities, with a special emphasis on prioritizing incumbent fossil fuel workers and members of DACs; and
3. The State must enact measures to protect wages, benefits, and other favorable terms and conditions of employment for any worker who loses their job because of climate change mitigation efforts.

In pursuit of these principles, New York State has invested extensively in clean energy workforce development programs, built out labor protections for State-supported clean energy projects, invested in economic development that support revitalization, invested in site re-use planning, and, when possible, supported shovel-ready projects that use union labor.[10,11] These State investments have been made in collaboration with critical partners in organized labor, local government, educational institutions, non-

[9] New York State Climate Action Council, 2022, "New York State Climate Action Council Scoping Plan" accessed July 1, 2025, https://climate.ny.gov/Resources/Scoping-Plan.

[10] See *Table 1* for an overview of bills and budget allocations since the Climate Act that aim to improve job quality and increase workforce development in clean energy.

[11] For example, NYSERDA's Just Transition Site Reuse Planning Program provides communities with planning and technical support services to inform future decision making at the local level to help mitigate any negative impacts of pending or future fossil fuel power plant closures.

profits, and the private sector. These efforts have resulted in one of the largest clean energy workforces in the country: New York State's clean energy job growth rate dramatically outpaces overall statewide job growth and offers a 12 percent wage premium compared to traditional energy jobs, in addition to higher unionization rates compared to the State average (see Section 2 for additional detail).[12]

Interagency collaboration and coordination have been a cornerstone of New York State's energy transition strategy. Together, State agencies and authorities have invested more than $213 million since 2016 into workforce development programs that support training and upskilling for clean energy jobs, with roughly $34 million annually in 2023 and 2024.[13] The programs are being implemented to meet the Climate Act's targets that 35 percent, with a goal of 40 percent, of investments flow to DACs. These programs are implemented across multiple agencies, including NYSERDA, DPS, DOL, SUNY, CUNY, NYPA, and ESD and are designed to leverage private, federal, and other funds to maximize impact.[14,15]

Over the next 15 years, the State must continue to address existing and projected workforce shortages and improve access to clean energy jobs. The State will continue to develop training and development pipelines that develop the workers needed to transition the energy system, with a focus on supporting incumbent fossil fuel workers, members of DACs, and Priority Populations, such as veterans, low-income individuals, and displaced fossil fuel workers. This includes attracting and upskilling workers to decarbonize the buildings and transportation sectors, expand renewable power, and develop and scale new technologies like advanced nuclear energy, battery storage, alternative fuels, and hydrogen. It also includes evolving the State's strategy to support the fossil fuel workforce as the State moves toward alternate energy sources. Simultaneously, the State will continue to work strategically so that training pipelines focus on industry demand so as to lead to clear employment outcomes for trainees.

New York State will continue to advance clean energy job quality, working towards the goal that every dollar the State invests in clean energy also contributes to creating jobs that are safe, pay a living wage, support career growth, and have collective bargaining rights, or other important labor protections.[16] Upholding labor standards improves the livelihood of New York's workers, addresses income inequality, supports community development, and ensures the strength and longevity of New York State's clean energy industry.

This chapter provides an overview of the State's progress in developing labor standards for clean energy jobs, catalogs key State agencies and their role in building out the clean energy workforce, and provides an outlook into the future, offering estimates of the jobs New York State can expect as we continue our energy transition over the coming 15 years. The chapter concludes with a strategic vision for a continued

[12] New York State Energy Research and Development Authority, "2024 Clean Energy Industry Report," accessed July 1, 2025, https://www.nyserda.ny.gov/About/Publications/New-York-Clean-Energy-Industry-Report.

[13] NYSERDA has invested roughly $180M since 2016, NYPA $25M since 2023, and ESD $8M since 2023.

[14] NYSERDA develops clean energy workforce policies, research, and workforce development programs, which are reviewed by DPS to ensure consistency with utility programs and the prudent use of ratepayer funds.

[15] OJET supports training for clean energy jobs and connects transitioning fossil fuel workers to opportunities for upskilling, reskilling, and new job opportunities in renewables.

[16] U.S. Department of Labor, *US Departments of Labor, Commerce announce coordinated effort to create good jobs, promote equity throughout the workforce*, Washington, DC, June 21, 2022, https://www.dol.gov/newsroom/releases/osec/osec20220621.

just energy transition in New York State that includes support for the existing fossil fuel workforce, increased access to clean energy jobs in DACs, robust workforce development for clean energy jobs, and high-quality labor standards for the jobs to come.

2. State of the Sector and Progress Report

2.1. Clean Energy Jobs in New York

The clean energy industry is growing and evolving rapidly, with workforce impacts changing just as quickly. Nationally, new clean energy jobs are created at twice the rate of overall job growth.[17] In New York, clean energy jobs are among the fastest growing employment sectors. While clean energy jobs make up just 2 percent of the employed statewide workforce, the number of clean energy jobs increased roughly 27 percent over the last decade, exceeding statewide job growth (see Figure 1).[18] Combined public and private investments in clean energy have climbed dramatically over the last decade, growing from roughly $506 million annually in 2012 to $6.2 billion in 2023. Between 2021 and 2023, investments doubled each year.[19] Significant job growth can be expected to continue as clean energy industry investments expand to support decarbonization, though the most impacted sectors and sub-sectors will shift and evolve as new technologies emerge and others mature.

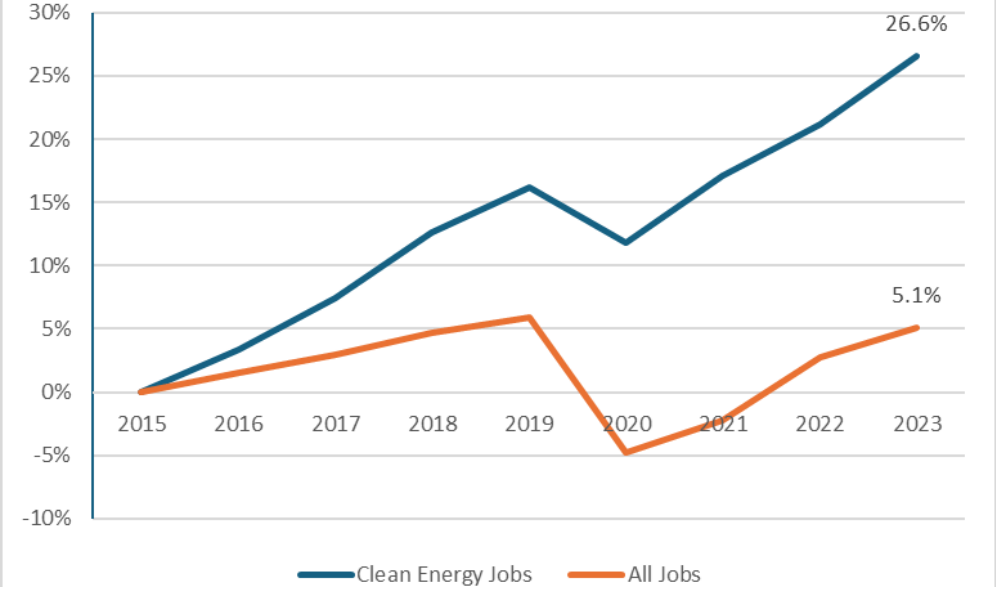

Figure 1: Cumulative growth in New York jobs since 2015[20]

[17] U.S. Department of Energy, "United States Energy & Employment Report 2024," Washington, DC. https://www.energy.gov/policy/us-energy-employment-jobs-report-useer.

[18] NYSERDA's Clean Energy Industry Report defines a clean energy job as one where a worker spends any amount of their labor hours directly involved in the research, development, production, manufacture, distribution, sales, implementation, installation, or repair of components, goods, or services related to the following sectors: renewable electric power generation; grid modernization and energy storage; building decarbonization and energy efficiency; renewable fuels; and clean and alternative fuels transportation.

