

Master Plan For Responsible Advanced Nuclear Development in New York:

Economic Impacts Analysis

NEW YORK STATE

NYSERDA Report 26-21a

November 2026

Notice

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Summary

The significant capital investments required to deploy 5 gigawatt-electric (GWe) of nuclear generating capacity has the potential to bring billions of dollars in economic benefits and thousands of jobs to New York. These investments will peak during construction and sustain economic benefits over decades of operations and provide workers with above-average wages, leading to the stimulation of the local economy and inducing new jobs across other sectors.

This analysis examines four deployment scenarios developed in the Advanced Nuclear Policy Options Paper (Options Paper) published by the New York State Energy Research and Development Authority (NYSERDA) and Department of Public Service (DPS) in June 2026 and builds on the methodology used for the preliminary economic impacts analysis developed in Appendix A of the Options Paper. Both the Options Paper analysis and the analysis presented in this study apply key assumptions in line with NYSERDA's 0x40 Techno-Economic Analysis.[1] The results presented herein add new details to the Options Paper analysis by considering the deployment of a full 5 GWe—as opposed to a per-GWe basis—of advanced nuclear.

The four scenarios include varying levels of estimated costs, local supply chain expansion opportunities, and speed to power. Several of the technologies used in the deployment scenarios are pre-commercialization and therefore subject to additional analytical uncertainty.

This analysis is designed to gauge the overall size of the in-state impacts associated with the construction and operations of the new nuclear capacity and is not intended to prescribe a specific pathway. It also does not capture the potential impacts of exporting reactor components that would likely offer substantial economic benefit in excess of what is estimated here.

The four deployment scenarios include:

- The deployment of large light-water reactors
- The deployment of light-water small modular reactors.
- Parallel deployment of large light-water reactors and light-water small modular reactors.
- Parallel deployment of large light-water reactors and Gen IV small modular reactors (examined based on liquid metal (sodium) cooled technology).

Table 1 summarizes the key economic impacts across the four scenarios

Table 1. Summary Scenario Results (billions, undiscounted).

	5GWe LLWR Pipeline	5GWe LW-SMR Pipeline	2 GWe LLWR & 3 GWe LW-SMR Parallel Deployment	2 GWe LLWR & 3 GWe Gen IV-SMR Parallel Deployment
Gross state product (GSP) per dollar of total investment	$0.68	$0.69	$0.67	$0.69
Total GSP	$89.4	$105.7	$100.7	$103.9
Planning and Construction Phase GSP	$12.6	$12.5	$14	$17.4
Operations Phase GSP	$76.7	$93.3	$86.7	$86.5
Average Construction Jobs (annual)	4,400	3,440	4,200	4,170
Average Operations Jobs (annual)	5,470	5,580	5,740	5,190
Local Taxes	$10.4	$12.5	$11.8	$12
State Taxes	$5.7	$6.7	$6.4	$6.6

Overall, the construction and 40-year operational lifetime of 5 GWe of nuclear reactors could generate between $89 billion and $105 billion in gross state product (GSP) (undiscounted). Annually, this is a roughly $1.6 billion contribution to GSP – in line with for instance the size of the State's crop farming industry annual contribution to GSP.

In terms of jobs:

- The planning and construction of 5 GWe of nuclear is expected to generate more than more 4,000 jobs a year on average. Of these, about 75% work directly on-site in the construction industry or throughout the supply chain, and 25% are induced jobs supported by workers spending their earnings. Depending on the scenario, workforce estimates reach peaks as high as 8,000 workers in one year.
- The long-term operations of 5 GWe of nuclear is expected to create more than 5,500 permanent in-state jobs, roughly 1,000 jobs per GWe, lasting at least 40 years and potentially up to 80 years.[2] Of these, about 60% work directly on-site or throughout the supply chain, and additional economic demand generated by these industry jobs creates the rest.

The analysis estimates economic benefits across four scenarios reflecting different nuclear reactor technologies and deployment timelines.

- The economic benefits generated (GSP) per dollar of capital and operating expenditures are similar across scenarios, indicating comparable economic contribution when adjusted for project costs.
- Most in-state economic benefits are anticipated to be from the engineering and design, installation, and operations of the reactors. Findings suggest that the in-state production of reactor component parts may deliver smaller economic benefits relative to these other categories, and thus the level of in-state capture of these components only modestly affected differences in economic impacts. However, substantial benefits could accrue if production in New York State ultimately supports a broader, national nuclear industry rather than just in-state deployment.

The economic benefits of supply chain development reported in this analysis are illustrative and conservative estimates. This analysis does not consider export opportunities for local nuclear component producers to serve an out-of-state market potentially orders of magnitude greater than the New York market, with projections that the U.S. alone has the potential to add 200 gigawatt-electric by 2050.[3] Benefits of constructing the manufacturing facilities for these nuclear component suppliers are also not considered in this analysis.

1. Introduction

This Economic Impacts Analysis is one of a collection of studies prepared by the New York State Energy Research and Development Authority (NYSERDA) and Department of Public Service (DPS) as part of the "Master Plan for Responsible Advanced Nuclear Development in New York" (Master Plan). Collectively, these studies examine the technical, economic, workforce, supply chain, regulatory, environmental, community, and infrastructure considerations associated with the potential deployment of advanced nuclear technologies in the State.

NYSERDA and DPS acknowledge the contributions of BW Research Partnership, Inc. (BW Research), working as a subcontractor to The Brattle Group, in preparing this analysis.

This Economic Impacts Analysis estimates the in-state economic benefits generated by the construction and operations of advanced nuclear reactors in New York. It is intended to inform economic development organizations, industry stakeholders, and policymakers of the potential jobs, labor income, tax revenues, and gross state product (GSP) that could be generated in New York.

This analysis builds on the 2026 New York State Advanced Nuclear Policy Options Paper[4] (Options Paper) Appendix A: Preliminary Economic Impacts Analysis methodology as its foundation and considers deployment pipelines of 5 gigawatt-electric (GWe), consistent with the Nuclear Reliability Backbone goal.

This Economic Impacts Analysis includes the following sections:

- **Section 2, Approach and Scope,** provides an overview of the general approach and scope of this analysis.
- **Section 3, Methodology,** provides a detailed methodology for the parts of this analysis that go beyond Appendix A of the Options Paper.
- **Section 4, Results: Economic Impacts**, presents the results across all four scenarios.
- **Section 5, Discussion**, discusses these results.

2. Approach and Scope

Economic impacts are considered for the planning, construction, and deployment of three nuclear reactor types: Large Light-Water Reactor (LLWR), Light-Water Small Modular Reactor (LW-SMR), and Liquid Metal (sodium) Cooled Reactor (Gen IV-SMR) (as an illustrative technology choice more broadly for Generation IV reactor types). In all cases, the analysis suggests that economic impacts are driven primarily by in-state labor intensity, overnight capital costs, and in-state capture of relevant supply chains and industries.

