

Master Plan For Responsible Advanced Nuclear Development in New York:

Supply Chain Study

NEW YORK STATE

NYSERDA Report 26-21b

November 2026

Notice

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Summary

New York State's plan to deploy 5 GW of new advanced nuclear generation creates a significant opportunity to strengthen its industrial base, support well-paying local jobs, and reduce the supply chain risks that can increase project costs and delay deployment. New York State enters this market with 45 existing nuclear suppliers and more than 16,000 firms in nuclear-adjacent industries with potentially relevant capabilities. Developing those capabilities will require a targeted, phased approach aligned with project demand, procurement schedules, and supplier readiness.

To determine the strategies that generate economic value while helping derisk nuclear deployment, this report evaluates:

(1) Near-term opportunities where New York has existing capabilities

(2) Longer-term opportunities to build new industrial strength

(3) Areas with limited opportunities to bring capacity to New York in the near to medium term that require partnerships with external suppliers

The Supply Chain Study is based on a mapping analysis of the supply chain needs of different advanced nuclear reactor technologies and identification of areas of existing industrial strength in New York. The study then considers barriers faced by firms considering advanced nuclear activities to offer conclusions on policy options based on trigger points aligned with market demand and technology maturity milestones.

Supply chain opportunities present themselves to New York State both in the area of nuclear fission and fusion energy. This study addresses both areas.

Findings – Nuclear Fission

New York has a strong potential supplier base. The study identifies 45 existing nuclear suppliers and more than 12,000 nuclear adjacent firms with potentially relevant capabilities. Of these, approximately three quarters are in the construction sector, and the remainder are in manufacturing and other related sectors. This industrial base provides New York State with a strong starting point for supplier development. However, experience in a clean tech energy industry does not guarantee readiness for nuclear procurement. Nuclear adjacent firms may

need additional quality systems, understanding of nuclear documentation, manufacturing equipment, or workforce preparation to meet the needs of advanced nuclear developer supply chain requirements. The existing in-state nuclear industry suppliers may need help in expanding their current production capacity or help to reach new buyers. Firms entering the market may first need guidance on the required qualifications and to what work they could actually supply. Of the firms examined in this initial analysis, approximately 50 percent have fewer than ten employees and may therefore have limited capacity to readily expand into the nuclear sector.

Supplier development can position New York firms to serve markets beyond New York. Supplier development programs can help prepare New York companies for opportunities that will come with in-state projects and from national and international advanced nuclear power project development. The continued operation of the existing New York nuclear fleet provides a market for maintenance, replacement components, engineering, and specialized services while local firms prepare for new construction of advanced reactors in New York and elsewhere. Serving existing markets can help companies retain skilled workers and sustain their capabilities while preparing for future advanced nuclear projects. In addition, a broader customer base may also strengthen business for nuclear equipment, testing facilities, and qualification investments.

Regional strengths support different supply chain roles. Regions across New York State offer different capabilities that can support supplier development and project delivery. As examples, Central New York and the Finger Lakes have strength in supporting the current operating nuclear fleet, construction services, and precision manufacturing. Western New York offers manufacturing capabilities, leveraging opportunities for coordination across the existing nuclear fleet. The Capital Region contributes electric grid and energy technology expertise. The New York, Long Island and the Mid-Hudson corridor provide engineering, finance, professional services, large contractor capacity and university partnerships. These strengths can help direct outreach and coordination of workforce and infrastructure planning.

The greatest near-term opportunity for New York companies lies in strengthening capabilities that create value regardless of reactor technology: Supply chain requirements vary depending on the advanced nuclear reactor being deployed. The most actionable near-term opportunities are focusing supply chain development on reactor-agnostic and balance-of-plant supply chain needs because these needs apply across technologies, align closely with New York State's existing capabilities, and can be advanced before project-specific procurement decisions are final. This includes civil construction; engineering and project development services; electrical equipment and installation; pumps, valves, seals, and heat exchangers;

instrumentation; nondestructive examination; quality assurance and quality control; and operations and maintenance (O&M) support.

Different actions are needed to prepare existing suppliers and develop additional capabilities. Where New York already has existing industrial strength, action should focus on moving companies from nuclear adjacency to nuclear readiness through supplier screening, help with qualifications, and providing visibility into procurements. Further State action that could be pursued to bring more manufacturing capacity to New York State includes strategic supplier recruitment, collaboration with other states and targeted cost-share programs.

Focus on strategic dependencies: Several reactor technologies share components that face high demand from limited production sources located outside of New York State and the U.S., including reactor pressure vessels, ultra-large forgings, steam generators, and fuel fabrication. Other requirements are technology specific, including high-assay low-enriched uranium (HALEU), tri-structural isotropic (TRISO) fuel, and sodium systems for certain advanced designs, including sodium-cooled fast reactors. Although these components and materials are essential to deployment, New York State has limited near-term opportunities to establish competitive in-State production. The State should therefore leverage reliable national and international supply partnerships while monitoring opportunities for targeted onshoring to meet both in-state and national needs as reactor technologies are selected and greater certainty emerges regarding project pipeline, deployment scale, and repeat demand that justify investment.

Take early action on supply chains: Supplier engagement must begin before the procurement packages, qualification pathways, and incumbent supplier networks are firmly established. Once the original equipment manufacturer and engineering, procurement, and construction approach are selected, opportunities for New York State firms to enter the project supply chain may narrow substantially. To address this risk, the State can consider a spectrum of options, from encouraging developers to open opportunities for New York State suppliers, such as through matchmaking, to setting requirements through the State's project procurement standards.

Findings – Fusion Energy

New York State has meaningful comparative strengths in several cross-cutting portions of the fusion supply chain. New York State's existing research institutions, advanced manufacturing capabilities, and laser-fusion assets provide potential points of alignment with fusion technology development, particularly in areas such as high-power lasers and optics, high-temperature superconducting materials and magnet components, advanced structural materials,

and precision manufacturing. These capabilities may be relevant even before fusion reaches grid-scale deployment and create strong opportunities for the State to participate in and build up the fusion supply chain.

The strongest near-term opportunities are those with value across all fusion technology concepts, and that benefit both nuclear fission and fusion, as well as adjacent industries. There is still uncertainty around which fusion concepts will achieve large-scale deployment and when fusion will be commercially viable. The most resilient and low risk economic opportunities lie in supply chain areas that support multiple competing fusion approaches. Equally, although fusion and fission differ in their underlying physics, fuel cycles, and regulatory treatment, there is alignment in the industrial capabilities and workforce needed to support advanced nuclear deployment. For New York State, this crossover creates an opportunity to invest in capabilities that are relevant to both near-term advanced fission activity and longer-term fusion commercialization. Early investments in supply chain opportunities that deliver value across technologies and industries can strengthen New York State's role in the broader fusion ecosystem and in adjacent sectors such as advanced fission, aerospace, semiconductors, hydrogen infrastructure, defense, and scientific research.

Conclusions

- **Establish a nuclear supplier readiness program to identify, qualify, and prepare firms for nuclear procurement through targeted technical assistance and supplier qualification support.**
- **Leverage programs aimed at nuclear project deployment to create opportunities for New York supply chain companies, e.g. through matchmaking with suppliers in community/developer engagement, by promoting supply chain participation plans and by considering supply chain participation opportunities on localized content in the State's procurement efforts for nuclear projects.**
- **Develop a "whole-of-government" longer-term supply chain strategy to build New York supply chain strength in a broader range of nuclear components and services and maintain access to any components coming from outside New York, including through strategic partnerships and collaboration with external suppliers and other states and jurisdictions, as well as targeted co-funding.**
- **Develop a strategy to support sectors of the fusion supply chain that offer value across fusion, fission and other industries; if appropriate, extend eligibility of nuclear supply chain initiatives to include fusion.**

1. Introduction

This Supply Chain Study is one of a collection of studies prepared by the New York State Energy Research and Development Authority (NYSERDA) and the 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 for 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 contributions 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) and a Fusion Energy Technical Working Group (FUS–TWG) made up of relevant and expert stakeholders to inform and validate this study.[1]

New York State's advanced nuclear planning process, including the New York Power Authority (NYPA) advanced nuclear project and broader deployment toward the 5 GW Nuclear Reliability Backbone Initiative (Nuclear Backbone) goal, will require expansion of in-state qualified supply chain capacity for components, materials, services, and project delivery.[2] The study examines where existing capabilities can support nuclear projects, what firms need to prepare, and which specialized components are likely to remain externally sourced. It aims to inform supplier readiness, procurement engagement and longer-term investments as project demand becomes clearer.

Supply chain opportunities present themselves to New York State both in the area of nuclear fission and fusion energy. This study addresses both areas.

1.1 Scope and Structure

This study is a screening-level assessment of opportunities for New York State firms to supply nuclear components and services to the Governor's Nuclear Reliability Backbone Initiative. It identifies relevant industries and potential supplier roles but does not verify any individual firm's qualifications, available production capacity, or the ability to meet a particular reactor

procurement package. The study also does not quantify national or international market demand or provide a comprehensive assessment of external supplier availability.

This Supply Chain Study includes the following sections:

- **Section 2, Supply Chain Needs,** identifies the advanced nuclear supply chain needs for four reactor technologies and distinguishes between components and services that apply regardless of technology and those that are dependent on the technology selected for deployment.
- **Section 3, Supply Chain Strengths and Opportunities,** evaluates the State's existing baseline and competitive advantages in construction, manufacturing, professional services, and other relevant industries for advanced nuclear deployment.
- **Section 4, Regional Dynamics,** presents a regional analysis of the State's existing industrial clusters within the priority supply chain segments for advanced nuclear deployment.
- **Section 5, Barriers,** evaluates the information, qualification, commercial productive capacity, workforce and infrastructure barriers to supply chain participation and scale-up.
- **Section 6, Policy Actions,** considers lessons from the State's offshore wind experience and other jurisdictions, and identifies recommended supply chain policy actions based on the assessment in this study.
- **Section 7, Fusion Energy Supply Chain,** provides an initial landscape assessment of New York State–based organizations with capabilities relevant to fusion energy development, surveys existing strengths across key enabling domains and highlights areas where the state may have comparative advantages, emerging capabilities, or strategic gaps that warrant further evaluation.

Additional information and data supporting the evaluations presented are provided in the following appendices:

- Appendix A: Stakeholder Input - Survey
- Appendix B: Stakeholder Input - Interviews
- Appendix C: Phases of a Nuclear Project Build
- Appendix D: North American Industry Classification System (NAICS) Code Matching
- Appendix E: Detailed Regional Profiles
- Appendix F: Advanced Nuclear Peer-State Program Review
- Appendix G: New York State Companies Involved in Fusion Energy

1.2 Data Sources and Methodology

The nuclear fission supply chain analysis combines industry and employment data with publicly available reactor information, secondary research, a survey of New York State firms, and stakeholder interviews. Reactor components and services were mapped to relevant industries, then compared with the State's; existing nuclear suppliers and firms in related industries.

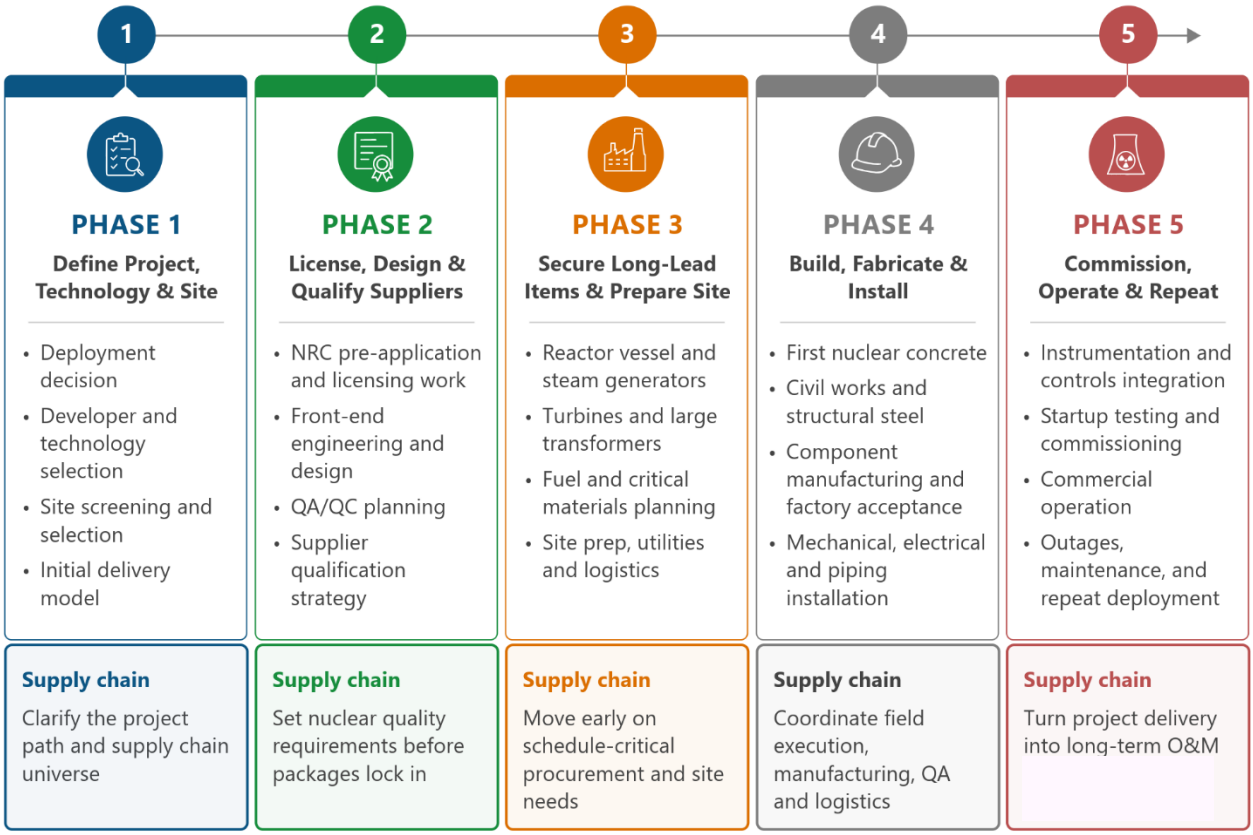
The survey of New York State firms reached out to a sample of 600 companies operating within the nuclear sector and adjacent to the nuclear sector and resulted in 154 responses used for the analysis in this study. Interviews involved 19 stakeholders from 11 organizations. These inputs informed the assessment of supplier interest, qualification barriers, procurement access, investment requirements, and demand visibility. The study also included two review checkpoints for validating findings and methodologies, with the Workforce and Supply Chain Technical Working Group of industry experts and State entities. Appendices A and B provide the methods, findings and limitations of the survey and stakeholder interviews.

To assess New York's position within the emerging fusion energy supply chain (Section 7), the analysis draws on responses to the NYSERDA's Request for Information (RFI) and data from the Fusion Energy Base catalog of organizations participating in the global fusion ecosystem, supplemented by additional research on New York State-based organizations.[3] These sources were used to identify New York State–based companies, research institutions, and laboratories that are active in, or adjacent to, key fusion-relevant technology areas.

2. Supply Chain Needs

Nuclear supply chain demand needs arise throughout project development, construction, operation and decommissioning, as shown in Figure 1.[4] Engineering and procurement planning begin before the physical construction of the reactor.[5] Additionally, manufacturing of the reactor, site installation, and testing follow as project requirements become more defined.[6] Eventually, maintenance and replacement components create continuing demand after the plant enters service.[7] Depending on the timing, each stage affects both work available to suppliers and the time they have to prepare an order.[8] Appendix C describes the phases of a nuclear project.

Figure 1. Illustrative Lifecycle Needs and Supplier Needs



Supplier preparation needs to begin before construction starts on the site.[9] Firms require enough time to understand likely work packages, meet quality and documentation requirements, and complete buyer qualifications.[10] The milestones explain when supply needs arise, but technology selection determines the specific components, materials and fuels required.[11] The following sections consider four representative reactor technologies – Generation III+ (Gen III+) and Generation IV (Gen IV) reactors – identify shared components, and

examine design-specific requirements and procurement constraints. This analysis provides a basis for assessing where New York firms could participate and what preparation they would need to be successful.

2.1 Reactor Technologies and Component Mapping

The study began by comparing the components and services needed across the four reactor technologies described below. It grouped components that perform similar functions into nine families and used three indicators to flag procurement concerns: long lead times, high cost, and constrained supply. Table 1 shows the component families and the indicators that apply to each. It should be noted that since some advanced nuclear reactor designs are still under development, the component mapping is subject to uncertainty.

Table 2 groups services that are required in nuclear generating facilities into six families according to the work they perform and when they are needed.

Together, the two tables establish the scope for distinguishing supply chain work that can be performed early from that which is dependent on the specific nuclear reactor technology selected.

The study compares four representative reactor technologies, including two established Gen III+ light-water designs and two emerging Gen IV advanced reactor designs.[12]

- Gen III+: Large Light-Water Reactor (LLWR)
- Gen III+: Light-Water Small Modular Reactor (lwSMR)
- Gen IV: High-Temperature Gas-Cooled Reactor (HTGR)
- Gen IV: Sodium-Cooled Fast Reactor (SFR)

The four reactor technologies are expected to require many of the same functions, including civil works, electricity generation, heat transfer, electrical distribution and engineering services.[13] However, a shared function does not imply an interchangeable product or part.[14] Materials, dimensions, operating conditions, and qualification requirements can differ across reactor technologies. Distinguishing between shared and technology-specific component and service requirements helps differentiate work that New York firms can begin preparing for before project technology/reactor design has been selected and the selected developer(s) introduce their buyer specifications.[15]

Gen III+ and light water technologies draw on existing established supply chains, while Gen IV reactors, such as the HTGR and the SFR, are in a first-of-a-kind industrialization process, lack

commercial-scale precedent, and may require a more novel, specialized set of supply chain capabilities.[16] The comparison examines representative requirements and procurement concerns; maturity and supply availability still depends on the selected reactor design and its purchasing requirements.

The analysis examined the extensive range of components each of the above technologies requires and offers a sub-selection of components identified as meriting more detailed examination throughout this study, grouped into "component families". The analysis uses three overlapping indicators for this initial prioritization:

- Long-lead time;
- High component costs;
- Constrained supply.

Lead time concerns when an item must be specified, qualified, ordered, and manufactured. Cost concerns an item's contribution to project expenditure. A supply constraint concerns the availability of suitable suppliers or production. A component family can meet more than one indicator. These indicators provide an initial assessment and may require further analysis to substantiate specific interventions.

Table 1 presents the common component families for the four reactor technologies and the prioritization indicators for each component family.

Table 2 summarizes the availability of relevant service families that, in addition to components, must be considered when evaluating supply chain availability.

Table 1. Common Component Families and Procurement Indicators

Component family	Long lead time	High cost	Supply constraint
Construction materials and fabricated metal products		✓	
Reactor vessels, forgings, and pressure components	✓	✓	✓
Steam-generation and heat-transfer equipment	✓	✓	✓
Turbines and generators	✓	✓	✓
Electrical equipment and grid integration	✓	✓	✓
Pumps, valves, seals, and coolant-handling equipment	✓	✓	✓
Instrumentation, controls, and precision components			✓
Specialized reactor materials	✓	✓	✓
Nuclear fuel and fuel-cycle inputs	✓	✓	✓

Table 2. Common Service Families

Service family	Role across reactor technology	When demand arises
Civil construction and installation	Site preparation, civil works, electrical and mechanical installation, and construction support.	Development and construction
Engineering and project services	Engineering, permitting support, project controls, procurement coordination, finance, and related professional services.	Development through delivery
Inspection, testing, and quality services	Testing, nondestructive examination, inspection, quality records, and assurance support.	Manufacture, construction, and operation
Operations, maintenance, and repair	Plant maintenance, outage work, repair, replacement equipment, and operating support.	Commissioning and operation
Logistics and transportation	Freight, heavy-haul routing, staging, lifting, and cargo handling.	Manufacture and construction; later maintenance
Waste management and remediation	Waste handling, remediation, and nuclear lifecycle services within the provider's authorization.	Operation and decommissioning
Source: IAEA, Industrial Involvement, NG-T-3.4 (2016); §§ 3.3.1–3.3.6, pp. 13–20; §§ 4.5–4.8, pp. 27–31. 10 CFR Part 50, Appendix B, "Quality Assurance Criteria"; criteria IX–XIII and XVII.		

2.2 Shared Component and Service Needs

Table 3 narrows the components and services to those that are shared between reactor types. This includes six of the nine component families and all six service families.

Table 3. Shared Scope for Supplier Assessment

Common component and service family	Shared scope across four reactor technologies for early assessment
Construction materials and fabricated metal products	Construction steel, concrete, and conventional fabricated products; associated forming and fabrication processes.
Steam-generation and heat-transfer equipment	Conventional heat-transfer equipment and related fabrication, machining, and testing processes.
Turbines and generators	Generation equipment, associated components, and manufacturing or servicing capabilities.
Electrical equipment and grid integration	Conventional electrical products, measuring devices, and balance-of-plant equipment.

Table 3. (continued)

Common component and service family	Shared scope across four reactor technologies for early assessment
Pumps, valves, seals, and coolant-handling equipment	Conventional pumps, valves, seals, and related machining, fabrication, and servicing processes.
Instrumentation, controls, and precision components	Conventional controls, sensors, measuring devices, precision products, and associated manufacturing processes.
Civil construction and installation	Site preparation, civil works, electrical and mechanical installation, and contractor capabilities.
Engineering and project services	Engineering, project controls, procurement coordination, permitting support, finance, and related professional capabilities.
Inspection, testing, and quality services	Laboratory testing, inspection, nondestructive examination, and quality documentation capabilities.
Operations, maintenance, and repair	Maintenance, outage support, equipment repair, and operating-service experience.
Logistics and transportation	Freight, cargo handling, staging, lifting, and heavy-haul provider capabilities.
Waste management and remediation	Waste-management planning, remediation, and relevant environmental-service capabilities.

For conventional products, early assessments can document what a firm already makes, the process it uses and the quality system it operates. The same inquiry can identify gaps requiring technical assistance or buyer discussion. Buyers can then identify relevant applications and preparation gaps. This work is useful before technology selection because it establishes a capability baseline; it does not authorize production without the required drawings, specifications, quantities, and acceptance criteria.[17]

The common service families in Table 3 extend supplier engagement beyond components. Engineering and construction services arise during project development and delivery, while operations, maintenance and repair create continuing requirements after commissioning.[18] This timing affects which buyers and work packages should be considered in early outreach.

2.3 Technology-Specific Requirements

In analyzing design-dependent reactor requirements, this study assesses the materials, fuels, and proprietary interfaces whose specifications depend on the selected reactor and its purchasing arrangements. There may be similarities across common functions and pathways for the reactor technologies, however, the equipment in the reactors may require different materials, manufacturing processes, or qualification.[19]

For two of the component families (Turbines and Generators and Electrical Equipment and Grid Integration), no significant design-dependent scope was identified, and these are therefore not presented in Table 4.

Table 4. Design-dependent Component Scope

Component family	Scope requiring defined project requirements	Information required for production or qualification
Construction materials and fabrication metal products	Material grades, dimensions, fabrications details and acceptance criteria depend on the application. Conventional scope remains extensive across the four technologies.	Design drawing, specifications, quantities, quality requirements, site conditions and delivery sequence.
Reactor vessels, forgings, and pressure components	Reactor vessels, major pressure components, and large forgings with dimensions, materials, and manufacturing requirements set by the design.	Vendor specifications, manufacturing and inspection requirements, qualified capacity, and procurement schedule.
Steam-generation and heat-transfer equipment	Major steam generators where the selected design requires them, and SFR sodium heat exchangers.	System configuration, operating conditions, materials, fabrication and testing requirements, and buyer acceptance.
Pumps, valves, seals, and coolant-handling equipment	HTGR helium circulators and sodium-compatible coolant equipment, including electromagnetic pumps where specified.	Coolant and system requirements, materials, operating conditions, interfaces, and qualification pathway.
Instrumentation, controls, and precision components	Proprietary control rod drives, reactor interfaces, and safety-related instrumentation and control applications.	Vendor interfaces, safety and performance requirements, testing, documentation, and purchasing arrangements.
Specialized reactor materials	Nuclear-grade graphite and high-temperature materials for HTGR applications, and sodium-compatible materials for SFR applications.	Material properties, production and testing requirements, acceptable sources, and the application within the selected design.

Table 4. (Continued)

Component family	Scope requiring defined project requirements	Information required for production or qualification
Nuclear fuel and fuel-cycle inputs	Fuel form, enrichment, and fabrication pathway. HALEU and TRISO requirements apply only where specified by the selected design.	Fuel specifications, qualified supply pathway, applicable approvals, production capacity, and delivery arrangements.

Source: 10 CFR Part 50, Appendix B, "Quality Assurance Criteria", criteria III–V and VII. IAEA, Procurement Engineering and Supply Chain Guidelines, NP-T-3.21 (2016); § 3.5, p. 55 onward.
Westinghouse Electric Company, "Design for Manufacturability (DFM)," n.d., accessed October 23, 2026. https://westinghousenuclear.com/data-sheet-library/design-for-manufacturability-dfm/;
Lohse et al., Advanced Reactor Supply Chain Assessment (April 2023); technology/component assessments and SFR/HTGR appendix specifications.
U.S. Department of Energy, "Nuclear 101: High-Temperature Gas Reactor" (n.d.); HTGR TRISO fuel description. U.S. Department of Energy, Nuclear Energy Supply Chain Deep Dive Assessment (February 24, 2022); § 2.2.2 and § 3.1.3, pp. 38–39. NRC, "Natrium," and TerraPower, "Natrium FAQ" (n.d.); Natrium HALEU metal-fuel example.

The analysis of technology-dependent components required for the four reactor technologies provides representative examples in Table 4 rather than a complete bill of materials for a selected project. The comparison identifies the information needed from the developer and buyer before firms make commitments to design-specific tooling, production, or qualification. The comparison does not establish a New York production opportunity from a component label alone.

2.4 Findings

Across the 15 prioritized component and services families, the comparison identifies, on the one hand, shared parts and functions and, on the other hand, components whose products and specifications vary among the four reactor technologies. For the most part, component families are neither fully technology-neutral nor fully technology-dependent, but rather this distinction can be drawn within each component family.

The greatest near-term opportunity for New York companies lies in strengthening capabilities that create value regardless of reactor technology: Supply chain requirements vary depending on the advanced nuclear reactor being deployed.[20] [21] The most actionable near-term opportunities are focusing supply chain development on reactor-agnostic and balance-of-plant supply chain needs because these needs apply across technologies, align closely with New York State's existing capabilities, and can be advanced before project-specific procurement decisions are final. This includes civil construction; engineering and project development services; electrical equipment and installation; pumps, valves, seals, and heat exchangers; instrumentation; nondestructive examination; quality assurance and quality control; and operations and maintenance (O&M) support.

Two implications follow. First, early action and engagement with suppliers can include both services and conventional manufactured products and shared processes. Second, shared need alone does not establish a New York strength or justify production investment; an assessment of existing New York strengths is provided as the next step in Section 3.

3. Supply Chain Strengths and Opportunities

This section assesses New York's existing industrial base against 15 component and service families, established in Section 2. It inventories nuclear-specific and nuclear-adjacent company activity in New York, as well as selected employment observations describing related workforces and industry concentrations throughout the State. This helps to establish where New York has existing supply chain strengths or may not yet have strengths but could develop them. Finally, the section also notes where it is less feasible to bring significant capability to New York in the near to medium term.

3.1 Industry Mapping and Supplier Inventory

The study links the components and service families introduced in Section 2 to six-digit North American Industry Classification System (NAICS) industries. NAICS classifies companies by their principal economic activity.[22] Based on this description, the analysis in this study linked each relevant component or service family to one or more relevant NAICS codes and vice versa. However, the NAICS classification does not contain nuclear-specific information.[23] On this basis, the NAICS analysis enables identification of companies as "nuclear adjacent" (active in a nuclear relevant field), but not as nuclear qualified. Confirming whether a company can contribute to the nuclear supply chain requires additional information about the products or services the company produces. Appendix D documents representative industries for the four reactor types.

In addition to nuclear adjacency, this analysis also identifies New York companies already active in the nuclear sector. The review draws on publicly available directories from the American Nuclear Society, the Gateway for Accelerated Innovation in Nuclear, the Nuclear Quality Standard Association, the U.S. Nuclear Regulatory Commission (NRC) Active Vendor List, and the American Society of Mechanical Engineers (ASME) Certificate Holder Directory, supplemented by secondary research of individual firms.[24] These identify activity in the nuclear sector, but do not confirm that the company, product or service is already qualified for a specific nuclear application or technology.[25]

The 66 nuclear specific records are associated with 45 distinct nuclear companies in New York. These include nuclear-certified firms that manufacture components or provide services to meet the needs of the current nuclear fleet or a focus on developing new advanced nuclear capacity and technologies, including manufacturers of pumps, valves, and heat exchangers, as well as developers, fuel lifecycle businesses and laboratories.

Table 5 presents the number of firms identified within each of the 15 component or service families presented in Section 2.

