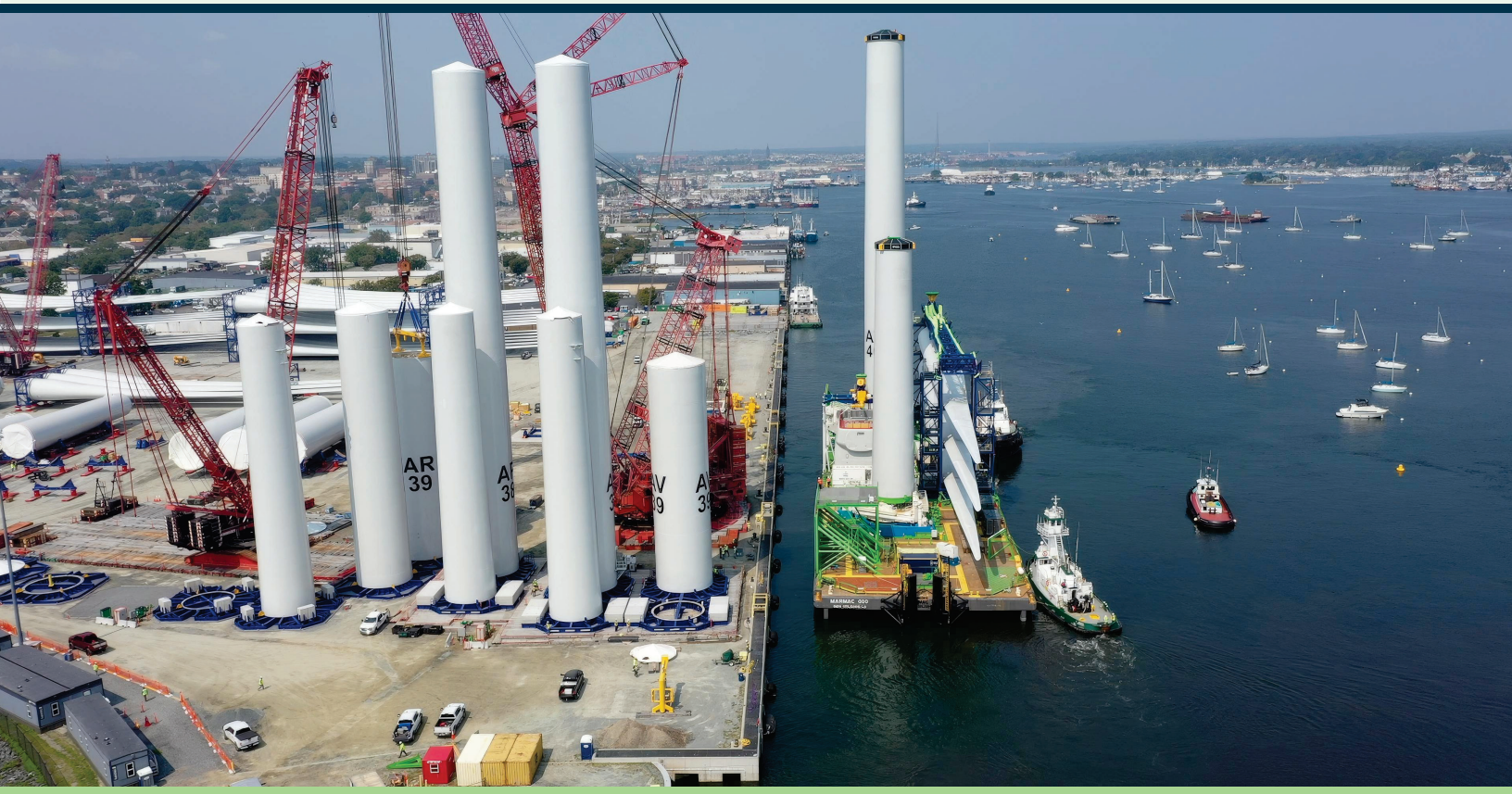
VINEYARD WIND 1



Impact On Jobs and Economic Output

Annual Report 4

December 2025

SPRINGLINE RESEARCH GROUP

VINEYARD WIND 1

Vineyard Wind is a joint venture between Avangrid Renewables and Copenhagen Infrastructure Partners. It is developing the Vineyard Wind 1 project, an 806-megawatt offshore wind farm located 15 miles south of Martha's Vineyard that is the first commercial-scale offshore wind energy project in the United States.

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David Borges, the author of this report, has analyzed the Vineyard Wind 1 project and broader renewable-energy impacts since 2017, beginning with his tenure as Director of Research at the UMass Dartmouth Public Policy Center.

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Executive Summary

Vineyard Wind's *Offshore Wind Development and Reporting Agreement* with the Massachusetts Department of Energy Resources requires annual reporting on jobs and progress toward achieving local economic impacts associated with Vineyard Wind 1. This is the fourth Annual Report and consolidates labor and spending data from 2017 through September 2025, encompassing the project's entire development phase, four years of construction, and the start of operations and maintenance (O&M).

Key Takeaways

- **Vineyard Wind 1 has created thousands of jobs.** More than 3,700 U.S.-based workers have been directly employed on the project to date, including both union and nonunion workers across development, construction, and O&M. Most are Massachusetts residents.
- **Construction is the most labor-intensive phase of the project.** Over 3,300 workers have been employed during the construction phase, with peak activity in Year 2, when work was underway simultaneously in Barnstable, Martha's Vineyard, offshore, and New Bedford.
- **Full-time equivalents (FTEs) capture the total volume of labor delivered on the project.** The project has generated 2,469 FTEs since 2017, reflecting the intensity and duration of work, including offshore rotations and high-hour schedules that go beyond simple worker counts.[1]
- **Union labor participation exceeded local hiring goals.** Seventy-one percent of union workers resided in Southeastern Massachusetts (SEMass), surpassing the project's 51% goal, demonstrating strong local engagement.
- **Offshore roles require highly specialized, high-wage labor**. Many offshore technicians, marine crews, and commissioning staff work 84 hours per week during rotations, earning premium wages and overtime that significantly boost economic impacts.
- **Vineyard Wind 1 has supported 6,404 FTE jobs in Massachusetts, $623.4 million in labor income, and $1.94 billion in total economic output.** This includes Vineyard Wind's direct spending as well as the additional business activity supported by supply chain and household spending.
- **O&M activity is already creating long-term jobs.** O&M supported 93 FTEs in its first two years and is expected to sustain approximately 80 to 100 permanent jobs annually once the project is fully operational.

[1] FTE measures the total labor hours worked, with one FTE equal to 2,080 hours of work.

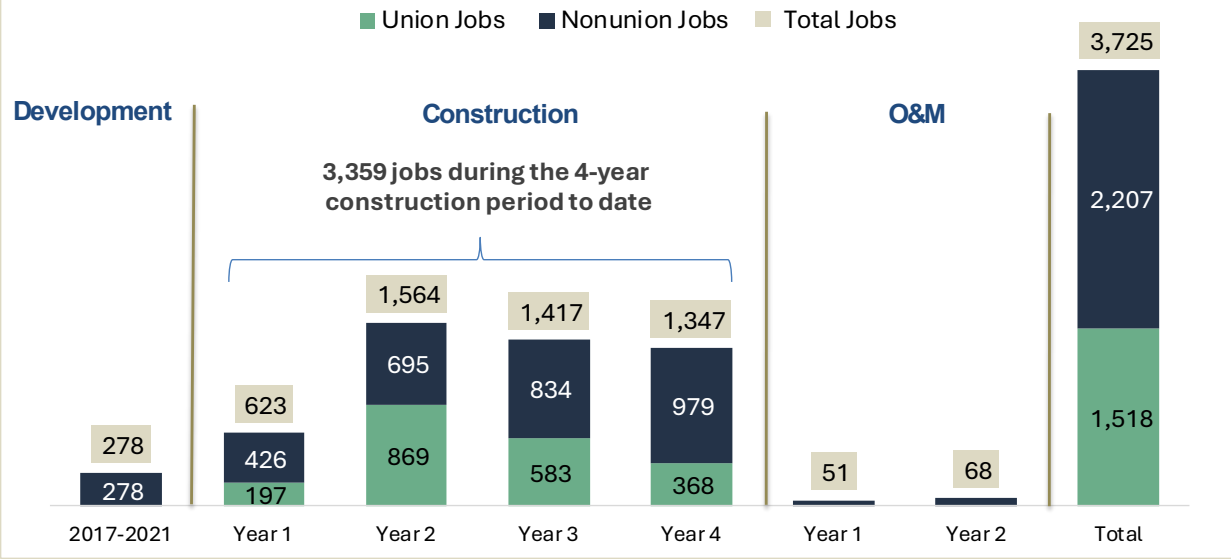
Jobs (Headcount)

Headcount represents the total number of individuals employed on the project, including both part-time and full-time workers.

Vineyard Wind 1 Has Directly Supported a Total of 3,725 Jobs, including 1,518 Union Positions and 2,207 Nonunion Positions (see Figure 1).

- The five-year development phase supported 278 workers.
- The construction phase has been the most labor-intensive period of the project, with 3,359 workers employed to date. Employment peaked in Year 2, when activity intensified simultaneously on the Barnstable onshore substation, O&M facilities on Martha's Vineyard, and at the New Bedford Marine Commerce Terminal, accompanied by the ramp-up of offshore installation work.[2]
- O&M supported 51 jobs in Year 1 and 68 jobs in Year 2. Once Vineyard Wind 1 is fully operational, O&M activity is expected to sustain approximately 80 to 100 jobs per year.[3]

Figure 1 | Jobs (Headcount), Development, Construction, and O&M Phases To Date



Source: Springline Research, based on monthly contractor reports.

[2] The total (last bar) represents the number of unique individual workers over the project scope, not the sum of the previous bars. Workers who maintain jobs across reporting years are captured in multiple years but counted once in the total.

[3] To improve accuracy, Vineyard Wind's nonunion headcount methodology was updated in Year 4 and then applied retroactively to all prior years. Under this revised approach, short-tenure nonunion workers (e.g., individuals appearing for only one or two months before being replaced) were removed to avoid overstating workforce size, and employees with multiple position-title changes were counted only once. As a result, headcount figures for all years have been recalculated for consistency, though this reduces comparability with prior annual reports.

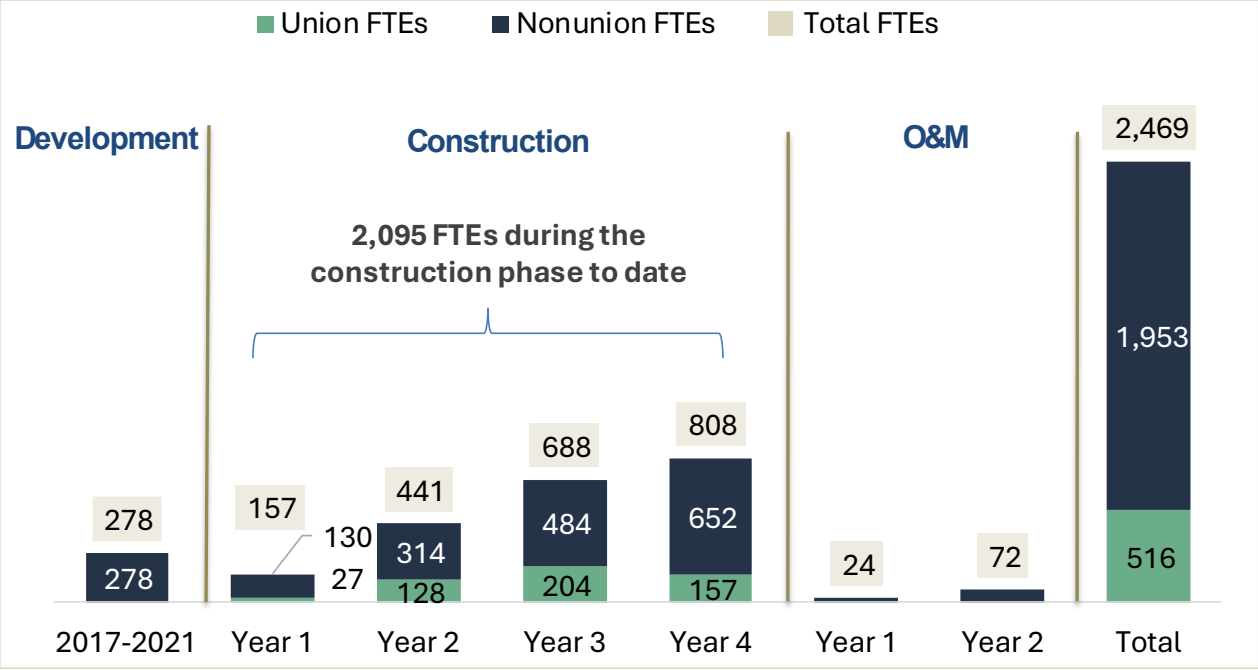
Full-Time Equivalents

FTEs measure the total volume of work performed, expressed as the equivalent of one person working full-time for one year (2,080 hours). For example, two half-time workers equal one FTE. Unlike headcount, which reflects the number of individuals involved, FTEs capture the intensity and duration of work, providing a clearer picture of the overall labor effort required for the project.