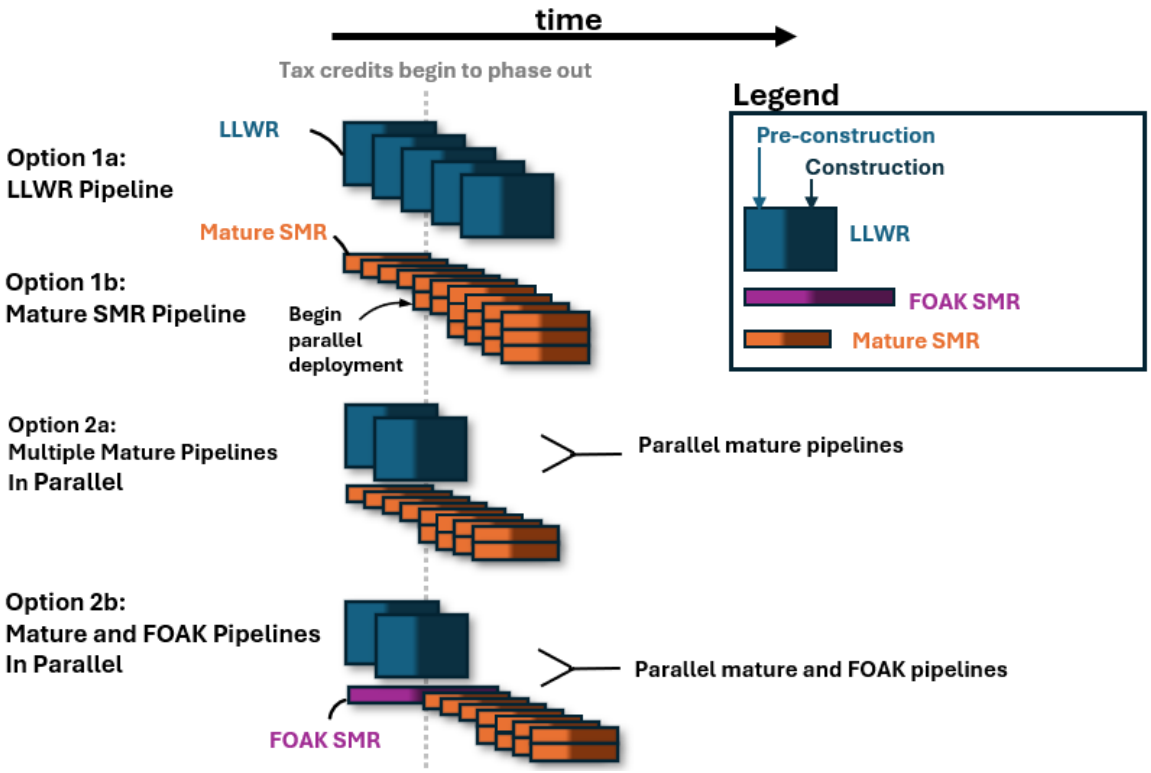
This analysis estimates the economic impacts of four deployment scenarios, detailed in this section and visualized in Figure 1. More granular assumption details are provided in Table 3 and Table 4. These scenarios are broadly consistent with the range of scenarios examined for deployment of 5 GW in Section 6 of the Options Paper. Several of the reactor types used in this study are pre-commercialization, and analysis in respect of these is therefore subject to additional uncertainty.

- **Scenario 1a: Pipeline of 5 LLWRs, or "LLWR Pipeline,"** considers the deployment of approximately 5 GWe of LLWRs. The LLWR Pipeline assumes that the commitment to one technology enables an increasing rate of local content over time as in-state industry scales to meet demand, and results in faster speed to power than scenarios with small modular reactor (SMR) technologies.
- **Scenario 1b: Pipeline of 20 LW-SMRs, or "LW-SMR Pipeline,"** considers the deployment of approximately 5 GWe of LW-SMRs. Like the LLWR Pipeline, the LW-SMR pipeline assumes an increasing rate of local content over time as in-state industry scales to meet demand, assumed at a somewhat higher level than for LLWR technology since the supply chain for LW-SMRs is likely less firmed up.
- **Scenario 2a: Multiple Pipelines in Parallel (2 LLWRs and 12 LW-SMRs), or "LLWR and LW-SMR Parallel Pipelines."** The LLWR and LW-SMR Parallel Deployment scenario deploys mature LLWRs along with LW-SMRs in parallel. This scenario involves a lower overall local content share compared to the other mixed-technology pathway modeled in the LLWR and Gen IV-SMR Parallel Deployment pathway because each of the two pipelines individually offers less volume and thus less incentive to supply chain companies to invest but achieves faster speed to power than both the LW-SMR Pipeline and the LLWR and Gen IV-SMR Parallel Deployment.

- **Scenario 2b: Mature and First-of-a-kind Parallel Pipelines (2 LLWRs and 12 Gen IV-SMR s), or "LLWR and Gen IV-SMR Parallel Pipeline."** The LLWR and Gen IV-SMR Parallel Deployment scenario deploys approximately 2 GWe of LLWRs and 3 GWe of a nascent Gen IV-SMR technology. The Gen IV-SMR technology is deployed on a more delayed schedule to allow for time to market. However, because of the nascent nature of technology, this is considered an economic development opportunity for the State, and higher levels of local content are assumed for the Gen IV technology compared to the LLWR and LW-SMR technologies.

Figure 1. Advanced Nuclear Deployment Pathways

Note: FOAK is First-of-a-Kind.



3. Methodology

This section provides an overview of the economic modeling process and the deployment scenarios. This analysis builds on the IMPLAN (Impact Analysis for Planning) input-output modeling methodology developed for, and discussed in, Appendix A of the Options Paper but is expanded to consider a larger scale of deployment (5 GWe), additional reactor technologies (Gen-IV SMR), and local content assumptions that increase over time.

For each phase of each scenario, this analysis estimates:

1. The **jobs** created in the State, across several categories (see Table 2):[a, b]

Table 2. Job Category Descriptions

Industry Jobs	**Direct Jobs**	Jobs directly associated with the initial economic activity of a given investment or activity (e.g., changes in wages, production, or jobs)
	Indirect Jobs	Jobs associated with the supply chain connected to the initial economic activity of the original investment or activity (e.g., purchases of goods and services or business tax impacts)
Induced Jobs		Jobs associated with additional household spending resulting from the additional direct and indirect employment that is generated from the initial economic activity of the original investment or activity (e.g., wages paid, household purchases, or household tax impacts)

2. The **total labor income** generated. This reflects wages, benefits, and payroll taxes paid to employees and payments received by self-employed workers or business owners.

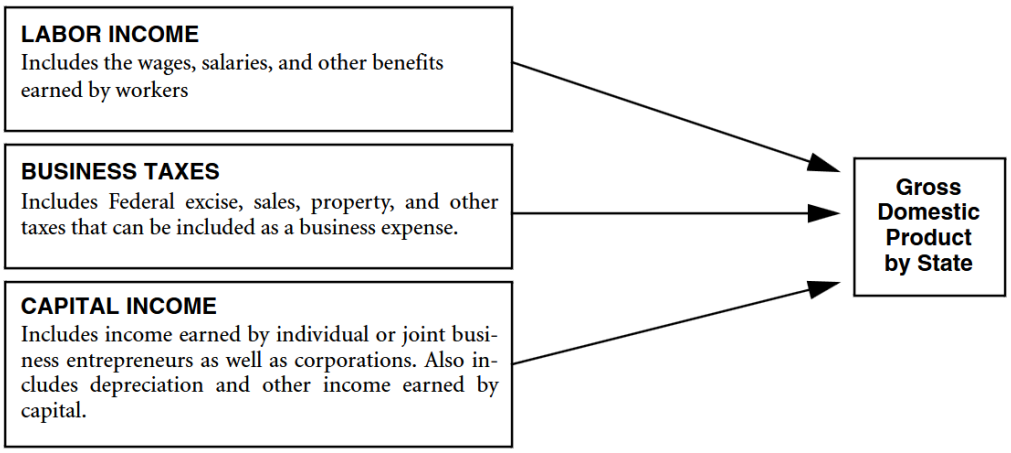
[a] This analysis focuses only on in-state potential economic benefits and does not quantify out-of-state activity, such as economic activity in other states or out-of-state workers brought in to support the construction or operations of these plants. Given uncertainties in the implementation of reactor deployment and future macroeconomic circumstances, there is potential for some of the in-state jobs reported in this section to be filled by out-of-state workers in practice, especially for certain high-demand occupations or short-term labor needs. Additionally, this analysis does not attempt to estimate any potential negative economic impacts to New York State, such as impacts to other industries in the State due to foregone investments or changes in electricity prices.

[b] Jobs reported as a cumulative measure for each phase take the form of job-years, or one job supported for one year. The analysis also estimates annual jobs for each phase, or individual jobs supported each year.

3. The **incremental local, state, and federal tax revenues** generated from these investments.[c]
4. The **value added**, or gross state product (GSP), generated from the initial economic activity. This reflects the total value of outputs and can be calculated by summing wages and tax revenues (see Figure 2).[d,5]

Figure 2. Components of Gross State Product

Source: Bureau of Economic Analysis, 2017



The model assumes a 40-year operational life of each reactor, though economic benefits will continue as long as the plant is operational. All values in this report are undiscounted and presented in 2025 dollars.

This analysis does not include:

- An assumed level of public investment or rate of return on that investment
- Quantitative analysis on the economic benefits of out-of-state exports of nuclear supply chain components
- The construction related to new or expanded nuclear component manufacturing facilities

Detailed assumptions for this analysis are discussed in this section.