Table 5. New York Firms by Component and Service Family

Component or service family	Nuclear specific firms	Adjacent firms
Construction materials and fabricated metal products	4	812
Reactor vessels, forgings, and pressure components	2	307
Steam-generation and heat-transfer equipment	1	102
Turbines and generators	2	111
Electrical equipment and grid integration	1	257
Pumps, valves, seals, and coolant-handling equipment	6	110
Instrumentation, controls, and precision components	5	805
Specialized reactor materials	18	74
Nuclear fuel and fuel-cycle inputs	0	16
Civil construction and installation	10	9,617
Engineering and project services	11	1,677
Inspection, testing, and quality services	1	228
Operations, maintenance, and repair	0	704
Logistics and transportation	0	0
Waste management and remediation	0	134

Some firms fall into more than one component or service family in which case they would appear multiple times in this table. In addition, the data is based on the firms' locations across the State, so a firm will again appear multiple times if it has multiple locations. Once such duplicates are discounted, the total number of nuclear-adjacent firms across New York is over 12,000. Of these, approximately three-quarters are in the construction sector, and the remainder are in manufacturing and other related sectors. This industrial base provides New York State with a strong starting point for supplier development. However, experience in a clean tech energy industry does not guarantee readiness for nuclear procurement. Nuclear adjacent firms may need additional quality systems, understanding of nuclear documentation, manufacturing equipment, or workforce preparation to meet the needs of advanced nuclear developer supply chain requirements. The existing in-state nuclear industry suppliers may need help in expanding

their current production capacity or help to reach new buyers. Firms entering the market may first need guidance on the required qualifications and to what work they could actually supply. Of the firms examined in this initial analysis, approximately 50 percent have fewer than ten employees and may therefore have limited capacity to readily expand into the nuclear sector.

Supplier development tied to New York's 5 GW deployment goal is discussed in more detail in Section 6 and can also help New York firms compete for work on new advanced nuclear projects elsewhere in the United States and abroad. A manufacturer that develops a production process or improves its quality system for one project may be able to apply that work to other projects, subject to each buyer's specifications and qualification requirements. The ability to compete for orders from multiple buyers including as regards out-of-state nuclear projects could strengthen the business case for investing in qualification, testing, or production capacity. These opportunities are important and also add to the case in favor of state action to pursue supply chain development, though potential export economic benefits have not been quantified in the Master Plan Economic Impacts Study at this time.

3.2 Employment Indicators

Employment and location quotients offer additional metrics for assessing where New York may have supply chain strengths. Employment measures the scale of an industry's workforce.[26] Employment location quotient (LQ) is calculated by dividing an industry's share of New York employment by that industry's share of U.S. employment.[27] A value above 1.0 indicates a greater relative employment concentration in New York than in the rest of the nation, an LQ below 1.0 indicates a smaller relative share.[28] Values both above 1.0 and below 1.0 are both considered in this analysis because an industry can have substantial employment without a high LQ or a high LQ with a relatively small workforce. As in Section 3.1, a limitation of the analysis is that its indicators are not nuclear specific but merely provide data on nuclear-adjacent industries.

This section examines these employment metrics for the sectors indicated in Section 3.1 as likely supply chain strengths for New York, namely construction and manufacturing. The following tables provide selected observations for manufacturing, construction, and related services.

Table 6 presents employment observations for manufacturing industries with LQs above 1.0 for the fourth quarter of 2025 and adds evidence for particular manufacturing connections.[29] These industries, which are active in both the sectors where Section 3.1 identified overall strengths in terms of firm count, as well as with significant employment concentrations based on job and LQ metrics shown below, appear to be focus areas for supply chain development to support

advanced nuclear energy in New York. Employment data was available based on NAICS codes and therefore the connection to the respective component family is also included in the table.

Table 6. Selected Manufacturing Employment and Connections to the Common Component Families

NAICS	Industry within manufacturing	Jobs	LQ	Connection to common component families
334416	Capacitor, resistor, coil, transformer, and other inductor manufacturing	1,929	1.87	Electrical equipment; instrumentation and controls
331491	Nonferrous metal (except copper and aluminum) rolling, drawing, and extruding	1,602	1.65	Fabricated products; materials
327110	Pottery, ceramics, and plumbing fixture manufacturing	1,446	1.61	Materials; evidence does not establish nuclear graphite capability
333611	Turbine and turbine generator set units manufacturing	1,895	1.47	Turbines and generators
334111	Electronic computer manufacturing	5,300	1.45	Instrumentation and controls; computing capabilities
332410	Power boiler and heat exchanger manufacturing	2,004	1.42	Steam-generation and heat-transfer equipment
334417	Electronic connector manufacturing	1,931	1.33	Electrical equipment; instrumentation and controls
331492	Secondary smelting, refining, and alloying of nonferrous metal (except copper and aluminum)	864	1.32	Fabricated products; materials
331313	Alumina refining and primary aluminum production	609	1.28	Fabricated products; materials
335999	All other miscellaneous electrical equipment and component manufacturing	3,006	1.27	Electrical equipment and grid integration
335314	Relay and industrial control manufacturing	3,302	1.25	Instrumentation, controls, and precision components
324121	Asphalt paving mixture and block manufacturing	1,387	1.18	Construction materials; site works
Source: Chmura Economics & Analytics, JobsEQ Industry Employment and Location Quotient Data (2025 Q4);				

Using this employment data from NAICS nuclear-adjacent industry classification to draw conclusions about nuclear strength requires particular care, especially for materials. For instance, employment in ceramics or metal processing provides an indicator but does not establish production of nuclear-grade graphite, coatings, or coolant-compatible reactor materials.

Table 7 shows New York industries with LQs below 1.0. Even though the LQ is below 1.0, several of these industries have significant New York State employment and may, therefore, still be attractive for supplying components and services to nuclear facilities. These include electrical and wiring installation contractors; plumbing, heating, and air-conditioning contractors; engineering services; and testing and repair.

Table 7. Selected Construction and Service Employment

NAICS	Industry	Jobs	LQ
Construction 238110	Poured concrete foundation and structure contractors	9,048	0.50
Construction 238210	Electrical and wiring installation contractors	61,657	0.82
Construction 238220	Plumbing, heating, and air-conditioning contractors	72,964	0.82
Construction 238910	Site preparation contractors	21,975	0.62
Professional services 541330	Engineering services	47,727	0.59
Professional services 541380	Testing laboratories and services	7,534	0.66
Repair and maintenance 811210	Electronic and precision equipment repair	4,099	0.60
Repair and maintenance 811310	Commercial and industrial machinery repair	5,554	0.34
Waste and support services 562112	Hazardous waste collection	645	0.78
Waste and support services 562211	Hazardous waste treatment and disposal	259	0.10
Source: Chmura Economics & Analytics, JobsEQ Industry Employment and Location Quotient Data (2025 Q4)			

3.3 Specialized Products and External Sourcing

The above metrics provide preliminary indicators of which nuclear adjacent industries are strengths in New York. Those most promising in the near term are categorized as Tier 1. Those that could become attractive but may require additional state actions are classified as Tier 2. Finally, Tier 3 includes specialized components for which the study has not verified a qualified New York source, existing suppliers elsewhere are well established, and the capability cannot easily be replicated in New York without substantial investment in specialized facilities, equipment, and qualified production processes. The below table provides initial indications of the areas that fall within this Tier 3. More detailed analysis is needed to confirm whether a New York source is unavailable, and which more specific parts of a component family must be sourced outside the state.

Table 8. Tier 3 Component Families

Component Family	Potential external dependencies and assessment needs
Reactor vessels, forgings, and pressure components	Large reactor vessels, integrated vessels, and ultra-large forgings
Steam-generation and heat-transfer equipment	Large nuclear steam generators and specialized heat exchangers, including sodium-compatible equipment, where specified by the design
Pumps, valves, seals, and coolant-handling equipment	Helium circulators, electromagnetic pumps, and specialized sodium-compatible coolant equipment where specified by the design
Instrumentation, controls, and precision components	Vendor-specific control rod drive mechanisms and proprietary reactor interfaces
Specialized reactor materials	Nuclear-grade graphite, high-temperature materials, and sodium-compatible reactor materials
Nuclear fuel and fuel-cycle inputs	Reactor fuel supply and fabrication, including conventional light-water fuel or HALEU, TRISO fuel, and metal fuel where specified

Source; Lohse et al., Advanced Reactor Supply Chain Assessment (April 2023); technology/component assessments and SFR/HTGR appendix specifications. U.S. Department of Energy, Nuclear Energy Supply Chain Deep Dive Assessment (February 24, 2022); § 2.2.1, pp. 16–20.; U.S. Department of Energy, Nuclear Energy Supply Chain Deep Dive Assessment (February 24, 2022); § 2.2.2 and § 3.1.3, pp. 38–39. U.S. Department of Energy, "Nuclear 101: High-Temperature Gas Reactor" (n.d.); HTGR TRISO fuel description. NRC, "Natrium," and TerraPower, "Natrium FAQ" (n.d.)

Table 8 identifies specialized products that may need to be obtained from suppliers outside New York. It does not cover every potential supply requirement. The required products, their technical specifications, and the available suppliers will depend on the selected reactor design.[30] The table should therefore guide further investigation rather than serve as a final determination of which products must be sourced externally.

3.4 Findings

The analysis in this section provides indicators for assessing specific components and services into three tiers.

- **Tier 1: Near-term prospects**. New York's existing industrial base provides a basis for assessing suppliers for work, with likely strengths identified in particular in areas such as civil construction, installation, engineering, and conventional fabrication.

- **Tier 2: Longer-term opportunities**. These are candidates where the analysis does not identify a current strength in New York, but where it may be feasible to develop capability in time to support reactor projects under the Nuclear Backbone goal in New

York. The inventory and employment data help identify where to investigate; they do not establish a commercially viable expansion on their own.

- **Tier 3: Provisional external dependencies**. Table 8 identifies specialized products for which this study has not verified a qualified New York supply pathway, including large reactor vessels and forgings, selected steam generators and specialized heat exchangers, and certain fuel products where specified by the design. Establishing in-state production for some of these items could require substantial investment and qualification effort. External sourcing is therefore a planning assumption to test for the selected design and work package. Qualified New York firms may still be able to perform related fabrication, inspection, installation, or maintenance even if the specialized product itself is sourced elsewhere.

New York has a strong potential supplier base. The study identifies 45 existing nuclear suppliers and more than 12,000 nuclear adjacent firms with potentially relevant capabilities. Of these, approximately three-quarters are in the construction sector, and the remainder are in manufacturing and other related sectors. This industrial base provides New York State with a strong starting point for supplier development. However, experience in a clean tech energy industry does not guarantee readiness for nuclear procurement.[31] Nuclear adjacent firms may need additional quality systems, understanding of nuclear documentation, manufacturing equipment, or workforce preparation to meet the needs of advanced nuclear developer supply chain requirements. The existing in-state nuclear industry suppliers may need help in expanding their current production capacity or help to reach new buyers. Firms entering the market may first need guidance on the required qualifications and to what work they could actually supply. Of the firms examined in this initial analysis, approximately 50 percent have fewer than ten employees and may therefore have limited capacity to readily expand into the nuclear sector.

Different actions are needed to prepare existing suppliers and develop additional capabilities. Where New York already has existing industrial strength, action should focus on moving companies from nuclear adjacency to nuclear readiness through supplier screening, help with qualifications, and providing visibility into procurements. Further State action that could be pursued to bring more manufacturing capacity to New York State includes strategic supplier recruitment, collaboration with other states and targeted cost-share programs.

Focus on strategic dependencies: Several reactor technologies share components that face high demand from limited production sources located outside of New York State and the U.S., including reactor pressure vessels, ultra-large forgings, steam generators, and fuel fabrication.[32]

Other requirements are technology specific, including high-assay low-enriched uranium (HALEU), tri-structural isotropic (TRISO) fuel, and sodium systems for certain advanced designs, including sodium-cooled fast reactors.[33] Although these components and materials are essential to deployment, New York State has limited near-term opportunities to establish competitive in-State production. The State should therefore leverage reliable national and international supply partnerships while monitoring opportunities for targeted onshoring to meet both in-state and national needs as reactor technologies are selected and greater certainty emerges regarding project pipeline, deployment scale, and repeat demand that justify investment.[34]

Where New York State has strengths or can build it, supplier development can position New York firms to serve markets beyond New York. Supplier development programs can help prepare New York companies for opportunities that will come with in-state projects and from national and international advanced nuclear power project development. The continued operation of the existing New York nuclear fleet provides a market for maintenance, replacement components, engineering, and specialized services while local firms prepare for new construction of advanced reactors in New York and elsewhere.[35] Serving existing markets can help companies retain skilled workers and sustain their capabilities while preparing for future advanced nuclear projects. In addition, a broader customer base may also strengthen business for nuclear equipment, testing facilities, and qualification investments.

4. Regional Dynamics

New York's regional supply chain is distributed across regions whose strengths arise from different combinations of industry, nuclear experience, research institutions, and transport connections. These assets support distinct functions: project development and finance, component manufacturing, construction and installation, operating services, and nuclear lifecycle work. This section examines the role of each region and how those roles can contribute within a statewide supply chain.

4.1 Purpose and Limits of the Regional Analysis

Sections 2 and 3 establish the reactor needs and the industrial evidence relevant to those needs. Geography adds information about where the related firms are located, how their activities are distributed and which functions depend closely on the project site. Concentration of firms with related processes can provide a geographical basis for shared training and supplier services, while a dispersed inventory may require broader access to resources. Transportation connections help identify where cargo and route assessments are relevant. Regional information thus helps organize outreach and preparation across the conclusions.

The State's existing firms and assets provide a relevant base for assessing near-term supply chain opportunities in advanced nuclear. The State's three operating nuclear sites along Lake Ontario—R.E. Ginna Clean Energy Center (Ginna), James A. FitzPatrick Clean Energy Center (J.A FitzPatrick), and Nine Mile Point Clean Energy Center (Nine Mile Point) Units 1 and 2—support ongoing O&M activities, the State's main nuclear operation workforce, and a relevant concentration of specialized nuclear service providers.[36] Beyond the operating power plants, the ecosystem supporting waste management and remediation services around Indian Point Energy Center provides important nuclear-relevant services that can be leveraged for future deployments.[37] These nuclear assets, combined with the State's strong industrial base, shape the strategy for establishing a short-term local supply to meet part of the needs of advanced nuclear deployments and generate economic opportunities for New Yorkers.

The regional assessment uses eight geographic groups from the study's maps and profiles. New York City, Long Island and Mid-Hudson are combined into one group, the seven other groups are Western New York, Finger Lakes, Central New York, Capital Region, Southern Tier, Mohawk Valley, and North Country. These groups cover the 10 economic development regions.[38] The analysis uses geographical patterns and industry composition, without calculating regional totals or ranking regions by supplier readiness. These items should be considered for further study.

4.2 The Regional Pattern of Supply Chain Activity

The study identifies the largest combined concentration of firms in the New York City (NYC), Long Island, and Mid-Hudson region especially in the construction, professional services and engineering, and support services industries. The Capital Region, Finger Lakes, Western NY, and Central NY regions also show meaningful clustering of both existing nuclear firms and adjacent firms. These clusters more directly align with the specialized component manufacturing needs of the advanced nuclear industry. Regional readiness, however, depends on more than firm count. It also depends on infrastructure, workforce, logistics, supplier qualification, and the role each region can realistically play in the supply chain.

The following maps illustrate visually where relevant firms are located across New York State:

- Figure 2 summarizes the location of all nuclear-specific and nuclear-adjacent firms identified in Section 3;
- Figure 3 shows only those in the construction sector;
- Figure 4 only shows those in sectors other than construction;
- Figure 5 only shows those in the manufacturing sector.

Figure 2. Distribution of Nuclear-relevant Firms in Large Industry Groups

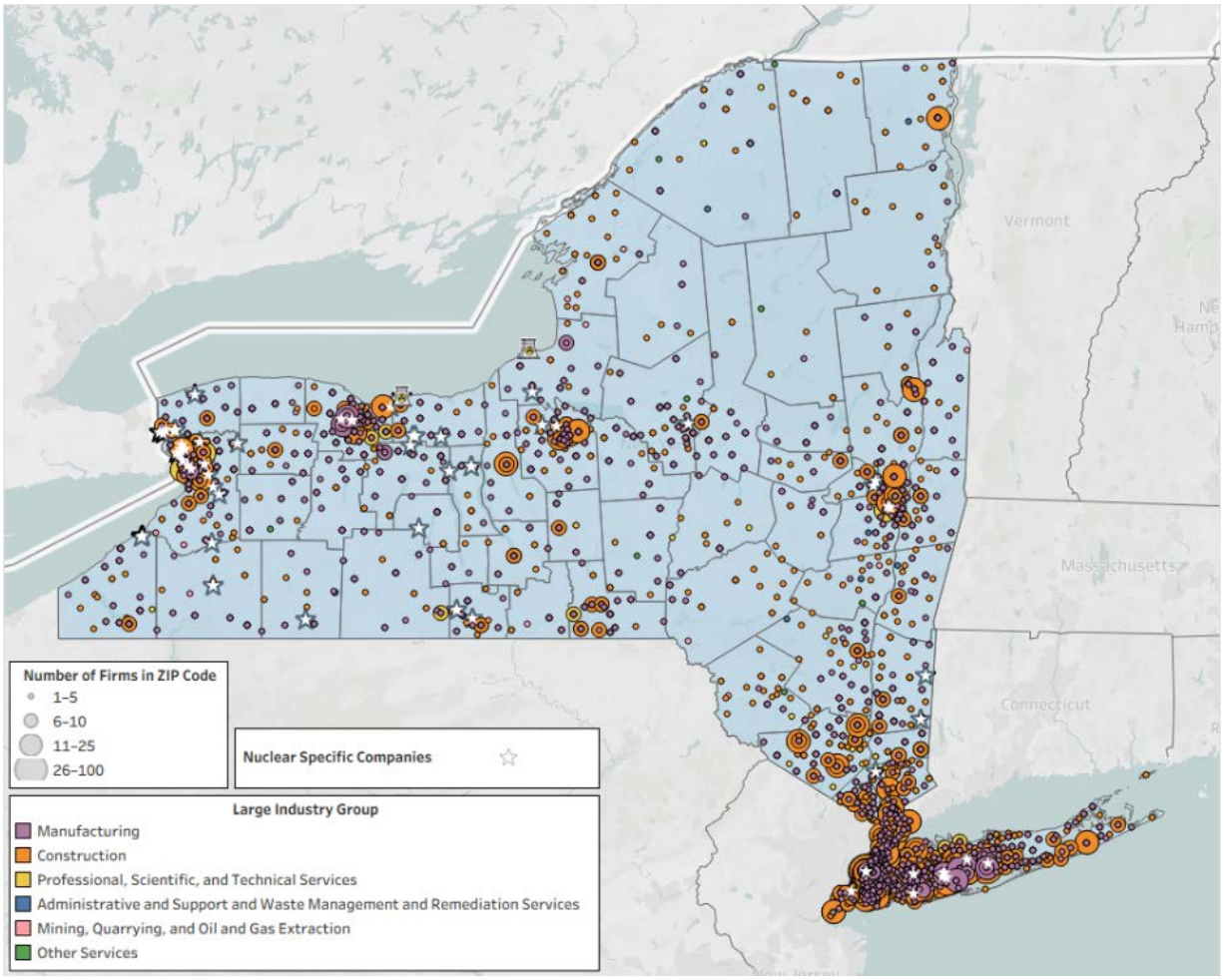


Figure 3. Distribution of Nuclear-relevant Construction Firms

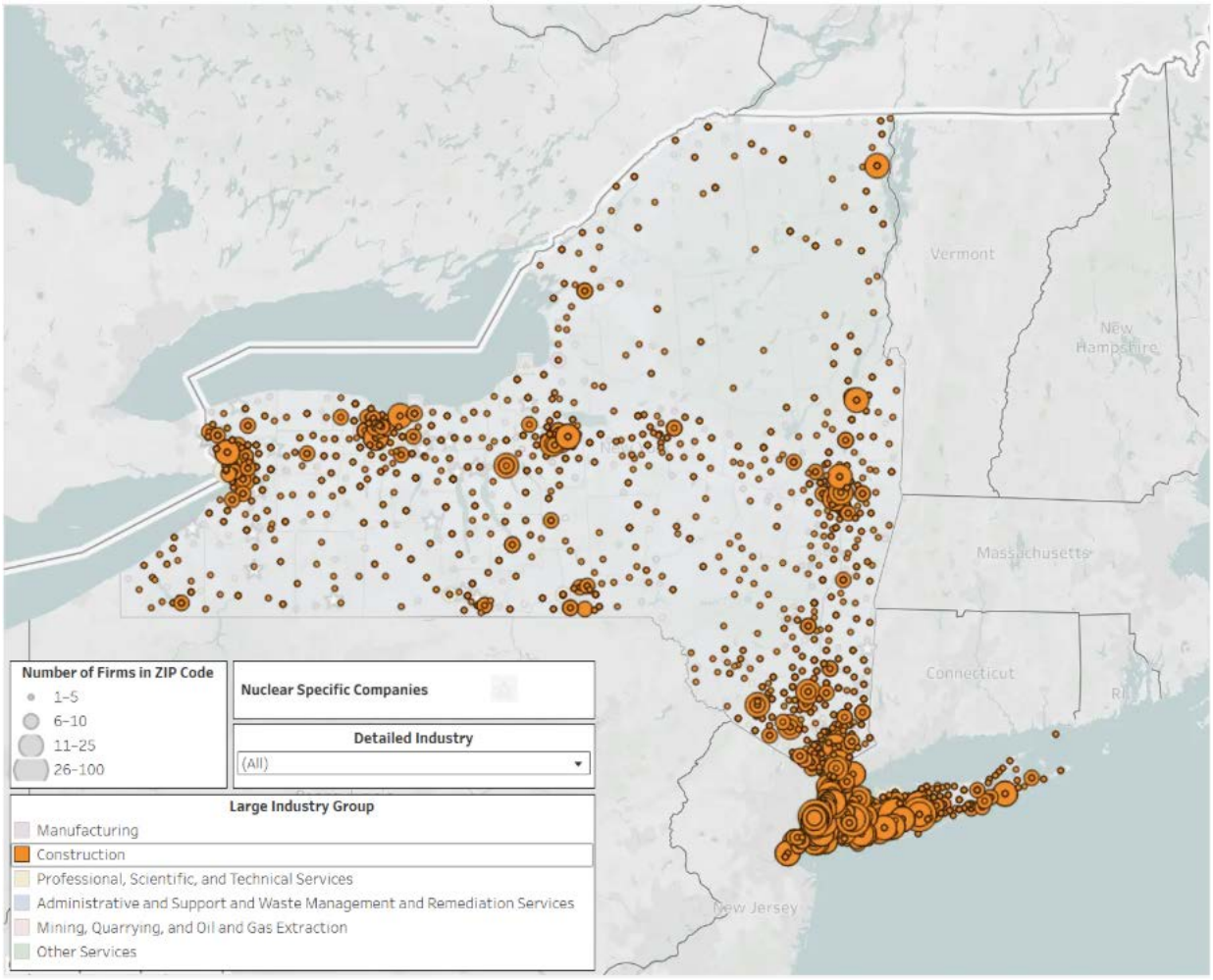


Figure 4. Distribution of Nuclear-relevant Firms in Large Industry Groups (Excluding Construction)

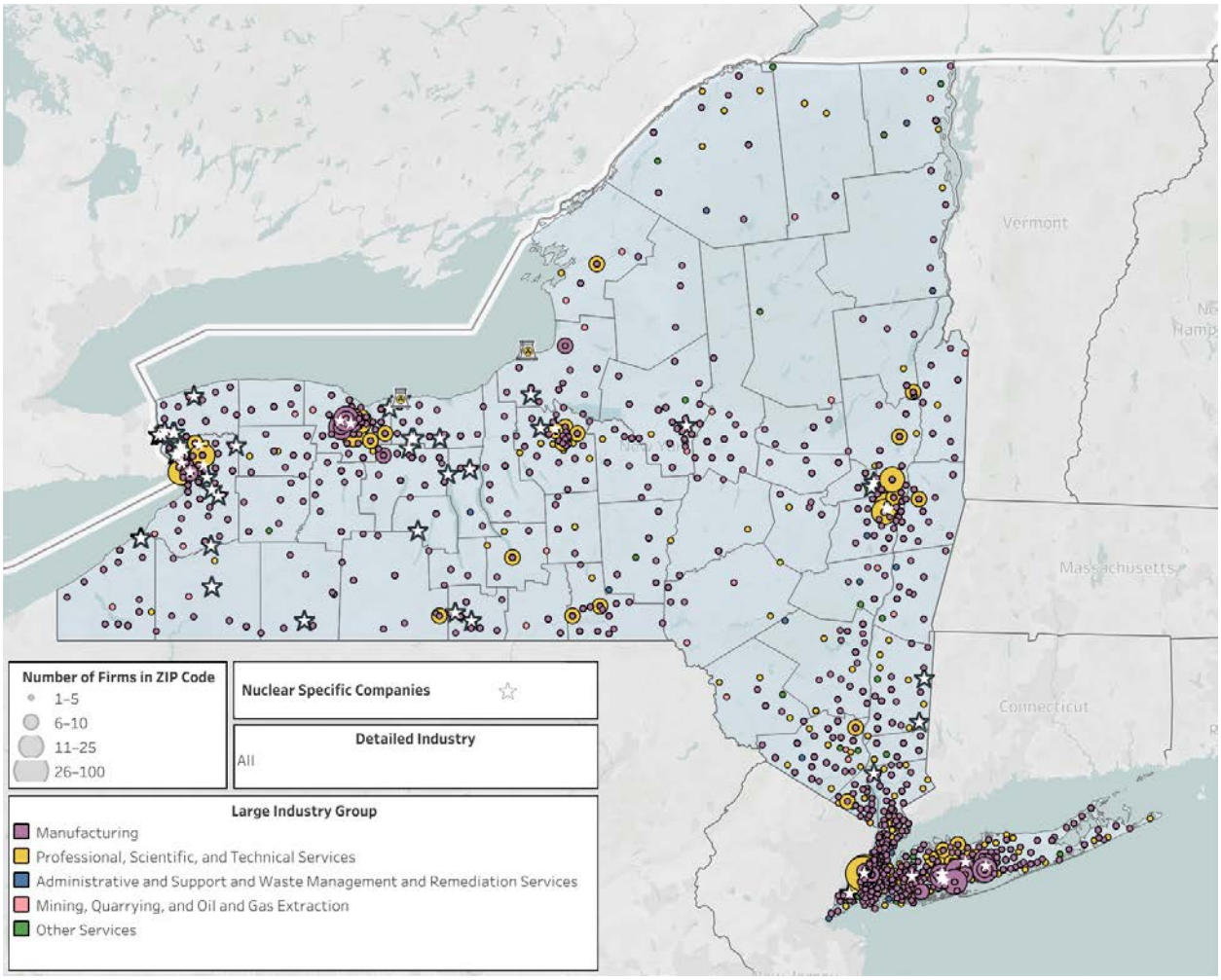
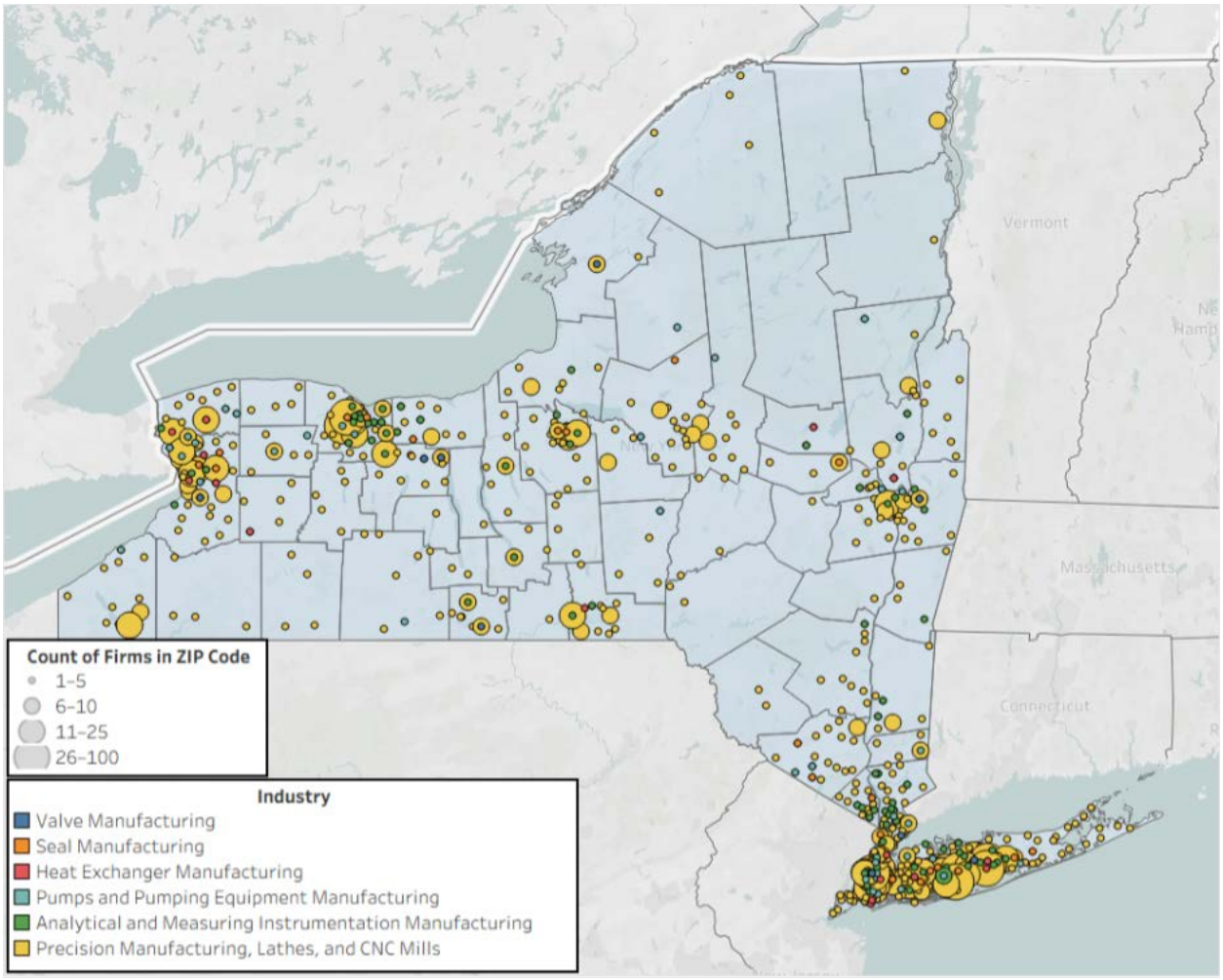


Figure 5. Distribution of Nuclear-relevant Manufacturing Firms



The State's advanced nuclear supply chain will not develop from a single hub. The State has several regional assets, each relevant to a different part of the work. Some regions are strongest in engineering, finance, project delivery, and professional services. Others are better positioned for manufacturing, logistics, construction support, operations and maintenance, or supplier qualification.