[19] New York State Energy Research and Development Authority, "2024 Clean Energy Industry Report," accessed July 1, 2025, https://www.nyserda.ny.gov/About/Publications/New-York-Clean-Energy-Industry-Report.

[20] New York State Energy Research and Development Authority, "2024 Clean Energy Industry Report," accessed July 1, 2025, https://www.nyserda.ny.gov/About/Publications/New-York-Clean-Energy-Industry-Report, (U.S. Bureau of Labor Statistics, 2025).

Of the 178,000 clean energy jobs in New York, more than 60 percent are concentrated in building decarbonization and energy efficiency roles, while the remainder are distributed across clean transportation, renewable power generation, renewable fuels, and grid modernization and energy storage (see Figure 2). Approximately three-quarters of New York's clean energy jobs are in installation, maintenance, repair, or other support services. The remaining quarter are engaged in professional services, sales, utilities, and a small share in manufacturing.

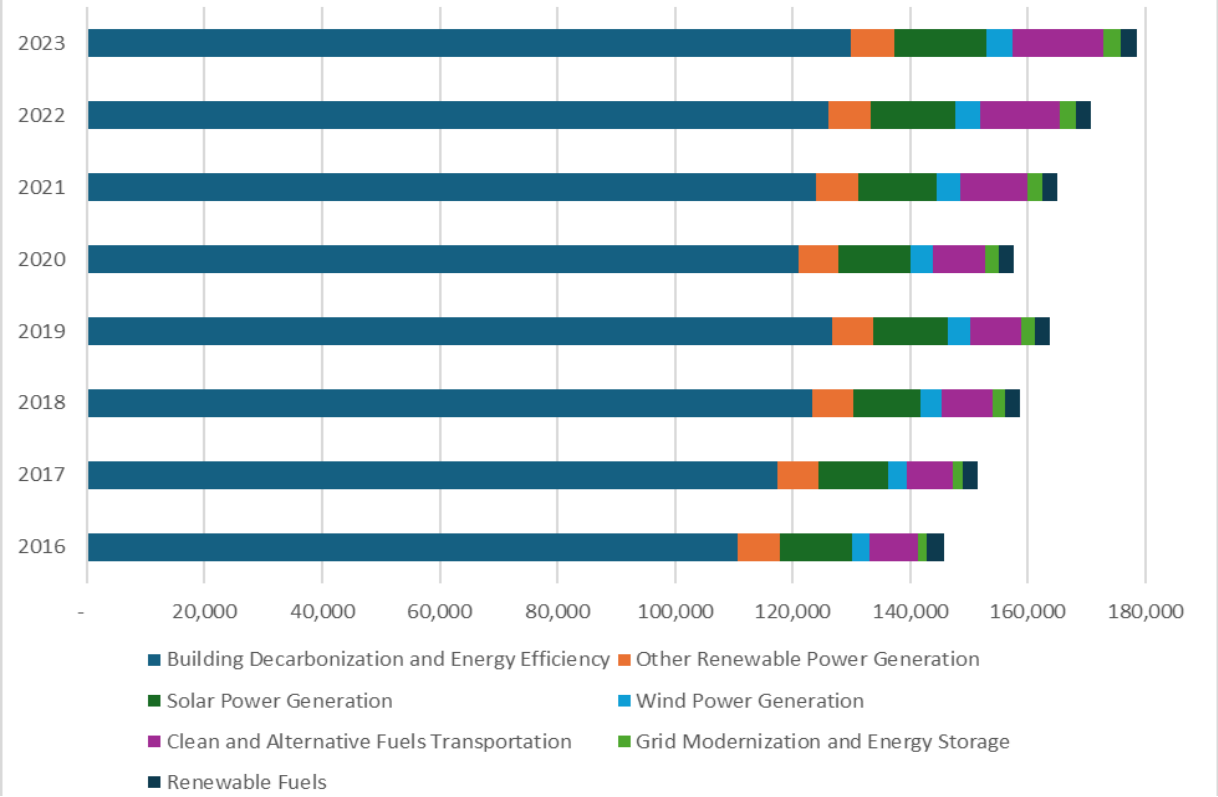

Figure 2: New York Clean Energy Jobs by Sector[21]

Despite impressive growth, New York's clean energy industry faces persistent challenges. In 2023, nearly all clean energy employers reported difficulties hiring.[22] As demand grows for many key clean energy jobs, this difficulty can be expected to be a central obstacle to meeting the State' goals. Nationally, solar photovoltaic installers and wind turbine technicians are among the fastest-growing occupations, with projected job growth rates of 48 percent and 60 percent, respectively, over the next decade—far exceeding the average for all occupations (4 percent). Other key roles, such as electricians (11 percent growth); heating, ventilation, and air conditioning (HVAC) mechanics and installers (9 percent); and plumbers, pipefitters, and steamfitters (6 percent) are also expected to grow faster than the

[21] New York State Energy Research and Development Authority, "2024 Clean Energy Industry Report," accessed July 1, 2025, https://www.nyserda.ny.gov/About/Publications/New-York-Clean-Energy-Industry-Report.
[22] Ibid.

economywide average.[23] In New York State, demand for these same occupations is anticipated to continue rising.[24] As clean energy technologies advance, employers are expected to face ongoing challenges upskilling their workforce to keep pace with this evolution.

> *"The need for workers [...] is corroborated by SUNY's own experience in constructing and operating clean energy buildings, which encounter a shortage of electricians, HVAC technicians, energy managers, and other skilled trades."*
>
> *[SUNY 2025–2030 Climate and Sustainability Action Plan]*

This increase in demand comes at a time when the trades occupations already face labor shortages. A shrinking construction trades workforce could impede the building of new clean energy infrastructure. Slower uptake into the construction trades has led to concerns surrounding available skilled workers and points to future shortages as the current labor force begins to near retirement and competition increases.[25]

2.2. Clean Energy Job Quality in New York

Nationally, the unionization rate for clean energy jobs grew to 12 percent in 2023, exceeding unionization rates in traditional energy jobs for the first time. This was driven in part by increased participation of the construction trades in building new transmission and generation.[26] This trend held in New York, where unionization rates for clean energy jobs exceeded those of fossil fuel jobs. In addition to climbing unionization rates, the State's clean energy jobs pay on average a 12 percent wage premium compared to traditional energy jobs, indicating higher job quality within this industry.[27]

However, DAC and low-income communities face unique barriers to accessing jobs and job training in clean energy. Generally, barriers to employment within clean energy include those common across the economy, as well as some specific to the Clean Energy ecosystem. The Climate Solutions Accelerator of the Genesee/Finger Lakes reports that common barriers to clean energy jobs "include the low appeal of the trades for many job seekers and students, as well as challenges around transportation and childcare. In Clean Energy-related workplaces, these can be heightened, especially since work sites are often

[23] U.S. Bureau of Labor Statistics, 2025, Employment Projections (EP), accessed February 2025, www.bls.gov/emp/; 2025, Quarterly Census of Employment and Wages (QCEW), accessed February 2025, bls.gov/cew.

[24] New York State Department of Labor, 2025, "New York State Long-Term Occupational Projections," accessed June 2025, https://dol.ny.gov/long-term-occupational-projections.

[25] Huang, Sophie. 2024. Rebuilding the Construction Trades Workforce. The Harvard Joint Center for Housing Studies. www.jchs.harvard.edu/blog/rebuilding-construction-trades-workforce; Greenberg, Ezrea, Erik Schaefer, and Brooke Weddl. 2024. Tradespeople wanted: The need for critical trade skills in the US. DC: McKinsey & Company. www.mckinsey.com/capabilities/people-and-organizational-performance/our-insights/tradespeople-wanted-the-need-for-critical-trade-skills-in-the-us.