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[c] Tax revenues are estimated based on a basic set of New York tax assumptions provided in IMPLAN. Nuclear reactors are assumed to be taxed following the same rates and structure levied on existing large privately-owned generating facilities in the State, without any adjustments for potential public ownership, subsidies, or additional tax benefits. For additional context, see www. support.implan.com/hc/en-us/articles/360041584233-Taxes-Where-s-the-Tax.

[d] IMPLAN defines value added as total output (also known as value of production) less the value of intermediate outputs into the production process. This can be calculated either by subtracting input costs from the final output or by summing labor income, property income, and taxes. See www.implan.com/resources/blog/understanding-implan-measures-of-gdp/.

3.1 Input Assumptions

Appendix A of the Options Paper details the assumptions and sources for the planning and construction phase model inputs for each reactor, including the overnight capital cost estimates and deployment timelines.[e] These assumptions include annual changes to overnight capital costs over time for each reactor in each scenario. This includes considering the impact of learning curves, both positive and negative, and how they change in response to technology maturity and reactor deployment timelines. The total capital expenditures and investment input into IMPLAN for the planning and operations phases are detailed in Table 3 and Figures 3 through 6. Overnight capital cost estimates are assumed to be unchanged by the share of local content. All assumptions are subject to uncertainty as detailed further in the Options Paper.

Table 3. Model Input Data by Scenario

Model Inputs	LLWR Pipeline	SMR Pipeline	LLWR and LW-SMR Parallel Pipeline	LLWR and Gen IV-SMR Parallel Pipeline
Total Operational Capacity–megawatt-electric (MWe)	5,550	5,000	5,220	5,220
Number of Reactors	5 LLWRs	20 LW-SMRs	2 LLWRs 12 LW-SMRs	2 LLWRs 12 Gen IV-SMRs
Years to Full Deployment	18	26	21	26
Operations Phase Annual Jobs	2,020	2,500	2,308	2,308

Appendix A of the Options Paper details the assumptions and sources for the operations phase model inputs. The operations phase job estimates for the Gen IV-SMR are assumed to be 125 jobs—consistent with the LW-SMR—due to the reactor having the same nameplate capacity as the LW-SMRs in the deployment scenarios and the limited information on operations phase employment for this reactor technology.

[e] The Westinghouse AP1000 was used as a model for component part mapping, construction, and operations for the LLWR, the GE Vernova Hitachi BWRX-300 was used as a model for the LW-SMR, and the TerraPower Natrium was used as a model for the Gen IV-SMR.

Figures 3 through 6 show the LLWR Pipeline (scenario 1a) is the fastest to deploy the target GWe capacity, with the fifth and final reactor coming online in year 19. The LLWR and LW-SMR Parallel Deployment scenario (scenario 2a) follows, with the last LW-SMR online in year 22 (see Figure 4). The LW-SMR Pipeline and the LLWR and Gen IV-SMR Parallel Deployment scenario both achieve full deployment in year 27.

Figure 3. Scenario 1a Model Inputs: Capital Expenditures in NYS ($millions) and Operational Nuclear Capacity (MWe)

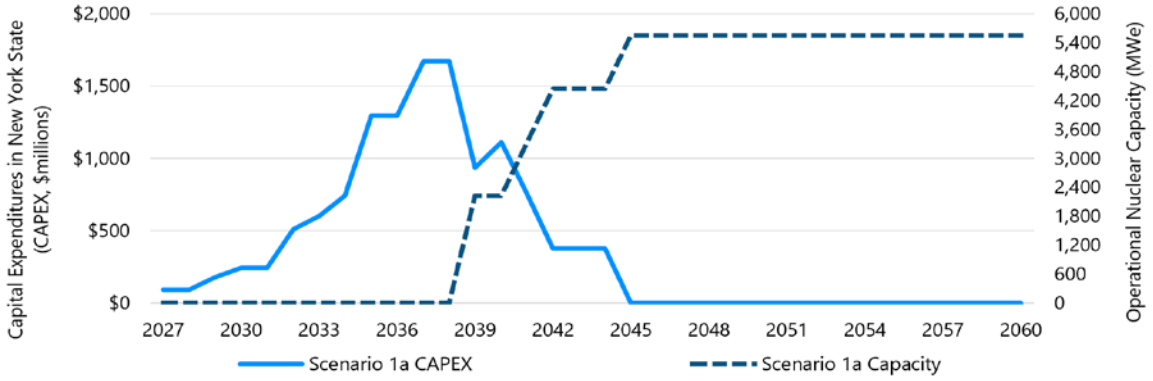


Figure 4. Scenario 1b Model Inputs: Capital Expenditures in NYS ($millions) and Operational Nuclear Capacity (MWe)

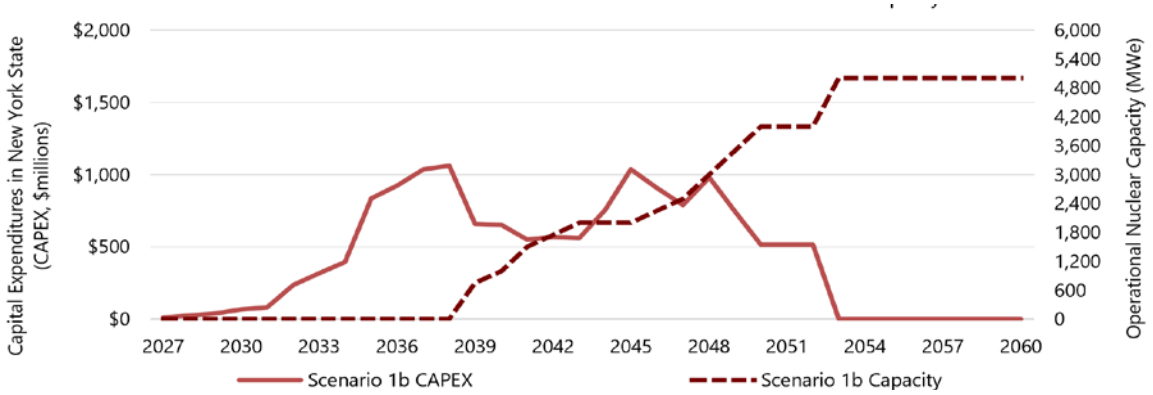


Figure 5. Scenario 2a Model Inputs: Capital Expenditures in NYS ($millions) and Operational Nuclear Capacity (MWe)

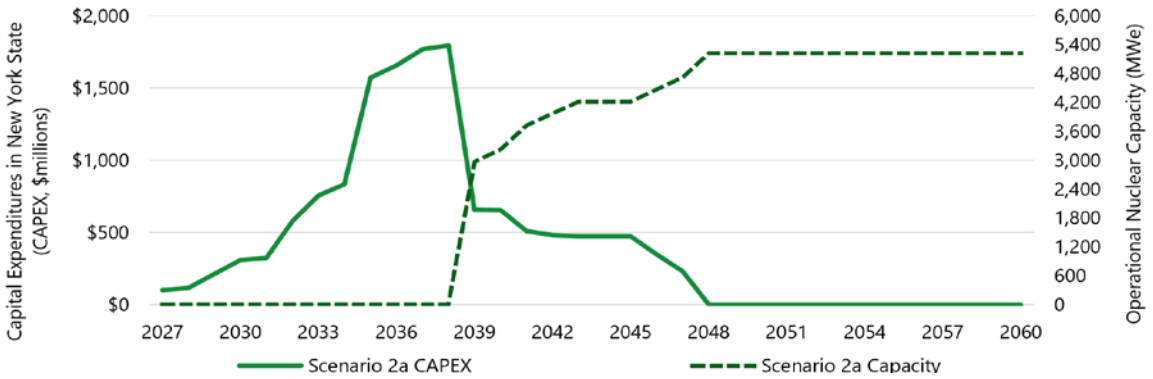
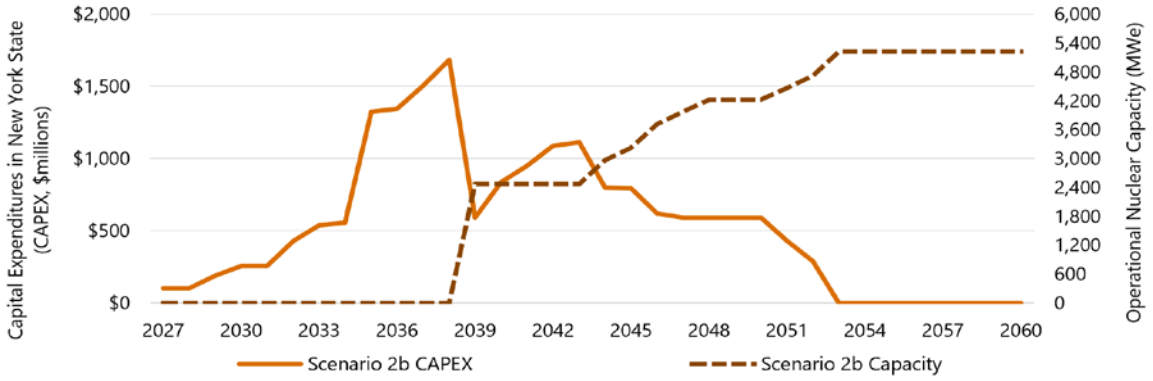


