

Master Plan For Responsible Advanced Nuclear Development in New York:

Workforce Development Study

NEW YORK STATE

NYSERDA Report 26-21c

November 2026

Notice

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Summary

New York State's ambitious goal of building and operating 5 gigawatt-electric (GWe) of new advanced nuclear generation will deliver significant economic and workforce benefits statewide. Careful consideration of workforce strengths, bottlenecks, and opportunities specific to the State can support effective planning to reduce risks and maximize local economic impact.

Rapid deployment of 5 GWe of advanced nuclear in the State is projected to require as many as 7,800 additional jobs in the pre-operations phase and 4,000 additional jobs during the operations and maintenance (O&M) phase. Jobs span skilled trades, construction and engineering roles, managers, operators and technicians, and a variety of supporting occupations. Nuclear project development has served, and will continue to serve, as a significant creator of high-quality, well-paying jobs, many of which are labor-organized and attainable for workers with diverse educational backgrounds and experience levels.

Existing projects demonstrate that nuclear plants can serve as regional employment drivers for New York State, with operations jobs representing a significant source of employment. Upstate New York's existing nuclear power plants—R.E. Ginna Clean Energy Center (Ginna); the James A. FitzPatrick Clean Energy Center (J.A. FitzPatrick); and the Nine Mile Point Clean Energy Center (Nine Mile Point) Units 1 and 2, —support about 24,800 in-state full-time jobs.[i,1] The potential for expansive employment growth underscores the importance of recruiting and cultivating a workforce capable of supporting each phase of nuclear development, including site preparation, construction, plant operations, maintenance and repair, and support services.

At the same time, the State's nuclear workforce has not needed to scale to this level since the nationwide nuclear expansion of the 1970s. New York State already possesses substantial training infrastructure for energy sector workers and employs many workers in transferable occupations. However, meeting future nuclear demand will require expanding and adapting existing workforce assets, alongside creating new training programs better suited to new technologies. Each strategy requires targeted, region-specific policies and funding. Furthermore, these efforts will need to be undertaken in tandem with other critical and high-priority jobs pipelines, including but not limited to other advanced manufacturing; synergies which must be

[i] Includes direct and secondary jobs.

identified and developed in order to ensure sustainable success. Intentional investment and planning today will yield tangible results in both the near and long term.

Understanding Job Estimates Presented in This Study

The employment figures presented in this study measure different types of employment and should not be interpreted as directly comparable to each other or to figures from external studies:

- **4,000 current nuclear operations workers:** The *U.S. Energy & Employment Report 2025* estimates that approximately 4,000 New York State workers were employed in the nuclear sector in 2024. This figure represents workers engaged in nuclear-related business activities across all value chains captured by the *U.S. Energy and Employment Report*; it does not include broader employment supported through worker spending or represent future workforce demand. A 2015 economic impact analysis estimated that the State's three upstate nuclear plants support 24,800 jobs statewide, largely from the 22,500 jobs supported by the secondary effects of lower energy prices relative to an alternative energy portfolio scenario, plus outage-related benefits and supply chain activities.
- **7,800 pre-operations workers and 4,000 operations and maintenance (O&M) workers at peak:** Economic impact modeling conducted by BW Research Partnership, Inc. (BW Research) (see Appendix A and the separate Master Plan Economic Impact Study) estimates that a 5 GWe buildout could require approximately 7,800 workers at the peak of pre-operations and 4,000 at the peak of O&M (direct and indirect but not induced jobs).
- **Average annual workforce demand:** Across the modeled development period, nuclear projects would require an average of approximately 3,100 pre-operations workers and 3,200 O&M workers during the operations phase (direct and indirect but not induced jobs). These annual averages smooth out periods of higher and lower demand and are therefore lower than the peak estimates.

New York State's nuclear workforce goals include:

1. Reducing the risk of critical labor shortages that could increase costs and cause delays
2. Ensuring New Yorkers are prepared for job opportunities in the nuclear sector
3. Planning for fluctuations in workforce demand at each project[2]

To meet these goals, this report provides insights into expected occupational demand, the State's workforce development infrastructure to meet the projected demand, and strategies to mitigate short-term spikes and reduce the risk of bottlenecks.

Findings

Demand

Annual and peak workforce demand: Across the modeled development period and scenarios, nuclear projects would require an average of approximately 3,100 pre-operations workers annually during the pre-operations phase and 3,200 O&M workers annually during the operations phase. These annual averages smooth out periods of higher and lower demand and are therefore lower than the peak estimates. The pre-operations phase may require around 7,900 jobs at peak, while the O&M phase may require 4,000 jobs at peak.

Reactor deployment timelines significantly affect workforce demand timing: While these workforce demand projections are relatively consistent across the modeled deployment scenarios, the timing of demand peaks varies substantially, reflecting differences in when projects are planned and constructed. These variations highlight the importance of aligning workforce development, training, and recruitment efforts with projected project schedules to ensure workers are available when demand is highest.

Approximately 4,000 workers are employed in nuclear operations across New York State: 51% in nuclear electric power generation utilities, 33% in professional and business services, 7% in trade, 6% in manufacturing, and 3% in construction. Architecture and engineering are the largest occupational groups with 655 workers (16% of total nuclear employment).

The nuclear workforce comprises two distinct phases that require different occupations and workforce development strategies: The pre-operations workforce supports construction and commissioning, while the O&M workforce operates the plant over its lifespan. High-demand occupations differ between pre-operations and O&M.

- **Pre-operations:** Initially, a small, specialized workforce is needed for site evaluation, licensing, financing, and environmental reviews, followed by substantial demand for skilled trades, construction management, manufacturing, logistics, and installation occupations. Construction trades drive the near-term workforce surge in New York State, with high demand for electricians, pipefitters, welders, concrete pourers, millwrights, operating engineers, and supervisors. Because many roles may not be needed

continuously, careful consideration is needed to determine where in-state workforce development is most efficient. Nuclear construction relies on familiar industrial construction skills, but the nuclear-specific overlay can create bottlenecks. Workers may need additional preparation in nuclear safety culture, quality assurance and control, regulatory compliance, the U.S. Nuclear Regulatory Commission (NRC) site access and background check regiments, and nuclear-grade materials and techniques.

- **Operations and maintenance:** Following construction and commissioning, workforce needs will shift to a sustained, long-term team of operators, technicians, engineers, maintenance staff, security personnel, radiation protection professionals, and plant managers. These roles often require longer lead times, plant-specific preparation, and sustained regional talent pipelines. Occupations with high projected demand and substantial representation in New York's existing nuclear workforce include nuclear technicians, reactor operators, nuclear engineers, security guards, first-line supervisors, general and operations managers, and lawyers. The peak O&M workforce will be smaller than the construction workforce but will require sustained, plant-specific pipelines.

Based on New York State's Nuclear Reliability Backbone goal of deploying 5 GWe of advanced nuclear capacity, peak workforce demand estimates for both pre-operations and O&M were used to estimate the corresponding required job numbers across a range of high-demand nuclear sector occupations. The risk matrices (Figures S-1 and S-2) identify occupations projected to account for the highest demand of workers in each phase, along with associated risks related to development intensity and supply/demand pressure.

Figure S-1. Risk Matrix for Pre-Operations High-Demand Occupations

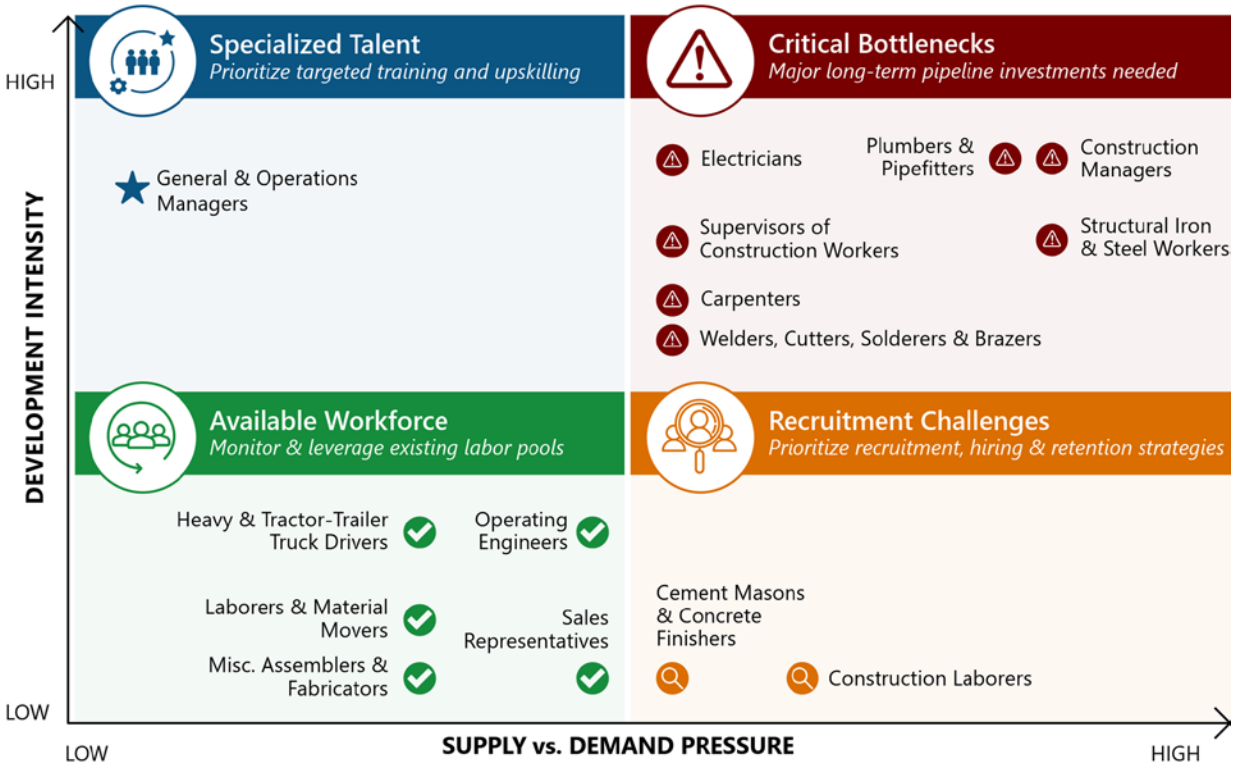
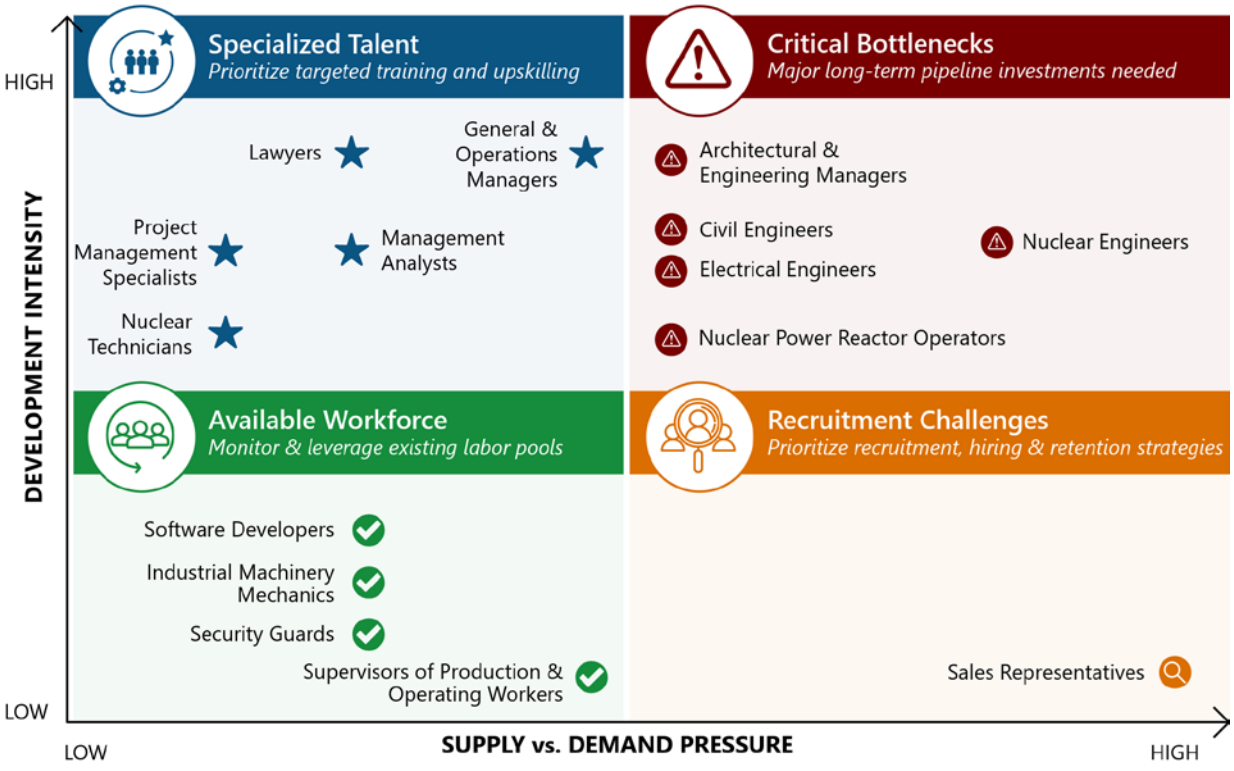


Figure S-2. Risk Matrix for O&M High-Demand Occupations



Additional Essential Operations

Several specialized roles are also essential to the safe, compliant, and continuous functioning of a nuclear power plant. Advanced nuclear creates opportunities for specialized skills in digital controls, cybersecurity, advanced manufacturing, modular fabrication, and technology-specific certifications. While these occupations may not generate significant net employment demand because relatively few workers are needed on-site, they are essential to plant engineering, licensing, construction readiness, commissioning, radiation protection, maintenance, safety compliance, and operations. Roles such as instrumentation and control technicians, health physicists, hazardous materials removal workers, health and safety engineers, and maintenance occupations are therefore critical enabling functions and should be considered strategically important even if they do not meet quantitative high-demand thresholds.

- **Specialized technical, scientific, and engineering positions will be more difficult to fill in the State.** Engineers, scientists, managers, health physicists, and other technical nuclear experts face constrained supply because of decades of limited nuclear development, an aging incumbent workforce, constrained academic pipelines, and national competition for specialized talent.
- **The O&M workforce faces the same national shortage of specialized nuclear talent as pre-operations,** particularly for nuclear engineers, scientists, health physicists, and other nuclear-specific experts essential to safe and reliable plant operations.

Ecosystem

New York State has a strong existing workforce ecosystem to meet the workforce needs for an 8.4 GW nuclear backbone, particularly for the construction trades. Assets include an operating commercial fleet, a nuclear-qualified decommissioning workforce, established labor apprenticeship systems, nuclear and nuclear-adjacent education programs, and a strong base of transferable industries. Specific key assets include:

- **Existing nuclear sites:** Nine Mile Point, J.A. FitzPatrick, and Ginna, plus the decommissioning workforce at Indian Point Energy Center (Indian Point)
- **Higher education:** 10 nuclear-focused training programs across 9 community colleges and 4-year institutions preparing nuclear engineers, technicians, and reactor operators
- **Shared educational networks:** 94 Board of Cooperative Educational Services (BOCES) programs providing training for target nuclear occupations

- **Labor and apprenticeships:** Strong labor presence statewide, including 13 electrician, 9 operating engineer, and 19 plumber and pipefitter apprenticeship programs
- **Employer-based learning:** Constellation internships, cooperative education opportunities, and technician pathways (Constellation owns and operates Nine Mile Point, J.A. Fitzpatrick, and Ginna)
- **Labs and adjacent sectors:** Brookhaven National Laboratory; Naval Nuclear Laboratory's Kesselring Site and Knolls Atomic Power Laboratory sites; Walthousen Reactor Critical Facility; and substantial advanced manufacturing, utility, energy generation, aerospace, and defense activity

New York State has a strong training and education base but significant regional variation. More than 500 public training and credentialing programs align with advanced nuclear target occupations, supported by 276 workforce-support provider locations. However, training is concentrated in Erie, Monroe, Suffolk, and five New York City counties, while many rural counties have fewer than 10 programs, creating an urban-rural mismatch where likely nuclear sites will be far from training concentrations.

New advanced nuclear construction will be supported by a strong, highly labor-organized construction workforce. Trades will drive the near-term workforce surge in the State, specifically electricians, pipefitters, welders, concrete pourers, millwrights, operating engineers, and supervisors. Under expected project labor agreements, signatory contractors will secure required labor and can scale through apprenticeships, journey-level hiring, lateral entry, and traveler networks. The key system challenge is maintaining sufficient numbers of qualified candidates and direct-entry pre-apprenticeship graduates.

The State's organized labor system can meet initial demand through apprenticeships, traveler networks, training centers, and experience scaling craft labor. This report's inventory identifies 42 organized labor programs for target occupations, and Upstate New York labor systems report capacity to scale when credible work commitments are visible. Sustaining nuclear expertise between builds will be critical to prevent institutional knowledge from being lost during multiyear development gaps.

Best-practice education models favor a layered system that maximizes specific institutional capacities. Strong nuclear academic anchors, broader nuclear exposure in engineering and technical programs, minors and concentrations, community-college technician pathways, nuclearized organized labor curricula, shared online or hybrid coursework, K–12 awareness, and rapid microcredentials where employer demand is clear.

Stackable credentials can help workers respond to changing demands by layering foundational "nuclear 101" competencies with specialized training. This modular approach supports mobility across technologies and occupations and creates transferable pathways across energy, manufacturing, and infrastructure sectors.

New York State's established workforce training ecosystem can support nuclear development nationwide. The State's extensive higher education, labor apprenticeship, workforce development, and existing nuclear training infrastructure create an opportunity to develop talent not only for New York State projects, but for the growing national nuclear industry. As training capacity expands, New York State can establish specialized programs and credentials that attract workers from across the country, prepare New Yorkers for both in- and out-of-state opportunities, and position the State as a national center for nuclear workforce education and training.

Retirement risk may increase replacement needs across both workforce phases: Several high-demand pre-operations and operations occupations have elevated retirement exposure, including first-line supervisors of construction trades and production workers, wholesale and manufacturing sales representatives, assemblers and fabricators, construction managers, structural iron and steel workers, heavy and tractor-trailer truck drivers, security guards, lawyers, electrical engineers, architectural and engineering managers, industrial machinery mechanics, and management analysts. Higher-than-average shares of workers age 55 or older in these occupations may increase replacement needs and constrain the availability of experienced workers as nuclear projects advance through construction and into operations.

Current funding

Significant existing funding is available and is likely sufficient to meet near-term needs. More than $600 million is available in current and recent workforce-related funding opportunities that could support occupations, skills, training infrastructure, and career pathways relevant to nuclear development. These resources are not a dedicated funding pool for nuclear workforce development. Instead, they show the scale of existing workforce infrastructure New York State can leverage as it prepares for nuclear expansion. Based on current preliminary analysis on training funding needs for the identified gaps, the available current funding levels should suffice for known needs. Actual investment amounts will depend on technology, deployment timelines, occupations targeted, training intensity and duration, the level of wraparound support provided, and the extent to which the State invests in specialized academic

and licensing pathways. Funding needs will need to be revisited as the nuclear deployment path becomes clearer.

Pathways to meeting demand

Coordinate workforce planning and scale investments with nuclear deployment pathways: Future workforce needs will depend on project locations, technology selection, procurement and offtake decisions, and deployment timelines, including the potential overlap of projects. These decisions will shape the timing, location, and scale of labor demand and the State's ability to meet it.

- Early coordination among developers, reactor-operators, organized labor, educators, and workforce partners—including regional planning—will be essential to align training investments with credible job opportunities and account for competition with other infrastructure projects for labor.
- Readiness planning should also consider housing, transportation, schools, hospitals, emergency planning, outage logistics, and other community infrastructure needed to support project development and operations.
- The State should continue to track project milestones, market developments, labor conditions, workforce assets, training capacity, support systems, and occupation-level demand by project phase to guide investment decisions.
- Near-term investments should prioritize scalable, low-risk actions that can expand as deployment plans become clearer, while substantial additional funding for highly specialized or project-specific training should be informed by credible demand signals.
- Given strong competition for targeted federal nuclear workforce funding, the State should also coordinate multisector partnerships to pursue funding opportunities and expand workforce capacity as project needs emerge.

New York State can leverage existing workforce capacity through transferable pathways: Many occupations needed for nuclear construction, operations, maintenance, and supply chains already exist in adjacent industries, including power generation, industrial maintenance, semiconductor construction, advanced manufacturing, aerospace, automotive, and military and defense. By mapping transferable skills, occupations, and major projects and supplementing existing training with targeted nuclear-specific requirements, the State can build on its established workforce and training infrastructure, reduce the time and cost of preparing workers, and accelerate workforce readiness for nuclear deployment.

Specific attention must be paid to nuclear career awareness campaigns: Workforce development is one of the most significant opportunities associated with advanced nuclear development, but access to these opportunities may not occur automatically and without intervention. Targeted outreach, financial assistance, and wraparound supports to reduce barriers to participation for residents of disadvantaged communities and other historically underserved populations is key to ensuring nuclear career opportunities. Ensuring that training opportunities are accessible to residents of disadvantaged communities and potential host and surrounding communities may help expand participation in the advanced nuclear workforce. This includes broad K–12 awareness, which is essential to normalize nuclear careers, especially in host communities.

Secure equitable access to workforce and economic benefits: Nuclear power facilities operate for generations, create stable employment opportunities, and provide significant benefits, including contributions to the local tax base in the communities where they are sited. State policies such as host community benefits, Minority- and Women-Owned Business Enterprise (MWBE) and Service-Disabled Veteran-Owned Business (SDVOB) expand opportunities for workers and communities at large. Any new nuclear development activity will be structured to ensure such economic benefits are equitably distributed and positively transformative within communities. Many communities require readily digestible ECJ-focused information about the range of opportunities, including specialized skills and education infrastructure to capitalize on these opportunities. Expanding equitable access will require targeted education, workforce development, and career pathways programs.

Several regional large-scale energy and infrastructure projects have successfully combined workforce investments with equity objectives by creating pre-apprenticeship programs, local hiring pathways, supplier readiness initiatives, and targeted support for underrepresented businesses. For example, offshore wind workforce initiatives in New York and other states have invested in community-based recruitment, paid training programs, and partnerships with labor unions and community colleges to connect residents of underserved communities to careers in construction, operations, and maintenance.

Interstate and federal coordination can help to avoid fragmented workforce strategies. Memoranda of understanding (MOUs) with neighboring states and regional consortia could provide coordination benefits through regular sharing of labor market insights, innovation ideas, and resource needs. The Nuclear Energy Institute (NEI) organizes many leading examples of this approach through regional consortium models, in which diverse stakeholders initially convene to pursue joint funding opportunities and evolve into sustained partnerships.

Conclusions for State Action

New York State's workforce strategies vary by the severity of anticipated labor constraints and the level of specialized intervention required. Some strategies can begin immediately—strengthening existing pipelines, improving coordination, and expanding awareness—while others depend on greater certainty around deployment timing, site and technology selection, employer and organized labor participation, and technology-specific training requirements.

Conclusion:

- **Leverage available workforce funding and programs, focusing near-term investment on strengthening broadly applicable workforce capacity including through upskilling experienced workers and transitioning workers from adjacent sectors, while avoiding substantial commitments to highly specialized or project-specific training until technology choices and project schedules become clearer.** Available funding sources include the New York Power Authority (NYPA) $40 million Nuclear Energy Workforce Training Program and a range of existing NYSERDA, New York State Department of Labor (NYSDOL), and Empire State Development (ESD) workforce development programs.

These near-term priorities include:

Improve visibility and accessibility of existing State workforce funding. Develop or use an existing centralized, regularly updated resource that helps employers, training providers, organized labor, and prospective workers identify available State workforce funding, eligible activities, application requirements, and relevant agency and authority contacts. Improve coordination and outreach across agencies and authorities to make existing programs easier to navigate, identify opportunities to align funding with nuclear workforce needs, and reduce duplication of resources and efforts.

Expand and modernize existing training infrastructure where established providers already have relevant capacity rather than creating parallel training systems. This can include grants for training equipment, specialized machinery, welding equipment, simulation technology, instructor capacity, and apprenticeship expansion. Organized labor and other established training providers already have classrooms, welding booths, instructors, curricula, and direct-entry pipelines, but modernizing equipment can be a significant barrier.

Focus first on upskilling experienced workers and transitioning workers from adjacent energy, industrial, manufacturing, and infrastructure sectors. Industry, NYSDOL, organized labor, and training providers should define transferable craft competencies and nuclear-specific qualifications, use competency-based assessments and targeted gap training, and establish formal trade-to-nuclear pathways that recognize existing competencies. As demand becomes clearer, expand apprenticeship intake, instructor capacity, equipment, and nuclear-specific training through existing systems rather than creating new ones.

Build local recruitment and coordinate career awareness campaigns across the State through trusted community partners. The State should work with local partners and existing outreach programs, such as NYSDOL's Teacher Ambassador Program and the State University of New York (SUNY)/City University of New York (CUNY) reconnect program, to align statewide messaging, build confidence in the State's nuclear commitments, and connect residents to credible nuclear career opportunities.

Expand apprenticeships, pre-apprenticeships, school partnerships, paid training opportunities, and workforce support to reduce barriers to participation. Local hiring and workforce planning approaches that strengthen host communities without creating workforce shortages in other sectors or relying predominantly on temporary workers from outside the region should be prioritized.

Recruitment strategies should be tailored to local labor market characteristics and training infrastructures, and supported through partnerships with high schools, technical schools, apprenticeship programs, and organizations serving underrepresented populations, including programs such as Helmets to Hard Hats and Nontraditional Employment for Women. Integrating equity objectives into project labor agreements early in project development, together with wraparound support services and clearly defined career pathways, can improve access to high-quality employment opportunities within host communities.

Conclusion:

- **Address further workforce requirements through a longer-term workforce strategy (covering aspects such as recurring regional planning, employer-led education-to-employment partnerships, and access to worker supports) as New York State's nuclear deployment path including technology choices and project schedules become clearer.**

A longer-term strategy can include the following aspects:

Establish a recurring regional workforce planning and forecasting process aligned with project sequencing. NextGen Nuclear New York should coordinate agencies and authorities, training providers, employers, organized labor, and regional partners to assess anticipated nuclear project schedules, peak workforce demand, occupation-specific needs, and competing infrastructure projects, incorporating insights from ESD. Use these forecasts to align training capacity and investments with regional demand, coordinate statewide career awareness with locally tailored recruitment strategies in host communities, and integrate worker supports—including transportation, housing, childcare, site-access planning, and language access—into project planning.

Tie training expansion to regional forecasts and project sequencing in New York State. NextGen Nuclear New York can establish a recurring regional planning process that gives State entities and training providers visibility into project schedules and anticipated peak demand. Forecasting can account for competing infrastructure projects, informed by ESD.

Leverage project labor agreements and State incentives to ensure strong job quality and comprehensive worker supports on nuclear construction projects. State agencies and authorities can tie relevant funding and incentives to projects adopting workforce standards that establish competitive wages, robust safety requirements, and apprenticeship utilization. Agreements and incentives can also require or fund wraparound supports—including mentorship, certification assistance, childcare, transportation, language access, mental health benefits, adequate accommodations, and other supports—that enable workers to enter training, complete apprenticeships, and remain employed.

Pursue employer-led education-to-employment partnerships that align with hiring needs. New York State can work with utilities, reactor operators, engineering firms, and supply-chain companies to define competencies, share staffing needs, shape curricula, and expand internships, co-ops, fellowships, applied research, and other work-based learning opportunities. The State can provide cost-sharing and dedicated funding for on-the-job training opportunities. and expand employer hiring incentives such as wage subsidies and other risk-sharing mechanisms.

Keep workforce programs flexible to account for new technology requirements and reassess workforce needs as reactor technologies and operating models mature. NYSERDA, NYPA, reactor operators, developers, and educational institutions should regularly update staffing assumptions as advanced reactor designs, automation, digital systems, vendor service

models, and centralized or remote operating approaches become clearer. Use findings to adjust program scale, curriculum, and recruitment priorities before making substantial investments.

Coordinate access to region-specific worker supports as part of project and training implementation. New York State should address uneven access to transportation and mobility assistance; childcare and schedule support; language and application assistance; reentry, disability, veteran, and mentorship services; and temporary housing, parking, shuttle, and site-access needs. Before recruitment begins, agencies and authorities should work with employers, organized labor, training providers, counties, and community organizations to assess site-specific barriers, identify providers, establish referral and coordination mechanisms, and close service gaps.

Conclusions:

- **Build on existing workforce and supply chain development initiatives – such as worker training, MWBE and SDVOB efforts, and place-based investments through existing programs – as well as community benefit frameworks to expand equitable access to the economic opportunities and benefits associated with advanced nuclear energy deployment.**

- **Support stronger interstate and federal coordination that avoids fragmented workforce strategies, including by pursuing memoranda of understanding with neighboring states and developing multi-state consortia to share labor market information and support planning and delivery of training.** This can include working with other states through existing initiatives, in particular the First Mover Initiative.

Conclusions for Other Stakeholders

In addition to conclusions for New York State, stakeholder interviews identified opportunities for organizations beyond State government to support nuclear workforce development. The following conclusions highlight actions that industry, labor organizations, educational institutions, workforce development organizations, and other partners can take to strengthen workforce pipelines, align training with industry needs, and support successful nuclear deployment in New York and nationally.

Pre-Operations

Strengthen the pipeline of nuclear construction supervisors and managers in New York State. Labor organizations and major contractors should create trade-specific field leadership

and management-development pathways for experienced craft workers and high-potential managers, preparing them for supervisory and construction management roles through training in nuclear safety, project coordination, and workforce management.

Use New York State incentives and project labor standards to attract experienced construction leaders from comparable project environments. Contractors and developers should recruit general and operations managers with experience in complex, highly regulated, or large-scale industrial and infrastructure projects. Relevant funding, financing, procurement, or incentives should support compensation packages appropriate to nuclear construction and prioritize expertise in safety, quality assurance, regulatory compliance, project coordination, and large-workforce management.

Host Community Benefit agreements and project labor agreements provide an example of mechanisms that can influence how economic benefits are distributed. Across energy, manufacturing, and infrastructure sectors, they have been used to support local hiring, apprenticeship programs, workforce development investments, supplier diversity initiatives, educational partnerships, affordable housing investments, environmental monitoring, transportation improvements, wraparound service needs, and other community priorities. By identifying these commitments early in project planning, Host Community Benefit Agreements can help increase transparency, create accountability, and improve confidence that project benefits will reach affected communities

Reinforce contractor-based leadership pipelines with State-supported development and advancement plans. State-funded major contractors should establish formal management-development plans that identify high-potential employees, assess nuclear-specific gaps, and prepare them for progressively senior roles. Employers should lead candidate selection, applied training, mentoring, and promotion; the State can support shared curricula, credentialing, and training infrastructure. Compensation progression and retention tools should encourage completion of specialized training and continued participation in the leadership pipeline.

Monitor regional workforce availability in New York State and provide targeted outreach rather than broad new training programs. Workforce boards and industry associations should communicate hiring timelines, qualifications, and locations through existing labor-market channels while tracking key occupation availability. Region-specific labor-supply analysis, such as that found in this report, should guide local-hire policies and avoid training residents for short-duration roles that are unsustainable with limited post-construction demand.