Table 9 relates the regional evidence to the same component and service families used in Section 2. The employment and location quotients reported in Section 3 describe New York industries statewide. They provide context for the mapped activities but cannot be assigned to individual regions. Regional strengths in this section refer to identifiable industry connections, operating or lifecycle assets, and geographic relationships. They are not estimates of available labor or qualified production capacity which should be studied further. Most regional maps in Appendix E distinguish contractor categories, consistent with the broad statewide construction inventory. The Finger Lakes map (Figure E-3) identifies a more specific manufacturing

connection in measuring and pumping equipment. The Capital Region, Southern Tier, Mohawk Valley, and North Country maps distinguish several manufacturing groups, while the Western and Central New York maps principally distinguish contractor types. Their different contractor categories limit direct comparisons of industrial diversity.

Table 9. Regional Evidence and Connections to Common Families

Region/Area	Selected regional evidence	Related common components and services families
NYC, Long Island, and Mid-Hudson	Contractor and engineering-service observations around NYC, Long Island, and Mid-Hudson nodes; repair and hazardous-waste categories.	Civil works; engineering and project services; repair; applicable lifecycle services.
Western New York	Buffalo-Niagara contractor observations and additional locations around Jamestown and Olean; West Valley provides a separate lifecycle context.	Civil works; field services; lifecycle work. Manufacturing and logistics require separate firm and route checks.
Finger Lakes	Rochester-area measuring and pumping-equipment observations; Ginna operating site in the Town of Ontario.	Pumps and valves; controls and precision products; operating and maintenance services.
Central New York	Syracuse contractor observations and additional Auburn/Cortland nodes; J.A. FitzPatrick and Nine Mile Point sites near Oswego.	Civil construction; installation; operating, maintenance, and relevant field services.
Capital Region	Albany-Schenectady-Troy, Saratoga Springs, and Glens Falls observations in metals, mineral products, machinery, electrical/electronic products, and contracting.	Fabricated products; electrical equipment; controls; civil works.
Southern Tier	Elmira, Binghamton, Ithaca, and other contractor and manufacturing observations.	Fabricated products; electrical equipment; controls; civil works.
Mohawk Valley	Utica/Herkimer, Amsterdam, and Johnstown observations in metals, machinery, electronics, fabricated products, and contracting.	Fabricated products; electrical equipment; controls; civil works.
North Country	Dispersed Watertown, Plattsburgh, and other contractor and manufacturing observations.	Civil works; fabricated products; electrical equipment; logistics subject to cargo and route checks.

Source: Albany Port District Commission, "Port Operations and Facilities," n.d., https://www.portofalbany.us/port-operations-facilities; NRC and Constellation, J.A. FitzPatrick and Nine Mile Point facility records and profiles (n.d.);

The regional picture points to a targeted strategy rather than a statewide one-size-fits-all approach. Downstate is strongest in project delivery, finance, engineering, permitting, construction management, and professional services. Western New York is strongest for manufacturing-related supplier development, logistics, and Great Lakes coordination. Central New York and the Finger Lakes are strongest for operating-fleet proximity, O&M support, construction services, workforce readiness, instrumentation, precision manufacturing, and supplier qualification. The Capital Region is strongest for coordination, technical assistance, grid and energy technology, research partnerships, and program delivery. The Southern Tier, Mohawk Valley, and North Country are better treated as selective opportunity areas that require more firm-level and site-specific screening.

This approach avoids two mistakes: assuming every region can support every part of the nuclear supply chain, and assuming supply chain opportunity exists only near operating nuclear plants. A better strategy is to match each region to the role it can realistically play and direct public action toward the specific gaps that limit that role.

4.3 Regional Strengths in Electronics, Controls, Sensors, and Precision Manufacturing

The State's strengths in electronics, grid technology, systems, semiconductors, and precision manufacturing are focused on the Capital Region, the Southern Tier, and Central New York. The Finger Lakes/Rochester region is particularly relevant to manufacturers of instrumentation and control equipment and could support advanced nuclear projects through qualification. These four regions host a large number of industrially capable firms that are not yet nuclear-capable, meaning that qualification specific to these areas is a focal point for enabling advanced nuclear opportunities.

Although the regions have different industrial strengths, their manufacturing potential and pathway toward advanced nuclear opportunities rely on supplier readiness programs, technical assistance, workforce coordination, and public-private coordination among suppliers, state and regional partners, economic development organizations, and training institutions. Further evaluation of these regions should consider targeted support for select firms in these industries to turn institutional and innovation advantages into measurable outcomes for the nuclear industry. Success outcomes should include firms implementing quality system upgrades, establishing connections between manufacturers and buyers, and implementing training programs aligned with actual manufacturing needs.

4.4 Regional Strengths in Engineering, Procurement, and Construction

The State's strengths in EPC and professional services are distributed across several regions, enabling multiple focal points to support project deployment throughout the state. The NYC/Long Island/Mid-Hudson Region has the strongest capabilities for professional services and project delivery. The region's capacity in engineering, finance, legal, environmental, remediation, project controls, and construction management is essential for front-end planning and procurement and licensing support before fieldwork begins.

Western New York, Central New York, and the Finger Lakes/Rochester Region align closely with construction mobilization, industrial services, and delivering a strong workforce in the trades. Beyond their industrial advantages, these regions have the infrastructure and logistical characteristics necessary to connect to the broader state through rail, freight, and ports, and the industrial assets to host heavy industrial activity. These regions can leverage their existing infrastructure and industrial capabilities, access to the Great Lakes, and their experience with New York State's current nuclear power plants to shape construction activities and logistics support for future advanced nuclear projects.

In the near term, the most useful State actions are likely to be supplier readiness, workforce alignment, procurement engagement, and project-delivery support. Over the medium term, the State can focus on qualification, quality systems, documentation practices, and buyer connections for firms in relevant industries. Larger supply chain development efforts should be tied to clear demand signals, confirmed infrastructure fit, and firms or sites that can credibly compete for nuclear-related work. Reactor and site decisions will refine this work, while firms with defined buyers and requirements may be able to advance specific preparations earlier.

4.5 Regional Strengths in Components, Materials, Logistics, and Specialized Services

The State has five main regions that host the majority of current nuclear -specific firms: Central New York, Finger Lakes, Western New York, Capital Region, and NYC/Long Island/Mid-Hudson. These regions also host several firms specializing in the manufacturing of the priority items outlined in Section 2, manufacturers of heat exchangers, pumps, valves, and grid-integration equipment. Although the manufacturers of priority items require further evaluation of nuclear readiness, these regions are a strong starting point for supplier outreach, buyer connections, and monitoring to support qualification.

This points to a set of regions specialized in nuclear-specific components and project delivery, while others may be better suited to selected logistics functions and industries with lower barriers or commercial-grade opportunities. The five regions outlined above are important candidates for further supplier development and require more in-depth engagement from the State.

4.6 Findings

Regional strengths support different supply chain roles. Regions across New York State offer different capabilities that can support supplier development and project delivery. Regional strengths can help direct outreach and coordination of workforce and infrastructure planning. Regional strengths do not establish that individual firms or areas within these regions are ready for nuclear energy work.

Developing supply chain opportunities and capitalizing on the State's existing industrial and infrastructure strengths require setting specific roles for different regions of the State. Table 10 summarizes the primary roles of different regions in the State, based on their existing industrial base and their strategic relevance given existing geographic, industrial, and infrastructure assets.

Table 10. Existing Regional Supply Chain Strengths

Region/area	Primary supply chain strength(s)	Strategic relevance
Western New York/ Buffalo/Niagara/ West Valley	Manufacturing, logistics, Great Lakes access, nuclear lifecycle services, cross-border coordination	Strong industrial base, logistics access, proximity to Canadian nuclear markets, and nuclear lifecycle experience
Central New York/ Syracuse/Oswego nuclear corridor	Existing nuclear workforce, construction services, O&M support, field services, supplier expansion	Proximity to operating nuclear facilities and a practical base for workforce and supplier readiness
Finger Lakes/ Rochester/Ginna corridor	Precision manufacturing, engineering, instrumentation, pumping and measuring equipment, nuclear O&M support	Combines nuclear operating experience with Rochester-area industrial and technical strengths

Table 10. (continued)

Region/area	Primary supply chain strength(s)	Strategic relevance
Capital Region/Tech Valley/Albany-Schenectady-Troy	State coordination, research, advanced manufacturing, grid and energy technology, supplier-readiness programming	Strong institutional, policy, research, and program-delivery capacity
NYC/Long Island/Mid-Hudson	Engineering, finance, project delivery, professional services, construction management, permitting, remediation services	Strongest for professional services, project execution, financing, advisory, and large-contractor capacity
Southern Tier/ Mohawk Valley/ North Country	Supporting manufacturing, industrial sites, logistics, workforce development, future development screening	Potential supporting regions, depending on firm-level, site, infrastructure, and workforce findings

The regional findings describe a supply chain in which project services, manufactured products, and field work can originate in different locations. New York City's finance and advisory capabilities can support an owner procuring equipment from upstate manufacturers; technical products from the Finger Lakes or other industrial regions can be installed and maintained by contractors working near a plant. These are plausible relationships arising from the identified strengths, not documented awards or guaranteed allocations of work. Their realization depends on procurement arrangements that connect firms to the appropriate buyer.

Some regional advantages are more dependent on project location than others. Engineering and selected manufactured products can serve distant customers, whereas construction labor, staging, and many site services depend more closely on the work's location and schedule. Ports and freight corridors can extend a region's reach, but route and handling requirements determine their usefulness for individual components. The project's eventual location may change the distribution of construction and logistics activity without eliminating the contribution of suppliers elsewhere in the State.

The region-by-region review therefore supports differentiated participation within a connected State economy. Industrial concentration, nuclear experience, research, and transport each contribute in different ways, and none is a complete measure of readiness. Section 5 examines the workforce, infrastructure, and qualification constraints that may limit these roles. Section 6 addresses how supplier assistance and project engagement can respond to the findings. The regional assessment concerns industrial participation and does not determine reactor siting or regulatory authorization.

5. Barriers

The industrial and regional evidence in Sections 2-4 identifies potentially relevant components, services, and processes. This section discusses barriers to leveraging this supplier base for the nuclear supply chain. The supplier survey and stakeholder interviews identify several obstacles to this transition, including qualification costs, limited procurement information, uncertain demand, and the need for specialized workers or equipment. These concerns are related: firms may need to invest before they can qualify for an order, while uncertainty about that order makes the investment difficult to justify.

The analysis draws on 154 retained survey responses and interviews with 19 stakeholders across 11 organizations. The findings distinguish barriers faced by individual suppliers from constraints affecting the availability of specialized components and fuel. A New York manufacturer may be able to address a documentation or inspection gap through targeted assistance. A shortage of specialized equipment or fuel may instead require procurement from established external suppliers and project-level coordination. The distinction matters when selecting interventions, because local supplier preparation cannot resolve every constraint affecting reactor deployment.

Maximizing the State's current industrial capabilities includes developing supplier qualification roadmaps, expanding the nuclear-qualified workforce, supporting QA and certification upgrades, and increasing production capacity for balance of plant components across multiple reactor technologies. Beyond the baseline market conditions required to develop the State's advanced nuclear supply chain, this section describes the size and severity of industry-wide and technology-specific pain points to develop a framework for nuclear opportunities and policy options.

5.1 Nuclear Qualification and Certification Requirements

Obtaining nuclear industry certifications was reported as a challenge by 60 percent of survey respondents. Respondents also reported uncertainty about the qualification pathway: 43 percent did not know which certification was required, and 48 percent of firms did not know how to obtain these certifications. Approximately 36 percent of respondents agreed that obtaining or sustaining certifications was too expensive, while a similar share answered “don’t know” or declined to respond.

Firms with relevant products may need to strengthen documentation or inspection practices, while others face changes to production controls, quality programs, or facilities. The cost of entry depends on the distance between the firm's current practices and the requirements of the proposed contract. Supplier assessment should establish that distance before determining the type and extent of assistance.

The requirements themselves serve different purposes. Nuclear Quality Assurance Requirements (NQA-1) provides a framework for nuclear quality assurance programs; ASME component certification covers specified activities under the applicable construction code.[39] International Organization for Standardization (ISO) 19443 sets quality-management requirements for organizations providing items or services that are important to nuclear safety.[40] These frameworks have different scopes. A prospective supplier should confirm which provisions apply to its work and what evidence the purchaser requires.

The administrative demands of nuclear procurement can extend beyond manufacturing an acceptable product.[41] Document control, supplier oversight, corrective action, training records, and material identification must support the buyer's review of how the work was performed.[42] A firm may therefore need quality personnel and record systems even where its production equipment is adequate. Such expenditure can precede an award, creating a financial burden that is closely connected to the demand uncertainty discussed in Section 5.2.

Commercial-grade product or component certification (or dedication) [43]a procurement route for certain commercial items intended for safety-related use.[44] The purchaser or a third-party dedicating entity establishes the item's critical characteristics and verifies their acceptability through appropriate inspections, tests, or analyses.[45] This route may allow a manufacturer to participate through an organization responsible for dedication, but the acceptance process still requires technical evidence and controlled records. Supplier guidance should explain those responsibilities and identify the organizations capable of carrying them out.

5.2 Procurement Access and Market Visibility

Finding nuclear industry information relevant to the firm was the most frequently reported challenge (72%). In addition, 43 percent of respondents did not know which certifications were required, and 48 percent did not know where to obtain them. This result concerns practical entry information, rather than general awareness of nuclear development. A supplier needs to know which organization purchases its work, what the procurement package includes, and when requirements and pre-qualification decisions are available[46] Reactor developers and original

equipment manufacturers may control proprietary systems and major reactor equipment, while engineering, procurement, and construction contractors purchase balance-of-plant equipment, construction services, and subcontracted work.[47] Owners influence specifications and delivery arrangements.[48] A supplier seeking entry must identify the organization purchasing its product and determine whether the scope is available to outside firms.

Demand uncertainty was reported as a challenge by 49 percent of respondents, while 76 percent considered market demand important to participation. Among manufacturing respondents, 83 percent considered purchase order commitments important, 66 percent design completion, and 62 percent design standardization. These responses distinguish for respondents the commercial value of anticipated orders from the technical information needed to plan production.

Supplier education should therefore progress from a general introduction to nuclear market opportunities to discussion about individual firms' products, prospective buyers, and requirement to meet before bidding. Early engagement with buyers should clarify prequalification procedures, procurement schedules, and point of contact. Connecting these preparations requirements to identifiable procurement opportunities would help firms assess whether prospective work justifies investment. As part of the supplier readiness initiative, the State should track buyer introductions, qualification decisions, bids, and awards as distinct stages. This would show whether engagement leads to commercial participation and identifies where firms encounter difficulties, such as buyer approval or progressing to a competitive bid.

Table 11 summarizes the study's stakeholder matrix, informed by interviews and related survey findings. It distinguishes the information and capabilities sought by purchasing organizations, existing suppliers, adjacent manufacturers, and workforce providers.

Table 11. Stakeholder Information and Conditions for Supplier Participation

Stakeholder group	Information or capabilities needed	Reported concerns	Reported conditions for participation or investment
Original equipment manufacturers (OEMs)	Defined designs, qualified suppliers, predictable demand, stable requirements	Fragmented markets, one-off projects, qualification costs, uncertain order volume	Repeat deployment, design standardization, procurement visibility, capable suppliers
Engineering, procurement, and construction contractors (EPCs)	Constructability, workforce, site conditions, design definition, clear interfaces	Labor availability, rework, sequencing risk, design changes, fragmented contracts	Early project definition, coordinated delivery planning, clear owner requirements
Existing nuclear suppliers	Expansion demand, skilled workers, stable orders, project timing	Audit requirements, labor constraints, uncertain expansion economics	Credible orders and timing, workforce availability, a viable expansion case
Adjacent manufacturers	Qualification guidance, training, buyer requirements, procurement access	Certification costs, unclear revenue case, documentation and audit preparation	Defined work packages, buyer connections, qualification assistance, a viable preparation cost
Workforce stakeholders	Demand forecasts, occupational requirements, employer commitments, training resources	Unclear timing, instructor capacity, competition from other industries	Employer-backed demand and training aligned with the work and schedule

The differences among stakeholder groups explain why procurement access and demand visibility are related but not interchangeable. An adjacent manufacturer may lack a defined entry route even where a project is advancing. An existing supplier may understand the requirements but lack enough expected work to justify expansion. Original equipment manufacturer (OEM) concerns focus on repeatable design and order volume which differ from EPC concerns about construction interfaces, workforce, and project sequencing. Workforce providers require occupational and scheduling information to align training with employer demand. While an overall deployment goal sets the direction, companies still need more specific visibility into the deployment path and project selection.

Interviewees commonly describe investment and siting interest as conditional on project awards, contracts, market access, or offtake. The shared needs assessment in Section 2 provides a basis for examining relevant capabilities before New York selects a technology. Firms with defined

buyer requirements can also pursue specific preparations during this period, however larger production commitments depend on the proposed work and credible demand, not deployment goals alone.

The selection of a reactor technology, the sites, and the procurement timelines represent tangible market signals that allow suppliers to decide whether to invest in facility upgrades, certifications, and equipment. Certainty and clarity around the volume and timing of potential demand are vital to enable supplier investment. For firms considering qualification pathways and the investments needed to support advanced nuclear activities, the distinction between market enthusiasm and actionable demand signals is key. Suppliers look for signals such as RFQs, project awards, contracts, offtake agreements, technology selection decisions, site selections, and repeat-deployment commitments before making large capital investments to obtain nuclear capabilities.

5.3 Production Equipment and Facilities

Among manufacturing respondents, 55 percent identified production-facility expansion costs as a challenge, compared with 39 percent identifying physical facility limitations. Expansion cost concerns relate to the expenditure a firm would need to justify; facility limitations concern the adequacy of its space, equipment, or production arrangements. Both can occur together, but the survey does not establish which facilities require particular changes or quantify the investment needed. The distinction gives this barrier a different basis from the certification and documentation concerns in Section 5.1.

For steam-generation and heat-transfer equipment, a manufacturer may need additional machining, assembly, or testing capability to produce the specified item and volume. Comparable questions arise for turbines and generators and for pumps, valves, seals, and coolant-handling equipment. A quality program can govern existing processes without increasing throughput, while new equipment may increase capacity but still require process qualification and inspection. Capacity and qualification costs can therefore overlap without being the same investment.

5.4 Workforce

Nuclear-industry workforce experience was reported as a challenge by 63 percent of survey respondents, compared with approximately 46 percent reporting workforce availability as a challenge. Training future workers was considered important by 78 percent and training current workers by 77 percent. The results distinguish experience from the proposed work from the

general quantity of labor. They indicate preparation concerns, but do not quantify vacancies, required staffing levels, or the number of workers available for a nuclear contract.

The workforce metrics in Section 3 describe a broader industrial base: electrical and wiring installation contractors account for 61,657 jobs statewide and machine shops for 8,259.[49] Those totals do not identify nuclear-experienced workers or spare labor capacity. Section 4 locates contractor and manufacturing activity and operating nuclear contexts but does not allocate these employment figures among regions. The combination establishes relevant industrial and geographic settings without resolving the supplier's occupational and staffing needs.

Manufacturing, construction, and operation require different worker preparation. Machining, welding, assembly, instrumentation, inspection, and maintenance involve specific processes and responsibilities. Applicable safety-related work requires appropriate training and supporting records; special processes, such as welding and nondestructive testing, require qualified personnel and procedures.[50] An organizational quality certificate is consequently different from an individual worker's qualifications. The interviews connect training to employer requirements and schedules.

Detailed occupational projections and training-provider capacity are addressed in the Master Plan Workforce Development Study.

5.5 Infrastructure and logistics

Infrastructure can constrain both production and delivery, but its relevance depends on the process, cargo, and destination. Electric service, water and wastewater capacity, floor space, staging, and lifting arrangements affect facility use or expansion. Route and handling requirements affect whether a manufactured item can reach the buyer. Table 12 identifies the questions that connect those physical conditions to the common families.

Transport access and heavy haul routes are particularly relevant for large items within reactor vessels, forgings, pressure components, steam-generation and heat-transfer equipment, and electrical equipment and grid integration. Load dimensions and weight, transfer points, bridges, clearances, lifting equipment, and site access must be considered together. New York State Department of Transportation (DOT) requires special hauling permits where defined highway loads exceed legal limits, and its route-screening information requires field verification.[51]

Other barriers arise at the production facility or service location. Utility and site conditions affect the processes proposed for manufacturing or testing; inspection, testing, and quality services

also depend on suitable equipment, methods, and personnel. Engineering and project services may be provided from a distance, while installation, maintenance, staging, and cargo handling are more closely tied to the work site. The regional analysis in Section 4 and Appendix E helps to locate these functions; determining the severity of a constraint requires further assessment of the proposed activity and location.

Table 12. Infrastructure Screening Factors for Regional Supply Chain Readiness

Factor to assess	Work-specific question	Illustrative connections to common families
Electric service and utility capacity	Can the facility support the proposed production or testing load, and what upgrades and lead times would be needed?	Electrical equipment and grid integration Construction materials and fabricated metal products
Water and wastewater capacity	Do the relevant cleaning, cooling, testing, or manufacturing processes have adequate water and discharge capacity?	Steam-generation and heat-transfer equipment Specialized reactor materials
Transport access and mode	How do cargo dimensions, weight, handling requirements, and destination affect the mode, route, and transfer points?	Logistics and transportation Construction materials and fabricated metal products
Heavy-haul routes and oversized cargo	What bridge, clearance, construction, permit, and delivery restrictions apply to the defined load?	Reactor vessels, forgings, and pressure components Steam-generation and heat-transfer equipment
Industrial sites and cargo handling	Are floor space, staging area, lifting capacity, and clearances adequate for the production, assembly, or delivery activity?	Civil construction and installation Turbines and generators
Testing, inspection, and supporting services	Are the required facilities, methods, equipment, and personnel available for the proposed work?	Inspection, testing, and quality services Operations, maintenance, and repair

5.6 Findings

Firms' awareness of opportunities to integrate into the nuclear supply chain is a primary concern in the short term. Linking industry with nuclear opportunities and information is a crucial first step in expanding the nuclear industrial base in New York State and introducing non-nuclear companies to the potential of the nuclear supply chain. Surveyed firms indicated strong interest

in exploring ways to support the nuclear supply chain, even though their awareness of available opportunities remains limited. State agencies and authorities could create informational and educational pathways to help current firms evaluate the revenue potential, costs, and requirements associated with nuclear activities.

Although New York State is viewed as a promising opportunity for developers and suppliers to establish local nuclear activities, they require long-term market signals that the State remains committed to nuclear deployment. The primary needs reported by firms and nuclear stakeholders include:

- **Supplier qualification pathways and integration with procurement**: This involves early engagement between firms, potential suppliers, and state agencies and authorities, including setting prequalification windows and aligning incentives with procurement goals. Suppliers rely on state entities to serve as conveners in nuclear development and deployment, coordinating with various supply chain partners and local stakeholders to develop tailored strategies and forge partnerships that promote engagement across the nuclear ecosystem.

- **Nuclear certification and workforce training**: Upskilling current workers and preparing a pipeline to meet projected workforce demand are critical considerations for firms to begin or continue offering products and services to the nuclear industry. Firms expressed uncertainty about nuclear certification pathways and an urgent need for a robust pipeline of qualified workers to support nuclear-specific activities in the short- and long-term.

- **Direction on reactor technologies and regulatory pathways**: The reactor technology selection process is essential for streamlining vendor qualification, workforce training, maintenance planning, and repeat construction. The State can facilitate a strong advanced nuclear supply chain by establishing a solid foundation that accommodates the reactor-neutral aspects of a nuclear supply chain, providing direction on reactor technologies, establishing procurement expectations, and describing licensing pathways.

6. Policy Actions

The policy response should prepare firms for work they can credibly supply and identify and target opportunities to establish additional New York capabilities. A discussion of lessons learned from other policies and jurisdictions is followed by a discussion of the recommended policy approaches available to pursue these objectives.

6.1 Lessons Learned from Offshore Wind

The State's experience developing supply chain programs and procurement for offshore wind offers several recent lessons for an advanced nuclear supply chain strategy. The main lesson is that the State should begin early, but scale carefully, particularly in the following areas for policy action.

1. **Assess competitiveness.** Local production should offer a viable cost, quality, and delivery proposition, and localization goals should account for those conditions. Cost management should be a central consideration in setting local content procurement targets and selecting supply chain segments to develop, as locally produced items need to be competitive in the global market.
2. **Examine demand beyond one project**. A manufacturing investment requires an assessment of repeat orders and potential national or international customers, alongside New York demand. Evaluate the national market for priority supply chain segments and collaborate with neighboring states to ensure a durable, national demand pipeline for the State's suppliers.
3. **Confirm the capability.** Build the supply chain development strategy around New York State's existing strengths to maximize current suppliers, workforce, and infrastructure. Supplier and workforce support should address verified products, processes, and preparation needs. The inventory can guide outreach, while firm and buyer assessment should establish the capability relevant to the proposed work.
4. **Begin preparation early and scale commitments with evidence**. Outreach, buyer engagement, and work-specific qualification can begin before deployment decisions are complete. Larger production, facility, and infrastructure investments require clearer specifications, credible orders, and an assessment of sustained use. Readiness assistance and industry-building investment address different decisions; neither follows automatically from a deployment goal. Align supplier development with credible demand scenarios, project schedules, and an understanding of where economic development opportunities and deployment risk priorities lie. Create a tiered framework for State intervention where investment and timing align with market trigger points,

overarching no-regrets opportunities, and broader demand for advanced nuclear components.

6.2 Other Jurisdictions

Some states are starting to pursue dedicated nuclear supply chain action.[52] The Advanced Nuclear First Mover Initiative is a state-led effort coordinated through the National Association of State Energy Officials (NASEO) to help early-moving states accelerate advanced nuclear deployment in a more coordinated and scalable way.[53] The initiative is led by co-chair states New York, Indiana, Kentucky, Tennessee, and Wyoming.[54] Other participating states include Louisiana, Maryland, Pennsylvania, Utah, Virginia, and West Virginia.[55] The initiative helps states identify supply chain needs, reduce financial and technology risk, support market adoption policies, coordinate procurement options, streamline federal permitting, explore state-federal-private financing structures, and create public-private partnerships for advanced nuclear projects.[56]

Tennessee has created a dedicated nuclear economic development fund focused on business investment, workforce development, and siting.[57] Texas has created a large advanced nuclear development fund with reimbursement tracks.[58] Indiana has enacted a small modular reactor (SMR) manufacturing tax credit and utility development-cost recovery.[59] Kentucky has created a nuclear authority and grants.[60] Maryland is building a procurement and cost-sharing framework.[61] Wyoming is using matching funds to leverage private and federal investment.[62] Appendix F provides details on actions in other jurisdictions.