Figure 6. Scenario 2b Model Inputs: Capital Expenditures in NYS ($millions) and Operational Nuclear Capacity (MWe)



3.2 Local Supply Chain Assumptions

To analyze the economic impacts generated throughout the nuclear supply chain, this analysis identifies existing businesses in the nuclear supply chain as well as businesses in adjacent industries that could potentially adapt to support the nuclear sector. Based on this existing in-State manufacturing capacity, a list of priority supply chain components that may be relevant to all four reactor technologies were identified through an analysis in the Supply Chain Study. The set of priority components is as follows:

- Heat exchangers
- Pumps
- Valves and seals
- Precision manufacturing, computer numerical control mills, and lathes
- Instrumentation and control for pressure and temperature

While the priority components for the Gen IV-SMR are the same as those listed in this section, due to differences in reactor design, two considerations for Gen IV-SMR supply chain development were identified:

1. Heat exchangers for Gen IV-SMRs come in different sizes and operate at different temperatures and pressures than those used in LLWRs or LW-SMRs. A firm supplying heat exchangers for LLWRs or LW-SMRs would need to modify production specifications in order to supply for Gen IV-SMRs and may also require additional quality assurance and quality control processes.
2. The pumps used in Gen IV-SMRs are electromagnetic pumps, which differ from the traditional fluid pumps used in LLWRs and LW-SMRs.

Three levels of local content assumptions—the share of priority components for New York's 5 GWe that can be manufactured in-state—were developed: a "current" level for year 2027, a "base" level for years 2028–2034, and a "high" level for years 2035 and beyond (see Table 4). The "current" level is based on existing in-state manufacturing capacity, the "base" level is a bridge between the "current" and "high" levels.

The "high" level serves as an estimate of what the State could capture through targeted and aggressive supply chain development to establish or expand in-state production of priority components. Under the "high" level, investments in the priority components are assumed to well exceed business-as-usual economic circumstances. The "high" level for the Gen IV-SMR is elevated to 100 percent based on the assumption that a more nascent technology will have greater opportunity for local supply chain capture.

Table 4. Assumed Local Content Percentages in Construction Phase

Priority Component	LLWR			LW-SMR			Gen IV-SMR		
	2027	2028-34	2035+	2027	2028-34	2035+	2027	2028-34	2035+
	Current	Base	High	Current	Base	High	Current	Base	High
Precision manufacturing, computer numerical control mills, and lathes	13%	20%	40%	20%	20%	40%	10%	13%	100%
Valves and seals	18%	20%	40%	19%	20%	40%	12%	22%	100%
Pumps	10%	20%	40%	10%	15%	28%	10%	20%	100%
Instrumentation and control for pressure and temperature	13%	20%	40%	13%	20%	40%	5%	14%	100%
Heat exchangers	20%	20%	40%	20%	20%	40%	10%	20%	100%

Differences in economic outcomes across the four scenarios being analyzed result from the assumed costs of the components associated with each reactor's design and is subject to uncertainty. While local content assumptions drive the amount of overnight capital costs captured by in-state businesses in this analysis, they do not have an impact on the magnitude of total overnight capital costs themselves, which in practice may change whether components are sourced in-state or out-of-state. In other words, this analysis assumes that the cost of components is the same, regardless of where they are sourced from.

Due to the high volume of nuclear generating capacity deployed in each scenario, the analysis assumed firms in the State would be able to supply no more than half of the identified components for a given reactor during the construction phase, with the exception of the Gen IV-SMR. During the operations phase, the analysis assumes that in-state firms can fulfill all equipment replacement for the priority components.

The analysis does not capture the economic benefits of in-state firms exporting components for reactors installed out-of-state, nor does it capture the economic benefits associated with the construction of new or expanded manufacturing facilities.

The investment and in-state capture for each scenario and each phase are detailed in Table 5.

Table 5. New York State Capture of Total Overnight Capital Costs by Scenario and Project Phase ($ millions)

Model Inputs	LLWR Pipeline	SMR Pipeline	LLWR and LW-SMR Parallel Pipeline	LLWR and Gen IV-SMR Parallel Pipeline
In-State-Captured Planning Phase Investment	$2,574	$678	$1,743	$1,881
In-State-Captured Construction Phase Investment	$9,956	$14,103	$12,582	$16,264
Total In-State-Captured Pre-Operations Phase Investment	$12,531	$14,782	$14,325	$18,145
Total Overnight Capital Cost	$57,117	$60,510	$64,777	$64,777
Share of Total Cost Captured by In-State Businesses Over All Years	22%	24%	22%	28%

4. Results: Economic Impacts

This section presents the economic impacts on the State under the four deployment scenarios.

4.1 Summary Results

Across the deployment scenarios, the State stands to gain between $89 and $105 billion in GSP through the planning, construction, and 40-year lifetime operations of a 5 GWe advanced nuclear fleet (see Table 6). This includes between $49 billion and $58 billion in income to workers, and between $16 billion and $19 billion in state and local tax revenues generated, with local taxes making up more than half of this total. Pre-operations phase activities can generate between 3,400 and 4,400 average annual jobs (including induced jobs), or between 79,000 and 109,000 total job-years. The operations phase of the reactors supports between 5,500 and 5,700 average annual jobs, or an estimated 252,000 to 301,000 total job-years.

Findings indicate significant economic impacts across all four scenarios. When the GSP generated in each conceptual scenario is taken relative to the total overnight capital costs and operating expenditures, all scenarios generate a similar level of economic benefits (see Table 7).[f]

Table 6. Summary Results: Planning, Construction, and Operations Phase Outputs per Scenario ($ millions)

Note: Shaded rows indicate sum totals.

	LLWR Pipeline	SMR Pipeline	LLWR and LW-SMR Parallel D Pipeline	LLWR and Gen IV-SMR Parallel Pipeline
Total Value Added (GSP)	$89,371	$105,725	$100,666	$103,947
Planning and Construction Phase	$12,638	$12,450	$14,008	$17,403
Operations Phase	$76,732	$93,275	$86,658	$86,543
Total Labor Income	$49,175	$58,137	$55,183	$57,282
Planning and Construction Phase	$8,202	$8,544	$9,038	$11,230
Operations Phase	$40,972	$49,593	$46,145	$46,051

[f] Since a portion of the overnight capital costs and operating expenditures are spent out-of-state, and only in-state GSP is estimated, figures reported here are less than $1.

Table 6. (continued)

	LLWR Pipeline	SMR Pipeline	LLWR and LW-SMR Parallel D Pipeline	LLWR and Gen IV-SMR Parallel Pipeline
Local Taxes	$10,395	$12,526	$11,803	$11,956
State Taxes	$5,690	$6,745	$6,441	$6,572
Planning and Construction Phase	$1,020	$804	$1,138	$1,432
Operations Phase	$15,065	$18,468	$17,106	$17,097
Average Construction Jobs (annual)	4,400	3,440	4,200	4,170
Average Operations Jobs (annual)	5,470	5,580	5,740	5,190

Full details on the overnight capital costs, including assumptions on annual changes in cost for each reactor type in each scenario can be found in Appendix D of the Options Paper.