Integrate language access into recruitment and training. Workforce boards and training providers should assess English-language service needs and incorporate occupation-specific language instruction, translated materials, application support, and safety communication when needed.

Provide streamlined, occupation-specific site-readiness training. Workers with core occupational skills should receive only detailed training in site expectations, nuclear safety and workplace requirements, documentation, and role-relevant quality practices, avoiding unnecessary nuclear content.

Integrate language access into recruitment and training. Workforce boards and training providers should assess English-language service needs and incorporate occupation-specific language instruction, translated materials, application support, and safety communication when needed.

Operations and Maintenance

Prioritize academic and technical training investments that add nuclear specialization to existing programs in New York State. SUNY, community colleges, and technical schools should first add nuclear minors, concentrations, microcredentials, certificates, shared online and hybrid courses, apprenticeship-linked training, and technician pathways rather than create entirely new degree programs. Institutions should "nuclearize" existing engineering curricula and use digital twins,[ii, 3] virtual or augmented reality, or other high-fidelity simulators to provide practical experience without the need for full-scale facilities.[iii]

Begin reactor operator development well before facilities enter service in New York State and use the State's existing facilities as regional training hubs. Reactor operators and training partners should recruit, screen, and develop operator candidates well before commissioning. The State's existing commercial plants should provide supervised experience in operating procedures and safety protocols that classrooms cannot fully replicate, particularly in rural regions that lack training sites, with transportation support to address commuting

[ii] A digital twin is a virtual representation of a nuclear energy process or system regularly updated with real data in order to synchronize with what is actually happening and improve the process of design, licensing, construction, decommissioning, and waste disposal.

[iii] Emerging examples in New York State include Rensselaer Polytechnic Institute's NuScale Power, which demonstrates how simulators can bridge gaps by enabling students to operate a fully simulated control room. Source: Duncan Crary, ""Rensselaer Polytechnic Institute Unveiled Nuclear Training Center at Ribbon-Cutting," Rensselaer Polytechnic Institute, March 25, 2025, https://news.rpi.edu/2025/03/31/rensselaer-polytechnic-institute-unveiled-nuclear-training-center-ribbon-cutting.

distances to isolated plant areas. Planning must account for hands-on experience, facility qualification, regulatory preparation, and licensing lead times.

Create structured transition pathways from the existing New York State fleet and adjacent industries. Reactor operators, developers, and training providers should expand Navy-to-Nuclear and Troops-to-Energy, recognizing transferable military experience through competency-based assessments and targeted add-on training. Transition strategies should also support workers moving from existing nuclear facilities as well as from utilities, defense, aerospace, and manufacturing.

Establish formal succession and knowledge-transfer programs in New York State. Nuclear employers should pair experienced workers nearing retirement with incoming professionals through mentoring, job shadowing, and phased responsibility transfer while experienced workers are still actively engaged.

Align curricula with employer requirements to retain graduates in New York State. Universities and employers should jointly update curricula for nuclear safety, quality systems, regulation, documentation, digital systems, and project delivery, while directly connecting students to in-state internships, hiring opportunities, and long-term career pathways.

Use targeted certifications and nuclear deployment training to supplement existing professional expertise. The SUNY system, professional associations, employers, and training providers should develop short certificates and continuing education in nuclear regulation, licensing, quality requirements, and documentation that build on existing qualifications rather than duplicate full degree programs.

Recruit experienced technical sales professionals and close nuclear-specific knowledge gaps through employer-led onboarding. Nuclear suppliers should recruit sales representatives from energy, industrial equipment, advanced manufacturing, and other technical markets and provide product-specific training in nuclear technologies, quality expectations, customer requirements, procurement, and documentation.

Recruit from New York State's many existing sectors with comparable regulatory and operational demands. Nuclear employers, developers, contractors, and suppliers should recruit lawyers, general and operations managers, project management specialists, management analysts, and technicians from highly regulated sectors with a strong New York State presence, including utilities, aerospace and defense, the Naval Nuclear Laboratory, and advanced manufacturing.

Use relocation and retention incentives selectively for difficult-to-fill positions. Employers and State agencies and authorities should target incentives to occupations and regions where specialized nuclear, regulatory, technical, or project-delivery experience is notably unavailable. Incentives should supplement competitive compensation, project continuity, advancement opportunities, and working conditions.

Provide occupation-specific nuclear onboarding rather than broad retraining. Employers should provide streamlined, role-appropriate instruction on nuclear safety culture, regulatory expectations, site access, quality requirements, facility procedures, and physical security that reflects each role's actual responsibilities.

1. Introduction

This Workforce Development Study is part of several supporting studies prepared by the New York State Research and Development Authority (NYSERDA) and the New York State Department of Public Service (DPS) as part of the "Master Plan for Responsible Advanced Nuclear Development in New York"(Master Plan). Collectively, these studies examine the technical, economic, workforce, supply chain, regulatory, environmental, community, and infrastructure considerations associated with deploying advanced nuclear technologies in New York State. Each study addresses a distinct topic area and offers analysis, findings and conclusions to contribute to a comprehensive roadmap for advanced nuclear development in New York.

NYSERDA and DPS acknowledge the contribution of BW Research Partnership, Inc. (BW Research), working as a subcontractor to The Brattle Group, in preparing this study. At the direction of NYSERDA and DPS, contractor Eastern Research Group (ERG) convened and facilitated a Workforce and Supply Chain Technical Working Group (WSC–TWG) made up of relevant and expert stakeholders to inform and validate this study.[4]

The Workforce Development Study aims to understand the workforce demand associated with nuclear deployment in New York State, ensuring an adequate labor supply for timely deployment while maximizing job opportunities for residents.

The Workforce Development Study includes the following sections:

- **Section 2, Methodology Overview,** begins by outlining the research methodology pursued for this study to analyze the labor supply and demand in New York State.
- **Section 3, Workforce Demand and Supply Gaps,** provides further details around modeled demand by occupation during the pre-operations and operations and maintenance (O&M) phases. This section also assesses New York State's capacity to meet that demand based on supply indicators across each phase.
- **Section 4, Additional Essential Occupations,** identifies an additional set of occupations that are outside the scope of high-demand occupations presented in this study but warrant specific workforce strategies based on their importance to the nuclear sector.
- **Section 5, Nuclear Workforce Training Ecosystem,** examines the broader system required to support sustained nuclear workforce development in New York State, including training and wraparound providers.

- **Section 6, Current State Workforce Program Funding,** offers an inventory of existing funding sources to help State agencies and authorities assess available resources, identify funding gaps, and determine which funds could support training the nuclear workforce.
- **Section 7, Pathways to Meeting Labor Demand,** analyzes strategies around transferable skills and upskilling pathways from adjacent occupations and industries to meet projected workforce demand, and offers the overall findings and conclusions of the study for State action and action by other stakeholders.

2. Methodology Overview

This section outlines the methodology used to analyze occupational demand and categorize those occupations most critical to New York State's emerging nuclear workforce.

This report elaborates on employment projections developed for four deployment scenarios in the Master Plan Economic Impact Analysis. The analysis used a sequential methodology to translate the quantity of employment into occupation-level detail, identify the occupations in highest demand for New York State's advanced nuclear workforce, and then prioritize a subset of occupations for deeper analysis of the State's training and workforce development ecosystem. The process began with estimating occupational demand, then assessing workforce gaps based on labor supply and demand pressures and finally identified target occupations where workforce development interventions may be most consequential.

Appendix A details the assumptions, data sources, scoring methods, and thresholds used in each stage of the analysis.

2.1 High-Demand Occupations

The analysis first translated projected employment associated with advanced nuclear development and operations into occupations using industry-specific occupational staffing patterns. These staffing patterns were applied to the peak pre-operations and Operations and Maintenance (O&M) phases across the modeled nuclear deployment scenarios. This produced estimates of the occupations and number of workers required to support advanced nuclear development in the State.

For both phases, the 15 high-demand occupations with the highest projected employment demand (30 total) were then examined through an occupational gap analysis, with two dimensions used for consideration:

1. **Supply versus demand risk**, which assessed the scale of projected nuclear demand relative to the existing supply and labor market conditions.
2. **Development intensity**, which assessed how difficult and time-intensive it may be to prepare additional workers for an occupation.

These factors were combined to characterize potential workforce gaps as mild, moderate, or severe.

2.2 Target Occupations

The occupational gap analysis established the broader universe of occupations likely to be in high demand for advanced nuclear deployment. From this universe, the analysis identified a more focused set of target occupations for the training inventory and workforce ecosystem analysis. Target occupations were selected based on their alignment with at least four of five criteria:

1. **Sustainable wages,** measured by whether the occupational average wage exceeds the statewide average
2. **Accessible/multiple entry pathways,** including opportunities that do not necessarily require a 4-year degree
3. **Potential nuclear workforce bottlenecks,** based on known workforce constraints identified through literature reviews, case studies, and stakeholder input[iv]
4. **Nuclear specialization,** reflecting occupations that are unique to or highly concentrated within the nuclear industry
5. **Timeline of need,** prioritizing occupations required early enough in project development that workforce preparation may need to begin in the near term

This screening process intentionally balances the scale of anticipated workforce demand with the feasibility and strategic importance of workforce development. As a result, the target occupation list is not limited to the occupations with the largest projected employment totals. It also captures specialized, difficult-to-develop, or potentially constrained occupations that could become critical bottlenecks during advanced nuclear deployment.

The resulting target occupations form the basis for the study's workforce ecosystem analysis. For these occupations, the study examined existing training and education infrastructure in New York State to determine whether the State has the capacity and pathways needed to prepare workers for those roles and where additional workforce development interventions may be warranted.

2.3 Additional Essential Occupations

This report also identifies additional essential occupations for nuclear power plants. These occupations are not analyzed in the above steps because they do not generate large net employment demand; only a limited number of workers in these occupations are typically

[iv] See Appendix C for a summary of findings from research interviews conducted with stakeholders.

required on-site. However, literature reviews, case studies, and expert stakeholder input shows qualified personnel in these roles are essential to the basic functioning of a nuclear power plant; without them, key activities could be delayed or halted. Thus, they are worth noting despite their absence from "high-demand occupations." See Appendix C for a summary of findings from research interviews conducted with stakeholders.

3. Workforce Demand, Supply and Gaps

Nuclear projects are large-scale employment generators and function as institutions for regional economies, delivering high-paying jobs, local tax revenue, and support for nearby businesses. The construction workforce for nuclear projects routinely numbers in the thousands, and ongoing operations typically require a substantial labor force, ranging from a few hundred to a few thousand workers per plant, supported by more staff who assist with maintenance during planned outages and inspections.[v]

The timeline for the State's nuclear development underscores the importance of meaningful planning. Siting, licensing, and permitting can take 3 or more years[5] while plant construction may require 8 years or more, depending on the reactor type and size.[6] Under these timelines, nuclear construction in the State could begin in less than 5 years, with plant operations beginning in less than 15 years.

Exploring Potential Need for New Certifications for Advanced Nuclear Technologies

Most nuclear roles today operate within a well-established credentialing framework. Highly specialized roles, such as reactor operators, require specific U.S. Nuclear Regulatory Commission (NRC) licensing, while the rest of the nuclear workforce relies on a combination of trade certifications and company- or reactor-specific training.

Stakeholders expect advanced nuclear technologies to also follow this certification model: a standardized foundation in nuclear safety and regulatory principles supplemented by targeted, technology-specific credentials that reflect differences in materials and systems. However, experts emphasize that significant uncertainty remains; regulatory frameworks for advanced reactors are still evolving, and no universally recognized certification pathways have been established.

Workforce preparation must begin well before these milestones to address labor shortages. Technicians and reactor operators supporting plant operations typically require several years of specialized training and on-the-job experience in addition to licensing and certification requirements. Many skilled trades needed during construction rely on apprenticeships or other training pathways that can take 4–5 years to complete. Engineering, scientific, and management roles, which are essential across all phases of nuclear development, generally require at least 4 years of college education. Each role benefits from extensive on-the-job experience. Given

[v] Sourced from case studies of existing nuclear power plant projects in the United States and internationally.

these lead times, the State must begin building the workforce ecosystem now to ensure that pathways are in place to support the full lifecycle of nuclear development.

Nuclear buildout will depend on two distinct but connected labor needs: a planning and construction workforce skilled in the siting, engineering, and safe construction of nuclear reactors, and an experienced operations workforce trained to run and maintain nuclear facilities safely over the long term. Each workforce will require targeted development strategies because the roles required to support these phases involve vastly different systems for recruiting and training systems. This distinction matters for workforce planning because the timing, duration, and transferability of demand will vary substantially across project phases. The existing labor market can easily absorb projected demand for some occupations, while other positions will require advanced workforce development or planning to meet short-term demand spikes. The analyses included in this section will assess critical gaps and solutions to right-size workforce development efforts to the sector's needs.

Exploring Traditional and Advanced Nuclear Occupational Differences

Based on research interviews with dozens of stakeholders spanning a range of activities within the nuclear sector, the workforce ecosystem, or the intersection of the two, demand signals currently point to an evolution—rather than a disruption—of occupational needs as the industry transitions from traditional to advanced nuclear. The industry does not expect major traditional nuclear occupations to disappear, as core demand remains strongest for skilled trades, technicians and operators, and engineers. Experts estimated that as much as 80% of existing traditional nuclear occupations will carry over directly, with skills that are largely transferable to advanced nuclear contexts.

However, stakeholders highlighted several important shifts. Specifically, advanced nuclear buildout may lead to growing demand for manufacturing and supply chain roles, driven by the rise of modular construction and off-site fabrication. At the same time, increased automation and digitalization may gradually reduce operator responsibilities, potentially stalling long-term demand growth for some operational roles. It will be important to monitor the development of advanced nuclear technologies to be prepared for changes in workforce needs and demand.

This section breaks down workforce demand by occupation across the two major nuclear project development phases: pre-operations and O&M numbers. Total peak job numbers are estimated in the Economic Impacts Studies that forms part of this Master Plan, across a range of 5 GWe deployment scenarios. Based on that analysis, the assessment in this section takes as its starting point a required **peak demand figure of 7,800 jobs in the pre-operations phase** and **4,000 jobs in the operations phase** to meet the needs of deployment and operation of 5 GW of advanced nuclear power generation. In addition to peak demand projections, the Master Plan

Economic Impact Analysis also provides projected annual average demand figures; the analysis in this section is focused on peak demand since it is peak demand that should drive planning considerations to ensure sufficient workforce is available.

This analysis estimates the high-demand nuclear sector occupations associated with the peak demand figures above. High-demand occupations are those projected to account for the largest absolute number of workers required by nuclear development, regardless of wage level, strategic importance, training complexity, or suitability for workforce intervention.

3.1 Pre-Operations Phase

The pre-operations phase comprises planning, development, and construction of nuclear projects. Planning and development activities are generally characterized by a smaller, highly specialized workforce focused on site selection and evaluation, regulatory and licensing requirements, project financing, and environmental reviews. Construction is substantially more labor-intensive and includes large-scale demand for skilled trades, construction and project management, manufacturing roles, transportation and logistics personnel, and installation occupations.

Many pre-operations roles are needed for a few months to 1–2 years in New York State, particularly if projects are not built continuously or on overlapping schedules. In these cases, the State will need to understand where developing in-state workforce capacity is most efficient versus where project demand may be better met by traveling workers who already move across large infrastructure projects.

3.1.1 Workforce Demand

Table 1 identifies occupations involved in the pre-operations phase of nuclear projects projected to face high demand, measured across four core workforce metrics (detailed job descriptions can be found in Appendix B):

1. **Economy-wide current employment in New York State** represents the total current employment of each occupation across the State's broader labor market.
2. **Economy-wide projected annual openings** estimate the average number of job vacancies expected each year for a specific occupation. This measure captures demand for workers by estimating how many new jobs will be created due to economic growth or industry expansion, plus how many existing jobs will need to be filled to replace workers leaving the occupation.

3. **Nuclear sector-specific current employment in the State** measures current pre-operations employment specifically within the nuclear energy sector for a given occupation.
4. **Nuclear sector-specific projected peak demand** quantifies the expected in-state demand within the nuclear sector during the pre-operations phase for a given occupation when that occupation's workforce is at its peak.

Ratios comparing projections to current employment provide useful indicators of relative workforce pressures. These ratios show whether projected openings or demand are modest or substantial relative to the occupation's current scale. For example, across the State's economy-wide workforce, projected annual openings equal 13% of current employment. This means that for every 100 workers currently employed, approximately 13 hires are projected to meet demand driven by growth, retirements, transfers, and other exits. Compared with other occupations, structural iron and steel workers show a high level of recurring hiring pressure, with projected annual openings totaling 23% of current employment (see Table 1).

Projected nuclear peak demand as a percentage of current nuclear employment provides a separate measure of nuclear-specific workforce pressure. This ratio shows how much future workforce requirements exceed the existing nuclear employment base. In many cases, the existing nuclear workforce in these occupations is small because the State currently has limited nuclear pre-operations activity (see Table 1). As a result, projected nuclear demand is especially high relative to current nuclear employment, and meeting future demand would likely require recruitment from adjacent industries, new entrants, and targeted training pipelines.

Table 1. Top 15 High-Demand Pre-Operations Phase Occupations

	Economy-Wide			Nuclear Sector-Specific		
Occupation Name	**State Current Employment[a]**	**Projected Annual Openings[b]**	**Projected Annual Openings as a % of Current Employment**	**State Current Employment [c]**	**Projected Peak Demand**	**Projected Peak Demand as a % of Current Employment**
Total, All Occupations	**9,688,000**	**1,255,769**	**13%**	**4,054**	**6,458**	**159%**
Construction Laborers	52,090	7,376	**14%**	11	809	**7,448%**
Plumbers, Pipefitters, and Steamfitters	23,210	3,183	**14%**	4	404	**10,817%**
Electricians	40,130	4,718	**12%**	46	378	**813%**
Welders, Cutters, Solderers, and Brazers	8,310	904	**11%**	23	279	**1,231%**
First-Line Supervisors of Construction Trades and Extraction Workers	29,600	2,648	**9%**	13	276	**2,062%**
Sales Representatives, Wholesale and Manufacturing	61,500	7,362	**12%**	63	204	**327%**
Carpenters	40,630	5,708	**14%**	2	202	**13,447%**
Miscellaneous Assemblers and Fabricators	33,180	3,325	**10%**	30	177	**598%**
General and Operations Managers	206,740	20,113	**10%**	121	167	**138%**
Construction Managers	10,280	1,450	**14%**	17	166	**976%**
Cement Masons and Concrete Finishers	9,060	540	**6%**	1	163	**17,827%**
Laborers and Freight, Stock, and Material Movers, Hand	100,950	15,428	**15%**	51	141	**279%**

Table 1. (continued)

	Economy-Wide			Nuclear Sector-Specific		
Occupation Name	**State Current Employment[a]**	**Projected Annual Openings[b]**	**Projected Annual Openings as a % of Current Employment**	**State Current Employment[c]**	**Projected Peak Demand**	**Projected Peak Demand as a % of Current Employment**
Structural Iron and Steel Workers	2,700	610	**23%**	0	135	**178,868%**
Heavy and Tractor-Trailer Truck Drivers	63,700	7,869	**12%**	19	107	**572%**
Operating Engineers and Other Construction Equipment Operators	14,490	1,803	**12%**	7	95	**1,327%**

3.1.2 Workforce Supply

Understanding New York State's workforce supply complements demand-side data and helps identify potential labor market gaps. The supply indicators presented in Table 2 provide insight into New York State's workforce infrastructure for high-demand pre-operations phase occupations. A low unemployment rate suggests a tight labor market, and a high share of workers age 55 and older indicates a higher risk of retirement. Similarly, a low location quotient (LQ) suggests that an occupation is underrepresented in the State relative to the national average.

Table 2. Supply Indicators for Pre-Operations High-Demand Occupations

Occupation Name	Unemployment Rate[a]	Share of Workers Age 55+[b]	Location Quotient[c]
Total, All Occupations	**4.3%**	**24.8%**	**1.00**
Construction Laborers	7.9%	19.5%	0.76
Plumbers, Pipefitters, and Steamfitters	3.2%	20.0%	0.80
Electricians	3.7%	20.1%	0.85
Welders, Cutters, Solderers, and Brazers	4.2%	22.4%	0.32
First-Line Supervisors of Construction Trades and Extraction Workers	3.4%	28.8%	0.58
Sales Representatives, Wholesale and Manufacturing	2.0%	26.8%	0.80
Carpenters	6.1%	21.9%	0.97
Miscellaneous Assemblers and Fabricators	6.6%	26.4%	0.38
General and Operations Managers	1.6%	22.7%	0.95
Construction Managers	2.0%	28.4%	0.43
Cement Masons and Concrete Finishers	8.5%	12.7%	0.71
Laborers and Freight, Stock, and Material Movers, Hand	8.7%	21.1%	0.55
Structural Iron and Steel Workers	6.3%	28.0%	0.63
Heavy and Tractor-Trailer Truck Drivers	4.4%	32.0%	0.50
Operating Engineers and Other Construction Equipment Operators	6.9%	22.3%	0.49

While job requirements do not measure labor supply directly, they help indicate how constrained, specialized, or expandable the potential labor pool may be. For example, New York State may have many electricians available, but apprenticeship requirements, licensing, competing construction demand, and the need for nuclear-specific site qualifications may still constrain near-term availability. Table 3 presents the education, training, experience, and certification requirements for the high-demand occupations in the pre-operations phase.

Table 3. Job Requirements for High-Demand Pre-Operations Occupations

Source: U.S. Bureau of Labor Statistics, "Occupational Projections and Worker Characteristics," August 2025, https://www.bls.gov/emp/tables/occupational-projections-and-characteristics.htm.

Occupation Name	Entry-Level Education	Previous Work Experience	On-the-Job Training[a]	Preferred or Required Certifications[b]
Construction Laborers	No formal educational credential	None	Short-term on-the-job training (or apprenticeship for some Skilled Laborer positions)	**Occupational Safety and Health Administration (OSHA) 10- and 30-hour construction certification:** Foundational certification for safety practices and standards on construction sites[c]
Plumbers, Pipefitters, and Steamfitters	High school diploma or equivalent	None	Apprenticeship	**Training under d. American Society of Mechanical Engineers (ASME) Section IX:** Industry-standard code governing welding and brazing qualifications[d]
Electricians	High school diploma or equivalent	None	Apprenticeship	**Electrician licenses** (typically issued by local jurisdictions) May require nuclear material-specific certifications depending on type of electrical work involved
Welders, Cutters, Solderers, and Brazers	High school diploma or equivalent	None	Moderate-term on-the-job training	**Training under ASME Section IX:** Industry-standard code governing welding and brazing qualifications[e] **AWS certifications:** Highly recognized credentials for quality assurance for welding across all sectors[f]
First-Line Supervisors of Construction Trades and Extraction Workers	High school diploma or equivalent	5 years or more	None	**OSHA 10- and 30-hour construction certification:** Foundational certification for safety practices and standards on construction sites[g]
Sales Representatives, Wholesale and Manufacturing	High school diploma or equivalent	None	Moderate-term on-the-job training	N/A
Carpenters	High school diploma or equivalent	None	Apprenticeship	May require a local license or nuclear material-specific certifications, depending on type of carpentry work involved

Table 3. (continued)

Occupation Name	Entry-Level Education	Previous Work Experience	On-the-Job Training[a]	Preferred or Required Certifications[b]
Miscellaneous Assemblers and Fabricators	High school diploma or equivalent	None	Moderate-term on-the-job training	**Training under ASME Section IX:** Industry-standard code governing welding and brazing qualifications[h]
General and Operations Managers	Bachelor's degree	5 years or more	None	N/A
Construction Managers	Bachelor's degree	None	Moderate-term on-the-job training	**OSHA 10- and 30-hour construction certification:** Foundational certification for safety practices and standards on construction sites[i]
Cement Masons and Concrete Finishers	No formal educational credential	None	Moderate-term on-the-job training	**Industry certifications typically required** (ACI certification)[j] **OSHA 10 and 30-hour construction certification:** foundational certification for safety practices and standards on construction sites[k]
Laborers and Freight, Stock, and Material Movers, Hand	No formal educational credential	None	Short-term on-the-job training	**OSHA 10 and 30-hour construction certification:** Foundational certification for safety practices and standards on construction sites[l] Some laborers and material movers need a state-issued license or commercial driver's license[m]
Structural Iron and Steel Workers	High school diploma or equivalent	None	Apprenticeship	**Training under ASME Section IX:** Industry-standard code governing welding and brazing qualifications[n]
Heavy and Tractor-Trailer Truck Drivers	Postsecondary nondegree award	None	Short-term on-the-job training	**Commercial driver's license**[o] **OSHA 10- and 30-hour construction certification**: Foundational certification for safety practices and standards on construction sites[p]

Table 3. (continued)

Occupation Name	Entry-Level Education	Previous Work Experience	On-the-Job Training[a]	Preferred or Required Certifications[b]
Operating Engineers and Other Construction Equipment Operators	High school diploma or equivalent	None	Moderate-term on-the-job training	Operators of specific equipment and machinery will require unique certifications (e.g., crane operators, forklift operators)[q] **OSHA 10 and 30-hour construction certification**: Foundational certification for safety practices and standards on construction sites[r] **Commercial driver's license:** Typically required to operate heavy machinery on job sites[s]

3.1.3 Gap Analysis

Based on the demand and supply data presented earlier, a gap analysis was conducted to identify the pre-operations occupations most at risk of falling short of workforce needs under new advanced nuclear buildout scenarios. The analysis is based on two factors:

1. **Supply-versus-demand pressure,** informed by the supply and demand indicators discussed earlier.
2. **Development intensity,** informed by factors that shape the time and investment required to prepare workers for the labor force as well as the accessibility of each occupation (see Table 3), which can indicate the relative feasibility of developing a larger pipeline of qualified workers.

The team assigned each occupation a numerical score for both supply-versus-demand pressure and development intensity. Occupations were then categorized as mild, moderate, or severe in risk of failing to meet projected demand without intervention based on these scores (see Table 4).

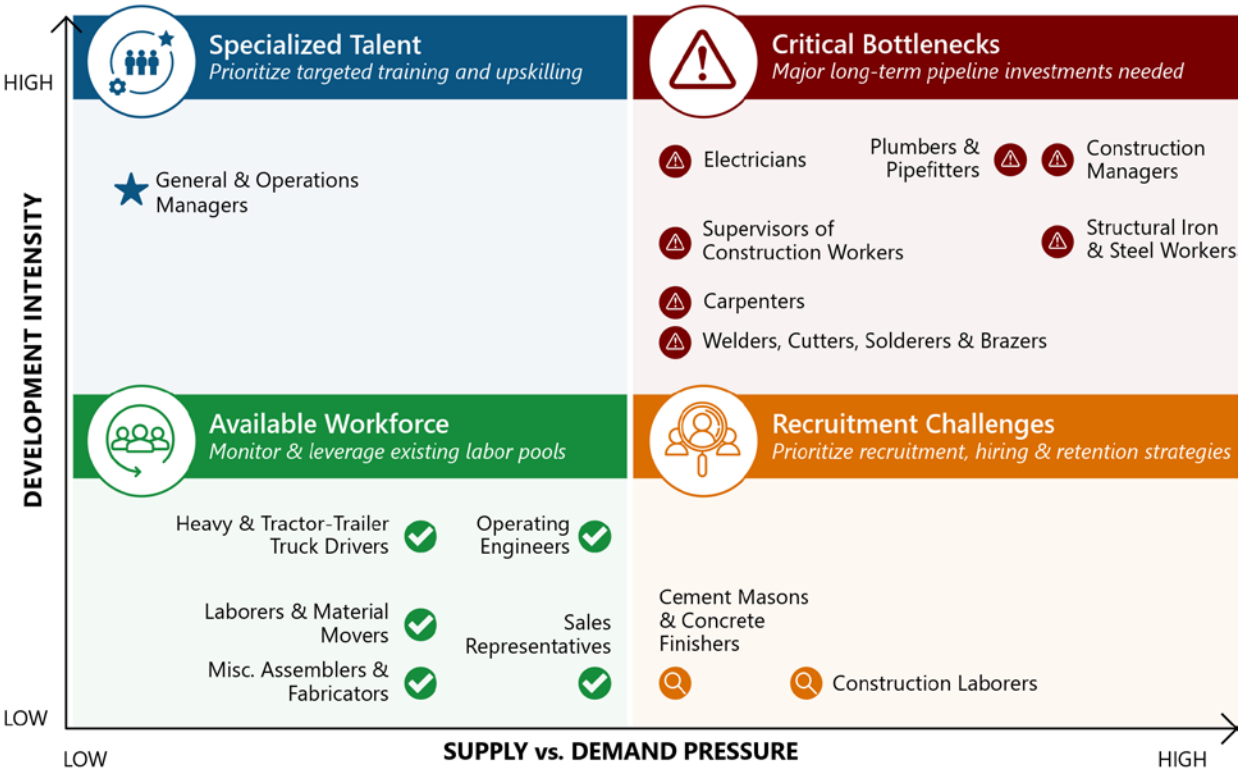
Table 4. Risk Levels for Pre-Operations High-Demand Occupations

Occupation Name	Supply vs. Demand Pressure	Development Intensity
Construction Laborers	**Severe**	**Mild**
Plumbers, Pipefitters, and Steamfitters	**Severe**	**Severe**
Electricians	**Moderate**	**Severe**
Welders, Cutters, Solderers, and Brazers	**Moderate**	**Moderate**
First-Line Supervisors of Construction Trades and Extraction Workers	**Moderate**	**Moderate**
Sales Representatives, Wholesale and Manufacturing	**Moderate**	**Mild**
Carpenters	**Moderate**	**Moderate**
Miscellaneous Assemblers and Fabricators	**Mild**	**Mild**
General and Operations Managers	**Mild**	**Severe**
Construction Managers	**Severe**	**Severe**
Cement Masons and Concrete Finishers	**Moderate**	**Mild**
Laborers and Freight, Stock, and Material Movers, Hand	**Mild**	**Mild**
Structural Iron and Steel Workers	**Severe**	**Moderate**
Heavy and Tractor-Trailer Truck Drivers	**Mild**	**Moderate**
Operating Engineers and Other Construction Equipment Operators	**Moderate**	**Moderate**

3.1.4 Pre-Operations Risk Matrix

Workforce strategies vary based on both the severity of anticipated labor market constraints and the level of specialized intervention required for each occupation. The nuclear workforce risk and intervention matrix shown in Figure 1 is based on two axes: Labor Demand versus Supply Constraint (low to high) and Training and Development Intensity (low to high).

Figure 1. Risk Matrix for Pre-Operations High-Demand Occupations



This matrix allows in-demand workers to be organized into four quadrants based on the type of workforce challenge they present and the broader solutions they require.

Figure 2. Organization of In-Demand Workers by Type of Workforce Challenge

	▼ Low Supply Pressure	▲ High Supply Pressure
▲ High Development Intensity	**Specialized Talent** Substantial workforce available but additional knowledge requirements mean targeted training and upskilling	**Critical Bottlenecks** Long lead times, limited available workers, and long-term pipelines require major investments
▼ Low Development Intensity	**Available Workforce** Monitor and leverage existing labor pools and avoid large interventions	**Recruitment Challenge** Competition for workers and less specialized training emphasize recruitment, hiring, and retention strategies

3.1.4.1 Higher Supply Pressure + Higher Development Intensity: Critical Bottlenecks

These occupations combine the greatest risk of shortages with the longest lead times to develop talent. They are the occupations most likely to become true bottlenecks. New workers will require substantial technical preparation, nuclear-specific qualifications, or lengthy apprenticeship pathways, and the available workforce is limited. These bottleneck occupations require large public–private coordination efforts and should receive the highest priority for workforce investment.

