UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

COMMONWEALTH OF MASSACHUSETTS, et al. Plaintiffs, and ALLIANCE FOR CLEAN ENERGY NEW YORK, Intervenor, v. DONALD J. TRUMP, et al. Defendants.	CIVIL ACTION NO. 25-11221-WGY

DECLARATION OF RYAN MURPHY,

EXECUTIVE DIRECTOR OF CLIMATE JOBS MASSACHUSETTS

I, Ryan Murphy, pursuant to 28 U.S.C. § 1746, hereby declare under penalty of perjury as follows:

I. RELEVANT BACKGROUND AND EXPERIENCE

1. I am over the age of 18 and competent to testify to the facts contained in this Declaration.

2. Since May 2023, I have served as the Executive Director of Climate Jobs Massachusetts ("CJMA"), a coalition of local and regional labor unions and related organizations that collectively represent hundreds of thousands of workers employed in Massachusetts.

3. CJMA works to support clean energy projects and the workers who build, operate, and maintain them. CJMA does so by promoting solutions to generate and distribute clean energy at scale and develop substantial opportunities for high-quality careers for existing and future energy workers.

4. CJMA coalition unions already represent thousands of building and construction trades workers who are or have been directly employed in the construction of the Vineyard Wind Project offshore windfarm and related port construction at the Port of New Bedford, the first port in the United States constructed to meet the particular demands of the offshore wind industry. See "Overview", available at https://www.vineyardwind.com/vw1-1 (last visited August 8, 2025).

5. Similarly, CJMA coalition unions represent over 150 building trades and construction workers who will be constructing the Port of Salem, tailoring the Port facility to the needs of offshore wind construction. See https://www.salemoffshorewind.com/ (last visited August 8, 2025).

6. Over the last two decades, CJMA coalition building and construction trades unions have worked collaboratively with wind developers to build the offshore wind industry and an American offshore wind workforce in Massachusetts and New England. CJMA building and construction trades union members have benefited, building careers in the offshore wind industry and supporting their families with excellent wages and benefits.

7. If the Presidential Memorandum issued January 20, 2025, indefinitely pausing agency action to approve offshore wind construction projects ("Presidential Memorandum" or "Memorandum") is upheld, the substantial investments made by CJMA building and construction trades union members to develop this industry and this industry's workforce in Massachusetts will be squandered. Moreover, many of these members' nascent careers in offshore wind will be upended.

8. Additionally, the Commonwealth's multi-decade financial commitment to the offshore wind industry totaling well over $200 million to build and support this industry, coupled with even greater financial investments from the private sector, will fail to realize the lasting economic, workforce development, and environmental goals that have attracted the Commonwealth to building this industry for so many years.

II. OUR BUILDING AND CONSTRUCTION TRADE UNION MEMBERS HAVE PROVIDED THEIR MEMBERSHIPS EXTENSIVE TRAINING, BUILDING AN AMERICAN WINDPOWER WORKFORCE.

9. CJMA's building and construction trade union members, through their joint apprenticeship and training programs, have collectively invested millions of dollars to launch, operate, and fund training programs that equip their memberships with offshore wind-specific health and safety training and all of the skills necessary to complete construction on windfarms on and offshore.

10. For example, Painters District Council 35 has expended over $600,000 over the last five years alone to provide its members training essential to meeting offshore wind developer requirements.

11. Similarly, Massachusetts-based local Carpenters unions have spent over $1,000,000 over the last five years providing offshore wind training to their members.

12. Over the course of the last five years, these building and construction trades unions have provided extensive specialized training to both journeypersons and apprentices, ensuring that their membership has training equal to or superior to the European and Asian workforces that offshore wind developers have utilized for decades.

13. Hundreds of Massachusetts building and construction trades union workers drawn from CJMA's member unions are already working on offshore wind. They stand ready, able, and willing to work on future Massachusetts and other New England wind farm projects.

14. These union members have prepared for more than working on a single wind farm project, they have prepared for a career in the wind industry, constructing offshore wind farms over the course of decades.

III. WHILE COMPRISING ONLY A SMALL FRACTION OF OVERALL CONSTRUCTION IN NEW ENGLAND, OFFSHORE WIND CONSTRUCTION IN NEW ENGLAND SINCE 2021 HAS ALREADY YIELDED SUBSTANTIAL WAGES AND BENEFITS FOR MASSACHUSETTS UNION MEMBERS.

15. Over the past several years, the memberships of CJMA building and construction trades unions have logged tens of thousands of work hours on offshore wind projects.

16. For instance, since the inception of Vineyard Wind 1, in 2021 until early July 2025, Ironworkers Local 37 members have worked 97,698 hours on the project, both on and offshore.

17. Similarly, over the last four years, Massachusetts-based local Carpenters unions have worked over 800,000 hours on Vineyard Wind 1, both on and offshore.

18. In order to maintain this pace, offshore wind construction must continue in Massachusetts, New England, and the Atlantic coast. This requires the construction of new projects, which have not yet received final approval from the Federal Government. Unless President Trump's Memorandum is struck down and/or the pause rescinded, the offshore wind industry's significant, positive, and direct economic impact on Massachusetts building and construction trades unions' memberships—and the Commonwealth—will be lost.

IV. THE COMMONWEALTH OF MASSACHUSETTS HAS MADE SIGNIFICANT, PERMANENT INVESTMENTS IN OFFSHORE WIND INFRASTRUCTURE AT MASSACHUSETTS PORTS, CREATING POTENTIAL FOR ECONOMIC AND WORKFORCE DEVELOPMENT OPPORTUNITIES IN THE OFFSHORE WIND INDUSTRY THAT WILL NOT BE REALIZED IF THE PRESIDENT MEMORANDUM IS UPHELD BY THIS COURT.

19. For almost fifteen (15) years, Massachusetts has invested substantial taxpayer dollars in building critical port infrastructure for the offshore wind industry. The full promise of these investments will not be realized if offshore wind projects and related infrastructure construction are substantially delayed or abandoned.

20. The Massachusetts Clean Energy Center ("MassCEC") owns two offshore wind terminals in Massachusetts. The first MassCEC offshore wind port is located in New Bedford, Massachusetts; it was developed by the Commonwealth of Massachusetts for offshore wind between 2012 and 2015 and is known as the New Bedford Marine Commerce Terminal.

21. The total cost of the Marine Commerce Terminal was approximately $300 million. Of that, the Commonwealth provided approximately $113 million in funding. Construction required the redevelopment of a 29-acre portion of the Port of New Bedford into

the Marine Commerce Terminal. In doing so, the Commonwealth developed the first port in the United States capable of providing a state of the art marshalling and assembly hub for the offshore wind industry. "What's Next for New Bedford's offshore wind terminal", New Bedford Light (April 2024), available at https://newbedfordlight.org/whats-next-for-new-bedford-marine-commerce-terminal-new-london-state-pier/ (last visited August 7, 2025).

22. In 2024, the Commonwealth, again invested in an expansion of the Marine Commerce Terminal. MassCEC began construction on a $45 million expansion of the Marine Commerce Terminal; the anticipated completion date is December 2026. "MassCEC Announces Expansion Plans for the New Bedford Marine Commerce Terminal (August 14, 2024)," available at https://www.masscec.com/press/masscec-announces-expansion-plans-new-bedford-marine-commerce-terminal (Last visited August 7, 2025).

23. From 2022 to the present, the New Bedford Marine Commerce Terminal has served as the primary marshalling and assembly port for Vineyard Wind 1. There are currently multiple offshore wind projects scheduled to utilize the Terminal for marshalling, construction, and or maintenance and operations in the near term. These projects include, but are not limited to, SouthCoast Wind, Vineyard Wind 2, and New England Wind 1 and 2. All of these projects are currently paused under the Presidential Memorandum.

24. MassCEC has also made substantial financial investments in the redevelopment of a second port dedicated to the offshore wind industry located in Salem, Massachusetts. "MassCEC Announces Expansion Plans for the New Bedford Marine Commerce Terminal (August 14, 2024)," supra, (in 2024, Mass CEC announced at $75 million investment as part of public-private partnership with Crowley, a long term leasor who will serve as the Port Operator of the Salem Offshore Wind Terminal, to redevelop the Port of Salem for offshore wind);

"MassCEC, City of Salem, and Crowley Announce Agreements for Salem Offshore Wind Terminal" (February 23, 2024), available at https://www.mass.gov/news/masscec-city-of-salem-and-crowley-announce-agreements-for-salem-offshore-wind-terminal#:~:text=Crowley%2C%20which%20purchased%20the%20property,to%20support%20offshore%20wind%20development (last visited August 7, 2025).

25. Construction of the Salem Offshore Wind Terminal, which includes both the redevelopment of terminal infrastructure and tailored harbor construction to meet the offshore wind industry's needs, is set to commence within calendar year 2025 with a completion date sometime in 2026 or 2027. Id.; see also "Massachusetts $300M Offshore Wind Terminal Starts as Key Sector Boost," Knapschaefer, J. and Rubin, D., https://www.enr.com/articles/59147-massachusetts-300m-offshore-wind-terminal-starts-as-key-sector-boost (last visited August 7, 2025).

V. MASSACHUSETTS COMMUNITIES AND THEIR RESIDENTS HAVE ONLY BEGUN TO BENEFIT FROM ECONOMIC AND WORKFORCE DEVELOPMENT INVESTMENTS RESULTING FROM THE RECONSTRUCTION OF THEIR PORTS FOR OFFSHORE WIND.

26. For instance, MassCEC's public-private partnership with Crowley LLC for the redevelopment of the Port of Salem will produce both initial economic and workforce development benefits for the City of Salem.

27. The construction project has been estimated to cost $300 million, funded through a combination of federal, state, and private funding. "Massachusetts $300M Offshore Wind Terminal Starts as Key Sector Boost," Knapschaefer, J. and Rubin, D., https://www.enr.com/articles/59147-massachusetts-300m-offshore-wind-terminal-starts-as-key-sector-boost (last visited August 7, 2025).

28. Moreover, the construction of the Salem Offshore Wind Terminal will

substantially improve the tax base of the City of Salem, bringing the property's assessed value from approximately $750,000 to approximately $220 million when the project is completed. Even with a substantial tax credit to Crowley, the City estimates that it will receive over $20 million a year from Crowley once the Salem Offshore Wind Terminal is constructed and in operation annually, through the completion of Crowley's twenty-year lease. These taxes will only be realized, however, if Crowley remains a leasor, which requires Crowley to maintain a steady clientele of offshore wind development clients over the course of its lease with the City of Salem. See "Salem could soon have an offshore wind staging facility after state's $30 million port deal", Boston Globe, Chesto, J. (December 27, 2023), available at https://www.bostonglobe.com/2023/12/27/business/salem-offshore-wind-staging-facility/#:~:text=53.5 (last visited August 8, 2025).

29. Additionally, Crowley and the City of Salem have agreed to an extensive community benefits agreement which provides over $9 million in community economic benefits, including a direct $3,715,000 contribution to the City of Salem schools, and an over $2 million commitment to expanding public safety and public works services, extensive vocational training opportunities for the wind industry in both secondary and higher education, and local recruitment of workers for operations and maintenance jobs. See https://www.salemma.gov/498/Offshore-Wind-Terminal-Project; https://www.salemma.gov/planning-and-community-development/pages/offshore-wind-terminal-project#:~:text=Commitments%20and%20funding%20for%20Salem,Schools%20through%20guest%20speaking%20engagements (last visited July 7, 2025).

30. The construction of the Salem Offshore Wind Terminal is expected to employ 150 construction workers in addition to supervisors, engineers and administrators during the

construction project, offering substantial new, but temporary, employment opportunities at the Port. Id.; see also "Healey-Driscoll Administration, City of Salem and Crowley Celebrate Groundbreaking of Second Offshore Wind Terminal", https://www.mass.gov/news/healey-driscoll-administration-city-of-salem-and-crowley-celebrate-groundbreaking-of-second-offshore-wind-terminal#:~:text=The%20terminal%20will%20provide%20opportunities,our%20tenants%20and%20their%20contractors (last visited July 7, 2024).

31. While the Salem Wind Terminal is expected to be constructed by early 2027, without large offshore wind development following shortly thereafter, the substantial federal, state, and private economic and workforce development investments in the Port of Salem will fail to yield a thriving, sustainable windfarm construction industry based in the City of Salem. "Despite federal pauses, Salem officials 'hopeful' offshore wind terminal project stays on track", McHugh, M., Salem News (July 3, 2025), available at https://www.salemnews.com/news/despite-federal-pauses-salem-officials-hopeful-offshore-wind-terminal-project-stays-on-track/article_5f607d6b-5158-4873-a703-cc50c8ba44ad.html#:~:text=Getting%20your%20Trinity%20Audio%20player,after%20the%20start%20of%20construction (last visited July 7, 2025); "Massachusetts communities that bet big on offshore wind face uncertainty", Barnes, J., et al, WBUR.ORG (April 18, 2025) available at https://www.wbur.org/news/2025/04/18/offshore-wind-businesses-massachusetts-new-england-trump (last visited July 7, 2025).

32. To date, developers for the following projects have stated that they will have all or part of their wind farm project marshalled and assembled in the Port of Salem: SouthCoast Wind, New England Wind 1, Vineyard Wind 2. All of these projects still require additional action by Federal government, which is currently indefinitely paused under the President's

Memorandum.