[26] U.S. Department of Energy, "United States Energy & Employment Report 2024," Washington, DC. https://www.energy.gov/policy/us-energy-employment-jobs-report-useer.

[27] New York State Energy Research and Development Authority, "2024 Clean Energy Industry Report," accessed July 1, 2025, https://www.nyserda.ny.gov/About/Publications/New-York-Clean-Energy-Industry-Report.

dispersed (homes) and outside urban areas (solar farms, for example)."[28] For example, while the Climate Act requires that 35 percent of the benefits of clean energy investments to accrue to DACs, roughly 30 percent of NYSERDA's 2024 workforce development trainees were DAC residents.[29]

Additionally, the quality of some solar jobs is another area for improvements. Even as the sector has steadily grown its skilled workforce and consistently hit new deployment milestones, surveys of New York solar workers indicate room for improvement in job quality including findings of high transience, pay inequity, high stimulant use, and lower union density in the solar subsector (<1 percent) compared to the national average for solar jobs (10percent).[30]

2.3. Fossil Energy Jobs In New York

Between 2016 and 2019, fossil-fuel-based jobs in New York remained relatively flat. During the COVID-19 pandemic in 2020, fossil-fuel jobs saw an 11 percent decline and have hovered around 140,000 since (Figure 3). The number of fossil-fuel-based jobs may continue to decline as the State works toward its decarbonization goals, including minimizing emissions from the natural gas distribution system, fossil fuel power stations, and vehicles. However, the magnitude and pace of this shift depends on both policy design and market conditions. [31]

[28] cgr. 2024. "The Finger Lakes Clean Energy: Current State and Future Prospects." https://static1.squarespace.com/static/5f69141a20665f4000eb34a2/t/6762f1995ed8a7033417f6e9/1734537628470/Clean+Energy+Jobs+Report+Final.pdf.

[29] New York State Energy Research and Development Authority, "NYSERDA DAC Investments and Benefits 2020-2024 (Filed under Matter 23-02017 - In the Matter of Reporting Investments and Benefits to Disadvantaged Communities)," accessed July 1, 2025, https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={30392196-0000-C12E-925F-4C0CFCF5789D}.

[30] Cornell Climate Jobs Institute. 2024. "Exploring the Conditions of the New York Solar Workforce." www.ilr.cornell.edu/sites/default/files-d8/2024-04/CJI-NYS%20Solar%20Workforce%20Report_April%202024_Final.pdf.

[31] Potential fossil plant closures were identified in Appendix D of the Scoping Plan. Under the 2023-2024 Enacted State Budget, NYPA will seek to retire its seven small natural gas power plants in New York City and Long Island so long as the retirements do not result in more than a de minimis increase in air emissions in disadvantaged communities and the plants are not needed for emergency power or electric system reliability. In May 2025, NYPA published its small natural gas power plant transition plan: www.nypa.gov/-/media/nypa/documents/document-library/renewables/sngpp-transition-plan.pdf.

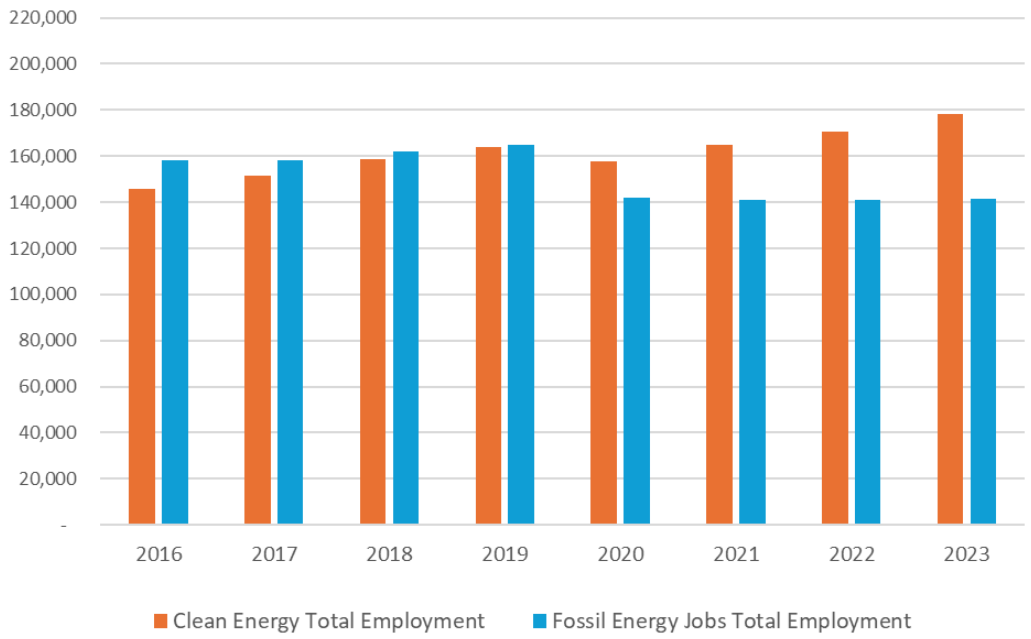

Figure 3: Clean Energy and Fossil Energy Jobs in New York since 2016

New York is committed to helping fossil fuel workers transition to clean energy jobs, including those in and from DACs. As a first step in worker tracking, New York State has updated the Worker Adjustment and Retraining Notification (WARN) system,[32] which requires employers give early warnings of closures and layoffs and indicate whether the closure or layoff is due to the energy transition. This allows the State to provide resources and services to specific energy workers who are facing imminent unemployment. Moving forward, DOL's fossil fuel worker tracking will continue to expand so that New York State is able to identify at-risk fossil fuel workers who are most in need of upskilling, reskilling, and connections to new jobs.

2.4. Labor Policy Developments

2.4.1. State Policy

New York State has advanced workforce protections and high-road labor standards for categories of clean energy projects, by implementing requirements for project labor agreements, prevailing wages, or pre-apprenticeships and apprenticeships, to name a few. Additionally, the State has undertaken new efforts to track displaced fossil fuel workers and to connect these workers with renewable projects. Table 1 summarizes the relevant energy workforce laws and policies.

Table 1 Summary of Relevant State Clean Energy Labor Laws and Policies

Law/Policy	Technology Area	Effective Date	Description
New York State Labor Law § 224-d	Publicly Funded Renewable Electricity	Enacted 2021	Extends prevailing wage requirements to cover certain renewable energy system private projects paid for in whole or in part with public funds.

[32] New York State Department of Labor (DOL). n.d. Apprenticeship Direct Entry. https://dol.ny.gov/direct-entry; n.d. *Worker Adjustment and Retraining Notification (WARN).* https://dol.ny.gov/worker-adjustment-and-retraining-notification-warn%29%3A.