3.1.4.2 Higher Supply Pressure + Lower Development Intensity: Recruitment Challenge

Workers can learn the skills for these occupations relatively quickly, but not enough workers may be willing to enter or remain in the field, and competition for workers could be intense. These occupations may not initially require extensive specialized nuclear training, but the industry could still struggle to attract enough workers, particularly in rural host communities or during simultaneous major infrastructure projects. The focus here is on targeted recruitment strategies rather than major training investments.

3.1.4.3 Lower Supply Pressure + Higher Development Intensity: Specialized Talent

Enough workers are likely available, but they need additional skills, certifications, or specialized knowledge to work in the nuclear industry. A substantial potential workforce may already exist in New York State's power generation, manufacturing, construction, and industrial sectors, but these workers need additional training and upskilling to meet nuclear quality, safety, and regulatory requirements.

3.1.4.4 Lower Supply Pressure + Lower Development Intensity: Available Workforce

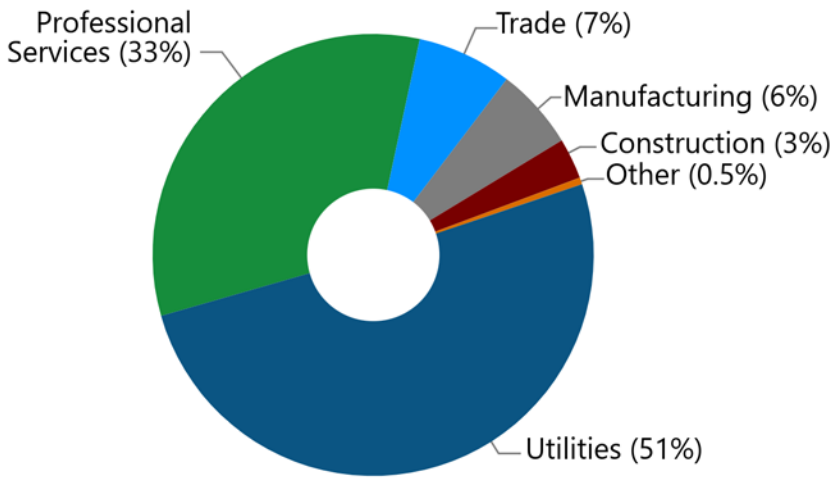
These occupations are unlikely to be major constraints and generally require limited workforce intervention. These occupations are less likely to constrain nuclear deployment and generally require modest intervention. The State should avoid over-investing workforce resources unless labor market conditions change.

3.2 Operations and Maintenance Phase

Once nuclear facilities become operational, workforce demand shifts toward long-term plant O&M, fuel handling, cybersecurity, engineering, and regulatory oversight. Safe, reliable O&M depends on a smaller but highly specialized workforce that must be available over the long term. Some occupations, such as nuclear engineers, licensed operators, and other technical or scientific professionals, require long training timelines and specialized credentials, and have limited national talent pipelines.

Because the State's nuclear sector is currently centered on operating facilities rather than developing or constructing new reactors, its existing nuclear workforce profile largely reflects operations-phase employment. As of 2024, the State's nuclear energy sector employs over 4,000 operations workers across all industries.[7] About half (51%) of all nuclear workers in the State are employed in nuclear electric power generation utilities, followed by professional and business services (33%), trade (7%), manufacturing (6%), and construction (3%) (see Figure 3).

Figure 3. Nuclear Employment by Industry in New York State, 2024

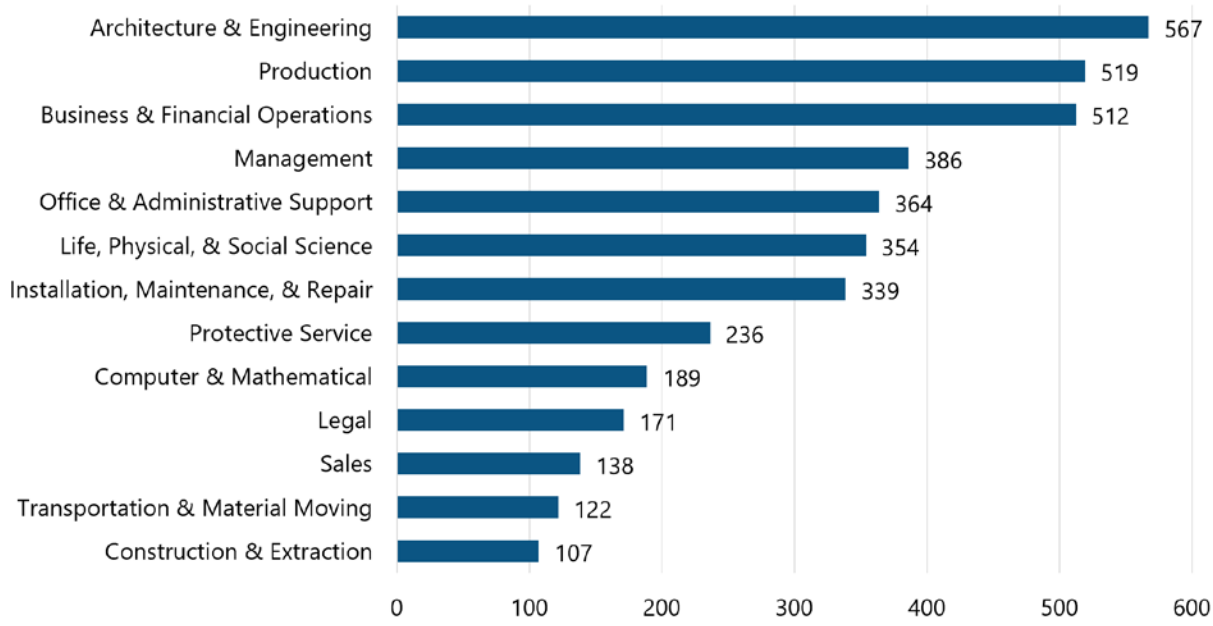


New York State's nuclear workforce spans many key occupational groups that reflect both the technical demands of operating nuclear facilities and the broader support functions required to sustain them. The largest share of workers (655, or 16%) falls within the architecture and engineering occupational group, which includes high-skill roles such as nuclear, electrical, industrial, environmental, and health and safety engineers. Production occupations form the second-largest group, primarily driven by nuclear power reactor operators. Business and financial operations also represent a significant segment of workers, with a high concentration

of occupations such as management analysts, project management specialists, and training and development specialists. While construction occupations[vi] comprise a smaller share of the State's nuclear workforce, demand for these occupations is expected to rise significantly as new facilities come online (see Figure 4).

Figure 4. Nuclear Employment by Occupational Group in New York State, 2024

Source: 2025 U.S. Energy and Employment Report and BW Research's proprietary staffing patterns.



The following sections describe the demand-and-supply pressures for the highest-demand occupations throughout the O&M phase, based on economic impact modeling conducted for this study. High-demand occupations are those projected to account for the largest absolute number of workers required by nuclear development, regardless of wage level, strategic importance, training complexity, or suitability for workforce intervention.

[vi] Occupational group titles follow the U.S. Bureau of Labor Statistics Standard Occupational Classification system. Under this system, "Construction and Extraction Occupations" (SOC Group 47) is a combined category. However, in the context of New York's nuclear workforce, employment within this category primarily reflects construction-related roles associated with facility development, maintenance, and infrastructure rather than mining or resource extraction activities.

3.2.1 Workforce Demand

Table 5 identifies occupations involved in the O&M phase of a nuclear project that are projected to be in high demand, measured across the four labor metrics described in Section 3.1.1 (detailed job descriptions can be found in Appendix B):

1. Economy-wide current employment in the State
2. Economy-wide projected annual openings
3. Nuclear sector-specific current employment in the State
4. Nuclear sector-specific projected peak demand

Ratios comparing projections to current employment indicate whether projected openings or demand are modest or substantial relative to the occupation's current scale. Compared with the pre-operations phase, many high-demand occupations during the O&M phase show modest recurring hiring pressure.

Projected nuclear peak demand as a percentage of current nuclear employment provides a separate measure of nuclear-specific workforce pressure, demonstrating the extent to which future workforce requirements exceed the existing nuclear employment base. In many cases, the existing nuclear workforce in these occupations will need to double to meet projected peak demand, represented by a ratio of 100% or more (see Table 5).

Table 5. Top 15 High-Demand O&M Phase Occupations

	Economy-Wide			Nuclear Sector-Specific		
Occupation Name	**State Current Employment[a,b]**	**Projected Annual Openings[c,d]**	**Projected Annual Openings as a % of Current Employment**	**State Current Employment[e]**	**Projected Peak Demand**	**Projected Peak Demand as a % of Current Employment**
Total, All Occupations	**9,688,000**	**1,255,769**	**13%**	**4,054**	**4,014**	**99%**
Nuclear Power Reactor Operators	230	30	**13%**	230	246	**107%**
Nuclear Engineers[f]	150	20	**13%**	150	224	**149%**
Security Guards	134,700	18,093	**13%**	206	197	**96%**
Nuclear Technicians	260	23	**9%**	260	195	**75%**

Table 5. (continued)

Occupation Name	Economy-Wide			Nuclear Sector-Specific		
	State Current Employment[a,b]	Projected Annual Openings[c,d]	Projected Annual Openings as a % of Current Employment	State Current Employment[e]	Projected Peak Demand	Projected Peak Demand as a % of Current Employment
General and Operations Managers	206,740	20,113	**10%**	121	129	**106%**
Civil Engineers	17,500	1,332	**8%**	54	116	**216%**
First-Line Supervisors of Production and Operating Workers	20,830	1,972	**9%**	125	116	**93%**
Lawyers	91,870	5,396	**6%**	101	103	**101%**
Sales Representatives, Wholesale and Manufacturing	61,500	7,362	**12%**	63	93	**149%**
Electrical Engineers	8,770	703	**8%**	80	93	**116%**
Project Management Specialists	68,020	4,310	**6%**	73	90	**123%**
Software Developers	113,510	6,491	**6%**	59	80	**136%**
Architectural and Engineering Managers	8,250	447	**5%**	57	74	**129%**
Industrial Machinery Mechanics	12,740	901	**7%**	75	72	**96%**
Management Analysts	69,150	6,963	**10%**	92	71	**79%**

3.2.2 Workforce Supply

Comparing demand-side data with State labor supply informs potential labor market gaps. The supply indicators in Table 6 offer insight into the State's existing workforce capacity for high-demand O&M occupations. See Section 3.1.1 for explanations of each indicator.

Table 6. Supply Indicators for O&M High-Demand Occupations

Occupation Name	Unemployment Rate[a]	Share of Workers Age 55+[b]	Location Quotient[c]
Total, All Occupations	**4.3%**	**24.8%**	**1.00**
Nuclear Power Reactor Operators	3.0%	19.2%	0.73
Nuclear Engineers	2.4%	24.0%	0.16
Security Guards	7.7%	26.0%	1.68
Nuclear Technicians	23.4%[d]	16.0%	0.66
General and Operations Managers	1.6%	22.7%	0.95
Civil Engineers	1.0%	22.5%	0.76
First-Line Supervisors of Production and Operating Workers	1.9%	27.3%	0.50
Lawyers	0.9%	31.5%	1.95
Sales Representatives, Wholesale and Manufacturing	2.0%	26.8%	0.80
Electrical Engineers	3.1%	26.2%	0.71
Project Management Specialists	1.9%	21.6%	1.02
Software Developers	3.3%	12.5%	1.08
Architectural and Engineering Managers	2.9%	33.6%	0.60
Industrial Machinery Mechanics	1.9%	30.1%	0.47
Management Analysts	4.3%	29.5%	1.24

Table 7 presents the education, training, and experience requirements for the high-demand occupations during the O&M phase.

Table 7. Job Requirements for High-Demand O&M Occupations

*Source: Education, work experience, and on-the-job training data sourced from the BLS and DOL's O*NET system. For employment and occupational data definitions, see https://www.bls.gov/emp/documentation/definitions.htm.*

Occupation Name	Entry-Level Education	Previous Work Experience	On-the-Job Training[a]	Preferred or Required Certifications[b]
Nuclear Power Reactor Operators	High school diploma or equivalent	None	Long-term on-the-job training	**Reactor Operator (RO) License:** Involves a written exam and operating test on a plant simulator. Must be renewed every 6 years, with a mandatory medical exam every 2 years; plant-specific license **NRC Senior Reactor Operator (SRO) License:** Requires all of the above, plus an additional written exam section and a more rigorous operating test[c] **Certified Nuclear Professional (CNP):** For individuals with >2 years of nuclear experience; includes written exam; recertify every 3 years; well suited for early- to mid-career workers in nuclear operations, regulatory compliance, quality assurance, safety, or project management[d]
Nuclear Engineers	Bachelor's degree	None	None	**Fundamentals of Engineering (FE) Exam and Professional Engineering (PE) License:** Requires bachelor's degree and a passing score on both exams[e] **CNP:** For individuals with >2 years of nuclear experience; includes written exam; recertify every 3 years; well suited for early- to mid-career workers in nuclear operations, regulatory compliance, quality assurance, safety, or project management[f] **Training under ASME Nuclear Component Quality Assurance (QA) Program:** Trained and qualified in QA and other areas to demonstrate technical proficiency[g]
Security Guards	High school diploma or equivalent	None	Short-term on-the-job training	All armed and unarmed security personnel must complete **an NRC-approved Training and Qualification (T&Q) Plan** with elements requiring recertification annually[h]

Table 7. (continued)

Occupation Name	Entry-Level Education	Previous Work Experience	On-the-Job Training[a]	Preferred or Required Certifications[b]
Nuclear Technicians	Associate degree	None	Moderate-term on-the-job training	Requires plant-specific structured training plan for radiological protection technicians under 10 Code of Federal Regulations (CFR) 50.120[i] **Registered Radiation Protection Technologist (RRPT):** Eligibility requirements and written exam; renewal every 5 years; highly valued but not universally required[j]
General and Operations Managers	Bachelor's degree	5 years or more	None	Requires plant-specific structured training plan for shift supervisors and shift technical advisors under 10 CFR 50.120[k]
Civil Engineers	Bachelor's degree	None	None	Requires plant-specific structured training plan for engineering personnel under 10 CFR 50.120[l] **FE Exam and PE License:** Requires bachelor's degree and a passing score on both exams[m]
First-Line Supervisors of Production and Operating Workers	High school diploma or equivalent	<5 years	None	Requires plant-specific structured training plan for shift supervisors and shift technical advisors under 10 CFR 50.120[n]
Lawyers	Doctoral or professional degree	None	None	State license
Sales Representatives, Wholesale and Manufacturing	High school diploma or equivalent	None	Moderate-term on-the-job training	N/A
Electrical Engineers	Bachelor's degree	None	None	Requires plant-specific structured training plan for engineering personnel under 10 CFR 50.120[o] **FE Exam and PE License:** Requires bachelor's degree and a passing score on both exams[p]

Table 7. (continued)

Occupation Name	Entry-Level Education	Previous Work Experience	On-the-Job Training[a]	Preferred or Required Certifications[b]
Project Management Specialists	Bachelor's degree	None	None	**CNP:** For individuals with >2 years of nuclear experience; includes written exam; recertify every 3 years; well suited for early- to mid-career workers in nuclear operations, regulatory compliance, quality assurance, safety, or project management[q] **Project Management Professional (PMP) Certification:** Industry-recognized credential for managers[r]
Software Developers	Bachelor's degree	None	None	N/A
Architectural and Engineering Managers	Bachelor's degree	≥5 years	None	Requires plant-specific structured training plan for engineering personnel under 10 CFR 50.120[s] **FE Exam and PE License:** Requires a bachelor's degree and a passing score on both exams[t] **CNP:** For individuals with >2 years of nuclear experience; includes a written exam; recertify every 3 years; well suited for early- to mid-career workers in nuclear operations, regulatory compliance, quality assurance, safety, or project management[u] **Training under ASME Nuclear Component QA Program:** Trained and qualified in QA and other areas to demonstrate technical proficiency[v] **PMP Certification:** Industry-recognized credential for managers[w]
Industrial Machinery Mechanics	High school diploma or equivalent	None	Long-term on-the-job training	Requires plant-specific structured training plan for mechanical maintenance personnel under 10 CFR 50.120[x]
Management Analysts	Bachelor's degree	<5 years	None	N/A

3.2.3 Gap Analysis

A comprehensive gap analysis of high-demand O&M occupations was conducted to determine which are most at risk of falling short of workforce needs. Section 3.1.1 details how this gap analysis was conducted.

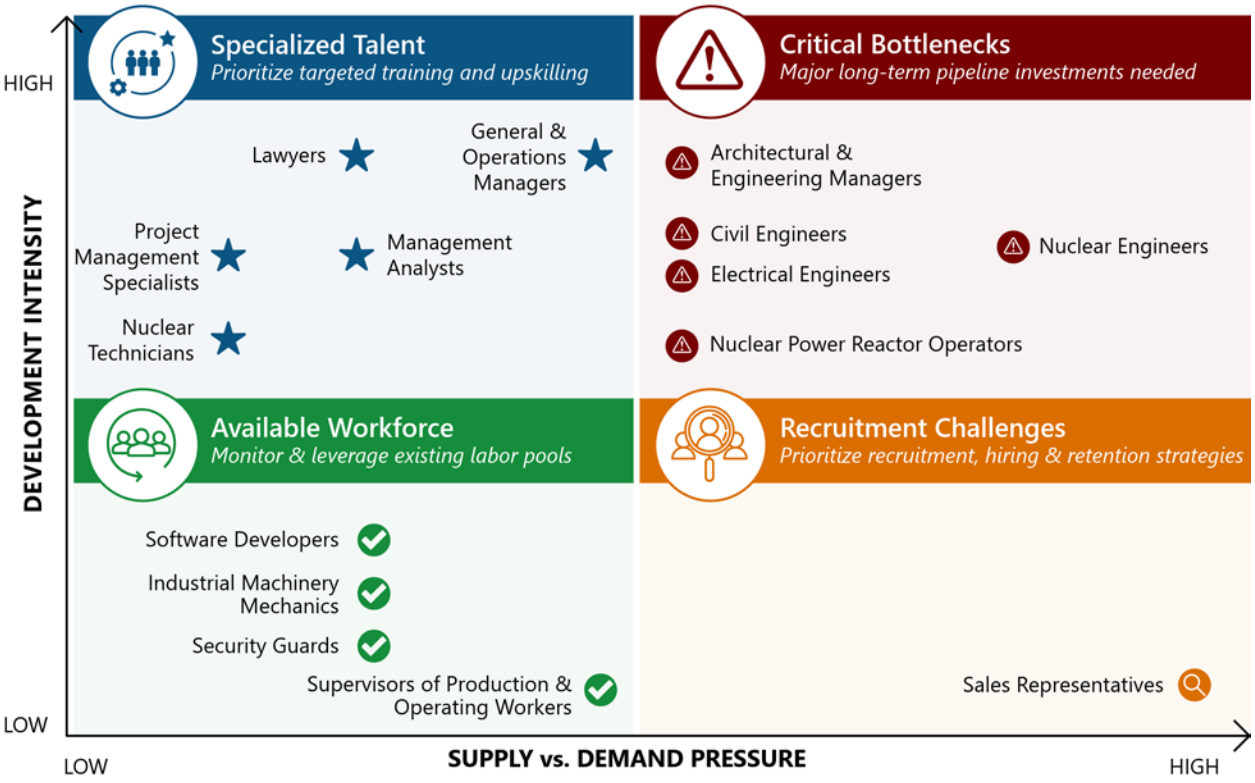
Table 8. Risk Levels for O&M High-Demand Occupations

Occupation Name	Supply vs. Demand Pressure	Development Intensity
Nuclear Power Reactor Operators	**Moderate**	**Moderate**
Nuclear Engineers	**Severe**	**Moderate**
Security Guards	**Moderate**	**Mild**
Nuclear Technicians	**Mild**	**Moderate**
General and Operations Managers	**Moderate**	**Severe**
Civil Engineers	**Moderate**	**Moderate**
First-Line Supervisors of Production and Operating Workers	**Moderate**	**Mild**
Lawyers	**Moderate**	**Severe**
Sales Representatives, Wholesale and Manufacturing, except Technical and Scientific Products	**Severe**	**Mild**
Electrical Engineers	**Moderate**	**Moderate**
Project Management Specialists	**Mild**	**Moderate**
Software Developers	**Moderate**	**Mild**
Architectural and Engineering Managers	**Moderate**	**Severe**
Industrial Machinery Mechanics	**Moderate**	**Mild**
Management Analysts	**Moderate**	**Moderate**

3.2.4 Operations and Maintenance Risk Matrix

Recommended workforce strategies vary based on both the severity of anticipated labor market constraints and the level of specialized intervention required for each occupation (Figure 5).

Figure 5. Risk Matrix for O&M High-Demand Occupations



3.3 Workforce Demand Timing

The analysis carried out to underpin the peak demand numbers assessed above also provides important insights on the timing of when demand peaks are likely to occur. It projects the total peak demand figures to be relatively constant across a range of assessed deployment scenarios and timelines – as noted above, total estimated peak demand used for 5 GW of advanced nuclear power generation in this analysis is 7,800 jobs at the pre-operations phase and 4,000 at the operations phase. However, the distribution of when peaks occur differs more significantly by scenario.

Figures 6 through 9 below charts the annual jobs projected in the Master Plan Economic Impacts Analysis to illustrate these differences. Scenario 1a considers the deployment of approximately 5 GWe of large light water reactors s, Scenario 1b considers the deployment of approximately 5 GWe of light water small modular reactors, Scenario 2a considers the deployment of mature large light water reactors along with light water small modular reactors in parallel, and Scenario 2b scenario deploys large light water reactors and a nascent, first-of-kind Generation IV (Gen IV) small modular reactor technology in parallel.

Figure 6. Scenario 1a Direct and Indirect Jobs, 2027–2060

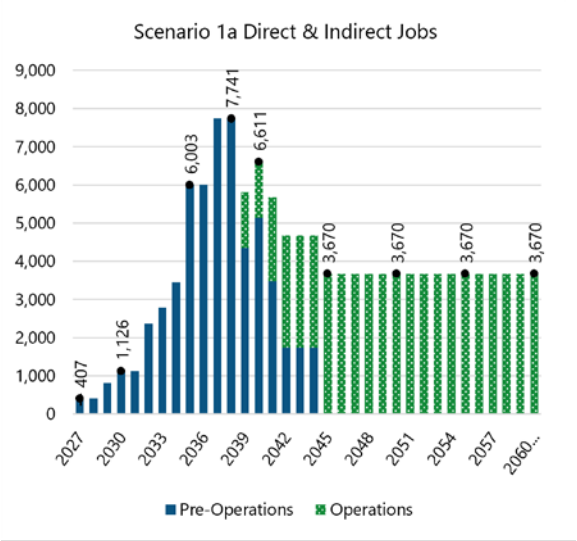


Figure 7. Scenario 1b Direct and Indirect Jobs, 2027–2060

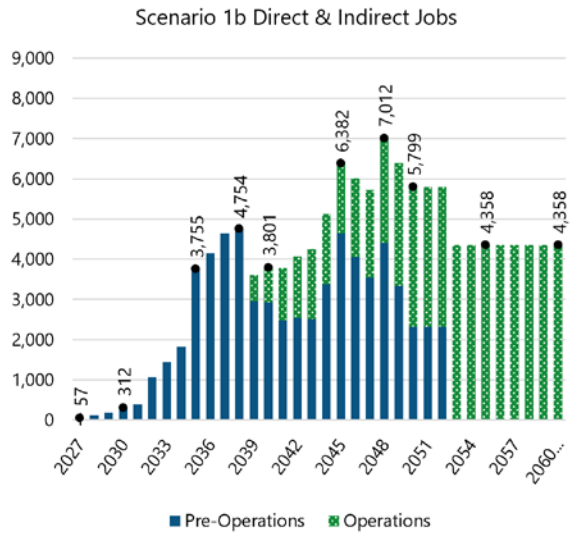


Figure 8. Scenario 2a Direct and Indirect Jobs, 2027–2060

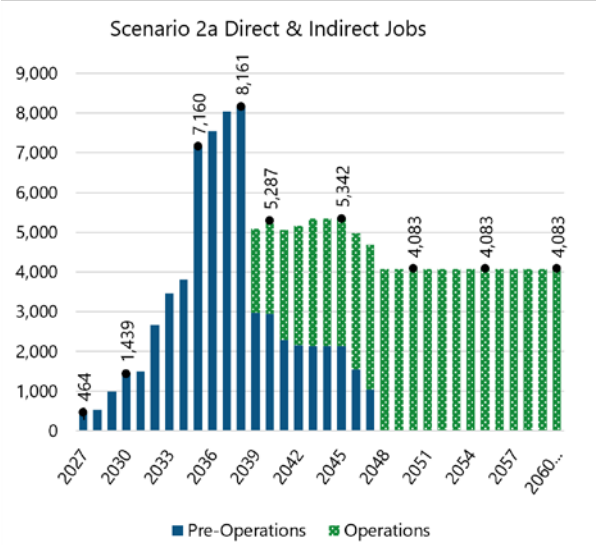
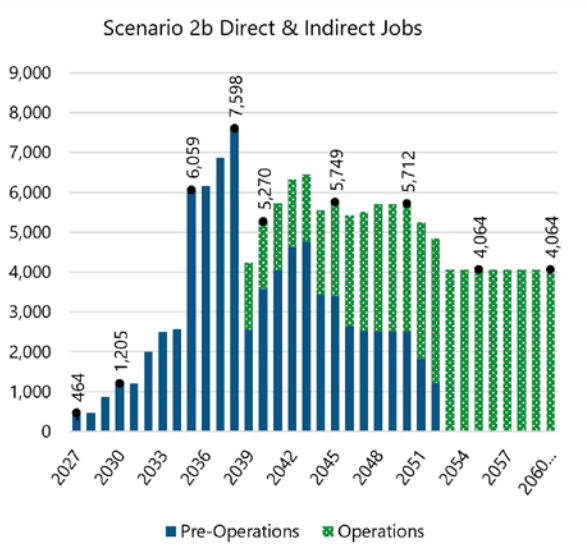


Figure 9. Scenario 2b Direct and Indirect Jobs, 2027–2060



Figures reproduced from the Master Plan Economic Impact Analysis.

These variations highlight the importance of aligning workforce development, training, and recruitment efforts with projected project schedules to ensure workers are available when demand is highest.

3.4 Findings

Annual and peak workforce demand projections: Across the modeled development period and scenarios, nuclear projects would require an average of approximately 3,100 pre-operations workers annually during the pre-operations phase and 3,200 O&M workers annually during the operations phase. These annual averages smooth out periods of higher and lower demand and are therefore lower than the peak estimates. The pre-operations phase may require around 7,900 jobs at peak, while the O&M phase may require 4,000 jobs at peak.

Reactor deployment timelines significantly affect workforce demand timing: While these workforce demand projections are relatively consistent across the modeled deployment scenarios, the timing of these peaks varies substantially, reflecting differences in when projects are planned and constructed. These variations highlight the importance of aligning workforce development, training, and recruitment efforts with projected project schedules to ensure workers are available when demand is highest.

Pre-operations and O&M require distinct workforce development strategies: Nuclear development creates two phases of workforce demand: a large, temporary pre-operations workforce supporting construction and commissioning, followed by a smaller, long-term O&M workforce operating the plant over its lifespan. Although the phases share some occupations and foundational skills, their workforce needs differ in scale, timing, employers, training systems, and labor organizations. For example, the local construction trade organizations that build a plant generally differ from the plant-based labor organizations representing workers during operations. [vii] These differences require coordinated but phase-specific workforce strategies.

- **Pre-operations:** Initially, a small, specialized workforce is needed for site evaluation, licensing, financing, and environmental reviews, followed by substantial demand for skilled trades, construction management, manufacturing, logistics, and installation occupations. Construction trades drive the near-term workforce surge in New York State, with high demand for electricians, pipefitters, welders, concrete pourers, millwrights, operating engineers, and supervisors. Because many roles may not be needed continuously, careful consideration is needed to determine where in-state workforce development is most efficient. Nuclear construction relies on familiar industrial construction skills, but the nuclear-specific overlay can create bottlenecks. Workers may

[vii] An electrician who constructs the plant and an electrician who later works inside it may both be organized labor members but likely belong to different locals and follow different training and career pathways. For instance, an electrician building a new plant in Upstate New York may belong to IBEW Local 43, a construction trade organization, whereas the electrician who works for the utility operating the plant may belong to Local 97.

need additional preparation in nuclear safety culture, quality assurance and control, regulatory compliance, the U.S. Nuclear Regulatory Commission (NRC) site access and background check regiments, and nuclear-grade materials and techniques.

- **Operations and maintenance:** Following construction and commissioning, demand will shift to a sustained workforce of operators, technicians, engineers, maintenance staff, security personnel, radiation protection professionals, and plant managers. While smaller on average than the construction workforce, O&M employment requires longer lead times, plant-specific preparation, and sustained regional talent pipelines. Occupations represented in New York State's existing nuclear fleet that are expected to see substantial demand under new nuclear development include nuclear technicians, nuclear power reactor operators, security guards, nuclear engineers, first-line supervisors of production and operating workers, general and operations managers, and lawyers. These occupations account for the highest employment counts in the State's existing nuclear sector.

Most occupations in advanced nuclear construction and operations resemble traditional nuclear roles, with changes largely concentrated in digital control rooms and instrumentation and control, more cybersecurity components, technology-specific material certifications, lower-pressure systems, enhanced safety features, and modular manufacturing with factory-to-site logistics. Current small modular reactor (SMR) designs and processes anticipate mass production in a factory setting, meaning more workers will be needed to manufacture and fabricate smaller advanced reactors. In contrast, microreactors and SMRs will require less construction labor than traditional and large advanced reactors. However, advanced Gen IV nuclear technologies do not overall create an entirely new occupational universe compared to traditional nuclear technologies.

3.4.1 Pre-Operations

Some occupations critical to the pre-operations phase face elevated retirement risk among New York State workers. First-line supervisors of construction trades, wholesale and manufacturing sales representatives, assemblers and fabricators, construction managers, structural iron and steel workers, and heavy and tractor-trailer truck drivers all have a larger share of workers age 55 or older than the statewide workforce average. This aging workforce may intensify replacement needs and constrain the availability of experienced workers as nuclear projects advance toward construction.

Nuclear project construction is mostly familiar industrial construction work, but nuclear-grade training requirements could create specific bottlenecks without dedicated focus by

State workforce entities. Nuclear construction relies on transferable craft and technical skills, but it also requires a nuclear-specific overlay that includes safety culture, quality assurance and control procedures, regulatory compliance, NRC mandated site access requirements and background checks, and experience working with nuclear-grade materials and techniques.

Emerging Best Practices:
Learning from Vogtle Units 3 and 4

The recent construction of Vogtle units 3 and 4 in Georgia provides important lessons for planning the workforce needed for future nuclear projects in New York State.