33. The Commonwealth of Massachusetts premised the 2024 selection of each of these wind farm projects on the substantial economic and workforce development benefits these projects were projected to provide to the Commonwealth and its communities, as well as the environmental benefits they would provide.[1] For example:

- The SouthCoast Wind Project was projected to create 3,915 jobs in Massachusetts and Rhode Island. The SouthCoast Wind Project proposal included developer partnerships with Bristol Community College, National Offshore Wind Institute, and the Massachusetts Maritime Academy, to offer training to Massachusetts residents to work in every level of the offshore wind industry. At the time of the award, construction was projected to commence in 2025 and deliver power in 2030. "Massachusetts and Rhode Island Announce Largest Offshore Wind Selection in New England History", available at https://www.mass.gov/news/massachusetts-and-rhode-island-announce-largest-offshore-wind-selection-in-new-england-history (last visited August 7, 2025).

- The New England Wind 1 Project was projected to create 4,400 jobs. New England 1's developer, Avangrid, agreed to provide $130 million in upfront and lease payments to spur the development of the offshore wind marshalling port in Salem and also agreed to locate its operations and maintenance hub in New Bedford. Id. At the time of the award, construction was expected to commence sometime in 2025 and deliver power in 2029. Id.

- The Vineyard Wind 2 Project was projected to generate 3,800 job-years of employment across New England, with 80 percent in Massachusetts. Vineyard Wind, Vineyard Wind 2's developer, also agreed to provide up to $37.5 million in directly funded initiatives to foster a diverse, inclusive offshore wind workforce and supply chain, help address energy burden for low- and moderate-income households, advance regional research efforts in fisheries and the environment, and establish the region as a global climate innovation lab. The project was expected to utilize the Salem Wind Terminal for staging and utilize the Port of New Bedford for operations and maintenance. Id.

34. Moreover, through their accepted proposals, all three developers confirmed their intent to utilize Project Labor Agreements (PLAs), ensuring that the wages, benefits, and other

[1] Of course, these projects would also have substantial environmental benefits. The Commonwealth estimates that these three projects collectively would, if built, power over 1.4 million Massachusetts homes, the equivalent of taking 1,000,000 gas-powered cars off the road.

terms and conditions set for the construction of their wind farms would meet and/or exceed the Commonwealth's prevailing standards for construction compensation, benefits, and working conditions. Id. By agreeing to contract with regional councils of local building and construction trades unions in close proximity to the Ports of New Bedford and Salem under a project labor agreement, the developers for each of these projects confirmed that they intended to draw a substantial portion of their construction workforce from communities in close proximity to the ports, creating substantial long-term construction employment opportunities as well as significant and direct economic benefits for the City of Salem and surrounding communities.

VI. THE WORKFORCE UTILIZATION AS WELL AS THE ECONOMIC DEVELOPMENT AND WORKFORCE DEVELOPMENT REALIZED IN THE CONSTRUCTION OF VINEYARD WIND 1 BETWEEN 2021 AND THE PRESENT DEMONSTRATE THAT THE COMMONWEALTH WILL BE SIGNIFICANTLY HARMED IF THE PROCESS FOR APPROVING ADDITIONAL WIND FARM PROJECTS REMAINS PAUSED INDEFINITELY.

35. Construction on Vineyard Wind 1, the first major offshore wind project developed in the United States, began in 2021 and is close to completion. It was marshalled and assembled at the New Bedford Marine Wind Terminal and has been constructed off the coast of Martha's Vineyard. While Vineyard Wind 1's estimates for job production are substantially smaller than each of the three projects identified above in which final federal approvals are still pending, its economic impact on the City of New Bedford, including but not limited to direct wages paid and jobs created, workforce development and training as well as other positive community impacts to date, gives us a snapshot of the substantial losses Massachusetts and specifically Salem, New Bedford and surrounding communities will suffer if these projects are further paused or ultimately not permitted to go forward.

36. Vineyard Wind 1 has already employed 3,453 workers in some capacity over the last four years, including nearly 1,400 building trades and construction workers operating principally out of the New Bedford Marine Terminal, in Barnstable, Massachusetts, where an onshore substation is under construction, and on the water. See Vineyard Wind Impact on Jobs and Economic Output, Annual Report 3 (November 2024).

37. To date, Vineyard Wind has expended approximately $329 million in Massachusetts, including over $196 million in direct labor costs. Additionally, "Vineyard Wind has also paid the state tens of millions in rent to lease the MassCEC terminal." "Our offshore wind tracker: What's new with wind projects off Massachusetts and beyond?", The New Bedford Light, Lemon, A. (June 30, 2025), available https://newbedfordlight.org/offshore-wind-tracker-whats-happening-to-massachusetts-projects (last visited August 8, 2025).

38. Moreover, in November 2024, Vineyard Wind reported that between 2021 and 2024, Vineyard Wind 1 had supported an additional 686 supply chain jobs in Massachusetts, resulting in an additional $41 million in wages and $167.7 million in new economic output indirectly attributable to Vineyard Wind 1. See Vineyard Wind Impact on Jobs and Economic Output, Annual Report 3 (November 2024), attached as Exhibit 1 to this Declaration.

VII. PRESIDENT TRUMP'S STATEMENTS THAT HE INTENDED TO SHUT DOWN THE U.S. WIND INDUSTRY HAVE ALREADY RESULTED IN THE PERMANENT LOSS OF SUBSTANTIAL ECONOMIC DEVELOPMENT AND JOBS IN MASSACHUSETTS IN THE OFFSHORE WIND INDUSTRY—BOTH IN CONSTRUCTION AND MANUFACTURING.

39. In January 2025, Prysmian Group withdrew from its proposed $725 million project to build and operate an industrial electrical cable factory that would have supplied the offshore wind industry after then President-Elect Trump threatened to shut down the offshore wind industry in the United States. This came after three (3) years of working through the permitting process with state and local officials and resolving multi-year litigation, allowing it to construct its factory and operate within the Commonwealth. The factory would have been located at Brayton Point, in Southeastern Massachusetts where the need for economic development and job opportunities is particularly acute. The Prysmian project would have employed between 50-80 construction workers through the duration of construction and between 200-350 manufacturing workers building the industrial cables once the factory was built. The company estimated that it would provide the City of Mansfield $10 million annually in tax revenue once operations commenced. "Prysmian abandons plans for offshore wind cable factory in Somerset", WBUR.ORG, Berke, B. (January 22, 2025), available at https://www.wbur.org/news/2025/01/22/prysmian-somerset-offshore-wind-cable-factory-canceled (last visited August 8, 2025); see also Prysmian Group at Reuters' Offshore Wind conference in Boston (11-12 July), available at https://www.prysmian.com/en/media/press-releases/prysmian-group-at-reuters-offshore-wind-conference-in-boston#:~:text=As%20already%20announced%2C%20Prysmian%20is,and%202%20and%20Coastal%20Virginia. (last visited August 8, 2025).

Signed under the pains and penalties of perjury,

Ryan Murphy

Exhibit 1

VINEYARD WIND

Vineyard Wind 1

Impact On Jobs and Economic Output

Annual Report 3

November 2024

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.

SPRINGLINE RESEARCH GROUP

Springline Research delivers data-driven solutions to help organizations achieve their goals, address challenges, and capitalize on opportunities. Our expertise spans economic development, impact analysis, strategic evaluation, and technical support, providing the insights and tools needed to drive growth, strengthen communities, and create lasting impact. We partner with public and private clients of all sizes, including local and state governments, small businesses, economic development organizations, industry, and nonprofit organizations.

David Borges, the author of this report, has been analyzing the impacts of the Vineyard Wind 1 project and renewable energy more broadly since 2017, during his tenure as Director of Research at the UMass Dartmouth Public Policy Center.

Acknowledgements

Acknowledgment and appreciation go to the following Vineyard Wind employees for providing critical data and support that made this report possible. While their contributions were essential to the research process, the analysis and writing of this report were conducted independently.

Jennifer Cullen, Director of Labor, Workforce, and Local Content
Dan Kent, Labor Relations Manager
Tess Dunleavy, Environmental Compliance Manager
Scott Ambrosia, Permit and Environmental Compliance Manager
Emily Rochon, Esq., Senior Manager, Strategic Implementation
Mackenzie Dalton, Senior Accountant
Rithik Porandla, Workforce and Local Content Intern

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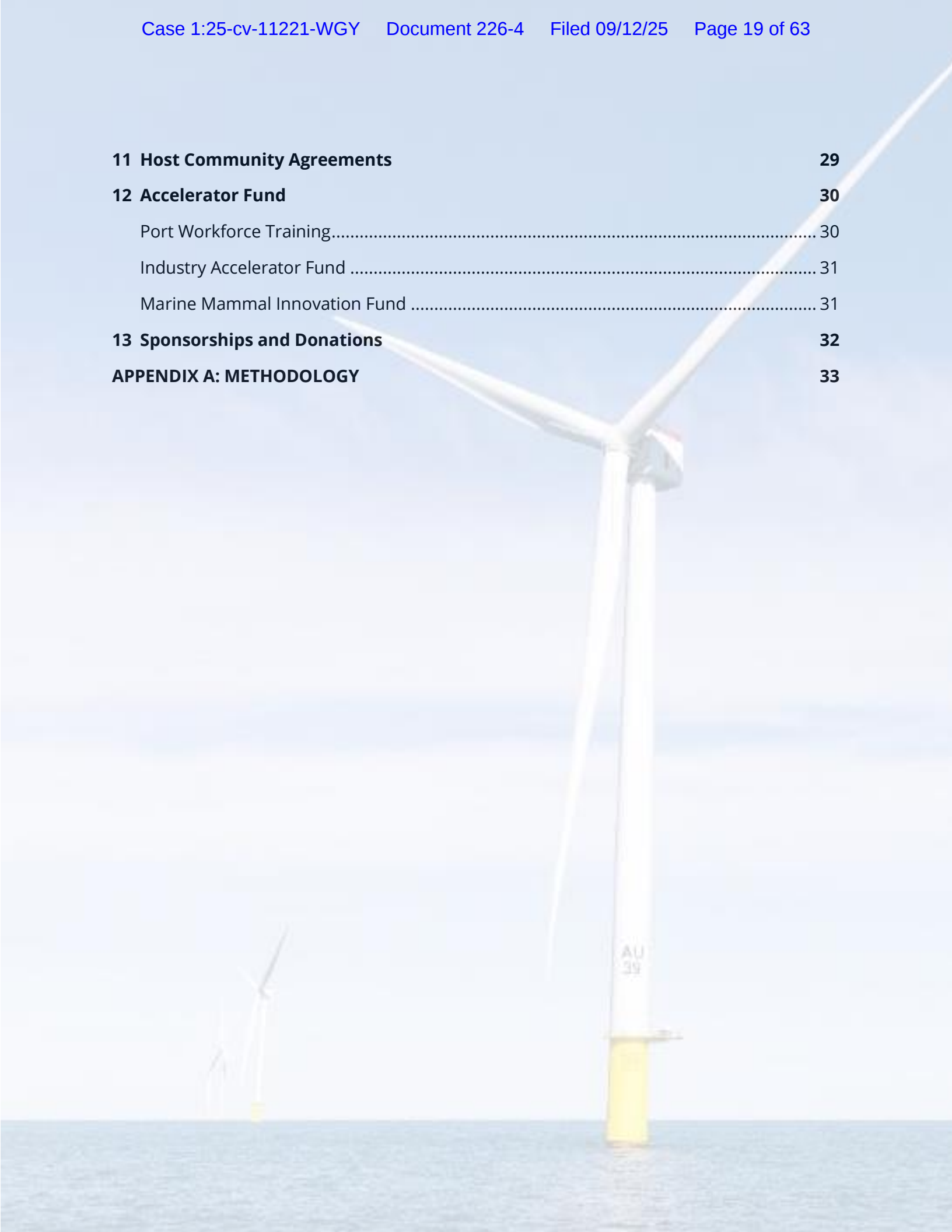


Executive Summary

Vineyard Wind's *Offshore Wind Development and Reporting Agreement* (henceforth, the *Agreement)* executed with the Massachusetts Department of Energy Resources (MA DOER) 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 2024 to measure Vineyard Wind's progress in meeting the requirements outlined in the *Agreement.*

This is the third annual report. The time periods covered by each report are below:

Annual Report Year 1: October 2017 to September 2022

Annual Report Year 2: October 2017 to September 2023

Annual Report Year 3: October 2017 to September 2024

How are Jobs Defined in this Report?

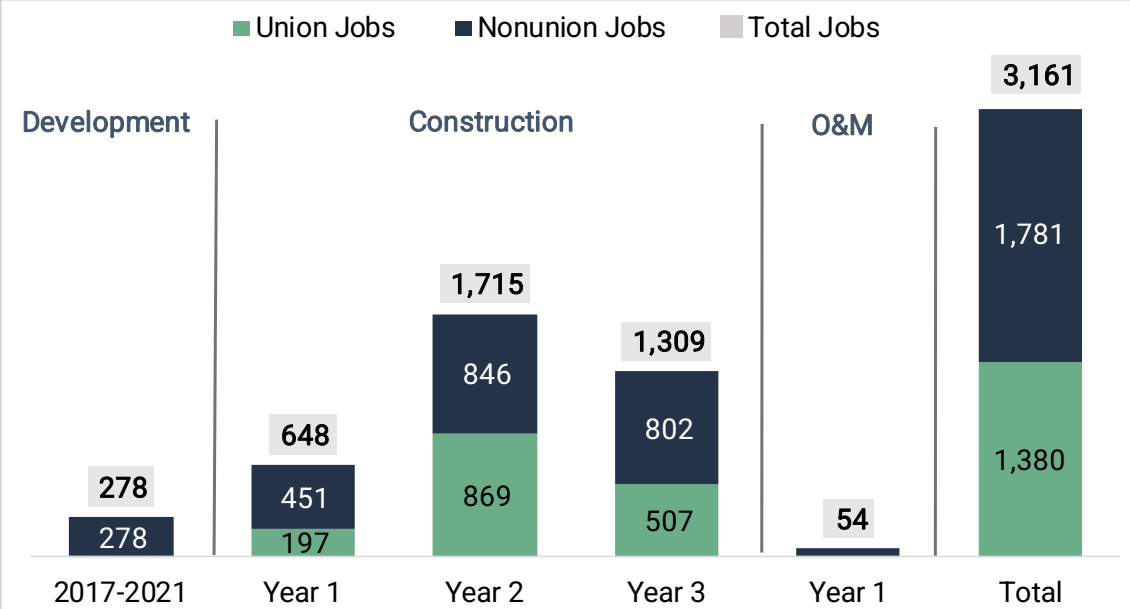
Economic impact assessments of construction and other temporary project-based activities are typically reported in the number of years of full-time work required, which is referred to in terms of Full-Time Equivalents (FTEs) or "job years." To ensure clarity and provide the most comprehensive and precise reporting of employment impacts, our analysis presents job 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. **Full-Time Equivalents (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).