Table 7. Total Value Added (GSP) Generated per Dollar of Total Overnight Capital Costs and Operating Expenditures, by Scenario

Scenario	Total GSP per $ of Total Expenditures
LLWR Pipeline (Scenario 1a)	$0.68
SMR Pipeline (Scenario 1b)	$0.69
LLWR and LW-SMR Parallel Deployment (Scenario 2a)	$0.67
LLWR and Gen IV-SMR Parallel Deployment (Scenario 2b)	$0.69

While results are broadly similar across the analysis, the scenarios still illustrate nuanced differences. In the LLWR and LW-SMR Parallel Deployment pathway (Scenario 2a) and the LLWR Pipeline (scenario 1a), where capacity is anticipated to deploy faster, pre-operations phase employment peaks higher (and sooner) than in the other scenarios (see Figures 7 through 10). The LLWR and LW-SMR Parallel Deployment pathway (Scenario 2a) is estimated to have the highest peak pre-operations employment of the four modeled scenarios, supporting about 8,200 direct and indirect jobs at peak, followed by the LLWR Pipeline (Scenario 1a) with 7,700 direct and indirect pre-operations jobs at peak.

Once all reactors are installed, long-term operations jobs across the four scenarios range from 3,700 to 4,400 direct and indirect jobs. Findings suggest that pre-operations jobs may vary most significantly across the scenarios, consistent with the differences in construction timelines and the more variable nature of construction employment needs.

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

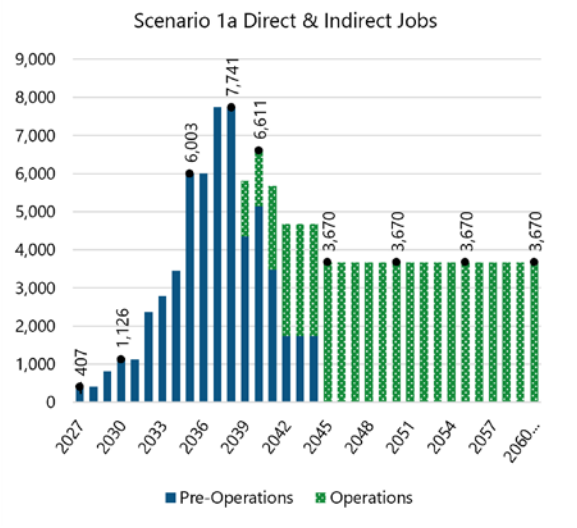


Figure 8. Scenario 1b Direct and Indirect Jobs, 2027–2060

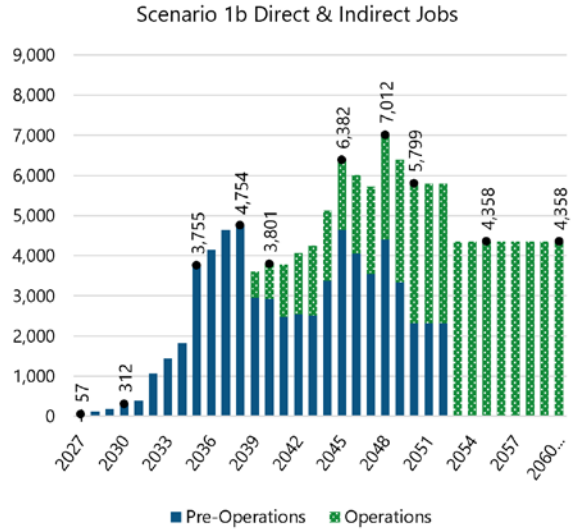


Figure 9. Scenario 2a Direct and Indirect Jobs, 2027–2060

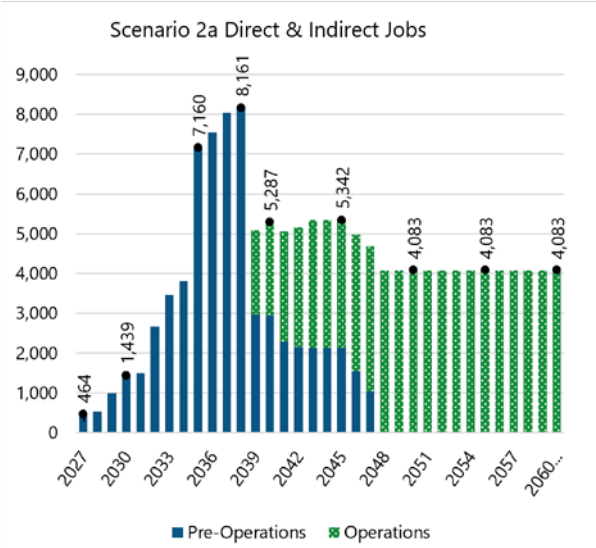
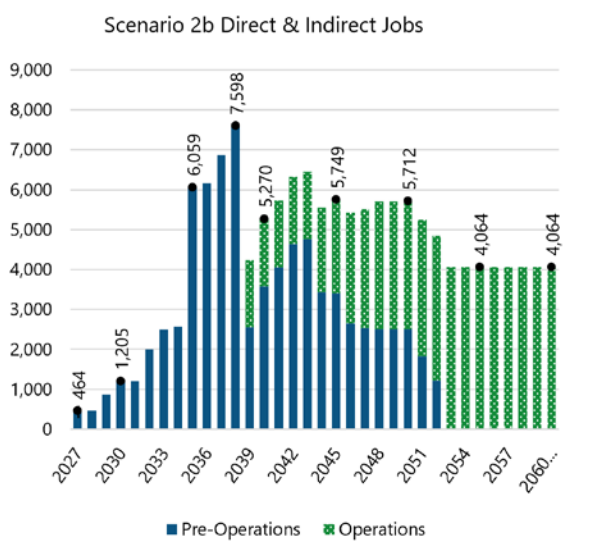


Figure 10. Scenario 2b Direct and Indirect Jobs, 2027–2060



4.2 Scenario 1a: LLWR Pipeline Detailed Results

During the 18-year pre-operations phase, the planning and construction of 5 GWe of LLWRs (scenario 1a) is estimated to create about 4,400 jobs, or 79,200 job-years, of which nearly three-quarters (73%) are employed directly and indirectly: on-site, providing support services, or throughout the supply chain (see Table 7). Job-years represent a full year of work and are significantly different from the total number of employees, which can fluctuate widely throughout the pre-operations period. During peak planning and construction activities, approximately 7,700 in-state workers are estimated to be employed directly and indirectly, while the operations of 5 GWe of LLWRs are estimated to support about 3,700 permanent, direct and indirect workers (see Figure 7). From the start of operations of the first reactor through the 40-year lifetime of all reactors, the operational activities are projected to contribute about $77 billion to GSP, $41 billion in labor income, and $15 billion in state and local taxes (see Tables 8 and 9).