Combined, Union and Nonunion Employment Totaled 2,469 FTEs Since 2017 (see Figure 2).

- The construction phase has been the most significant in terms of FTE generation, with 2,095 FTEs created to date.
- Notably, although headcount peaked in Year 2 of the construction phase, FTEs were highest in Year 3. This reflects an increase in total hours worked as marshaling and offshore installation work intensified, along with the addition of more offshore rotation workers, whose monthly hours are substantially higher than those of most onshore employees.
- O&M supported 24 FTEs in Year 1 and 72 FTEs in Year 2.[4]

Figure 2 | FTEs, Development, Construction, and O&M Phases To Date



Source: Springline Research, based on monthly contractor reports.

[4] FTEs exceed headcount in Year 2 of O&M due to the amount of overtime worked by offshore technicians.

Economic Impacts on the Massachusetts Economy

The Vineyard Wind 1 project has generated substantial economic activity across Massachusetts through direct employment, supplier purchases, and household spending. These impacts extend well beyond the project's on-site workforce and highlight the broader economic contribution of the offshore wind sector in the Commonwealth.

Overall Economic Effects

Since 2017, Vineyard Wind 1 has supported 6,404 FTEs in Massachusetts, $623.4 million in labor income, and $1.94 billion in total economic output (see Table 1).

These totals include the jobs and income created directly on the project, the employment supported in the project's supply chain (indirect effect), and the spending generated when workers use their earnings in the local economy (induced effect).

Table 1 | Vineyard Wind 1 Economic Impacts to Date (in $millions)

Massachusetts Economic Impact			
Impact Type	**FTEs**	**Labor Income**	**Output**
Direct Effect	2,666	$388.4	$976.7
Indirect Effect	1,720	$83.4	$477.5
Induced Effect	2,017	$151.6	$488.3
Total Effect	6,404	$623.4	$1,942.5

Source: Springline Research, based on monthly contractor reports.
Labor is a subset of output, and the two figures should not be summed.

1. Overview

Vineyard Wind is currently building the nation's first utility-scale offshore wind energy project 15 miles south of Martha's Vineyard. When completed, the project will consist of 62 offshore turbines spaced one nautical mile apart and will generate 806 megawatts of electricity, enough to power over 400,000 homes.

Vineyard Wind 1's *Offshore Wind Development and Reporting Agreement,* executed with the Massachusetts Department of Energy Resources in 2020, requires Vineyard Wind to deliver written annual progress reports that summarize the company's progress in achieving the goals set forth in Section 1 of the *Agreement*. Accordingly, this analysis utilizes job and expenditure data collected from 2017 through September 2025 to measure Vineyard Wind 1's progress in meeting the eight requirements outlined in the *Agreement*:

(a) the number and place of residence of Vineyard Wind employees,

(b) the number and place of residence of workers employed by Vineyard Wind's subcontractors,

(c) an estimate of the direct, indirect, and induced employment and economic output impacts in Massachusetts and Southeastern Massachusetts resulting from the project,

(d) the extent to which the job and impact results align with the estimates contained in the project proposal *Request for Proposals for Long-Term Contracts for Offshore Wind Energy Projects,*

(e) relevant lessons learned that Massachusetts officials can use to improve economic outcomes for Massachusetts and inform future state offshore wind procurement and programmatic efforts,

(f) the impact of projects supported by Vineyard Wind's Resiliency and Affordability Fund,

(g) the impact of the Host Community Agreement with the Town of Barnstable, and

(h) the share of the Innovations in Marine Mammals Protection Fund spent in Massachusetts, which institutions received funding, and the projects supported.

2. Project Phases and Dates Included in the Analysis

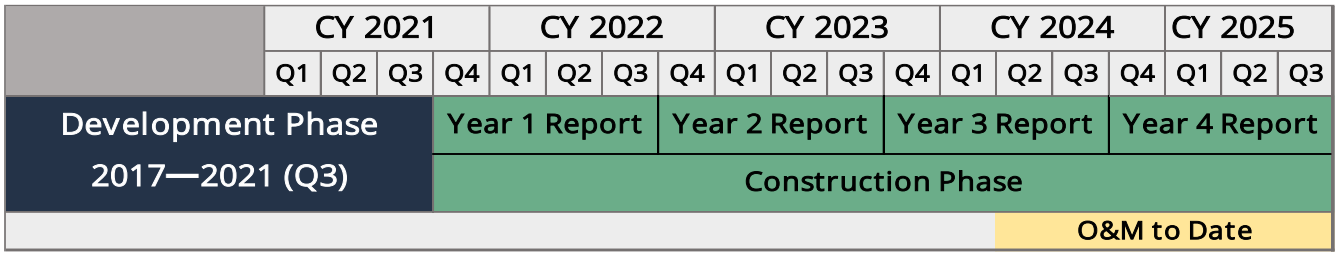
Vineyard Wind 1 has progressed through several distinct stages, each characterized by diverse types of activity, workforce demands, and regional economic impacts. The first annual monitoring report covered the entire development phase (2017 through the third quarter of 2021) and captured expenditures and employment associated with project design, permitting, environmental review, stakeholder engagement, and early procurement efforts.

The first report also included preliminary estimates of jobs and expenditures for the early construction phase (October 2021 through September 2022), during which most activity was concentrated on onshore civil works in Barnstable, including site preparation and interconnection infrastructure for the offshore wind farm.

The second and third annual reports tracked the substantial expansion of project activity beginning in late 2022, when marshaling and offshore installation work intensified in New Bedford. Most major activity, including foundation and turbine installation, offshore cable work, and vessel-based support, occurred throughout 2023 and 2024.

The third annual report also documented the start of O&M activities in the second quarter of 2024, marking the early transition from construction to long-term operations. The current analysis therefore covers four full 12-month project periods (October 2021–September 2025) and includes the initial onset of O&M, which will continue throughout the project's 25-year operating life (see Figure 3).

Figure 3 | Project Phases Included in the Analysis



3. Data Collection and Methodology

The process of gathering job, expenditure, and other relevant information from Vineyard Wind and its contractors and subcontractors began in earnest in October 2021, shortly after the project's financial close.[5] Two main data collection tools were utilized to track project activity:

1) A historical spreadsheet tracker to obtain development-related job and expenditure data from 2017 to 2021. These data were the basis for the bulk of the first annual report.

2) A monthly reporting spreadsheet that Tier 1 contractors were required to submit starting in October 2021. Over 500 monthly reports have been received from Tier 1 contractors to date.[6]

Development Phase Data Collection

From the outset, conversations with contractors and subcontractors made it clear that obtaining accurate historical data from all companies would be difficult, particularly from smaller companies no longer working on the project. Consequently, data collection efforts focused on obtaining detailed job and expenditure data from companies with contracts valued at $1 million or more (n=48), which accounted for 90% of the total contract value during the development phase.

Construction and O&M Phase Data Collection

Beginning in October 2021, Tier 1 suppliers were required to use a monthly reporting spreadsheet to capture detailed project activity and spending. The tool records both labor inputs, covering union and nonunion workers, and nonpayroll expenditures across three geographic levels: the U.S., the Commonwealth of Massachusetts, and SEMass.

In addition to tracking direct labor and spending, Tier 1 contractors reported subcontractor expenditures and workforce demographic characteristics, including race, gender, tribal affiliation, and veteran status. They also provided corresponding data for their major Tier 2 subcontractors (by contract amount), along with aggregate contract amounts for smaller Tier 2 and Tier 3 firms, to capture a more complete accounting of the project's extended supply chain and economic reach.

How are Jobs Reported?

The labor needs of offshore wind projects are concentrated in construction phase activities, which, by their very nature, are project-based and not permanent. The actual number of workers on the project includes both part-time and full-time workers who may be on the project for several years, one year, or less. For example, many union workers are on the project for a month or less, since

[5] A more detailed methodology can be found in Appendix A.

[6] A Tier 1 contractor refers to a primary contractor directly engaged by the project owner or developer to deliver key aspects of a project. These contractors typically oversee large, critical portions of the work and often oversee subcontractors (tier two and beyond) who perform more specialized or supplementary tasks.

individual construction workers frequently move from site-to-site and to other projects, and the number of workers on the project often changes based on the status of the construction activities.

Estimating employment impacts for the construction phase is inherently more complex than for ongoing operations, which can be more clearly defined as permanent jobs. Construction employment fluctuates over time and across phases of activity, so economic impact analyses of such projects are conventionally expressed in job years, that is, the number of FTE positions required to complete the work over a given period.

Although this measure can be less intuitive, it provides a more precise and contextually accurate representation of employment effects than a simple headcount at any given point in time. Misinterpretations sometimes arise when readers assume that all construction-related jobs are permanent; in reality, these positions exist only for the duration of the project phase and oftentimes range in weekly hours from part-time to overtime.

To provide a clear and comprehensive picture, this analysis reports employment in two complementary ways:

1. **Headcount**: The total number of individuals employed on the project, whether full-time or part-time, at any point during the reporting period.
2. **Full-Time Equivalents**: The total labor hours worked, standardized to represent full-time positions (with one FTE equal to 2,080 hours of work).

Together, these measures provide a workforce- and labor-based perspective on employment, reflecting the scale and intensity of project-related work.

4. Workforce Composition and Scope

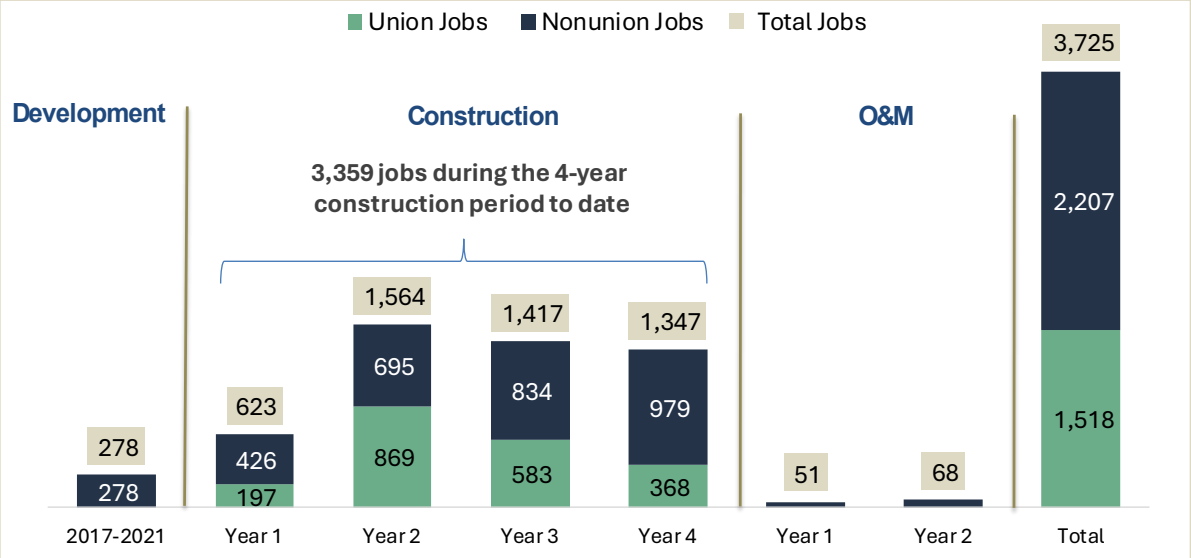
Vineyard Wind 1 has required a workforce tailored to the unique demands of the United States' first commercial-scale offshore wind project. Labor needs span the full project lifecycle: development, onshore construction, offshore installation, and the transition to long-term O&M. The project has drawn from a diverse array of occupations, including engineers, technicians, electricians, environmental specialists, marine crews, project managers, and administrative staff, each supporting different elements of project delivery.