Vineyard Wind 1 has directly supported 3,161 jobs, comprising 1,380 union positions and 1,781 nonunion positions.

- The five-year **development phase** supported 278 jobs.
- The **construction phase** has been the most labor-intensive, with 648 jobs in Year 1 (451 nonunion, 197 union), 1,715 in Year 2 (846 nonunion, 869 union), and 1,309 in Year 3 (802 nonunion, 507 union).[1]
- **Operations and Maintenance (O&M)** contributed 54 jobs, with most workers starting in June and July 2024. Once the wind farm becomes fully operational, the O&M phase is projected to employ approximately 94 workers annually, including 88 full-time and 6 part-time positions.

Figure 1 | Jobs (Headcount)
Development, Construction, and O&M Phase to Date



Source: Springline Research from monthly contractor reports

[1] The total (last bar) in Figure 1 represents the number of individual workers over the eight-year period, not the sum of the previous bars. That is, there have been 3,161 unique workers on the project since 2017. Some of these workers may have been employed on the project in multiple years. The same applies to the construction phase.

Including the indirect and induced effects, Vineyard Wind 1 has supported 3,405 FTEs, $331.1 million in labor income, and $890.4 million in economic output in Massachusetts.

- **Indirect (Supply Chain) Effects:** The project's direct payroll and nonpayroll expenditures supported an additional 686 indirect supply chain jobs during the project period. The project also indirectly supported $41.8 million in labor income and $167.7 million of new economic output in Massachusetts. More than 70 South Coast companies have secured work from Vineyard Wind 1, including 51 based in New Bedford.
- **Induced (Household Income) Effects:** Additional household spending that resulted from the direct and indirect impacts induced an additional 1,109 jobs that supported $82.2 million in labor income and $274.2 million in new economic output in Massachusetts.
- Industries most affected by induced impacts are typically those that cater to household spending, including retail, healthcare, real estate, food services, and personal services. These sectors benefit from increased consumer spending as workers and households use their income to purchase goods and services.

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

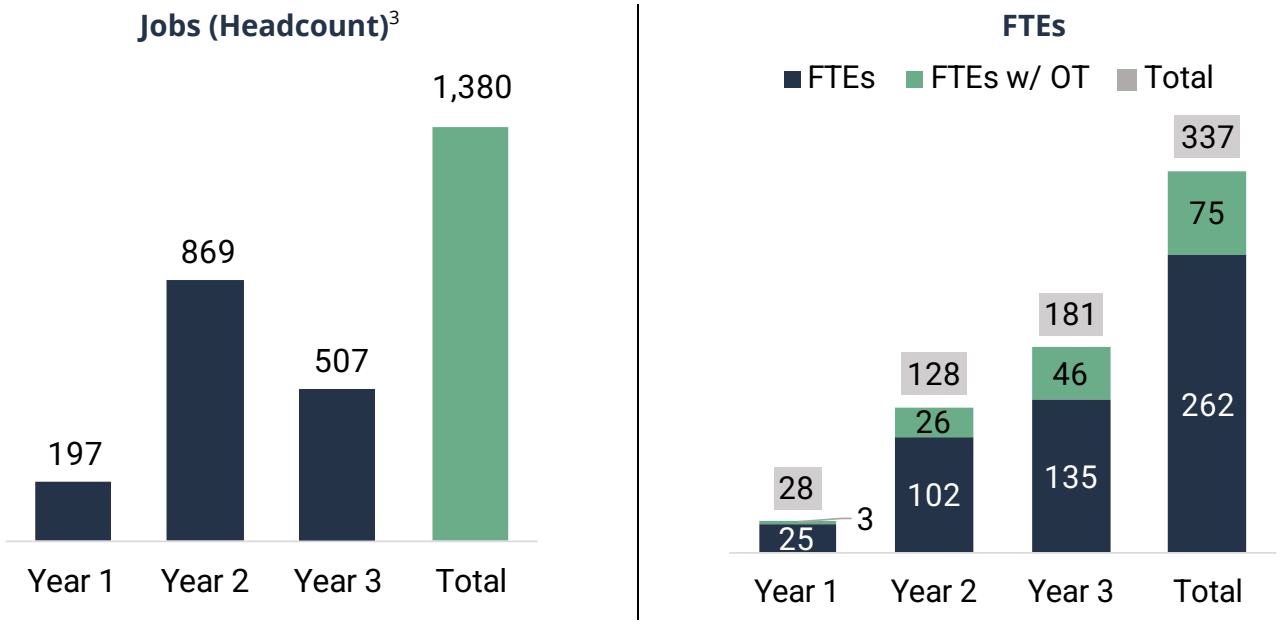
Vineyard Wind 1 Impacts			
Impact Type	**FTEs**	**Labor Income**	**Output**
Direct Effect	1,610	$209.2	$448.5
Indirect Effect	686	$41.8	$167.7
Induced Effect	1,109	$82.2	$274.2
Total Effect	3,405	$333.1	$890.4

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

Nearly 1,400 union workers have been employed on the project, which equates to 337 FTEs.

- **Union worker headcount peaked during Year 2** of construction at 869 workers, which accounted for the majority (63%) of the 1,380 union job total.[2] Year 2 of construction marked the peak period of activity across all project sites, including the onshore substation in Barnstable, marshaling operations at the New Bedford Marine Commerce Terminal, all offshore scopes, and the construction of O&M facilities on Martha's Vineyard.
- **In contrast, FTEs reached their highest point in Year 3** with 181 union FTEs, driven by an increase in year-round employment compared to previous years.
- **Union overtime hours are considerable,** accounting for 22% of total union hours. Accordingly, Figure 2 shows the standard FTE calculation without overtime (262 FTEs) as well as the additional FTEs when overtime is included (+75 FTEs for a total of 337 FTEs).

Figure 2 | Union Jobs and FTEs



Source: Springline Research from monthly contractor reports

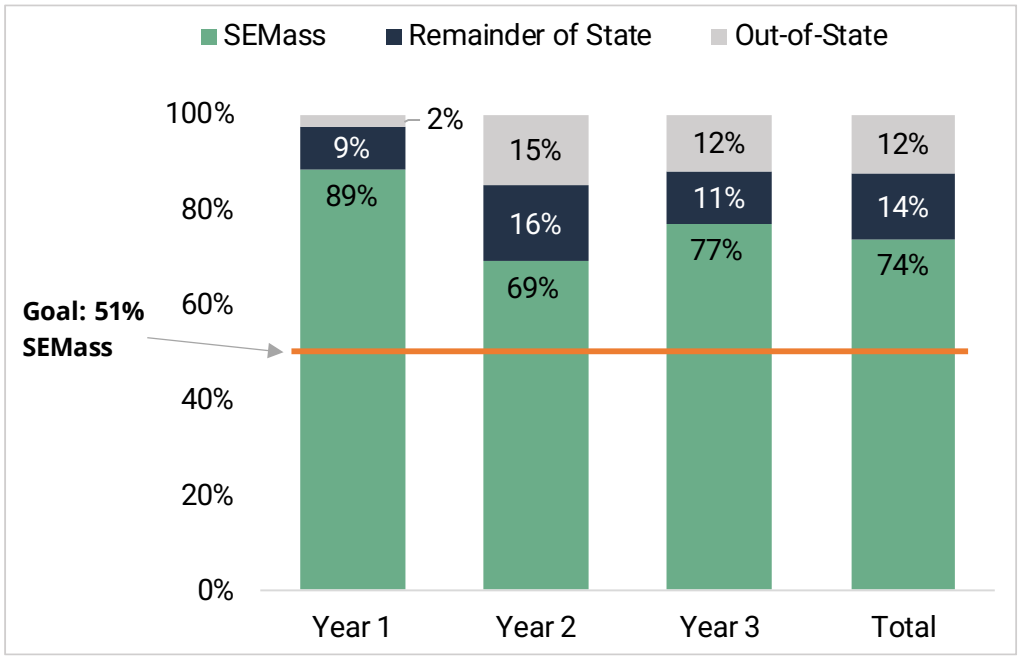
[2] No union workers were employed during the Development or O&M phases.

[3] While some of the same employees may have worked in Year 1, Year 2, and/or Year 3, these jobs are only counted once in the total headcount (fourth bar in the chart). Thus, the total headcount of 1,380 over the three-year period is not the sum of workers in Year 1, Year 2, and Year 3.

Seventy-four percent of union workers are residents of Southeastern Massachusetts (SEMass).[4]

- Vineyard Wind 1 exceeded its goal of ensuring that at least 51% of union workers were residents of Southeastern Massachusetts.
- The union workforce is primarily concentrated in the South Coast region, where marshaling work is taking place, with 324 workers residing in New Bedford, 85 in Fall River, and 30 in Dartmouth.
- Many workers also reside on Cape Cod, where much of the work focused on installing the onshore cables and constructing the onshore substation in Barnstable. This includes 37 residents of Falmouth and 21 residents of Barnstable.
- Approximately 35 union workers, or 2% of the total, relocated to Southeastern Massachusetts for the project, with the majority settling in Greater New Bedford. However, it is expected that most of these workers will leave the region after the project's completion.

Figure 3 | Union Employee Residence



Source: Springline Research from monthly contractor reports

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

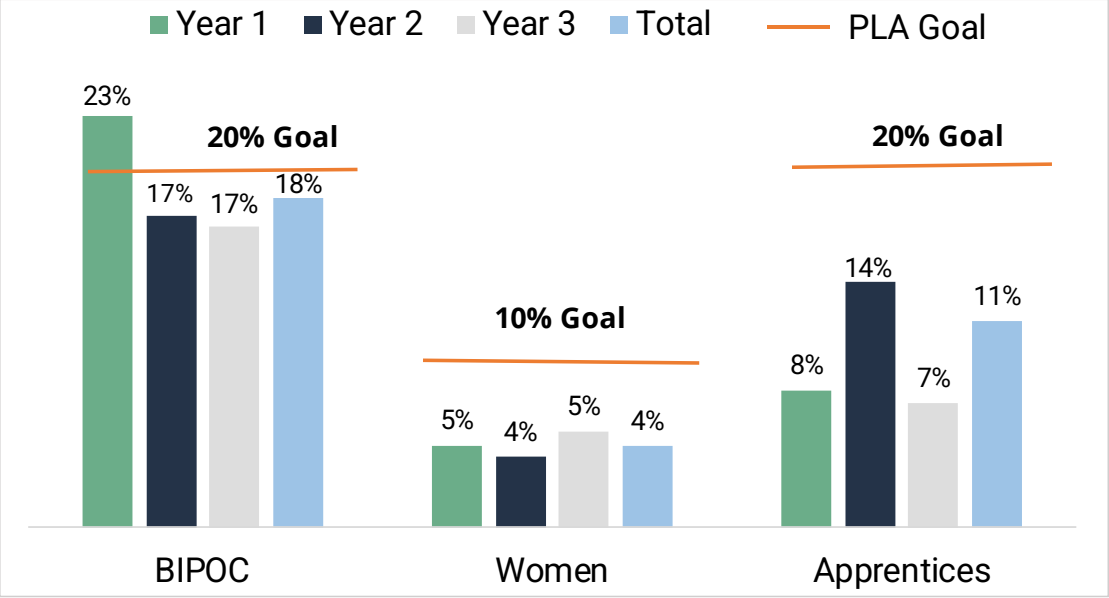
Data gathered through Vineyard Wind's Project Labor Agreements indicate that 18% of union workers identify as BIPOC, 4% are women, and 11% are apprentices.