Worker retention depends on predictable project sequencing, realistic schedules, and high-quality jobs. Long construction timelines, repeated schedule changes, and gaps between major phases erode workforce continuity. Vogtle showed that recruiting enough workers is only one part of the challenge—keeping them through a long and complex construction process is equally important. Strong partnerships, organized labor, consistent safety culture, and worker support programs can improve stability. For projects in New York State, these practices will be particularly important during permitting delays, transitions between construction phases, or other periods when workers may otherwise leave for more predictable opportunities.

3.4.2 Operations and Maintenance

Approximately 4,000 workers are employed in nuclear operations across New York State. Just over half (51%) work in nuclear electric power generation utilities, followed by professional and business services (33%), trade (7%), manufacturing (6%), and construction (3%). Architecture and engineering occupations represent the largest occupational group in the sector, accounting for 655 workers, or 16% of total nuclear employment. This group includes highly skilled roles such as nuclear, electrical, industrial, environmental, and health and safety engineers. Production occupations form the second-largest group, driven largely by nuclear power reactor operators. Occupations currently represented in New York State's existing nuclear fleet that are expected to see heavy future demand under new nuclear development in the State include nuclear technicians, nuclear power reactor operators, security guards, nuclear engineers, first-line supervisors of production and operating workers, general and operations managers, and lawyers. These occupations have the highest employment count in the State's nuclear sector.

The peak O&M workforce will be smaller than the construction workforce but will require sustained, plant-specific pipelines. After construction and commissioning, workforce demand in New York State will transition from a large, temporary project team to a long-term workforce of operators, technicians, engineers, maintenance staff, security personnel, radiation protection professionals, and plant management. Many of these positions will require longer lead times, more plant-specific preparation, and a sustained regional talent pipeline.

Several occupations projected to be in high demand during nuclear plant operations face the challenge of many workers approaching retirement age. Security guards, first-line supervisors of production workers, lawyers, wholesale and manufacturing sales representatives, electrical engineers, architectural and engineering managers, industrial machinery mechanics, and management analysts all have a higher share of workers over age 55 than the average New York State total workforce.

4. Additional Essential Occupations

In addition to the occupations identified as target occupations across nuclear pre-operations and O&M activities, several specialized roles are essential to the safe, compliant, and continuous functioning of a nuclear power plant (Table 9). These occupations may not generate large net employment demand because only a limited number of workers are typically required on-site at any given facility. However, without qualified personnel in these roles, key activities related to plant engineering, licensing, construction readiness, commissioning, radiation protection, maintenance, safety compliance, and ongoing operations could be delayed or halted. These occupations represent critical enabling functions within the nuclear workforce. As a result, they should be considered strategically important even though they do not meet quantitative high-demand thresholds for target occupations.

Table 9 Additional Essential Occupations and Education, Work Experience, and Training and Certification Requirements

Occupation	Entry-Level Education	Previous Work Experience	On-the-Job Training[a]	Preferred or Required Certifications for Nuclear Work[b]
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay (commonly referred to as "Instrumentation and Control Technicians")	Postsecondary nondegree award	Less than 5 years	Moderate-term on-the-job training	Requires plant-specific structured training plan under 10 CFR 50.120[c] **CNP:** For individuals with >2 years of nuclear experience; includes written exam; recertify every 3 years; well suited for early- to mid-career workers in nuclear operations, regulatory compliance, quality assurance, safety, or project management[d] **ASME Nuclear Component Certifications:** Certifications in QA and other areas to demonstrate technical proficiency in nuclear safety[e]
Health Physicists	Doctoral or professional degree	None	None	**Certified Health Physicist (CHP):** Industry-standard professional certification for radiation safety professionals; generally required for senior radiation protection and health engineering personnel[f]

Table 9. (continued)

Occupation	Entry-Level Education	Previous Work Experience	On-the-Job Training[a]	Preferred or Required Certifications for Nuclear Work[b]
Hazardous Materials Removal Workers	High school diploma or equivalent	None	Moderate-term on-the-job training	**OSHA 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) Certification:** Foundational certification for workers handling hazardous materials and waste[g] Requires specific employer-based training about radiation hazards under 10 CFR 19.12[h]
Health and Safety Engineers	Bachelor's degree	None	None	**FE Exam & PE License:** Requires bachelor's degree and a passing score on both exams[i] Requires plant-specific structured training plan under 10 CFR 50.120[j] **CNP:** For individuals with >2 years of nuclear experience; includes written exam; recertify every 3 years; well suited for early to mid-career workers in nuclear operations, regulatory compliance, quality assurance, safety, or project management[k]
Maintenance and Repair Workers, General	High school diploma or equivalent	None	Moderate-term on-the-job training	N/A

4.1 Findings

Several specialized roles are essential to the safe, compliant, and continuous functioning of a nuclear power plant. Advanced nuclear increases opportunities for specialized skills within areas such as digital controls, cybersecurity, advanced manufacturing, modular fabrication, and technology-specific certifications. These occupations may not generate large net employment demand because only a limited number of workers are typically required on-site at any given facility. However, without qualified personnel in these roles, key activities related to plant engineering, licensing, construction readiness, commissioning, radiation protection, maintenance, safety compliance, and ongoing operations could be delayed or halted. Instrumentation and control technicians, health physicists, hazardous materials removal workers, health and safety engineers, and maintenance occupations represent critical enabling functions

within the nuclear workforce. As a result, they should be considered strategically important even though they do not meet quantitative high-demand thresholds for target occupations.

Specialized technical, scientific, and engineering positions will be comparatively difficult to fill. The State's greater risk in meeting projected nuclear employment needs centers on whether it can produce and attract enough specialized engineers, scientists, management roles, health physicists, and other technical experts to support design, licensing, safety, and construction. The shortage of these professionals stems from decades of limited nuclear development, an aging incumbent workforce, constrained academic programs, and competition for the same specialized talent.

New York State's nuclear O&M workforce faces the same shortages affecting specialized and highly technical nuclear occupations in the pre-operations phase. The national shortage of nuclear engineers, scientists, health physicists, and other nuclear-specific experts essential to safe and reliable operations will also affect O&M pipelines in the State.

5. Nuclear Workforce Training Ecosystem

The ecosystem of organizations that build and sustain the workforce pipeline for advanced nuclear development is vast and interconnected. Successful nuclear deployment depends on coordination across stakeholders within education and training, workforce development, labor, government, reactor operators, labs, and regulatory bodies. This multi-institutional workforce system requires aligned career awareness, education pathways, employer demand signals, labor supply, and access to funding and research.

Additionally, the institutional momentum that supported the nation's last nuclear expansion in the mid- to late 1900s is no longer as prominent, and stakeholders must rebuild today's workforce pipeline as projects are being planned. The regions that rebuild training pathways most efficiently will be best positioned to reduce the risk of initial workforce bottlenecks. The decommissioning of Indian Point offers New York State a strong advantage for training and transitioning workers; the plant's existing workforce provides a high-quality pool of in-state, nuclear-qualified workers with relevant experience. Rebuilding this pipeline will require alignment among education and training stakeholders involved in preparing the range of occupations needed across the industry.

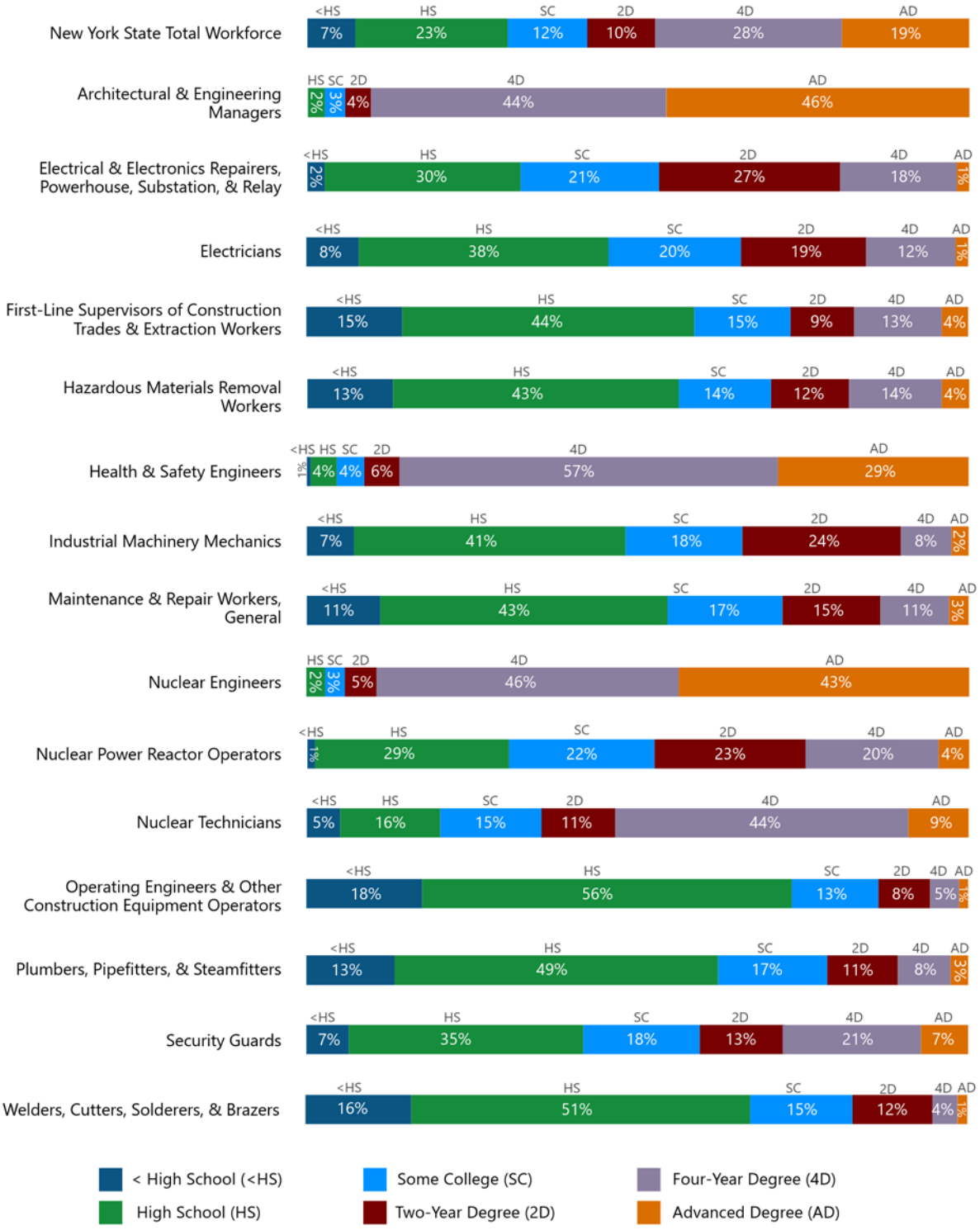
Prioritizing Target Occupations

Previous sections of this report have identified occupations with high projected demand within the nuclear sector. The training inventory focuses on a subset of those high-demand occupations aligned with broader NYSERDA strategic priorities, such as job quality, accessibility, and scalability. Target occupations were identified based on strategically relevant criteria that align with the goals of the Master Plan and New York State's larger clean energy workforce priorities: wage quality, accessibility and multiple entry pathways, potential workforce bottlenecks, projected or nuclear-specific demand, specialization within the nuclear industry, and the timing of need across the project development cycle. This approach focuses the training inventory analysis on roles critical to nuclear development, that offer meaningful workforce opportunities, and that may require targeted State intervention. Appendix A details the target occupation selection.

The sector supports both highly specialized professional roles and skilled trades accessible through multiple entry points and training routes, as seen in the educational attainment among current New York State nuclear workers in target occupations (Figure 10).

Figure 10. Educational Attainment by Target Occupation in New York State

Source: JobsEQ," Labor Market Data, 2025 Q3," proprietary database, Chmura Economics & Analytics, 2025, https://www.chmura.com/.



Given the technical nature and specialized training and credentialing required for many nuclear jobs, the industry generally offers high-paying, sustainable careers. Across the economy-wide workforce, the nuclear industry offers an average annual wage of over $121,000—62% higher than the average wage across non–New York City counties in New York State ($75,100), and 48% higher than the statewide annual wage ($82,460). Many target occupations in the nuclear sector earn higher annual wages than those in the general economy (see Table 10).

Table 10. Annual Wages by Target Occupation

Occupation Name	State Average Annual Wage (Statewide)[a]	State Average Annual Wage (Non-NYC)[b,c]	Nuclear Industry Average Annual Wage (U.S.)[d]
Total Economy-wide Workforce	**$82,460**	**$75,100**	**$121,620**
Architectural and Engineering Managers	$188,270	$183,100	$186,880
Electricians	$84,860	$84,000	$109,770
First-Line Supervisors of Construction Trades and Extraction Workers	$98,910	$98,400	$138,760
Industrial Machinery Mechanics	$72,990	$73,900	$107,610
Nuclear Engineers	$150,090	$150,100	$139,900
Nuclear Power Reactor Operators	$128,370	$127,800	$120,750
Nuclear Technicians	$136,950	$135,300	$117,760
Operating Engineers and Other Construction Equipment Operators	$90,690	$89,100	N/A
Plumbers, Pipefitters, and Steamfitters	$83,790	$84,900	N/A
Security Guards	$46,450	$45,500	$66,460
Welders, Cutters, Solderers, and Brazers	$62,810	$61,200	$103,210

5.1 Inventory of New York State's Training and Education Ecosystem

To establish a foundation of relevant programs available across New York State, an inventory of all statewide training and education programs available for each target occupation was developed (Table 11). This inventory includes degree programs, certifications, career and technical education (CTE) programs, apprenticeships, and other outcomes that apply to each occupation.[viii] Additional detail on the development of the inventory is in Appendix A.

[viii] Not all programs included in the inventory are necessarily nuclear-specific—some may already include nuclear-relevant content. Others may require adaptation to meet the industry's specialized needs.

Many target occupations do not require a single prescribed educational pathway and instead offer multiple entry points. The inventory is an initial step in understanding the range of existing programs, not an exhaustive or mandatory roadmap for entering a given occupation.[ix]

Table 11. Number of Training Programs in New York State by Target Occupation and Outcome

Occupation	CTE Program/ Course	Certificate (Credit & Noncredit Bearing)	Associate Degree	Bachelor's Degree	Advanced Degree (Master's, Doctoral)	Internships, Apprenticeships & Pre-Apprenticeships	Other (Micro-credentials, Continuing Ed, Job Readiness, Upskilling, Test Prep)	TOTAL
Architectural and Engineering Managers	0	0	12	30	11	0	2	**55**
Electricians	11	29	4	0	0	96	27	**167**
First-Line Supervisors of Construction Trades and Extraction Workers	0	8	6	9	4	2	2	**31**
Industrial Machinery Mechanics	0	1	0	0	0	10	0	**11**
Nuclear Engineers	0	4	0	3	0	0	1	**8**

[ix] While additional courses and training opportunities may develop applicable skills, this inventory focuses specifically on programs that directly align with occupational requirements—particularly those with curricula that closely correspond to the core job tasks, responsibilities, and qualifications for each role.

Table 11. (continued)

Occupation	CTE Program/ Course	Minor/ Certificate (Credit & Noncredit Bearing)	Associate Degree	Bachelor's Degree	Advanced Degree (Master's, Doctoral)	Internships, Apprenticeships & Pre-Apprenticeships	Other (Micro-credentials, Continuing Ed, Job Readiness, Upskilling, Test Prep)	TOTAL
Nuclear Power Reactor Operators	0	3	1	0	0	0	0	**4**
Nuclear Technicians	0	0	1	0	0	2	1	**4**
Operating Engineers and Other Construction Equipment Operators	0	6	0	0	0	26	0	**32**
Plumbers, Pipefitters, and Steamfitters	2	5	2	0	0	60	19	**88**
Security Guards	0	52	0	0	0	0	0	**52**
Welders, Cutters, Solderers, and Brazers	11	26	6	0	0	5	36	**84**

Training programs for target occupations are unevenly distributed across New York State counties, with a strong concentration in a handful of major population and economic centers—including Erie County (home to Buffalo), Suffolk County (Long Island), and Monroe County (home to Rochester). The New York City boroughs also collectively account for a significant share of programs. In contrast, many counties have fewer than 10 programs, and several rural counties, including Chenango, Essex, Lewis, and Sullivan, report only one program each. More than a dozen programs are offered online, expanding access beyond county boundaries.

Overall, the data indicate that training opportunities are concentrated in more urban and populous regions, with more limited in-person access across rural counties, an imbalance that

may prove to be a particular gap given that nuclear facilities and related energy infrastructure are often sited in more rural areas, where local training pipelines appear comparatively smaller.

Case Studies of Existing and Newly Funded Nuclear Training and Education Programs in New York State (Continued)

Program Name: Bachelor of Science in Nuclear Engineering Technology

Institution Name: Excelsior University

Relevant Occupation(s): Nuclear Engineer, Nuclear Power Reactor Operator, Nuclear Technician

This program offers an online pathway for students and working adults pursuing technical careers in the nuclear sector. The program is particularly relevant for incumbent workers, military-trained personnel, and students who need a flexible route into nuclear occupations.[a]

The curriculum emphasizes practice-ready skills in reactor operations, health physics, quality assurance, chemistry, and instrumentation and control, and offers concentrations in general nuclear engineering technology, nuclear cybersecurity, and nuclear leadership.

The program is notable for its scale, with 214 bachelor's degrees awarded in 2024, making it one of the largest degree-producing nuclear education pathways in New York State.[b] Its 100% online format and alignment with nuclear utility and U.S. Navy training make it a potentially important statewide workforce asset, particularly for workers seeking career advancement without leaving employment.

[a]Excelsior University, "Bachelor of Science in Nuclear Engineering Technology," need date, accessed July 27, 2026, https://www.excelsior.edu/program/bachelor-of-science-in-nuclear-engineering-technology/).
[b]National Center for Education Statistics (NCES), "College Navigator: Excelsior University," need date, accessed July 27, 2026, https://nces.ed.gov/collegenavigator/?q=excelsior&s=all&id=196680

Case Studies of Existing and Newly Funded Nuclear Training and Education Programs in New York State (Continued)

Program Name: Nuclear Engineering Concentration (Certificate)

Institution Name: City College of New York (CCNY)

Relevant Occupation(s): Nuclear Engineer, Nuclear Power Reactor Operator, Nuclear Technician

This program trains the next generation of nuclear workers and is the only nuclear engineering program offered in the tri-state area. The certificate program includes three courses: nuclear reactor physics and engineering, nuclear reactor thermal hydraulics, and nuclear reactor design, operation, and safety.[c]

Since 2009, approximately 1,000 students have taken one or more nuclear engineering courses, and graduates have moved into nuclear roles across the U.S., including national laboratories, research and development, utilities, and the Nuclear Regulatory Commission (NRC). The program has garnered substantial federal support, including more than $10 million in NRC- and U.S. Department of Energy-(DOE) related research funding over approximately 15 years, as well as scholarship funds for students tied to pursuing nuclear employment after graduation.

[c]City University of New York (CUNY) Energy Institute, "Nuclear Engineering Program," need date, accessed July 27, 2026, https://www1.cuny.edu/sites/energy/about/nuclear/)

Program Name: Bachelor of Science in Nuclear Engineering

Institution Name: U.S. Military Academy (USMA), West Point

Relevant Occupation(s): Nuclear Engineer, Nuclear Power Reactor Operator, Nuclear Technician

The program is a distinctive pathway that combines engineering education with military leadership development. The program provides cadets with a broad background for graduate study and U.S. Army assignments requiring expertise in mechanical engineering, applied radiation physics, nuclear weapons and weapons effects, and related technical areas. The major draws on coursework across physics, mathematics, mechanical engineering, civil engineering, electrical engineering, and nuclear engineering.[d]

The program conferred 21 bachelor's degrees in 2024 (see National Center for Education Statistics [NCES], "College Navigator: Excelsior University"). Unlike civilian programs focused primarily on utility or commercial nuclear employment, the USMA's pathway is best understood as a national-security and leadership-oriented pipeline. It prepares technically trained officers who can apply nuclear knowledge across industries.

[d]USMA, "Nuclear Engineering Major," need date, accessed July 27, 2026, https://www.westpoint.edu/academics/majors-and-minors/nuclear-engineering-major.

Case Studies of Existing and Newly Funded Nuclear Training and Education Programs in New York State (Continued)

Program Name: Bachelor of Science in Nuclear Engineering

Institution Name: Rensselaer Polytechnic Institute (RPI)

Relevant Occupation(s): Nuclear Engineer, Nuclear Power Reactor Operator, Nuclear Technician

RPI's program is one of New York State's 4-year nuclear engineering programs. The institution offers access to state-of-the-art research facilities, preparing graduates for professional practice, high-quality graduate programs, and leadership in engineering and science.[e]

National Center for Education Statistics (NCES) completion statistics identify 16 bachelor's degree graduates and 9 advanced degree graduates in nuclear engineering in 2024.[f] suggesting RPI's dual role in producing entry-level nuclear engineers and supporting graduate-level research talent.

In 2026, the U.S. Department of Energy's (DOE) Office of Nuclear Energy awarded $1.1 million to RPI for the RENEW partnership program to "enhance workforce training and safety education, develop and deliver innovative educational programs, and promote public awareness of the nuclear industry".[g]

[e]RPI, "Nuclear Engineering," accessed July 27, 2026, https://ne.mane.rpi.edu/.

[f]National Center for Education Statistics (NCES), "College Navigator: Excelsior University".

[g]U.S. Department of Energy (DOE), Office of Nuclear Energy, "Office of Nuclear Energy Awards $49M to Enhance Nuclear Safety Training and Workforce Development," April 7, 2026, https://www.energy.gov/ne/articles/office-nuclear-energy-awards-49m-enhance-nuclear-safety-training-and-workforce.

Program Name: Associate of Applied Science in Energy Systems

Institution Name: SUNY Westchester Community College (SUNY Westchester)

Relevant Occupation(s): Nuclear Technician

SUNY Westchester offers a broader energy-sector technician pathway that prepares graduates for entry-level positions in energy generation, transmission, and distribution. The curriculum was developed with industry leaders, including the New York Power Authority (NYPA) and Con Edison, and covers the fundamentals across multiple energy sources, including nuclear.[h]

The program addresses the broader energy technician skill base that nuclear deployment depends on, including electrical and electronic theory, equipment operation, and mechanical and thermal systems, and could serve as a community-college bridge into nuclear technician roles.

[h]SUNY Westchester Community College, "Energy Systems A.A.S.," need date, accessed July 27, 2026, https://www.sunywcc.edu/academics/majors-programs/energy-systems-aas/.

Case Studies of Existing and Newly Funded Nuclear Training and Education Programs in New York State (Continued)

Program Name: Radiation Protection Technician Co-Ops and Nuclear Technical Internships

Institution Name: Constellation Energy Corporation

Relevant Occupation(s): Nuclear Technician

Constellation's internship and co-op pathways provide a direct employer-based bridge into nuclear work. Constellation's generation business includes nuclear, natural gas, oil, geothermal, hydro, wind, and solar assets, and the internship program includes areas such as engineering, mechanical and electrical technology, chemistry, radiation protection, emergency management, health physics, physics, and operations or power plant technology.

Internships are typically brief, paid opportunities for students pursuing bachelor's or 2-year technical degrees, while co-ops provide longer work experiences for students seeking work experience or academic credit.[i]

Internships and co-ops matter because plant-based nuclear roles require training, access authorization, a safety culture, and site-specific qualifications beyond classroom instruction. Constellation's internships, co-ops, and radiation protection trainee pathways convert classroom preparation into plant-qualified experience, helping build the technician, radiation protection, operations, and maintenance workforce needed to sustain nuclear generation in New York State.

[i]Constellation Energy Corporation, "Internships and Co-Ops," need date, accessed July 27, 2026, https://jobs.constellationenergy.com/internships.

Program Name: Nuclear Engineering Minor

Institution Name: University at Buffalo

Relevant Occupation(s): Nuclear Engineer

The University at Buffalo offers the first nuclear engineering credential among SUNY university centers. Developed through student advocacy, faculty engagement, and consultation with industry partners—including New York Power Authority (NYPA) and the New York State Research and Development Authority (NYSERDA)—the minor responds to growing State and regional demand for nuclear expertise.

The curriculum introduces students to nuclear science, reactor engineering, materials, the nuclear fuel cycle, and applied radiochemistry. It prepares engineering students to apply nuclear principles to energy production, reactor operation, safety and risk analysis, environmental management, and other applications such as medicine.[j]

[j]University at Buffalo, "Nuclear Engineering Minor," need date, accessed July 27, 2026, https://engineering.buffalo.edu/chemical-biological/academics/undergraduate/nuclear-engineering-minor.html.

5.2 Inventory of Wraparound Support Services

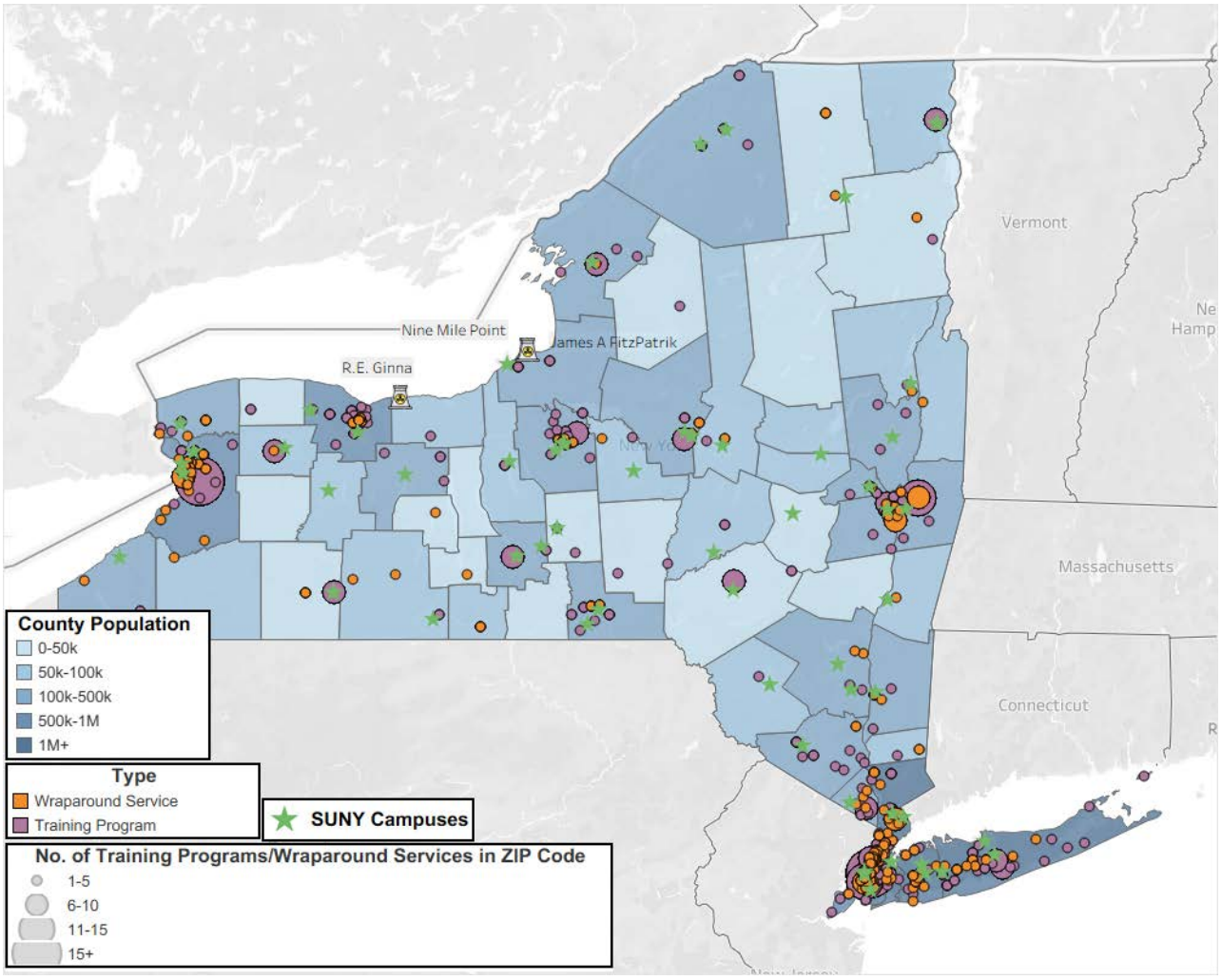
Wraparound services are critical to ensuring workers entering, reentering, or transitioning within the workforce are supported, and that job and training opportunities are accessible and equitable. For this analysis, "wraparound support services" are defined as resources that reduce barriers to accessing workforce training and employment opportunities. These services include, but are not limited to, transportation assistance, childcare, housing support, food security programs, behavioral health services, financial assistance, and veteran services.[8]

A comprehensive inventory of 276 locations that provide wraparound support services to workers across New York State was developed. Despite a significant presence of wraparound support providers in the State for workforce entry or reentry, persistent barriers to the energy workforce remain, and research highlights the need for greater access to and awareness of wraparound service providers in particular regions of the State.[9] Additional detail on the development of the inventory can be found in Appendix A.

5.2.1 Locations and Geography

Wraparound service organizations operate across New York State, with the highest concentration in the New York City region (28%), followed by Western New York (16%), which are among the State's most populous metropolitan areas. In contrast, the most rural regions had the lowest concentrations of service providers. The North Country and Mohawk Valley regions each had six providers, or 2% of the inventory. Despite major geographic disparities across urban versus rural areas in the State, training programs and wraparound service provider locations are strongly correlated (Figure 11).

Figure 11. Training Programs and Wraparound Support Services in New York State



5.2.2 Services Offered

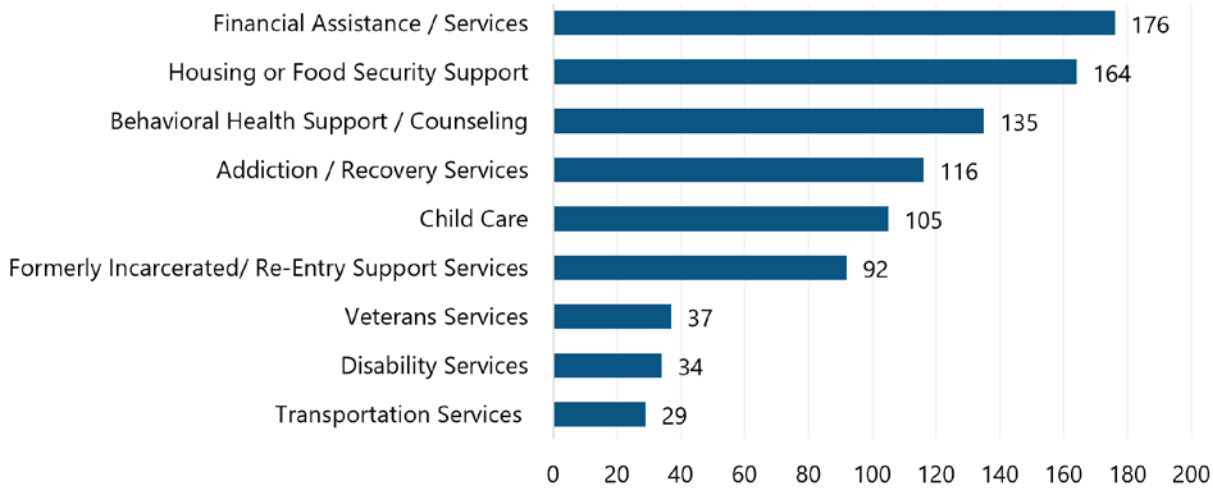
The inventory highlights a wide range of supportive services, showing a well-developed wraparound ecosystem that can address the diverse needs of job seekers and workers in certain regions of New York State. Organizations that provide financial assistance and services comprise the largest share of wraparound providers (64%), followed by housing or food security support (59%). About half of the State's regions cite housing affordability and availability as a barrier to workforce entry.[10,11] By prioritizing services that address common economic and behavioral barriers, these organizations provide foundational support, ensuring workers can access workforce training programs and pursue stable employment.