Public Authorities Law § 1005 27-a	NYPA-Owned Renewable Electricity	Amendment Effective 2023	Requires PLAs, apprenticeship agreements, and agreements with labor for project maintenance and operation. Encourages prioritization of transitioning workers who have lost their employment or will be losing their employment in the non-renewable energy generation sector.
New York State Public Buildings Law § 91(7)	Decarbonization of State-owned facilities	Amendment Effective 2023	Requires PLAs and payment of prevailing wages for decarbonization of State-owned facilities.
Utility Thermal Energy Network and Jobs Act (UTENJA)	Utility Thermal Networks	November 2023 (Commission Order), Pilot under development as of 2025	Extends prevailing wage and direct entry pre-apprenticeship requirements to thermal energy projects. Gives hiring priority to utility workers transitioning from fossil fuel jobs; operations and maintenance positions must first be offered to these displaced workers.
Wage Requirements New York Sun (NYSERDA)	On-Site and Community Solar	April 2022	NY-Sun projects over 1MW must pay prevailing wages. Projects that comply are eligible for a Prevailing Wage Adder, the amount based on project size and location.
Creation of the DOL Office of Just Energy Transition (OJET)	Sector-Wide	Office opened in 2023	Supports both new workers and workers transitioning from the fossil fuel sector to quality jobs in clean energy, with a focus on serving traditionally underrepresented groups. Collaborates with NYPA on the utilization of funding pursuant to PAL 1005(27-d) for clean energy workforce development initiatives.
$1 Billion Sustainable Future Program		FY2026 Budget	Projects that receive at least $100,000 require apprenticeship agreements and consideration of pre-apprenticeship direct entry programs for the recruitment of local and/or disadvantaged workers. All construction and maintenance projects over $5 million require PLAs.

2.4.2. National Policy

The 2022 Federal Inflation Reduction Act (IRA) authorized federal financial support to clean energy with a focus on high-quality labor standards and an emphasis on job quality. Most notably, the IRA's clean energy tax credits—a critical source of funding for large-scale renewable development and efficiency investments—included additional incentives for projects with prevailing wages or registered apprenticeship requirements.[33] However, shifting priorities—including halted federal programs, funding, and mixed market signals—within the new federal administration will likely dampen clean energy investments, though the full extent of the impacts on the industry is not yet clear.

Despite the shifting priorities at the Federal level, State-to-State coordination continues to drive national change for clean energy jobs. Governor Hochul is a member of and recently served as the co-chair of the United States Climate Alliance (USCA), a bipartisan coalition of 24 governors securing America's net-zero future by advancing state-led, high-impact climate action.[34] The USCA governors represent approximately 60 percent of the U.S. economy and 55 percent of the U.S. population. In 2024, the USCA launched the Climate-Ready Workforce Initiative, which commits to training 1 million new Registered Apprentices by 2035. In collaboration with other States, New York remains committed to growing career pathways in climate and clean energy fields through the gold standard Registered Apprenticeship model.

[33] The Department of the Treasury, Internal Revenue Service. 2024. Treasury, IRS release guidance on the prevailing wage and apprenticeship requirements for increased credit and deduction amounts under the Inflation Reduction Act. Washington, DC, June. https://www.irs.gov/newsroom/treasury-irs-release-guidance-on-the-prevailing-wage-and-apprenticeship-requirements-for-increased-credit-and-deduction-amounts-under-the-inflation-reduction-act. Also see U.S. Internal Revenue Code sections 30C; 45; 48; 179D.

[34] United States Climate Alliance. 2024. *U.S. Climate Alliance Launches Governors' Climate-Ready Workforce Initiative, Aims to Train 1 Million New Registered Apprentices by 2035.* September. https://usclimatealliance.org/press-releases/building-a-climate-ready-workforce-sep-2024/.

2.5. State Workforce Development Programs

NYSERDA serves as the leading State agency responsible for promoting clean energy workforce development, alongside key clean energy workforce training initiatives at DOL, SUNY, ESD, NYPA, and others. As described below, other State agencies have expanded their roles in the clean energy workforce development ecosystem in recent years. Table 2 summarizes the key State entities involved in supporting clean energy workforce development activity. All the agencies fund clean energy workforce training and wraparound supportive services.

Table 2 Summary of Ongoing New York Workforce Development Programs[35]

State Entity	Description	Relevant Funding Streams
NYSERDA	NYSERDA administers roughly $180 million of clean energy workforce development programming focused on supporting capacity building and wage support.	Apprenticeship and Pre-apprenticeship Clean Energy Training; Offshore Wind Training Institute; Energy Efficiency and Clean Technology Training; Building Operations and Maintenance Training; and more.
DOL OJET	Up to $25 million annually in clean energy workforce development, allocated from NYPA.	$9 million for Growing the Clean Energy Workforce (GCEW); Renewable Energy Training Initiatives (RETI)
NYPA	Up to $25 million in funding to allocate to clean energy workforce development. Funding is administered in collaboration with OJET.	See NYPA programs in section 2.5.5.
SUNY	SUNY administers targeted clean energy training programs and has a wide reach across the education spectrum, including pre-college, undergraduate, graduate, technical, and community colleges. Campuses are uniquely positioned as “living labs” given its extensive physical footprint and decarbonization goals, for example, the Suffolk Community College Renewable Energy/STEM Center.;	Offshore Wind Training Institute (OWTI) ($8 million distributed); Agricultural and Clean Energy Technology (ACET) Center; various microcredential programs, including for HVAC training (a significant expansion with $5 million in NYPA funds in 2025); SUNY Transformation Fund grants ($2.6 million) for workforce training on electrification of buildings and vehicles; and many relevant degree, certification, and training programs in renewable energy and green buildings. The SFY26 budget provides $28.2 million to SUNY for free community college for adult learners in high-demand fields, including green technologies.
ESD OSWD	Roughly $8 million awarded to date toward clean energy-related workforce development training for underserved populations.	Workforce Development Capital Grant and Pay for Performance Grant Programs
DOT	Partnership with SUNY Cobleskill to train existing fleet technician to support the electrification of DOT’s fleet.	

2.5.1. NYSERDA Workforce Development Programs

New York State contributes to the development of its clean energy workforce by financing a variety of workforce training programs, including pre-apprenticeships and apprenticeships. NYSERDA’s workforce development programs help upskill existing workers and train and place new workers across all clean energy sectors, including building decarbonization, energy storage, solar, onshore and offshore wind, electric transmission and distribution, and EV charging. In conjunction with DOL, NYSERDA has expanded its approach from funding standalone training programs to funding activities that support training and placing individuals in high-quality clean energy jobs. NYSERDA’s programs broadly support two types of activities:[36]

[35] Not included in this table is DOS Code Enforcement Training Program.

[36] A snapshot of NYSERDA’s workforce development programs can be found at https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/Fact-Sheets/workforce-fact-sheet.pdf. Open solicitations and funding opportunities are continually updated and available at www.nyserda.ny.gov/Funding-Opportunities/Current-Funding-Opportunities.

- **Capacity building** funding is available to clean energy workforce training organizations and supports the development of training curricula, instructor training, and equipping learning labs for hands-on-training. Example programs include the Apprenticeship and Pre-apprenticeship Clean Energy Training (PON 5437) to prepare trainees for employment in clean energy; Energy Efficiency and Clean Technology Training (PON 3981) that provides hands-on experience; and Offshore Wind Training (PON 4595).
- **Wage support** is available to clean energy employers to subsidize the cost of hiring and training new clean energy workers, interns, and climate justice fellows. Example programs include On-the-Job Training (3982), Clean Energy Internships (PON 4000) and Climate Justice Fellowship (PON 4772).

To date, NYSERDA has funded training for 32,000 clean energy workers (2018–2024), about a sixth of the number of clean energy jobs expected in the coming years, highlighting the need for additional investment. By the end of 2025, NYSERDA will have met its training goal of more than 40,000 clean energy workers.

NYSERDA's clean energy career awareness activities across the state provide young people with an opportunity to explore a variety of pathways to contribute to an expanding clean energy economy (see example below on NYSERDA's partnership with Roadtrip Nation). For example, NYSERDA funded the training of 400 educators through the Clean Energy for Educators initiative, which provided educators with professional learning and networking opportunities to increase the number of young people interested in careers in clean energy. Especially as demand for skilled trades increases, there is a need to provide young people with early exposure to these career options. To support this, NYSERDA has leveraged its partnerships with labor organizations to engage schools statewide with skilled tradespeople and increase awareness of earn-as-you-learn models.