Vineyard Wind's Project Labor Agreements (PLAs) with its union contractors stipulate several hiring goals related to Diversity, Equity, and Inclusion as well as the number of apprentices on the project:

1. **Black, Indigenous, and People of Color (BIPOC):** 20% of total union jobs (headcount)[5]
2. **Women:** 10% of total union jobs (headcount)
3. **Apprentice:** One-in-five total union workers (headcount)

While the project is approaching its BIPOC participation goal, the percentage of women employed is lower than anticipated. These shortfalls highlight broader workforce challenges, particularly within construction and maritime industry jobs, which are predominantly held by men. In addition, the project fell short of apprenticeship goal primarily due to the specialized nature of offshore work.[6]

Figure 4 | Number of Union Workers Meeting PLA Goals



Source: Springline Research from monthly contractor reports

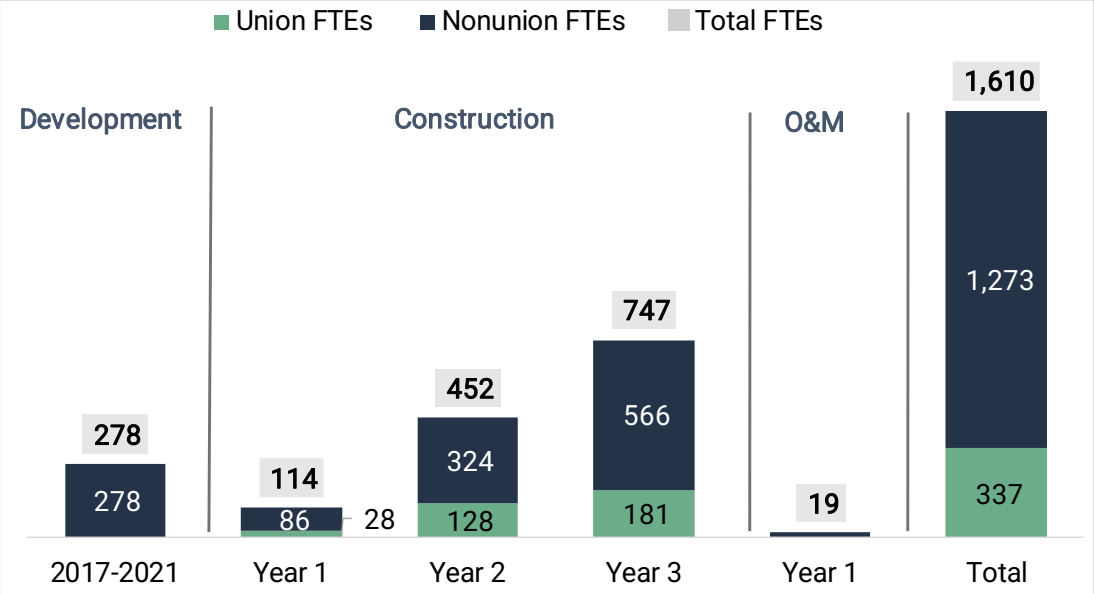
[5] BIPOC (Black, Indigenous, and people of color) is defined as any employee whose race is not White-alone.

[6] Note: These factors will be discussed in greater detail in the body of the report.

Combined, union and nonunion employment totaled 1,610 FTEs since 2017.

- The construction phase has been the most significant in terms of FTE generation: 114 FTEs in Year 1, 452 FTEs in Year 2, and 747 FTEs in Year 3.
- Notably, while the number of workers was highest during Year 2 of the construction phase, FTEs were highest in Year 3. This contrast is due to union employees working more hours on the project as marshaling and offshore activity increased.
- Most O&M workers began in June or July 2024, resulting in only three to four months of work on the project, hence the low number of FTEs compared to other phases.

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



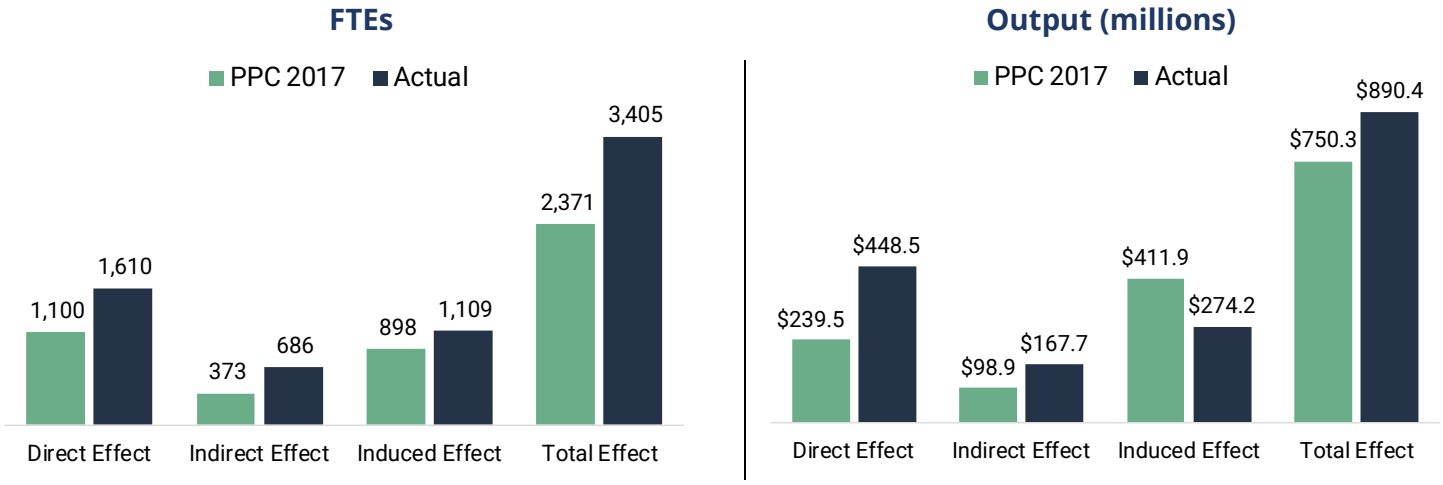
Source: Springline Research from monthly contractor reports

The job and economic impacts of the Vineyard Wind 1 project exceed initial estimates.

The UMass Dartmouth Public Policy Center (PPC) conducted a 2017 analysis projecting the employment and economic output contributions of the proposed Vineyard Wind 1 project to the Commonwealth of Massachusetts. The charts below compare the PPC's projections with current estimates, revealing that the job and economic impacts to date have exceeded the 2017 projections, even though construction is not yet complete. This is partly due to the extended time frame of the project.

- **Total FTEs:** The total employment impacts are 3,405 FTEs, which compares to the 2017 estimate of 2,371 FTEs, a difference of +1,034 FTEs.
- **Total Economic Output:** The total output impact is $890.4 million, which compares to the 2017 inflation adjusted estimate of $750.3 million, a difference of $140.1 million.

Figure 6 | Employment Impacts
2017 PPC Estimate Versus Actual



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

1 Overview

Vineyard Wind is currently building the nation's first utility-scale offshore wind energy project fifteen miles south of Martha's Vineyard. When completed, the Vineyard Wind 1 project will consist of an array of 62 wind turbines, spaced 1 nautical mile apart, that will generate 806 megawatts (MW) of electricity and power over 400,000 homes.

Vineyard Wind's *Offshore Wind Development and Reporting Agreement* (henceforth, the *Agreement*) executed with the Massachusetts Department of Energy Resources (MA DOER) 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 2024 to measure Vineyard Wind's progress in meeting the following 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,

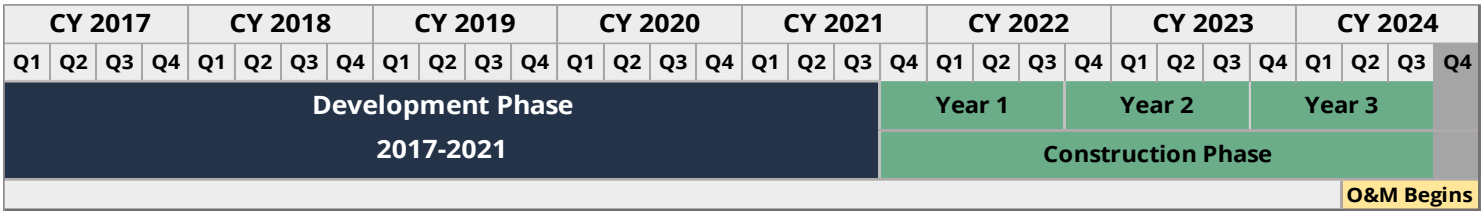
(g) the impact of the Host Community Agreement with the Town of Barnstable,

(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

The first annual monitoring report included job and expenditure estimates for the full development phase (2017-2021). The first report also included estimates related to construction phase jobs and expenditures from October 2021 through September 2021, with much of the construction-related activity focused on onshore work in the town of Barnstable. Marshaling and offshore construction ramped up in Q4 2022, with the bulk of the marshalling and offshore construction impacts beginning in Q2 2023 and still ongoing. Operations and Maintenance (O&M) activity began in Q2 2024. Accordingly, the current analysis includes three 12-month construction periods and the start of O&M (see Figure 7).

Figure 7 | 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 subcontractors began in October 2021, shortly after the project's financial close. Two main data collection tools were utilized to track project activity:

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

2) A monthly spreadsheet tracking template that Tier 1 contractors were required to submit monthly beginning in October 2021. Over 450 monthly reports have been received from Tier 1 contractors to date.[7]

Development Phase Data Collection

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

Construction Phase Data Collection

A monthly data tracking tool was completed by Tier 1 suppliers beginning in October 2021. The tracking tool includes inputs for labor—both union and non-union—as well as nonpayroll expenditures by three geographic levels of analysis: the U.S., Massachusetts, and SEMass.[8] Subcontractor expenditures made by the Tier 1 suppliers and demographic data such as race, gender, tribal affiliation, and veteran status were tracked as well. In addition, Tier 1 contractors provided similar information for their larger Tier 2 contracts, while also providing the overall contract amounts for smaller Tier 2 and Tier 3 contractors.

[7] 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 handle large, critical portions of the work and often oversee subcontractors (tier two and beyond) who perform more specialized or supplementary tasks.

[8] Defined as Barnstable, Bristol, Dukes, Nantucket, and Plymouth Counties.

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 of the union workers on the project work for only a month or less, since individual construction workers frequently move from site-to-site and to other projects, and the number of workers on the project frequently changes based on the status of the construction project.

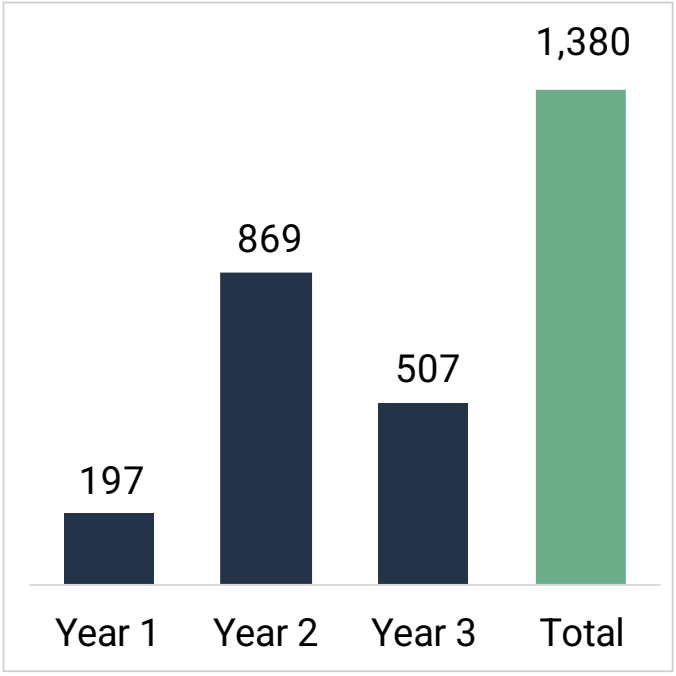
The temporal dynamic of construction phase jobs makes estimating employment impacts less intuitive than for ongoing activities that can be accurately defined as "permanent." Consequently, economic impact assessments of construction and other temporary project-based activities are typically reported in terms of the number of years of full-time work required. While less intuitive, this approach allows for more context sensitive and empirically accurate estimates of employment impacts. This is frequently misunderstood by some who reflexively, and mistakenly, assume construction projects last forever. To limit the chance of this misunderstanding and to provide the most complete and accurate reporting of job impacts possible, our analysis reports employment impacts in two ways—the number of workers employed on the project or headcount (whether part-time or full), and the number of job years of work associated with the project, which are reported as full-time equivalents (FTEs). One FTE is equivalent to 2,080 hours of work.

4 Union and Nonunion Workforce

Nearly 1,400 Union Workers Have Been Employed on The Vineyard Wind 1 Project

Nearly 1,400 unique union workers have been employed during VW1's construction phase through September 2024. Figure 8 presents union workers by the year in which they worked. Importantly, while some of the same workers may have worked multiple years, their jobs are counted only once in the total headcount (last bar in Figure 8). That is, the total headcount over the three-year period is not the sum of workers in Year 1, Year 2, and Year 3, but rather, the sum of individual workers employed through the entire analysis period.[9]

Figure 8 | Union Jobs (Headcount), by Year



Source: Springline Research from monthly contractor reports

[9] During the first two years of the project, data collection occurred in a rapidly evolving environment, leading to incomplete reporting from some Tier 1 contractors in Years 1 and 2. These gaps have since been addressed, resulting in some worker counts that differ from those in previous years' reports.

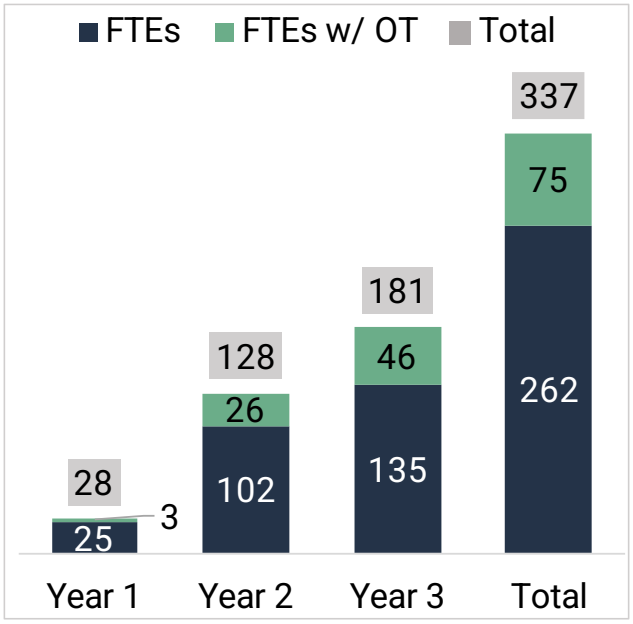
Union Workers Account for 262 FTEs on the Project, 337 FTEs When Overtime Is Included

The seasonality of construction employment can have a significant impact on the number of workers, since construction work is heavily dependent on weather conditions. In addition, some project scopes require less than a year to complete. Offshore wind construction both onshore and offshore is also governed by a series of commitments and regulations to protect communities and sensitive species, all of which limit the times when construction can occur. These limitations restrict the construction season and leave the project vulnerable to unexpected delays, which can alter the timing of project employment.