Additionally, the inventory appears less often to support specific populations. Organizations providing disability services (12%) and veterans services (13%) represent two of the three least common support categories identified (Figure 12). As a result, individuals within these groups

may encounter gaps in service availability, particularly in areas where these organizations are not geographically accessible.

While New York State has a robust wraparound service ecosystem offering food and housing support, financial assistance, and behavioral health and counseling support, among others, evidence at the regional level shows that affordability and access to these services remain critical barriers for many populations. Transportation assistance is the least common wraparound service identified in the inventory, with only 29 providers (Figure 12), despite its well-documented role supporting access to training and employment opportunities for disadvantaged communities.[12] The lack of accessible, affordable, and reliable transportation is a particularly crucial barrier for the nuclear workforce, where jobs may be located in areas without public transportation routes and far from population hubs. High transportation costs and lack of driver's licenses inhibit entry into the workforce in both urban and rural regions. Lack of public transportation access is particularly severe in the North Country, Western New York, Long Island, and Mid-Hudson regions.[13]

Figure 12. Organization Locations by Services Offered



5.3 Findings

New York State has significant existing assets to support advanced nuclear workforce development, including an operating commercial fleet, a nuclear-qualified decommissioning workforce, established organized labor apprenticeship systems, nuclear and nuclear-adjacent education programs, and a strong presence in transferable industries. The State's existing assets include:

- **Existing nuclear sites**: Nine Mile Point Clean Energy Center (Nine Mile Point), James A. FitzPatrick Clean Energy Center (J.A. FitzPatrick), and R.E. Ginna Clean Energy Center (Ginna), as well as the decommissioning workforce at Indian Point Energy Center (Indian Point)
- **Higher education**: 10 nuclear-focused training programs across 9 community colleges and 4-year institutions preparing nuclear engineers, technicians, and reactor operators
- **Shared educational networks**: 94 Board of Cooperative Educational Services (BOCES) programs that provide training for target nuclear occupations
- **Labor and apprenticeships**: Strong organized labor presence statewide, including 13 electrician, 9 operating engineer, and 19 plumber and pipefitter apprenticeship programs
- **Employer-based learning**: Constellation internships, cooperative education opportunities, and technician pathways (Constellation owns and operates Nine Mile Point, J. A. Fitzpatrick, and Ginna)
- **Labs and adjacent sectors**: Brookhaven National Laboratory; Naval Nuclear Laboratory's Kesselring Site and Knolls Atomic Power Laboratory; and substantial advanced manufacturing, utility, energy generation, aerospace, and defense activity

New York State's training and education landscape features a strong foundation of relevant programs, but regional variations could create challenges based on where nuclear development occurs in the State. New York State possesses more than 500 public training and credentialing programs aligned with the advanced nuclear target occupations and 276 workforce-support provider locations. However, training is concentrated in Erie, Monroe, Suffolk, and the New York City counties, while many rural counties have fewer than 10 programs—an urban-rural mismatch that is important because likely nuclear sites and operating facilities are often farther from the largest training concentrations.

A strong, highly labor-organized construction workforce will support new advanced nuclear construction. Construction trades will drive the near-term workforce surge in New York State: electricians, pipefitters, welders, concrete pourers, millwrights, operating engineers, and supervisors will be most in demand during the pre-operations phase. Because most projects are expected to be delivered through project labor agreements in the State, signatory contractors will be primarily responsible for securing the required labor. These contractors can meet demand through several mechanisms, including expanding the existing apprentice and journey-level workforce, bringing experienced nonunion workers into organized labor through lateral entry, and recruiting travelers from other union locals nationwide. Construction labor organizations indicated that these tools provide considerable flexibility to scale the workforce. The most relevant consideration for the broader workforce development system is whether a sufficient pipeline of direct-entry pre-apprenticeship graduates and other qualified candidates will be available for unions and signatory contractors to recruit as demand increases. New York State's existing apprenticeship capacity can also help advanced nuclear projects meet prevailing wage and apprenticeship requirements for the Investment Tax Credit (ITC), which requires registered apprentices to perform at least 15 percent of labor hours.

Stakeholder Insights

"For unions, trainers are already in place and are up to speed with the latest technology. We have facilities and infrastructure. We have local field representatives who are already in the community talking to folks about recruitment."

New York State's existing organized labor system can meet initial demand with its strong organized labor apprenticeship infrastructure, traveler networks, training centers, and experience scaling craft labor for major industrial and infrastructure projects. The training inventory identifies 42 organized labor-offered programs for target occupations, concentrated in electricians, plumbers and pipefitters, and welders, and stakeholder interviews indicate that Upstate New York labor systems in Buffalo, Rochester, and Syracuse can scale when credible work commitments are visible. Sustaining nuclear expertise between builds will be critical to preventing specialized skills and institutional knowledge from being lost during multiyear development gaps.

Stakeholder Insights

"Right now, everyone has been gearing up for the work here in New York. Gateway, Penn Station, offshore wind, Buffalo stadium, Micron, bus terminal, airports, etc.—we have been preparing."

Best practice approaches in nuclear education and training creates a layered system that maximizes specific institutional capacities. This consists of a few stronger nuclear academic

anchors, broader nuclear exposure across engineering and technical programs, colleges and universities adding nuclear minors and credentials, community colleges incorporating technician pathways, organized labor nuclearizing existing curricula, and entities sharing online or hybrid coursework, greater awareness incorporated into K–12 education, and fast-turn microcredentials where employer demand is clear.

Stackable credentialing approaches will be important tools for the State's educational institutions to help workers respond to changing nuclear workforce demands. Layering foundational "nuclear 101" competencies with more specialized training on top allows workers to pivot across technologies and occupations as the market evolves. This type of modular training approach could support more transferable career pathways across New York State's energy, manufacturing, and infrastructure industries.

New York State's established workforce training ecosystem can support nuclear development nationwide: The State's extensive higher education, union apprenticeship, workforce development, and existing nuclear training infrastructure create an opportunity to develop talent not only for New York State projects, but for the growing national nuclear industry. As training capacity expands, New York State can establish specialized programs and credentials that attract workers from across the country, prepare New Yorkers for both in- and out-of-state opportunities, and position the State as a national center for nuclear workforce education and training.

6. Current State Workforce Program Funding

To maximize benefits for workers and trainees, State agencies and authorities need a clear understanding of the funding opportunities available across entities and programs. This study offers an inventory of existing funding sources to help State agencies and authorities assess available resources, identify funding gaps, and determine which funds could support training the nuclear workforce (see Table 12). This exercise included reviewing funding tied to target occupations, training, and apprenticeships; examining broader energy-related funding streams; and categorizing other funding sources that could support workforce development for nuclear workers. The inventory also serves as a centralized resource for training providers, workforce development organizations, educational institutions, employers, and other stakeholders seeking to identify existing New York State funding opportunities that could potentially support nuclear workforce development.

The inventory estimates the total funding associated with these opportunities, but the amounts should not be interpreted as entirely uncommitted funding available for new nuclear-specific initiatives. Some funding may already be awarded, allocated, or actively supporting existing programs and participants. In addition, the inventory does not assume that funding should be redirected away from other industries, populations, or workforce priorities. Instead, the inventory includes programs that support occupations, skills, and industries that are transferable to the nuclear sector (see Section 5). Many existing investments in other energy sectors, construction trades, advanced manufacturing, engineering, and related technical fields can strengthen the nuclear workforce pipeline even when they are not explicitly labeled as nuclear workforce programs. Under this framework, funding already used to train workers in transferable occupations may also benefit the nuclear sector by expanding the pool of workers with relevant foundational skills and experience.

The total funding presented in the inventory should therefore be viewed as an indication of the scale of existing workforce resources that may contribute to nuclear workforce readiness, rather than as a discrete pool of funding available exclusively for nuclear workforce development.

Table 12. Existing Funding Programs by Government Entity

Program or Funding Name	Sponsor Entity	Funding Amount	Description
Nuclear Energy Workforce Training	NYPA	$40M total program funding 2026–2030; approximately $10M per year	needed for advanced nuclear development in Upstate New York by partnering with technical high schools, community colleges, universities, labor organizations, State- or federally recognized Tribal nations and organizations, and others, to develop nuclear energy technical training, retraining, coursework, and apprenticeship programs. Governor Kathy Hochul announced $10 million in NYPA funding awards to support advanced nuclear workforce development programs across New York State, part of a broader $40 million commitment under the NextGen Nuclear New York initiative.[a]
Clean Energy Career Pathways Training (PON 6121)	NYSERDA	$30M multiyear solicitation, 2026–2030; $30M refers to total program pool across solicitation period	Already supports energy workforce development by funding technical training, career preparation, wraparound services, and job placement for new workers entering clean energy careers.
On-the-Job Training for Energy Efficiency and Clean Technology (PON 3982)	NYSERDA	$22.9M rolling, multiyear program through 2030 or until funds are exhausted	Already supports energy workforce development by reimbursing eligible clean energy employers for structured training of new hires in energy efficiency, clean technology, and related roles.
Technical Skills Training and Upskilling (PON 6122)	NYSERDA	$20M rolling, multiyear solicitation, 2026–2030; $20M refers to total program pool over solicitation period	Already supports energy workforce development by funding training that upgrades the skills of existing workers and students in clean energy technologies, systems, and industry practices.
Apprenticeship and Pre-Apprenticeship Clean Energy Training (PON 5437)	NYSERDA	$15M multiyear solicitation; $15M refers to total funding pool for active solicitation period	Already supports energy workforce development by expanding union pathways for clean energy occupations and related construction trades.

Table 12. (continued)

Program or Funding Name	Sponsor Entity	Funding Amount	Description
Clean Energy Workforce Training Initiative	NYPA, NYSDOL	Up to $25M per year; recurring annual authorization	Already supports energy workforce development by funding clean energy training and pre-apprenticeship models, although its usefulness for nuclear depends on whether nuclear-related activities are eligible.
Environmental Justice Internships	NYPA	$5M, recurring program $5M refers to funding provided to date	Already supports energy workforce development by giving students from historically underserved communities paid exposure to energy, environmental, and utility-sector career pathways.
Energy and Carbon Management and Resilience Program	NYS Homes and Community Renewal (NYSHCR), SUNY/CUNY	$10M total program funding 2023–2029	Already supports the energy workforce pipeline by offering comprehensive education in energy occupations, covering core principles, pathways to professional certifications, and hands-on training.
Weatherization Assistance Program (WAP) Training and Technical Assistance Funding	NYSHCR	Ranges <~$5M; budgeted within each WAP program year and varies by annual federal allocations	Already supports energy workforce development by building contractor, auditor, installer, and provider capacity in weatherization, building performance, and residential energy upgrades, all of which may transfer to nuclear.
Green Jobs for Youth Grant	DEC	$4M one-time, finite solicitation	Already supports the early energy talent pipeline by funding skills training, certifications, job placement, and employer partnerships for young people in environmental justice communities.
Western New York Economic Development Fund (WNYEDF) (Proceeds) Program	NYPA	~$60M ongoing, rolling program; available balance varies as proceeds are generated and awards are made	Could support energy workforce development in Western New York by funding economic development projects within a 3-mile radius of the Robert Moses Niagara Power Plant, including training partnerships, workforce development, or employer investments connected to energy and advanced manufacturing.

Table 12. (continued)

Program or Funding Name	Sponsor Entity	Funding Amount	Description
New York Economic Development Funding (NYEDF) (Proceeds) Program	NYPA	~$7M ongoing, rolling program; available balance varies as proceeds are generated and awards are made	Could support energy workforce development in St. Lawrence County by funding economic development projects that include training partnerships, workforce development, or employer investments, or training partnerships tied to energy and advanced manufacturing.
New York Power Authority (NYPA) Contributions and Sponsorships	NYPA	~$4M in 2025; annual spending varies by approved sponsorships and contributions	Could support nuclear and energy workforce development by funding nonprofit, municipal, tribal, or educational partners that deliver outreach, career exposure, training, or wraparound supports.
Future Energy Leaders Scholarship (FELS) program	NYPA	$7M recurring annual scholarship; $700K refers to cumulative funding provided to date	Could support the long-term nuclear workforce pipeline by helping students pursue energy-related education and credentials, especially in technical, engineering, environmental, or utility fields.
Regional Economic Development Council (REDC) Advancing Collaboration for High-Impact Initiatives for Economic Visions and Expansion (ACHIEVE) Competition	ESD	$150M one-time, finite allocation	Could support nuclear and energy workforce development by funding high-impact regional initiatives that align workforce training, education, infrastructure, and employer partnerships around advanced energy opportunities.
Pay for Performance (P4P) Grant Program	ESD Office of Strategic Workforce Development (OSWD)	$115M multiyear program pool; $115M refers to cumulative program capacity	Could support nuclear and energy workforce development by funding curriculum development, instruction, trainee support, outreach, and program expansion for employer-aligned training.

Table 12. (continued)

Program or Funding Name	Sponsor Entity	Funding Amount	Description
Regional Council Capital Funds (RCCF) Program	ESD	$60M recurring annual; $60M refers to the amount available for 2026	Could support nuclear and energy workforce development by funding capital projects such as training facilities, labs, equipment, or campus upgrades that help regions prepare workers for energy-sector growth.
Workforce Development Capital Grant Program	ESD OSWD	$35M finite program pool; $35M refers to the total currently available	Could support nuclear and energy workforce development by helping training providers purchase equipment, renovate facilities, or expand instructional capacity for technical energy occupations.
Strategic Planning and Feasibility Studies Program	ESD	$1M recurring, subject to annual availability; $1M refers to the total amount available in 2025	Could support nuclear and energy workforce development by funding regional planning, feasibility studies, and needs assessments that define training infrastructure, employer demand, and implementation pathways.
Employment Preparation Education (EPE)	New York State Education Department (NYSED)	$96M recurring annual; $96M refers to the appropriation for 2026-2027 year	Could support the broader energy workforce pipeline by helping adults earn foundational education credentials needed to enter technical training, apprenticeships, or entry-level energy careers.
Customized Training Grant Program	New York City Department of Small Business Services	~$1.5 recurring program; $1.5M refers to current cycle pool	Could support energy workforce development by helping NYC employers train incumbent workers in energy efficiency, clean technology, building systems, project management, or other technical skills.

Table 12. (continued)

Program or Funding Name	Sponsor Entity	Funding Amount	Description
Total Identified Funding	**All entities**	**$610.1M - $707.1M[b]**	**This includes one-time, annual, multiyear, and cumulative funding amounts. The lower estimate sums all reported fixed or approximate funding amounts, including historical funding provided to date, single-year allocations, and identified multi-year commitments. As such, these estimates represent cumulative funding amounts across varying periods rather than funding available or expended in a single year. Some programs support broader economic and workforce development activities that support transferable occupations and are not exclusively dedicated to nuclear energy.**

The scale of workforce investment required to support advanced nuclear deployment will depend on the occupations targeted, existing skills and qualifications of workers, the intensity of training required, and the extent to which costs are supported through existing resources. The estimates below represent plausible per-worker costs for those entering, transitioning into, or advancing within the nuclear workforce; they are intended to help inform future workforce planning as deployment decisions become clearer. The estimates are not intended to capture the full cost of educating, training, licensing, or qualifying workers from start to finish, nor the total investment that academic institutions, employers, labor organizations, and other workforce partners may need to raise from federal, private, philanthropic, or other funding sources.

For planning purposes, workforce training and support can be grouped into three tiers:

- Tier 1: $500–$1,999 per worker for basic training or re/upskilling
- Tier 2: $2,000–$9,999 per worker for more advanced and intensive training
- Tier 3: $10,000–$25,000 per worker to help broaden access for populations historically underrepresented in the workforce through more intensive supports

The estimates outlined in Table 13 assume that 75% of pre-operations workers will fall into Tier 1, 15% into Tier 2, and 10% into Tier 3. This distribution reflects the understanding that many construction workers will enter nuclear projects with established occupational skills and

existing connections to union apprenticeship and training systems. State support for these workers may therefore focus on nuclear-specific qualifications, targeted upskilling, certifications, wraparound services, and ensuring training connects to available jobs. For O&M positions, the estimate assumes a more even split (45% each) between Tiers 1 and 2, given the more technical nature of these roles and their greater need for targeted training, upskilling, and workforce entry support (see Table 13).

These per-worker estimates should not be interpreted as the maximum investment required for any occupation; the amounts are not intended to fully fund the multiyear education, experience, licensing, and qualification pathways required to produce nuclear engineers, health physicists, licensed operators, or other highly specialized professionals. Instead, the estimates capture the incremental State support that could help workers complete relevant coursework, obtain nuclear-specific qualifications, participate in internships or work-based learning, address financial barriers, or transition from adjacent fields. Broader investments in faculty, academic programs, laboratories, scholarships, and other specialized-talent infrastructure would require additional funding from multiple sources.

Table 13. Funding Totals Based on Estimated Average Annual Workers

Project Phase	Average Annual Employment Estimates			Funding Amounts Estimate		
	Tier 1	Tier 2	Tier 3	Tier 1 $500–$1,999	Tier 2 $2,000–$9,999	Tier 3 $10,000–$25,000
Pre-Operations	2,100	420	280	$1,050,000–$4,197,900	$840,000–$4,199,580	$2,800,000–$7,000,000
O&M	1,440	1,440	320	$720,000–$2,878,560	$2,880,000–$14,398,560	$3,200,000–$8,000,000

6.1 Finding

Significant existing funding is available and is likely adequate for the immediate time horizon: More than $600 million is available in current and recent workforce-related funding opportunities that could support occupations, skills, training infrastructure, and career pathways relevant to nuclear development. These resources are not a dedicated funding pool for nuclear workforce development. Instead, they show the scale of existing workforce infrastructure New

York State can leverage as it prepares for nuclear expansion. Based on current preliminary analysis on training funding needs for the identified gaps, the available current funding levels should suffice for known needs. Actual investment amounts will depend on technology, deployment timelines, occupations targeted, training intensity and duration, the level of wraparound support provided, and the extent to which the State invests in specialized academic and licensing pathways. Funding needs will need to be revisited as the nuclear deployment path becomes clearer.

7. Pathways to Meeting Labor Demand

Following on the above analysis outlining demand and gaps that need to be addressed and, the inventory of the relevant existing workforce training ecosystem and available State funding, this section offers findings and conclusions on specific actions the State can take to further strengthen existing capacity and meet the expected demand. For this purpose, agencies and authorities engaged intensively with key stakeholders convened through a the WSC-TWG. Additional research interviews with nearly 50 stakeholders involved in nuclear workforce development in New York State and nationwide were also conducted. Quoted excerpts from stakeholder engagement are provided to illustrate the stakeholder perspectives. Further detail on the input received from stakeholders in set out in Appendix C.

7.1 Near-term Action vs Longer-term Strategy

New York State's advanced nuclear workforce readiness will depend on three intersecting project development considerations: site location, technology selection, and timeline. The selection of or multiple nuclear reactor types, the location of development within the State, and the potential for overlap of individual nuclear builds will all affect the State's ability to meet workforce demand. Additionally, a resilient and sustainable nuclear workforce depends not only on the available supply of plant construction and operations labor, but also on housing, transportation, schools, hospitals, emergency planning, outage logistics, and long-term community development.

Stakeholder Insights

"Economics of nuclear make sense when you build multiple units on one site and keep the same workforce from the first to the second to the third unit."

"Need to have economic development and infrastructure people at the table—people aren't thinking about this."

"If there are thousands of new humans located there, you need that many new homes, hospitals, transportation options, etc."

Training and education systems will require clear workforce demand signals from nuclear projects to scale effectively and responsibly. Training providers, organized labor, and other workforce partners can expand capacity, but require confidence that jobs will materialize and clarity on when different roles will be needed—particularly because nuclear projects will compete with other major infrastructure projects for labor. These signals depend on upstream decisions related to siting, procurement, technology selection, and offtake that require coordinated project planning with workforce preparation to enable responsible capacity expansion. For the State to plan effectively for new nuclear development, it must continue to inventory, monitor, and compare the current workforce assets, labor market conditions, training

infrastructure, and support systems already in place to prepare workers for careers in nuclear construction and operations, as well as the projected demand and scale for individual occupations involved in each phase of a project buildout.

Track market developments and emerging workforce dynamics across the State before committing additional workforce funding to support nuclear project buildout. Agencies and authorities should continue to monitor project timelines, technology selection, procurement decisions, and emerging workforce demand before committing substantial additional funding to highly specialized or project-specific training programs. Competition for targeted federal nuclear workforce funding will be strong, and the State should lead in coordinating multisector partnerships for funding applications.

7.2 Near-term Action: Focus on Transition Pathways

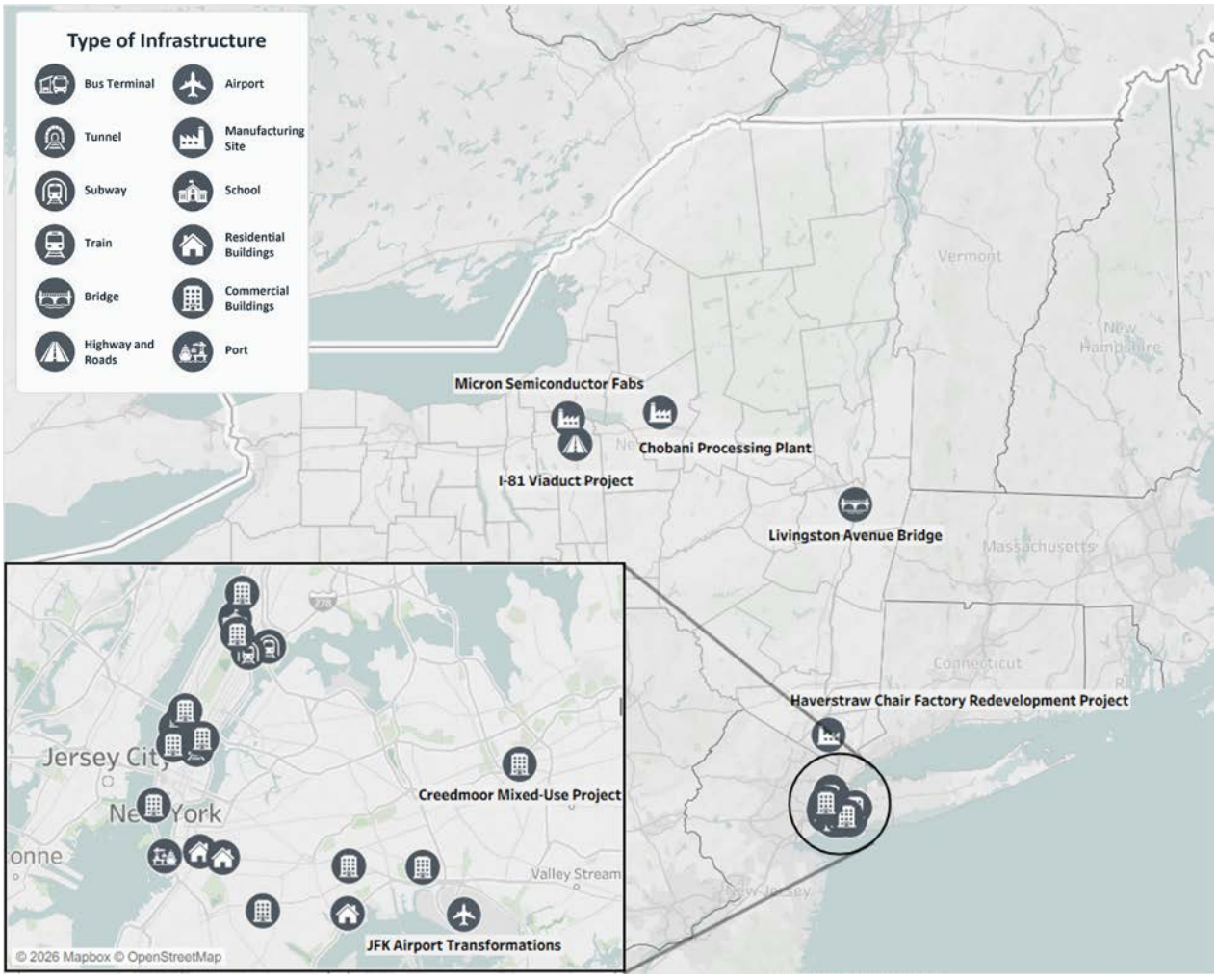
To maximize New York State's existing assets, transferable pathways can be a foundational element of the State's nuclear workforce approach. Many workers needed for nuclear construction, operations, maintenance, and supply chain occupations already work in adjacent industries, including other power generation, industrial maintenance, semiconductor construction, advanced manufacturing, aerospace, automotive, and military and defense. Rather than building an entirely new workforce system around nuclear, the State can identify occupations and industries with overlapping skill requirements and add targeted nuclear-specific training where needed. This approach will allow New York State to better use existing workers, training infrastructure, and industry experience while reducing the time and cost of standing up new programs.

This strategy is especially relevant during the pre-operations phase, when much of nuclear construction relies on familiar craft skills already developed through major infrastructure, industrial, and energy projects. Labor unions generally describe nuclear construction as an extension of work their members already perform in other project settings. Boilermakers, insulators, pipefitters, electricians, ironworkers, and many other crafts all have highly transferable underlying skills; the primary difference is the nuclear-specific overlay, including site protocols, safety culture, working with nuclear-grade materials, quality assurance and control documentation, NRC access requirements, and other compliance expectations.

With many of the occupational assets needed to support future nuclear development already available in New York State, the key workforce challenge is determining how to transfer capacity to nuclear opportunities in a structured way. This requires mapping adjacent occupations, work

activities, and associated industries and major projects where nuclear-relevant skills are already being used. Projects such as Micron Semiconductor Products, Inc.'s semiconductor fab in Onondaga County, the redesign and reconstruction of Penn Station in Manhattan, proposed data center builds, transmission upgrade projects, and numerous other large infrastructure projects already train or employ workers with skills that could transfer into nuclear construction or related supply chain roles (Figure 13). Refer to Appendix D for a list of major demand-pull infrastructure projects occurring or upcoming in the State and their estimated timelines and labor demand.

Figure 13. Current or Upcoming Major Infrastructure Projects in New York State



These projects create both opportunities and challenges. With appropriate sequencing, workers may be able to move from one project to another as demand shifts, including into nuclear builds. However, if multiple projects simultaneously reach peak labor demand for an occupation, nuclear development will compete with other infrastructure sites for many of the same trades

(Figure 14). A strong transferable pathways strategy should treat existing and upcoming projects not only as potential sources of labor competition, but also as training grounds, feeder systems, and indicators of where relevant skills are already being developed across New York State. Additionally, coordinating project timelines, creating pathways between major projects, and maintaining modular training and knowledge-sharing networks can help preserve institutional knowledge and expertise during gaps in project development and reduce the time and cost of rebuilding the workforce for each new nuclear project.

Figure 14. Timeline of Major Infrastructure Projects

Appendix E has additional information and sources of job figures.

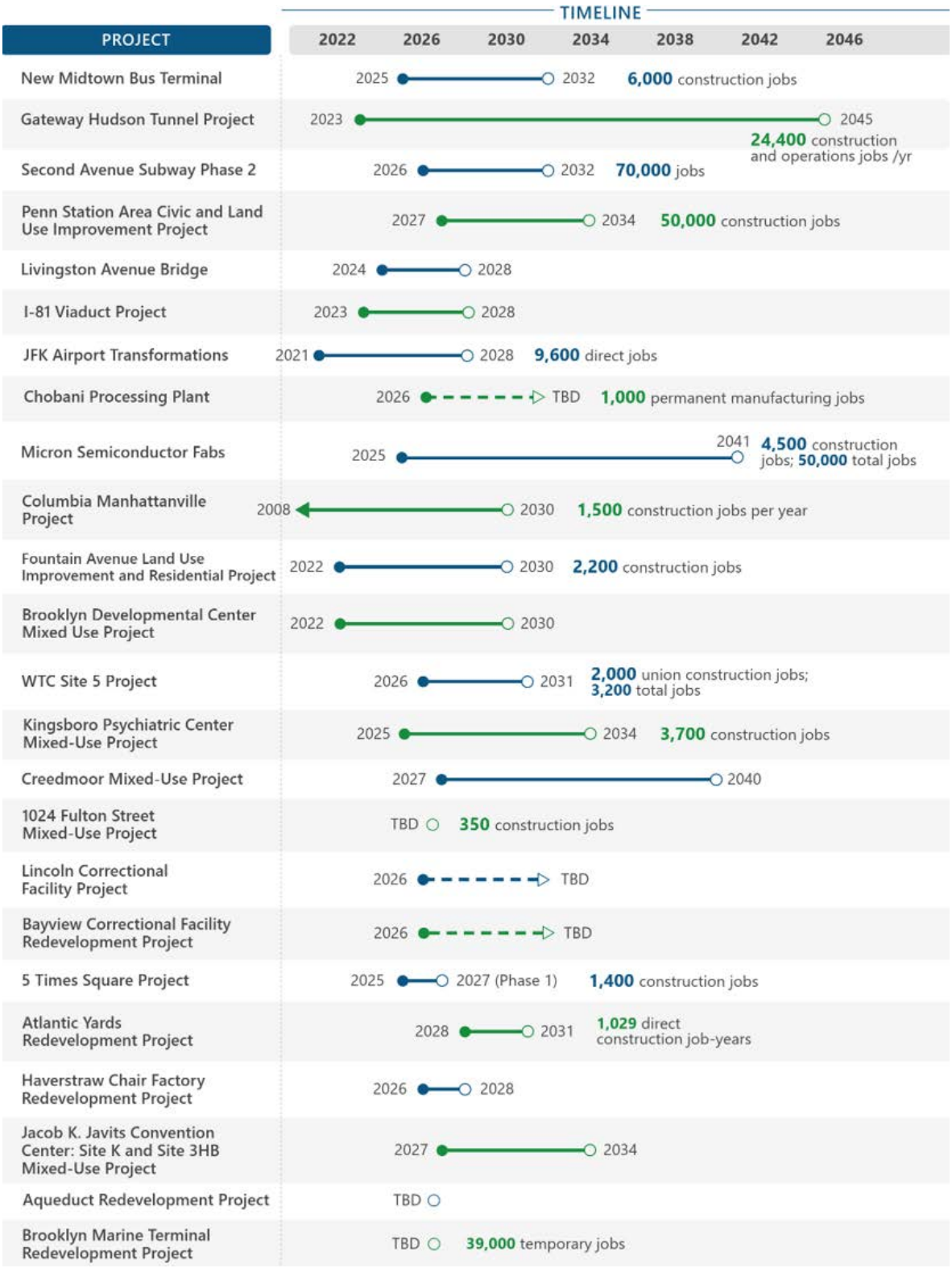


Figure 15 applies this mapping approach to the target occupations assessed in this study. For each occupation, it identifies transferable work activities and current or upcoming New York State–specific projects or industries where those skills are already being deployed. The State also benefits from having an existing commercial nuclear workforce at its operating plants, as well as workers at Indian Point—which is undergoing decommissioning—who may be positioned to transition into future nuclear projects. This could be particularly valuable for recruiting O&M personnel who are in limited supply in both New York State and across the country (e.g., nuclear engineers, health physicists), whose experience is directly applicable to decommissioning and new-build environments. Together, these existing workforce assets and transferable pathways can help the State avoid duplicative or speculative training investments. Instead of creating broad nuclear workforce programs before project details are clear, the State could support short, modular, occupation-specific bridge training for workers already in transferable pathways.