Headcount

Over 3,700 Workers Have Been Employed on Vineyard Wind 1.

Figure 4 presents the worker headcount since the Vineyard Wind 1 development phase began in 2017.[7] Throughout the Vineyard Wind 1 project, union labor followed a predictable and project-driven trajectory. Union employment was highest during the early and mid-construction period when most activity centered on onshore works, including the construction of O&M facilities on Martha's Vineyard, the Barnstable onshore substation, cable duct bank installation, roadway reconstruction, and associated electrical and structural work. These tasks align closely with traditional union trades, resulting in strong union participation during Years 1 and 2 of construction.[8]

Figure 4 | Jobs (Headcount), Development, Construction, and O&M Phases



Source: Springline Research, based on monthly contractor reports.

[7] The total (last bar) represents the number of unique individual workers over project scope, not the sum of the previous bars. Workers who maintain jobs across reporting years are captured in multiple years but count only once in the total.

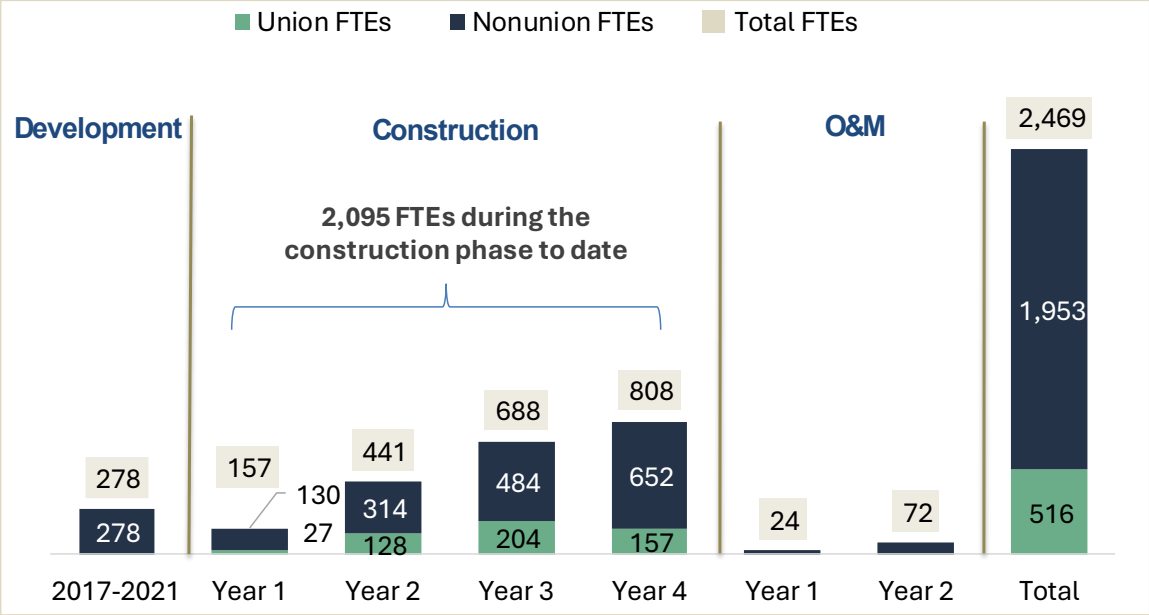
[8] To improve accuracy, Vineyard Wind 1's nonunion headcount methodology was updated in Year 4 and then applied retroactively to all prior years. Under this revised approach, short-tenure nonunion workers (e.g., individuals who appear for only one or two months before being replaced) were removed to avoid overstating workforce size, and employees with multiple position-title changes were counted only once. As a result, headcount figures for all years have been recalculated for consistency, though this reduces comparability with prior annual reports.

Full-Time Equivalents

Work on the Project Has Resulted in 2,469 FTEs To Date

As Vineyard Wind 1 entered its peak construction period in Years 2 through 4, the scale and diversity of labor requirements intensified (see Figure 5). This increase was mainly driven by offshore technicians, electricians, and commissioning crews working extended schedules, often multi-week rotations with 12-hour shifts, which substantially expanded the total labor hours needed to meet offshore installation demands. These patterns underscore the scale and complexity of the workforce required to deliver a project of this size, as well as the specialized skills and certifications essential for the safe and efficient construction of offshore wind infrastructure.

Figure 5 | FTEs, Development, Construction, and O&M Phases



Source: Springline Research, based on monthly contractor reports.

The sections that follow break down this total workforce into its union and nonunion components, reflecting the distinct roles each group has played on the project. Union workers were primarily engaged in skilled construction, with labor concentrated at key onshore construction sites and the New Bedford Marine Commerce Terminal.

5. Union Workforce Composition

Union labor has played a leading role in the construction of Vineyard Wind 1, particularly in skilled trades. This section provides an overview of union workforce participation, including headcount, FTEs, worker residence, demographic characteristics, and apprentice involvement.

In its successful 2017 Section 83C bid, Vineyard Wind included a Letter of Intent with the Massachusetts Building Trades to negotiate a Project Labor Agreement (PLA), committing that construction would be performed with union labor. In 2021, Vineyard Wind and the Southeastern Massachusetts Building Trades Unions executed the nation's first offshore wind PLA. This historic agreement ensured the country's first commercial-scale offshore wind project would be built utilizing skilled local tradespeople. At the time of execution, the project estimated it would create approximately 500 union jobs; it achieved that target and then exceeded it.

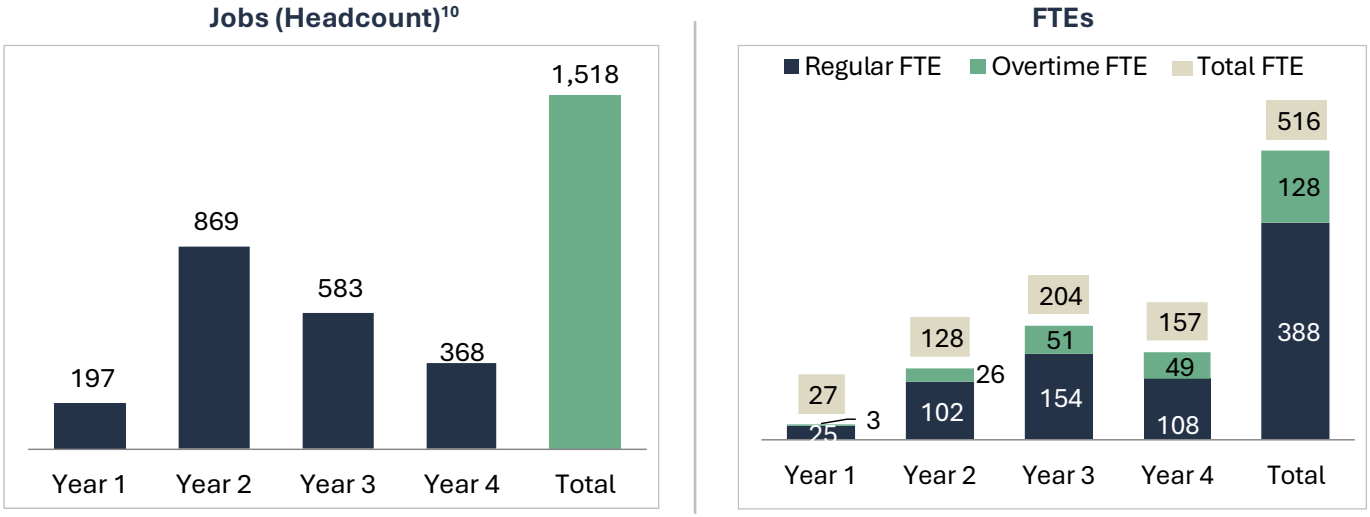
In addition to ensuring the inclusion of the local workforce in the industry, the PLA addressed working conditions and schedules, established training funds, and identified mechanisms for collaboration among Vineyard Wind, contractors, and unions.

Through September 2025, 1,518 union workers have been employed on the project, which equates to over one million labor hours and 516 FTEs (see Figure 6).[9]

- Union worker headcount peaked during Year 2 of construction at 869 workers, while the number of FTEs was highest in Year 3. The latter part of Year 2 and all of Year 3 marked the peak period of activity across all project sites.
- Additional union headcount and FTEs declined in Year 4 as onshore civil works, such as construction of the Barnstable onshore substation and associated road work, were largely completed. Most remaining activity shifted offshore, where the workforce is predominantly nonunion and involved in marine and installation operations.

[9] No union workers were employed during the development or O&M phases.

Figure 6 | Union Jobs and FTEs



Source: Springline Research, based on monthly contractor reports.

Fewer Workers, More Hours: Union Labor Intensified in Year 3 and Year 4

As construction of Vineyard Wind 1 progressed, union labor needs did not decline; rather, they became more concentrated and stable as the project shifted from onshore civil works to offshore installation. During the early construction phase, particularly in Barnstable, Martha's Vineyard, and during port preparation in New Bedford, union headcount grew quickly as multiple onshore work packages mobilized simultaneously. As these civil and electrical works neared completion, the pace of new union hiring slowed.

Once offshore activity became the primary focus, the need for new union positions declined, but workers already engaged on the project remained for longer durations and accumulated substantially more hours. By Years 3 and 4, the union workforce had transitioned to a smaller, more specialized group supporting offshore and port-based activities, and although headcount decreased, total labor effort increased.

This shift is evident in the data: the FTE-to-headcount ratio for union workers nearly doubled between Years 1–2 to Years 3–4. In other words, even with fewer union workers on the roster, each worker contributed significantly more hours as offshore activity intensified, driven by extended shifts and substantial overtime. This pattern is typical of offshore wind construction. Early phases require a broad range of union trades for civil works, electrical installation, and land-based infrastructure, while later phases depend on a smaller, experienced union workforce performing high-hour, high-intensity assignments offshore.

[10] While some employees worked across multiple years of the construction period—Year 1, Year 2, Year 3, and Year 4—each individual is counted only once in the total headcount. Accordingly, the total headcount of 1,527 represents the number of unique union workers over the four-year period, not the sum of annual counts.

Union Worker Residence and Commuting Patterns

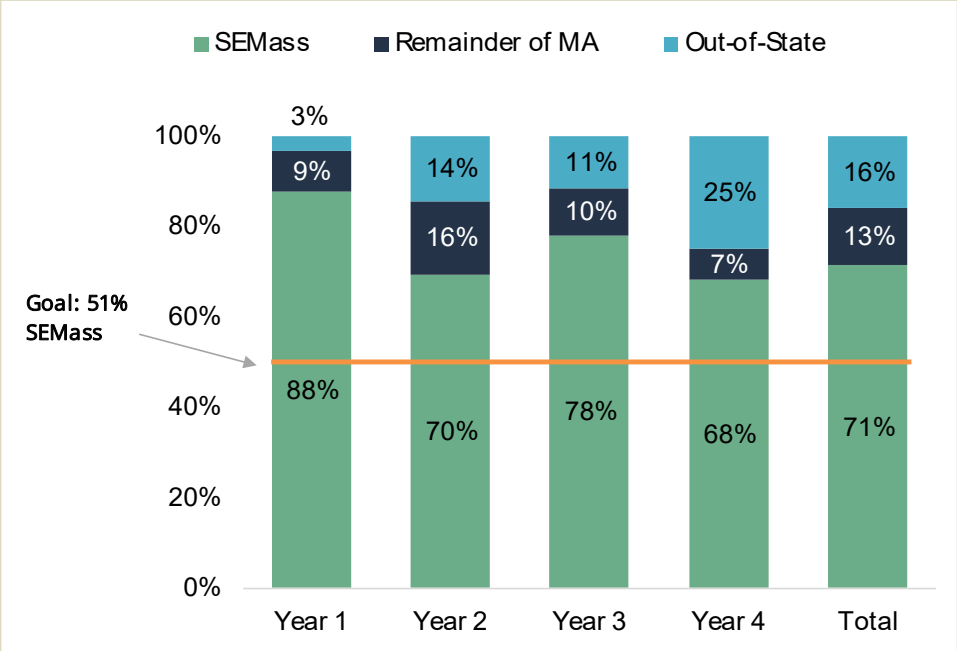
Nearly Three-in-Four Union Workers Are Southeastern Massachusetts Residents

Vineyard Wind set a goal for 51% of union workers on the project to be residents of SEMass.[11] To date, 71% of union workers were residents of SEMass during their participation in the project (see Figure 7).