Accordingly, FTEs are a more accurate and meaningful metric for understanding the labor commitment required for a major construction project because the metric provides the clearest picture of the total labor effort involved in the project.

- **Union overtime hours on the Vineyard Wind 1 project are considerable,** accounting for 22% of total union hours. Accordingly, Figure 9 shows the standard FTE calculation without overtime (262 FTEs), as well as the additional FTEs when overtime is included (+75 FTEs for a total of 337 FTEs).

Figure 9 | FTEs with and without Overtime



Source: Springline Research from monthly contractor reports

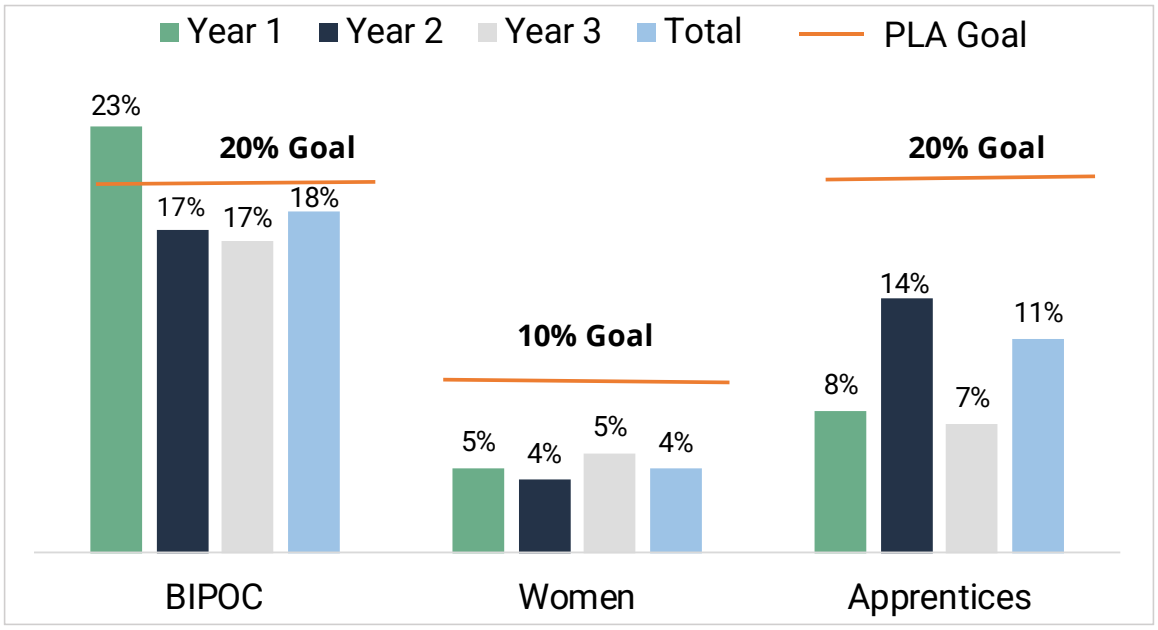
Data Gathered Through Vineyard Wind's Project Labor Agreements Indicate That 18% of Union Workers Identify As BIPOC, 4% Are Women, and 11% Are Apprentices.

Vineyard Wind's Project Labor Agreements (PLAs) with its union contractors stipulate several hiring goals related to Diversity, Equity, and Inclusion (DEI) as well as the number of apprentices on the project:

1. **Black, Indigenous, and People of Color (BIPOC):** 20% of total union jobs (headcount)
2. **Women:** 10% of total union jobs (headcount)
3. **Apprentice:** one-in-five union workers (headcount)

To date, 18% of union workers on the Vineyard Wind 1 project meet the BIPOC criteria,[10] women comprise 4% of the union workforce, and 11% of workers are apprentices (see Figure 10).[11]

Figure 10 | Number of Union Workers Meeting PLA Goals



Source: Springline Research from monthly contractor reports

[10] BIPOC (Black, Indigenous, and people of color) is defined as any employee whose race is not White-alone.

[11] Although nearly all workers are covered under a PLA, certain union workers, such as members of the International Longshoremen's Association and the Seafarers International Union, are not covered.

While the project nearly achieved its BIPOC participation goal, the percentage of women involved fell significantly short. This outcome reflects broader systemic challenges in workforce demographics. The reliance on construction labor, a traditionally male-dominated field, underscored the existing pipeline gap for women and, to a lesser extent, BIPOC workers.

The Vineyard Wind 1 project fell short of its 20% apprenticeship goal due to several key factors. First, offshore wind involves less traditional construction work compared to most major construction projects. While work at the Barnstable onshore substation aligned with standard practices and was more conducive to employing apprentices, contractors were less motivated to take on apprentices for specialized offshore tasks, where there is a steeper learning curve and where meeting schedule deadlines are paramount. This explanation is supported by the workforce data: the number of apprentices peaked in Year 2 when activity in Barnstable was at its height and then declined in Year 3 as the focus shifted to more specialized tasks at the port and offshore.

Second, offshore operations are constrained by space limitations, particularly the number of beds on vessels. Offshore workers must be highly experienced and versatile to ensure the crew's effectiveness, leaving fewer opportunities for apprentices.

Finally, differences in apprenticeship models contributed to the shortfall. European systems like the “Danish Model,” place greater responsibility on contractors to develop apprentices. Some contractors on the Vineyard Wind 1 project, unfamiliar with the level of responsibility required, participated without accepting apprentices, despite the goals outlined in the PLA.[12] Apprenticeships are discussed further in Section 9.

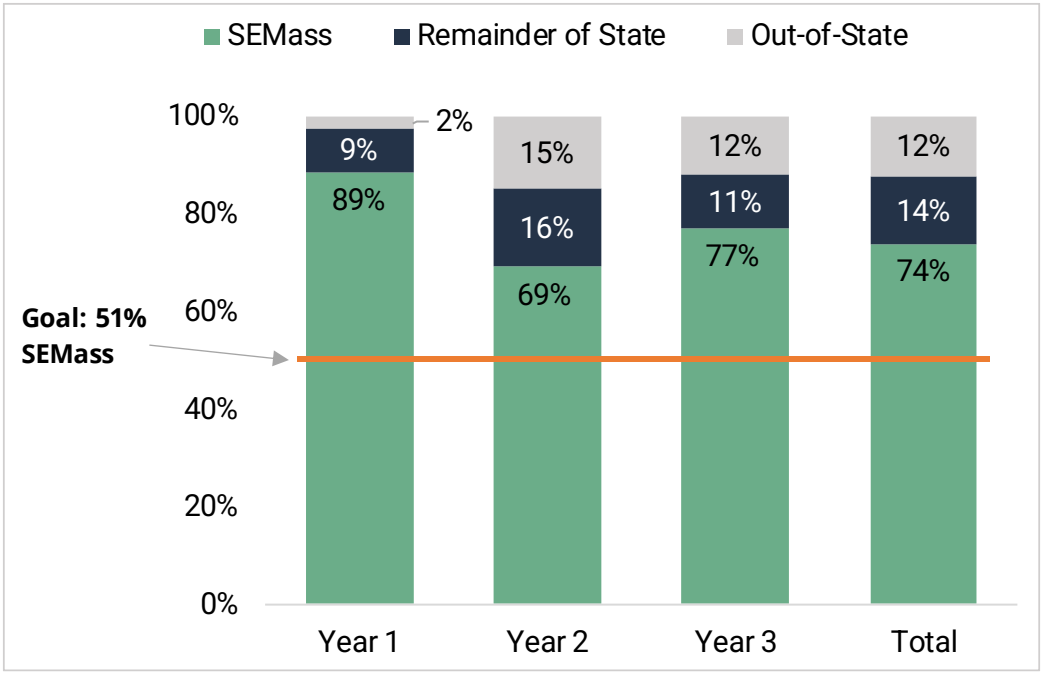
[12] The Danish Model of offshore wind development, particularly regarding apprenticeships, is a structured approach to workforce development that emphasizes strong collaboration between governments, educational institutions, labor unions, and private industry. It is considered one of the most effective systems for integrating apprenticeships into large-scale infrastructure projects like offshore wind.

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

Vineyard Wind set a goal of having 51% of union workers on the project residing in Southeastern Massachusetts (SEMass).[13] To date, 74% of union workers were residents of SEMass (see Figure 11). Local employment in this report includes all employees on the job site, including workers who relocated to SEMass to work on the project. Approximately 35 union workers, or 2% of the total, relocated to SEMass for the project.

By living in the region, these workers support the local economy through spending on housing, food, transportation, retail goods, and services. However, residents contribute more significantly to the local economy through sustained spending on housing, utilities, and services. In contrast, relocators provide a short-term boost, but much of their income may flow back to their home communities, limiting their overall local impact.

Figure 11 | Union Employee Place of Residence[14]



Source: Springline Research from monthly contractor reports

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

[14] While some of the same workers may have worked in Year 1, and/or Year 2, and/or in Year 3, these jobs are only counted once in the total headcount (fourth bar in the chart).

In terms of county of residence, 54.7% of Massachusetts-based union workers reside in Bristol County, while 18.9% are Plymouth County residents and 10.4% are Barnstable County residents (see Table 2).[15]

Table 2 | Union Employee Place of Residence by Massachusetts County, Massachusetts-Based Employees

County	Number	Percent
Barnstable	127	10.4%
Bristol	671	54.7%
Dukes	1	0.1%
Essex	19	1.5%
Hampden	1	0.1%
Middlesex	40	3.3%
Norfolk	76	6.2%
Plymouth	232	18.9%
Suffolk	39	3.2%
Worcester	20	1.6%

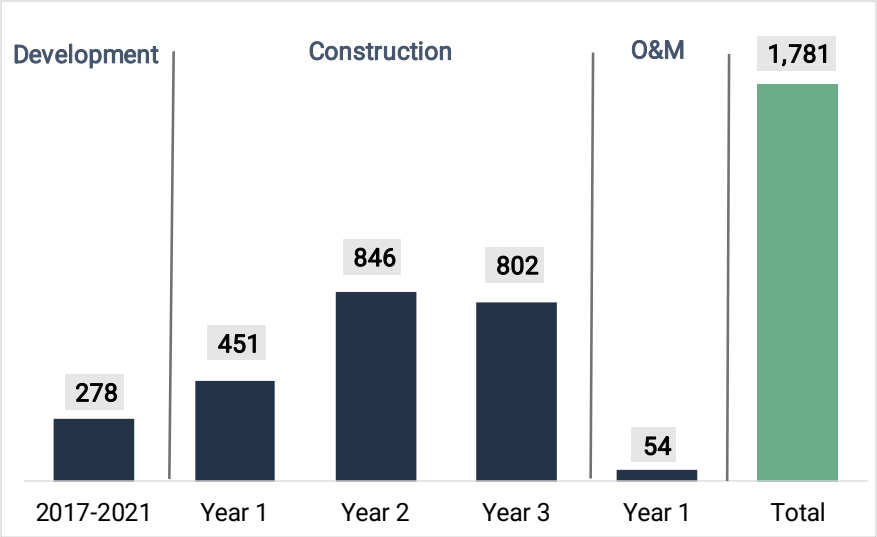
Source: Springline Research from monthly contractor reports
Counties highlighted in gray are in SEMass.

[15] These figures are based on Massachusetts residents only and thus the percentages do not add to those in Figure 11, which includes out-of-state workers. Some monthly subcontractor reports were missing ZIP Codes; thus we are unable to report the county level for these workers. Accordingly, the number of workers does not equal the total in Figure 8.

Nearly 1,800 Nonunion Workers Have Been on the Project Since 2017, Which Equates to 1,273 FTEs

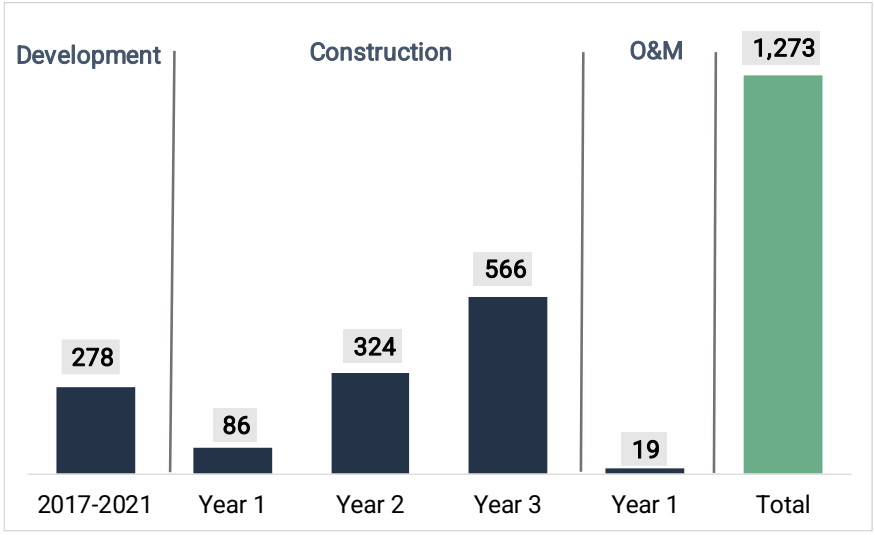
To date, there have been 1,781 nonunion workers on the project, which equates to 1,273 FTEs (see Figure 12 and Figure 13). These data include U.S.-based workers performing roles outside the union scope, such as development, project management, non-union mariners, and fishermen operating support vessels. Foreign workers, including those in manufacturing facilities outside the U.S. or on foreign-flagged vessels, are not included in these figures.