Table 8. Detailed Economic Impacts, Scenario 1a: LLWR Pipeline

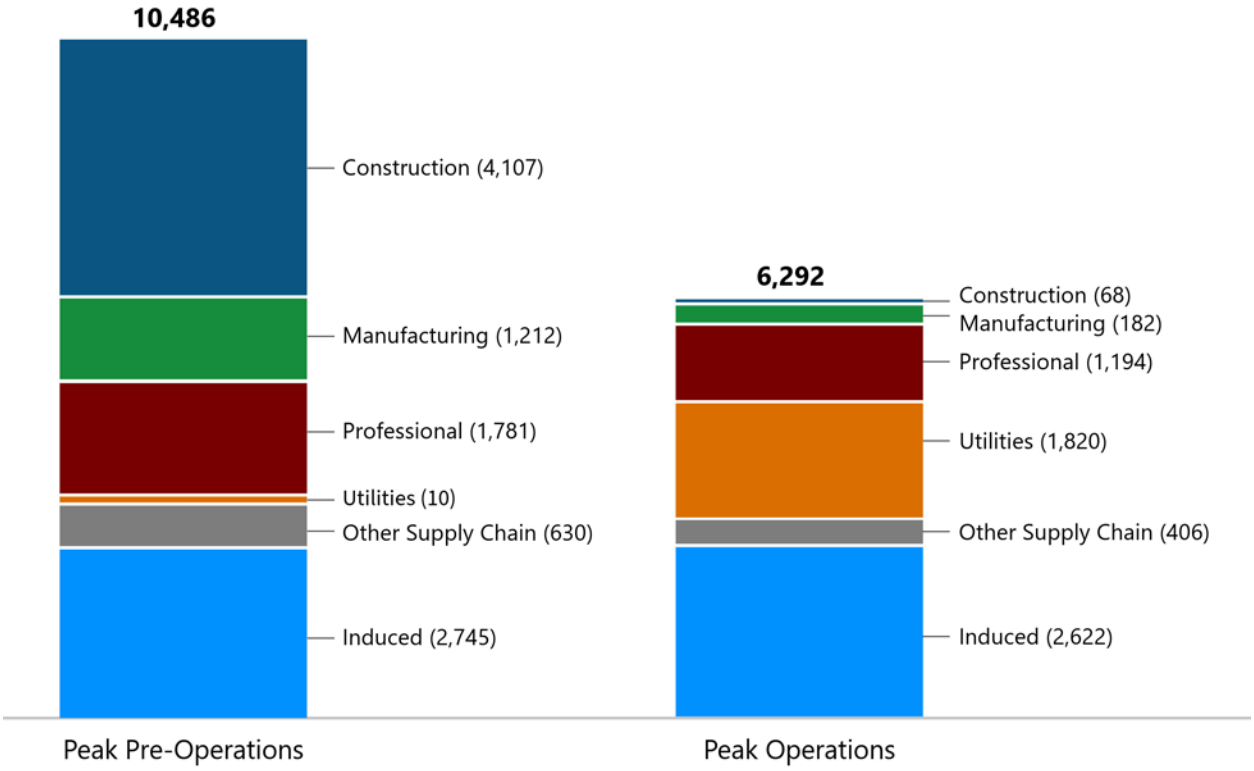
	Employment (total job-years)	Employment (average annual jobs)	Labor Income ($ millions)	Value Added ($ millions)
Planning & Construction Phase (total impacts over 18-year period)				
Direct	44,873	2,493	$5,058	$7,151
Indirect	13,269	737	$1,450	$2,338
Induced	21,079	1,171	$1,694	$3,150
Total	**79,220**	**4,401**	**$8,202**	**$12,638**
Operations Phase (total impacts over 40-year operational reactor lifetime, cumulative 46-year period)				
Direct	80,800	1,757	$22,904	$43,456
Indirect	66,007	1,435	$9,398	$17,169
Induced	104,892	2,280	$8,671	$16,108
Total	**251,699**	**5,472**	**$40,972**	**$76,732**

Table 9. Detailed Tax Impacts, Scenario 1a: LLWR Pipeline ($ millions)

Taxes		
	Planning & Construction Phase	**Operations Phase**
Local	$532	$9,863
State	$488	$5,202
Federal	$1,867	$9,807
Total	**$2,887**	**$24,871**

During the peak of pre-operations phase activities, in-state workers are estimated to be found primarily in the construction industry supporting on-site installation of the LLWRs, while additional in-state jobs are found in professional services working on engineering and design, siting, and permitting, and in manufacturing industries supporting the component supply for these reactors. During the operations phase, most employment is found in the electric generating utility industry (primarily working onsite at the generating facility), while nearly 200 manufacturing jobs are supported by the continued need for replacement parts. Induced jobs stimulated by nuclear workers spending their wages in the local economy are generated at a higher rate in the operations phase due to the above-average wages earned relative to the pre-operations phase workers (see Figure 11).

Figure 11. Peak Jobs by Industry, LLWR Pipeline



4.3 Scenario 1b: LW-SMR Pipeline Detailed Results

During the 26-year pre-operations phase, the planning and construction of 5 GWe of LW-SMRs in scenario 1b is estimated to create about 3,400 jobs, totaling 89,600 job-years, of which nearly three-quarters (74%) are employed directly and indirectly: on-site, providing support services, or throughout the supply chain (see Table 10). During peak planning and construction activities, approximately 4,800 in-state workers are estimated to be employed directly and indirectly, while the operations of 5 GWe of LW-SMRs are estimated to support about 4,400 permanent, direct and indirect workers (see Figure 8). Over the 40-year lifetime of all reactors, the operational activities will contribute about $93 billion to GSP, $50 billion in labor income, and $18 billion in state and local taxes (see Tables 10 and 11).

Table 10. Detailed Economic Impacts, Scenario 1b: LW-SMR Pipeline

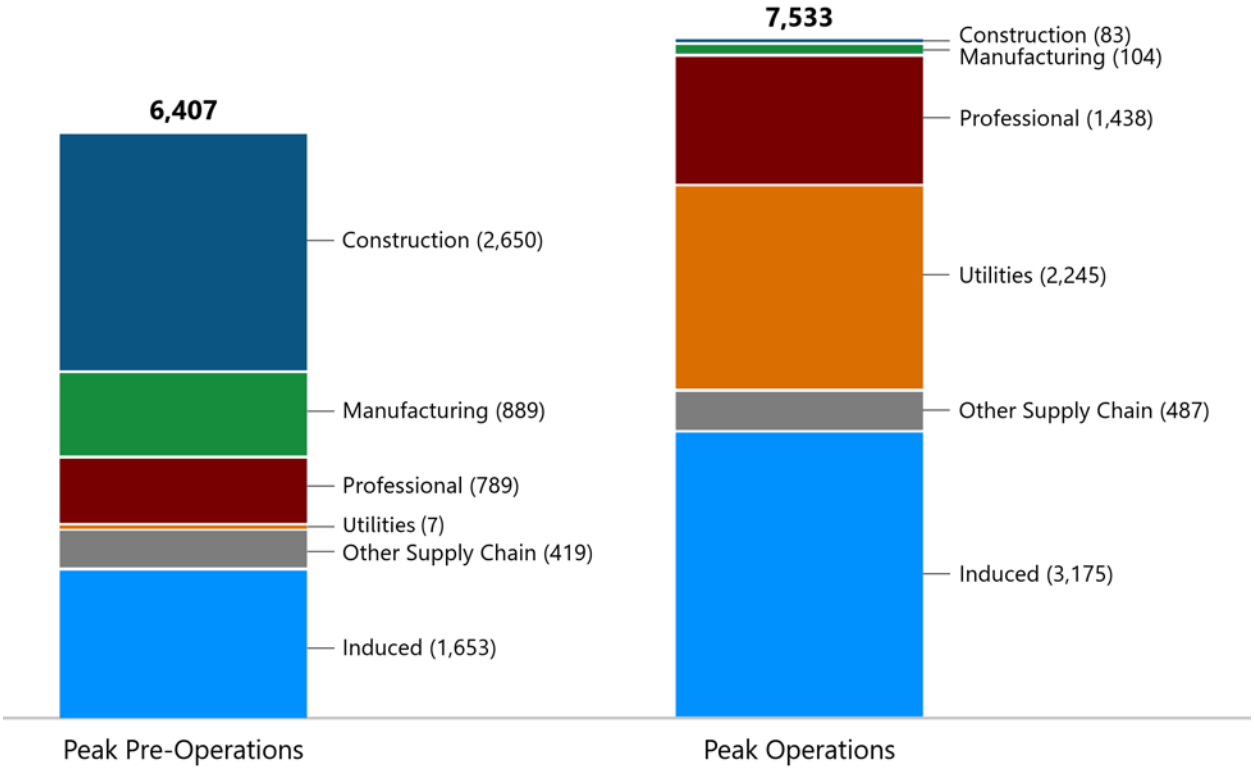
	Employment (total job-years)	Employment (average annual jobs)	Labor Income ($ millions)	Value Added ($ millions)
Planning & Construction Phase (total impacts over 26-year period)				
Direct	51,924	1,997	$5,275	$7,112
Indirect	14,430	555	$1,504	$2,273
Induced	23,260	895	$1,765	$3,066
Total	**89,615**	**3,447**	**$8,544**	**$12,450**
Operations Phase (total impacts over 40-year operational reactor lifetime, cumulative 54-year period)				
Direct	100,000	1,852	$28,292	$53,650
Indirect	74,305	1,376	$10,801	$20,120
Induced	127,017	2,352	$10,500	$19,505
Total	**301,322**	**5,580**	**$49,593**	**$93,275**

Table 11. Detailed Tax Impacts, Scenario 1b: LW-SMR Pipeline ($ millions)

Taxes		
	Planning & Construction Phase	**Operations Phase**
Local	$421	$12,105
State	$382	$6,363
Federal	$1,441	$11,881
Total	**$2,244**	**$30,349**

During the peak of pre-operations phase activities, in-state workers are estimated to be found primarily in the construction industry supporting on-site installation of the LW-SMRs, and to a lesser degree in manufacturing industries supporting the component supply for these reactors, or in professional services working on engineering and design, siting, and permitting. During the operations phase, most employment is found in the electric generating utility industry, while about 100 manufacturing jobs are supported by the continued need for replacement parts. Induced jobs stimulated by nuclear workers spending their wages in the local economy are generated at a higher rate in the operations phase due to higher wages (see Figure 12).