In 2023, NYSERDA partnered with Roadtrip Nation to create a 4-part docuseries called "Empowered State" to explore careers and innovations in clean and renewable energy through the eyes of three young adults. NYSERDA also worked with Roadtrip Nation to create a community portal to host additional clean energy career content and resources.[1]

2.5.2. DOL Clean Energy Workforce Development Programs

In April 2023, DOL established the Office of Just Energy Transition (OJET) to support training for clean energy jobs and connect transitioning fossil fuel workers to opportunities for upskilling, reskilling, and new job opportunities in renewables. OJET offers resources to identify skills and occupations within the clean energy economy. OJET also facilitates critical connections and engagement between clean energy industry employers, training providers, and job seekers, including K-12 clean energy career awareness. Starting in 2024, OJET launched two funding streams to support a just energy transition, with a unique focus on wraparound services for workers-in-training.

- **Growing the Clean Energy Workforce**[37] **(GCEW):** These grants support the creation and expansion of clean energy training programs and pre-apprenticeship opportunities in building electrification, renewable energy, electric vehicle charging, or energy-intensive industries. Funding also covers wraparound services for program participation, such as transportation and childcare support.

- **Renewable Energy Training Initiatives (RETI)**: These funds are allocated directly to local Workforce Development Boards to support workers transitioning away from fossil fuel work and residential clean energy workers in the areas of weatherization and building performance.

2.5.3. SUNY Clean Energy Workforce Development Programs

SUNY is uniquely positioned to respond to regional clean energy training needs and maintains extensive partnership programs with community-based organizations, Boards of Cooperative Educational Services (BOCES), local governments, and state agencies. SUNY's campuses serve as "living labs" for building decarbonization training. Central to SUNY's objective is to "facilitate New Yorkers' transition to well-paid careers in the climate and sustainability field, with a particular focus on environmental justice communities and displaced workers." SUNY's 2025–2030 Climate and Sustainability Action Plan highlights the expansion of its clean energy workforce training as a key priority.[38] In particular, SUNY aims to:

- Increase its credit and non-credit workforce training programs to address the evolving workforce needs for green jobs, including internships and P-TECH programs;

- Increase enrollment, retention, and completion of green workforce development programs; and

- Increase green jobs pathways and placements in climate and sustainability-related industries, especially for residents of disadvantaged communities, adult learners, and other individuals who face barriers to participating in the green energy field.

In addition to its role in educating New York's future workforce across its 64 schools, including 30 community colleges, SUNY also administers several clean energy training programs.

- **Offshore Wind Training Institute (OWTI)** has been creating and expanding programs to prepare students and transitioning workers for careers in the offshore wind industry. It is spearheaded by Stony Brook University and Farmingdale State College in partnership with NYSERDA and has funded more than 20 programs across New York State.

- **Campus as a living lab programs, such as the renewable energy and STEM center at Suffolk County Community College** launched in 2023 and houses the National Grid training center, an offshore wind training center, HVAC programs, and other clean energy training programs. The

[37] DOL, *Workforce Governance: Funding Opportunities - Review Current & Archived Funding Opportunities Including Additional Resources,* accessed July 5, 2025, https://dol.ny.gov/funding-opportunities-0.

[38] State University of New York (SUNY). 2025. "SUNY Climate and Sustainbility Action Plan 2025-2030." www.suny.edu/media/suny/content-assets/documents/sustainability/Sustainability-Plan.pdf.

center brings together State, local, and private capital investments with academic programs and union and private partnerships.[39]

- **Economic Transformation fund grants** totaling $2.6 million to 12 schools in late 2024 to develop academic and training programs for the electrification of buildings and/or vehicles.[40]
- **Microcredentials.** Fall 2025 will mark the launch of The SUNY Clean Energy Microcredential Initiative under a joint $5M grant from NYPA and DOL. The program will feature three projects: scaling enrollment in existing clean energy microcredentials already underway at SUNY campuses; developing new clean energy microcredentials at campuses not yet offering them, extending the program's reach across the state; and introducing a first-of-its kind pilot program of microcredentials to recognize clean energy instruction and related internships for P-Tech students. Together the program will create 800 new seats in clean energy microcredentials across two- and four-year campuses as well as prepare a critical evaluation of how microcredentials can be implemented at P-Tech. All microcredentials will be credit-bearing and stackable to a degree, providing early entry into the workforce and the opportunity for learners to continue their education while they work.
- **Free Community College** for green technologies and other high-demand fields, including green technologies. The New York State Opportunity Promise program makes community college free for eligible adults (25-55, who have not attained a college degree) to pursue associate degrees in high-demand fields like healthcare, science, technology, engineering, green technologies and math. The state allocated $47 million for the first year of the program, including $28 million for SUNY.

2.5.4. ESD Clean Energy Workforce Development Programs

In April 2022, New York State ESD established the Office of Strategic Workforce Development (OSWD) to administer $350 million in workforce development funding, aiming to better align training efforts with the needs of employers across the state. OSWD's grant programs focus on employer-driven, high-demand training in statewide priority sectors, including clean energy, construction, and advanced manufacturing. OSWD's programs also emphasize creating opportunities for underserved populations, including those not in the labor force, unemployed and underemployed workers, and low-income individuals.[41] To date, OSWD grants have helped launch new workforce training initiatives and strengthen existing programs at community colleges, state universities, BOCES, and union-led organizations, with a focus on expanding access and opportunities in high-growth industries like clean energy.

OSWD's programs offer hands-on experience, industry-recognized credentials, and support services such as stipends, transportation, and childcare to remove barriers to employment. These programs also aim

[39] Suffolk County Community College, *Renewable Energy/STEM Center*, accessed July 5, 2025, https://www.sunysuffolk.edu/stem/stem-center.jsp.

[40] Grantees were Adirondack Community College, Alfred State College, SUNY Canton, SUNY Cobleskill, Columbia-Greene Community College, SUNY Delhi, Farmingdale State College, Monroe Community College, SUNY Morrisville, Schenectady Community College, Suffolk Community College, and Ulster Community College.

[41] ESD Office of Strategic Workforce Development, https://esd.ny.gov/office-strategic-workforce-development.

to increase exposure to clean energy and adjacent workforce fields with high employability or direct entry to apprenticeships and/or immediate employment, and to increase enrollment and completion of clean energy related trainings statewide.

2.5.5. NYPA Clean Energy Workforce Development Programs

NYPA's programs focus on creating energy career pathways through fellowships and career academies for middle and high school students; project based paid internships and industry recognized certification for community college students; and training in emerging technologies. NYPA's EV Workforce Pathways program, for example, trains the next generation of automotive technicians who will support the State's electric vehicle transition. Since 2021 NYPA has collaborated with 22 auto-tech programs to provide resources and training equipment. Program stakeholders and recipients include BOCES, Career and Technical Education (CTE) High Schools and Community Colleges throughout New York State.

In May 2023, NYPA was granted expanded authority to assist the State in meeting its decarbonization goals, including directives to administer $25 million annually in clean energy workforce development programs in collaboration with DOL.[42] In March 2024, NYPA and DOL entered into a Cooperative Agreement for programs related to workforce training, retraining and apprenticeship opportunities in the renewable energy field. In its first year of funding, NYPA launched new workforce development initiatives and contributed funding to expand the capacity of existing workforce development programs.[43]

As the program matures, NYPA will expand its focus to education development and training workers earlier in the pipeline. In collaboration with DOL, NYPA has already awarded $5 million to SUNY to administer the SUNY Clean Energy Microcredential Initiative, with an emphasis on funds that support DACs and the provision of wraparound services, such as tuition, transportation, and childcare.[44] NYPA has also provided Soulful Synergy funding to deliver specialized training on advanced building weatherization techniques and skill in building and transportation electrification to 80 participants, and is supporting the Clean Energy Training Academy and Internship Program to prepare New York City Housing Authority residents for careers in the clean energy sector.[45]

2.5.6. DOT Fleet Technician Workforce Development Efforts

The New York State Department of Transportation (DOT) has built critical partnerships and programs to address worker and skill gaps in the fleet technician workforce. First, DOT has partnered with SUNY Cobleskill to train existing fleet technicians in the skills needed for fleet conversions to electric, plug-in hybrid, and alternative-fuel powered vehicles. To bring new workers into the transportation technician

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[42] New York Power Authority. 2023. *Legislation Gives New York Power Authority Additional Authority to Advance Renewable Energy Generation and Decarbonization in New York State.* May. www.nypa.gov/news/press-releases/2023/20230503-legislation.