Figure 12 | Nonunion Jobs (Headcount)



Source: Springline Research from monthly contractor reports

Figure 13 | Nonunion FTEs

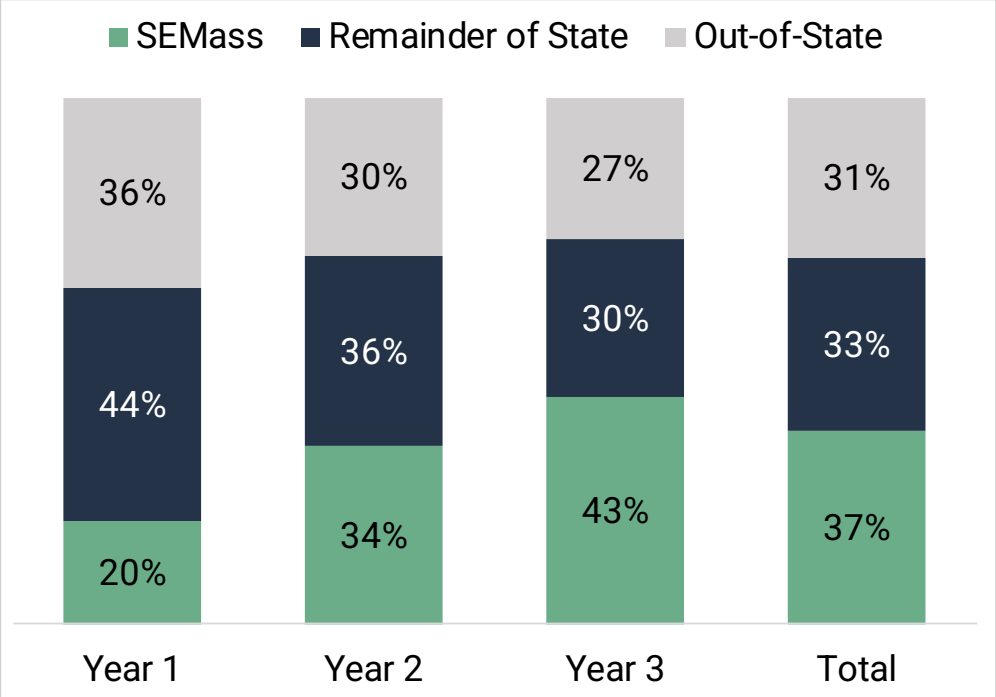


Source: Springline Research from monthly contractor reports

Thirty-Seven Percent of Nonunion Workers Over the Construction And O&M Phase Were Residents of SEMass

Thirty-seven percent of nonunion workers over the construction and O&M phase were residents of SEMass (see Figure 14). A third (33%) reside in other areas of Massachusetts, while 31% reside out-of-state.[16]

Figure 14 | Nonunion Employee Place of Residence



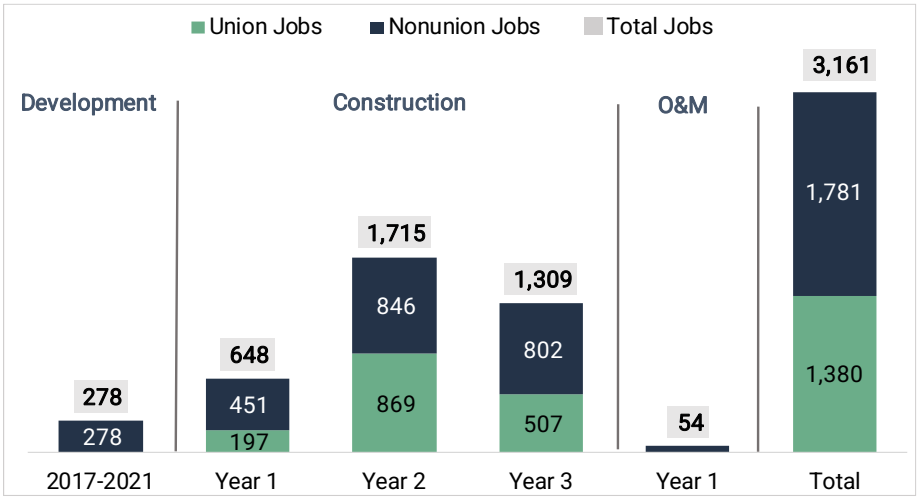
Source: Springline Research from monthly contractor reports

[16] Worker residence for the development phase is not available.

Over 3,000 Workers Have Been Employed on the Vineyard Wind 1 Project, Which Equates to 1,610 FTEs

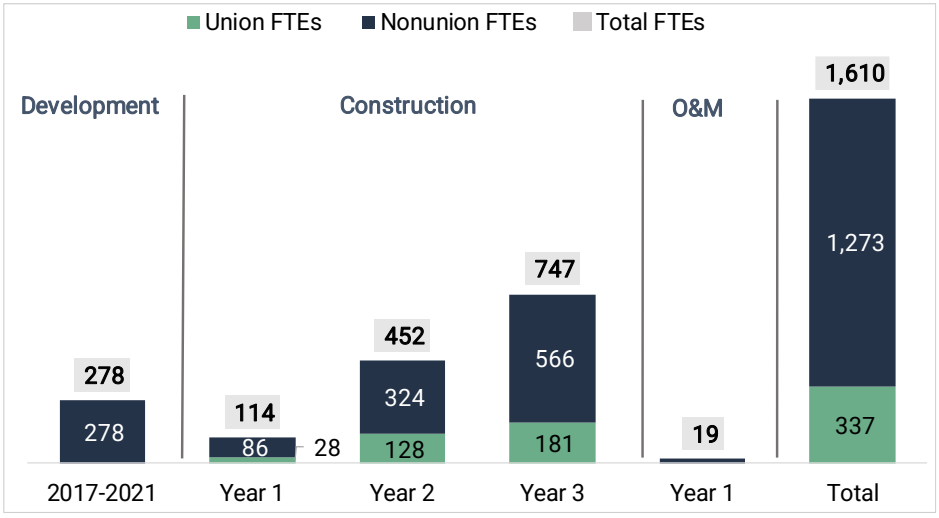
Figure 15 and Figure 16 present the worker headcount and FTEs since the Vineyard Wind 1 development phase began in 2017. To date, a total of 3,161 workers have been employed on the project since 2017, which supported 1,595 FTEs.[17]

Figure 15 | Jobs (Headcount), Development, Construction, and O&M Phases



Source: Springline Research from monthly contractor reports

Figure 16 | FTEs, Development, Construction, and O&M Phases



Source: Springline Research from monthly contractor reports

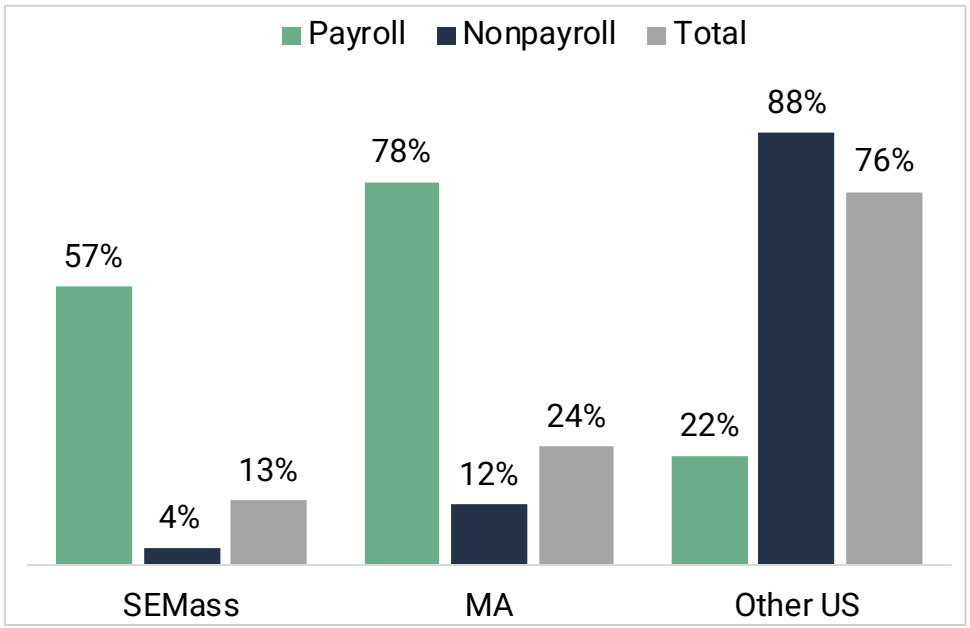
[17] The total (last bar) represents the number of individual workers over the seven-year period, not the sum of the previous bars. That is, there have been 3,161 unique workers on the project since 2017. Some of these workers may have been employed on the project in multiple years.

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

Figure 17 presents the percentage of U.S.-based direct payroll and nonpayroll expenditures of the project to date across three regions: SEMass, Massachusetts, and the remainder of the U.S.

- SEMass, as the project's immediate location, experiences substantial benefits from payroll impacts, with 57% of total U.S. labor income going to residents of this region. Additionally, Massachusetts residents received 78% of the total labor income.
- The substantial nonpayroll impacts outside Massachusetts (88%) reflect the outsourcing of major equipment manufacturing and specialized services to other U.S. regions due to the lack of a local supply chain, including for major components like cables and vessels.[18]

Figure 17 | Payroll and Nonpayroll Expenditures by Region, January 2017 - September 2024 in $millions



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

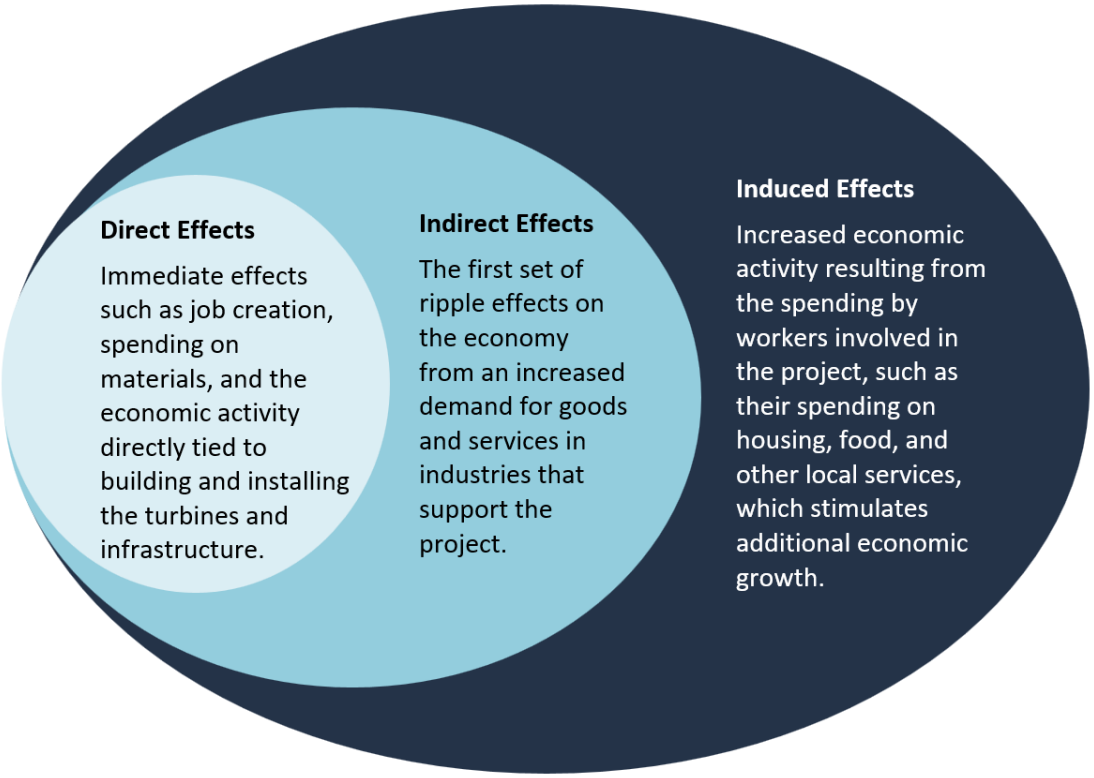
[18] Payroll and nonpayroll expenditures do not include costs incurred because of the blade breakage in July 2024.

6 Economic Impacts on the Massachusetts Economy

Economic Impact Methodology and Definitions[19]

Economic impacts measure how spending associated with an industry circulates through and affects an economy. For example, employee wages and purchases made from suppliers circulate through the economy and support additional spending and job creation, that is, the original expenditures and job creation are multiplied. Measuring these ripple effects on the economy provides a fuller picture of Vineyard Wind 1's economic contribution. These impacts are expressed as direct effects, indirect effects, and induced effects (see Figure 18).

Figure 18 | Examples of an Offshore Wind Project's Economic Effects



[19] More detail on the report's methodology can be found in Appendix A.

Economic impacts (i.e., direct, indirect, and induced) are presented in four categories: jobs, labor income, value added, 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 economic impact analysis, all construction labor income is considered local because it is tied to the 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 is the total value of a business's production and is the sum of the value of all goods and services produced by the business.

In Total, the Vineyard Wind 1 Project Has Supported 3,405 FTEs, $333.1 Million in Labor Income and $890.4 Million In Economic Output for Massachusetts

- **Indirect Impacts:** The project's direct payroll and nonpayroll expenditures have supported an additional 686 indirect jobs during the project period, $41.8 million in labor income, and $167.7 million in economic output in Massachusetts.
- **Induced Impacts:** The direct and indirect impacts induced an additional 1,109 jobs that supported $82.2 million in labor income and $274.2 million in new economic output for Massachusetts.