Among other jurisdictions reviewed, Tennessee, Texas and Wyoming offer three distinct examples of state support for nuclear supply chain development. Tennessee's Nuclear Energy Fund reached $95 million in cumulative appropriations, and the state's Manufacturing Extension Partnership offers supplier readiness assessments and quality systems assistance. [63] Texas's $350 million nuclear development fund makes up to $70 million available for project development and supply chain reimbursement and up to $250 million for construction reimbursement.[64] Wyoming announced a separate $100 million matching award to BWXT's proposed fuel fabrication facility.[65]

6.3 Policy Action

Actions from the State for supply chain development should be targeted, sequenced, and tied to the barriers and opportunities identified in this study. These actions should focus on investing in segments of the supply chain where existing firms in New York have an industrial fit, where intervention can reduce deployment risk, and where firms can credibly transition from adjacent capabilities to direct nuclear participation.

The assessments of advanced nuclear supply chain needs in Section 2 and the capabilities of firms in New York in Section 3 point towards two different types of phasing that should drive State action:

- **Supply chain need**. By distinguishing between shared components, services and processes that are needed regardless of selected deployment technologies, and those that are specific to a particular deployment technology, state action can first focus on no-regrets shared components and then expand into technology-specific action as deployment projects selected their reactor technologies.
- **Supply chain strength**. By distinguishing between supply chain sectors based on their current level of strength in New York, the policy response can also be formulated in a nuanced way that distinguishes between different action appropriate where New York has existing strengths, compared to the type of action needed to build strength, but also recognizing that some areas do not lend themselves to efforts to bring supply chain capability to New York in the near to medium future.

The regional strengths identified in Section 4 should also be considered as part of policy design. Leveraging regional strengths within New York requires creating linkages between buyers and sellers, such as through procurement arrangements. Workforce and infrastructure planning should also reflect the regional analysis.

This study develops its conclusions on policy action based on three main steps:

1. The first step was offered in Sections 2 and 3 which distinguished between a near-term focus on cross-cutting needs served by existing in-state capabilities, and longer-term actions on design-dependent supply chain development.
2. The second step identifies what types of policy interventions are needed, based on the barrier analysis in Section 5.
3. The third step brings together the first and second steps by determining which of the policy actions needed to overcome barriers should be pursued in the near-term vs the medium/longer term.

Conclusion: Supplier Readiness Program

- **Establish a nuclear supplier readiness program to identify, qualify, and prepare firms for nuclear procurement through targeted technical assistance and supplier qualification support.**

While nuclear adjacency does not mean firms are immediately ready to start supplying nuclear parts and services, it means that there are significant numbers of firms that could do so, and that the effort needed to get them ready will be comparatively limited. The State's first task is to convert existing nuclear-adjacent supply chain strength into readiness. The stakeholder survey and interviews for this study indicate that firms are more likely to invest, expand, partner, or pursue qualifications when current uncertainties about nuclear construction projects are resolved and policy actions help overcome the barriers to supplier participation identified in Section 5. This requires clearer information, visible demand signals, support for supplier qualification, workforce coordination, and procurement engagement.

While the extent of State intervention to overcome barriers will be relatively limited in the sectors identified as potential strengths, the exact type of support will still differ. Some firms need market education and procurement visibility. Others need qualification support, quality-system upgrades, commercial-grade dedication guidance, documentation systems, or audit readiness. Some require capital equipment or facility upgrades. Others face workforce, infrastructure, logistics, heavy-haul, or buyer-access barriers. The policy tool should match the barrier.

Tools include supplier outreach, readiness screening, QA/QC awareness, procurement pathway mapping, regional cluster mapping, and external dependency tracking.

Initially, action should focus on technology-neutral components and services as identified in Chapter 2, including heat exchangers, pumps, valves, precision manufacturing, instrumentation, electrical equipment for balance of plant (BOP), construction and civil works, engineering, and O&M support. Other actions should wait until the State nuclear deployment strategy is finalized as that decision will clarify the component packages, long-lead items, supplier qualification requirements, regional workforce needs, logistics constraints, and infrastructure gaps.

A supplier readiness program can assess those firms against the work they could supply and provide practical assistance with qualification, quality controls, and production documentation required by the reactor developer. The focus of the supplier readiness program should be on

companies with a reasonable prospect of winning work, with program assistance tailored to the requirements of the product or service the company can compete for. By helping companies with early preparation, companies would be given time to address any requirements from the developers before bidding begins.

- **Qualification and Quality Systems Support**. Support offered through the supplier readiness program can include technical assistance and cost-sharing for NQA-1 awareness, ASME code requirements, ASME nuclear certification readiness (where applicable), ISO 19443 alignment, documentation systems, material traceability requirements, supplier controls, audit preparation, and commercial-grade dedication awareness.
- **Workforce Alignment**. Supply chain readiness and capitalizing on market opportunities depend on the availability of a qualified workforce for firms. As part of the supplier readiness program, the State should align workforce programs with the occupations most likely to constrain deployment, such as welders, electricians, plumbers, nuclear engineers, operators, and safety workers, as further detailed in the Master Plan Workforce Development Study. An assessment of nuclear workforce readiness, gaps and state action is provided in the Master Plan Workforce Development Study. This workforce program should support supplier readiness by targeting occupations, regions, and potential labor pools based on the analysis in this study, and by applying the phased approach described in this study, beginning with workforce development for cross-cutting supply chain needs and gradually increasing in specificity. As in New York's offshore wind programs, nuclear supply chain and workforce efforts should closely track project commitments and manufacturing investments to prepare the workforce in parallel with its supply chain.

Conclusion: Include Supply Chain Opportunities in Other State Actions

- **Leverage programs aimed at nuclear project deployment to create opportunities for New York supply chain companies, e.g. through matchmaking with suppliers in community/developer engagement, by promoting supply chain participation plans and by considering supply chain participation opportunities for localized content in the State's procurement efforts for nuclear projects.**

This conclusion aims to create linkages among developers, suppliers, and communities. As decisions are made on reactor technologies and project locations, the linkages will increasingly focus on technology-specific components and regional expansion based on the selections.

The State could help facilitate discussions through a supply chain participation plan to identify the contracts open to competition, qualifications requirements for the parts or services, and help companies understand the bid schedules in relation to their current orderbook before any supplier arrangements are settled.

The State could establish channels for market engagement that give suppliers early visibility into the procurement needs, timing, nuclear standards, and market entry points before procurement packages get locked into existing supplier networks. Beyond engagement channels, the State could explore prequalification windows, procurement calendars, supplier days, supplier-developer-community matchmaking, and targeted guidance on industry and buyer requirements.

On the developer, OEM, EPC, and operator side, State entities could engage with and inform stakeholders about the procurement packages open to in-state suppliers, those that are proprietary or largely controlled by existing supplier networks, and those where the State plans to help develop in-state suppliers. This incentivizes early engagement, avoids speculative investments for suppliers, and creates an opportunity for developer-supplier engagement before procurement decisions reach a decision point.

Conclusion: Longer-Term Strategy

- **Develop a "whole-of-government" longer-term supply chain strategy to build New York supply chain strength in a broader range of nuclear components and services and maintain access to any components coming from outside New York, including through strategic partnerships and collaboration with external suppliers and other states and jurisdictions as well as targeted co-funding.**

Where a supplier readiness program targets those sectors where an existing strong nuclear-adjacent supplier base can be developed to nuclear readiness, a longer-term strategy is needed to develop such strength in promising sectors. In addition, where in-state local production is unlikely in the near term, the state should plan for external sourcing, especially among long lead items including specialized components and fuels.

- **Strategic Supplier Recruitment and Partnerships**. Where New York firms do not have an existing strength, supplier recruitment, partnerships with experienced external suppliers, and coordination with out-of-state and federal actors can expand the local capabilities. Most efforts in this area will require clarity on reactor

technology and site selection to help identify which technology-specific components needed for the chosen technology should be targeted.

- **Federal and Peer State Collaboration**. Federal and out-of-state actions may indicate opportunities for partnerships, supplier development, technical exchanges, or co-investments. The State can monitor and coordinate with the U.S. Department of Energy (DOE), peer states, and Canadian actors, where useful, to pursue supply chain strategies that avoid duplicative recruitment efforts, share findings, and address supply chain needs jointly.
- **Targeted Grants, Loans, or Co-Funding Programs.** Tools such as low-cost financing, tax incentives, capital grants, and public-private partnerships are important for targeting supply chain development but should be conditional and triggered only when the State can verify visibility into demand pipelines, firm-readiness pathways, workforce availability, and infrastructure fit. Long-term supply chain investments require especially detailed assessments of triggers and measurable value factors, as they entail greater public investment and more extensive planning. Opportunities such as heavy fabrication, specialized components, and modular assembly support require strong market signals and maturity that evidence to the State that there will be repeat demand and a realistic procurement pathway.
- **Monitoring and Management of Externally Sourced Segments**. As a starting point and building on the analysis in this study, a register of segments that cannot be localized in the near term due to being too specialized, capital-intensive, or globally constrained can be built out further. These segments such as HALEU, ultra-large forgings, large reactor vessels, steam generators, control rod drive mechanisms, specialty alloys, sodium-specific primary systems, electromagnetic pumps, and others identified in Section 3, need to be monitored for cost and timeline considerations of planned projects, and to identify opportunities for localization as they arise.

7. Fusion Energy Supply Chain

Fusion energy has long been viewed as a potential source of abundant, low-carbon electricity, but for seven decades it remained primarily a scientific endeavor rather than a near-term energy option. In recent years, several developments have shifted the field from incremental and theoretical research toward early-stage commercial development. However, fusion remains pre-commercial: no fusion system has yet operated as a complete electricity-generating facility. There are more than 50 private developers pursuing fusion worldwide, with many of them concentrated in the United States. The Master Plan Fusion Energy Study explains the science of fusion, its main technology approaches and the state of the industry in more detail.

A significant portion of the fusion supply chain overlaps with existing industries such as aerospace, advanced nuclear, defense, and scientific research. At the same time, several critical components are specific to fusion and remain underdeveloped. These elements have limited analogs in other industries and will require dedicated development, testing, and manufacturing capacity.

A central challenge to fusion supply chain development is the lack of clear demand signals and standardized technical requirements. Fusion development is currently being pursued through distinct technological approaches, which differ in how they create and maintain the conditions required to achieve fusion reactions. They can be broadly categorized into three groups: magnetic confinement fusion (MCF), inertial confinement fusion (ICF), and magneto-inertial fusion (MIF). There is currently no clear indicator which approach will ultimately produce a commercial power plant. Given this status and limited long-term procurement commitments, suppliers face difficulty justifying investments in specialized manufacturing capacity. This uncertainty, combined with capital-intensive development cycles and evolving technology designs, limits the ability of supply chains to scale in advance of any potential commercial deployment.

This section provides an initial landscape assessment of New York State–based organizations with capabilities relevant to fusion energy development. It surveys existing strengths across key enabling domains and highlights areas where the state may have comparative advantages, emerging capabilities, or strategic gaps that warrant further evaluation. To assess New York State's position within the nascent fusion energy supply chain, this analysis draws on responses to the NYSERDA's Advanced Nuclear RFI and data from the Fusion Energy Base catalog of organizations participating in the global fusion ecosystem, supplemented by additional research

on New York State-based organizations.[66] These sources were used to identify New York State–based companies, research institutions, and laboratories that are active in, or adjacent to, key fusion-relevant technology areas.

7.1 New York State Fusion Supply Chain Overview

The fusion supply chain ecosystem includes organizations capable of providing critical knowledge, advanced components, enabling materials, specialized manufacturing, and integrated systems required to construct and operate future facilities.

This section seeks to identify areas where New York State–based entities are well positioned to participate in this evolving market and where support for fusion, fission and other adjacent industries can expand overall economic opportunity in the state. This scope of relevant entities includes research institutions, advanced manufacturers, materials producers, engineering services firms, and adjacent high-technology sectors that may be capable of serving emerging fusion supply chains.

The primary supply chain needs and their application and importance across fusion machines is shown in Table 13. Many of these enabling capabilities are applicable across magnetic confinement, inertial confinement, and alternative fusion concepts, and in several cases have applications beyond fusion in adjacent advanced manufacturing, energy, aerospace, semiconductor, and defense markets. As shown in Table 13, several supply chain capabilities, including advanced structural materials, precision vacuum systems, tritium handling, radiation-hardened electronics and instrumentation, high-precision manufacturing, and control software, are relevant across all three technology categories. Given the technical and commercial uncertainty surrounding both when fusion will be commercially viable and which fusion concepts may ultimately achieve large-scale deployment, supply chain areas that support multiple competing approaches may present more resilient economic opportunities.

Table 13. Fusion supply chain categories and their role in different fusion systems

Supply Chain Category	Applicable Technology Approach	Role in Fusion Systems
High-Temperature Superconducting (HTS) Wire & Magnet Systems	MCF	Generates strong magnetic fields for plasma confinement; enables compact, high-field designs
Cryogenic Systems	MCF, ICF	Maintains superconducting magnets and supports cooling of key subsystems
High-Power Laser & Optical Systems	ICF	Primary driver in ICF; also used for diagnostics and plasma measurement across concepts
High-Power Power Electronics & Pulsed Power	ICF	Provides pulsed energy for plasma initiation, compression, or laser systems
Advanced Structural Materials	All	Required for vacuum vessels, first wall, and structural integrity under extreme heat and radiation
Precision Vacuum Systems	All	Maintains ultra-high vacuum for plasma confinement or laser beamlines
Radiation-Hardened Electronics & Instrumentation	All	Enables monitoring, diagnostics, and control in high-radiation environments
Heat Exchangers & Thermal Management	All	Converts fusion heat into usable power and manages thermal loads
Tritium Handling & Isotope Processing	All	Supports fuel supply, recycling, and breeding for deuterium-tritium systems
High-Precision Manufacturing & Advanced Machining	All	Fabricates complex components such as vacuum vessels, coils, and optical systems
Control Software, Digital Twins & AI	All	Enables plasma control, system optimization, and predictive maintenance

Identified New York State-based players were mapped into these domains based on demonstrated capabilities, ongoing research, production activities, or applicable adjacent expertise. Table 14 summarizes where the state currently has meaningful capabilities and provides an indicative qualitative assessment of competitiveness (Low, Medium, Medium-High, High) relative to national and international peers based on the following criteria:

- **Low**: Limited or no meaningful in-state presence of private industry, with minimal supporting academic or research activity. Capabilities are fragmented and not competitive with leading regions.

- **Medium**: Some presence of private companies and/or academic institutions with relevant capabilities, but the ecosystem lacks scale, specialization, or differentiation. New York State is broadly on par with other regions but not a clear leader.
- **High**: Strong, well-established ecosystem with significant industrial base and leading academic/research institutions. New York State demonstrates clear competitive advantage, including recognized leaders, critical mass, and/or unique capabilities relative to other regions.

Table 14. Current fusion expertise and supply chain in New York State

Source: This table was assembled based on responses from NYSERDA's Advanced Nuclear Request for Information (RFI 5946), Fusion Energy Base, and additional research on New York based companies.

Component	Current NYS Universities, National Labs, and Companies	NYS Strength/ Competitiveness
High-Temperature Superconducting (HTS) Wire & Magnet Systems	Brookhaven National Lab (BNL) Canyon Magnet Energy SuperPower Arnold Magnetics	**Medium-High**
Cryogenic systems	Bluefors Cryocooler Technologies	**Low**
High-Power Laser & Optical Systems	University of Rochester, LLE Rochester Institute of Technology (RIT) Columbia Optimax Systems Navitar Sydor Technologies AmeriCOM Corning Coherent	**High**
High-Power Power Electronics & Pulsed Power Systems	University of Rochester, LLE Cornell University CAEN (power supplies/ instrumentation)	**Medium**
Advanced Structural Materials	Rensselaer Polytechnic Institute (RPI) Stony Brook University Brookhaven National Lab (BNL) Arnold Magnetics Cerion Nanomaterials CoorsTek EPRI GE Aerospace Research Center	**Medium-High**

Table 14. (Continued)

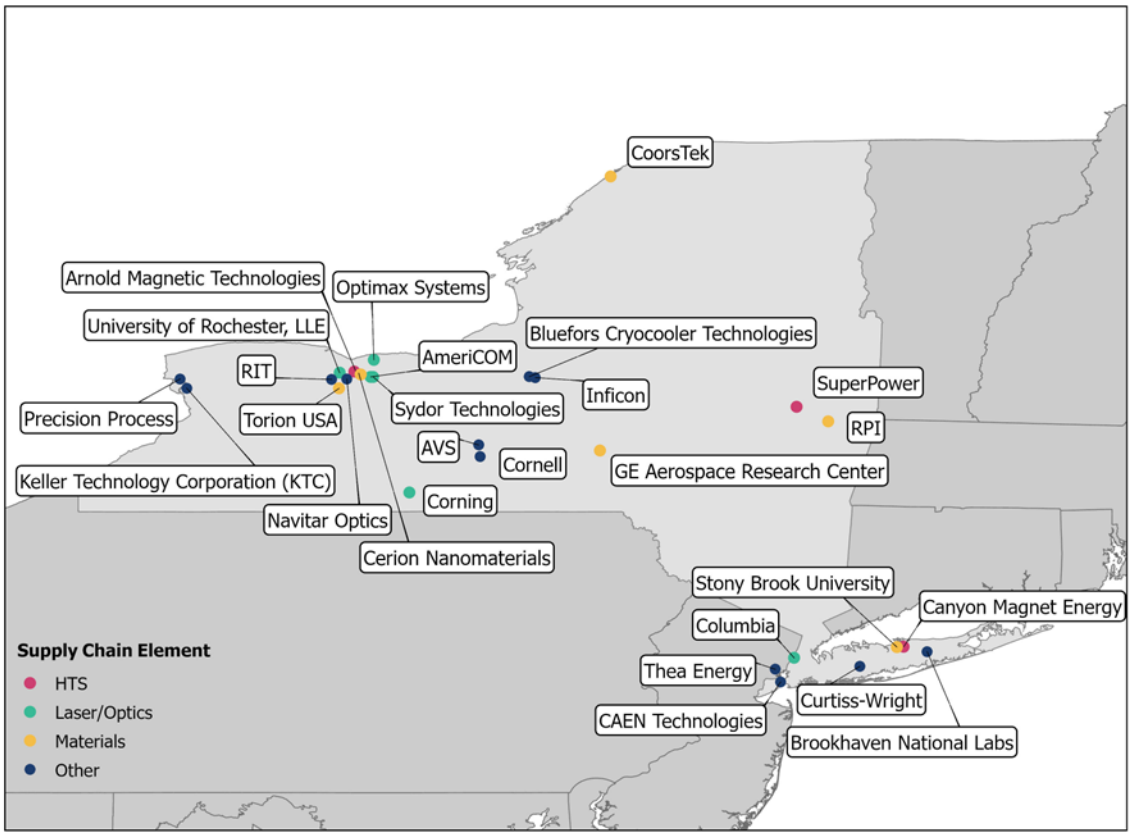
Component	Current NYS Universities, National Labs, and Companies	NYS Strength/ Competitiveness
Precision Vacuum Systems	Univ. of Rochester, LLE AVS Keller Technology Corporation	**Medium**
Radiation-Hardened Electronics & Instrumentation	Rensselaer Polytechnic Institute (RPI) AVS Curtiss-Wright Inficon, Inc.	**Medium**
Heat Exchangers & Thermal Management Systems		**Low**
Tritium Handling & Isotope Processing Systems	Univ. of Rochester, LLE EPRI (roadmap/coordinator) Torion USA	**Medium**
High-Precision Manufacturing & Advanced Machining	Rochester Institute of Technology (RIT) AVS GE Aerospace Research Center Keller Technology Corporation Precision Process Equipment	**Medium-High**
Control Software, Digital Twins & AI Systems	Rensselaer Polytechnic Institute (RPI) Accenture GE Aerospace Research Center	**Medium**
Fusion Machine Developer	Thea Energy* (stellarator)	**Low**

* Based in New Jersey but is included here given the proximity to NYS.

Note that the set of organizations included in Table 14 is likely not exhaustive. Further details on these companies are provided in Appendix G. Geographic distribution of these organizations across New York State is illustrated in Figure 6.

Figure 6. Map of Fusion-Relevant Organizations in New York State

Sources: Created based on publicly listed addresses for each organization.



7.2 Priority Fusion Supply Chain Sectors

Overall, New York State is well positioned to play a significant role in the emerging fusion energy ecosystem by leveraging its existing industrial base, research institutions, and national laboratory infrastructure. It has meaningful strengths in several high-value enabling domains that could support multiple fusion technology pathways and create strong opportunities for the state to participate in and benefit from the fusion supply chain. These strengths are concentrated in:

- High-power lasers and optics
- HTS materials and magnet components
- Advanced structural materials
- Precision manufacturing and vacuum systems

Each of these four areas is discussed in more detail in the following sections, providing a deeper look into the most promising areas.

7.2.1 High-Power Laser and Optical Systems

High-power lasers and precision optics are the primary driver in ICF and are used for diagnostics and plasma measurement, materials testing, and advanced instrumentation across other concepts. The same capabilities serve defense, aerospace, semiconductor manufacturing and medical imaging.

New York Landscape

New York is already nationally and internationally competitive in high-power laser and optical systems, anchored by the University of Rochester's Laboratory for Laser Energetics (LLE), one of the world's leading ICF research institutions and optics programs, operates the OMEGA laser facilities, trains engineers and scientists with in fusion-relevant photonics and plasma diagnostics, and parters with industry.[67] Beyond research, LLE serves as a key workforce development and technology hub for high-power laser systems, training engineers and scientists with direct experience in fusion-relevant photonics and plasma diagnostics. LLE has spun startups out and participated in public-private partnerships – recently entered into a partnership with Focused Energy Inc., a private fusion startup, studying laser-plasma instabilities. This collaboration was awarded a $6.9 million DOE INFUSE grant. The Rochester Institute of Technology (RIT) adds programs in optics, imaging science, photonics, and precision manufacturing. Several non-academic New York State-based organizations in the optics-space working directly on fusion-relevant capabilities, including Sydor Technologies, Optimax Systems, AmeriCOM, Navitar and Corning.[68,69,70,71,72] Together, these institutions and firms provide capabilities in precision optics fabrication, laser system components, advanced imaging, and diagnostic instrumentation.

These fusion-specific activities build on the Rochester region's existing optics and imaging industry, shaped by companies such as Eastman Kodak, Bausch & Lomb, and Xerox, which offers a deep engineering talent base and supplier network. This broader industrial base could position New York State to expand its role in fusion as the industry grows.

Market Applications

Optics and photonics capabilities have broad applications beyond fusion, including defense, aerospace, semiconductor manufacturing, medical imaging, and advanced manufacturing. For this reason, investments in this sector have the potential to be lower risk compared to investments tied to a single fusion design. Even if inertial fusion commercialization timelines extend, the development of laser, imaging, and photonics expertise will likely support adjacent

industries and have the flexibility to have applications across multiple fusion technology pathways.

Opportunities

Where appropriate, supplier readiness and partnership initiatives could support research institutions and in-state manufacturers and encourage optics and photonics companies not currently active in fusion to expand their customer base with fusion-relevant product lines.

7.2.2 High-Temperature Superconducting Wire and Magnet Systems

HTS wire and magnet systems generate the strong magnetic fields needed for plasma confinement in MCF systems. The same technology serves power grids, medical imaging, research magnets, and advanced motors and generators.

New York Landscape

New York has a meaningful foothold in HTS technologies, which are central to next-generation tokamak and compact fusion concepts. This ecosystem is supported by Brookhaven National Laboratory's (BNL) research expertise in superconducting materials and magnet science, SuperPower's globally relevant HTS wire manufacturing presence in Glenville, and companies such as Canyon Magnet Energy and Arnold Magnetics contribute to magnet system development and advanced magnetic components.[73,74,75]

New York State may also have adjacent industrial strengths that could support expansion in HTS manufacturing. For example, advanced materials and glass/ceramic manufacturing expertise in the state may offer long-term opportunities in substrate manufacturing, ribbon ceramics, or other materials relevant to HTS tape production and insulation systems. In addition, Phoenix Tailings recently announced selecting Rochester to build a commercial-scale facility to process mined and recycled feedstock to support domestic rare earth metal production, feedstocks that are critical for HTS tape production.[76] While not currently fusion-specific, these capabilities suggest potential pathways to deepen vertical integration within the HTS supply chain.

Market Applications

New York's advanced materials and glass/ceramic manufacturing expertise may offer long-term opportunities in substrate manufacturing, ribbon ceramics, or other materials relevant to HTS tape production and insulation systems. HTS technologies have applications across multiple

sectors beyond fusion. For example, Rare-earth barium copper oxide (REBCO)-based conductors such as those produced by SuperPower are used in:

- Superconducting power cables and grid modernization projects
- Fault current limiters and grid stabilization systems
- High-field research magnets
- Advanced medical imaging systems
- Superconducting motors and generators for marine, aerospace, and industrial applications

HTS technologies are not required for all fusion technology types, so demand depends on which approaches succeed. While this may introduce some uncertainty regarding the specific role of HTS in the long-term fusion landscape, their applications across multiple sectors beyond fusion, reduce the risk of any HTS investments.

Opportunities

Where appropriate, supplier readiness and partnership initiatives could encourage collaboration between New York wire producers and magnet system integrators, and the development of shared magnet testing and qualification infrastructure. In addition, strategic engagement with adjacent materials and ceramics manufacturers could help incentivize those organizations to work on the development of domestic substrate and insulation capabilities, further strengthening supply chain resilience and positioning New York State for participation in both fusion and non-fusion HTS markets.

7.2.3 Advanced Structural Materials

Advanced structural materials are essential to both advanced fission and fusion. Both sectors need materials that withstand radiation, high temperatures, and corrosion. Fusion environments impose extreme conditions on materials, including high neutron flux, cyclic thermal loading, strong magnetic fields, vacuum compatibility requirements, and, in the case of Deuterium–tritium (D-T) systems, exposure to hydrogen isotopes such as tritium. In fusion, the environment is more extreme, and structural materials must also endure high neutron flux, strong magnetic fields, vacuum compatibility, and resist exposure to tritium. These requirements apply to first-wall and blanket structures, vacuum vessels, cryostat components, support frames, high-field magnet structures, and fuel-handling systems.

New York Landscape

New York has a strong base of materials science research and advanced materials manufacturing capabilities. RPI, Stony Brook University and BNL are advancing research in material performance under radiation and extreme conditions.[77,78,79] New York does not host high-flux neutron irradiation facilities like those at Oak Ridge and Idaho National Laboratories, so researchers rely on national laboratory partners for full materials qualification.

Arnold Magnetic Technologies produces high-performance magnetic materials and specialty alloys used in aerospace, defense, and industrial applications that could be applied to fusion. CoorsTek produces engineered ceramic materials used in extreme environments across energy, defense, and industrial applications and is collaborating to develop components for fusion systems.[80] Corning and other major materials manufacturers add considerable experience in ceramics, high-temperature materials design, thermal stability engineering, corrosion resistance, and precision ceramic manufacturing.[81]

Market Applications

High-temperature structural alloys, hydrogen embrittlement mitigation, advanced ceramic fabrication, vacuum-compatible large-scale assemblies, and advanced manufacturing qualification methods —both adapted from fission and developed to address fusion-specific conditions—have applications beyond fusion. Investments in these enabling domains could support fusion development while also strengthening capabilities relevant to advanced fission systems, including high-temperature operation, radiation-tolerant materials, and qualification of advanced manufacturing for safety-critical components in next-generation reactors (e.g., sodium-, gas-, and molten salt–cooled designs). These capabilities also extend to aerospace, hydrogen infrastructure, and semiconductor manufacturing.[82] Because nearly all fusion concepts need these capabilities as well, making investment in advanced structural materials represents one of the lower-risk pathways within the fusion ecosystem.

Opportunities

Where appropriate, state initiatives could support expanded materials R&D collaborations between universities and industry, funding pilot-scale materials processing and qualification facilities, or facilitating cost-shared access to national laboratory irradiation infrastructure. Support for advanced ceramics and alloy manufacturing scale-up, weld qualification programs, and tritium-compatible materials testing could further position New York State firms to compete for fusion and non-fusion supply chain opportunities. In addition, coordinated engagement with large in-state materials manufacturers could help evaluate the feasibility of adapting existing

high-temperature and precision-processing capabilities to fusion-relevant applications, strengthening both fusion readiness and cross-sector industrial competitiveness.

7.2.4 Advanced Precision Manufacturing and Vacuum Systems

Fusion facilities require large-scale, high-tolerance mechanical assemblies, vacuum chambers, structural frames, cryostat housings, beamline hardware, and cleanroom-integrated subsystems. These components must meet stringent specifications for dimensional accuracy, weld integrity, surface finish, contamination control, and documentation traceability. These capabilities are not unique to fusion – the same precision fabrication, welding and quality assurance are essential for fission reactor components and many other industries.

New York Landscape

New York has a strong foundation in advanced precision manufacturing and vacuum-compatible fabrication that is directly relevant to fusion systems. Keller Technology Corporation supports high-specification industrial sectors including energy, aerospace, and advanced manufacturing and have provided components for fusion research labs, including the International Thermonuclear Experimental Reactor (ITER), a multi-national collaborative effort to demonstrate a large MCF device.[83]

New York's advanced manufacturing ecosystem—particularly in the Capital District and Western New York State—includes precision machining firms, specialty metal fabricators, semiconductor equipment suppliers, and aerospace-grade manufacturers. The State's semiconductor and nanotechnology infrastructure offers additional capabilities in vacuum engineering, clean assembly, materials characterization, and tightly controlled process environments that align with fusion system requirements. New York's aerospace and defense manufacturing base, including firms such as Moog Inc., Howmet Aerospace, Curtiss-Wright, specialize in high-performance alloys, precision machining, advanced welding, cryogenic systems, and extreme-environment component qualification that could translate directly to fusion plant subsystems.