Local employment, as defined in this report, includes all workers physically present on the job site, including those who temporarily relocated to SEMass for the project. Approximately 113 union workers, about 7% of the total, relocated to the region. While these workers contribute to the SEMass economy by spending on housing, food, transportation, and other daily needs, their economic impact is generally smaller and shorter in duration compared to long-term residents.

It is also important to note how geographic classifications affect the presentation of worker residency. For example, Iron Workers Local 37 is headquartered in East Providence, Rhode Island. Under the project's reporting framework, any workers from this local are categorized as "Out of State," even though East Providence is geographically closer to the project site than other Massachusetts locals, such as those based in the Boston area, which fall under "Remainder of MA." As a result, some workers who are functionally part of the regional labor supply appear in the "Out of State" category purely due to state boundaries rather than actual proximity to the project. This distinction is relevant when interpreting the distribution of the workforce across regions.

Figure 7 | Union Worker Place of Residence



Source: Springline Research, based on monthly contractor reports.

[11] SEMass is defined as including the counties of Barnstable, Bristol, Dukes, Nantucket, and Plymouth.

In terms of the county of residence, 54% of Massachusetts-based union workers have resided in Bristol County, while 20% are Plymouth County residents and 9% are Barnstable County residents (see Table 2).

Table 2 | Union Worker Place of Residence by Massachusetts County, Massachusetts-based Employees

County	Percent
Barnstable	9%
Bristol	54%
Dukes	0.1%
Essex	2%
Hampden	0.1%
Middlesex	3%
Norfolk	7%
Plymouth	20%
Suffolk	3%
Worcester	2%

Source: Springline Research, based on monthly contractor reports.

Counties highlighted in gray are in SEMass.

Workforce Diversity and Apprenticeship Participation

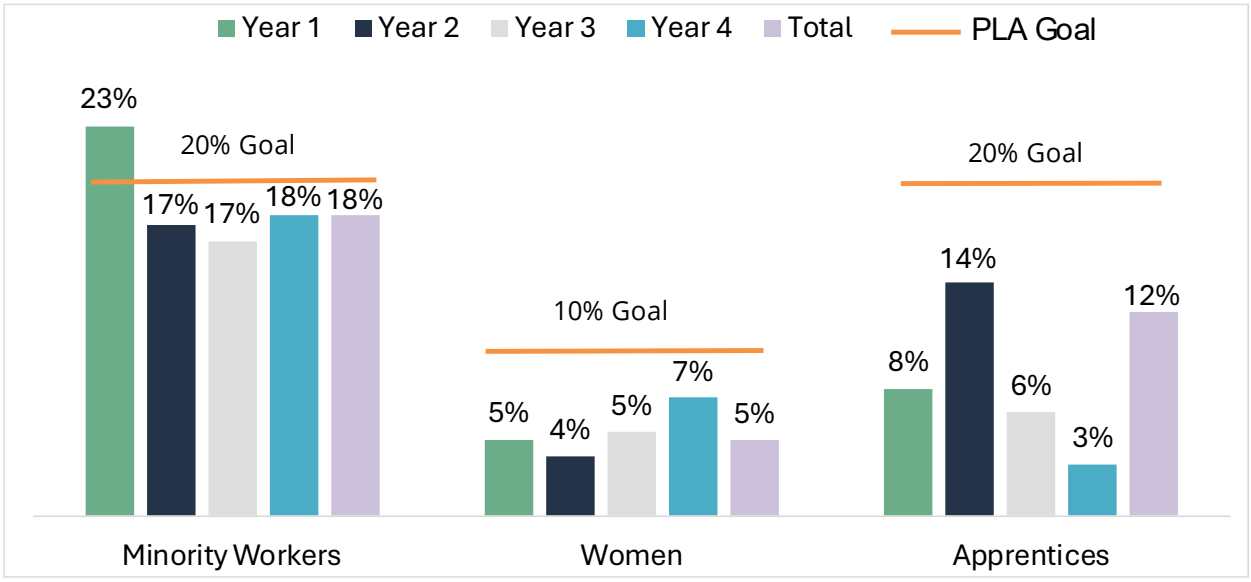
Data from the PLA Show that 18% of Union Workers Identify as Members of a Minority Group, 5% Are Women, and 11% Are Apprentices

The Project Labor Agreement (PLA) between Vineyard Wind and its union contractors includes voluntary hiring benchmarks intended to support broad participation in the project workforce:

1. **Minority Workers:** 20% of total union jobs (headcount)
2. **Women:** 10% of total union jobs (headcount)
3. **Apprentices:** One-in-five union workers (headcount)

Although Vineyard Wind 1 was not contractually obligated to meet specific demographic targets, documenting workforce characteristics provides a clearer understanding of participation across groups and supports transparency for project partners, unions, and other stakeholders. Based on available data, 18% of union workers identify with a race other than White-alone,[12] women account for 5% of union headcount, and 12% of workers have been apprentices (see Figure 8).[13]

Figure 8 | Number of Union Workers Meeting PLA Goals



Source: Springline Research, based on monthly contractor reports.

[12] "Minority" refers to workers who identify with any race other than White alone. This definition follows U.S. Census Bureau race classification categories, although the Census Bureau does not use the term "minority" as an official designation.

[13] Although nearly all construction workers fall under the PLA, certain unions involved in offshore wind, such as the International Longshoremen's Association and the Seafarers International Union, are not covered because their work is classified as maritime operations rather than construction.

Participation, Representation, and Apprenticeship Dynamics

The following discussion highlights demographic participation trends and explains why apprenticeship opportunities were limited during key phases of the project.

Minority Group and Gender Representation

While the project came close to meeting its minority participation goal, the share of women employed on Vineyard Wind 1 was lower than targeted. This reflects broader, long-standing demographic challenges in the construction sector, which remains heavily male-dominated. The project's reliance on construction and skilled trades highlights existing pipeline limitations for women and, to a lesser extent, for minority workers entering these fields. Furthermore, the nature of offshore wind work schedules and rotations often limits women's interest in and availability for these roles, as these schedules can conflict with family and caregiving responsibilities, which women disproportionately bear.

Apprenticeship Participation and Barriers

The project fell short of its 20% apprenticeship goal due to several structural factors. Offshore wind construction involves fewer traditional construction tasks than most major infrastructure projects. While civil works at the Barnstable onshore substation aligned with standard practices and was well-suited to employing apprentices, the specialized nature of offshore installation created fewer opportunities. Contractors were less inclined to bring apprentices into high-risk, high-skill offshore roles where steep learning curves, certification requirements, and strict schedule constraints limit flexibility. Workforce data support this pattern: apprenticeship levels peaked during Year 2, when Barnstable-based onshore work peaked, and declined in Years 3 and 4 as activity shifted to more specialized marshaling and offshore installation tasks.

Constraints of Offshore Work and Differences in Apprenticeship Models

Offshore operations also face practical limitations. Vessel capacity, particularly the number of beds, restricts crew size, and available spots must be filled by experienced workers capable of performing multiple tasks under demanding conditions. These constraints significantly reduce the number of appropriate opportunities for apprentices.

As apprentices accrue work hours and reach training milestones, they graduate to journeymen. Given the project's duration, several workers who initially were hired as apprentices became journeymen. These workers had gained critical experience on the project, and contractors preferred to retain them as journeymen, rather than hire new apprentices. In addition to Year 4 work being heavily focused on specialized offshore scopes, the natural progression of apprentices to journeymen impacted apprenticeship rates.

6. Nonunion Workforce Composition

Nonunion employment on Vineyard Wind 1 covered a wide range of occupations. This section presents nonunion headcount, FTEs, and the geographic distribution of these workers.

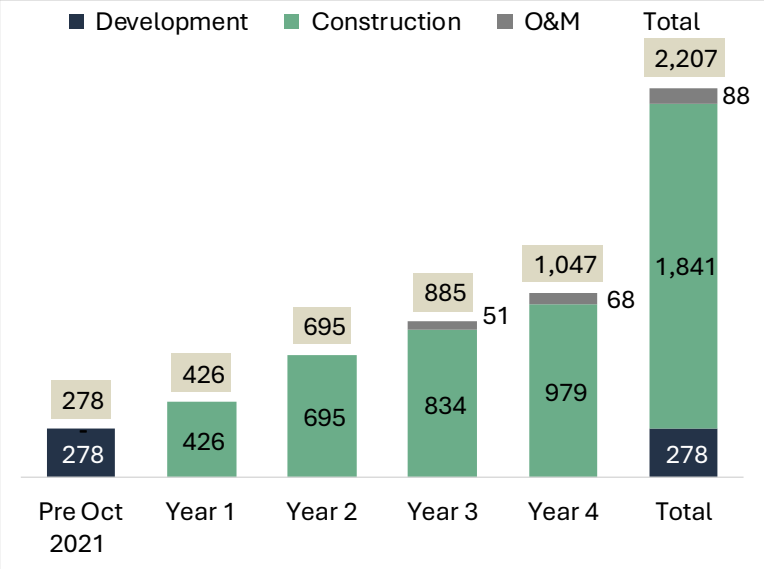
Nonunion roles were split between office-based functions and a substantial number of field and offshore positions. Many nonunion workers, such as specialized technicians, lifting specialists, environmental monitors, vessel crews, rope-access crews, and commissioning teams, were based at the New Bedford Marine Commerce Terminal or offshore on vessels and installation platforms. Others, including engineers, planners, analysts, and administrative staff, supported the project from office settings. Although nonunion work is often perceived as primarily administrative, a sizable portion of nonunion workers were actively engaged in technical and operational tasks central to offshore construction.

Headcount and FTEs

More than 2,200 nonunion workers have been employed on the project.

In total, 2,207 nonunion workers participated in the project to date, with Year 4 representing the peak of employment (see Figure 9). The steady rise in nonunion participation is driven in part by the increasing reliance on specialized offshore crews, including turbine technicians, rope-access teams, commissioning engineers, and marine operations personnel. These roles are typically filled by nonunion workers with prior experience in offshore wind or offshore oil and gas, many of whom rotate in from outside Massachusetts to meet the project's technical requirements. An increasing O&M workforce also adds to the total.

Figure 9 | Nonunion Jobs (Headcount)



Source: Springline Research, based on monthly contractor reports.

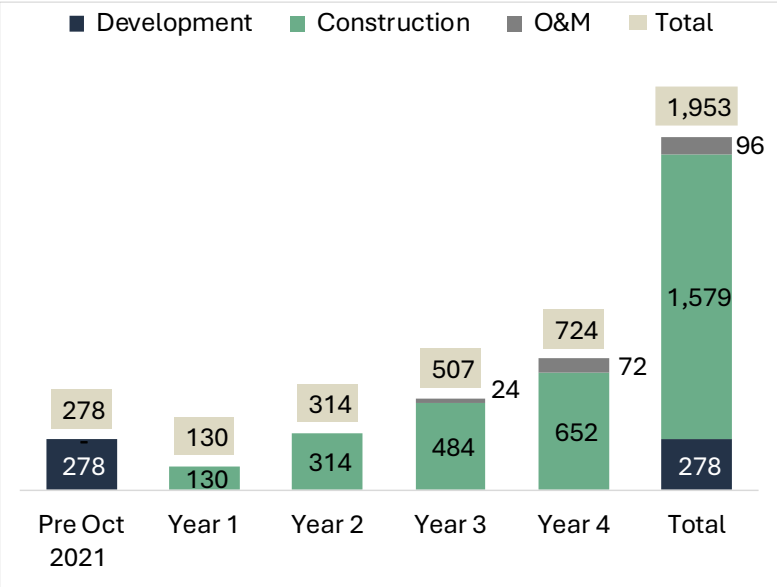
In addition, nonunion employment expanded as the project's engineering, project management, environmental, and logistical needs grew more complex. Specialized firms providing cable installation support, offshore logistics, marine coordination, and high-voltage commissioning also increased their presence on the project during Years 3 and 4, further boosting the nonunion workforce numbers.