Figure 12. Peak Jobs by Industry, LW-SMR Pipeline



4.4 Scenario 2a: LLWR and LW-SMR Parallel Deployment Detailed Results

During the 21-year pre-operations phase, the planning and construction of 5 GWe of LLWRs and LW-SMRs in scenario 2a is estimated to create about 88,300 job-years, of which nearly three quarters (73%) are employed directly and indirectly: on-site, providing support services, or throughout the supply chain (see Table 12). During peak planning and construction activities, approximately 8,200 in-state workers are estimated to be employed directly and indirectly, while the combined operations of 2 GWe of LLWRs and 3 GWe of LW-SMRs are estimated to support about 4,100 permanent, direct and indirect workers (see Figure 9). Over the 40-year lifetime of all reactors, the operational activities will contribute about $87 billion to GSP, $46 billion in labor income, and more than $17 billion in state and local taxes (see Tables 12 and 13).

Table 12. Detailed Economic Impacts, Scenario 2a: LLWR and LW-SMR Parallel Deployment

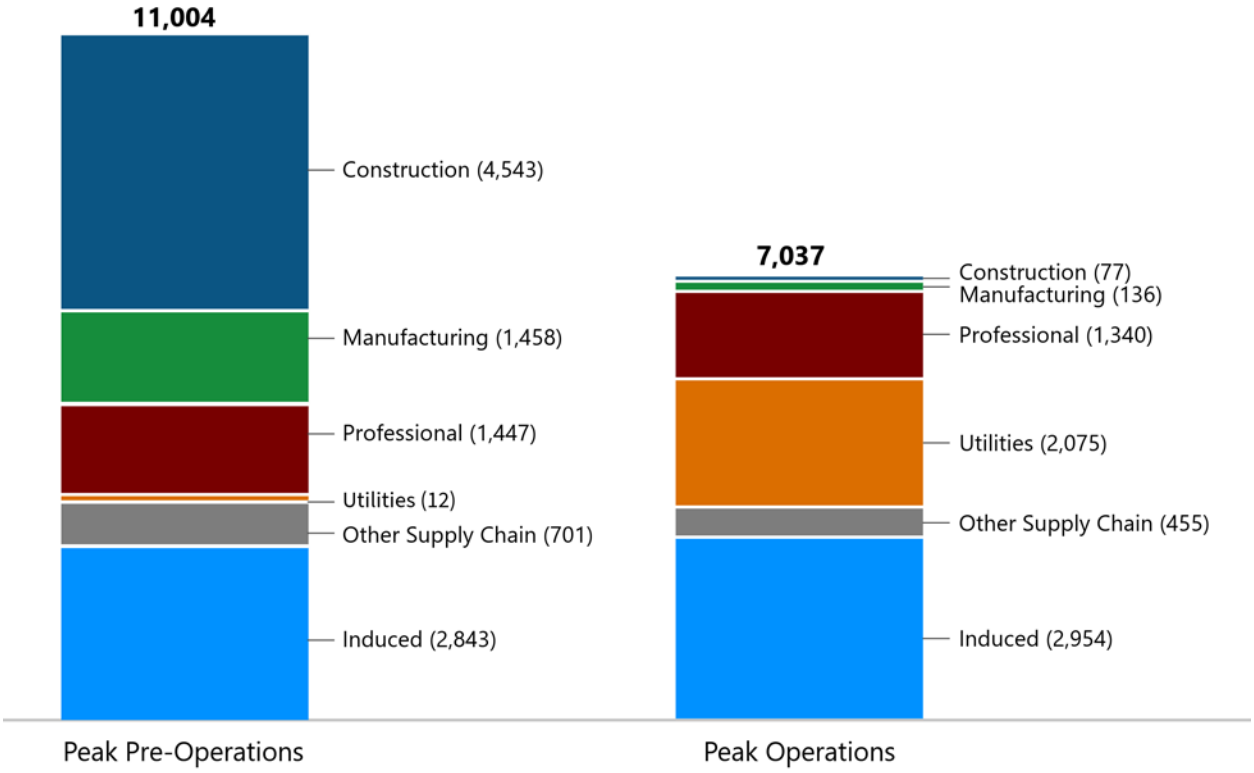
	Employment (total job-years)	Employment (average annual jobs)	Labor Income ($ millions)	Value Added ($ millions)
Planning & Construction Phase (total impacts over 21-year period)				
Direct	50,540	2,407	$5,571	$7,955
Indirect	14,563	693	$1,600	$2,582
Induced	23,222	1,106	$1,867	$3,471
Total	**88,325**	**4,206**	**$9,038**	**$14,008**
Operations Phase (total impacts over 40-year operational reactor lifetime, cumulative 49-year period)				
Direct	92,320	1,884	$26,137	$49,572
Indirect	70,986	1,449	$10,239	$18,939
Induced	118,167	2,412	$9,769	$18,146
Total	**281,473**	**5,744**	**$46,145**	**$86,658**

Table 13. Detailed Tax Impacts, Scenario 2a: LLWR and LW-SMR Parallel Deployment ($ millions)

Taxes		
	Planning & Construction Phase	**Operations Phase**
Local	$595	$11,208
State	$543	$5,898
Federal	$2,060	$11,051
Total	**$3,198**	**$28,158**

During the peak of pre-operations phase activities, in-state workers are found primarily in the construction industry supporting on-site installation of the LLWRs and LW-SMRs, and to a lesser degree in manufacturing industries and in professional services. During the operations phase, most employment is found in utilities and roughly 100 manufacturing jobs are supported by the need for replacement parts. Induced jobs stimulated by nuclear workers spending their wages in the local economy are generated at a higher rate in the operations phase (see Figure 13).

Figure 13. Peak Jobs by Industry, LLWR and LW-SMR Parallel Deployment



4.5 Scenario 2b: LLWR and Gen IV-SMR Parallel Deployment Detailed Results

During the 26-year pre-operations phase, the planning and construction of 5 GWe of LLWRs and Gen IV-SMR s (scenario 2b) is estimated to create about 4,100 jobs, or 108,500 job-years, of which nearly three quarters (74%) are employed directly and indirectly: on-site, providing support services, or throughout the supply chain (see Table 14). During peak planning and construction activities, approximately 7,600 in-state workers are estimated to be employed directly and indirectly, while the combined operations of 2 GWe of LLWRs and 3 GWe of Gen IV-SMR s are estimated to support about 4,100 permanent, direct and indirect workers (see Figure 10). Over the 40-year lifetime of all reactors, operational activities contribute about $87 billion to GSP, $46 billion in labor income, and $17 billion in state and local taxes (see Tables 14 and 15).