Table 3 | Total Project Impacts in Massachusetts to Date[20] (in $millions)

Total Vineyard Wind 1 Impacts			
Impact Type	**FTEs**	**Labor Income**	**Output**
Direct Effect	1,610	$209.2	$448.5
Indirect Effect	686	$41.8	$167.7
Induced Effect	1,109	$82.2	$274.2
Total Effect	3,405	$333.1	$890.4

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

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

The next 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.

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

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

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 from monthly contractor reports
Labor is a subset of output; the two figures should not be summed.

Construction Phase Impacts

Construction phase economic activity to date has supported 2,708 FTEs, $270.9 million in labor income, and $718.3 million in economic output in the Massachusetts economy.

- **Indirect Impacts:** Vineyard Wind's direct payroll and nonpayroll expenditure have supported an additional 546 indirect jobs during the construction phase to date. These jobs supported $30.1 million in labor income and supported $139.2 million in new economic output in Massachusetts.
- **Induced Impacts:** The direct and indirect impacts induced an additional 849 jobs that supported $64.7 million in labor income and $227.5 million in new economic output.

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

Construction Phase			
Impact Type	FTEs	Labor Income	Output
Direct Effect	1,313	$176.2	$351.7
Indirect Effect	546	$30.1	$139.2
Induced Effect	849	$64.7	$227.5
Total Effect	2,708	$270.9	$718.3

Source: Springline Research from monthly contractor reports
Labor 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 31 FTEs, $2.9 million in labor income, and $5.4 million in economic output in the Massachusetts economy.

- **Indirect Impacts:** Vineyard Wind's direct payroll and nonpayroll expenditures have supported an additional three indirect jobs during the O&M phase to date. These jobs supported $0.2 million in labor income and supported $0.7 million in new economic output in Massachusetts.
- **Induced Impacts:** The direct and indirect impacts induced an additional nine jobs that supported $0.7 million in labor income and $1.8 million in new economic output.

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

O&M Phase			
Impact Type	**FTEs**	**Labor Income**	**Output**
Direct Effect	19	$2.0	$2.9
Indirect Effect	3	$0.2	$0.7
Induced Effect	9	$0.7	$1.8
Total Effect	31	$2.9	$5.4

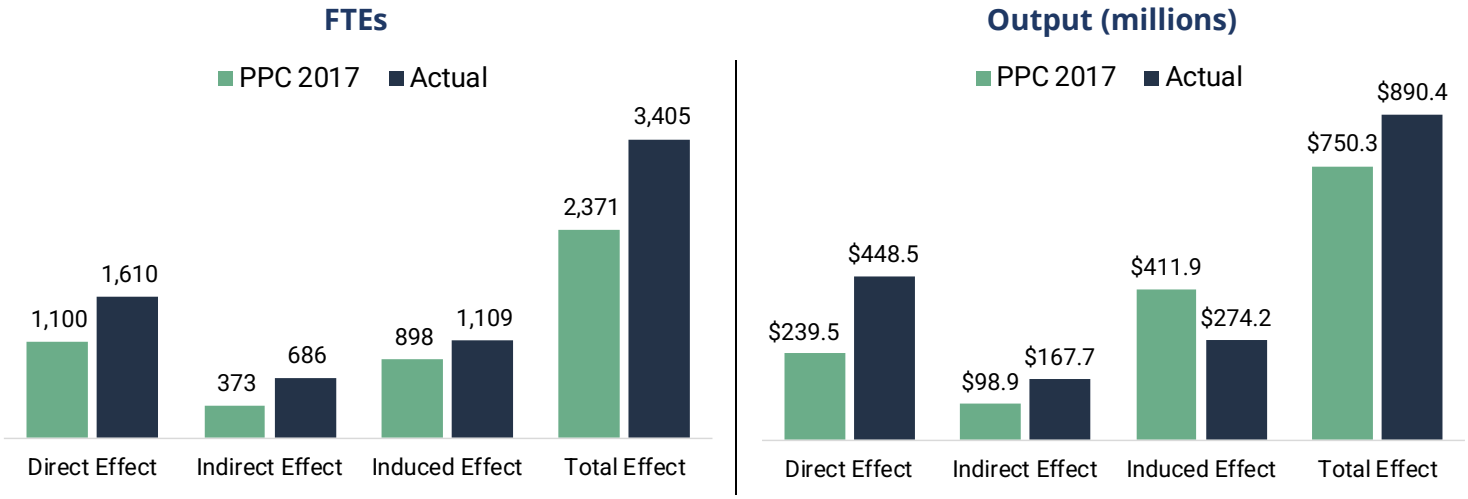
Source: Springline Research from monthly contractor reports
Labor is a subset of output; the two figures should not be summed.

7 Comparison to UMass Dartmouth Public Policy Center 2017 Estimates

The Public Policy Center (PPC) at UMass Dartmouth conducted an analysis in 2017 that described the economic contributions to employment and economic output that the proposed Vineyard Wind 1 project would have on the Commonwealth of Massachusetts and the regional economy of Southeastern Massachusetts. This section examines how the results reported here align with the estimates provided in the 2017 report.

- **Total FTEs:** The total employment impacts are 3,405 FTEs, which compares to the 2017 estimate of 2,371 FTEs, a difference of +1,034 FTEs.
- **Total Economic Output:** The total output impact is $890.4 million, which compares to the 2017 inflation adjusted estimate of $750.3 million, a difference of $140.1 million.

Figure 19 | Employment Impacts
2017 PPC Estimate Versus Actual



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

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

The Vineyard Wind 1 project has not only generated direct economic impacts but has also served as a catalyst for other significant capital projects in New Bedford. These projects, while not directly part of Vineyard Wind 1, are at least tangentially connected and reflect the broader influence of the offshore wind industry's emergence in the region. Investments in infrastructure, such as port upgrades, marine support facilities, and workforce training centers, were spurred by the anticipated needs of Vineyard Wind 1 and future offshore wind projects. These developments have strengthened New Bedford's position as a hub for offshore wind activity, creating additional economic benefits and enhancing the region's capacity for long-term growth.

Notable projects include Bristol Community College's National Offshore Wind Institute, established to provide workforce training tailored to the offshore wind sector, and the redevelopment of the Foss Marine Terminal, a strategic site supporting offshore wind logistics and operations. Additionally, the Massachusetts Clean Energy Center (MassCEC) committed resources to initiate the development of an Ocean Renewable Energy Innovation Center New Bedford and announced plans for the expansion and improvement of the New Bedford Marine Commerce Terminal. The City of New Bedford also recently announced the development of an offshore wind/marine technology focused coworking space called The Quest. While note directly responsible for these developments, Vineyard Wind 1 represents a proof-of-concept for a U.S. offshore wind industry, which made these projects worthy, viable investments.

9 Key Challenges in Constructing Vineyard Wind 1

As the first large-scale offshore wind farm in the United States, Vineyard Wind 1 has faced several unique challenges during its construction, which are likely to differentiate it from future offshore wind projects. Regulatory obstacles, supply chain limitations, local labor market conditions, and COVID-19 disruptions all contributed to delays and cost increases. Many of these challenges are likely to be addressed in future projects as the regulatory framework evolves, supply chains develop, and local workforces gain more experience in offshore wind.

Regulatory Obstacles and Permitting Delays

One of the most significant challenges in constructing Vineyard Wind 1 is navigating a complex and evolving regulatory environment. As the first commercial-scale offshore wind project in the U.S., it was subject to heightened scrutiny from multiple federal, state, and local agencies. The regulatory process for offshore wind projects in the U.S. was, at the time, undeveloped, leading to protracted permitting timelines. In a project where tight sequencing of installation activities is necessary to construct in short windows of time, a delay in one piece of offshore installation work can have cascading effects on timelines.

The evolving regulatory and political landscape also contributed to uncertainty, as the U.S. lacked established frameworks compared to more mature offshore wind markets in Europe. Vineyard Wind 1 set a precedent, and many of the delays it experienced may serve as a learning experience for future projects, helping streamline regulatory approvals going forward.

COVID-19 Pandemic Disruptions

The COVID-19 pandemic posed substantial challenges during the planning and early construction phases of the Vineyard Wind 1 project. The pandemic caused significant disruptions to global supply chains, labor availability, and project timelines. With restrictions on travel and workforce mobility, several key components that were being manufactured overseas (such as wind turbines and other specialized equipment) faced production delays. Factory shutdowns, shipping delays, and logistical constraints hampered the supply of critical components.

Additionally, the pandemic prevented on-site personnel from progressing project activities as scheduled. Health and safety protocols, quarantine requirements, and

social distancing measures slowed construction progress. While some of these disruptions were temporary, they added significant delays to the overall schedule.

Recruiting a Local and Diverse Workforce in a Tight Labor Market

Challenges of Building a Skilled Local Workforce

While the project has created significant employment opportunities, finding sufficient skilled local labor has proven challenging. Offshore wind projects require specialized skills in areas like maritime engineering, offshore construction, and turbine installation, which were not readily available in the local labor market. With no regional experience in large-scale offshore wind or offshore construction, much of the workforce had to be trained locally or brought in from other regions and countries with more expertise, particularly in the initial stages of the project.

Compounding this challenge, the Vineyard Wind 1 project coincided with historically low unemployment rates at both the state and national levels. In this tight labor market, competition for workers in construction and building trades has been intense. Many workers were unwilling to pursue specialized training and certification for offshore wind roles when competitive wages were available in jobs requiring no additional qualifications. Also, small project delays due to weather or other factors often disrupted the availability of trained workers, as they sought other jobs with immediate start dates. This issue was particularly challenging given the small pool of offshore-capable workers and the limited capacity to train backup labor on short notice.

Union and Nonunion Workforce Dynamics

The project also had to navigate complexities related to balancing union and nonunion labor. At times, union halls reached full employment, leaving limited workers available for offshore jobs. Additionally, several contractors often sought labor from the same unions simultaneously, placing stress on union halls to manage competing demands for certified and skilled workers. This lack of coordination occasionally led to difficulties in fulfilling workforce needs.

Furthermore, ensuring smooth collaboration between foreign and domestic workers added another layer of complexity. Future projects are expected to benefit from a larger pool of work-ready labor in the region, as ongoing workforce development efforts bolster the local construction and building trades sectors.

Regional Supply Chain

While Vineyard Wind 1 was expected to generate significant economic benefits, including job creation and increased local spending, the extent of these benefits was dependent on the development of a regional supply chain. As the first large-scale offshore wind project in the U.S., Vineyard Wind 1 had to contend with an underdeveloped domestic supply chain for offshore wind components. Unlike in Europe, where the offshore wind industry has a mature supply chain, the U.S. lacked sufficient manufacturing capacity, port infrastructure, and specialized vessels required for installing large turbines. For example, many of the components, including the wind turbines, had to be sourced from international suppliers, which not only increased transportation costs but also introduced delays in manufacturing and delivery due to global bottlenecks.

The project also highlighted the challenges of developing a local supply chain for offshore wind. While the project anticipated overseas suppliers for Tier 1 equipment (e.g., wind turbines, offshore installation vessels), the lack of readily available Tier 2 and Tier 3 services (e.g., support vessels, specialized noise mitigation equipment, crew transfer vessels) has impacted project timelines. Lead time to obtaining backup equipment or to identify alternative solutions can prove lengthy and difficult when equipment breaks. In a project where tight sequencing of installation activities is necessary to construct in short windows of time, a delay in one piece of offshore installation work can have cascading effects on timelines. For instance, a supplier managing multiple global contracts may need to halt work entirely during project delays to fulfill other commitments, which can subsequently cause further delays in other phases of the project.

Efforts to localize the supply chain are underway, but the full economic benefits of such initiatives will materialize in future projects as the industry matures in the U.S. The Vineyard Wind 1 project did help to kickstart this process, but it faced higher costs and fewer regional economic benefits than might be seen in future projects where a more robust local supply chain is in place.

Lack of US-Flagged Offshore Wind Vessels

The lack of U.S.-flagged offshore wind vessels has been a significant challenge for the Vineyard Wind 1 project and underscores a broader issue facing the expansion of offshore wind in the United States. Under the requirements of the Jones Act, goods transported between U.S. ports must be carried on vessels that are U.S.-built, owned,

and operated. However, the current fleet of U.S.-flagged offshore wind vessels is insufficient to meet the unique demands of offshore wind development, particularly for specialized tasks like turbine installation, cable laying, and maintenance.

For Vineyard Wind 1, this shortage has necessitated the use of creative solutions. Foreign-flagged vessels, which are often more readily available and designed for offshore wind operations, have been used in conjunction with Jones Act-compliant feeder barges to transport materials. While effective, this approach adds logistical complexity and increases costs. Additionally, scheduling delays can arise as the limited number of U.S.-flagged offshore wind vessels becomes a bottleneck in project timelines, further straining the development process.

As the U.S. aims to expand offshore wind capacity to thirty GW by 2030, the need for more U.S.-flagged offshore wind vessels is becoming increasingly urgent. A larger domestic fleet would not only reduce reliance on foreign vessels but also streamline operations and improve compliance with the Jones Act without additional logistical challenges. Furthermore, investment in US-flagged offshore wind vessels presents an economic opportunity, by creating jobs in shipbuilding, crewing, and maintenance, while supporting local content goals for offshore wind development.

Data Collection

The collection of job data from some contractors and subcontractors was a challenge. A key issue stemmed from the fact that data-sharing agreements were informally established after contracts had already been signed, and consequently, some companies did not prioritize data reporting, especially at the beginning of the project.

Going forward, data-sharing agreements should be formalized and incorporated into contracts from the outset. Clearly defined reporting requirements and timelines, included as part of the contractual obligations, will ensure that contractors understand the importance of data transparency and compliance before commencing work. Additionally, implementing penalties for non-compliance or incentives for timely and accurate reporting could further improve adherence to data-sharing agreements and enhance the quality of the information collected.