Overall, the pattern reflects the increasing intensity of work as the project progressed from onshore preparation to offshore turbine installation and commissioning, with its higher reliance on nonunion labor. To date, cumulative construction FTEs total 1,579, with an additional 96 FTEs associated with early O&M.

Figure 10 shows how labor demand intensified over the course of the Vineyard Wind 1 project when measured in FTEs. Development activities prior to October 2021 accounted for all 278 FTEs, but FTEs increased substantially once construction began and work shifted from planning to full-scale civil, electrical, and offshore activities. Labor needs continued to rise as marshaling and offshore installation work accelerated, reaching their highest level in Year 4 with 652 construction FTEs.

Overall, the pattern reflects the increasing intensity of work as the project progressed from onshore preparation to offshore turbine installation and commissioning, with its higher reliance on nonunion labor. To date, cumulative construction FTEs total 1,579, with an additional 96 FTEs associated with early O&M.

Figure 10 | Nonunion FTEs



Source: Springline Research, based on monthly contractor reports.

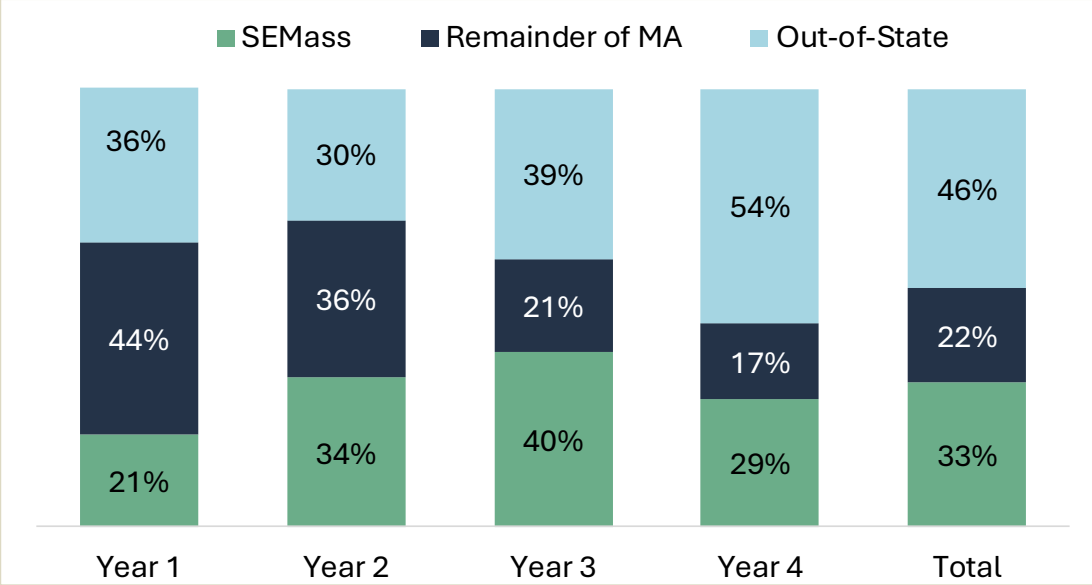
Nonunion Residence and Commuting Patterns

Thirty-Two Percent of Nonunion Workers During the Construction and O&M Phases Were SEMass Residents

Figure 11 shows the distribution of nonunion workers by region. Nonunion employment in Massachusetts ranged from 36% to 70% annually, averaging 55% over the full period.

Unlike union construction work, which draws heavily from local contractors and local hiring halls, the nonunion workforce includes many offshore technicians, commissioning specialists, engineers, environmental monitors, and vessel crew members who travel to the region on rotational schedules. These specialized positions rely on national and international labor pools, resulting in a higher proportion of out-of-state workers and a lower share of SEMass residents compared to union employment.

Figure 11 | Nonunion Worker Employee Place of Residence



Source: Springline Research, based on monthly contractor reports.

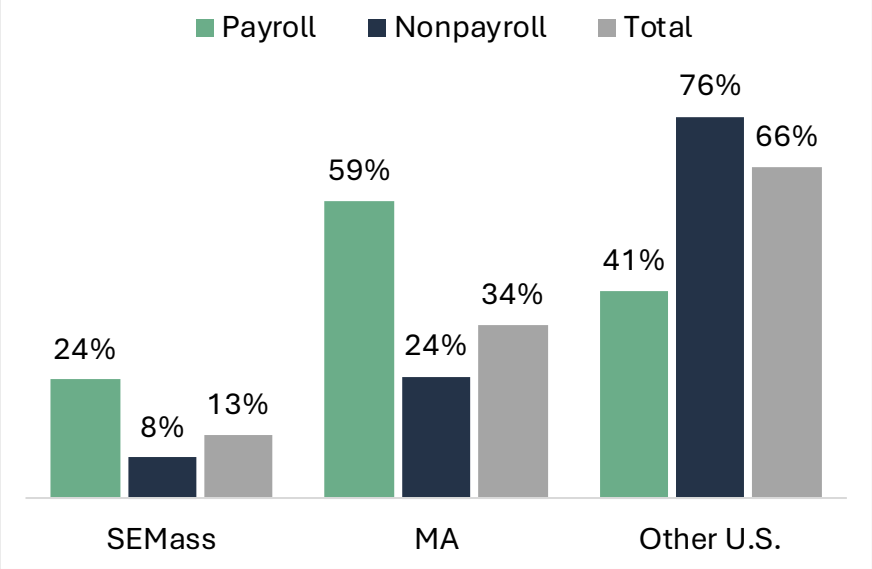
7. U.S.-Based Direct Payroll and Nonpayroll Expenditures

Figure 12 shows the distribution of U.S.-based payroll and nonpayroll expenditures across SEMass, Massachusetts, and the remainder of the U.S. The spending pattern reflects the fundamentally capital-intensive nature of offshore wind development. Payroll represents about 18% of total U.S. expenditures, which aligns with typical industry patterns. Vineyard Wind 1's largest cost components, such as turbines, foundations, cables, the offshore substation, and specialized marine vessels, are capital-intensive items whose material and fabrication costs substantially exceed direct labor spending and were sourced largely from non-U.S. suppliers.

As the project has progressed, the geographic distribution of payroll has shifted. During the early construction period, payroll was more heavily concentrated in Massachusetts because union civil, electrical, and marine trades were working on the Barnstable onshore substation, cable duct banks, and shoreside marshaling activities.

However, as onshore work tapered off and offshore installation activities intensified, labor demand shifted toward vessel crews, commissioning teams, and specialized nonunion offshore technicians, many of whom are based outside Massachusetts. A critical factor behind the shift away from in-state labor is that vessel crews come with the vessels themselves. Because the U.S. offshore wind fleet remains limited, most Jones Act-compliant vessels capable of offshore support work are homeported along the Gulf Coast. As a result, their crews are predominantly Gulf Coast-based, which led to an increase in out-of-state payroll once the project moved offshore.

Figure 12 | Payroll and Nonpayroll Expenditures by Region, January 2017–September 2025



Source: Springline Research, based on monthly contractor reports.
Massachusetts includes SEMass; these figures should not be summed.

This pattern reflects the current structure of the U.S. offshore wind supply chain. Until more offshore construction and support vessels are homeported or permanently stationed in New England, vessel-based labor will continue to be sourced primarily from outside the region.

Vessel crews typically operate on two- and three-week rotational schedules and consistently work high-hour weeks, often exceeding 80–90 hours, leading to substantial overtime costs. Because a sizable portion of these offshore workers reside outside the state, and in some cases outside the country, a larger portion of payroll expenditures is allocated outside Massachusetts during the later phases of the project. [14]

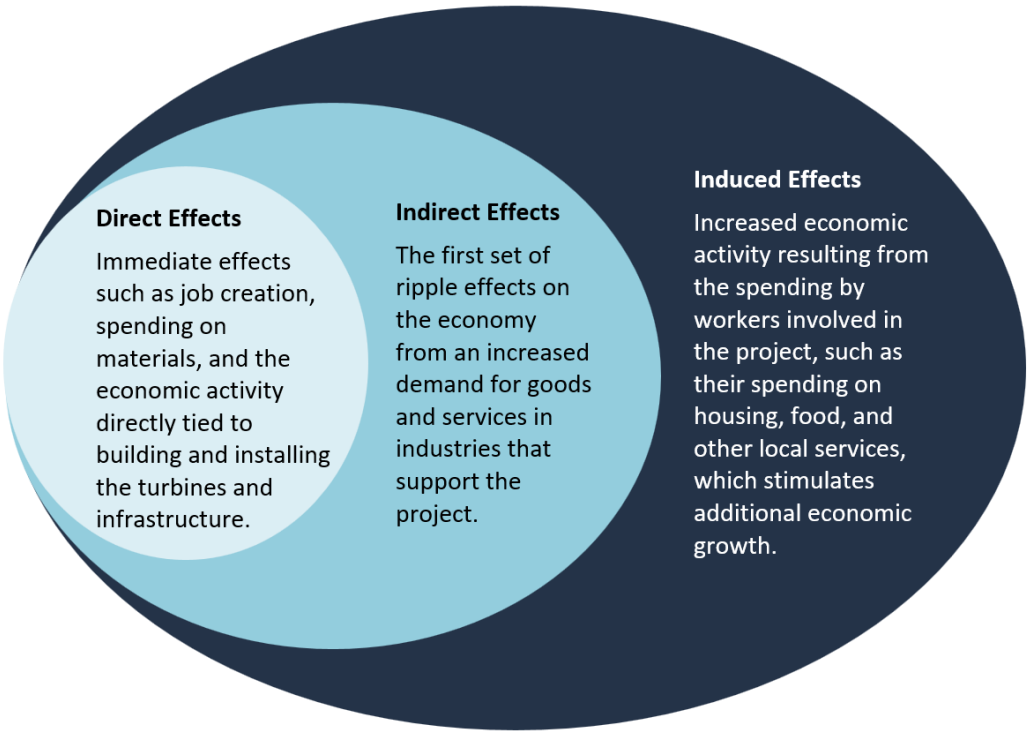
[14] Non-U.S. payroll and nonpayroll expenditures are not included in the totals, nor are the costs incurred due to the blade breakage in July 2024.

8. Economic and Employment Impacts in Massachusetts

The Vineyard Wind 1 project has generated substantial economic benefits for Massachusetts through both its direct expenditures and the broader ripple effects that extend across the state's supply chain. Spending by Vineyard Wind, its Tier 1 contractors, and their subcontractors has supported thousands of jobs, stimulated activity across multiple industries, and contributed to state and local tax revenues. These impacts have been quantified using the IMPLAN input-output model, which tracks how project-related spending circulates through the Massachusetts economy, producing direct, indirect, and induced effects.

In essence, employee wages and purchases made from suppliers generate additional rounds of spending and job creation, magnifying the project's total economic contribution. Measuring these ripple effects provides a comprehensive picture of Vineyard Wind 1's role in supporting economic growth throughout the Commonwealth (see Figure 13).[15]

Figure 13 | Examples of an Offshore Wind Project's Economic Effects



[15] Additional details on the report's methodology can be found in Appendix A.

Economic impacts (i.e., direct, indirect, and induced) are broken into four categories: jobs, labor income, and output.

Jobs: To ensure clarity and provide the most comprehensive and precise reporting of employment impacts, our analysis presents data in two forms:

1. **Headcount**: This represents the total number of individuals employed on the project, including both part-time and full-time workers.
2. **FTEs or Job Years**: This measure represents the total amount of work performed on the project, expressed as the equivalent of one person working full-time for one year (2,080 hours). For example, two people working on the project half-time would equal one FTE (or one job year).