[43] New York State Governor's Office. 2024. *Governor Hochul Announces $11.6 Million to Develop Clean Energy Industry Workforce.* https://www.governor.ny.gov/news/governor-hochul-announces-116-million-develop-clean-energy-industry-workforce.

[44] NYPA issued its RFP in July of 2024 and made two tranches of awards. At the close of FY 24/25, NYPA will have awarded $25 million inclusive of the $9 million to DOL and $5 million to SUNY.

[45] A full list of NYPA's approved workforce development and training investment can be found in Appendix G to the 2025 NYPA Renewables Strategic Plan (https://www.nypa.gov/public-hearings).

industry, DOT strategically recruits from BOCES, high schools, and colleges across New York State and has a goal to launch an apprenticeship program to bring new transportation technicians into the State workforce.

2.5.7. Non-Governmental and City Programs

State government programs are part of a much larger ecosystem of clean energy workforce training programs across New York. Non-profit training providers, labor unions, pre-apprenticeships, employer-based training programs, universities and community colleges, and grade schools and BOCES all offer critical programs, degrees, and credentials to prepare the clean energy workforce. For example, BOCES serve all upstate districts and play an important role in rural communities. City government offices, such as the New York City Mayor's Office of Talent and Workforce Development, create local plans and offer their own funding for clean energy workforce training. Continued collaboration between State, non-governmental, and city-based programs will be critical to prepare the current and future clean energy workforce.

3. Outlook (2025 – 2040)

Under the Additional Action scenario of the State Energy Plan Pathways Analysis, energy sector jobs are expected to grow by 13 percent, or roughly 60,500 jobs between 2025 and 2040. The electric sector will experience the fastest growth at 32 percent (or 44,500 net jobs), followed by the buildings sector with 23 percent growth (38,000 net jobs). In the electricity sector, increases are concentrated largely in renewable energy sources such as wind, hydropower, and solar, as well as in storage and electric distribution jobs. In the buildings sector, increases are expected in both commercial and residential work, with the most dramatic increases expected in residential shell work, where workforce demand is expected to more than double by 2040. This expected growth will create a significant need for clean energy workforce training as well as extensive coordination across State agencies. Net jobs in the transportation and fuels sector are expected to decrease between 2025 and 2040 – by 14 percent and 13 percent, respectively – consistent with decreased investments in fossil fuels modeled in the Additional Action scenario. Additional results are discussed in the Economic Impacts: Jobs Analysis chapter of this Plan.

4. Themes and Recommended Actions

New York's energy workforce policies should include both protective and proactive measures that support a just transition to a decarbonized economy.[46] Protective policies provide existing fossil fuel workers who lose their jobs due to State climate policies with support systems and safety nets when making the transition to new employment. Protective policies also require that new clean energy jobs are high-quality, safe, well-paying, and inclusive, especially when these jobs are supported by State investments. Simultaneously, proactive policies provide an ecosystem of clean energy schooling, training, and employment opportunities for New York residents, with an emphasis on creating pathways for DACs. Proactive policies are responsive to emerging industries, existing industries that must expand to support the State's climate goals, and industries that may shrink because of these goals. To arrive at a set of truly

[46] Vachon, Todd E. 2023. *Clean Air and Good Jobs: US Labor & the Struggle for Climate Justice.* Philadelphia, PA: Temple University Press.

transformative just transition policies, New York should consider the following mix of protective and proactive recommendations.

4.1. Workforce Development Funding

The clean energy industry is highly dynamic and growing quickly. Strategically developed workforce development programs can build up enough capacity of skilled workers so that the State can meet the needs of its clean energy ambitions across the electricity, building decarbonization, and transportation sectors. Workforce development will need to support the operations and expansion of existing technologies, while supporting the scale up of emerging energy systems including thermal energy networks and advanced nuclear. Extensive coordination is needed to ensure that the pipeline of jobs will materialize for these trained workers. Table 2, above, summarizes the key State-led workforce development initiatives currently underway. As the clean energy industry evolves, these programs will need to adapt to changing needs. The sections below highlight several sector-specific considerations.

4.1.1. Building Decarbonization and Resiliency

To enable a scaling of investments into efficient, low-carbon, and resilient buildings, the State will need to invest in expanding and advancing the skills of the buildings workforce to keep pace with evolving demand. The workforce that supports energy efficiency upgrades and other related building decarbonization work currently makes up more than 60 percent of New York's clean energy workforce, and will play a critical role in implementing large-scale investments in energy efficiency, weatherization, electrification, and integrating new energy sources into existing buildings—as well as the engineering, policy, planning, research, and administrative capacities that will support the modernization and transformation of our building stock. At the same time, buildings across New York State will likely continue to be exposed to more extreme flooding, precipitation, wind, and heat events due to a changing climate, highlighting the need to embed resiliency measures in the State's residential, commercial, and institutional buildings.

The prioritization of energy efficiency and weatherization investments will facilitate the State's decarbonization efforts. The scale of efficiency work needed will require expanded workforce capacity across a range of occupations, including energy auditors, code inspectors, insulation installers, plumbers, steamfitters, pipefitters, glaziers, electricians, HVAC technicians, and more. These demands will compound the already-high demand for workers in this sector. In 2023, virtually all New York employers expressed some level of difficulty hiring workers in the building decarbonization and energy efficiency space, pointing to the existing need to scale up this workforce.[47]

The buildings transition will also rely heavily on emerging and quickly evolving technologies being adopted at scale. Advanced HVAC technologies such as cold climate heat pumps, heat pump water heaters, industrial heat pumps, and others will be an important tool to improve building efficiency. Investing in advanced HVAC training and program development will be critical as New York's buildings transition to newer heat-pump-based systems and other high-efficiency technology. To maximize impact,

[47] New York State Energy Research and Development Authority, "2024 Clean Energy Industry Report," accessed July 1, 2025, https://www.nyserda.ny.gov/About/Publications/New-York-Clean-Energy-Industry-Report.

training programs and other workforce development aimed at the HVAC workforce should reflect feedback from operational experience in the field and available labor supply and demand data.

4.1.2. Electricity

As discussed in the Electricity chapter of this Plan, the State must tailor its workforce development programs to attract an adequate and skilled labor pool to support the near- and long-term needs of the electricity sector. In particular, support for training and retraining will be needed to expand and modernize the State's electric transmission and distribution infrastructure to support increased demand for electricity, the integration of renewable energy, as well as substantial planned utility spending on the distribution system to enhance reliability and resiliency, including breaker replacements, system hardening, automation, substation upgrades, and storm response measures. Additionally, training will be needed to support the management, maintenance, and upgrading of existing clean electric generation facilities and the construction, installation, and operation of new clean generation resources including onshore and offshore wind, distributed and large-scale solar, energy storage, as well as potential future development of advanced nuclear and other emerging clean firm technologies.