10 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).[21] Vineyard Wind is contributing $15 million in total funding over 15 years to support the development of distributed battery energy storage and solar projects in local host communities, as well as to reduce low-income ratepayers' electric utility bills. RAP is focused on supporting projects and delivering benefits to low-income ratepayers in the CE Geographic Region, which includes New Bedford, Martha's Vineyard, Nantucket, Barnstable, and Somerset, as well as to the Mashpee Wampanoag Tribe and Wampanoag Tribe of Gay Head (Aquinnah).

In its third year, RAP partners continue to explore opportunities to support resiliency projects and have delivered additional direct benefits to low-income ratepayers since the last reporting period. Citizens provided funding for the first resiliency project in the CE Geographic Region for the Mashpee Wampanoag Tribe.[22] The project will install rooftop solar for eight low-income, senior housing units located in Mashpee. A second stage will also add battery energy storage to each unit. The project is under construction and should be completed by early 2025.

Citizens also enrolls low-income ratepayers from cities and towns in the CE Geographic Region into a community solar program, Joe-4-Sun (J4S). J4S leverages the Massachusetts SMART program to operate low-income, community shared solar projects, which generate solar bill credits and lower electricity bills for low-income households. RAP offers eligible and enrolled customers a 100% discount on the bill credits, which is double the 50% discount regular J4S customers receive.

At the time of reporting, 198 low-income ratepayers were enrolled in the J4S program, a 3% increase over last year, with another 186 in the process of being enrolled, a 9% increase versus the previous year. Overall, this represents a year-over-year increase of 22 participants. Based on the program, each household is expected to receive about $600 in electricity bill savings. Given the program's current capacity and remaining availability to subscribers, Citizens was able to link customers' bill savings to their

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

[22] The CE Geographic region includes New Bedford, Barnstable, Nantucket, Somerset, and the Mashpee Wampanoag Tribe.

household electricity consumption, providing greater benefit to RAP participants who need it most. Since the last reporting period, participants received about $210,000 in electricity bill savings, with half of that, $105,000, provided by RAP funds, an average of $1,325 per household.

Since inception, J4S RAP participants have received over $500,000 in electricity bill savings, with half coming directly from RAP funds.[23] It should be noted that as RAP participant enrollment continues to increase, the total value of bill credits allocated to each household will be adjusted to accommodate the number of enrollees while staying within the allowable budget. However, the basic construct will remain—that is, the RAP will pay for the customer's remaining 50% share of the bill credits. Based on the current enrollment, the households enrolled in the program should collectively experience annual electricity bill savings.

Table 7 | Joe-4-Sun Program Participation

Community	# Participants	# In Process of Enrolling	Total
Barnstable	28	36	64
Martha's Vineyard	23	15	38
Nantucket *	0	0	0
New Bedford	83	76	159
Somerset	26	24	50
Tribes**	38	35	73
Total	198	186	384

* Nantucket is not currently eligible for J4S program due to no Citizens solar projects in Nantucket territory

** Tribes include Mashpee Wampanoag Tribe and Aquinnah Tribe of Gay Head

Vineyard Power has also partnered with Cape Light Compact (CLC) to subsidize electricity rates for income-eligible customers enrolled in Cape Light Compact's 100% renewable electricity supply program on Martha's Vineyard. Approximately 440 income eligible households have received a total of $240,000 ($545/household) in power supply subsidies since 2023. In addition, Vineyard Power has committed over $1.2 million in

[23] This is not a direct calculation as the number of participants has changed, but it is an average savings per RAP participant.

RAP funds to subsidize distributed solar and battery storage projects at critical facilities for the County of Dukes County, the Town of Tisbury, and the Town of West Tisbury, and lent the Aquinnah Wampanoag Tribal Housing Authority approximately $45,000 to install solar and battery storage systems on a tribal housing duplex apartment.

11 Host Community Agreements

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 each year in combined property taxes and Host Community Payments (HCP). The agreement guarantees a total HCP of $16 million, plus an additional $60,000 (adjusted for inflation annually), for each year the project is in operation beyond 25 years. To date, Vineyard Wind has made payments under the HCA of $640,000 in 2022 (Q2), $1.49 million in 2023 (Q2), and $1.18 million in 2024 (Q2).

Apart from these payments, the HCA provided an opportunity for detailed review and consultation by the Town of Vineyard Wind's specifications for its onshore substation, including funding for the town to retain an external consultant. It also ensured close and ongoing communication and coordination between Vineyard Wind and town staff. Beyond the HCA, Barnstable and Vineyard Wind collaborated on the Town's sewer expansion effort by co-locating sewer infrastructure along the cable route, with Vineyard Wind assuming road reconstruction costs. This has saved the town millions in project costs and minimized the need for future road construction, and helping to address the local environmental impact of wastewater and nitrogen loading that degrades the town's bays, estuaries, and ponds. The HCA also provided $80,000 in funding for reconstruction of the bath and restroom facilities at Covell's Beach.

12 Accelerator Fund

In its Section 83C bid into Massachusetts in 2017, Vineyard Wind committed $15 million to an Accelerator Fund, broken into three initiatives: 1) Windward Workforce ($2 million) for initiatives that will build a skilled offshore wind workforce centered in southeastern Massachusetts; 2) Industry Accelerator Fund ($10 million) to attract additional investment in infrastructure and supply chain development; and, 3) Marine Mammal Innovation Fund ($3 million) to advance technologies that will allow for greater expansion of offshore wind, while continuing to protect marine mammals. The funds were deposited into a joint trust account at financial close of the project, comanaged with the MassCEC under the Offshore Wind Accelerator Program Agreement, executed on September 29, 2021.

At the time of this report, $15 million dollars has been committed to initiatives in coordination with MassCEC. Some of the major projects funded from the Accelerator Fund are listed below.

Port Workforce Training

Under the Offshore Wind Accelerator Program Agreement, Vineyard Wind has launched the Windward Workforce Fund. This initiative aims to support the recruitment, mentoring, and training of Massachusetts residents, particularly those in Southeastern Massachusetts, by collaborating with community colleges and other organizations. Its primary goal is to build a strong, diverse, and inclusive workforce for the Commonwealth's emerging offshore wind industry by addressing key gaps and barriers in existing workforce development programs. Efforts include funding for the creation and expansion of training and educational programs to meet industry needs, offering globally recognized certifications for offshore wind technicians, and providing specialized certifications from component OEMs.

Through this collaboration, Vineyard Wind and MassCEC enhanced the workforce readiness of maritime labor in Southeastern Massachusetts. Establishing a well-trained and capable workforce within port communities is critical to the success of the offshore wind industry. The initiative places particular emphasis on achieving the highest standards of health, safety, and environmental excellence, while also focusing on diversifying the labor pool to ensure greater access and opportunities for historically disadvantaged communities.

Industry Accelerator Fund

Pursuant to the Offshore Wind Accelerator Program Agreement, Vineyard Wind has established the Industry Accelerator Fund. The purpose of this initiative is to accelerate the development of the offshore wind supply chain, businesses, and infrastructure in the Commonwealth of Massachusetts by integrating existing and new Massachusetts businesses into the supply chain. This includes businesses that provide environmental services and technologies, support the establishment of offshore wind-related manufacturing facilities, and/or support the expansion or improvement of port facilities to serve offshore wind.

An enterprise hub in New Bedford called The Quest will be developed with funding from the Industry Accelerator Fund, as well as matching funds from the City of New Bedford. The Quest is designed to serve as a hub for ocean cluster companies, focusing on four interconnected marine industry sectors: aquaculture, commercial fishing and processing, innovation and technology, and offshore renewable energy. The New Bedford Economic Development Council will receive the funds and coordinate the project in partnership with the City of New Bedford Department of Facilities and Fleet Management.

Marine Mammal Innovation Fund

Project Ocean W'aKEs

Pursuant to the Offshore Wind Accelerator Program Agreement, Vineyard Wind has established the Marine Mammal Innovation Fund. The purpose of this initiative is to support the development and demonstration of innovative methods and technologies that enhance protections for marine mammals and support regional monitoring efforts as the Massachusetts and US offshore wind industry continues to grow in a sustainable manner.

This initiative has allocated funds to Woods Hole Oceanographic Institute (WHOI) to study the potential hydrodynamic effects of offshore wind turbines on Nantucket Shoals. Funding is being used to conduct a study in response to the National Academies of Sciences, Engineering, and Medicine's study. This study concluded that the impacts of offshore wind projects on North Atlantic right whale prey availability in the Nantucket Shoals region will be challenging to distinguish from other significant impacts, for example those driven by global climate change and other naturally occurring phenomena. In response, Vineyard Wind requested a joint proposal from WHOI, Rutgers University, and Hereon. Together, they are assessing the hydrodynamic

impacts of ocean and wind wakes associated with wind turbines in the Vineyard Wind 1 lease area through in situ data collection and modeling. A final report detailing the findings of this study will be made publicly available.

13 Sponsorships and Donations

Vineyard Wind provides sponsorships and donations throughout the year to various local organizations. In the past year, Vineyard Wind provided over $130,000 in sponsorships and donations to local organizations in the areas of education, fisheries, environment, and workforce. 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.

APPENDIX A: METHODOLOGY

Data Collection

Data collection to obtain job, expenditure, and other information from Vineyard Wind and its subcontractors began in earnest in October 2021, shortly following the project's financial close. Two primary data collection tools were developed and used to monitor relevant project activity:

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

2) A monthly spreadsheet tracking template that Tier 1 contractors were required to submit monthly beginning in October 2021. These tracking templates were focused on construction phase activities. Over 300 monthly reports were received from Tier 1 contractors.

Development Phase

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

Construction Phase

A monthly data collection spreadsheet was completed monthly by the Tier 1 suppliers. The tracking sheet includes inputs for labor—both union and non-union—as well as nonpayroll expenditures by three geographic levels of analysis: the U.S., Massachusetts, and Southeastern Massachusetts. Subcontractor expenditures made by the Tier 1 suppliers, as well as various diversity, equity, and inclusion data such as race, gender, tribal affiliation, and veteran status were also tracked. Tier 1 contractors also provided the same information for their larger Tier 2 contracts, while also providing the overall contract amounts for smaller Tier 2 and Tier 3 contractors.

IMPLAN Model

The economic impacts of the proposed project are specified 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. We constructed an input-output model for the state of Massachusetts. Model outputs are reported in 2024 dollars. The latest available IMPLAN dataset is for 2022.

Direct Inputs to the Impact Model

Employee Compensation[24]

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 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 compensation for Massachusetts-based workers only. Adjustments were made to account for IMPLAN's in-commuting methodology.

Nonpayroll Expenditures

Nonpayroll expenditures were obtained from the Tier 1 contractor monthly reports, which as noted in the previous tables, included the expenditure category, the amount, and where the expenditure was made (i.e., SEMass, MA, Other US).

It is not possible to accurately estimate the economic impact of the Vineyard Wind 1 project'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, we were able to utilize a more precise method for estimating 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.

The table below lists the IMPLAN industry codes used in this analysis. More than 1,200 individual expenditures were mapped to 52 IMPLAN sectors for each scenario

[24] Employee compensation includes wages and benefits.

examined (see table below). As noted above, the model includes only those expenditures that occurred in Massachusetts.

Table 10. IMPLAN Sectors Used to Construct the Model for Massachusetts

IMPLAN Code	IMPLAN Description
28	Stone mining and quarrying
51	Construction of new commercial structures, including farm structures
52	Construction of new power and communication structures
54	Construction of new highways and streets
152	Printing
204	Ready-mix concrete manufacturing
216	Iron, steel pipe and tube manufacturing from purchased steel
221	Aluminum sheet, plate, and foil manufacturing
236	Fabricated Structural Metal Manufacturing
259	Other fabricated metal product manufacturing
281	Turbine and turbine generator set units manufacturing
310	Other Electrical Equipment and Component Manufacturing
330	Motor and Generator Manufacturing
334	Ship building
385	Sign manufacturing
393	Wholesale - Professional and commercial equipment and supplies
394	Water transportation
395	Wholesale - Machinery, equipment, and supplies
403	Retail - Furniture and home furnishings stores
405	Retail - Building material and garden equipment and supplies stores
406	Retail - Food and beverage stores
408	Retail - Gasoline stores
409	Retail - Clothing and clothing accessories stores
411	Retail - General merchandise stores
412	Retail - Miscellaneous store retailers
414	Air transportation
414	Retail - Miscellaneous store retailers
416	Water transportation
417	Truck Transportation
418	Transit and ground passenger transportation
444	Insurance carriers, except direct life
447	Other real estate
450	Automotive equipment rental and leasing
453	Commercial and Industrial Machinery and Equipment Rental and Leasing
454	Employment Services
455	Legal services
456	Accounting, tax preparation, bookkeeping, and payroll services

IMPLAN Code	IMPLAN Description
457	Architectural, Engineering, and Related Services
458	Specialized design services
463	Environmental and other technical consulting services
465	Advertising, public relations, and related services
468	Marketing research and all other miscellaneous professional, scientific, and technical services
470	Office administrative services
473	Business support services
477	Landscape and horticultural services
478	Other Support Services
479	Waste management and remediation services
507	Hotels and motels, including casino hotels
509	Full-service restaurants
522	Grantmaking, giving, and social advocacy organizations
534	Employment and payroll of local government, non-education
539	Employment and payroll of state govt, education

Who is Considered Local?

In economic impact analysis, employment is determined by the location of the job rather than the individual's place of residence. Therefore, even if a worker is brought in from outside the region, they are still considered as “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.

Project Years and Multiple Models

IMPLAN is an annual model and employment estimates provided by IMPLAN represent annualized employment values. However, payroll and nonpayroll expenditures occurred over multiple years. To account for the phases of the project, 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.