Labor Income: Labor income is the sum of all payments made to employees, including wages, salaries, benefits, and payroll taxes, as well as payments received by self-employed individuals and unincorporated business owners across the defined economy.

In the economic impact analysis, all construction labor income is considered local because it is tied to economic activity occurring within the project's region. This approach assumes that all workers, regardless of residence, temporarily contribute to the local economy through their labor at the project site.

Output: Output measures the total value of all goods and services produced as a result of project spending. It includes not only Vineyard Wind's direct expenditures, but also the additional business activity generated through suppliers and household spending. Because it captures the full ripple effect across the economy, output exceeds the project's direct spending.

In Total, Vineyard Wind 1 Has Supported 6,404 FTEs, $623.4 Million in Labor Income, and $1.94 Billion In Economic Output in Massachusetts.

- **Indirect Impacts:** The project's direct payroll and nonpayroll expenditures have supported an additional 1,720 indirect jobs, $83.4 million in labor income, and $477.5 million in economic output in Massachusetts.
- **Induced Impacts:** The direct and indirect impacts induced an additional 2,017 jobs that supported $151.6 million in labor income and $488.3 million in new economic output in Massachusetts.

Table 3 | Total Project Impacts in Massachusetts to Date[16] (in $millions)

Massachusetts Economic Impact			
Impact Type	**FTEs**	**Labor Income**	**Output**
Direct Effect	2,666	$388.4	$976.7
Indirect Effect	1,720	$83.4	$477.5
Induced Effect	2,017	$151.6	$488.3
Total Effect	6,404	$623.4	$1,942.5

Source: Springline Research, based on monthly contractor reports.
Labor income is a subset of output; the two figures should not be summed.

[16] IMPLAN employment figures include both part-time and full-time positions, representing the total number of jobs supported. To ensure consistency and accuracy in the analysis, IMPLAN's conversion tables were utilized to standardize all employment data to FTEs.

The following three sections break out the impacts above by phase.

Development Phase Impacts, 2017–2021

In total, development phase economic activity supported 666 FTEs, $59.3 million in labor income, and $166.6 million in economic output in Massachusetts.

- **Indirect Impacts:** Vineyard Wind's direct payroll and nonpayroll expenditures supported an additional 137 indirect jobs during the development phase. These jobs supported $11.5 million in labor income and $27.8 million in economic output in Massachusetts.
- **Induced Impacts:** The direct and indirect impacts induced an additional 251 jobs that supported $16.8 million in labor income and $44.9 million in economic output in Massachusetts.

Table 4 | Direct, Indirect, and Induced Impacts, Development Phase (in $millions)

Massachusetts Impact

Development Phase (2017 - 2021)

Impact Type	FTEs	Labor Income	Output
Direct Effect	278	$31.1	$93.9
Indirect Effect	137	$11.5	$27.8
Induced Effect	251	$16.8	$44.9
Total Effect	666	$59.3	$166.6

Source: Springline Research, based on monthly contractor reports.

Labor income is a subset of output; the two figures should not be summed.

Construction Phase Impacts

Construction phase economic activity to date has supported 5,576 FTEs, $544.2 million in labor income, and $1.7 billion in economic output in Massachusetts.

- **Indirect Impacts:** Vineyard Wind's direct payroll and nonpayroll expenditures have supported an additional 1,579 indirect jobs during the construction phase to date. These jobs supported $71.6 million in labor income and $447.5 million in economic output in Massachusetts.
- **Induced Impacts:** The direct and indirect impacts induced an additional 1,704 jobs that supported $130.1 million in labor income and $430.6 million in economic output in Massachusetts.

Table 5 | Direct, Indirect, and Induced Impacts, Construction Phase (in $millions)

Massachusetts Impact			
Construction Phase			
Impact Type	**FTEs**	**Labor Income**	**Output**
Direct Effect	2,292	$342.5	$865.3
Indirect Effect	1,579	$71.6	$447.5
Induced Effect	1,704	$130.1	$430.6
Total Effect	5,576	$544.2	$1,743.5

Source: Springline Research, based on monthly contractor reports.
Labor income is a subset of output; the two figures should not be summed.

Operations and Maintenance Phase Impacts

O&M phase economic activity to date has supported 162 FTEs, $19.8 million in labor income, and $32.4 million in economic output in Massachusetts.

- **Indirect Impacts:** Vineyard Wind's direct payroll and nonpayroll expenditures have supported an additional four indirect jobs during the O&M phase to date. These jobs have supported $0.4 million in labor income and $2.2 million in economic output in Massachusetts.
- **Induced Impacts:** The direct and indirect impacts induced an additional 62 jobs that supported $19.8 million in labor income and $32.4 million in economic output in Massachusetts.

Table 6 | Direct, Indirect, and Induced Impacts, O&M Phase (in $millions)

Massachusetts Impact

Operations & Maintenance Phase

Impact Type	FTEs	Labor Income	Output
Direct Effect	96	$14.8	$17.5
Indirect Effect	4	$0.4	$2.2
Induced Effect	62	$4.7	$12.7
Total Effect	162	$19.8	$32.4

Source: Springline Research, based on monthly contractor reports.

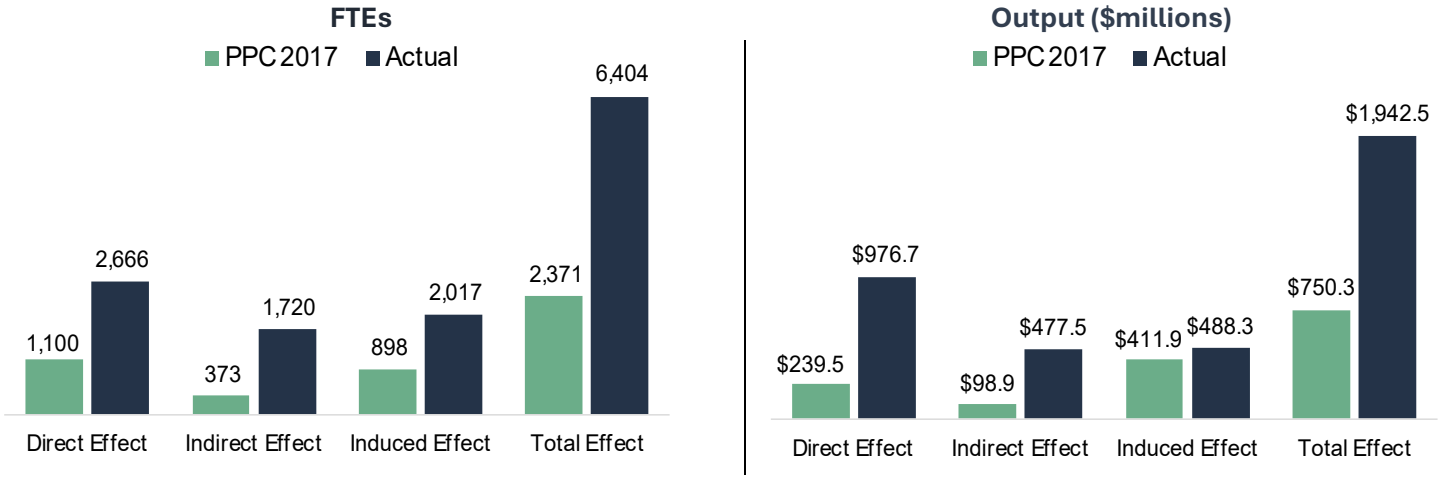
Labor income is a subset of output; the two figures should not be summed.

9. Comparison of UMass Dartmouth Public Policy Center 2017 Estimates

In 2017, the Public Policy Center (PPC) at UMass Dartmouth prepared an assessment of the anticipated employment and economic output associated with the proposed Vineyard Wind 1 project in Massachusetts.

The current economic impacts of Vineyard Wind 1 exceed the 2017 PPC projections by a substantial margin, with 6,404 total FTEs compared to PPC's estimate of 2,371 FTEs, and $1.9 billion in economic output compared to PPC's inflation-adjusted estimate of $750.3 million (see Figure 14).

Figure 14 | Employment Impacts
2017 PPC Estimate Versus Actual



Source: Estimate; UMass Dartmouth Public Policy Center (2017).
Current; Springline Research and Vineyard Wind.

Several factors explain these differences:

- **Longer-than-expected project timeline:** The project unfolded over a longer period than was assumed in 2017 due to permitting delays, regulatory uncertainty for the first U.S. commercial-scale offshore wind project, and periods of construction inactivity tied to environmental windows and a blade failure event in 2024.[17] This extended duration increased total labor requirements and the cumulative number of workers involved in the project.
- **Higher-than-anticipated supply-chain and installation costs:** Since 2017, the global offshore wind market has experienced significant cost escalation. Component prices, steel costs, vessel day-rates, marine fuel costs, and specialized technical services costs all rose

[17] "Environmental windows" refer to periods when construction activity is restricted due to weather conditions, marine-mammal protection requirements, seasonal limitations (such as limits on work in Barnstable during the summer), and other regulatory constraints designed to minimize environmental impacts.

dramatically. Higher spending on materials, logistics, and offshore services naturally generated larger economic impacts.

- **Limited domestic offshore wind supply chain in initial stages:** Unlike PPC's expectations of moderate local expenditures, actual supply-chain needs required greater reliance on U.S. firms across many states, particularly for marine logistics, engineering, commissioning, and vessel operations. This broadened the domestic spending footprint and increased indirect and induced impacts.
- **Increased use of specialized offshore labor:** Offshore technicians, commissioning engineers, and vessel crews worked substantially more hours and at higher wage rates than anticipated in 2017. These high-hour, high-wage roles have amplified both direct labor income and induced effects.
- **Conservative assumptions in the 2017 PPC model:** The PPC analysis was conservative given the uncertainties around the emerging U.S. offshore wind market at the time. Many assumptions, such as shorter construction duration, lower offshore labor requirements, modest logistic demands, and more constrained supply-chain spending, underestimated the scope and intensity of actual project activity.

The original PPC analysis applied conservative assumptions reflecting the limited information available about the emerging U.S. offshore wind industry at the time. Several inputs, such as a shorter construction period, fewer offshore labor requirements, lower logistical demand, and a more limited scope of supply-chain activity, resulted in projections that understated the scale of economic activity ultimately associated with Vineyard Wind 1.

These assumptions did not imply that project costs would be higher than expected. Rather, they constrained the modeled magnitude of economic contributions by underestimating the level of on-the-ground work and associated spending that the project ultimately generated. The difference between the 2017 projections and actual outcomes reflects the inherent uncertainty of modeling a first-of-its-kind commercial-scale offshore wind project in the United States.

10. Other Economic Benefits: Catalyzing the Offshore Wind Ecosystem in New Bedford

Vineyard Wind 1 has generated substantial direct economic benefits and catalyzed a wave of related investment in New Bedford and the broader region. Although these subsequent initiatives are not formally part of the project, they are connected to the project's influence and demonstrate how the emergence of the offshore wind industry is reshaping the regional economy.

In anticipation of the infrastructure and workforce needs associated with Vineyard Wind 1 and future offshore wind projects, public and private partners have invested in port improvements, marine logistics facilities, and specialized training centers. These efforts have strengthened New Bedford's position as the nation's primary hub for offshore wind assembly and O&M, while also creating long-term economic development spillovers that extend beyond the immediate project.

Several notable examples illustrate this momentum:

- The Massachusetts Clean Energy Center (MassCEC) advanced complementary initiatives, oftentimes combining state investment with the Vineyard Wind 1 Accelerator Funds (see Section 14), including planning for expansion and modernization of the New Bedford Marine Commerce Terminal to support future projects.
- Bristol Community College's National Offshore Wind Institute was established to provide specialized workforce training and globally recognized safety certifications for offshore wind technicians.
- The Foss Marine Terminal was redeveloped from a decommissioned power plant into a critical logistics and staging site for offshore wind vessels and components.

While Vineyard Wind 1 neither financed nor managed these initiatives, its advancement helped demonstrate the feasibility of large-scale offshore wind development in the United States. Furthermore, the project helped clarify market conditions and informed investment decisions, supporting continued regional activity in the offshore wind and associated sectors.