Market Applications

Precision manufacturing and vacuum systems are required across nearly all fusion concepts, regardless of whether magnetic confinement or inertial approaches ultimately dominate. As such, investments in this sector are less dependent on a single technological pathway. Advanced precision manufacturing has broad applications beyond fusion, including semiconductor

fabrication equipment, aerospace systems, energy infrastructure, defense platforms, and advanced research facilities.

Opportunities

New York's cross-sector industrial base could be strengthened at the same time as its fusion capabilities through initiatives that support investments in vacuum fabrication capability, cleanroom assembly standards, weld qualification, metrology capacity, and workforce training.

7.3 Tritium Fuel Cycle

Most fusion concepts under development use a fuel made of deuterium and tritium, a radioactive form of hydrogen. Commercial fusion plants will need systems to safely store, process, recover and eventually breed tritium. While New York's tritium capabilities are less developed than its leading strengths in the areas discussed in the previous section, the state has a notable base of specialized expertise in tritium handling and processing that could become increasingly valuable as fusion developers progress toward deuterium-tritium operation. This expertise is particularly relevant because tritium fuel-cycle integration remains an active area of development across the fusion industry. Although many of the underlying technologies for storing, transferring, monitoring, and recovering tritium are well established, commercial fusion will require these systems to be integrated with reactor-specific materials, breeding systems, process streams, and operating conditions.

New York State has specialized private-sector tritium expertise through Torion USA, which designs and supplies tritium handling and processing systems for fusion applications, and Tritium Solutions, Inc., specializes in the development and design of tritium fuel cycles in fusion systems. Both forms are based in the Rochester area.[84] The University of Rochester also provides relevant tritium-handling experience through its fusion research activities. While the scale and operating profile of this work differ from those of a future commercial fusion power plant, the underlying technical and safety expertise represents an in-state capability that could support future research, workforce development, regulator training, and industry partnerships.

7.4 State-Level Initiatives

As fusion moves toward commercialization, several states are beginning to adopt policies aimed at developing the industrial and workforce capabilities to support a future fusion industry. These efforts generally fall into three categories:

- Making fusion and fusion-component manufacturing explicitly eligible for existing clean-energy or advanced-manufacturing incentives
- Creating fusion-specific financial support for research, manufacturing, or commercialization
- Investing in workforce and advanced-manufacturing capabilities that can serve fusion alongside adjacent industries.

More states are also recognizing that fusion commercialization will depend on industrial capabilities and workforce readiness, not just reactor development. Many of these capabilities overlap with those required for advanced nuclear fission systems and related industries, suggesting opportunities to leverage and adapt existing workforce development pathways. Common approaches include:

- Supporting industries relevant to fusion (e.g., superconductors, photonics, advanced manufacturing)
- Expanding workforce training in adjacent technical fields
- Leveraging existing industrial clusters rather than building new ones from scratch

Emerging approaches in California, New Mexico and Wisconsin demonstrate that support for a fusion supply chain does not necessarily require creation of a wholly new incentive structure.[85,86,87] By explicitly including fusion in existing clean-energy and advanced-manufacturing programs, a state can provide targeted tax relief for fusion-related capital investment or use broader economic-development grants to attract and expand fusion manufacturers. While supply chains can develop along with global fusion efforts, co-location with a pilot or demonstration facility could provide in-state companies with earlier and more direct access to component qualification, iterative design cycles, and long-term procurement opportunities. States that have adopted these approaches have seen subsequent siting of fusion R&D facilities and proposed pilot plants. This approach may be particularly useful given the overlap between fusion supply-chain requirements and existing industries such as advanced manufacturing, superconducting technologies, photonics, precision machining, power electronics, and advanced materials, as well as New York State's existing manufacturing, R&D, and clean energy incentive programs.

7.5 Findings and Conclusion

New York State has meaningful comparative strengths in several cross-cutting portions of the fusion supply chain. New York State's existing research institutions, advanced manufacturing capabilities, and laser-fusion assets provide potential points of alignment with fusion technology development, particularly in areas such as high-power lasers and optics, high-

temperature superconducting materials and magnet components, advanced structural materials, and precision manufacturing. These capabilities may be relevant even before fusion reaches grid-scale deployment and create strong opportunities for the State to participate in and build up the fusion supply chain.

The strongest near-term opportunities are those with value across all fusion technology concepts, and that benefit both nuclear fission and fusion, as well as adjacent industries. There is still uncertainty around which fusion concepts will achieve large-scale deployment and when fusion will be commercially viable. The most resilient and low risk economic opportunities lie in supply chain areas that support multiple competing fusion approaches. Equally, although fusion and fission differ in their underlying physics, fuel cycles, and regulatory treatment, there is alignment in the industrial capabilities and workforce needed to support advanced nuclear deployment. For New York State, this crossover creates an opportunity to invest in capabilities that are relevant to both near-term advanced fission activity and longer-term fusion commercialization. Early investments in supply chain opportunities that deliver value across technologies and industries can strengthen New York State's role in the broader fusion ecosystem and in adjacent sectors such as advanced fission, aerospace, semiconductors, hydrogen infrastructure, defense, and scientific research.

Conclusion:

- **Develop a strategy to support sectors of the fusion supply chain that offer value across fusion, fission and other industries; if appropriate, extend eligibility of nuclear supply chain initiatives to include fusion.**

Acronyms and Abbreviations

ASME	American Society of Mechanical Engineers
BNL	Brookhaven National Laboratory
BOP	balance of plant
BW Research	BW Research Partnership, Inc.
DOE	U.S. Department of Energy
DOT	New York State Department of Transportation
DPS	New York State Department of Public Service
EPC	engineering, procurement, and construction
FOAK	first-of-a-kind
Gen III+	Generation III+ reactor
Gen IV	Generation IV reactor
HALEU	high-assay low-enriched uranium
HTGR	high-temperature gas-cooled reactor
HTS	High-Temperature Superconducting Wire
I&C	instrumentation and control
ICF	inertial confinement fusion
INL	Idaho National Laboratory
ISO	International Organization for Standardization
ITER	International Thermonuclear Experimental Reactor
LANCE	Louisiana Advanced Nuclear Competitive Edge
LANE	Louisiana Advanced Nuclear Exploration
LLE	University of Rochester's Laboratory for Laser Energetics
LLWR	large light-water reactor
LQ	location quotient
LWR	light-water reactor
lwSMR	light-water small modular reactor
Master Plan	"Master Plan for Responsible Advanced Nuclear Development in New York"
MCF	magnetic confinement fusion
MIF	magneto-inertial fusion

MOU	memorandum of understanding
NAICS	North American Industry Classification System
NASEO	the National Association of State Energy Officials
NDE	nondestructive evaluation
NQA-1	Nuclear Quality Assurance-1
NQSA	Nuclear Quality Standard Association
NRC	U.S. Nuclear Regulatory Commission
NYPA	New York Power Authority
NYSERDA	New York State Energy Research and Development Authority
O&M	operations and maintenance
OEM	original equipment manufacturer
PJM	Pennsylvania-New Jersey-Maryland Interconnection
QA	quality assurance
QC	quality control
REBCO	Rare-earth barium copper oxide
RFP	request for proposal
RFQ	request for quotation
RIT	Rochester Institute of Technology
SFR	sodium-cooled fast reactor
SMR	small modular reactor
TANEO	Texas Advanced Nuclear Energy Office
TNECD	Tennessee Department of Economic and Community Development
TRISO	tri-structural isotropic fuel
TVA	Tennessee Valley Authority
WVDP	West Valley Demonstration Project

Appendix A. Stakeholder Input - Survey

The analysis sent surveys to approximately 600 randomly selected firms across New York State working in the nuclear sector and those adjacent to the nuclear sector to assess their interest in offering products or services to the nuclear industry and to understand existing barriers, perceived opportunities, and challenges they face in considering nuclear-related activities. The survey sample included New York State firms currently operating in the nuclear industry, as well as a broader set of non-nuclear firms from manufacturing, construction, professional and business services, wholesale trade, and transportation industries relevant to nuclear. The survey gathered responses from 218 stakeholders, of which:

- 128 full responses from New York firms.
- 64 respondents terminated early as they reported no interest in offering products or services to the nuclear industry.
- 26 partial responses from respondents who completed at least half of the survey, totaling 154 responses considered in this effort.

Of the firms responding:

- 44 firms currently support the nuclear industry.
- 15 firms previously involved in the nuclear supply chain, but not currently.
- 131 firms that had never been involved with the nuclear industry.
- 25 firms that are not aware of the products or services that support the nuclear industry.

A.1 Stakeholder Feedback

- **A large share of firms are unaware of existing opportunities to support the nuclear supply chain, largely due to limited access to clear and relevant nuclear industry information.** Finding relevant information about the nuclear industry was the most cited challenge (72%) among respondents (Figure A-11).
- **Nuclear-specific workforce experience and certification requirements are major obstacles.** At least three-fifths of firms reported challenges related to workforce experience in the nuclear industry (63%) and obtaining nuclear industry certifications (60%) (Figure A-11). Firms lack clarity about the pathways to nuclear certification, which delays their entry into nuclear activities and creates a significant barrier to entry (Figure A-13).
- **A majority of firms that know of the opportunities in nuclear report that they can easily adapt their current products and services to the needs of the nuclear**

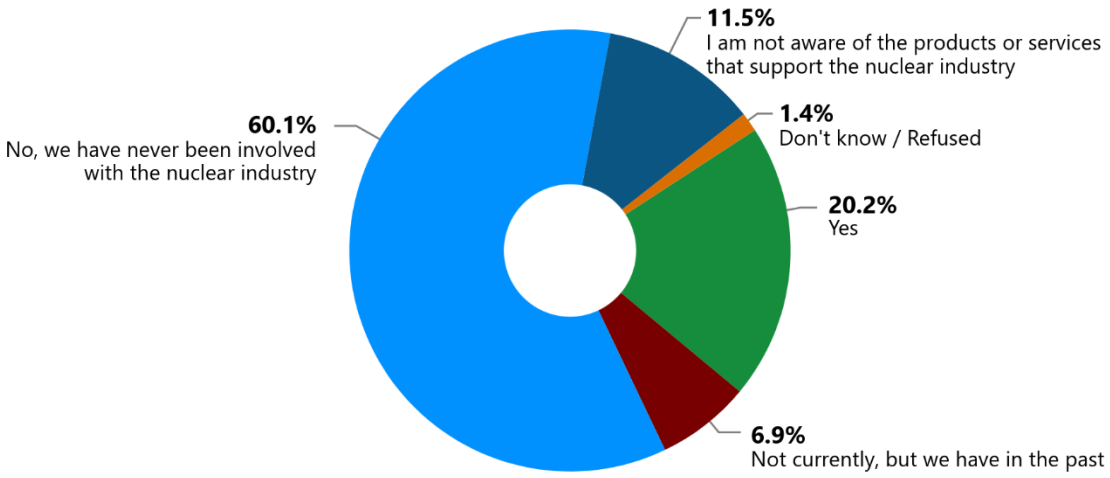
industry (84% of these firms). Several of these firms also see New York's nuclear industry as an opportunity for revenue growth (86%) or as a strategy to gain a competitive advantage (75%) (Figure A-10).

- **For manufacturers, the main challenge in supplying the nuclear industry is the capital investment required to expand their facilities.** More than half of the manufacturing firms (55%) cited the costs of a facility expansion as a challenge to join the nuclear supply chain (Figure A-12).
- **Clear regulatory and certification guidance is the most critical support firms need.** Firms reported the need for further guidance as the single biggest impediment to supplying to the nuclear industry (Figure A-16).
- **Workforce development support is important for firms to begin or continue offering products or services to the nuclear industry.** A large share of firms demonstrated the importance of education and training programs to support future workers (78%) and current workers (77%) in joining or continuing in the nuclear supply chain (Figure A-15).
- **Funding for workforce programs is an important lever to attract firms to the nuclear industry.** A large share of firms reported a strong interest in programs that reimburse the cost of additional training or certification (83%), as well as state guidance on nuclear-specific training programs (79%), and partnerships with local colleges and technical schools (70%) (Figure A-18).

A.2 Respondent Profile

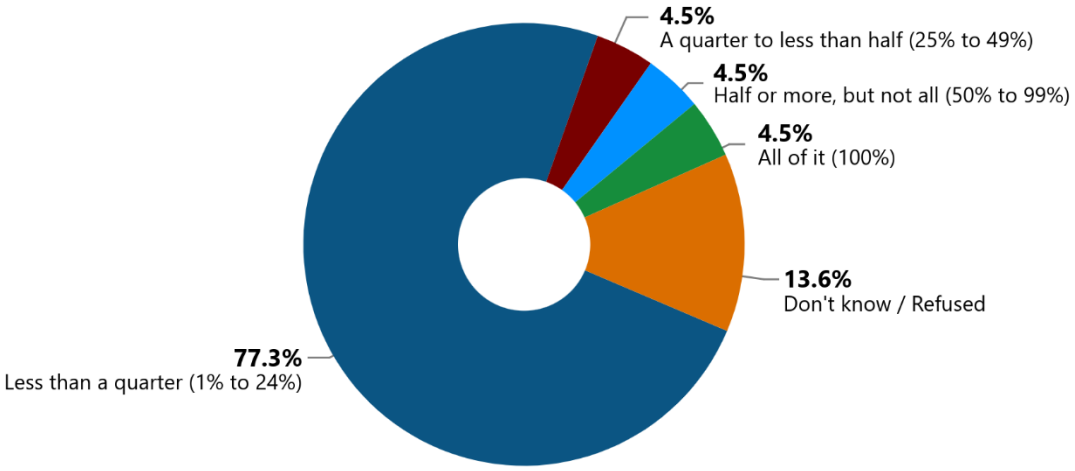
One-fifth (20%) of survey respondents currently offer products or services to the nuclear industry. However, the majority of respondents (60%) have never been involved in the nuclear industry, and 7% are not currently involved but were in the past (Figure A-1).

Figure A-1. Firms Currently Involved with the Nuclear Supply Chain Industry



Among firms currently offering products or services to the nuclear industry, about three-quarters (77%) reported that less than a quarter of their revenue comes from supporting nuclear (Figure A-2). None of the responding firms derives its revenue solely from the nuclear industry.

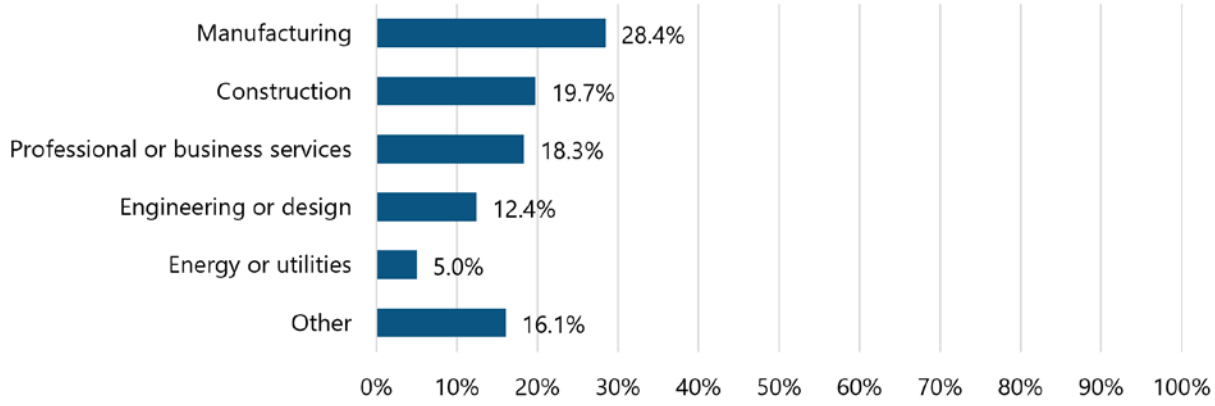
Figure A-2. Share of Total Gross Revenue Related to Products or Services that Support the Nuclear Industry



Most of the surveyed firms are in the manufacturing (28%), construction (20%), and professional or business services (18%) industries (Figure A-3).

Figure A-3. Firms' Industry Focus

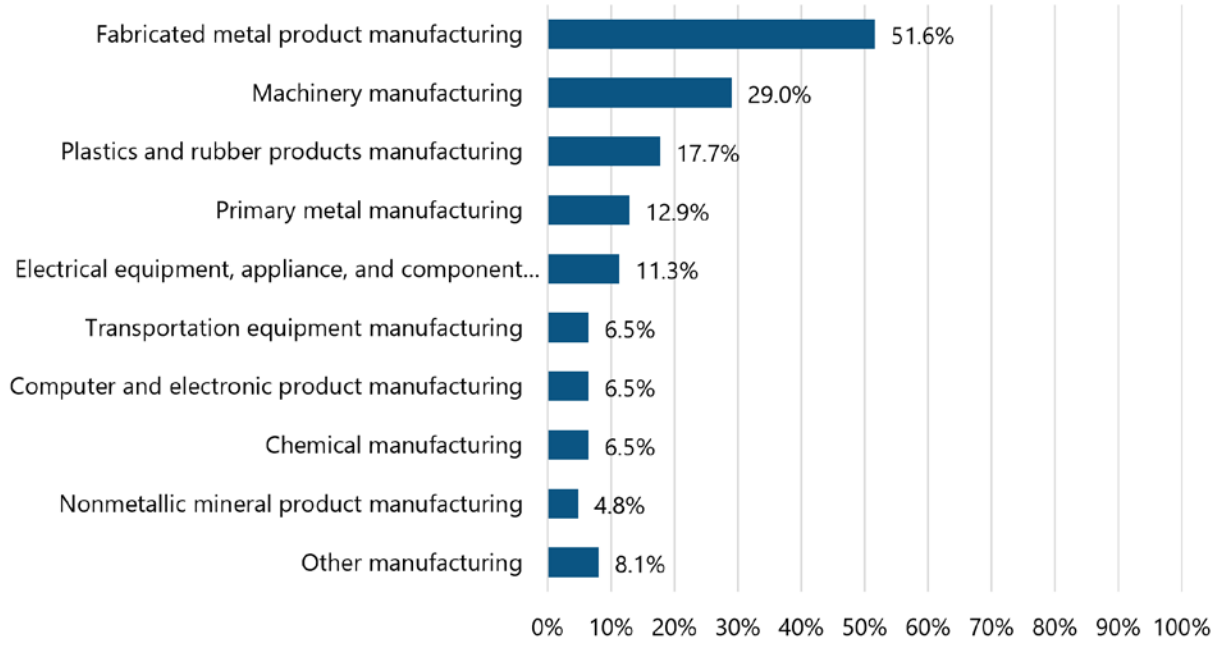
Note: The "Other" category includes finance, insurance, or real estate (4%), Information and Communications Technology (ICT) (4%), wholesale trade (2%), transportation and logistics (1%), and other industries (6%).



Among these manufacturing firms, more than half (52%) are involved in fabricated metal product manufacturing, and about a third (29%) are in machinery manufacturing (Figure A-4).

Figure A-4. Manufacturing Focus

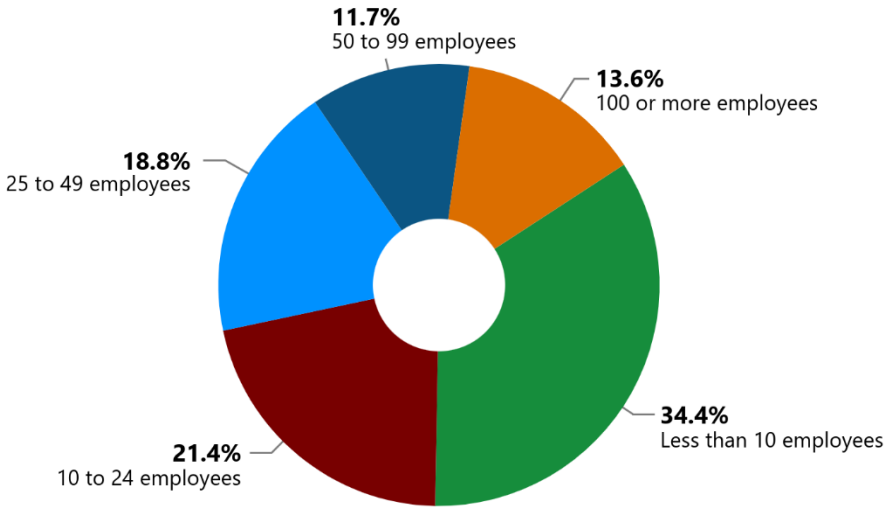
Note: Multiple responses permitted; percentages may sum to more than 100%.



The median self-reported size of all surveyed firms is 15 employees, and on average, they

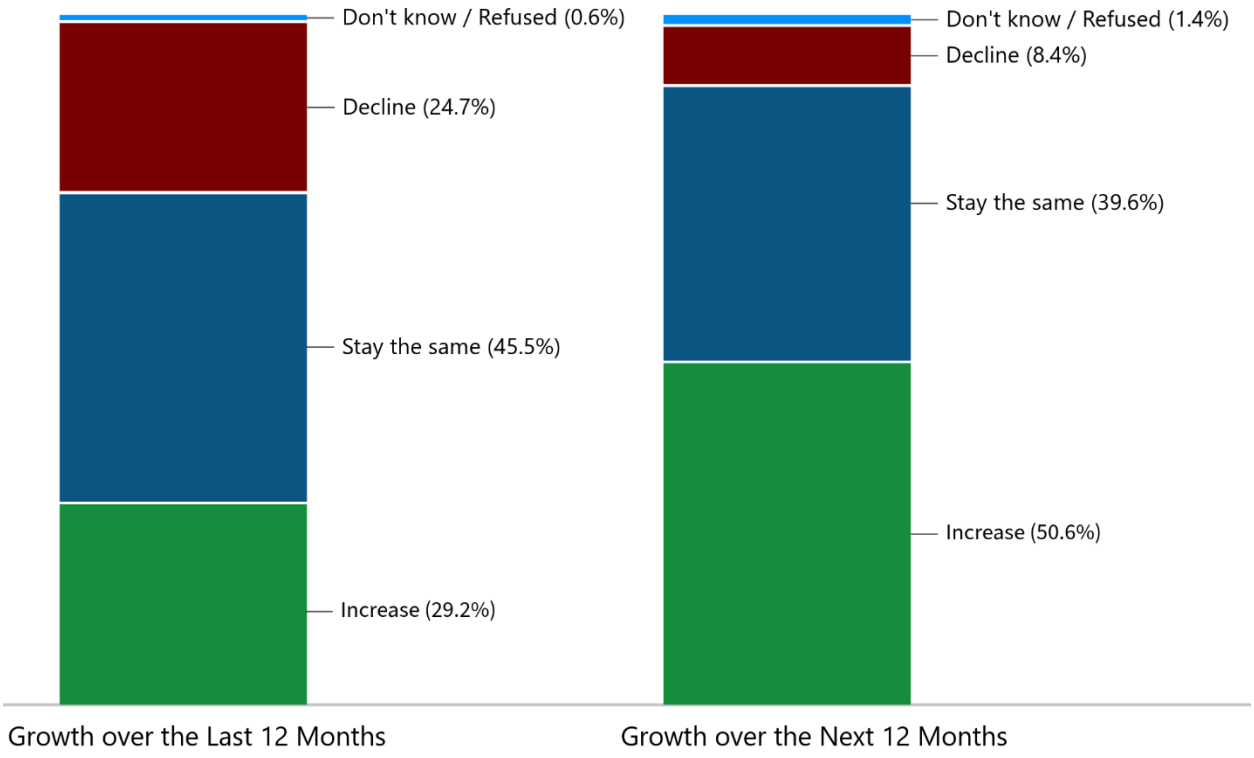
employ 42 workers. More than half (56%) of firms had fewer than 25 employees, including 34% of firms with fewer than 10 employees and 21% with 10 to 24 employees. Approximately a quarter of respondents (25%) had 50 or more employees, and 14% were large firms with 100 or more employees (Figure A-5).

Figure A-5. Number of Employees by Firm



Less than a third (29%) of firms reported an increase in their workforce in the last 12 months. However, half (51%) of them expect their number of employees to grow over the next 12 months (Figure A-6).

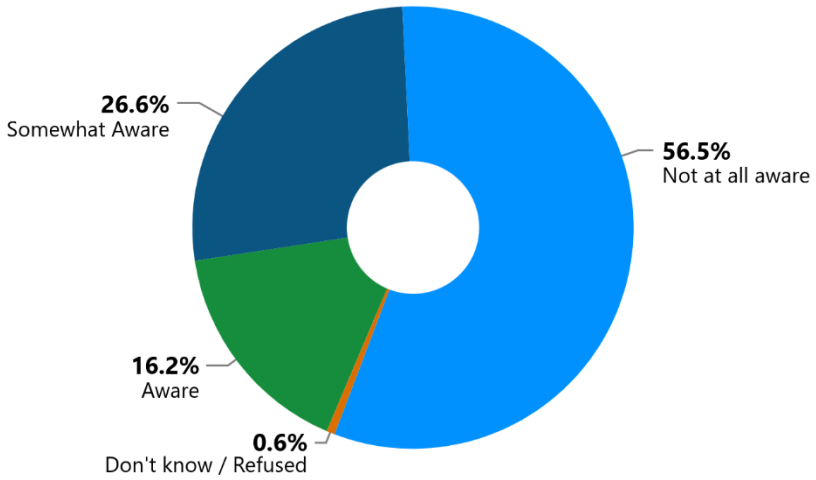
Figure A-6. Past and Expected Growth in Employment



A.3 Perception of Opportunity

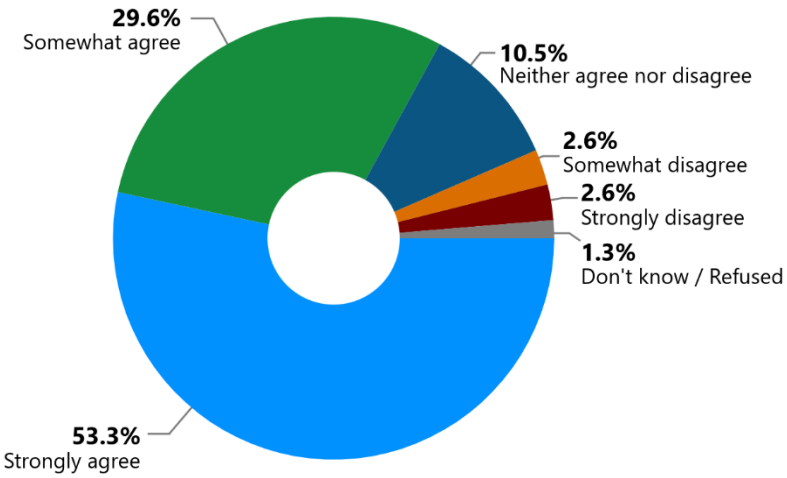
More than half (56%) of respondents reported not being aware of the opportunities to offer products or services to support the nuclear supply chain industry. A quarter (27%) of firms reported being somewhat aware of opportunities in the nuclear supply chain. Only one in six (16%) firms reported being aware of opportunities to support nuclear activities (Figure A-7).

Figure A-7. Awareness of the Opportunities in the Nuclear Supply Chain Industry



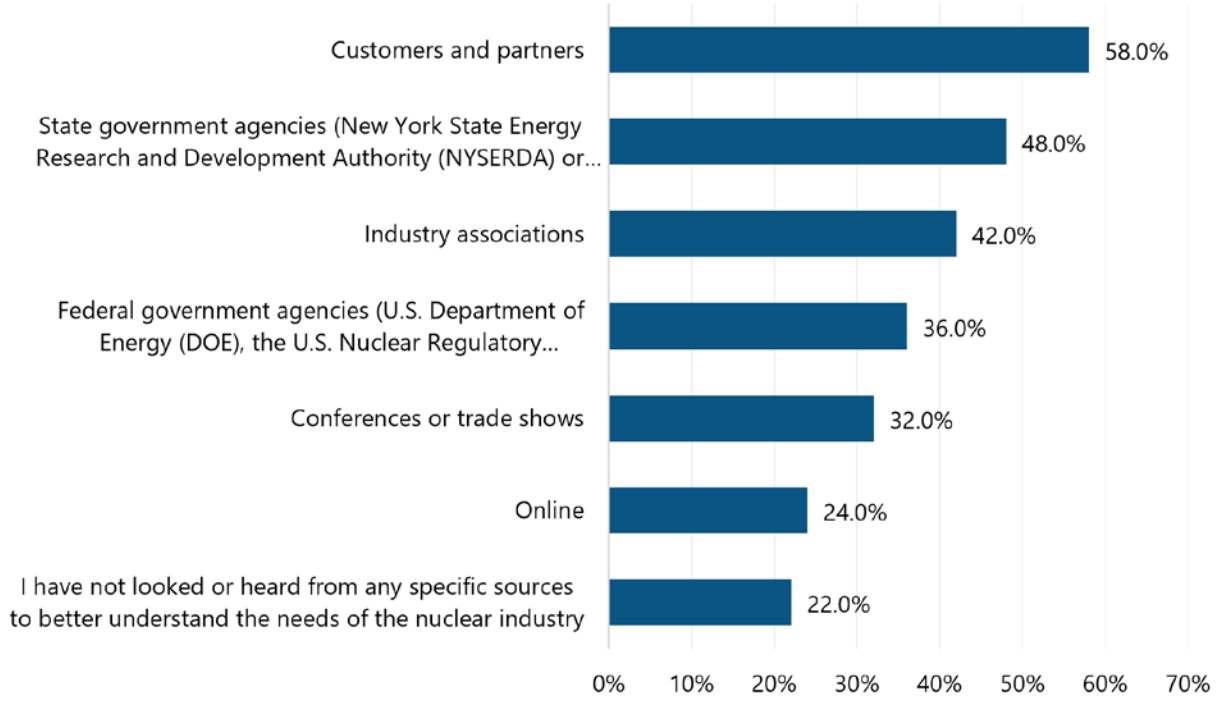
There is significant interest in exploring ways to support the nuclear supply chain, despite limited awareness of opportunities. Over half (53%) of respondents strongly agreed with the following statement: "We are not aware of opportunities to support the nuclear industry, but if there is something our location could provide, we would like to know", and 30% somewhat agree (Figure A-8).