Figure 15. Transferable Pathways by Target Occupation

*Source: Detailed work activities sourced from DOL's O*NET OnLine: https://www.onetonline.org/. Industries and infrastructure projects sourced from stakeholder interviews and ESD New York State Signature Projects: https://esd.ny.gov/signature-projects.*

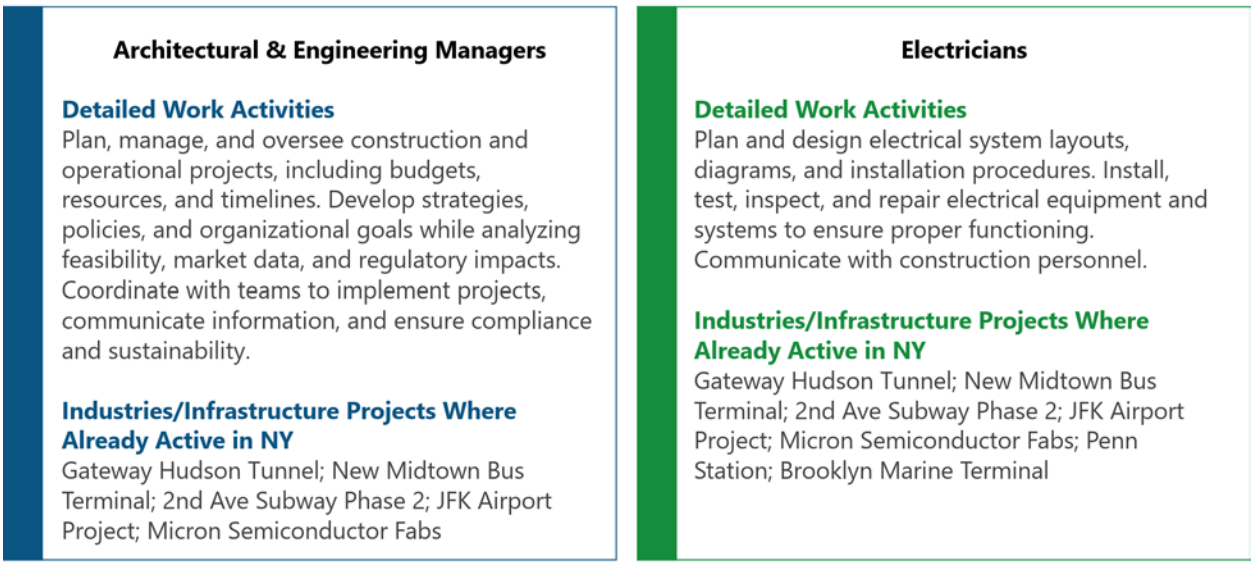


Figure 15. (continued)

First-Line Supervisors of Construction Trades

Detailed Work Activities
Evaluate projects and monitor construction activities to ensure compliance with technical specifications. Coordinate and direct personnel, estimate labor and materials, and manage project resources. Document site conditions to support project execution.

Industries/Infrastructure Projects Where Already Active in NY
Gateway Hudson Tunnel; New Midtown Bus Terminal; 2nd Ave Subway Phase 2; JFK Airport Project; Micron Semiconductor Fabs; Penn Station; Brooklyn Marine Terminal

Industrial Machinery Mechanics

Detailed Work Activities
Inspect, maintain, and repair mechanical equipment to ensure proper operation. Disassemble, adjust, replace parts, and reassemble equipment, including testing performance and analyzing issues. Interpret technical specifications.

Industries/Infrastructure Projects Where Already Active in NY
Gateway Hudson Tunnel; Chobani Processing Plant; Brooklyn Marine Terminal Redevelopment Project; JFK Airport Project; Micron Semiconductor Fabs; New Midtown Bus Terminal

Nuclear Engineers

Detailed Work Activities
Design and test nuclear energy systems and equipment. Analyze performance data, resolve operational issues, and support maintenance. Prepare technical reports, develop procedures and work plants, and coordinate regulatory compliance.

Industries/Infrastructure Projects Where Already Active in NY
Brookhaven National Lab in Upton, NY; Kesselring Naval Nuclear Site in West Milton, NY; Knolls Atomic Power Lab in Niskayuna, NY; NY commercial nuclear power plants; Aerospace, maritime, & defense industries

Nuclear Power Reactor Operators

Detailed Work Activities
Operate and monitor nuclear reactor and power generation equipment to control electricity production. Diagnose equipment malfunctions, coordinate repairs, and inspect facilities. Record operational data and communicate with team to support operations.

Industries/Infrastructure Projects Where Already Active in NY
Kesselring Naval Nuclear Site in West Milton, NY; Knolls Atomic Power Lab in Niskayuna, NY; NY commercial nuclear power plants; Aerospace, maritime, & defense industries; Other power generation

Nuclear Technicians

Detailed Work Activities
Monitor operations and ensure compliance with safety and regulatory standards. Maintain, test, and inspect equipment, including measuring radiation and collecting environmental data. Communicate hazards, coordinate with teams, and support emergency response and safety procedures.

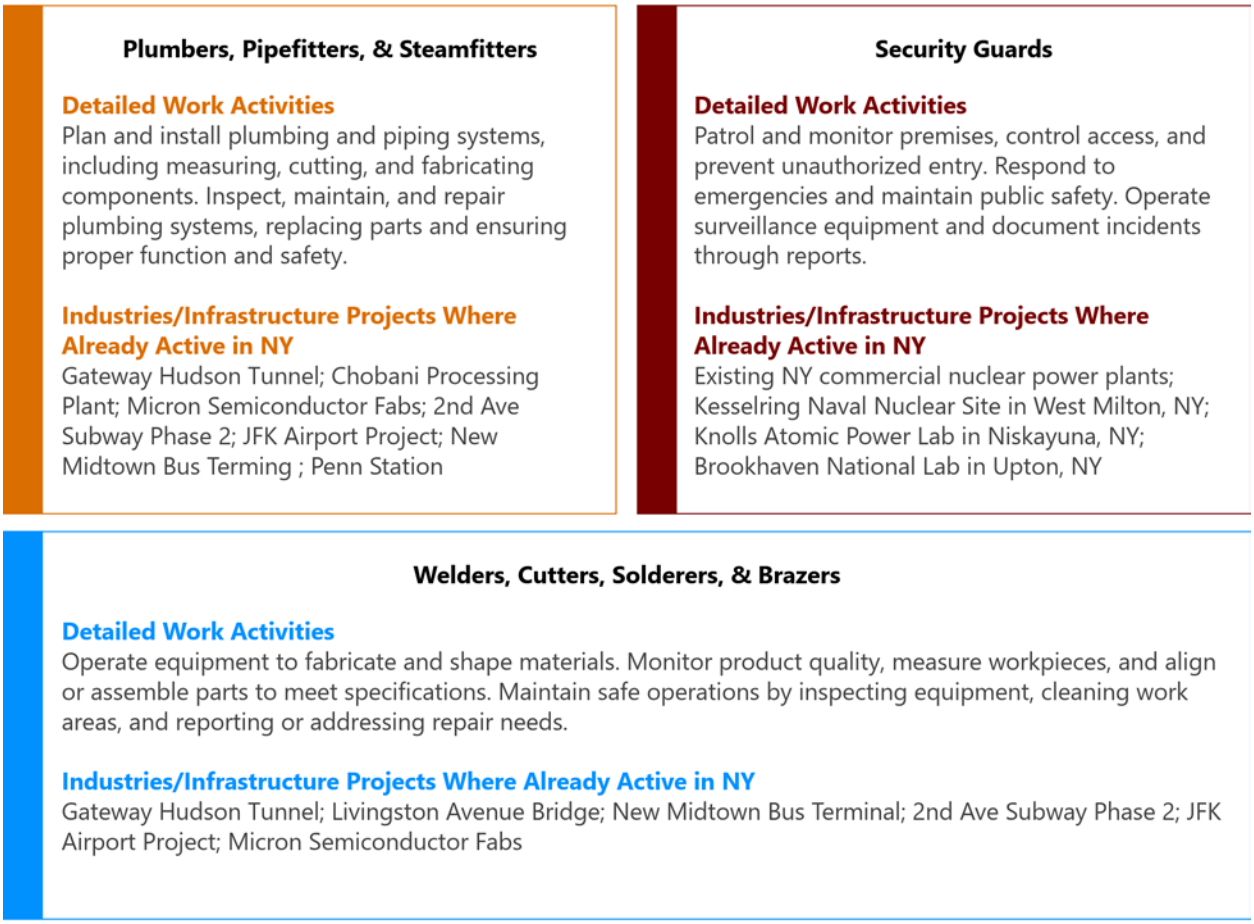
Industries/Infrastructure Projects Where Already Active in NY
Kesselring Naval Nuclear Site in West Milton, NY; Knolls Atomic Power Lab in Niskayuna, NY; NY commercial nuclear power plants; Aerospace, maritime, & defense industries

Operating Engineers & Other Equipment Operators

Detailed Work Activities
Operate construction equipment to move materials, prepare sites, and support project activities. Maintain tools and equipment, identify repair needs, and assist with installation or setup.

Industries/Infrastructure Projects Where Already Active in NY
Gateway Hudson Tunnel; 2nd Ave Subway Phase 2; New Midtown Bus Terminal; I-81 Viaduct Project; Livingston Avenue Bridge; JFK Airport Project; Brooklyn Marine Terminal; Chobani Processing Plant' Columbia Manhattanville Project

Figure 15. (continued)



7.3 Other findings for State action

Specific attention must be paid to nuclear career awareness campaigns: Workforce development is one of the most significant opportunities associated with advanced nuclear development, but access to these opportunities may not occur automatically and without intervention. Targeted outreach, financial assistance, and wraparound supports to reduce barriers to participation for residents of disadvantaged communities and other historically underserved populations is key to ensuring nuclear career opportunities. Ensuring that training opportunities are accessible to residents of disadvantaged communities and potential host and surrounding communities may help expand participation in the advanced nuclear workforce. This includes broad K–12 awareness, which is essential to normalize nuclear careers, especially in host communities.

Worker retention in New York State depends on both predictable project sequencing and strong job quality. Lessons from the recent Vogtle plant builds in Georgia show that long schedules, missed deadlines, morale challenges, and gaps between builds can erode workforce continuity and push workers out of the sector. Multiunit builds, repeat work, and clear transitions between projects across New York State and the surrounding region can help retain workers.

Emerging Best Practices: Lessons Learned from Offshore Wind Workforce Development

New York State invested millions of dollars in developing workforce programs for its emerging offshore wind sector. These strategies, and subsequent lessons learned, provide valuable insights for nuclear workforce investments.[a]

Local workforce engagement must be intentional and begin well before construction. Ørsted, the developer of South Fork Wind, began building its workforce pipeline early, exposing potential workers to offshore wind careers and screening candidates before investing in specialized training. For nuclear projects, which also have long preconstruction timelines and extensive training requirements, local community outreach to potential workers should begin during the licensing and site preparation phase, not after construction contracts are signed.

However, certification timing must align with project schedules. Many offshore wind projects have shown that when workers earn safety certifications too far in advance, engagement can drop and credentials may expire before work begins, weakening the return on training investments. The nuclear industry faces a similar risk, particularly with occupations that require extensive certifications from the NRC, ASME, OSHA, and other entities.

Project labor agreements (PLAs) are valuable resources but must reflect regional workforce realities. Vineyard Wind 1 came close to meeting its Black, Indigenous, and People of Color hiring goal (19.6% vs. 20%) but fell well short of its goal for female hires (3.6% vs. 10%) and apprentices (12.4% vs. 20%). These gaps reflected a shortage of eligible workers at the scale the PLA assumed, not a lack of commitment. In the nuclear industry, the challenge may be even greater, as workers must often overcome additional barriers such as security clearances, radiation worker training, and ASME or NRC certifications before they can begin on-site work. As a result, diversity and equity goals embedded in PLAs are most likely to succeed when paired with early, sustained workforce development efforts that build a qualified and diverse talent pipeline.

[a]New York State Research and Development Authority (NYSERDA), "Lessons Learned from New York's East Coast Offshore Wind Projects," 2026).

Secure equitable access to workforce and economic benefits: Nuclear power facilities operate for generations, create stable employment opportunities, and provide significant benefits, including contributions to the local tax base in the communities where they are sited. State policies such as host community benefits, Minority- and Women-Owned Business Enterprise (MWBE) and Service-Disabled Veteran-Owned Business (SDVOB) expand opportunities for workers and communities at large. Any new nuclear development activity will be structured to ensure such economic benefits are equitably distributed and positively transformative within communities. Many communities require readily digestible ECJ-focused information about the range of opportunities, including specialized skills and education infrastructure to capitalize on these opportunities. Expanding equitable access will require targeted education, workforce development, and career pathways programs.

Equity targets and local recruitment will require region-specific boots-on-the-ground efforts that build on and leverage statewide programs. Labor organizations report success recruiting directly from New York State high schools, BOCES, technical schools, and programs serving underrepresented populations (e.g., Helmets to Hard Hats, Nontraditional Employment for Women). Targeted messaging to surrounding communities can highlight the high-wage nuclear careers available to people in places that need long-term economic opportunity. Project labor agreements are a good opportunity to integrate entry pathways for local workers and wraparound support services tied to real jobs.

Several regional large-scale energy and infrastructure projects have successfully combined workforce investments with equity objectives by creating pre-apprenticeship programs, local hiring pathways, supplier readiness initiatives, and targeted support for underrepresented businesses. For example, offshore wind workforce initiatives in New York and other states have invested in community-based recruitment, paid training programs, and partnerships with labor unions and community colleges to connect residents of underserved communities to careers in construction, operations, and maintenance.

Understanding existing housing conditions and community service capacity can help assess a community's ability to absorb short-term construction population growth to mitigate potential impacts before construction begins. As an example, building parks with RV hookups near rural nuclear construction sites could help address short-term housing needs and then serve as an RV park/tourism opportunity after construction. The Master Plan Regulatory Issues and Safety Study further discusses the potential for development to accommodate short term needs and legacy issues that have resulted.

Interstate and federal coordination can help to avoid fragmented workforce strategies. Memoranda of understanding (MOUs) with neighboring states and regional consortia could provide coordination benefits through regular sharing of labor market insights, innovation ideas, and resource needs. The Nuclear Energy Institute (NEI) organizes many leading examples of this approach through regional consortium models, in which diverse stakeholders initially convene to pursue joint funding opportunities and evolve into sustained partnerships

Stakeholder Insights

"The State is the biggest player in this space. They have to own it. You see this happening in Texas, Virginia—the most important thing is traction."

"No one can do this alone. If we all work together, to manage components of supply chain, it can be successful."

"There does need to be federal direction or recommendation if you want to see this done efficiently and scalable. There's no direction, so all these states are taking off."

Access to region-specific worker supports benefits from coordination. In New York State, many services needed to improve worker access and retention already exist, but access and capacity vary by region, and some supports will be especially crucial for nuclear jobs, given their likely geography and occupation requirements. This means transportation and mobility assistance for rural residents traveling to plants or training hubs; childcare and schedule support for apprentices and trainees; language access and application assistance; reentry, disability, veteran, and mentorship services; and temporary housing, parking, shuttle, and site-access planning during peak construction. The study inventories 276 provider locations but finds uneven geographic access. State agencies and authorities should work with employers, organized labor, training providers, counties, and community-based organizations to assess the selected site's specific workforce barriers and regional conditions, identify relevant providers and programs, establish referral and coordination mechanisms, and address service gaps before recruitment begins.

Stakeholder Insights

"You're not just building power plants; you're building communities."

"Where are your kids going to school? Where are you going shopping? Where is public transit? All of these things are cultural and nearly impossible to change. Training local is vital because these are actually the hardest things to overcome."

"Any industry with hopes of a decades-long footprint has to take care of its people."

7.4 Conclusions – State Action

Based on the findings above and the analysis set out throughout this study, this section sets out conclusions for State action both in the near term and through long-term strategy development, as well as by seeking out cooperation opportunities with other states.

Conclusion:

- **Leverage available workforce funding and programs, focusing near-term investment on strengthening broadly applicable workforce capacity including through upskilling experienced workers and transitioning workers from adjacent sectors, while avoiding substantial commitments to highly specialized or project-specific training until technology choices and project schedules become clearer.** Available funding sources include the NYPA $40 million Nuclear Energy Workforce Training Program and a range of existing NYSERDA, NYSDOL, and ESD workforce development programs.

These recommended near-term priorities include:

Improve visibility and accessibility of existing State workforce funding. Develop or use an existing centralized, regularly updated resource that helps employers, training providers, organized labor, and prospective workers identify available State workforce funding, eligible activities, application requirements, and relevant agency and authority contacts. Improve coordination and outreach across agencies and authorities to make existing programs easier to navigate, identify opportunities to align funding with nuclear workforce needs, and reduce duplication of resources and efforts.

Expand and modernize existing training infrastructure where established providers already have relevant capacity rather than creating parallel training systems. This can include grants for training equipment, specialized machinery, welding equipment, simulation technology, instructor capacity, and apprenticeship expansion. Unions and other established training providers already have classrooms, welding booths, instructors, curricula, and direct-entry pipelines, but modernizing equipment can be a significant barrier.

Focus first on upskilling experienced workers and transitioning workers from adjacent energy, industrial, manufacturing, and infrastructure sectors. Industry, NYSDOL, organized labor, and training providers should define transferable craft competencies and nuclear-specific qualifications, use competency-based assessments and targeted gap training, and establish

formal trade-to-nuclear pathways that recognize existing competencies. As demand becomes clearer, expand apprenticeship intake, instructor capacity, equipment, and nuclear-specific training through existing systems rather than creating new ones.

Build local recruitment and coordinate career awareness campaigns across the State through trusted community partners. The State should work with local partners and existing outreach programs, such as NYSDOL's Teacher Ambassador Program, to align statewide messaging, build confidence in the State's nuclear commitments, and connect residents to credible nuclear career opportunities.

Expand apprenticeships, pre-apprenticeships, school partnerships, paid training opportunities, and workforce support to reduce barriers to participation. Local hiring and workforce planning approaches that strengthen host communities without creating workforce shortages in other sectors or relying predominantly on temporary workers from outside the region should be prioritized.

Recruitment strategies should be tailored to local labor market characteristics and training infrastructures, and supported through partnerships with high schools, technical schools, apprenticeship programs, and organizations serving underrepresented populations, including programs such as Helmets to Hard Hats and Nontraditional Employment for Women. Integrating equity objectives into project labor agreements early in project development, together with wraparound support services and clearly defined career pathways, can improve access to high-quality employment opportunities within host communities.

Conclusion:

- **Address further workforce requirements through a longer-term workforce strategy (covering aspects such as recurring regional planning, employer-led education-to-employment partnerships, and access to worker supports) as New York State's nuclear deployment path including technology choices and project schedules become clearer.**

A longer-term strategy can include the following aspects:

Establish a recurring regional workforce planning and forecasting process aligned with project sequencing. NextGen Nuclear New York should coordinate agencies and authorities, training providers, employers, organized labor, and regional partners to assess anticipated nuclear project schedules, peak workforce demand, occupation-specific needs, and competing

infrastructure projects, incorporating insights from ESD. Use these forecasts to align training capacity and investments with regional demand, coordinate statewide career awareness with locally tailored recruitment strategies in host communities, and integrate worker supports—including transportation, housing, childcare, site-access planning, and language access—into project planning.

Tie training expansion to regional forecasts and project sequencing in New York State. NextGen Nuclear New York can establish a recurring regional planning process that gives State entities and training providers visibility into project schedules and anticipated peak demand. Forecasting can account for competing infrastructure projects, informed by ESD.

Leverage project labor agreements and State incentives to ensure strong job quality and comprehensive worker supports on nuclear construction projects. State agencies and authorities can tie relevant funding and incentives to projects adopting workforce standards that establish competitive wages, robust safety requirements, and apprenticeship utilization. Agreements and incentives can also require or fund wraparound supports—including mentorship, certification assistance, childcare, transportation, language access, mental health benefits, adequate accommodations, and other supports—that enable workers to enter training, complete apprenticeships, and remain employed.

Stakeholder Insights

"Make it a project of choice. Wages are good, but it's also about the work environment."

Pursue employer-led education-to-employment partnerships that align with hiring needs. New York State can work with utilities, reactor operators, engineering firms, and supply-chain companies to define competencies, share staffing needs, shape curricula, and expand internships, co-ops, fellowships, applied research, and other work-based learning opportunities. The State can provide cost-sharing and dedicated funding for on-the-job training opportunities. and expand employer hiring incentives such as wage subsidies and other risk-sharing mechanisms.

Keep workforce programs flexible to account for new technology requirements and reassess workforce needs as reactor technologies and operating models mature. NYSERDA, NYPA, reactor developers, developers, and educational institutions should regularly update staffing assumptions as advanced reactor designs, automation, digital systems, vendor service models, and centralized or remote operating approaches become clearer. Use findings to adjust program scale, curriculum, and recruitment priorities before making substantial investments.

Coordinate access to region-specific worker supports as part of project and training implementation. New York State should address uneven access to transportation and mobility assistance; childcare and schedule support; language and application assistance; reentry, disability, veteran, and mentorship services; and temporary housing, parking, shuttle, and site-access needs. Before recruitment begins, agencies and authorities should work with employers, unions, training providers, counties, and community organizations to assess site-specific barriers, identify providers, establish referral and coordination mechanisms, and close service gaps.

Conclusion:

- **Build on existing workforce and supply chain development initiatives – such as worker training, MWBE and SDVOB efforts, and place-based investments through existing programs – as well as community benefit frameworks to expand equitable access to the economic opportunities and benefits associated with advanced nuclear energy deployment.**

Conclusion:

- **Support stronger interstate and federal coordination that avoids fragmented workforce strategies, including by pursuing memoranda of understanding with neighboring states and developing multi-state consortia to share labor market information and support planning and delivery of training.** This can include working with other states through existing initiatives, in particular the First Mover Initiative.

7.5 Conclusions for Other Stakeholders

In addition to conclusions for New York State, stakeholder interviews identified opportunities for organizations beyond State government to support nuclear workforce development. The following conclusions highlight actions that industry, labor organizations, educational institutions, workforce development organizations, and other partners can take to strengthen workforce pipelines, align training with industry needs, and support successful nuclear deployment in New York and nationally.

7.5.1 Pre operations

Strengthen the pipeline of nuclear construction supervisors and managers in New York State. Unions and major contractors should establish trade-specific field leadership and internal

management-development pathways for experienced craft workers and high-potential managers. Programs should prepare participants for first-line supervisory and construction management roles through training in nuclear safety, project coordination, and workforce management.

Use New York State incentives and project labor standards to attract experienced construction leaders from comparable project environments. Major contractors and developers should target general and operations managers with experience delivering complex, highly regulated, or large-scale industrial and infrastructure projects. Relevant State entities should condition project funding, financing, procurement, or economic development incentives on contractors offering compensation packages that reflect the specialized demands of nuclear construction (e.g., competitive wage premiums, strong health and retirement benefits, relocation assistance). Recruitment criteria should prioritize demonstrated expertise in safety, quality assurance, project coordination, regulatory compliance, and large-workforce management.

Host Community Benefit agreements and project labor agreements provide an example of mechanisms that can influence how economic benefits are distributed. Across energy, manufacturing, and infrastructure sectors, they have been used to support local hiring, apprenticeship programs, workforce development investments, supplier diversity initiatives, educational partnerships, affordable housing investments, environmental monitoring, transportation improvements, wraparound service needs, and other community priorities. By identifying these commitments early in project planning, Host Community Benefit Agreements can help increase transparency, create accountability, and improve confidence that project benefits will reach affected communities

Reinforce contractor-based leadership pipelines with New York State-supported development and advancement plans. Major contractors receiving State funding should establish formal management-development plans that identify high-potential employees, assess nuclear-specific competency gaps, and prepare candidates for progressively more senior leadership roles. Employers should lead candidate selection, applied training, mentoring, and promotion, while the State can fund shared nuclear-management curricula, credentialing, and training infrastructure. Contractors should also use wage progression, certification pay, retention bonuses, and enhanced benefits to incentivize employees to complete specialized training and remain in the nuclear construction leadership pipeline.

Monitor regional workforce availability in New York State and provide targeted outreach rather than broad new training programs. To meet demand, workforce boards and industry associations should work with employers to communicate expected hiring timelines, qualifications, and job locations through existing labor-market channels while tracking the regional availability of operating engineers, truck drivers, material movers, assemblers and fabricators, and manufacturing sales representatives. Expand the labor-supply analysis developed in this report to understand region-specific labor dynamics and identify occupations suitable for local-hire policies, avoiding training residents for short-term roles with limited post-construction demand.

Stakeholder Insights

"It's not a great model to train people to sit on the bench . . . they'll go somewhere else."

"We don't expect exact numbers, but without that we cannot train—because we are training people to sit on the sidelines."

"If you train someone and then you don't have a job for them, it's a loss."

Integrate language access into recruitment and training. Workforce boards and training providers should assess demand for English language services and incorporate occupation-specific language instruction, translated materials, application assistance, and safety communication into recruitment and onboarding where needed.

Provide streamlined, occupation-specific site-readiness training. Workers with core occupational skills should receive short training in site expectations, basic safety, nuclear workplace requirements, and any role-specific documentation or quality practices. Tailor training to the occupation and avoid adding unnecessary nuclear content to roles that do not require it.

Integrate language access into recruitment and training. Workforce boards and training providers should assess English-language service needs and incorporate occupation-specific language instruction, translated materials, application support, and safety communication when needed.

7.5.2 Operations and maintenance

Prioritize academic investments that add nuclear specialization to existing programs in New York State. The SUNY system, community colleges, and technical schools should prioritize expanding nuclear minors, concentrations, microcredentials, certificates, shared online or hybrid courses, apprenticeship-linked training, and technician pathways rather than create entirely new degree programs. Effective examples already exist in the State, including SUNY Maritime College's and the University at Buffalo's nuclear engineering minors, as well as the City College of New York's (CCNY) nuclear engineering concentration. Institutions should "nuclearize" existing engineering curricula and incorporate digital twins[x] and virtual or augmented reality of various advanced reactors because these technologies offer students tangible experience working with reactors without the need for full-scale physical facilities. Emerging examples—such as Rensselaer Polytechnic Institute's (RPI) NuScale Power[14] demonstrate how high-fidelity simulators can bridge this gap by enabling students to operate a fully simulated reactor control room with real-world operational scenarios.

Stakeholder Insights

"Take the existing engineering programs and 'nuclearize' them and collaborate across the country to use other assets. These are going to be the trends you will see because it is expensive to bring in all new programs."

"I don't think every campus needs a nuclear program, because the scale isn't going to be that great."

Begin reactor operator development well before facilities enter service in New York State and use the State's existing facilities as regional training hubs. Reactor operators and training partners should work together to recruit, screen, and develop operator candidates well before commissioning. The State's existing commercial nuclear fleet should serve as the primary platform for supervised experience and exposure to operating procedures, safety practices, and other qualifications that classrooms cannot fully replicate, especially in rural regions that lack established nuclear education and training programs. The State should coordinate with training providers to fund transportation assistance and other mobility supports so distance from these

[x] A digital twin is a virtual representation of a nuclear energy process or system regularly updated with real data in order to synchronize with what is actually happening and improve the process of design, licensing, construction, decommissioning, and waste disposal. Source: David J. Kropaczek, Vittorio Badalassi, Prashant K. Jain, Pradeep Ramuhalli, and W. David Pointer, "Digital Twins for Nuclear Power Plants and Facilities," in The Digital Twin, ed. N. Crespi, A. T. Drobot, and R. Minerva (Springer, 2023), https://doi.org/10.1007/978-3-031-21343-4_31; U.S. Nuclear Regulatory Commission, "Digital Twins," accessed July 27, 2026, https://www.nrc.gov/reactors/power/digital-twins.

facilities does not prevent participation. Planning must reflect the time required for hands-on experience, facility-specific qualification, regulatory preparation, and licensing.

Create structured transition pathways from the existing New York State fleet and adjacent industries. Reactor operators, developers, and training providers should promote Navy-to-Nuclear, Troops-to-Energy, and related transition pathways that recognize transferable experience in military nuclear propulsion and provide targeted gap training. The U.S. Navy's nuclear workforce has knowledgeable, experienced staff in advanced nuclear reactor technology—around 20% of all nuclear utility employees are veterans. Competency-based assessments and targeted nuclear add-on training allow qualified workers to enter civilian nuclear roles without duplicating prior education or experience. Transition strategies should support workers moving from existing nuclear facilities as well as from utilities, defense, aerospace, manufacturing, and other regulated environments.

Establish formal succession and knowledge-transfer programs in New York State. Reactor operators and other nuclear employers should pair experienced workers approaching retirement with incoming professionals and technicians through mentoring, job shadowing, and phased responsibility transfer. These programs must begin while experienced workers remain actively engaged.

Align curricula with employer requirements to retain graduates in New York State. Universities and employers should jointly update curricula to reflect nuclear safety, quality systems, regulatory requirements, documentation, digital systems, and project delivery. Programs should connect students directly to in-state internships, hiring opportunities, and long-term career pathways so expanded educational capacity also strengthens graduate retention.

Use targeted certifications and nuclear deployment training to supplement existing professional expertise. The SUNY system, professional associations, employers, and training providers should develop short certificate and continuing-education programs in nuclear regulation, licensing, quality requirements, and documentation. These programs should build on existing legal, management, analytical, technical, or project-management qualifications rather than duplicate full-degree programs.

Recruit experienced technical sales professionals and close nuclear-specific knowledge gaps through employer-led onboarding. Nuclear suppliers should target wholesale and manufacturing sales representatives with experience in energy, industrial equipment, advanced

manufacturing, or other technical markets. Employers should provide product-specific instruction on nuclear technologies, quality expectations, customer requirements, procurement practices, and documentation.

Recruit from New York State's many existing sectors with comparable regulatory and operational demands. Reactor operators, developers, contractors, and suppliers should recruit lawyers, general and operations managers, project management specialists, management analysts, and technicians from highly regulated sectors that already have an increased presence in New York State—including the utilities sector, the aerospace and defense industry, the Naval Nuclear Laboratory, and advanced manufacturing.

Use relocation and retention incentives selectively for difficult-to-fill positions. Employers and State agencies and authorities should target incentives to occupations and regions where specialized nuclear, regulatory, technical, or project-delivery experience is notably unavailable. Incentives should supplement competitive compensation, project continuity, advancement opportunities, and acceptable living and working conditions.

Provide occupation-specific nuclear onboarding rather than broad retraining. Employers should provide streamlined instruction on nuclear safety culture, regulatory expectations, site access, quality requirements, facility procedures, and physical security, as appropriate to each occupation. The scope of onboarding should reflect the role's actual responsibilities and qualifications.