11. Key Challenges in Constructing Vineyard Wind 1

As the first commercial-scale offshore wind farm in the U.S., Vineyard Wind 1 encountered a series of challenges that influenced its development and construction timeline. Many of these issues reflect the realities of building a complex, capital-intensive project in a market where supply chains, regulatory processes, workforce experience, and maritime infrastructure are still maturing. While some challenges were unique to a first-of-its-kind project, others offer lessons for streamlining the development of future U.S. offshore wind projects.

Regulatory Complexity and Permitting Delays

Navigating an evolving U.S. regulatory environment was one of the project's earliest and most significant hurdles. Vineyard Wind 1 faced extensive review from multiple federal, state, and local agencies at a time when permitting procedures for offshore wind were still developing. These prolonged reviews introduced timing uncertainty that complicated construction sequencing—particularly offshore, where turbine, foundation, and cable installation must occur within narrow seasonal windows. As the first project through this process, Vineyard Wind 1 effectively established precedents that can inform future regulatory pathways.

First of Its Kind Project

In addition to navigating a new permitting and regulatory landscape, Vineyard Wind 1 was the first large-scale marine infrastructure project of its kind on the East Coast. The construction effort has involved multiple Tier 1 contractors from the U.S. and Europe, dozens of Tier 2 and Tier 3 subcontractors, and a management structure that combined personnel with international offshore wind experience and local workers familiar with U.S. requirements. This combination introduced multiple layers of complexity in project management, contracting, and execution.

The offshore environment is inherently dynamic and can affect project schedules, vessel availability, and maritime logistics. Workers must adapt to shifting timelines, which can pose challenges for individuals pursuing offshore assignments. For example, delays in one work scope or unexpected vessel maintenance can push a rotation start date by weeks or months, requiring crews to adjust their schedules. The project team, including contractors, unions, and workforce development partners, had to manage these conditions by responding to frequent schedule changes and ensuring that appropriately trained personnel were available when needed.

Underdeveloped U.S. Offshore Wind Supply Chain

As the first large-scale project of its kind, Vineyard Wind 1 relied on international suppliers for turbines, foundations, cables, and other specialized components. The domestic supply chain lacked large-scale fabrication capacity, offshore-capable vessels, and certain technical services required for turbine installation.

Tier 2 and Tier 3 services, such as specialized survey vessels, noise-mitigation equipment, and commissioning specialists, were in limited supply in the U.S., forcing contractors to source expertise from Europe or the Gulf Coast. Delays in one part of the supply chain often produced cascading impacts because of the tightly coordinated offshore installation schedule.

While efforts to localize the supply chain for future offshore wind projects are underway, including new manufacturing facilities and port investments, Vineyard Wind 1 relied on a global network of suppliers, increasing logistical complexity and limiting the magnitude of local economic benefits relative to future projects.

COVID-19 Pandemic Disruptions

The COVID-19 pandemic caused global supply chain disruptions that affected manufacturing, shipping, and access to specialized components built overseas. Production delays, factory shutdowns, and restrictions on international travel slowed delivery of critical equipment, such as turbines and electrical components.

On-site construction was also affected. Health protocols, quarantine requirements, and staffing disruptions temporarily reduced productivity and contributed to schedule delays. Although these conditions eventually eased, the pandemic introduced timing challenges during key phases of the project's early development.

Challenges in Building a Skilled Local Workforce

Limited Offshore Wind Experience in the Domestic Labor Market

Because the U.S. offshore wind industry is still emerging, Vineyard Wind 1 faced a shortage of workers with direct experience in offshore turbine installation, cable laying, commissioning, and marine operations. While the project generated strong local hiring opportunities, many specialized roles required workers from outside Massachusetts, including international technicians from more mature offshore wind markets.

Tight Labor Market Conditions

Construction Years 1–3 occurred during historically low unemployment periods. Competition for skilled construction and electrical workers was intense, and not all workers were willing to pursue offshore certifications for work in a pioneering industry when traditional well-paid land-based jobs were readily available. Weather-related delays and shifting offshore windows made it challenging to retain specialized staff without backup labor, which was not readily available in the region.

Union and Nonunion Workforce Dynamics

Union labor played a leading role in onshore civil works, cable duct bank installation, and construction of the Barnstable onshore substation. As offshore construction accelerated in Years 3 and 4, however, labor needs shifted toward offshore technicians, commissioning specialists, and

vessel crews, many of whom work on rotational schedules and are based outside Massachusetts. Although the Project labor Agreement identified numerous offshore roles suitable for local labor, substantial training and recruitment needs remained. At times, local union halls reached full employment, limiting the supply of qualified workers and requiring contractors to source union labor from out of state.

Offshore wind has some of the most stringent safety standards globally. While unions, contractors, and Vineyard Wind, in partnership with MassCEC and local training institutions, advanced training programs targeting these gaps, the project still required the integration of experienced offshore crews to meet health and safety requirements, installation timelines, and vessel operational demands. This reliance contributed to higher payroll expenditures outside Massachusetts and, in some cases, outside the U.S., particularly in the later construction stages.

Globally, offshore wind is a mature industry, and many companies, vessels, and crews had significant prior experience before Vineyard Wind 1. For these firms, however, working under a PLA was new, and they often found it challenging to effectively incorporate union labor in a manner consistent with PLA provisions. Some contractors subcontracted the labor component of their scope, yet few local union firms had the specialized technical capabilities necessary to support global offshore wind contractors. This limited capacity made it difficult for European Tier 1 contractors to identify local partners who could meet offshore wind health, safety, and environment (HSE) standards, comply with PLA requirements, and demonstrate the technical competencies expected in the industry.

Shortage of U.S.-Flagged Offshore Wind Vessels

A persistent challenge was the limited availability of U.S.-flagged vessels capable of supporting offshore wind construction. Under the Jones Act, goods transported between U.S. ports must move on U.S.-built and U.S.-crewed vessels, but the domestic fleet does not yet include the full range of offshore wind installation vessels used routinely in Europe.

To address this constraint, Vineyard Wind 1 employed a feeder-barge system in which Jones Act-compliant vessels transported components to foreign-flagged installation vessels stationed offshore. While workable, this system increased coordination complexity and introduced scheduling risks, contributing to construction delays. Expansion of the domestic installation vessel fleet will be critical to improving the efficiency of construction logistics on future U.S. offshore wind projects.

Data Collection Challenges

Collecting consistent workforce and expenditure data from contractors posed its own challenges, particularly early in the project. Data-sharing expectations were not fully formalized when many Tier 1 contracts were executed, resulting in incomplete or inconsistent reporting from some contractors during the initial months of construction.

As the project advanced, reporting improved; however, Vineyard Wind 1 underscored the need to establish clear, enforceable data-sharing requirements at contract execution. Embedding specific

reporting obligations into contracts, supported by compliance mechanisms such as incentives or penalties, can help ensure timely and accurate data submissions.

In addition, the project highlighted the operational risk created by contractor-level workforce turnover over a multi-year construction timeline. As staff transitioned to other projects or left their organizations, institutional knowledge of reporting processes diminished, contributing to gaps in continuity and data consistency. Future offshore wind projects should plan for this by implementing reporting systems that do not rely on specific individuals to function and that receive ongoing oversight to maintain consistency throughout a project's lifecycle.

Summary

As a first-of-its-kind project, Vineyard Wind 1 faced regulatory, logistical, workforce, and supply-chain challenges that reflect the early stage of the U.S. offshore wind industry. Many of these constraints, particularly regulatory processes, vessel availability, local workforce experience, and domestic manufacturing capacity, are expected to improve as the industry matures. The lessons learned from Vineyard Wind 1 will help streamline future offshore wind projects and strengthen the long-term development of a robust U.S. offshore wind supply chain.

12. Resiliency and Affordability Fund

Vineyard Wind has established the Resiliency and Affordability Program (RAP) in partnership with Citizens Energy Corporation (Citizens) and Vineyard Power Development Fund, Inc. (Vineyard Power). As part of its successful 2017 Section 83C bid, Vineyard Wind committed $15 million to the program to advance distributed solar and battery storage projects in Vineyard Wind 1 host communities and to help lower electricity costs for low-income households. To fulfill this commitment, Vineyard Wind established the Resiliency and Affordability Program (RAP) in partnership with Citizens Energy Corporation (Citizens) and Vineyard Power Development Fund, Inc. (Vineyard Power).[18]

The first $1 million in program funding was provided when the project achieved financial close in 2021, and the next $1 million will be provided once the project enters into commercial operation. The remaining funds will be provided annually thereafter in $1 million increments until the $15 million commitment is complete.

RAP is being implemented in the following communities: New Bedford, Martha's Vineyard, Nantucket, Barnstable, and Somerset, as well as to the Mashpee Wampanoag Tribe and Wampanoag Tribe of Gay Head (Aquinnah).

Citizens Energy Corporation

Citizens is responsible for implementing the RAP in New Bedford, Nantucket, Barnstable, and Somerset, as well as with the Mashpee Wampanoag Tribe. In 2024, Citizens awarded a grant to support its first resiliency project: installing rooftop solar panels on eight newly constructed low-income senior tribal housing units for the Mashpee Wampanoag Tribe. Completed in the first quarter of 2025, the solar panel project is the primary phase, with the potential to add battery storage in the future. A total of $194,950 in RAP funds covered the costs of this initial phase.

Citizens also continues to manage the low-income ratepayers enrolled in the Joe-4-Sun (J4S) program. J4S leverages the Massachusetts SMART program to operate low-income community-shared solar projects that generate solar bill credits to lower electricity bills for low-income households. Under RAP, eligible customers receive a 100% discount on solar bill credits (i.e., the credits are provided at no cost), which is twice the 50% discount regular J4S customers receive. Since its inception, J4S RAP participants have saved over $600,000 on electricity bills, with half of those savings directly attributable to RAP.

Vineyard Power Development Fund, Inc.

Vineyard Power is responsible for implementing the RAP on Martha's Vineyard, as well as with the Wampanoag Tribe of Gay Head (Aquinnah). Vineyard Power, in partnership with Cape Light Compact

[18] Vineyard Power Development Fund, Inc. is an affiliate of Vineyard Power Cooperative, Vineyard Wind's community benefits partner on Martha's Vineyard.

(CLC), distributes RAP funds to subsidize electricity rates for income-eligible ratepayers enrolled in CLC's 100% renewable electricity supply program on Martha's Vineyard. Between 2023 and September 2025, approximately 430 income-eligible households have received $340,000 in benefits ($790 per household).

In 2025, Vineyard Power provided $40,000 in RAP funding to the Island Housing Trust, a non-profit organization that develops permanently affordable housing on Martha's Vineyard, to install rooftop solar on affordable housing units. Additionally, Vineyard Power pledged $220,000 in future funding to support the development of rooftop solar for 116 additional affordable housing units.

Vineyard Power also partnered with Mass General Brigham and PowerOptions to leverage approximately $105,000 in RAP funds through a pilot solar project at Martha's Vineyard Hospital's workforce housing. The project will provide $550,000 in ratepayer assistance to income-eligible residents on Martha's Vineyard over the next 25 years. Vineyard Power has also pledged $30,000 in RAP funding to Camp Jabberwocky for rooftop solar paired battery storage to back up critical electric loads. This project will power medical equipment and refrigeration for medical supplies during power outages.

Lastly, Vineyard Power plans to continue a loan program supported by RAP funding to support the Aquinnah Wampanoag Tribal Housing Authority's installation of rooftop solar and battery storage on up to eight new tribal housing units. These units will be 100% fossil-fuel-free and net-zero-emission. Vineyard Power also collaborates with the Tribe to enroll tribal members into its income-eligible ratepayer assistance program and the J4S program described above.

13. Barnstable Host Community Agreement

Vineyard Wind entered into a Host Community Agreement (HCA) with the town of Barnstable in October 2018. The HCA requires Vineyard Wind to make annual payments to the Town of at least $1.534 million in combined property taxes and Host Community Payments (HCPs). The HCA guarantees a total of $16 million in HCPs, plus an additional $60,000 (adjusted for inflation annually), for each year the project is in operation beyond 25 years.