4.1.3. Transportation

Continued investments into electric vehicle deployment in New York are essential to lowering the State's transportation-related emissions. As discussed in the Transportation chapter of this Plan, there is a pressing need to develop a workforce to perform the planning, installation, and maintenance of vehicle charging networks. This need can be supported through workforce development targeted to training EV installers and technicians to keep pace with the rapid expansion of new and existing charging infrastructure.

4.1.4. State Funding for Direct Entry and Pre-Apprenticeship Programs

New York State should continue funding Direct Entry and other pre-apprenticeship programs that support clean energy projects, especially in industries and occupations with projected worker shortages.[48] Registered Apprenticeships are an important tool for economic mobility and growth. While New York State Registered Apprenticeships remain the gold standard of workforce development for middle-skill workers in high-demand occupations, New Yorkers in DACs have historically faced barriers to entering careers in the building trades. To help expand Registered Apprenticeship opportunities for all New Yorkers and to fill gaps in clean energy labor supply, New York State should commit long-term funding to Direct Entry and pre-apprenticeship training providers that are preparing workers for clean energy trades, such as electricians, plumbers, roofers, manufacturing, supply chain, and more.

4.1.5. Prioritizing Early Education

There is a particular need for more outreach at the K–12 and college levels to attract the next generation of clean energy workers. Nonprofit organizations in the clean energy space have already begun developing education and training for young people. DOL should work with these organizations to more deeply incorporate education into its existing teacher ambassador program. Agencies including DOL and NYSERDA should also coordinate on forthcoming K–12 career outreach. NYSERDA can also expand

[48] New York State Department of Labor (DOL). n.d. *Apprenticeship Direct Entry.* https://dol.ny.gov/direct-entry.

outreach to educators, which already includes offering free clean energy workshops and providing them with teaching resources.

4.1.6. Clean Energy Career Training on SUNY Campuses

To expand the pipeline of clean energy workers and help existing energy workers build the skills they need to keep pace with technological advances, SUNY offers accredited training onsite in clean energy industries, career support services, and prepares trainees for certifications and basic skills for entry-level jobs in renewable-related industries. With close coordination between DOL, the State Workforce Investment Board[49], BOCES[50], and SUNY, the expanded training curriculum could respond to market demand so that trainees have a clear career path into the industry following training.

The dynamic SUNY clean energy educational offerings connects individuals to training opportunities across the State through campus-specific training centers. The Clean Energy Hubs may act as credible messengers to connect interested community members to local training opportunities. DOL should also help refer transitioning fossil fuel workers to these SUNY training centers, particularly for micro-credentials or certificates that they would need to transition into a clean energy career.

Recommendations

- **NYSERDA, DOL, and ESD should identify opportunities to incentivize and bolster workforce training participation in key occupations** where shortages are projected (such as technicians, construction trades, and manufacturing). Workforce development efforts should also prioritize:
    - The need to expand the capacity of the energy efficiency workforce and target the development of installation and operation skills for high-efficiency HVAC equipment;
    - A growing demand for building and maintaining new transmission and distribution infrastructure;
    - Further investments in energy storage, distributed and large scale solar, thermal energy networks, and wind;
    - Building up transferrable skills that would support future nuclear development; and
    - Training to support the expansion and operations of EV charging infrastructure.
- **DOL, NYSERDA, and ESD should continue funding Direct Entry and pre-apprenticeship programs** that support clean energy projects, including identifying any need for additional long-term State funding.
- **NYSERDA and DOL should expand clean energy career awareness in K-12 schools across NYS** and initiatives to provide educational resources.
- **New York State should continue and expand investments into clean energy career training curriculums** on SUNY/CUNY campuses and BOCES across the state.

[49] Additional information about the State Workforce Investment Board (SWIB) is available at: https://dol.ny.gov/new-york-state-workforce-investment-board.

[50] Boards of Cooperative Educational Services (BOCES) partner with nearly all of the State's school districts to offer career and technical training for high school students and adult learners. See: https://www.boces.org/services/

4.2. Labor Standards

As summarized in Table 1 above, the State has made progress on enacting minimum jobs standards for clean energy projects. Minimum labor standards are effective tools to improve job quality and project outcomes, and contribute to creating jobs that are safe, pay a living wage, support career growth, and have collective bargaining rights.[51] For example, prevailing wage requirements can ensure that minimum pay standards are met, while Project Labor Agreements and Labor Peace Agreements are used to protect the rights of covered workers. Safety requirements can protect workers from dangerous working conditions, such as extreme weather and other unsafe working conditions. Labor standards also improve project outcomes and final work products, the result of standardized training and high productivity. However, the clean energy industry is highly varied, and as a result may require specific labor standards to guarantee high job quality.

To remain proactive in its commitment to high-quality clean energy jobs, New York State should assess the coverage of labor standards across energy sectors to ensure that workers are well-protected. This would allow the State to better identify opportunities to expand coverage, especially where State funds support the underlying clean energy project. Where minimum labor standards are not relevant, this research should explore other policies to ensure job quality, such as ensuring on-the-job safety, regular pay, and access to benefits for clean energy projects supported through State funding. This research should also incorporate analysis of smaller scale projects and companies where labor standards may not apply, but where ensuring high job quality is still important.

Recommendations

- **DOL and NYSERDA should undertake research that analyzes the labor standards that apply to clean energy jobs.** This analysis should identify gaps in labor standard coverage and consider policy actions that can ensure clean energy jobs are high quality.

4.3. Accessibility and Awareness of Clean Energy Jobs and Job Training in Disadvantaged Communities

New York State prioritizes clean energy workforce development funding for members of DACs and other priority groups, such as veterans and others; however, the State can do more to ensure that its workforce development initiatives are reaching these communities, as they have less than proportional participation rates in clean energy training jobs and training programs. To continue attracting New Yorkers, especially residents of DACs, the State will need to continue to partner with trusted community organizations to bring DAC members into the unionized trades through career and industry awareness.

A 2023 survey found that nearly two-thirds of New Yorkers looking for work had not considered working in the clean energy industry.[52] Low participation may be due to the lack of knowledge or education on clean energy and what clean energy jobs can look like. Work in clean energy can take many forms across

[51] U.S. Department of Labor, “US Departments of Labor, Commerce announce coordinated effort to create good jobs, promote equity throughout the workforce,” accessed July 5, 2025, https://www.dol.gov/newsroom/releases/osec/osec20220621.

[52] New York State Energy Research and Development Authority, "2024 Clean Energy Industry Report," accessed July 1, 2025, https://www.nyserda.ny.gov/About/Publications/New-York-Clean-Energy-Industry-Report.

many occupations ranging from solar panel installer, HVAC repair, operating engineer, administrative support, researcher, energy auditor, and so on. Clean energy work can also include the development of small businesses or entrepreneurial activities.

While New York State needs to increase awareness of clean energy job opportunities, the State also needs to consider and address barriers to participation. Participation in training programs can be bolstered and facilitated through the provision of wraparound services. These services can lower cost barriers or other obstacles associated with obtaining clean energy job training, such as the cost of certification, the cost of transportation, the need for job stipends, the cost and availability of housing or lodging, childcare support, and reentry supports.[53] Wraparound services can also include funding that supports job placements. State-level communications and engagement campaigns should amplify clean energy job trainings and related wraparound services.

4.3.1. Communicating Opportunities in Clean Energy

State agencies, education providers at all levels, and industry partners should coordinate communications campaigns that clearly articulate clean energy careers, entrepreneurship, and training opportunities, when possible. Campaigns should provide relevant education on clean energy topics, generate interest in clean energy careers, and be able to communicate why entering this market can be a community and/or family wealth-building opportunity. The State should remain committed to communicating the existence of programs through community spaces, educational spaces, school curricula, job fairs, and other relevant community networks, including NYSERDA's Regional Clean Energy Hubs.