Acronyms and Abbreviations

ACHIEVE	Advancing Collaboration for High-Impact Initiatives for Economic Visions & Expansion
ASME	American Society of Mechanical Engineers
AWS	American Welding Society
BLS	United States Bureau of Labor Statistics
BOCES	Board of Cooperative Educational Services
BW Research	BW Research Partnership, Inc.
CCNY	City College of New York
CFR	Code of Federal Regulations
CNP	Certified Nuclear Professional
CTE	career and technical education
CUNY	City University of New York
DEC	New York State Department of Environmental Conservation
DPS	New York State Department of Public Service
ECJ	Environmental and Climate Justice
ESD	Empire State Development
FE	Fundamentals of Engineering
FELS	Future Energy Leaders Scholarship
HAZWOPER	Hazardous Waste Operations and Emergency Response
Gen IV	Generation IV
GWe	gigawatt-electric
LLWR	Large Light-Water Reactor
LQ	Location Quotient
LW-SMR	Light-Water Small Modular Reactor
Master Plan	"Master Plan for Responsible Advanced Nuclear Development in New York"
MOU	Memoranda of Understanding
NCES	National Center for Education Statistics
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
NYEDF	New York Economic Development Funding
NYPA	New York Power Authority
NYSDOL	New York State Department of Labor
NYSED	New York State Education Department
NYSERDA	New York State Energy Research and Development Authority
NYSHCR	New York State Homes and Community Renewal
O&M	operations and maintenance
OSHA	Occupational Safety and Health Administration

OSWD	ESD Office of Strategic Workforce Development
P4P	Pay for Performance
PE	Professional Engineering
PLA	project labor agreement
PMP	Project Management Professional
PON	Program Opportunity Notice
QA	quality assurance
QA/QC	quality assurance/quality control
QC	quality control
RCCF	Regional Council Capital Funds Program
REDC	Regional Economic Development Council
RO	Reactor Operator
RPI	Rensselaer Polytechnic Institute
RRPT	Registered Radiation Protection Technologist
SFR	sodium-cooled fast reactor
SMR	small modular reactor
SOC	Standard Occupational Classification
SRO	Senior Reactor Operator
SUNY	State University of New York
T&Q	training and qualification
USMA	U.S. Military Academy
WAP	Weatherization Assistance Program
WDI	Workforce Development Institute
WNYEDF	Western New York Economic Development Fund

Appendix A. Methodology

A.1 Occupational Demand Projections

The following overview summarizes the methodology for conversion of employment outputs to the occupational outputs used throughout the analyses in Section 3 of this report. The steps are as follows:

1. Developed an inventory of staffing patterns for each of the following industry groups using publicly available industry-occupation matrix data from the U.S. Bureau of Labor Statistics (BLS). The resulting staffing pattern for each industry is a weighted average of many nuclear-relevant industries within each industry group.
    - Agriculture
    - Mining and extraction
    - Construction
    - Professional services
    - Manufacturing
    - Utilities
    - Wholesale trade
    - Other
2. Where available, modified each industry's staffing pattern using survey data of nuclear and energy generation firms. This was completed for the construction, manufacturing, and other industry staffing patterns. Additional modifications were made for the construction industry staffing pattern, relying on feedback from advanced nuclear industry experts to more accurately capture the types of occupations needed on-site.
3. Calculated average peak *pre-operations*, as well as the average peak *operations* employment across the four advanced nuclear deployment scenarios detailed in the Master Plan Economic Impacts Analysis. This analysis includes only direct and indirect employment and omits induced employment to focus on occupations that directly support nuclear facilities or the nuclear supply chain.
4. Run the pre-operations average employment and the operations average employment separately through the staffing patterns for each of the industry groups. Occupational outputs are grouped by Standard Occupational Classification (SOC) code.

A.2 Target Occupations

Identifying the target occupations presented in Section 3 enables a more rigorous analysis and more targeted findings, leading to actionable and impactful conclusions that support the specialized workforce strategies needed in the nuclear sector.

To qualify as a target occupation for the State, at least four of the following criteria were met:

1. **Sustainable wages:** Occupations with average annual wages higher than the average of New York State's entire workforce.
2. **Accessible or multiple entry points:** Occupations with lower educational barriers to entry, such as high school or vocational pathways, on-the-job training, and certification programs. Focusing on more attainable roles helps ensure workforce development interventions can reach jobseekers across New York State and from diverse backgrounds and communities.
3. **Potential nuclear bottlenecks:** Occupations that have high potential of posing bottlenecks—as informed by this study's literature review, case studies, and findings to date—based on industry needs in Quality Assurance (QA)/Quality Control (QC), fuel handling, radiation protection, maintenance tech shortages, nuclear-grade security and safety, as well as the timing and volume of construction trades workers required.
4. **Unique to nuclear:** Occupations that exist almost exclusively or in highly specialized form within nuclear and comprise a substantial portion of nuclear employment in New York State.
5. **Timeline of need:** Occupations needed in the near term, specifically those needed earliest in the nuclear project development timeline, are included for consideration as the most pressing jobs required for immediate nuclear buildout.

A.3 Occupational Gap Analysis

The occupational gap analysis presented in Sections 3.1.3 and 3.2.3 was conducted in three sequential steps:

1. Scored occupations for supply-demand risk
2. Scored occupations for development intensity
3. Combined the two scores into a phase-specific matrix measuring mild, moderate, and severe gaps

The analysis was conducted separately for the pre-operations and operations and maintenance (O&M) phases to reflect differences in occupational mix, timing, and workforce requirements across the nuclear project lifecycle

A.3.1 Supply-Demand Risk

The first step assessed how strongly high-demand occupations may face labor market constraints. The analysis began by identifying the top occupations with the highest projected absolute demand in each phase. For each occupation, the analysis compiled:

1. Current employment data from the BLS Occupational and Employment Wage Statistics, *U.S. Energy and Employment Report* data, and BW Research Partnership, Inc. (BW Research) staffing patterns
2. Projected demand data from the Economic Impacts Analysis workstream and New York State Department of Labor (NYSDOL) employment projections data

For supply data, the analysis compiled:

1. State-specific LQ data from the BLS
2. Age demographics data from JobsEQ
3. Unemployment rate from JobsEQ

For the pre-operations phase, the supply-demand risk score incorporated six indicators. Three indicators measured demand pressure: projected nuclear demand as a share of current State nuclear employment, projected demand as a share of total State employment, and projected annual openings as a share of current employment. Three indicators measured supply risk: the unemployment rate, the share of workers age 55 and older, and the location quotient (LQ).

The demand-pressure indicators were scored on a 0-to-2 basis, using percentile ranking among the occupations analyzed, with occupations in the bottom third receiving 0 points, the middle third receiving 1 point, and the top third receiving 2 points. The supply-risk indicators were scored as binary indicators—occupations received 1 point where unemployment was below the State's economy-wide benchmark, the share of workers age 55 and older was above the State's economy-wide benchmark, and the LQ was below the State's economy-wide benchmark. These scores across both demand and supply indicators were summed to produce a pre-operations workforce pressure score out of 9.

For the O&M phase, the same logic was applied with a smaller set of indicators. The supply-demand risk score included two demand-pressure indicators—projected nuclear demand as a share of current New York State nuclear operations employment and projected annual openings as a share of current employment. The same three supply-risk indicators used in the pre-operations analysis were also applied to O&M: unemployment rate, share of workers age 55 and older, and LQ. Demand-pressure indicators were again scored using bottom-, middle-, and top-

third percentile thresholds. Supply-risk indicators were scored against the all-occupation benchmark. These component scores were summed to produce an O&M workforce pressure score out of 7.

A.3.2 Development Intensity

The second step assessed the relative difficulty, time, and investment required to develop workers for each occupation. Development intensity was scored separately for the pre-operations and O&M occupation lists using five factors: education, prior work experience, on-the-job training, certification intensity, and the overall development timeline. These factors were intended to capture both formal entry requirements and practical barriers to developing qualified workers at scale.

Education, work experience, and on-the-job training requirements were drawn from BLS data. Education was scored from 0 to 2, with lower scores assigned to occupations requiring no formal credential or a high school diploma, a score of 1 assigned to occupations requiring an associate degree, and a score of 2 assigned to occupations requiring a bachelor's, doctoral, or professional degree. Work experience was also scored from 0 to 2, with no required experience receiving 0 points, less than 5 years receiving 1 point, and 5 or more years receiving 2 points. On-the-job training was also scored from 0 to 2, with no training receiving 0 points, short- or moderate-term training receiving 1 point, and long-term training or apprenticeships receiving 2 points. Certification intensity was assigned based on how much an occupation typically requires safety credentials, occupational certifications, professional licenses, plant-specific qualifications, or regulatory credentials. Occupations with low certification intensity received 0 points, those with moderate certification intensity received 1 point, and those with high certification intensity received 2 points. The development timeline was scored from 0 to 2, with of less than 2 years receiving 0 points; 3–4 years, 1 point, and 5 or more years, 2 points. The 5-factor scores were summed to produce a total development intensity score.

A.3.3 Mild, Moderate, Severe Thresholds and Matrix

Supply-demand risk scores and development intensity scores were converted into mild, moderate, and severe categories using phase-specific percentile cutoffs. For pre-operations, occupations with scores below the bottom-third cutoff were classified as mild, occupations in the middle range were classified as moderate, and occupations above the top-third cutoff were classified as severe.

A.4 Training and Wraparound Services Inventories

This section provides additional detail on the methods used in developing Section 5 of this report. A comprehensive inventory of over 500 publicly available training and credentialing programs based in New York State that serve the 11 target occupations was developed. The team identified these trainings by reviewing programs offered through at the State University of New York (SUNY) system, community college system, career technical education school districts, labor organizations, and other local entities. All programs included in the inventory were publicly available when the research was completed; programs not offered or not marketed to the public were therefore excluded. The following information was collected: program name, host institution name, host institution type, program partners, ZIP Code, primary occupational focus, and degree or outcome. The inventory provides a comprehensive overview of relevant programs available across the State for target occupations; however, many of the occupations do not require a single prescribed educational pathway and instead offer multiple points of entry. As such, the inventory should be viewed as a resource for understanding the range of existing programs rather than as an exhaustive or mandatory roadmap for entering a given occupation. Furthermore, while additional courses and training opportunities may build applicable skills, this inventory focuses on programs that directly align with occupational requirements—particularly those with curricula that closely correspond to the core job tasks, responsibilities, and qualifications associated with each role.

A comprehensive inventory of 276 organization locations that provide wraparound support services to workers across New York State was also developed. These were identified by reviewing State nonprofits, community-based organizations, social service providers, religious institutions, and government agency services. The specific wraparound services these organizations offer were cataloged. Because New York State has a wide range of social services providers, the inventory was limited to entities that either provide their own workforce development programs, such as general education classes, career and job support, and certifications, or partnerships with organizations that offer workforce development support.

Appendix B. Job Descriptions for Target and Additional Essential Occupations

Table B-1. Job Descriptions for Target and Additional Essential Occupations: Pre-Operations Phase

Occupation	Job Description[a]
Architectural and Engineering Managers	Plan, direct, and coordinate architecture and engineering for nuclear projects.
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	Inspect, test, repair, and maintain electrical equipment on nuclear construction sites, ensuring equipment and systems meet regulatory and compliance standards. Also known as Instrumentation and Control Technicians.
Electricians	Perform operation, repairs, and maintenance throughout the power plant. Install control and switchboard wiring and monitor fire equipment, batteries, and other equipment to support implementation of NRC requirements. Verify that essential instruments are accounted for and kept within calibration.
First-Line Supervisors of Construction Trades and Extraction Workers	Supervise and coordinate construction workers' activities on nuclear construction sites.
Hazardous Materials Removal Workers	Identify, remove, transport, or dispose of hazardous materials, including radioactive materials, on a nuclear construction site.
Health and Safety Engineers	Promote worksite safety by applying knowledge of nuclear and hazardous processes, chemistry, mechanics, and industrial health and safety laws.
Industrial Machinery Mechanics	Repair, install, adjust, or maintain machinery and heavy equipment according to construction plans.
Maintenance and Repair Workers, General	Perform maintenance work to keep machines, mechanical equipment, and structures in repair.
Nuclear Engineers	Lead system design and development from conceptual through preliminary and detailed design, fabrication, assembly, and commissioning. Perform, lead, or manage completion of nuclear regulatory design certification and plant licensing.
Operating Engineers and Other Construction Equipment Operators	Operate power construction equipment for nuclear plant construction. May repair and maintain equipment.
Plumbers, Pipefitters, and Steamfitters	Put together piping made of various materials, bend piping as required, read and interpret piping drawings to fabricate assemblies, and clean and break pipes with a grinder.
Security Guards (Nuclear-Grade)	Guard, patrol, and monitor nuclear construction site premises to prevent infractions of rules and regulations.
Welders, Cutters, Solderers, and Braziers	Weld piping and equipment into systems in the power plant.

Table B-2. Job Descriptions for Target and Additional Essential Occupations: Operations and Maintenance Phase

Occupation	Job Description [a]
Architectural and Engineering Managers	Responsible for managing site systems, design, and component engineering.
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	Locate and correct challenges in control systems and instruments. Repair electrical and mechanical instruments and controls. Inspect, test, adjust, calibrate, and install nuclear power plant instrumentation and control equipment. Also known as Instrumentation and Control Technicians.
Electricians	Perform work ranging from repairs to new equipment installations. Monitor and test equipment.
Hazardous Materials Removal Workers	Identify, remove, pack, transport, and dispose of radioactive waste materials in a nuclear power plant.
Health and Safety Engineers	Investigate worksite accidents to determine causes and preventive measures. Conduct research to evaluate plant safety. Conduct worker training in safety laws and regulations and monitor hazardous conditions. Ensure that fire protection remains controlled and coordinate technical support in case of fires and other emergencies.
Industrial Machinery Mechanics	Repair and maintain the operating condition of production or processing machinery or equipment. Disassemble and reassemble machinery or equipment to make repairs.
Maintenance and Repair Workers, General	Perform routine plant maintenance. Inspect, operate, or test machinery or equipment to diagnose malfunctions.
Nuclear Engineers	Responsible for the safe operation of reactor vessels in plants and engineering activities related to site safety. Maintain expertise in fuel mechanical designs. Provide input and reviews for fuel assembly design and fabrication process changes.
Nuclear Power Reactor Operators	Monitor and supervise plant operations for the control room. Ensure operations are performed safely and under control. Directly control the nuclear reactor's reactivity from plant startup to plant shutdown from the control panels in the control room or other remote panels.
Nuclear Technicians	Perform reactor disassembly and reassembly, fuel handling activities, component handling, and equipment-related maintenance. Oversees radiological source control. Prepares, revises, and processes radiation protection-related activities. Also known as Radiation Protection Technicians.
Plumbers, Pipefitters, and Steamfitters	Perform work ranging from repairs to new installations of piping and equipment and monitor and test equipment.
Security Guards (Nuclear-Grade)	Protect special nuclear material from theft and against radiological sabotage. Work with nuclear professionals, company employees, and contractors from initial badging through the security checkpoints throughout the plant. Control and search any equipment, tools, or components allowed on-site to ensure nothing unanticipated enters that could pose a risk.
Welders, Cutters, Solderers, and Braziers	Use hand-welding, flame-cutting, hand-soldering, or brazing equipment to weld or join nuclear-grade metal components or to fill holes, indentations, or seams of fabricated metal products.

Appendix C. Summary of Workforce Stakeholder Engagement

BW Research conducted research interviews with nearly 50 stakeholders involved in nuclear workforce development in New York State and nationwide. The findings across these interviews are presented in aggregate below, providing learnings addressing workforce development topics in nuclear energy development. Each learning is followed by quoted excerpts to maximize transparency. These learnings come solely from these interviews and provide a point-in-time review of the opinions and perspectives shared.

Nuclear workforce planning is challenged by uncertainty in the scale and timing of future deployment, which is about tension with the substantial labor requirements of nuclear construction. Labor organizations and training providers are hesitant to expand training capacity without clearer signals that jobs will materialize, particularly given the long lead times required to develop skilled workers and the risk of training workers too early for projects that may be delayed. Nuclear facilities require workers across construction, operations, maintenance, and supporting occupations; efforts to prepare many nuclear workers must start years before commissioning. More detailed workforce demand projections and clearer deployment timelines were viewed as critical for aligning workforce investments with industry needs.

> *"A growth problem is a great problem, but it's still a problem."*
>
> *"Opinions vary—what do you need in 5 to 7 years? Industry folks can't tell me exactly what they need. New nuclear companies stop talking at this point in the conversation and honestly say we aren't thinking about it; we just want to design our reactor."*
>
> *"It's not a great model to train people to sit on the bench . . . they'll go somewhere else."*
>
> *"The most helpful thing we could have is estimates of numbers and by when. We don't expect exact numbers, but without that, we cannot train, because we are training people to sit on the sidelines."*
>
> *"If you train someone and then you don't have a job for them, it's a loss."*
>
> *"There is a real fear about burning people; we have done this before with other industries—asking people to take the courses, and then they are wondering where their job is. It's a great disservice."*

"When plants are planned, and we have identified the developer, these partnerships will be easier—but there are a lot of things to be done before that happens."

Worker retention may present challenges for future nuclear projects in New York State, particularly during permitting delays and gaps between project phases. Stakeholders pointed to experiences from projects such as Vogtle, where high attrition and schedule delays reduced workforce continuity over time, with trained workers moving to other opportunities when the project stalled or the timeline shifted. Many nuclear occupations have transferable skills across energy and infrastructure sectors, suggesting that regional labor pools and connections with adjacent projects may be effective strategies.

"Vogtle 3 and 4 had enormous attrition . . . 70 to 80% of electricians left the project rather than stay with it between units 3 and 4. They had an overly aggressive schedule and low staff morale from constantly missing deadlines."

"You can only retain workers if you put in retention models. You can't be sitting around waiting for the construction permit. They will move on to other jobs."

"With Micron, we had to get workers trained, but until it was ready to be built, we had to know what other projects around we could send them to?"

"Many newly trained workers can go in different directions and then get into new nuclear."

"Economics of nuclear make sense when you build multiple units on one site and keep the same workforce from the first to the second to the third unit."

Concurrent large-scale energy and infrastructure projects in the State could significantly strain its construction workforce, particularly for nuclear-grade construction trades and other skilled occupations in limited supply. Stakeholders expressed concern that if multiple projects advance simultaneously—including nuclear, semiconductor, data center, transportation, and other major infrastructure developments—the State could face worker shortages with the specialized experience required for highly technical construction environments. At the same time, sustained demand across these sectors may support broader expansion of the skilled trades workforce pipeline, while creating opportunities to recruit workers from industry-adjacent sectors such as manufacturing, aerospace, automation, and the military, where experience with safety, quality assurance, and complex technical systems may be transferable.

"Construction across the country isn't going away. Given the shortage of trades, that is definitely a big focus."

"Simultaneous builds in the region are going to be a stress. . .what is our ability to fill the pipeline to do this?"

"Is there a construction trade that wouldn't be involved in nuclear? No, it touches everyone."

"The biggest issue is finding the humans to build this plant."

"There's lots of data centers looking at sites in New York; it's likely that at least some will progress."

Coordinating and sequencing major projects across the State and neighboring regions could help stabilize workforce demand and improve labor retention. Stakeholders suggested that staggering projects and creating opportunities for workers to transition between sites over time may help the State maintain a more stable, skilled workforce pipeline during future nuclear expansion.

"[Other projects] were building 3 [units] on the same site—by the time you get through one, you just move workers from site to site."

"It's not atypical for our folks to move about. People knew that a massive project was going on in Georgia and they could put in to move down there if they couldn't find work elsewhere."

The nuclear industry will benefit from stronger interstate and federal coordination to avoid fragmented workforce strategies and should prioritize learning from past experience. Stakeholders described the current approach as siloed by individual states and said that establishing a clearer national direction could help align workforce investments, training systems, and project planning across regions. Coordination across states is emerging in some regions that are exploring how best to share training, labor, and supply chain development.

"No one can do this alone. If we all work together to manage components of supply chain, it can be successful."

"There does need to be federal direction or recommendation if you want to see this done efficiently and scalable. There's no direction, so all these states are taking off."

"Multiple states and regions in North America are ahead of New York in this game; it would behoove them to study those and learn from the people who have a head start."

In general, construction trades represent the most immediate workforce need for future nuclear deployment. Interviewees consistently identified recruiting skilled trade and craft occupations as a critical near-term challenge given the industry's limited recent experience navigating large-scale nuclear construction. Technicians can often be developed in a matter of years, but journeyman-level expertise on a construction site takes many more years to develop and depends heavily on apprenticeship systems and experienced mentors that cannot be expanded quickly. Nuclear construction demand may begin slowly, but will rapidly accelerate to a significant scale, placing a premium on workers with nuclear-grade construction experience and the ability to operate in highly regulated environments.

"This hasn't happened in a long time. This makes me a little more nervous for the construction workforce."

"Construction will be your pinch point; that comes fast and furious."

"Skilled trade and craft workers—you won't succeed if you don't have them."

"Don't care if I can operate them if I can't build them."

Unlike some other states, New York State's union apprenticeship and training infrastructure is viewed as a major asset for supporting future nuclear workforce needs. Many trades in New York State may already be well prepared for nuclear construction, and organized labor can efficiently supply and train skilled tradespeople through existing apprenticeship systems and targeted upskilling. The State's existing workforce and nuclear ecosystem may also be stronger than is often recognized, reflecting the State's history of commercial nuclear operations and the presence of experienced operators, skilled trades workers, companies, and professionals familiar with nuclear requirements. Existing union training infrastructure and workers from adjacent industries such as power generation, construction, and advanced manufacturing provide the State with a stronger starting point than is often recognized.

"Are the trades actually ready? In New York, they are more than likely. There is an existing workforce—this is underestimated."

"New York State has a history of operating nuclear commercial facilities, with seasoned operators, workforce, companies, familiar with requirements and expectations."

"For unions, trainers are in place already and are up to speed with the latest technology. We have facilities and infrastructure. We have local field representatives that are already in the community talking to folks about recruitment."

"The workforce that maintains the facilities has knowledge and skills and are always keeping certifications and training up to date."

Nuclear workforce strategies will need to emphasize flexibility, foundational competencies, and transferable skills given continued uncertainty around reactor buildout timing, siting, and specific technologies. Many workers receiving nuclear-related education or training may initially work in adjacent industries before transitioning into advanced nuclear, suggesting that broad technical foundations and modular, stackable credentialing approaches may be more effective than highly specialized training pathways. Building foundational "nuclear 101" competencies and layering specialized training in areas such as safety, security, or advanced fuel types over time will allow workers to pivot across technologies and occupations as the market evolves without overbuilding capacity for jobs that may not materialize. This approach may also support more durable career pathways across energy, manufacturing, and infrastructure sectors, while helping educational institutions adapt to emerging workforce requirements that remain difficult to fully define today.

"Don't build capacity for jobs that don't exist."

"They may not start in the advanced nuclear industry, but give them the foundations. This is helpful because people can pivot when the market pivots."

New York State can also to meet part of its future nuclear workforce needs by upskilling workers with adjacent trade and industrial experience rather than developing entirely new talent pipelines. Many occupations critical to nuclear deployment—including welders, electricians, pipefitters, and manufacturing workers—already possess partially transferable skill sets that can be adapted through targeted training and nuclear-specific credentialing. Because these workers can move between industries over time, investments in broad construction and industrial workforce capacity may support both near-term labor market needs and future nuclear deployment.

"New technologies will require unique training for our people—this is a component for upskilling but not a massive concern."

"You are still going to need pipefitters, welders, electricians, concrete pouring. Many of these skills can be translated into other fields."

"The demand is to train workers now, but where will they go once trained for the next 5 to 10 years? Many occupations can go in different directions and then get into new nuclear."

Training and workforce requirements for advanced nuclear technologies remain highly uncertain, particularly for reactor operations, digital systems, and regulatory licensing. Because advanced reactor developers are pursuing different technologies and designs, future training models, minimum competency standards, and licensing pathways have not yet been fully defined. Questions remain regarding how operators will be trained, how digital control rooms and passive safety systems may alter traditional roles, and whether future training infrastructure will rely on centralized models rather than the on-site approaches used for existing light-water reactors (LWRs). Advanced nuclear technologies will need to mature and regulatory frameworks will need to evolve to resolve these questions for the State's workforce and training systems.

"This is a looming question nobody knows the answer to yet. What is the minimum standard of training and development needed to be safe and secure?"

"Because every organization in advanced nuclear is looking at a different type of technology, the training has to be different."

"Operating a reactor is a long time away—we've got to proof it out, have the digital twin. . . we haven't even built any of the reactors."

"Biggest black hole right now is understanding how training will occur."

"These are the types of questions people are pondering out in the world, and nobody has an absolute answer just yet. We won't until we have operational plans. It is going to be very hard to strategically plan without these."

Advanced nuclear technologies may increase demand for workers with manufacturing, digital, cybersecurity, and interdisciplinary engineering skills alongside traditional nuclear occupations. The shift toward small modular reactors (SMRs) and advanced reactors may place greater emphasis on digital instrumentation and controls, software, cybersecurity, and factory-

based manufacturing as modules are produced off-site and assembled in the field. While the extent of these changes remains uncertain, the State can leverage its strengths in advanced manufacturing and semiconductors, as well as its broad engineering and research ecosystems, to meet these emerging workforce needs.

> *"For SMRs, we don't quite know what those jobs will entail because they won't need as much emphasis on actual control because of passive safety systems and digital things in place, mitigating current LWR operator activities."*

> *"Looking at positions that have more manufacturing experience because modules are produced in a factory off-site, shipped to the site, finished assembly and installation on-site. . .as opposed to a traditional build of ground-up on-site."*

Near-term workforce investments may be most effective when focused on no-regrets strategies such as training infrastructure, internships, transferable skills, and foundational technical programs that can support multiple industries while preserving flexibility as nuclear technologies and markets evolve. Many occupations require years of classroom instruction, hands-on experience, and regulatory qualification before workers are fully job-ready in both construction and operations. This capacity cannot be expanded quickly. At the same time, uncertainty surrounding deployment timelines creates risks when investing in highly specialized programs before demand is established. This highlights the need for investment in long-term workforce infrastructure and transferable skills that benefit the State workforce more broadly.

> *"We need to start now—investing money to create the infrastructure around training centers—to have time and funding to deploy people to internships to get the hands-on experience."*

> *"Yes, we don't have the PhD programs, but that's a 10-year issue."*

Hands-on experience and work-based learning will be essential components of nuclear workforce development but may currently represent a constraint for the State. Classroom education alone is insufficient for many nuclear occupations, particularly licensed operators and skilled trades that require plant-based experience, regulatory qualification, and supervised learning before workers are fully job-ready. In the near term, the State may need to rely on out-of-state facilities, employer partnerships, simulators, and training centers to provide the practical experience required for licensing and qualification.

"It is critically important, and regulatorily required, that the workforce experience sits alongside the education experience."

"Licensed operators have to sit in class for two years before they can sit for a license. You can set it poorly. I know of a two-year program that unfortunately didn't offer enough in-plant experience to get them entry-level into the door."

"You have to go out of state to get the experience, then you bring it back. This is the stopgap for where we are today and where we will be tomorrow."

"Industry actually echoed the sentiment of industry needing to stop being spectators."

Visible State leadership through public messaging and proactive community engagement will be vital to advancing nuclear workforce development in New York State. Most students and community members have limited exposure to the nuclear industry outside communities with existing plants and may harbor negative associations with nuclear energy, making nuclear literacy, education, and outreach increasingly important for attracting future workers. Building long-term nuclear workforce pipelines in the State will require earlier engagement with students through K–12, career and technical education (CTE), and postsecondary pathways. This will require dedicated government leadership coordinated efforts among industry and educational institutions. The State has a unique role to play in building public trust and signaling that nuclear development is a long-term priority, helping create the traction needed to attract investment, expand workforce pipelines, and build support in host communities.

"The State endorsement is critical—'We are behind this; we want this to happen.'"

"The State is the biggest player in this space. [It has] to own it. You see this happening in Texas, Virginia—the most important thing is traction."

"The governor will need to roll out the red carpet and communicate with communities where it will be developed. That supportive sentiment is very important."

"Nuclear has a negative connotation, and people are scared of it. Companies have to do the outreach. Schools have to support recruitment. States and federal government need to drive that messaging."

"When we go into schools, people have no idea—unless they have some kind of tie to it. It's going to be increasingly harder to get the education out there. Messaging and marketing will be critical to bring young workers into this."

"The education of nuclear coming back into fashion is a good role for government. We need to educate the public on nuclear being safe; that is going to be the biggest pushback we are going to get."

State workforce funding programs already play an important role in helping New York State training providers modernize equipment, expand apprenticeship capacity, and prepare workers for emerging energy technologies through grants for training facilities, new machinery, simulation technologies, and materials. Stakeholders emphasize the significant costs associated with maintaining modern equipment, facilities, and hands-on training capacity. While federal funding is increasingly available to support nuclear workforce development, the State will also need to maximize existing state and institutional resources to sustain workforce development efforts even during periods of federal uncertainty.

"We currently have funding for upgrading machinery and new technologies; we are continuing to add more… it's always moving with changes in generation technologies."

"Every dollar we get goes immediately to training people."

"We got a grant three years ago that was hugely helpful. New machines can be thousands of dollars, and consumables (rods, metal) become expensive."

"We use funding for equipment and supplies. The State is incredibly helpful to partner with."

"Money also needs to come from federal sources—need to keep making sure legislators understand what needs to happen."

New York State must also play a central leadership role in coordinating nuclear workforce development and broader ecosystem planning. Successful nuclear deployment depends not only on universities, community colleges, industry, labor, and reactor operators, but also on economic development, housing, infrastructure, and community organizations that shape regional growth. Nuclear development requires long-term governance, visible public commitment, and coordination across education, workforce, industry, economic development, and infrastructure systems that no single institution can provide on its own. Governor-appointed authorities, advisory boards, and other formal leadership bodies can provide strategic direction, accountability, and continuity across administrations while signaling to industry and communities that the State is committed to long-term nuclear development.

"It is important to have a political authority as a resource for nuclear—appointed by the Governor, meet quarterly, have annual reports."

"Building a pipeline, and this pipeline cannot just be comprised of four-year institutions. There will not be just one university to supply all students."

"Need to have economic development and infrastructure people at the table—people aren't thinking about this."

"The only way to have a sustainable workforce ecosystem is to have all these people at the table."

"If there are thousands of new humans located there, you need that many new homes, hospitals, transportation options, etc."

Dedicated conveners and intermediary organizations can also play a critical role in coordinating the State's nuclear workforce ecosystem, particularly if formal governance structures are slow to develop or do not align workforce systems. Successful public–private partnerships often depend on trusted organizations or individuals that bring together employers, educational institutions, labor organizations, reactor operators, and public entities that may not otherwise collaborate. Despite the importance of these functions, coordination and convening activities often lack stable funding, which can limit the long-term sustainability of workforce initiatives.

"These public-private partnerships come together when one person or organization says, 'I will bring all these people together.' This is where the most urgent investments are needed though, because this requires funding."

"Funding for conveners and organizers is urgent—most organizations can't serve as one without it."

New York State currently appears to have limited nuclear-specific higher education capacity and coordination compared to other states. Stakeholders described a lack of major nuclear engineering programs, limited interaction among existing institutions, and limited visibility into the State's nuclear education assets and academic networks. Existing nuclear expertise within the State's higher education may be fragmented or have declined over time, while expanding programs may be challenged by limited faculty capacity and specialized

expertise. New partnership models with nuclear companies may help align academic programs with the pace, needs, and applied workforce demands of the nuclear industry.