Vineyard Wind has made $2.7 million in payments under the HCA to date. These payments are primarily dedicated toward drinking water infrastructure, particularly in Hyannis, where PFAS contamination has presented an ongoing challenge. The Fund was created to help offset the costs of water system upgrades, including new wellheads, PFAS treatment infrastructure, and other capital needs.

The HCA has ensured close and ongoing communication and coordination between Vineyard Wind and Town staff. Beyond the HCA, Vineyard Wind and Barnstable have collaborated on the Town's sewer expansion effort by co-locating sewer infrastructure along the project's onshore cable route, with Vineyard Wind assuming road reconstruction costs. This has saved the Town millions of dollars and reduced the need for future road construction, while helping address the local environmental impacts of wastewater and nitrogen loading that degrade the Town's bays, estuaries, and ponds. The HCA also provided $80,000 in funding for the reconstruction of the bath and restroom facilities at Covell's Beach.

In addition to financial and infrastructure benefits, the project provided a temporary but meaningful boost in local employment. Dozens of Barnstable residents were employed in construction and logistics roles, contributing to onshore substation civil works and supporting offshore operations. Their wages and the spending they generated provided additional benefits to the local economy.

14. Accelerator Fund

As part of its successful 2017 Section 83C bid, Vineyard Wind committed $15 million to an Accelerator Fund to support workforce development, supply chain advancement, and marine mammal protection. These funds were placed into a joint trust account with MassCEC in 2021 when the project achieved financial close, consistent with the Offshore Wind Accelerator Program Agreement. At the time of this report, nearly the entire $15 million has now been committed, with approximately $14 million already distributed to the below projects.

The Fund consists of three major initiatives:

1. **Windward Workforce ($2 million):** Expand training and education programs to grow a skilled offshore wind workforce, with particular emphasis on SEMass.
2. **Industry Accelerator Fund ($10 million):** Support offshore wind supply chain development, infrastructure improvements, environmental technologies, and port capacity upgrades.
3. **Marine Mammal Innovation Fund ($3 million):** Promote new tools and technologies that enhance marine mammal protection and monitoring.

Industry Accelerator Fund ($10 Million)

The Quest

Funding has been awarded for the development of The Quest, a dedicated coworking and innovation space for offshore wind and marine technology enterprises in New Bedford. The facility will support companies in aquaculture, commercial fishing, marine technology, and offshore wind, and is being developed through a collaboration between the New Bedford Economic Development Council and the City of New Bedford.

New Bedford Ocean Cluster (NBOC)

Vineyard Wind partnered with the NBOC to expand opportunities for local businesses and to strengthen the city's marine economy. The NBOC fosters collaboration across four core pillars—commercial fishing and processing, aquaculture, marine technology, and offshore renewables—and plays a key role in connecting local vendors with offshore wind opportunities.

Fishing Vessel Forward Vision

This initiative is designed to reduce a key barrier to fishing-vessel participation in offshore wind: adherence to project-required HSE standards. By supporting vessel inspections, safety equipment upgrades, automatic identification system installations, personal locator beacon purchases, and credentialing, the program has enabled local vessels and crews to meet the technical and safety requirements necessary for offshore wind work. As a result, 56 New England fishing vessels are now qualified for offshore wind operations, and over 50 have been contracted and worked on Vineyard Wind 1.

To date, Vineyard Wind 1 Accelerator Fund has provided funding for inspections, equipment upgrades, oily bilge-water pump-outs, and training and certifications. These funds were intended to enable vessels and crew to become eligible to work on Vineyard Wind 1 and future offshore wind projects and do not represent payment for work performed.

Once individual fishermen obtain Merchant Mariner Credentials, they also gain broader access to maritime employment opportunities, including tugboat and offshore operations roles. In doing so, the initiative expands options for local mariners and strengthens their ability to compete for a broader range of maritime work, without displacing the existing fishing industry.

Thayer Mahan – Big Bubble Curtain

Funding supported Thayer Mahan's development and operationalization of a "big bubble curtain" system to mitigate underwater noise during foundation pile driving. A secondary system was successfully deployed as a pilot during foundation installation on Vineyard Wind 1, helping establish local capacity for this important environmental protection technology. Before this initiative, there were no companies in the U.S. capable of supplying this critical technology.

Oceantic Network Supply Chain Education and Training

Funding has been used to support Oceantic Network (formerly the Business Network for Offshore Wind) courses—including *Offshore Wind 101*, *Offshore Wind Ready*, and *Foundation 2 Blade*—to provide Massachusetts vendors with specialized training and improve supply chain readiness. This funding was primarily aimed at offering education opportunities for local Minority- and Women-owned Business Enterprises.

Workboat Wishlist

This initiative provides targeted support to local construction support vessels and to the shoreside service companies that maintain them. Funds have supported training (e.g., STCW,[19] Able Seaman), improved fendering for crew transfer vessels, welding equipment, tow bridles, cordage, and other essential upgrades needed for offshore wind readiness.

Marine Mammal Innovation Fund ($3 Million)

Project Ocean W'aKEs

Vineyard Wind 1 Accelerator Fund and MassCEC funded Woods Hole Oceanographic Institution, Rutgers University, and Hereon to study the hydrodynamic impacts of turbine wakes on ocean conditions and potential effects on North Atlantic right whale prey availability. This ongoing work aims to address data gaps identified in federal studies, and its results will be published upon completion.

[19] The International Convention on Standards of Training, Certification and Watch-keeping for Seafarers (STCW), 1978, as amended.

Charles River Analytics – Thermal Imaging Pilot

This pilot compared the performance of a thermal-imaging marine mammal detection system with that of trained protected species observers. The project also explored remote verification, impacts of vessel speed on detection, and optimal camera setups.

Thayer Mahan – Passive Acoustic Monitoring (PAM)

Funding supported development and deployment of a real-time PAM system with remote alert capabilities. These systems were positioned ahead of transiting vessels to detect North Atlantic right whales and other species, improving compliance with mitigation requirements and advancing monitoring technology for the broader U.S. OSW industry.

Windward Workforce ($2 Million)

Building Pathways South (BPS)

Funding supported a pre-apprenticeship program aimed at diversifying the union workforce, with a focus on SEMass residents, women, minority workers, veterans, and tribal members. BPS prepares workers for union apprenticeships and provides a well-established pathway into family-sustaining careers in the building trades.

Turbine Installation Training Initiative

To address specialized training needs for offshore turbine installation, Vineyard Wind, GE (Vineyard Wind 1's turbine supplier), and relevant unions collaborated to design and fund training programs to ensure a qualified workforce for turbine installation. Programs included the Offshore Suitability Experience at Massachusetts Maritime Academy and Helicopter Underwater Escape Training, the only such program available in the Northeast.

MassCEC Offshore Wind Works Solicitations

Vineyard Wind 1 Accelerator Fund has contributed financially and through technical support to MassCEC's annual workforce development grants. MassCEC has awarded grants supporting offshore wind workforce training programs across more than two dozen institutions, covering skilled trades, vocational schools, higher education, supply chain development, and diversity initiatives.

Port Workforce Training

Vineyard Wind 1 Accelerator Fund supported a maritime workforce solicitation focused on offshore wind port workers. Funding was awarded to the New Bedford Foss Marine Terminal (in partnership with the International Longshoremen's Association Local 1413) for safety and stevedore operations training needed for emerging offshore wind port activity.

5. Sponsorships and Donations

Every year, Vineyard Wind provides sponsorships and donations to local organizations. Between 2021 and 2024, Vineyard Wind provided $884,474 in sponsorships and donations to dozens of local organizations in the areas of education, fisheries, the environment, and workforce development. Examples of organizations and events supported include the National Marine Educator Association, Community Boating Center of New Bedford, Martha's Vineyard Preservation Trust, Cape Verdean Recognition Scholarship, New Bedford Whaling Museum, Massachusetts Lobstermen's Association, AHA! Night, and Leadership Southcoast (see Table 8).

Table 7 | Vineyard Wind Sponsorships and Donations

Year	Amount
2021	$7,860
2022	$96,040
2023	$643,149
2024	$137,425
Total	**$884,474**

Source: Vineyard Wind.

APPENDIX A: METHODOLOGY

Data Collection

Data collection to obtain job, expenditure, and other relevant information from Vineyard Wind and its contractors and subcontractors began in earnest in October 2021, shortly after the project's financial close. Two main data collection tools were utilized to track project activity:

1) A historical spreadsheet tracker to obtain development-related job and expenditure data from 2017 to 2021. These data were the basis for the bulk of the first annual report.

2) A monthly reporting spreadsheet that Tier 1 contractors were required to submit starting in October 2021. These tracking templates focus on construction phase activities. Over 500 monthly reports were received from Tier 1 contractors.

Development Phase

From the outset, conversations with contractors and subcontractors made it clear that obtaining accurate historical data would be difficult from all companies, particularly from smaller companies no longer working on the project. Consequently, data collection efforts focused on obtaining detailed job and expenditure data from companies with contracts valued at $1 million or more (n=48), which accounted for 90.3% of the total contract value during the development phase. These companies were asked to provide their annual Massachusetts expenditures and counts of Massachusetts-based employees for the 2017–2021 period for activities that directly supported the Vineyard Wind 1 project. Thirty-five of the 49 subcontractors (69%) complied with this request.

Construction and O&M Phases

Tier 1 suppliers completed a monthly reporting spreadsheet. The spreadsheet includes inputs for labor, both union and nonunion, as well as nonpayroll expenditures across three geographic levels: the U.S., the Commonwealth of Massachusetts, and SEMass. Subcontractor expenditures for Tier 1 contractors, as well as workforce demographic characteristics, including race, gender, tribal affiliation, and veteran status, were also tracked. Tier 1 contractors also provided the same information for their major Tier 2 subcontractors (by contract amount), along with aggregate contract amounts for smaller Tier 2 and Tier 3 firms, to capture a more complete accounting of the project's extended supply chain and economic reach.

IMPLAN Model

Vineyard Wind 1's economic impacts were quantified using IMPLAN, which is an input-output database and model that traces a project's purchases of goods, services, and labor through an economic area. For the analysis, an input-output model for Massachusetts was constructed, with model outputs reported in 2024 dollars. The latest available IMPLAN dataset is for 2022.

Direct Inputs to the Impact Model

Employee Compensation[20]

Union employee compensation was estimated by utilizing actual wage and benefit data detailed in each union's prevailing wage schedule. Employee compensation for nonunion workers was estimated utilizing Massachusetts occupational wage data from Lightcast and the U.S. Bureau of Labor Statistics. These data served as the primary inputs to the IMPLAN model as labor income. All union workers are considered local on the project, and therefore, all employee compensation for union workers is included in the Massachusetts total. Conversely, nonunion employee compensation includes only compensation for Massachusetts-based workers. Adjustments were made to account for IMPLAN's in-commuting methodology.

Nonpayroll Expenditures

Nonpayroll expenditures were obtained from the Tier 1 contractors' monthly reports, which, as noted in previous tables in this report, included the expenditure category, amount, and location (i.e., SEMass, Massachusetts, and Other U.S.).

It is not possible to accurately estimate the economic impact of Vineyard Wind 1's operations and capital expenditures simply by changing the output of an aggregated offshore wind industry in the econometric model because a mature offshore wind industry does not exist in the U.S. However, because expenditures were reported by category, it was possible to use a more precise method to estimate the project's economic impacts by specifying a list of changes in the output of each industry that is a beneficiary of the project's purchases.

Who is Considered Local?

In economic impact analysis, employment is determined by job location rather than an individual's place of residence. Therefore, even if a worker is brought in from outside the region, they are still considered "local" employment for the duration of their work. Thus, local employment in this report includes all union employees on the job site, including workers who relocated to SEMass to work on the project. However, the definition of local employment used in this report excludes non-U.S.-based workers assigned to non–Jones Act–compliant vessels, which were staffed by foreign crews.

Project Years and Multiple Models

IMPLAN is an annual model, and the employment estimates it provides represent annualized employment values. However, payroll and nonpayroll expenditures occurred over multiple years. To account for the project's phases, several input-output models were constructed depending on the year in which the expenditures were made. The results of these individual yearly models were then aggregated to produce the final impact tables.

[20] Employee compensation includes wages and benefits.