Figure A-8. Firms Not Aware of Opportunities to Support Nuclear, But Would Like More Information



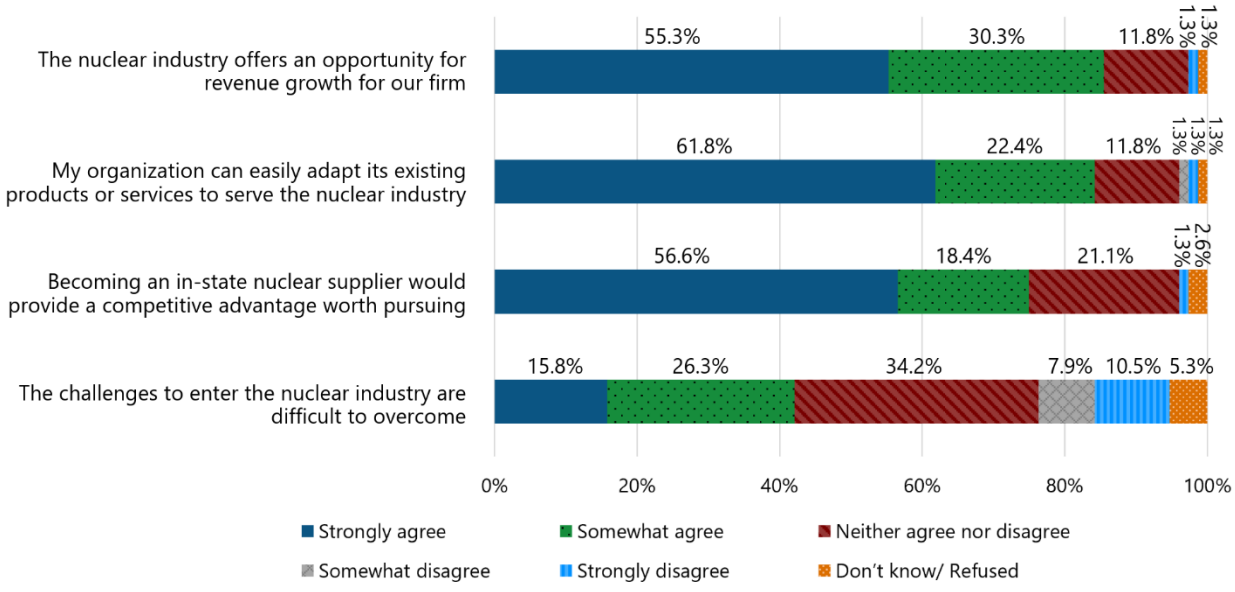
Among firm representatives aware of opportunities to support the nuclear supply chain, most (58%) reported learning about them from customers or partners. Nearly half (48%) received this information from state government agencies and authorities such as NYSERDA or NYPA, and about two-fifths (42%) from industry associations (Figure A-9).

Figure A-9. Sources to Find Information on the Nuclear Supply Chain Industry



The majority of firms (86%) agree (strongly or somewhat agree) that the nuclear industry offers an opportunity for revenue growth for their firms, and three-quarters (75%) see it as a comparative advantage worth pursuing. However, over two-fifths (42%) of firms agree that the challenges to entering the nuclear industry are difficult to overcome (Figure A-10).

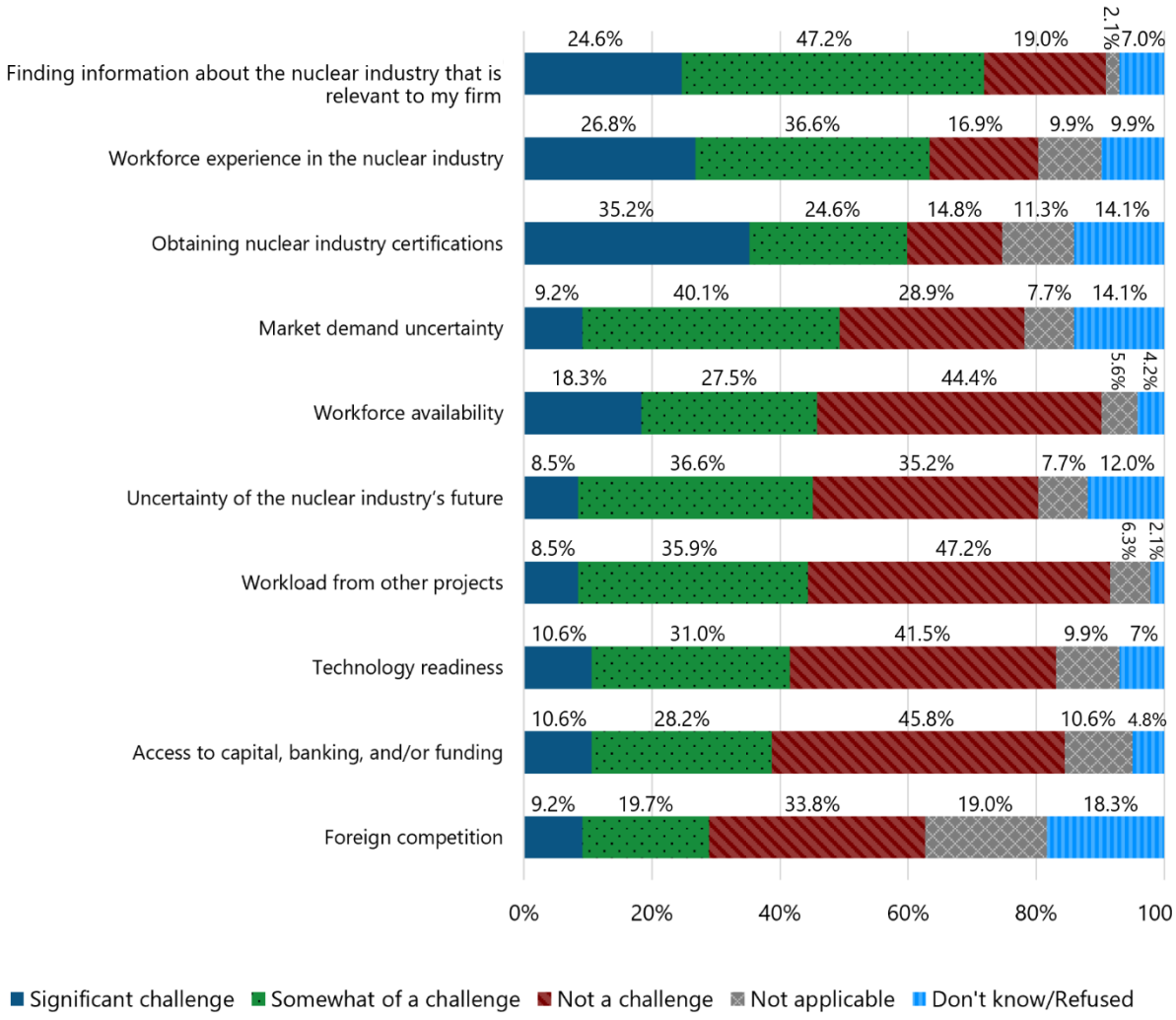
Figure A-10. Agreement with Statements Regarding Nuclear Industry



A.4 Barriers and Certifications

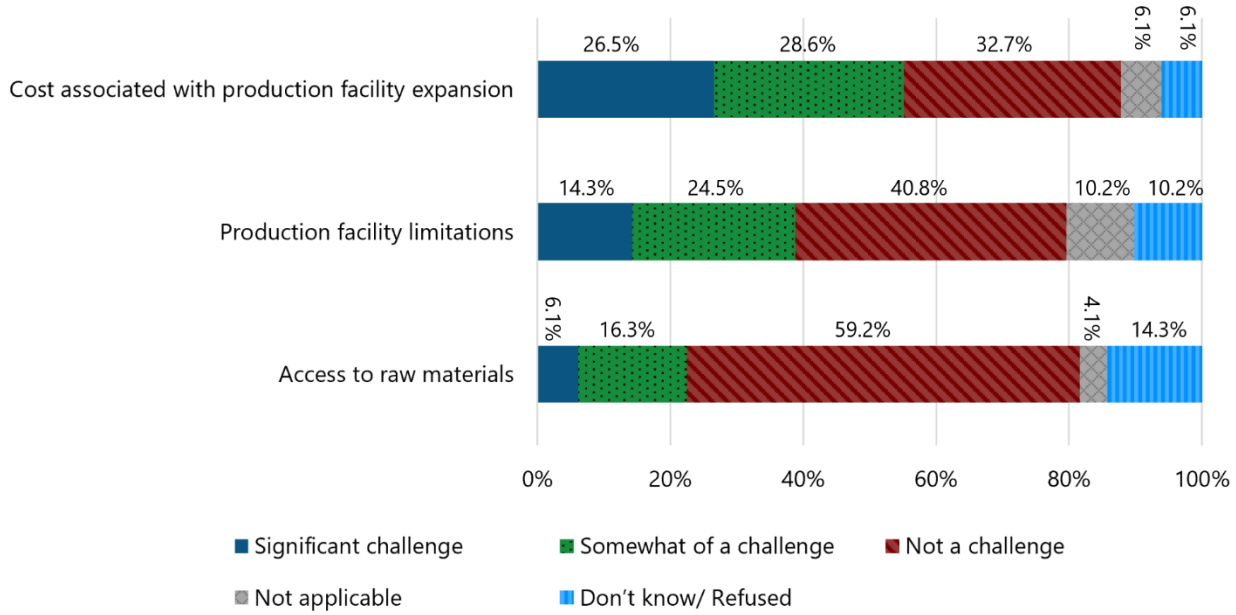
Access to relevant information, nuclear-specific workforce experience, and certification requirements were the most frequently cited challenges for firms seeking to enter or continue offering products or services to support the nuclear industry. Finding information relevant to firms about the nuclear industry was the most cited challenge (72%), followed by workforce experience in the nuclear industry (63%) and obtaining nuclear industry certifications (60%). Market demand uncertainty and concerns over the future of the nuclear industry were also challenging areas, with half (49%) of respondents reporting market demand uncertainty as a challenge and 45% reporting uncertainty of the nuclear industry's future as a challenge (Figure A-11).

Figure A-11. Challenges with Beginning or Continuing to Offer Products or Services to the Nuclear Supply Chain Industry



More than half of manufacturing respondents (55%) reported that the costs associated with production facility expansion were a challenge (significant and somewhat significant challenge). Just under two-fifths (39%) reported production facility limitations as a challenge, and nearly three-in-five (59%) reported that access to raw materials was not a challenge (Figure A-12).

Figure A-12. Manufacturers' Challenges with Offering Products or Services to the Nuclear Industry



Nuclear industry-specific certifications are a major barrier, driven by a lack of clarity about what certifications are required and where to obtain them. Nearly half (48%) of respondents disagreed with the statement that they know where to go to obtain nuclear industry certifications (Figure A-13). In addition, over two-fifths (43%) disagreed with the statement that they know what certifications are required to offer products or services to the nuclear industry. Reflecting these gaps, nearly four in five firms reported not holding any nuclear industry-specific certifications (Figure A-14).

Figure A-13. Agreement with Statements Regarding Nuclear Industry-Specific Certifications

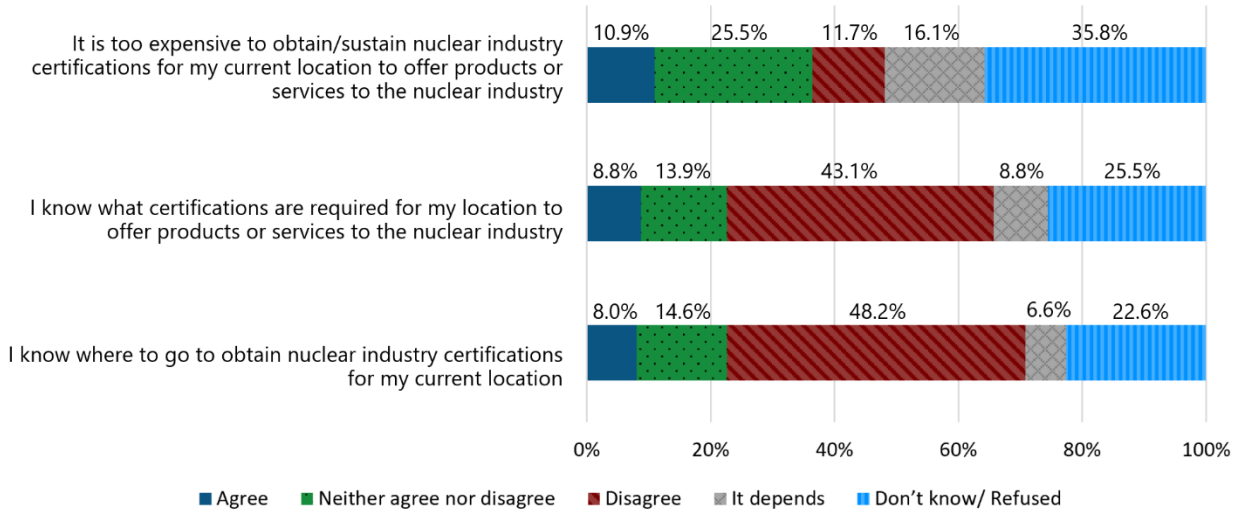
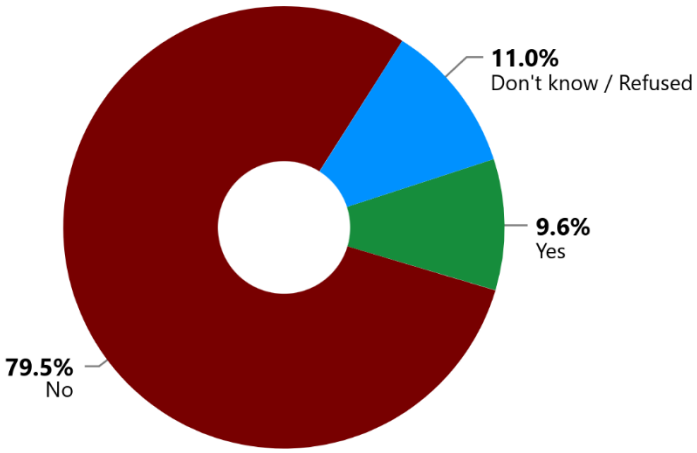


Figure A-14. Current Location's Nuclear Industry-Specific Certifications



A.5 Support and Guidance

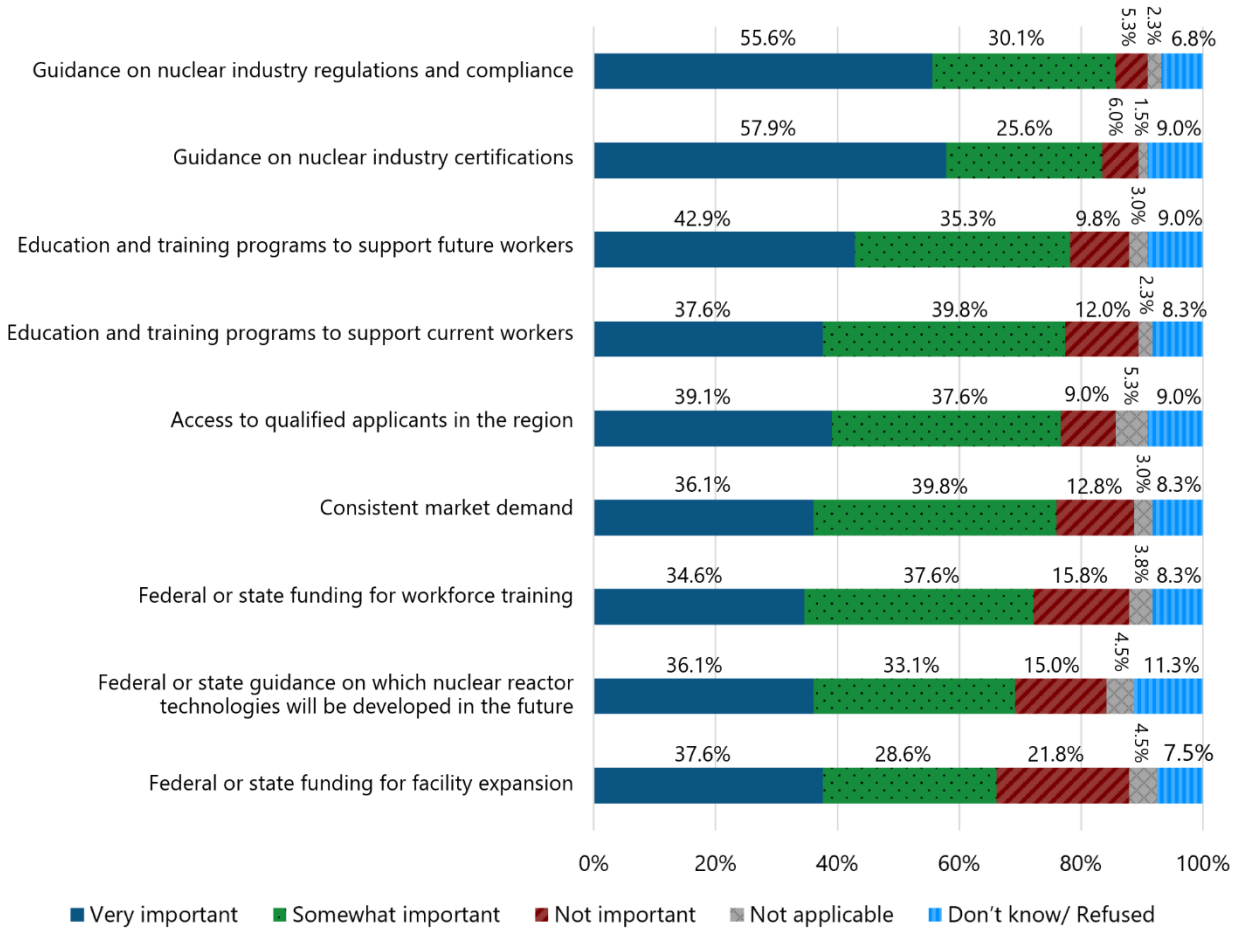
Firms reported the importance of clear guidance, workforce training, and predictable market conditions to support their entry into or continued offering of products or services to the nuclear industry. Guidance on nuclear industry regulations and compliance (86%) and on nuclear industry certifications (83%) were the two most frequently cited forms of support needed to begin or continue offering products or services to the nuclear supply chain industry (Figure A-15).

Workforce development emerged as another major priority. Nearly four-in-five firms reported education and training programs to support future workers (78%) and current workers

(77%) as important (very important and somewhat important). In addition, 72% also reported that federal or state funding for workforce training was important (Figure A-15).

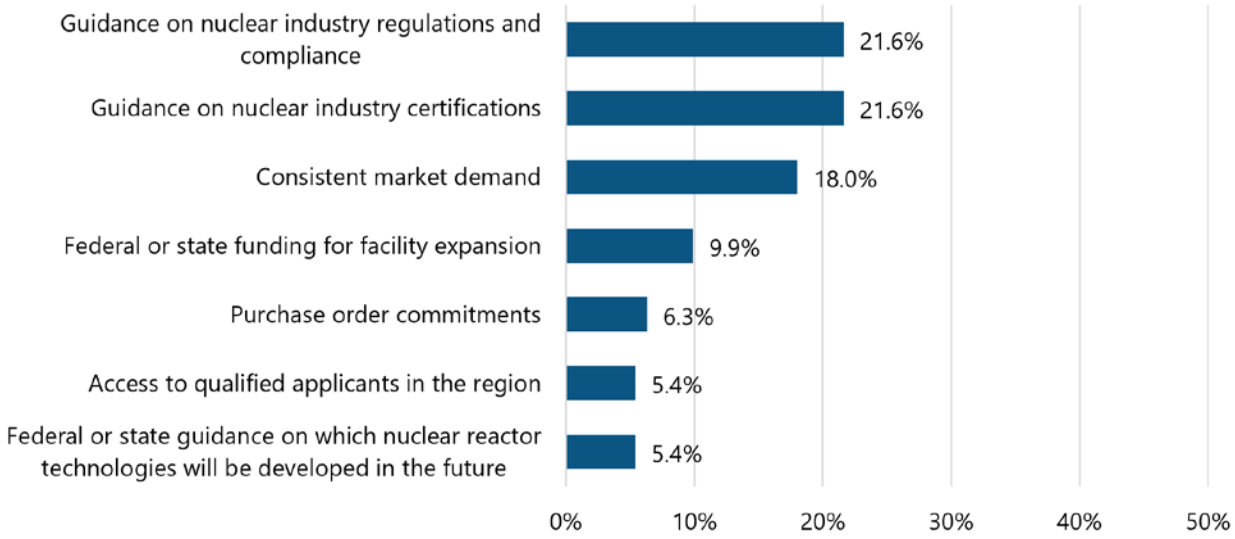
Market stability is crucial for firms to enter or continue offering products or services to the nuclear supply chain industry. Three-quarters (76%) of respondents cited consistent market demand as important, and an additional 69% reported that federal or state guidance on which nuclear reactor technologies will be developed in the future is important (Figure A-15).

Figure A-15. Support Needed to Begin or Continue Offering Products or Services to the Nuclear Industry



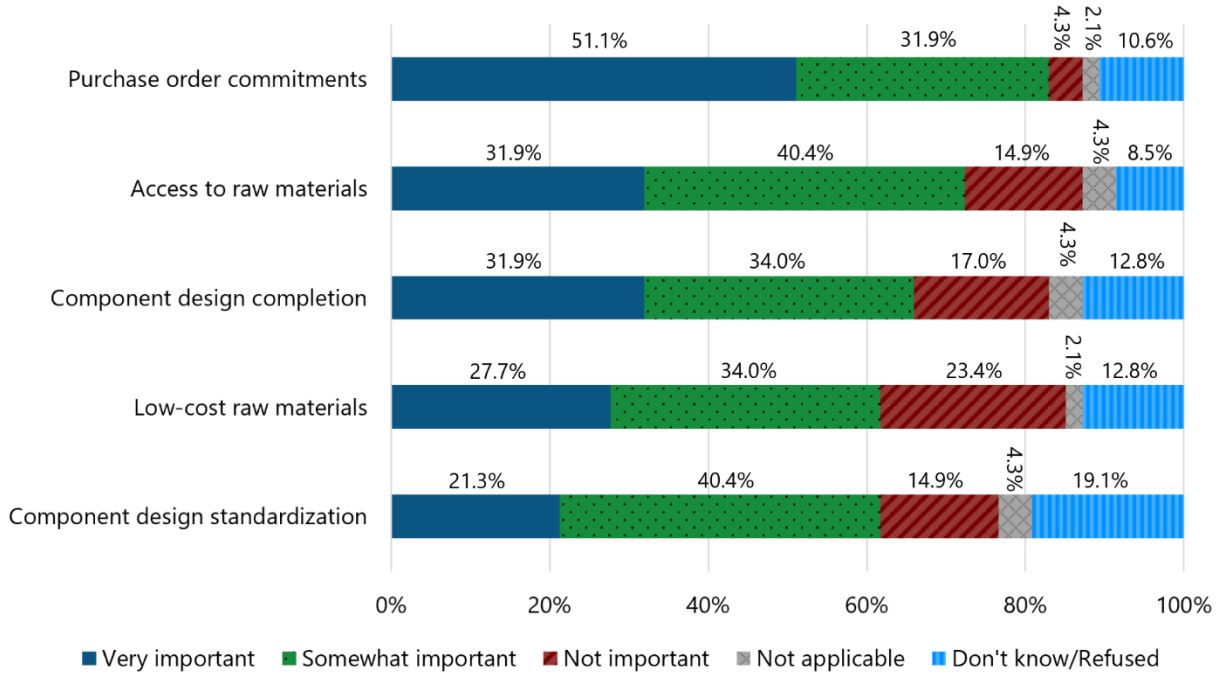
When asked which type of support is most critical for beginning or continuing to offer products or services to the nuclear supply chain industry, respondents most frequently cited guidance on nuclear industry regulations and compliance, and guidance on nuclear industry certifications, with each cited by 22% of respondents. Consistent market demand followed, with just under one-in-five (18%) of respondents reporting this as the most critical support needed (Figure A-16).

Figure A-16. Most Critical Support Needed to Begin or Continue Offering Products or Services to the Nuclear Industry



Purchase order commitments are critical to manufacturers. Over four-fifths (83%) of manufacturing firms reported that purchase order commitments were important (very important and somewhat important), and about three-quarters (72%) cited the importance of access to raw materials. In addition, two-thirds of manufacturers reported component design completion (66%) and component design standardization (62%) as important (Figure A-17).

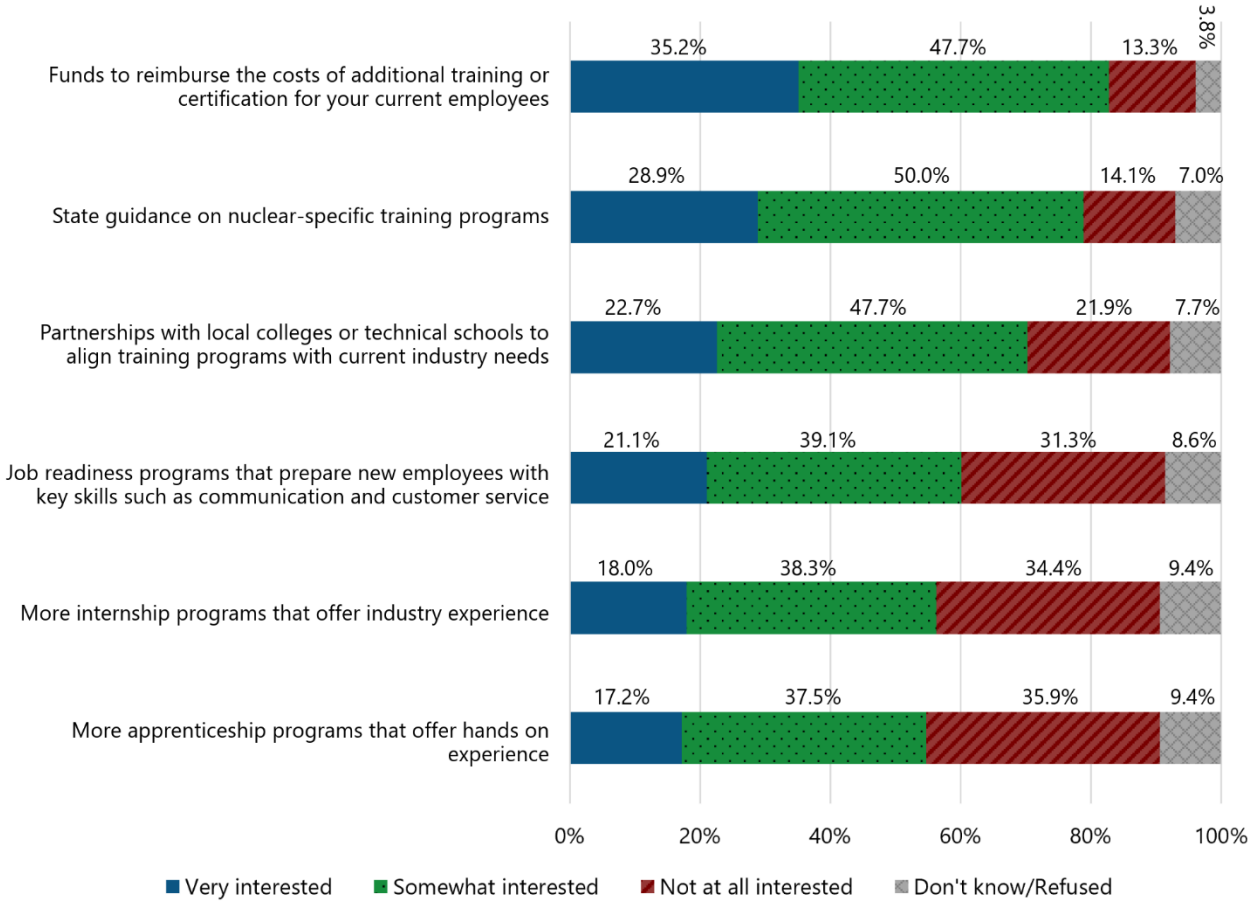
Figure A-17. Support Needed to Begin or Continue Offering Products or Services to the Nuclear Industry for Manufacturers



A.6 Interest in Programs to Support Workforce Needs

Firms showed the greatest interest in programs that reimburse the costs of additional training or certifications and clear state guidance on nuclear-specific training programs to support workforce needs. Funds to reimburse the cost of additional training or certifications for current employees (83%) and state guidance on nuclear-specific training programs (79%) were the two programs firms were most interested in (very interested and somewhat interested). Firms also demonstrated a strong interest in developing partnerships with local colleges or technical schools to align training programs with current industry needs (70%) (Figure A-18).