> *"Other schools have nuclear engineering departments, but not in New York. We are actively trying to hire new instructors, hopefully someone with a nuclear engineering background."*

> *"Nuclear academics are mostly totally out of practice in doing this kind of industrial, private sector partnerships. You need to find and create those connectors in the academic space."*

> *"One of the disconnects is between industry and faculty . . . faculty are not assessed for tenure on industry collaboration. The speed of pace between academia and the real world is two totally different things."*

> *"We have a lot of nuclear-adjacent programs but not nuclear-specific."*

Expanding New York State's nuclear education capacity may initially rely more on adapting existing institutions and programs than building entirely new nuclear departments. Given continued uncertainty around reactor technologies, staffing models, and long-term workforce demand, as well as the longer timeline to develop workers for operations roles, stakeholders emphasized the importance of pursuing no-regrets strategies. This includes integrating nuclear content into existing engineering and technical programs, creating minors and concentrations, and embedding nuclear concepts across disciplines. Because developing new programs and hiring specialized faculty can be costly and time-intensive, State institutions may benefit from leveraging existing educational assets and collaborating with universities and training providers in other states to share curricula, digital resources, and specialized expertise while workforce needs continue to evolve.

> *"There is so much interest in nuclear energy, so for colleges in New York, what will need to happen is: Take the existing engineering programs and 'nuclearize' them and collaborate across the country to use other assets. These are going to be the trends you will see because it is expensive to bring in all new programs."*

> *"Nuclear is completely creeping into many disciplines."*

> *"From a technical perspective, academia feels they adapt curricula pretty quickly. They are more worried about the positions we don't yet know about."*

"We fit experiences into courses along the same realm of what the class is about, such as a nuclear chemistry class or something where it makes sense. We aren't changing any curriculum."

"I don't think every campus needs a nuclear program, because the scale isn't going to be that great."

"Microcredentials and noncredit training [are] really easy."

Developing local pipelines of technicians and skilled trades workers will be more important for long-term nuclear workforce stability than relying heavily on imported talent. Locally rooted workers often demonstrate stronger retention and long-term career commitment, while relying heavily on traveling workers may be more difficult in rural regions that compete with higher-wage urban labor markets. Cross-industry workforce investments and transferable skills may help address these concerns by creating career opportunities that remain valuable even if nuclear deployment timelines shift. Stakeholders emphasized that community colleges, trade schools, and organized labor apprenticeship programs will be central for local workforce development. Communities with experience in failed energy projects will need reassurance about clear pathways to employment for their residents, either in nuclear or other transferable opportunities.

"Take Global Foundries—no one thought [it was] actually coming, so we didn't have the infrastructure or training in place. [It] ended up hiring people from all over the globe who all ended up leaving."

"The hang up in the community is 'you've told us this would happen and we've been burned.' A lot of folks have gone to school for this industry, and it's not panned out."

"Community colleges are looking for how they can help promote the nuclear industry because it is such a contributor to the local economy."

"The facility says they love to hire local people because they have higher retention. Training is so extensive, and these people want to stay in the area and further their career here."

"You're not just building power plants, you're building communities."

"Where are your kids going to school? Where are you going shopping? Where is public transit? All of these things are cultural and nearly impossible to change. Training local is vital because these are actually the hardest things to overcome."

"Any industry with hopes of a decades-long footprint has to take care of its people."

The following findings are aggregated from 12 interviews with State-specific labor unions.

Craft labor expressed strong support for nuclear generation and buildout, describing it as a major source of highly skilled, well-paid work that could support a wide range of activities involving virtually every construction trade. Stakeholders emphasized that nuclear projects generate demand not only during construction but also during ongoing refueling outages, maintenance, repairs, and system modifications, which provide long-term employment opportunities. Nuclear work was often described as technically complex, highly specialized, and attractive to workers seeking stable careers, while supporting strong organized labor and benefits.

"There's no downside as far as we can see. Nuclear touches everyone."

"It has been a massive component of our work: intricate, cool, interesting, pays really well."

"People want to work on this; it isn't like any other project."

Labor demand pressure could come from multiple directions in New York State over the coming decade, potentially risking our ability to meet nuclear workforce demand. Stakeholders pointed to major semiconductor, energy, transportation, and manufacturing projects in Central and Upstate New York, as well as competing demand from neighboring states, all of which draw from overlapping pools of skilled workers. If most of these projects come to fruition, that could reshape regional labor markets, especially Upstate New York, and place sustained pressure on the skilled trades workforce. While labor organizations are actively preparing for this growth, the scale and duration of planned investments may test the capacity of existing workforce pipelines and regional labor markets.

"Right now, everyone has been gearing up for the work here in New York. Gateway, Penn Station, offshore wind, Buffalo stadium, Micron, bus terminal, airports, etc.—we have been preparing."

"Other demand could come from the western side of Pennsylvania. Homer City—[it was] the largest coal power plants—[is] repowering . . . to natural gas. That'll suck up all members from Pennsylvania and Ohio."

"No one has seen this amount of investment in the Central region. We went from $500 million in capital investment to $6 billion to $8 billion in commitments."

While specialized nuclear requirements could create workforce bottlenecks in some occupations, many of the core skills needed for nuclear construction already exist in organized labor pools or are transferable from existing energy and industrial sectors. Organized labor stakeholders emphasized that nuclear construction relies on familiar capabilities such as welding, industrial piping, and electrical work, but applies them in a far more stringent, protocol-driven regulatory environment. As a result, the primary challenge may be less about developing entirely new skill sets and more about qualifying workers to meet nuclear-specific standards, particularly in areas such as nuclear-grade welding and work performed in highly regulated environments.

"From a construction standpoint—it's nothing new but the processes that are followed. NRC has to document everything correctly. And nuclear welding requirements are much higher."

"It's almost a clean build because of the sensitivity of the project. It's similar to semiconductor manufacturing—very proprietary, very closed, and heavily regulated."

"It takes a different type of construction worker—it's protocol-driven, you're not going to have the cowboy in the pickup truck."

"The complementary part is that these different projects have similarities in QA/QC, in building and putting together the packaging."

"Work in coal, natural gas, oil—they're still high-pressure welding skills. Our skills are transferable from fossil fuels."

"It's not a new age industry—I don't have the same concerns. Offshore wind came on very quickly—two years, and then we were starting to build. We had to roll out a training module in six months through training centers."

Given their existing workforce and training infrastructure, New York unions believe they are well positioned to support the initial phases of nuclear development, particularly in

Upstate regions with existing nuclear experience and established training capacity. Stakeholders pointed to strong apprenticeship systems, specialized training facilities, and a workforce already familiar with nuclear protocols as key advantages for New York. However, the scale and duration of nuclear construction projects are likely to require expanded recruitment pipelines, increased apprenticeship capacity, and some reliance on traveling workers, particularly during peak construction periods. Over the long term, sustained deployment will need to include developing permanent local workforce pipelines through trade schools, community colleges, military transition programs, and other regional talent sources.

> *"In the early part of the build, it's much easier to staff. The pinch points there are going to be the massive amounts of concrete and the ironworkers, the fortified structure."*
>
> *"The Northeast region could support three to four plants, and then it depends on geography."*
>
> *"Upstate unions, Buffalo, Rochester, Syracuse; they're fully prepared to scale up; they're already doing nuclear, fully aware of the protocols."*
>
> *"We're going to need a good year out, and we're going to have to poach from other plants, but it won't be hard."*
>
> *"As long as we have work—we could get 200 apprentices in a year."*
>
> *"2018 shut down coal plants—lots of members up there looking for work."*
>
> *"Some reliance on traveling workers is inevitable. Vogtle pulled from like 32 different states."*

Prevailing wage policies are unlikely to significantly affect recruitment because wages and benefits for many skilled nuclear occupations already exceed prevailing wage standards. While these compensation structures can help attract some traveling workers, siting nuclear facilities in rural areas may still create recruitment challenges such as regional wage differences, housing availability, and temporary relocation costs, which can reduce a project's net attractiveness. As a result, long-term workforce strategies may depend less on wage policy and more on ensuring safe workplaces, high-quality project environments, and developing local labor pipelines.

> *"[A] nuclear plant has great money from the beginning. The only folks who will be impacted are cleaning crews and security—that's the only time prevailing wage applies."*

"Industry standard is typically much higher for prevailing wage. Especially for key workers."

"Rate structure does support traveling workers from the south—but won't pull from the established markets."

"We have journeyed traveling workers, but the challenge is people going to rural areas that pay less than NYC."

Current demand for organized labor workers in New York State remains inconsistent, especially outside New York City, which poses a barrier to expanding apprenticeship programs and workforce capacity ahead of future nuclear projects. Trades emphasized that unions can only scale recruitment, apprenticeship slots, and training infrastructure when long-term work is visible. They will be very hesitant to make any substantial investments without clearer project commitments. Given the long lead times required to develop skilled workers, sustained demand signals will be essential to ensuring organized labor readiness.

"We need to sustain the employers we have and grow membership. The problem is not bringing projects online; we don't have consistent union jobs coming online."

"Until there is a consistent pipeline of jobs, you won't see all the slots for apprenticeship open."

"So if we had more work, I could bring in more apprenticeships to grow it gradually. But there's a lack of work currently and projected over the next 6–8 years—that could be a bigger problem."

"Recruiting journeymen to states can happen, but it takes time, and we need the investment commitment before we start to turn the ship in this direction."

New York State's offshore wind experience was consistently cited as an important model for early workforce planning and stakeholder coordination. Organized labor emphasized that engaging developers and industry well before project deployment helped clarify training needs, technical requirements, and workforce investments before construction began. Early clarity on project specifications, domestic content requirements, and long-term commitments was considered essential to enabling employers and training providers to invest with confidence.

"We were talking about offshore wind about 15 years ahead of the cycle. Same now in nuclear—ensure those provisions have domestic content."

"We want to make sure we are engaged early with new technologies and new developers—so we can understand their concerns. Gives us first-hand knowledge of training that might be coming down the pike."

"Technical specs must be clarified early."

New York State's offshore wind experience has created institutional knowledge, working relationships, and trust that could help accelerate advanced nuclear development. Organized labor stakeholders pointed to years of collaboration among State agencies and authorities, labor organizations, and industry partners that helped identify workforce gaps, establish working groups, and address emerging challenges. Existing relationships with agencies and authorities such as New York State Research and Development Authority (NYSERDA) and Empire State Development (ESD) can provide a strong foundation for nuclear workforce planning, supply chain development, and domestic manufacturing strategies, as neighboring states also pursue advanced energy investments.

"There's been enough learning in the offshore wind in the State agencies to kick this off. We've been down this road, worked through the problems together."

"NYSERDA was there at the start, working with the unions. I don't know if you brought in another entity, if that would work."

"I have much more trust in NYSERDA to work with our concerns over the last 10 years."

"The working groups for offshore wind went a long way toward eliminating blind spots and gaps."

Workforce policies, funding, and interagency coordination will play a central role in ensuring that New York State workers benefit from future nuclear development. Stakeholders emphasized that project labor agreements (PLAs), labor standards, domestic content requirements, local hiring policies, and workforce funding can influence who performs the work and how workforce benefits are distributed. Interviewees also stressed the importance of aligning workforce investments with project deployment timelines, noting that stronger coordination across State agencies and authorities will be necessary to facilitate continued investments in training facilities and equipment.

"We would feel better if there were a State law that said that there was a [required] labor agreement piece."

"Part of the lesson learned on offshore wind is that companies building want to bring their own workforces—there are many policy mechanisms that can require the use of a local workforce."

Local infrastructure investments, particularly in transportation, housing, and worker logistics, will be critical to supporting nuclear construction and workforce deployment. Large-scale nuclear projects can require thousands of workers on-site during peak construction periods, creating significant demands on local roads, parking, lodging, and site access. Organized labor stakeholders highlighted the importance of early planning for these supporting systems, which may be as important to project success as workforce development itself.

"You have to consider getting people in and out of the project. Vogtle had 8,000 people at peak on a two-lane road. Had to drive a half hour from the parking lot to the site."

"Where are we going to stick these people? Can't put them in Syracuse. We're going to need man camps."

Nuclear investments could provide an important opportunity to create high-quality jobs and support long-term economic mobility in disadvantaged communities. Stakeholders emphasized that realizing these benefits will require intentionally connecting local residents with recruitment, training, and career pathways while balancing the need for experienced workers during project development. Given the long timelines associated with nuclear deployment, early investment in local talent may help ensure communities share in the economic benefits of future projects.

"This could really center on making sure folks have access to these high-quality jobs. You can bring entire generations out of poverty."

"Need experienced people but also have to reflect people from the community and give the kids local opportunities."

"With such a long lead time—don't discount local folks."

Experiences from the Vogtle project suggest that staffing large-scale nuclear construction projects is achievable, but that retention and a stable workforce depend on other criteria. This includes project logistics, housing, site access, worker experience, and regulatory requirements that can affect retention over time. Positive practices such as strong labor-management partnerships, extensive use of union labor, safety culture, and worker support

programs were viewed as important strategies for supporting workforce stability on future nuclear projects.

> *"Make it a project of choice. Wages are good, but also, it's about the work environment."*

Appendix D. Major Demand-Pull Infrastructure Projects across New York State

This Appendix offers estimates into projected labor demand for other major infrastructure projects that were considered in the Gap analysis.

Table D-1. Major Demand-Pull Infrastructure Projects across New York State

Project	County	Projected Labor Demand	Timeline
New Midtown Bus Terminal	New York	**6,000 construction jobs**[a]	Construction start: 2025 Expected completion: 2032[b]
Gateway Hudson Tunnel Project	New York	**24,400 construction and operations jobs per year 2023–2060**; includes direct, indirect, induced, and broader economic-related employment effects[c]	Construction start: 2023 Expected completion: 2045[d]
Second Avenue Subway Phase 2	New York	**70,000 jobs** [e]	Construction start: 2026 [f] Expected completion: 2032 [f]
Penn Station Area Civic and Land Use Improvement Project	New York	**50,000 construction jobs** [g]	Construction expected start: 2027 [h] Expected completion: 2034[i]
Livingston Avenue Bridge	Albany, Rensselaer	Data unavailable	Construction start: 2024 Expected completion: 2028 [j]
I-81 Viaduct Project	Onondaga	Data unavailable	Construction start: 2023 Expected completion: 2028 [k]
JFK Airport Transformations	Queens	**9,600 direct jobs** [l]	Construction start: 2021 Expected completion: 2028[m]
Chobani Processing Plant	Oneida	**1,000 permanent manufacturing jobs**; project-specific construction unavailable [n]	Construction start: 2026 [o] Expected completion: TBD
Micron Semiconductor Fabs	Onondaga	**4,500 construction jobs** [p] 50,000 total jobs [q]	Construction start: 2025 Expected completion: 2041 [r]
Columbia Manhattanville Project	New York	**1,500 construction jobs per year** [s]	Construction start: 2008 Expected completion: 2030 [t]
Fountain Avenue Land Use Improvement and Residential Project	Kings	**2,200 construction jobs** [u]	Construction start: 2022 Expected completion: 2030 [v]

Table D-1. (continued)

Project	County	Projected Labor Demand	Timeline
Brooklyn Developmental Center Mixed Use Project	Kings	Data unavailable	Construction start: 2022 Expected completion: 2030 [w]
WTC Site 5 Project	New York	**2,000 union construction jobs; 3,200 total jobs** [x]	Construction start: 2026 Expected completion: 2031 [y]
Kingsboro Psychiatric Center Mixed-Use Project	Kings	**3,700 construction jobs** [z]	Construction start: 2025 Expected completion: 2034 [aa]
Creedmoor Mixed-Use Project	Queens	Data unavailable	Expected construction start: 2027 Expected completion: 2040 [bb]
1024 Fulton Street Mixed-Use Project	Kings	**350 construction jobs**[cc]	Construction start: TBD Expected completion: TBD
Lincoln Correctional Facility Project	New York	Data unavailable	Construction start: 2026[dd] Expected completion: TBD
Bayview Correctional Facility Redevelopment Project	New York	Data unavailable	Construction start: 2026[ee] Expected completion: TBD
5 Times Square Project	New York	**1,400 construction jobs**[ff]	Construction start: 2025 Expected completion: 2027 (Phase 1) [gg]
Atlantic Yards Redevelopment Project	Kings	**15,000 construction jobs** [hh]	Expected construction start: 2028 Expected completion: 2031
Haverstraw Chair Factory Redevelopment Project	Rockland	**1,029 direct construction job-years** [ii]	Construction start: 2026 Expected completion: 2028[jj]
Jacob K. Javits Convention Center: Site K and Site 3HB Mixed-Use Project	New York	Data unavailable	Construction start: 2027 Expected completion: 2034[kk]
Aqueduct Redevelopment Project	Queens	Data unavailable	Construction start: TBD Expected completion: TBD
Brooklyn Marine Terminal Redevelopment Project	Kings	**39,000 temporary jobs**[ii]	Construction start: TBD Expected completion: TBD

Appendix E. Further details on conclusions

This appendix offers further information on detailed strategies, timelines, and suggested key stakeholders.

Timeline stages are presented in the tables below and are defined by the following boundaries:

Before Project is Defined: Recommended actions that do not depend on a specific project, site, technology, or hiring forecast and can proceed under current uncertainty.

As Project Parameters are Defined: Recommended actions that become practical once there is sufficient clarity on likely sites or host regions, reactor technology and scale, project sequencing, financing/development pathway, and preliminary occupational demand.

As Deployment Approaches: Recommended actions that require project-specific workforce requirements, employers/contractors, hiring volumes and schedules, facility or technology requirements, and operating models to be substantially defined.

Table E-1. Timeline and Key Stakeholders for Pre-Operations

Risk Matrix Category	Conclusion	Timeline	Key Stakeholders
Critical Bottlenecks	Prioritize low-risk investments that build on existing workers and training infrastructure in the State.	Before project is defined	• New York State • Unions • Training Providers • Employers
	Strengthen the pipeline of nuclear construction supervisors and managers in New York State.	As project parameters are defined	• Unions • Contractors
	Tie training expansion to regional forecasts and project sequencing in New York State.	As project parameters are defined	• New York State
Recruitment Challenges	Build local recruitment and coordinate career awareness campaigns across the State through trusted community partners.	As project parameters are defined	• Workforce boards • CBOs • WDI • K–12 System • Unions • New York State
	Leverage project labor agreements and State incentives to ensure strong job quality and comprehensive worker supports on nuclear construction projects.	As project parameters are defined	• New York State • Unions • Training Providers • Employers

Table E-1. (Continued)

Risk Matrix Category	Conclusion	Timeline	Key Stakeholders
Specialized Talent	Reinforce contractor-based leadership pipelines with State-supported development and advancement plans.	As project parameters are defined	• Contractors • New York State • Employers
	Use State incentives and project labor standards to attract experienced construction leaders from comparable project environments.	As deployment approaches	• Contractors • New York State
Available Workforce	Monitor regional workforce availability in New York State and provide targeted outreach rather than broad new training programs.	As project parameters are defined	• Workforce boards • Industry associations • Employers
	Integrate language access into recruitment and training.	As project parameters are defined	• Workforce Boards • Training providers • CBOs • WDI
	Provide streamlined, occupation-specific site-readiness training.	As deployment approaches	• Training providers • Unions

Higher Supply Pressure + Higher Development Intensity—Critical Bottlenecks
These occupations combine the greatest risk of shortages with the longest lead times to develop talent. They are the occupations most likely to become true bottlenecks. New workers will require substantial technical preparation, nuclear-specific qualifications, or lengthy apprenticeship pathways, and the available workforce is limited. These bottleneck occupations require large public-private coordination efforts and should receive the highest priority for workforce investment.

Higher Supply Pressure + Lower Development Intensity—Recruitment Challenge
Workers can learn the skills for these occupations relatively quickly, but there may not be enough workers willing to enter or remain in the field, and competition for workers could be intense. These occupations may not initially require extensive specialized nuclear training, but the industry could still struggle to attract enough workers, particularly in rural host communities or during simultaneous major infrastructure projects. The focus here is on targeted recruitment strategies rather than major training investments.

Lower Supply Pressure + Higher Development Intensity—Specialized Talent
There are likely to be enough workers available, but they need additional skills, certifications, or specialized knowledge to work in the nuclear industry. A substantial potential workforce may already exist in New York's power generation, manufacturing, construction, and industrial sectors, but these workers need additional training and upskilling to meet nuclear quality, safety, and regulatory requirements.

Lower Supply Pressure + Lower Development Intensity—Available Workforce
These occupations are unlikely to be major constraints and generally require limited workforce intervention. These occupations are less likely to constrain nuclear deployment and generally require modest intervention. The State should avoid over-investing workforce resources unless labor market conditions change.

Figure E-1. Strategies for Pre-Operations Occupations

Source: NYSERDA Jobs and Supply Chain Technical Working Group

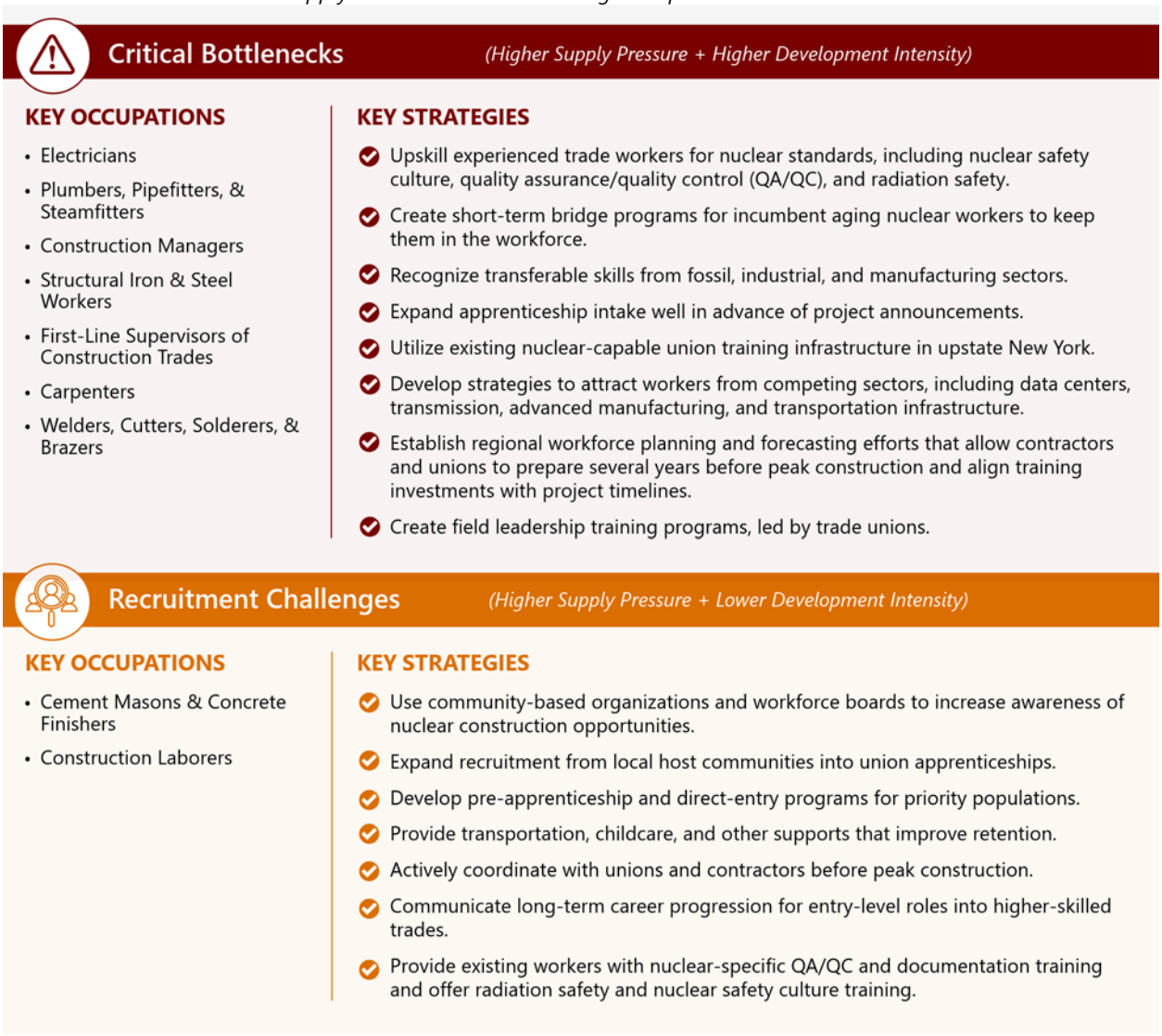


Figure E-1. (continued)



Table E-2. Timeline and Key Stakeholders for O&M

Risk Matrix Category	Conclusion	Timeline	Key Stakeholders
Critical Bottlenecks	Prioritize academic investments that add nuclear specialization to existing programs in the State.	Before project is defined	• SUNY • Technical schools • K–12 systems • NYSED
	Begin reactor operator development before facilities enter service in New York State and use the State's existing facilities as regional training hubs.	As project parameters are defined	• Reactor operators • Training providers • New York State
	Require employer-led education-to-employment partnerships that align with hiring needs.	As project parameters are defined	• New York State • Reactor operators • Employers
	Align curricula with employer requirements to retain graduates in New York State.	As project parameters are defined	• SUNY • Employers • New York State

Table E-2. (continued)

Risk Matrix Category	Conclusion	Timeline	Key Stakeholders
Critical Bottlenecks	Create structured transition pathways from the existing New York State fleet and adjacent industries.	Before project is defined	• Reactor operators • Training providers • Employers • New York State
Recruitment Challenges	Recruit experienced technical sales professionals and close nuclear-specific knowledge gaps through employer-led onboarding.	As deployment approaches	• Employers • New York State
Specialized Talent	Recruit from New York State's many existing sectors with comparable regulatory and operational demands.	As deployment approaches	• Reactor operators • Employers • New York State
	Use targeted certifications and nuclear deployment training to supplement existing professional expertise.	As project parameters are defined	• SUNY • Industry associations • Employers • Training providers
	Use relocation and retention incentives selectively for difficult-to-fill positions.	As deployment approaches	• Employers • New York State
	Establish formal succession and knowledge-transfer programs in the State.	Before project is defined	• Reactor operators • Employers • New York State
Available Workforce	Provide occupation-specific nuclear onboarding rather than broad retraining.	As deployment approaches	• Employers • New York State
	Reassess workforce needs as reactor technologies and operating models mature.	As project parameters are defined	• New York State • Reactor operators • Employers • SUNY • Technical schools

Figure E-2. Strategies for O&M Occupations



Endnotes

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Table Endnotes

Table 1

[a.] The figure represents all workers economy-wide, including and excluding those specifically in the nuclear energy sector. Source: U.S. Bureau of Labor Statistics (BLS), Occupational Employment and Wage Statistics, May 2025, https://www.bls.gov/oes/.

[b.] Figure represents the sum of projected employment change and separations across the entire workforce, where separations = occupational transfers + labor force exits. Source: New York State Department of Labor (DOL), Long-Term Occupational Employment Projections, 2022–2032. https://dol.ny.gov/employment-projections.

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Table 3

[a.] The U.S. Bureau of Labor Statistics (BLS) defines "on-the-job training" as "Training or preparation that is typically needed, once employed in an occupation, to attain competency in the skills needed in that occupation. Training is occupation-specific rather than job-specific; skills learned can be transferred to another job in the same occupation." Occupations are assigned one of six categories: Internship/residency, apprenticeship, long-term on-the-job training, moderate-term on-the-job training, short-term on-the-job training, or none. Source: U.S. Bureau of Labor Statistics, "Employment Projections Data Definitions," need date, accessed September 10, 2026, https://www.bls.gov/emp/documentation/definitions.htm.

[b.] Beyond certifications listed in the table, workers on a nuclear construction site must pass site clearances, including comprehensive background checks and regular drug screenings. Additionally, most skilled trades require safety training, including OSHA certifications obtained during apprenticeships or other training.

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Table 5

[a.] Figure represents all workers economy-wide, including and excluding those specifically in the nuclear energy sector.

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[c.] Figure represents the sum of projected employment change and separations across the entire workforce, where separations = occupational transfers + labor force exits.

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[f.] Nuclear engineers, as a specific occupation, are important to overall nuclear plant performance but are not always involved in day-to-day operations. The broader category of engineers is critical to both overall and day-to-day operations and is employed across a wide range of activities. The discrepancy in reporting nuclear engineers stems from differences in how the BLS classifies workers as nuclear engineers and how it codes them by degree or function. The larger takeaway remains the importance of recruiting and training engineers with nuclear knowledge and experience, which could include a background in nuclear, mechanical, electrical, or other engineering.

Table 6

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[d.] Small sample size; the figure should be interpreted with caution.

Table 7

[a.] The U.S. Bureau of Labor Statistics (BLS) defines "on-the-job training" as "Training or preparation that is typically needed, once employed in an occupation, to attain competency in the skills needed in that occupation. Training is occupation-specific rather than job-specific; skills learned can be transferred to another job in the same occupation." Occupations are assigned one of six categories: Internship/residency, apprenticeship, long-term on-the-job training, moderate-term on-the-job training, short-term on-the-job training, or none. Source: U.S. Bureau of Labor Statistics, "Employment Projections Data Definitions," need date, accessed September 10, 2026, https://www.bls.gov/emp/documentation/definitions.htm.

[b.] Beyond certifications listed in the table, workers on a nuclear construction site must pass site clearances, including comprehensive background checks and regular drug screenings. Additionally, most skilled trades must undergo safety training, typically OSHA certifications obtained during apprenticeships.

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Make this note match the style of the others. It may be note 57, but I'm not sure.

[m.] (BLS 2025)

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[o.] U.S. Nuclear Regulatory Commission (NRC), "10 CFR 50.120—Training and Qualification of Nuclear Power Plant Personnel."

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Table 9

[a.] On-the-job training is defined by the BLS as "Training or preparation that is typically needed, once employed in an occupation, to attain competency in the skills needed in that occupation. Training is occupation-specific rather than job-specific; skills learned can be transferred to another job in the same occupation." Occupations are assigned one of six categories: Internship/residency, apprenticeship, long-term on-the-job training, moderate-term on-the-job

training, short-term on-the-job training, or none. Source: U.S. Bureau of Labor Statistics, "Employment Projections Data Definitions," accessed September 10, 2026, https://www.bls.gov/emp/documentation/definitions.htm.

[b.] Beyond certifications listed in the table, workers on a nuclear construction site must pass site clearances, including comprehensive background checks and regular drug screenings. Additionally, most skilled trades are required to undergo safety training, typically OSHA certifications obtained during apprenticeships.

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Table 12

[a.] Key 2026 NYPA Workforce Awards & Recipients: State University of New York at Stony Brook — Received $945,000 for welding, HVAC/R, and radiation training with internships at Brookhaven National Laboratory. Workforce Development Institute and NYS Building & Construction Trades Council — Received $3.65 million to train union trade workers for nuclear construction. Rensselaer Polytechnic Institute (RPI) — Received $1.86 million to lead a training consortium with SUNY Westchester Community College and SUNY Onondaga Community College. Manufacturers Talent Institute (MTI) / MACNY — Received $1.062 million for advanced nuclear manufacturing careers in Central New York.

[b.] The upper estimate incorporates the approximate maximum reported amounts for variable and capped programs. Reported amounts represent different funding measures and timeframes, including historical expenditures, annual allocations, and funding commitments that may be distributed over multiple years.

Table B-1

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Table B-2

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Table D-1

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