Table 14. Detailed Economic Impacts, Scenario 2b: LLWR and Gen IV-SMR Parallel Deployment

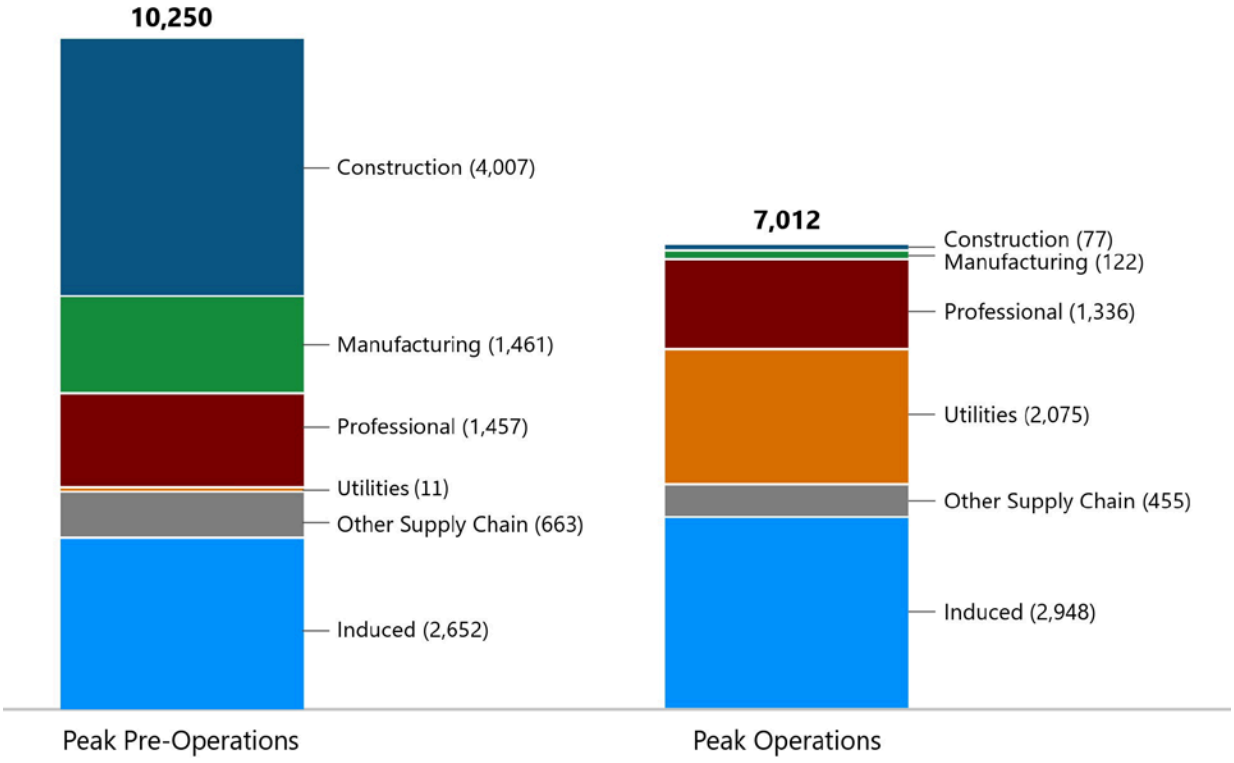
	Employment (total job-years)	Employment (average annual jobs)	Labor Income ($ millions)	Value Added ($ millions)
Planning & Construction Phase (total impacts over 26-year period)				
Direct	61,926	2,382	$6,871	$9,794
Indirect	18,239	701	$2,046	$3,308
Induced	28,344	1,090	$2,313	$4,301
Total	**108,508**	**4,173**	**$11,230**	**$17,403**
Operations Phase (total impacts over 40-year operational reactor lifetime, cumulative 54-year period)				
Direct	92,320	1,710	$26,137	$49,572
Indirect	70,235	1,301	$10,166	$18,861
Induced	117,931	2,184	$9,749	$18,110
Total	**280,486**	**5,194**	**$46,051**	**$86,543**

Table 15. Detailed Tax Impacts, Scenario 2b: LLWR and Gen IV-SMR Parallel Deployment ($ millions)

Taxes		
	Planning & Construction Phase	**Operations Phase**
Local	$753	$11,203
State	$678	$5,894
Federal	$2,557	$11,031
Total	**$3,989**	**$28,128**

During the peak of pre-operations phase activities, in-state workers are estimated to be found primarily in the construction industry supporting on-site installation of the LLWRs and Gen IV-SMRs, and to a lesser degree, in professional services working on engineering and design, siting, and permitting, and in manufacturing industries supporting the component supply for these reactors. During the operations phase, most employment is found in the electric generating utility industry, while more than 100 manufacturing jobs are supported by the need for replacement parts. Induced jobs stimulated by nuclear workers spending their wages in the local economy are generated at a higher rate in the operations phase (see Figure 14).

Figure 14. Peak Jobs by Industry, LLWR, and Gen IV-SMR Parallel Deployment



5. Discussion

Reactor technology selection will be the result of careful consideration of a wide range of aspects. This analysis offers insights on one aspect: economic benefits and how they may differ across deployment approaches. The projected economic benefits outlined above are driven by four primary factors: capital expenditure, operational expenditure, labor assumptions, and supply chain capture. Given the limited deployment of advanced nuclear technologies to date, all four of these factors are subject to uncertainty, in particular as regards the technologies other than LLWR.

- Capital and operational expenditures affect the total level of investment into a project and therefore are a major contributor to overall economic impacts.
- Labor assumptions define the number of workers needed to operate the generation facility. The more labor intensive the operation of a facility is, the more labor income and overall value added is generated.
- Supply chain capture defines the share of reactor components that can be manufactured in New York and therefore increases the share of spending that is captured in-state.

This analysis finds largely comparable benefits between the deployment scenarios, ranging from $89 billion to $105 billion. On a per dollar invested basis, the benefits converge further: delivering between $0.67 and $0.69 of GSP per dollar of total capital and operational expenditure. Similarly, all four scenarios project roughly 4,000 pre-operations and more than 5,000 operations jobs (discussed in additional detail in the Workforce Development Study of the Master Plan). Such results indicate compelling baseline economic benefits regardless of the deployment pathway ultimately pursued.

Several other factors must be considered in comparing the benefits of different deployment scenarios. For example, this analysis assumes that a more mature large light water reactor technology will allow capacity to be deployed on an accelerated timeline and a lower cost compared to less mature reactor technologies. While not quantified in our estimates, these factors could lower overall project risk, increase the time-adjusted value of the benefits, and lower potential impacts to ratepayers.

This analysis does not reflect logistical constraints. For example, while a commitment to a pipeline of one technology may potentially lower project costs, the high demand for a single technology could create bottlenecks and delays if the component supply chain is not established in time, exemplifying the potential benefits of diversification. On the other hand, deploying multiple technologies might not allow reactor costs to decrease as much over time as they would in the single reactor pathways, leading to relatively greater per-reactor cost reductions. Ultimately, reactor technology selection will be the result of careful consideration of all aspects, not just economic development.

Less mature reactors may present potentially greater economic development opportunities through the capture of the supply chain, which could increase economic benefits and drive regional economic impacts. This is explored through a scenario with Gen IV technology, though this scenario is subject to the greatest uncertainty in this analysis around total cost, project timelines, supply chain opportunities, and resulting economic benefits. Notably, this scenario likely undercounts the economic benefits associated with the Gen IV-SMR reactor. The economic impacts reported in this analysis only capture the construction and operations of in-state reactor deployments. Gen IV technology may offer greater opportunities to build in-state manufacturing capacity than more mature technology, and once such in-state manufacturing capacity is achieved, New York firms could potentially serve an out-of-state export market for Gen IV-SMR component supply, which is not quantified in this analysis. Similarly, this analysis does not include the economic benefits of constructing the manufacturing facilities themselves or other capital investment into manufacturing equipment.

All scenarios are estimated to support a similar number of permanent manufacturing jobs (100–200 jobs per year) relating to replacement parts needed for in-state reactors during the operations phase. However, an expanded, out-of-state market for these parts could increase the number of manufacturing jobs and relevant benefits. This is particularly important to consider for the LW-SMRs and Gen IV technologies, for which the supply chains are less mature and there may be greater opportunities for capture by a first mover.

Priority components identified for supply chain development in this analysis—heat exchangers, pumps, valves and seals, precision manufacturing, computer numerical control mills, and lathes; and instrumentation and control for temperature and pressure—are utilized in the design of all reactor types, which reduces risk in supply chain development and broadens the potential benefits available to capture in an export market scenario.

Acronyms and Abbreviations

DPS	Department of Public Service
FOAK	First-of-a-Kind
Gen IV	Generation IV reactor
Gen IV-SMR	Generation IV small modular reactor
GSP	gross state product
GW	gigawatt
GWe	gigawatt-electric
IMPLAN	Impact Analysis for Planning
LLWR	large light-water reactor
LW-SMR	light-water small modular reactor
MWe	megawatt-electric
NYSERDA	New York State Energy Research and Development Authority
SMR	small modular reactor
NYS, State	New York State

Endnotes

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