Figure A-18. Interest in the Following Programs to Support Workforce Needs



Appendix B. Stakeholder Input - Interviews

Firms across New York State were interviewed to assess their interest in offering products or services to the nuclear industry and to understand existing barriers, perceived opportunities, and challenges.

Nineteen stakeholders across 11 organizations involved in the nuclear supply chain were interviewed, with a concentration in reactor design and fabrication, component and fuel manufacturing, and nuclear-specific workforce and economic research. The main areas of discussion were:

- Expected demand growth and pipeline of projects
- Examples of effective localization of supply chains
- Workforce development in building supply chains
- Effective state policy mechanisms
- Critical supply chain risks, bottlenecks, and challenges
- New York-specific capabilities and advantages

This section outlines the main takeaways and commonalities across interviews to highlight New York's current and potential nuclear supply chain and the necessary actions to foster long-term growth.

It is important to note that findings reflect qualitative interviews with stakeholders who may have a commercial interest in nuclear project deployment, siting, or project awards. Additionally, interviewees are involved in different nuclear technologies, which may shape their perspectives and introduce bias toward certain reactor types. Findings and quoted material should be interpreted with these considerations in mind.

Stakeholder Feedback

- **Credible project commitments and customer demand are foundational for supply chain localization.** Suppliers generally show enthusiasm for siting in New York, but the lack of visibility into the state's stance and uncertainty around projects are major barriers to making an immediate commitment. Suppliers differentiate between broad market enthusiasm and actionable demand, as evidenced by RFPs, contracts, or order books, when determining where to build next. To mitigate these uncertainties, state agencies and authorities can help create real projects, broker offtake relationships, or make procurement commitments and strengthen supplier confidence. **The absence of a concrete project and**

demand signal around which supply chain and workforce decisions can be organized remains one of the main bottlenecks to building suppliers' appetite for supply chain commitments in New York. Stakeholders offered a wide range of potential commitments to New York, from exploratory siting and supplier engagement to larger capital investments, but nearly all were presented as **conditional on project awards, market access, and offtake.** Interviewees generally agreed that once New York chooses projects, sites, or developers—and demonstrates that these choices are durable—many other pieces become easier to mobilize.

- **State financial incentives are necessary to build the supply chain but are insufficient on their own.** Incentives should be complemented by site readiness, clear regulations, and a visible long-term commitment from the State to nuclear energy. While developers and manufacturers emphasize that financial incentives are crucial for attracting business, they recognize that several other factors are important beyond larger tax credits alone. Financial options include tax incentives, grants, transferable credits, training funds, loan support, and direct project involvement, demonstrating New York's dedication to expanding nuclear energy. However, there is serious competition from other states, as they offer substantial incentives like upfront capital for manufacturing facilities, public-fund leveraging, and significant tax breaks to support infrastructure or fuel capacity. **Other non-financial levers that are just as critical include practical site readiness** (with transportation access, space for manufacturing, and clarity on environmental review and permitting pathways) and political durability—firms require long-term confidence that they will not be invited in only to be later blocked by politics or public opposition.

- **Workforce is a key issue for both supply chain considerations and project deliveries, and it is the most pressing constraint requiring near-term strategic planning.** Robust workforce pipelines across construction, manufacturing, operations, and regulatory compliance are essential for both project development and supply chain expansion. Within the supply chain, occupations in construction trades, welding, nuclear quality control and assurance, operators, and other licensed personnel will be more challenging to scale compared to many traditional supply inputs.

- Stakeholders highlighted the importance of thinking in cascades: the individuals needed for planning, construction, and operation of facilities are not interchangeable, **so training pipelines must be tailored accordingly.** Interviewees pointed to current project partnerships, such as Vogtle's community college pipeline programs, as useful examples but also acknowledged the difficulty of recruiting enough skilled labor to meet nuclear standards, site requirements, and employment screens. However, project certainty is the primary source of skepticism about building large training pipelines, because **workers and**

educational institutions need assurance of job availability after training. Therefore, New York cannot train workers in isolation; **workforce programs must be linked to actual projects and employer demand.**

- **New York should prioritize converting adjacent industries as an effective localization strategy.** Supply chain resilience does not always mean maximizing local content at all costs. An overly rigid localization strategy can raise costs, delay projects, and force reliance on inexperienced suppliers. Selective localization is a more practical way to deploy the 5 GWe of nuclear power efficiently, with the State focusing its resources on specific nodes where it has a credible competitive advantage, while importing proven capabilities to successfully build the early projects.
    - Aerospace, defense, oil and gas, maritime manufacturing, and advanced manufacturing suppliers are promising feeder sectors for the nuclear industry. New York should focus on identifying firms with transferable skills and support efforts to upgrade quality, obtain certifications, retool facilities, and provide training to help them enter the nuclear space. The most feasible opportunities are in capabilities adjacent to the State's existing industrial strengths, such as metal components, mechanical fabrication, heat exchangers, general balance of plant, and specific low-pressure or maritime-transferable components. Other promising areas include specialized machining, advanced welding, robotics, coatings, and certain types of instrumentation and control (I&C) and sensor manufacturing.
- **Most critical bottlenecks and risks are shared across the U.S. and global nuclear markets, many of which cannot be solved by New York alone.** Capacity constraints are concentrated in a set of critical nodes: nuclear fuel pathways; pressure vessels and large forgings; graphite; steam generators and heat exchangers; instrumentation and controls; and qualified fabrication capacity. A notable risk highlighted by one stakeholder was the back end of the fuel cycle, underscoring that spent-fuel management and recycling were major blind spots in reactor economics. Requiring developers to submit complete used-fuel management plans helps mitigate this risk. The issue raises an important caution: cost and supply chain analyses that ignore waste management and storage may understate true deployment requirements.
- **Many core capabilities remain essential regardless of the reactor type or nuclear technology sector.** These include qualified welding and machining, nuclear-grade concrete and civil works, documentation and material traceability, compliance with ASME Section III, NQA-quality systems, specialized fabrication, logistics for heavy or oversized components, and workers trained in nuclear safety and radioactive material handling. Several interviewees emphasized the importance of standardization, suggesting that New York should prevent

the market from fragmenting into too many designs, as a narrower range of technologies simplifies workforce training, vendor qualification, maintenance, and repeat construction.

- **New York should bring all partners and key stakeholders into the same process rather than pursuing these issues in parallel.** Public sector entities are expected to serve as conveners in nuclear development and deployment, involving developers, manufacturers, local suppliers, economic development agencies, workforce providers, and major power buyers. Interviews suggest that partnership strategies should focus on individual projects: activities such as training, supplier qualification, and site planning are more effective when tailored to specific technologies, locations, and planned sequences.

Appendix C. Phases of a Nuclear Project Build

C.1 Early-Stage Supply Chain Needs

Early-stage supply chain needs arise before construction and should be treated as critical to project readiness.[88] This stage includes developer engagement, OEM engagement, licensing support, environmental analysis, siting analysis, front-end engineering, procurement strategy, QA, supplier qualification, long-lead component identification, and fuel planning.[89] These activities shape the project's schedule, cost risk, supplier base, and potential for New York firms to participate.

This stage is where the State has the best opportunity to avoid late supplier lock-in. Developers, OEMs, EPCs, and owner-operators often rely on established supplier networks, proprietary systems, and prequalified vendors.[90] If New York firms do not understand procurement requirements until formal packages are issued, many opportunities may already be closed. Early engagement can help identify which packages may be realistic for New York firms and which are likely to remain externally sourced.

QA planning is also an early-stage need.[91] Nuclear projects require supplier controls, documentation, traceability, inspection records, corrective action programs, configuration management, and audit readiness.[92] Firms may need significant time to understand and prepare for these requirements. For some components, full nuclear certification may be required; for others, commercial-grade dedication or nonsafety-related balance-of-plant pathways may be more realistic.[93]

Long-lead procurement and fuel planning also need early attention.[94] Reactor vessels, large forgings, steam generators, turbines, transformers, specialized fuels, nuclear-grade graphite, sodium-compatible systems, and other constrained items may affect project schedules if procurement is delayed.[95] Not all of these items are realistic in-state opportunities, but they still matter for deployment risk. The State should track these items, understand external dependencies, and ensure that developers and OEMs have credible procurement and risk mitigation plans.

Before a developer, technology, or site is finalized, the State can still begin low-regret preparation. This includes supplier outreach, nuclear market education, firm readiness screening, procurement pathway mapping, regional cluster mapping, QA awareness, and early engagement

with developers, OEMs, EPCs, utilities, labor, and training providers. More targeted actions should begin once the first reactor pathway or likely site becomes clear. Needs that arise before construction, including OEM and developer engagement, licensing support, engineering and environmental studies, QA planning, supplier qualification, procurement strategy, long-lead component identification, and fuel planning[96].

Construction-stage supply chain needs are tied to site work, civil construction, installation, and field execution.[97] This stage requires site preparation contractors, civil contractors, excavation, grading, concrete, steel, rebar, construction materials, cranes, heavy equipment, temporary facilities, laydown areas, water and utility connections, site security, logistics planning, safety management, and construction oversight.[98] These needs often create the largest near-term opportunity for local and regional firms.

Mechanical, electrical, and piping installation are also central to this stage.[99] The project will need mechanical contractors, electrical contractors, pipefitters, welders, electricians, instrumentation technicians, inspectors, testing firms, and field services.[100] These activities may be more accessible to State firms than highly specialized nuclear island manufacturing, but firms will still need to meet project-specific standards, documentation requirements, QC, and schedule expectations.[101]

Construction-stage work should not be treated as ordinary infrastructure construction. Nuclear projects require more disciplined project controls, safety procedures, QA, inspection practices, traceability, and documentation than many conventional projects.[102] Even firms that are experienced in large industrial construction may need orientation to nuclear quality culture and project-specific procedures before they can support a nuclear build.[103]

The site location decision is especially important for construction-stage supply chain planning. Once a likely site is known, the State can identify the most relevant regional contractors, logistics providers, construction workforce, heavy-haul routes, staging areas, utility needs, and infrastructure constraints. This allows State support to move from broad readiness to targeted regional activation.

C.2 Manufacturing and Component Delivery Needs

Manufacturing and component delivery needs include both major components and supporting systems.[104] These needs may include fabrication, machining, forgings, castings, pumps, valves, heat exchangers, electrical equipment, transformers, switchgear, instrumentation and controls,

sensors, digital systems, cybersecurity-related systems, testing, inspection, factory acceptance, packaging, and heavy-haul logistics.[105] Some components are safety-related or proprietary, while others may be nonsafety-related balance-of-plant items that are more accessible to qualified or qualifiable firms.[106]

Manufacturing needs vary by reactor technology.[107] Large light-water reactors require large components, major forgings, steam generators, turbine systems, transformers, and extensive civil and balance-of-plant work.[108] Light-water small modular reactors may reduce the size of some components but can introduce vendor-specific modules and factory-based fabrication.[109] High-temperature gas-cooled reactors (HTGRs) may require tri-structural isotropic (TRISO) fuel, nuclear-grade graphite, helium circulators, and high-temperature components.[110] Sodium fast reactors may require high-assay low-enriched uranium (HALEU) metal fuel, sodium systems, electromagnetic pumps, and sodium-compatible primary components.[111]

For New York, the most realistic manufacturing opportunities are likely to be in segments where reactor needs overlap with existing or adjacent industrial strengths. These include electrical equipment, controls, instrumentation, sensors, precision manufacturing, pumps, valves, seals, heat exchangers, selected balance-of-plant components, and specialized services. These areas matter because they are relevant across multiple reactor technologies and may deliver more durable value than items tied to a single reactor design.

Some manufacturing needs are likely to remain externally sourced in the near term. These include ultra-large forgings, reactor pressure vessels, specialized nuclear fuel fabrication, HALEU, TRISO fuel, nuclear-grade graphite, sodium systems, and certain proprietary or highly specialized Gen IV components. These items should still be monitored because they may affect deployment risk, but they should not be overstated as immediate in-state economic development opportunities.

Component delivery also requires logistics planning.[112] Large or sensitive equipment may require specialized packaging, factory acceptance testing, quality documentation, route surveys, rail access, port or barge access, heavy-haul permitting, crane capacity, staging areas, and careful coordination with the construction schedule.[113] These logistics needs may create opportunities for regions with strong transportation assets, but they also require site- and route-specific screening once the project location is clearer.

C.3 Commissioning, Operations, and Outage Supply Chain Needs

Commissioning and start-up create a bridge between construction and long-term operations.[114] During this stage, the project requires testing, calibration, instrumentation support, systems integration, quality verification, procedure development, training, start-up testing, safety reviews, and documentation closeout.[115] These activities depend on both the OEM and the owner-operator, but they may also create opportunities for specialized engineering, testing, inspection, and technical service firms.[116]

Operations and maintenance needs create recurring supply chain demand after the plant enters service.[117] These needs include spare parts, replacement components, maintenance services, calibration, inspection, testing, radiation protection, health physics support, training, security-related services, digital systems support, and technical consulting.[118] Unlike construction, which is concentrated during a defined period, operations and maintenance create long-term opportunities that can support durable supplier relationships.

Outage work is a particularly important part of the nuclear lifecycle. Outages require specialized contractors, inspection services, maintenance crews, replacement parts, radiation protection workers, QA/QC support, nondestructive evaluation (NDE) technicians, project controls, and outage planning.[119] Firms that can support outage work may be well-positioned to build nuclear experience and later support new reactor deployment.

New York's existing nuclear assets should be treated as part of the State's supply chain readiness base. The operating nuclear facilities at Ginna, J.A. FitzPatrick, and Nine Mile Point provide ongoing nuclear operations, maintenance, outage, safety culture, and supplier experience.[120] The Indian Point decommissioning ecosystem also provides relevant nuclear lifecycle capabilities, including remediation, radiation protection, waste management, health physics, and QA/QC experience.[121] These assets can help the State build from existing nuclear knowledge rather than starting from scratch.

Appendix D. NAICS Code Matching

The analysis of the families in the following table is an illustrative search pool for 68 relevant NAICS industry codes, rather than an exhaustive or exclusive assignment of all 126 codes (Table D-1).

Table D-1. Common Families and Broad Industry Bridge

Component or service family	Representative mapped NAICS industries
Construction materials and fabricated metal products	212319, 212321, 327310, 327320, 327390, 331110, 332312, 332313, 332322, 332722, 324121
Reactor vessels, forgings, and pressure components	332111, 332313, 332420, 332410, 332999
Steam-generation and heat-transfer equipment	332410, 333414, 333415
Turbines and generators	333611, 335312
Electrical equipment and grid integration	335311, 335312, 335313, 335929, 334416, 334417, 335999
Pumps, valves, seals, and coolant-handling equipment	333996, 333914, 332911, 339991, 333912
Instrumentation, controls, and precision components	334513, 334519, 334516, 335314, 334111, 332710, 334515
Specialized reactor materials	335991, 327110, 325120, 325180, 331491
Nuclear fuel and fuel-cycle inputs	325180, 212290
Civil construction and installation	236210, 237110, 237130, 237990, 238110, 238120, 238210, 238220, 238390, 238910
Engineering and project services	541330, 541360, 541420, 541620
Inspection, testing, and quality services	541380
Operations, maintenance, and repair	811210, 811310, 221113
Logistics and transportation	484220, 484320, 488510, 493110
Waste management and remediation	562112, 562211, 562991

Appendix E. Detailed Regional Profiles

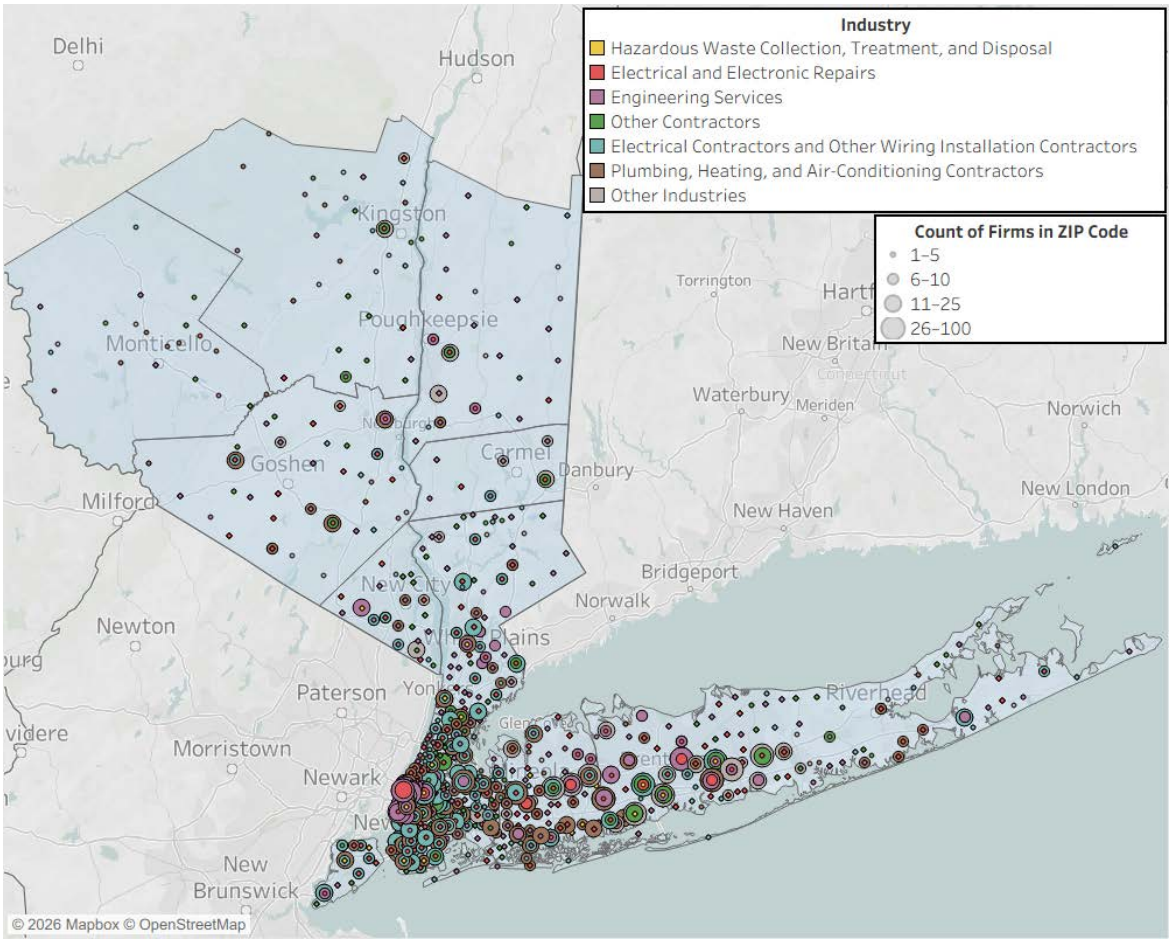
New York City/Long Island/Mid-Hudson

The New York City, Long Island, and Mid-Hudson corridor is the State's strongest region for services and project delivery. Its value is in engineering, finance, legal and advisory services, permitting, environmental review, remediation, construction management, project controls, and large-contractor capacity. These are not secondary functions. Nuclear projects require substantial front-end planning, procurement support, licensing support, project discipline, and construction management before major fieldwork begins.[122]

This corridor also has the State's largest concentration of electrical, plumbing, heating, ventilation, and air conditioning, and engineering and professional services firms that could support BOP work, installation, commissioning, and field services. Its environmental and remediation capabilities may also be relevant to site preparation and lifecycle services.

The region is less suited to heavy manufacturing or large modular staging due to land costs, congestion, limited heavy-industrial space, and complex oversized cargo movement. For supply chain planning, the downstate corridor is best treated as a project-delivery and professional services hub rather than the primary target for large-component manufacturing.

Figure E-1. Distribution of Selected Nuclear-relevant Firms in NYC/Long Island/Mid-Hudson



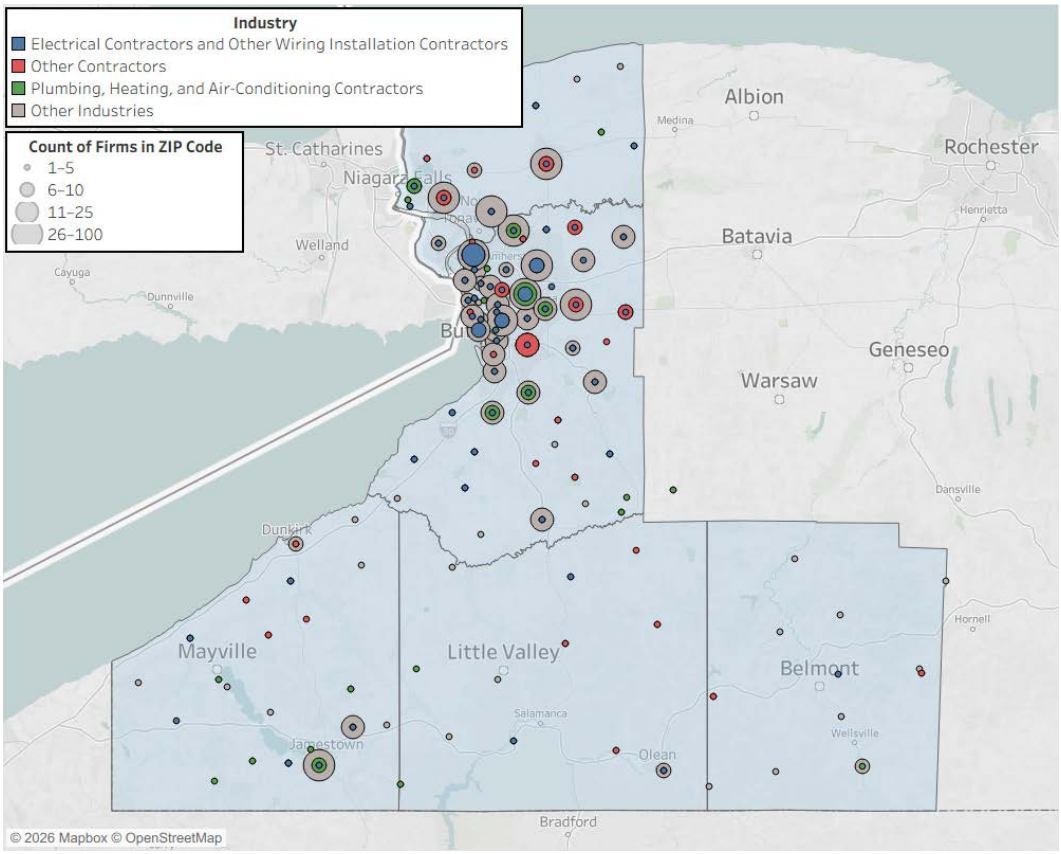
Western New York/Buffalo/Niagara/West Valley

Western New York has one of the clearest industrial roles in the State. It combines industrial capacity with access to Lakes Erie and Ontario, freight corridors, and nearby Canadian nuclear markets. Those assets make it relevant for construction support, logistics, selected manufacturing, and longer-term supply chain development tied to the Great Lakes economy.

The region's manufacturing base may support BOP equipment, industrial services, fabrication, and selected components that do not require the most difficult nuclear qualifications. Its proximity to Ontario is also important because Canadian nuclear activity creates a nearby market, potential supplier relationships, and technical expertise.[123] Western New York also has nuclear lifecycle relevance through the West Valley site, which reflects the region's long-standing nuclear cleanup and waste-management presence.[124] That legacy does not by itself create a broad manufacturing opportunity, but it gives the region a practical connection to nuclear services and specialized contractors.

The main question for the region is how far its logistics and industrial assets can be extended: rail, port access, heavy-haul routes, crane and lift capacity, industrial sites, utility service, and wastewater capacity will determine whether the region can support larger manufacturing or staging opportunities, or whether its near-term role is focused on supplier development and logistics support. This should be addressed in future regional screenings and studies.

Figure E-2. Distribution of Selected Nuclear-relevant Firms in the Western NY region



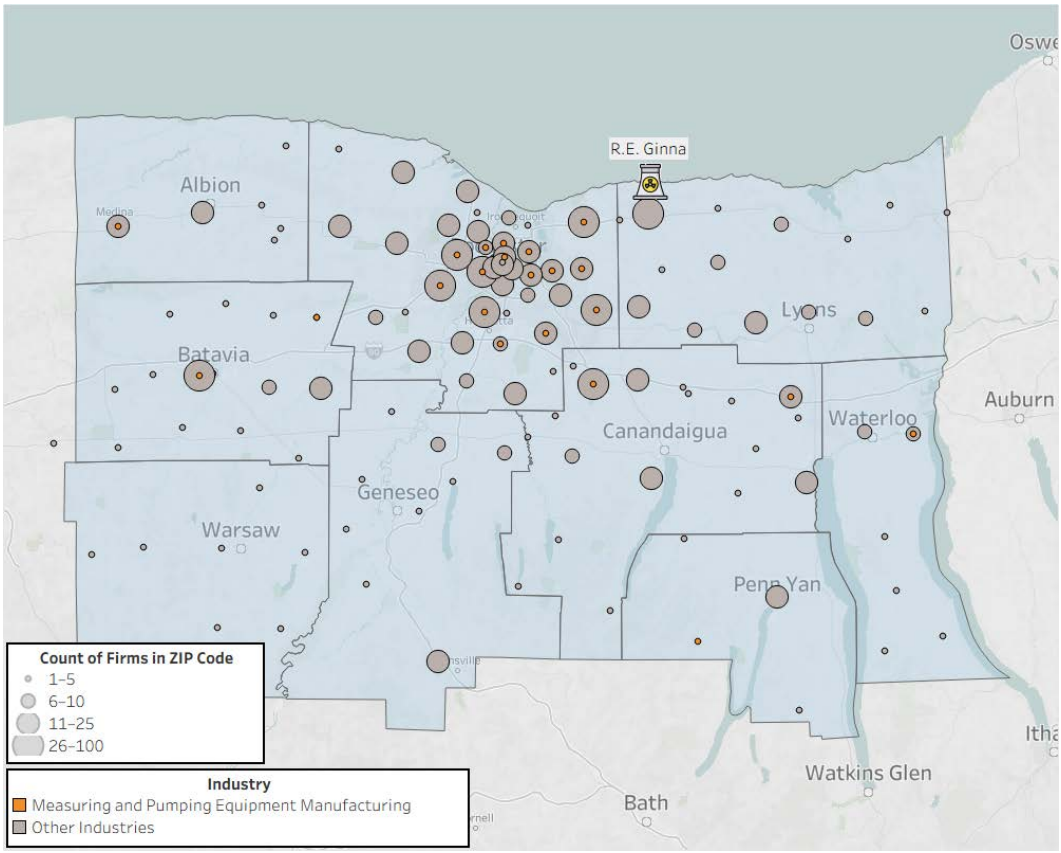
Finger Lakes/Rochester/Ginna Corridor

The Finger Lakes region combines operating nuclear proximity with the Rochester area's technical and manufacturing base. The area hosts the R.E. Ginna nuclear power plant, making it a strong candidate for supplier qualifications and target capacity development, particularly for firms in instrumentation, measuring equipment, pumping equipment, engineering, maintenance, and precision manufacturing.[125] Additionally, the region benefits from its proximity to Lake Ontario and the broader upstate manufacturing corridor, providing logistical advantages that enhance manufacturing, logistics, and construction efforts needing both industrial space and access to various transportation options.

This region is better framed as a technical supplier corridor than a broad heavy manufacturing center. Its most credible opportunities are in BOP systems, instrumentation, controls, O&M support, engineering services, and selected component needs where firms can meet nuclear quality and procurement requirements.

Because many of the region's opportunities involve firms that may be industrially capable but not yet nuclear-ready, qualification support will matter. QA systems, documentation, traceability, inspection readiness, audit preparation, and buyer connections are likely to be more important than traditional economic development incentives alone.