4.3.2. Wraparound Services Funding for Trainees

State agencies are keenly aware that barriers to entry can often prevent members of DACs from starting and completing job training programs. Often, the lack of wraparound services, including supports for childcare, transportation, housing, health care, and mentorship, can act as a barrier. State agencies receive workforce development funding from various sources, some with more or less flexibility to fund such services. As such, State workforce development offices must continue to collaborate to fund wraparound services. Such collaboration may also extend to non-profit providers, or other entities that can help fill funding and coordination gaps.

4.3.3. Clean Energy Job Training for Currently and Formerly Incarcerated New Yorkers.

DOL should expand existing environmental literacy programs in correctional facilities to include specific clean energy job training and expand programming to more facilities. This program expansion would provide a path to good jobs in clean energy, while also expanding the pool of eligible energy workers in high-need occupations.

4.3.4. Research on Jobs for Disadvantaged Community Members

To the extent possible, New York estimates the number of clean energy jobs located in DACs as well as the number of DAC residents in clean energy jobs. However, current efforts do not provide further granularity beyond these estimates. Additionally, NYSERDA currently monitors job retention 12 months

[53] NYCHA's Clean Energy Academy is an example of a program that offers wraparound supports (e.g., a $1,500 job stipend).

post-training but does not have access to retention rates beyond that. More detailed analysis, as well as the expansion of tracking efforts, is needed to measure the long-term placement success rates of the State's clean energy investments.

Recommendations

- **New York State should consider launching new statewide communications campaigns** to promote inclusive participation in clean energy careers.
- **New York State** should continue to identify and pursue opportunities to carve out funding for wraparound services, such as childcare, transportation, and job placement funding to remove barriers to participation.
- **DOL should expand clean energy training programs in correctional facilities.**
- **NYSERDA, in collaboration with DOL, should identify new ways to study and track the representation and long-term retention of individuals from DACs in clean energy jobs,** especially individuals who have completed State-funded training.

4.4. Just Transition Policies for Fossil Gas Employment Impacts

The State is committed to creating pathways for New Yorkers to move into new, high-quality clean energy jobs and to support those transitioning out of fossil-fuel-energy-based employment. Currently, there are roughly 140,000 jobs in fossil fuel electric generation plants, the natural gas distribution system, the transportation and storage of delivered fuel, and other related fossil fuel jobs. Over the time horizon of this plan, jobs impacts in these subsectors are expected to vary, with some anticipated to occur sooner than others.

Well-designed workforce and labor policy can promote a just transition for these workers through a combination of proactive investments into efforts such as retraining, upskilling, or right of first refusal for workers transitioning into clean energy fields. The State should also consider protective measures for fossil workers who are negatively affected by the State's climate policy but for whom transitioning to a clean energy field is not possible.

4.4.1. Research on Mapping New York's Fossil Fuel Workforce

Further research is needed to better understand the employment impacts of transitioning the various fossil fuel subsectors. This research should quantify and qualify the State's fossil workforce, including an assessment of the occupations, skills, wages, age, and location of workers across the subsectors. This research should estimate the short- and mid-term workforce needs to support possible transition activities and serve as a baseline to support the assessment of possible just transition policies.

This research should examine the natural gas distribution subsector to support ongoing gas utility long-term planning activities and State policy development. Analysis of this subsector should consider the potential employment impacts of changes to ongoing maintenance of the existing distribution systems, civil engineering efforts to ensure the continued safe operation of such systems in service territories that continue to host such systems, the safe decommissioning of sections of the systems, and the

construction and installation of equipment to support non-pipeline alternatives, alternative fuels, and other related decarbonization activities. Additionally, this research should highlight existing fossil fuel occupations with highly transferrable skills to the clean energy sector, such as in distributed thermal networks, nuclear energy, or otherwise.

A better understanding of the State's fossil workforce will enable future research to explore the protective transition policies identified in the following section.

4.4.2. Safety Net Policies for Workers at Risk of Job Loss Due to Climate Change Mitigation Policies

While many of the skillsets of New York's fossil workers may be transferrable, transitioning to a new career may not be an option depending on age, lack of regional opportunities, or the pay differential for new roles. In addition to the displaced worker tracking and associated support that OJET offers (see Table 1), New York must research and develop adequate safety net measures to support workers who may be negatively impacted due to climate policies.

The detailed understanding of the State's fossil workforce established by the research in Section 4.4.1 will enable additional research that estimates the potential impacts of policies like a bridge to retirement for older fossil workers, wage guarantees for fossil workers transitioning into lower roles, support to pension funds impacted by the transition, or support to communities built around transitioning industries.

Recommendations

- **NYSERDA and DOL should undertake research to assess the employment impacts of transitioning fossil fuel subsectors** to address a dearth of research on the topic at the state and national level. This research should be designed to better inform how to design and prioritize just transition policies.
- **NYSERDA and DOL should research and estimate the potential impacts of safety net measures that support workers negatively impacted by climate mitigation policies.** Such measures could include wage guarantees, bridge to retirement, transitional opportunities, and/or support for communities facing plant closures.
- **New York State should consider a Just Transition Fund, with dynamic support from multiple sources, that could support the funding of safety net measures mentioned above.**

4.5. Continue and Expand Statewide Workforce Development Coordination Efforts

As training and research needs expand and evolve, and as more State agencies join the clean energy workforce development ecosystem, further coordination will be needed. Deeper coordination can help fill gaps in programming and prioritize the dissemination of resources where they are needed most. Interagency cooperation also supports streamlined processes and yields faster and better results from clean energy programs. Statewide coordination should continue to include local and non-governmental workforce training providers, including labor unions, non-profit training providers, wraparound service providers, municipal and county governments, and employers.

4.5.1. Align Statewide Definitions of Green Occupations and Industries

To make clean energy jobs accessible to wide range of communities, the State should offer clear tools and education on the industries that are expanding, the jobs that will be available in those industries, and the training programs needed to obtain those jobs. Many State agencies have already developed similar resources, such as DOL's Green Topics Dashboard,[54] NYSERDA's Energize Your Future[55], and NYSERDA's Offshore Wind Training tool[56] (made in collaboration with the New Jersey Economic Development Authority).

To increase clarity and consistency, the State needs to collaboratively define green industries and green jobs. Developing a standardized mechanism statewide for defining, measuring, and projecting green occupations will streamline implementation of clean energy workforce development programming, including delivering and making accessible career opportunities within and to members of DACs, veterans, and incumbent fossil fuel workers.

4.5.2. Align and Streamline Work Requirements

To facilitate a prepared and adequate clean energy workforce, New York State should identify opportunities to better align and streamline regulatory requirements, licensing, and training processes for clean energy jobs. The State should continue its current effort to review the available Civil Service titles that can address future clean energy needs within State government. Additionally, the State should review differences in regional licensing requirements that may provide barriers to accomplishing clean energy transition work. The State must ensure the addition of new technology meets high class standards for skill training and job regulation.

Recommendations

- **DOL should coordinate with partner agencies to streamline state program evaluations and facilitate study of career pathways.**
- **DOL should continue coordinating with other State agencies in the GreenNY Council, including the Department of Civil Service, to modernize and adjust civil service titles to meet clean energy labor demands within State jobs.**

[54] DOL, *Exploring Occupations by Green Topic*, accessed July 5, 2025, https://dol.ny.gov/exploring-occupations-green-topic.
[55] NYSERDA, *Energize Your Future*, accessed July 5, 2025, https://www.nyserda.ny.gov/All-Programs/Clean-Energy-Workforce-Development-and-Training/Energize-Your-Future.
[56] NJEDA and NYSERDA, *Offshore Wind Training New York & New Jersey*, accessed July 5, 2025, https://www.offshorewindtraining.org/.