Figure E-3. Distribution of Selected Nuclear-relevant Firms in the Finger Lakes region

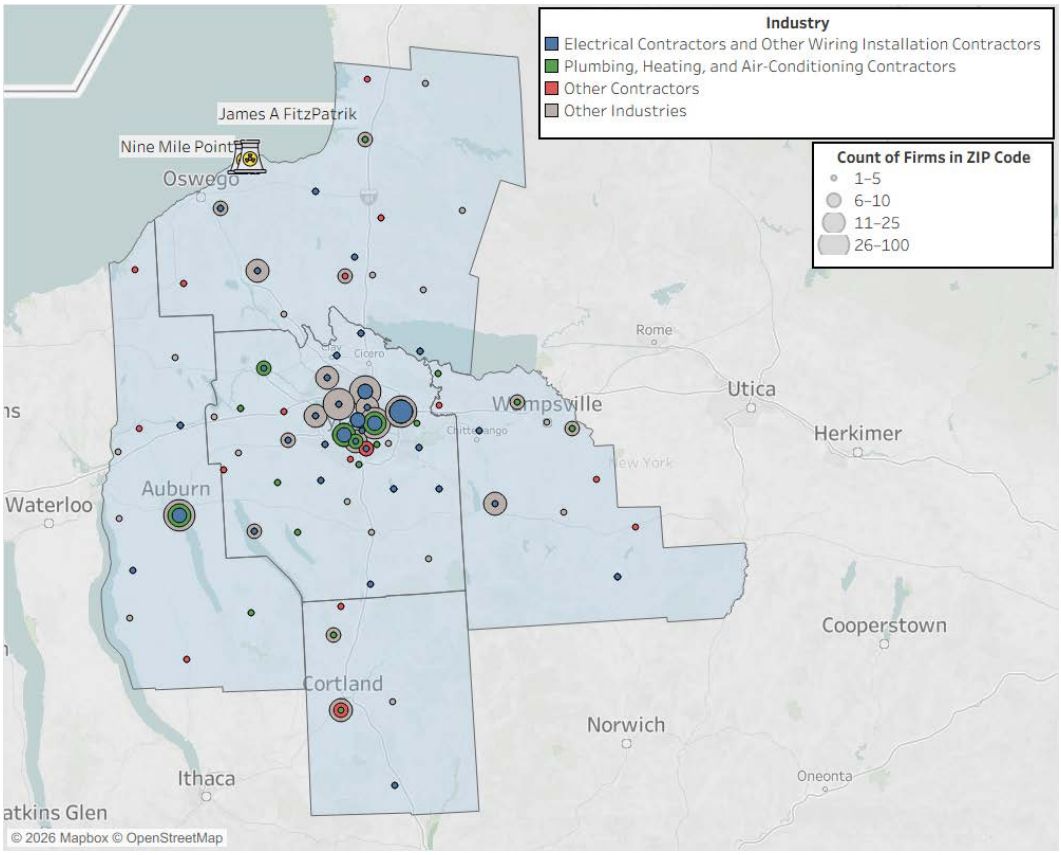


Central New York/Syracuse/Oswego Corridor

The Central New York region is anchored by two major points: Syracuse, an industrial hub, and the Lake Ontario nuclear corridor, which includes two operating nuclear sites in Oswego.[126] Syracuse has a particular concentration of contractors and services relevant to new advanced nuclear construction and operations support.

The region is well positioned for construction support, electrical and mechanical contracting, field services, O&M support, project mobilization, and supplier-readiness pilots. Existing nuclear activity gives the region a useful base of experience in workforce training, quality culture, outage support, and nuclear-specific service work. For future advanced nuclear projects, Central New York's value is likely to be in execution. Trades, field services, QC, NDEs, construction sequencing, site support, and supplier relationships are all central to keeping projects on schedule. A larger nuclear buildout would require more nuclear-qualified workers, more firms prepared for nuclear procurement, and earlier engagement among developers, EPCs, organized labor, training providers, and local suppliers.

Figure E-4. Distribution of Selected Nuclear-relevant Firms in the Central New York region



Capital Region/Tech Valley

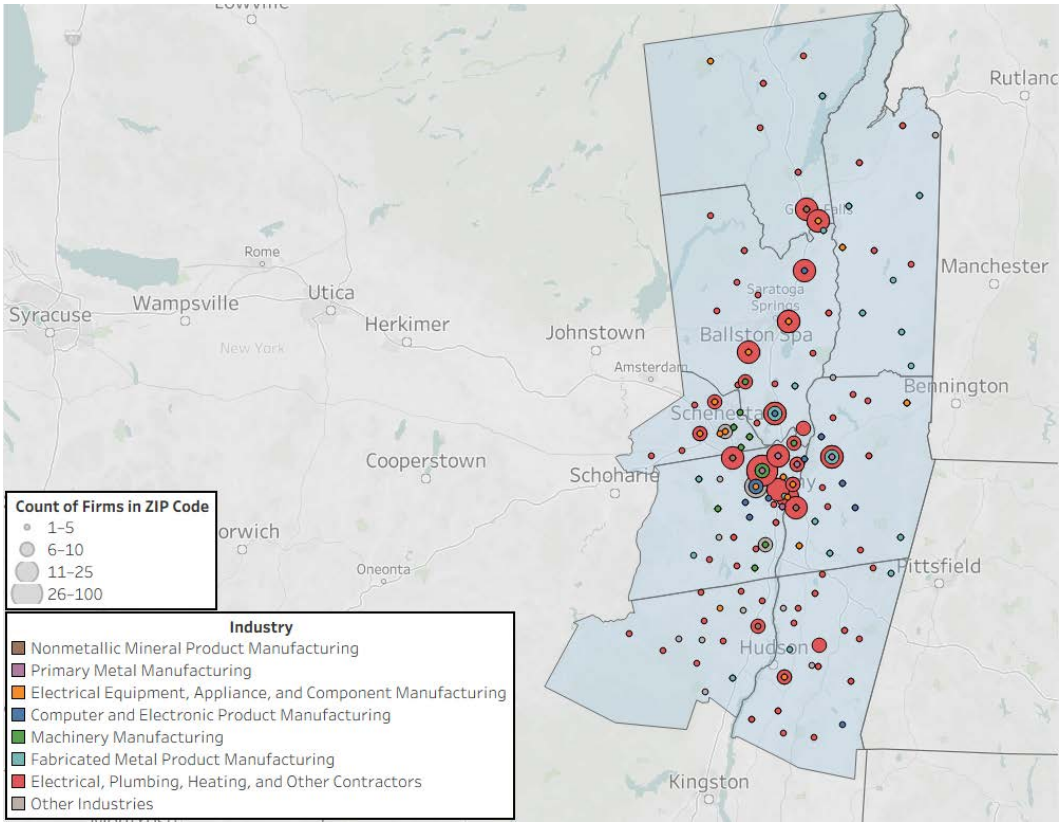
The Capital Region has a different role from the operating nuclear regions. Its strongest value is as a coordination, program delivery, advanced manufacturing, grid technology, and research corridor. The Albany-Schenectady-Troy area, together with nodes such as Glens Falls and

Saratoga Springs, has technical manufacturing, metals, electronics, semiconductor-related activity, skilled labor, and a strong institutional base.

The region can support supply chain development through supplier-readiness programming, technical assistance, workforce coordination, research partnerships, grid-related industries, and public-sector program implementation. Its location also makes it a practical place to coordinate among state entities, utilities, developers, economic development organizations, training institutions, and regional partners. The Port of Albany, freight rail, interstate connections, and Hudson River barge access may support selected industrial or grid-equipment opportunities.[127] Those assets should be evaluated against specific supply chain needs rather than treated as a general solution for all large-component movement.

For the Capital Region, the central planning question is how to turn institutional and research strengths into measurable supplier outcomes: firms assessed for nuclear readiness, firms entering quality system upgrades, firms connected to buyers, and training programs aligned with actual supply chain needs.

Figure E-5. Distribution of Selected Nuclear-relevant Firms in the Capital Region



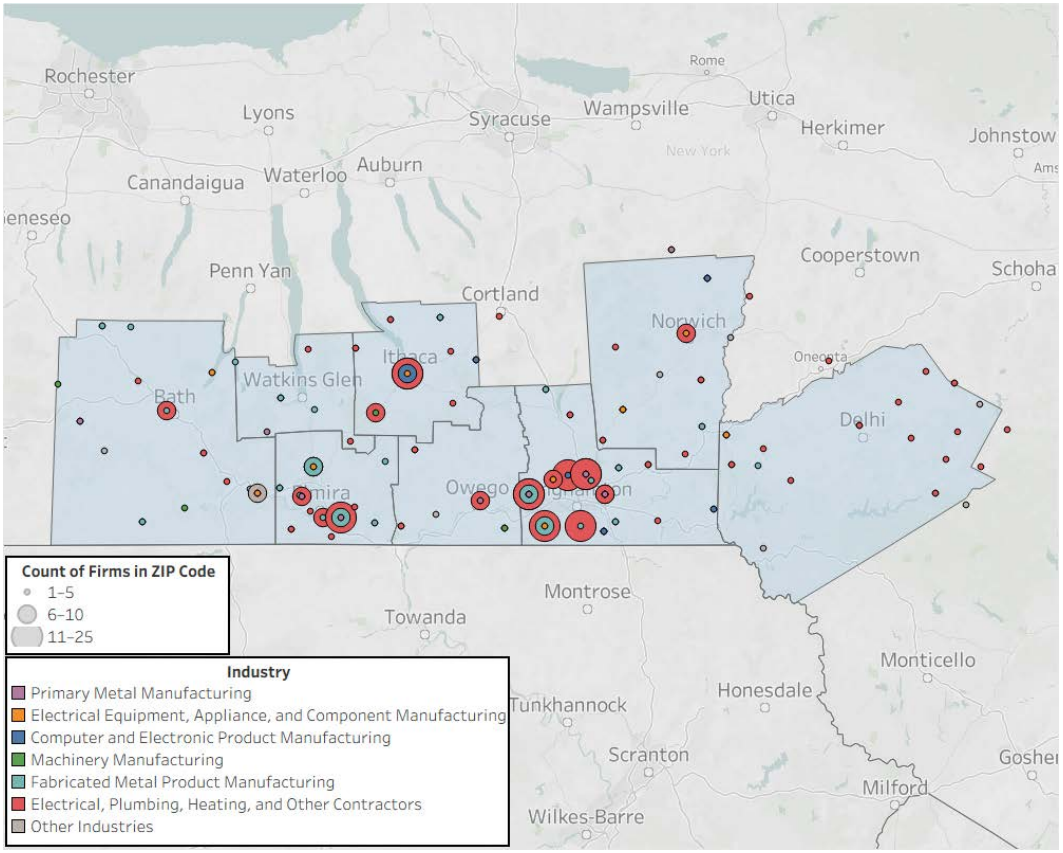
Southern Tier

The Southern Tier is best viewed as a supporting region with targeted opportunities. Its nuclear-adjacent capabilities are concentrated along the Interstate 86 corridor, including the Elmira and Binghamton areas, with contractors relevant to construction and BOP needs, an electronics base, and specialty materials capabilities in parts of the region.

The region's value will depend on specific firms rather than broad regional claims. Electronics, specialty materials, construction support, and access to nearby industrial corridors may create opportunities if the firms are ready for nuclear procurement and meet quality requirements.

The Southern Tier should remain in the screening process for supplier development and site-specific opportunities, but the case should be built from firm-level data, workforce availability, and infrastructure conditions rather than a general claim of regional readiness.

Figure E-6. Distribution of Selected Nuclear-relevant Firms in the Southern Tier region

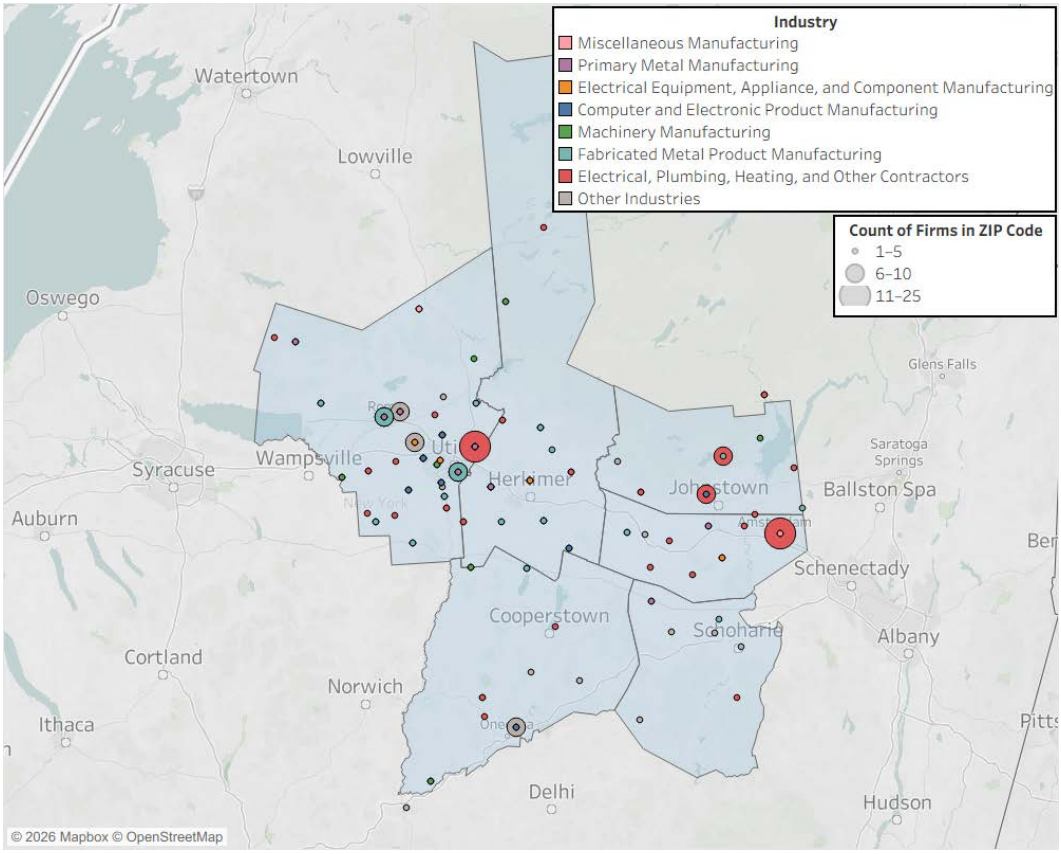


Mohawk Valley

The Mohawk Valley has a practical role as a connector between the Capital Region and Central New York. Its industrial assets are concentrated along the Interstate 90 corridor, particularly around Utica, with strengths in fabricated metals, electronic devices, and related manufacturing activity.

Those strengths may support supplier development for BOP equipment, electronics, fabricated-metal inputs, and selected industrial components. The region's transportation position also makes it relevant for logistics, supplier coordination, and movement of materials across the State. The Mohawk Valley opportunity should be tied to specific firm readiness. Relevant manufacturers may have the right industrial capabilities, but nuclear participation will depend on quality systems, documentation, procurement access, workforce readiness, and early buyer engagement.[128]

Figure E-7. Distribution of Selected Nuclear-relevant Firms in the Mohawk Valley region

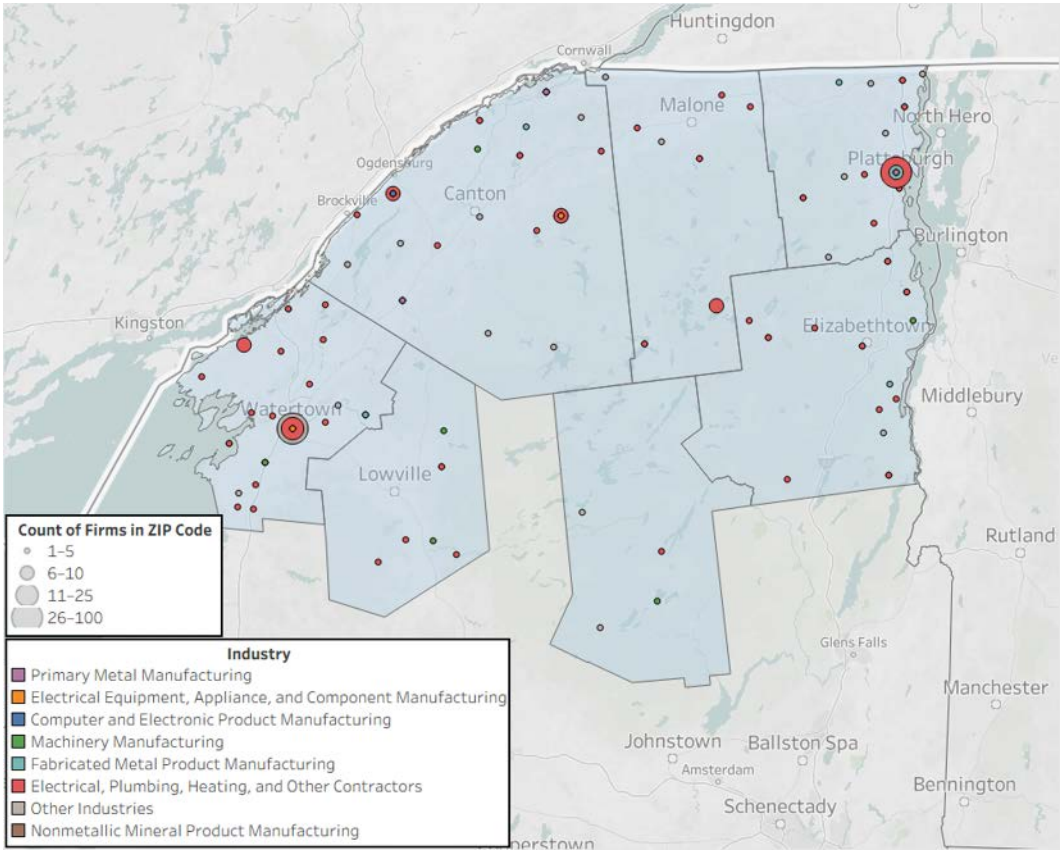


North Country

The North Country has a more dispersed industrial base, with contractor and industrial activity around Plattsburgh and Watertown. Its geography gives it strategic relevance through access to Lake Ontario, proximity to Canadian markets, and connections to nearby nuclear-adjacent firms in neighboring states and provinces.

The region should be viewed as a selective opportunity area. It may support contractors, logistics, workforce development, or targeted supplier relationships, particularly where cross-border or water-based logistics are relevant. The case for broader supply chain development in the region needs to be grounded in specific firms, sites, infrastructure, or workforce assets. The North Country should remain part of the statewide screening framework but should avoid putting it on the same footing as regions with stronger evidence of existing nuclear activity, dense supplier clusters, or broader manufacturing capacity.

Figure E-8. Distribution of Selected Nuclear-relevant Firms in the North Country region



Appendix F. Advanced Nuclear Peer-State Program Review

This peer-state review compares how other states and jurisdictions are moving from nuclear planning to implementation. The review focuses on the tools that change supplier behavior: dedicated funds, reimbursement programs, tax credits, procurement mechanisms, utility cost-recovery pathways, workforce investments, site-readiness programs, and centralized coordination functions. The central question for the State is not whether other states support nuclear, but how they are creating market certainty, reducing early project risk, and positioning themselves to attract suppliers before a national nuclear order book is fully established.

Indiana

Indiana is using tax policy and utility cost recovery to create early market signals. Its Small Modular Nuclear Reactor Manufacturing Expense Tax Credit equals 20% of qualified SMR manufacturing investment, and the state has also advanced mechanisms for utilities to recover approved SMR development costs.[129] Indiana's Nuclear Indiana Coalition and university-led analysis support planning for siting, workforce, large-load, and supply chain.[130]

Kentucky

Kentucky has moved from exploration to governance and grants.[131] The Kentucky Nuclear Energy Development Authority provides a formal institutional home for nuclear planning, and Senate Bill 179 appropriated $10 million for nuclear development, including $8 million for competitive grants and $2 million for laser and photonics workforce development in Paducah.[132] The state's grant structure is modest, but it gives companies, communities, and institutions a defined pathway to seek support.

Tennessee

Tennessee is the leading dedicated-fund example. Its $95million Nuclear Energy Fund supports nuclear business investment, workforce development, and site development, with a strong emphasis on expanding the Oak Ridge-centered nuclear ecosystem.[133] Tennessee is using the fund as an economic development tool to recruit companies, support universities and training assets, and demonstrate that the state has a specific nuclear value proposition.[134] The total reflects cumulative appropriations since 2023.[135] The University of Tennessee's Manufacturing Extension Partnership provides on-site readiness assessments and assistance with nuclear quality systems and audit preparation.[136] Separately, the U.S. Department of Energy selected TVA for

$400 million in federal support for its small modular reactor effort.[137] The Nuclear Regulatory Commission issued the Clinch River Unit 1 construction permit on September 28, 2026.[138]

Wyoming

Wyoming is the clearest deployment-centered first-mover state because the TerraPower Natrium project gives it a specific project around which to organize infrastructure, workforce, permitting, and supplier learning. Wyoming's Energy Matching Funds program is broader than nuclear but highly relevant. Since 2022, the state has appropriated $155 million in matching funds to leverage federal or private dollars for research, demonstration, pilot, and deployment projects related to Wyoming's energy needs.[139] Under the separate Large Project Energy Matching Funds program, Wyoming announced a $100 million award to BWXT for a proposed commercial TRISO fuel fabrication facility in Gillette.[140] The program requires at least a 1:1 match; the announced award does not establish disbursement or operating capacity.[141] In August 2026, TerraPower announced 12 supplier awards for the Natrium project, a separate indication that the project is generating procurement activity.[142]

Louisiana

The Louisiana Advanced Nuclear Competitive Edge (LANCE) framework is built around industrial value, not only electricity generation.[143] It examines opportunities in generation, supply chain, and value chain, including the use of nuclear heat and power in industry.[144] The proposed Louisiana Advanced Nuclear Exploration (LANE) program would use a small monthly meter surcharge to support feasibility studies, site assessments, economic analysis, and licensing or permitting preparation for participating utilities.[145]

Maryland

Maryland's most relevant contribution is the link between advanced nuclear and procurement. The Next Generation Energy Act created a Public Service Commission process for procurement of new advanced nuclear generation and directed work on procurement rules, nuclear credits, and potential cost-sharing with neighboring PJM states and federal agencies.[146] A first RFP is expected after the regulatory structure is developed.[147]

Pennsylvania

Pennsylvania combines existing nuclear assets, Westinghouse-related supplier activity, research institutions, and large-load demand. Constellation's Microsoft-backed restart of Three Mile Island Unit 1 as the Crane Clean Energy Center is expected to restore roughly 835 MW of

carbon-free electricity and was presented as creating thousands of direct and indirect jobs, large tax benefits, and substantial GDP impacts.[148]

Utah

Utah is building a broad energy growth platform through Operation Gigawatt and HB 249.[149] The state is using nuclear power as part of an energy-abundance strategy that includes the Nuclear Energy Consortium, Utah Energy Council, energy development zones, and an investment fund framework.[150] The model links nuclear readiness to broader questions of power supply, industrial growth, land use, infrastructure, and community readiness.

Virginia

Virginia links nuclear development to utility planning and large customer demand. Dominion Energy and Amazon have an MOU to explore SMR development structures in Virginia, while the state has also developed innovation and financing tools for clean energy infrastructure.[151] The key market signal is not only a state program, but a combination of utility project development, existing nuclear sites, and large-load demand from data centers and other customers. Virginia Energy awarded $2.4 million to the Virginia Innovative Nuclear Hub for workforce and supply chain work, including manufacturing assessments and a small grants program.[152] A separate federally funded workforce accelerator ties employer reimbursement to verified training completion and six-month retention.[153]

West Virginia

West Virginia is an early-stage monitoring state. Its most important, completed action was the repeal of the state's ban on nuclear power plant construction, opening the door for future projects.[154] More recent advanced baseload financing ideas should be tracked, but they should not be treated as an implemented program model unless and until they are enacted, funded, and operationalized.

Texas

House Bill 14 created the Texas Advanced Nuclear Development Fund, and the state appropriated $350 million to support project development, supply chain, and construction reimbursement programs through the Texas Advanced Nuclear Energy Office.[155] The initial solicitations made up to $70 million available for project development and supply chain reimbursement and up to $280 million for advanced nuclear construction reimbursement.[156] Under the project development and supply chain track, individual awards are capped at the

lesser of 50 percent of qualifying expenses or $12.5 million.[157] Applications for the initial round closed. The materials reviewed did not identify publicly announced recipients as of November 4, 2026.[158] This is the strongest example of a state moving from planning to a funded, centralized implementation model. A separate reimbursement track for larger manufacturing investments would allow New York to require documented buyer demand, a company contribution, and verified milestones before payment.

Ontario, Canada

Ontario is New York State's most important nearby deployment comparator. Ontario Power Generation's Darlington New Nuclear Project received a license to construct one BWRX-300 in April 2025, creating a real SMR deployment and supply chain learning opportunity across Lake Ontario.[159] Ontario's project gives suppliers, training providers, regulators, and construction firms a nearby reference case.

Michigan

Michigan's Palisades restart demonstrates the value of existing nuclear infrastructure, community familiarity, workforce continuity, federal financing, and power purchase commitments. DOE closed a $1.52 billion loan to support restoration and resumption of service at the 800 MW Palisades plant, subject to NRC approvals[160]. This is not the same as a new-build model, but it shows how existing nuclear assets can reduce development friction.

Conclusion

The peer review shows that the State can draw on a growing set of state and regional models but should not adopt any single model wholesale. Tennessee's dedicated nuclear fund, Texas's centralized coordination and reimbursement approach, Wyoming's use of matching funds for a specific industrial investment, Virginia's utility and customer-driven development work, Michigan's use of existing nuclear assets, and Ontario's active deployment pathway all offer useful lessons.

Appendix G. New York State Companies Involved in Fusion Energy

Table G-1. High-Level Summary of New York State Companies Involved in Fusion

Sources and Notes: Assembled based on fusion-related response to NYSERDA's Advanced Nuclear Request for Information (RFI 5946) and desktop research.

Organization	Fusion Role & NYS Value	Org Type / Status
Accenture	Digital twins & AI training Workforce upskilling Project transformation	Commercial services firm
AmeriCOM	Optics manufacturing hub (COM-Lab) DPOC / HELOS participation Workforce & supplier development	Nonprofit/consortium
Arnold Magnetic Technologies	High-performance magnets (SmCo, NdFeB) Magnetic assemblies Harsh-environment expertise	Commercial manufacturer
Bluefors Cryocooler Technologies	Cryogenic cooling systems; supports superconducting magnets and other low-temperature fusion systems	Commercial cryogenics manufacturer
CAEN Technologies	Power electronics & instrumentation Magnet/accelerator systems High-reliability components	Commercial instrumentation firm
Canyon Magnet Energy	HTS magnet systems developer Complements SuperPower wire Early-stage innovation	Early-stage HTS company
Coherent	High-power lasers and photonics; laser components and optical systems relevant to inertial fusion and diagnostics	Commercial laser/photonics manufacturer
CoorsTek	Advanced ceramics (plasma-facing, insulation, substrates) High-temp / radiation-tolerant materials Relevant to blankets, HTS substrates	Commercial advanced materials manufacturer
Corning Incorporated	Specialty glass, optics, and advanced materials; capabilities relevant to high-power laser systems and fusion components	Commercial advanced materials manufacturer
Curtiss-Wright	Nuclear-grade components & controls Reactor systems, pumps, valves Defense & nuclear supply-chain	Large public industrial/defense contractor
EPRI	Fusion blankets & fuel cycles Codes, standards, materials analysis Industry coordination	Nonprofit R&D consortium

Table G-1. (Continued)

Organization	Fusion Role & NYS Value	Org Type / Status
INFICON, Inc.	Vacuum instrumentation, leak detection, and process-control systems relevant to fusion vacuum and fuel-handling systems	Commercial instrumentation manufacturer
Keller Technology Corp.	Precision metal fabrication Vacuum chambers & pressure vessels Cryogenic/structural hardware	Commercial manufacturer
Navitar Optics	Precision optical systems Diagnostics & imaging components Rochester optics cluster	Commercial optics manufacturer
Optimax Systems	High-precision optics fabrication Supports laser/diagnostic systems Large optics capacity	Commercial optics manufacturer
SuperPower	REBCO HTS wire manufacturer Strategic domestic supply Fusion magnet enabler	Commercial manufacturer (Furukawa)
Sydor Technologies	High-speed imaging and diagnostics; optical and electro-optic systems for high-energy-density and fusion applications	Commercial diagnostics / optics manufacturer
Thea Energy* **Not located in NYS*	Commercializing planar-coil stellarator Interested in NYS siting	Commercial fusion developer (PPPL spinout)
Torion	Advanced nuclear fuel cycle technology Fuel fabrication & isotope handling relevance Fusion-adjacent fuel systems expertise	Commercial nuclear technology firm
AVS	Harsh-environment fusion systems Ultra-high vacuum, radiation, cryogenic & high-field applications	Commercial scientific equipment manufacturer
GE Aerospace	Aerospace sensors & components Harsh-environment instrumentation Advanced manufacturing capabilities	Large aerospace manufacturer
Cerion Nanomaterials	Engineered metal, oxide & ceramic nanomaterials Materials scale-up & manufacturing	Commercial advanced materials manufacturer
Precision Process	Custom electroplating & wet-processing systems Precision equipment engineering & fabrication	Commercial equipment manufacturer

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