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Vessel Construction for Offshore Wind Power Generation

Introduction

The Biden Administration's goal of having 30 gigawatts of offshore wind power generation installed by 2030 will require construction of at least 2,100 wind turbines, according to the Department of Energy (DOE). Seven turbines are currently operating in state and federal waters. Construction of two additional offshore wind farms started in summer 2023 and another is to begin construction later in 2023. This activity is taking place in coastal waters from Virginia to Massachusetts. More construction projects are planned for other coastal areas, though project cost inflation, including higher interest rates, is prompting reevaluation of some installations.

To construct and maintain offshore wind turbines, a number of different vessel types are needed. Many of these vessels must be built in the United States pursuant to a 1920 law commonly known as the Jones Act (P.L. 66-261). Vessel construction is underway. Several smaller and simpler vessels have been built, but the larger, more complicated vessels can take three to four years to complete. Without more domestic shipbuilding activity for these larger, more complicated vessels, DOE estimates that about half of planned offshore wind projects will be delayed beyond 2030. In addition to reconsidering the 1920 import ban of foreign-built vessels, Congress can influence vessel cost and availability through existing loan, grant, and tax shelter programs provided to domestic shipbuilders.

Shipbuilding Needs and Activity

News reports indicate that about 25-30 vessels for offshore wind have been recently delivered, are under construction, or are on order from U.S. shipyards. The most sophisticated and complicated vessel needed for offshore wind energy production is the *wind turbine installation vessel* (WTIV), a vessel with a large crane that installs the various segments of a turbine. The vessels have "jack up legs," legs attached to the hull that can be retracted and extended to the sea bed so that they essentially become fixed platforms when turbine construction is underway. The one WTIV currently under construction in the United States is planned at 472 feet in length, accommodating over 100 workers. It is being built in Brownsville, TX, and is expected to be ready for sea trials in 2024.

WTIVs do not necessarily have to be built in the United States if they perform strictly construction and do not transport merchandise or passengers on the U.S. outer continental shelf. The Jones Act requirement for U.S.-built vessels applies specifically to the coastwise (domestic) transportation of merchandise or passengers between any two U.S. points. Under the interpretation of Customs and Border Protection (CBP), the agency responsible for enforcing the Jones Act, as long as a WTIV remains stationary during construction and does not transport merchandise or passengers as it moves from one turbine to the next, it can be foreign-built.

A U.S.-built WTIV would be required if it were to transport wind turbine components from a U.S. port to an offshore construction site. While this could be the most efficient option, logistically, given the expense and time required to build a Jones Act compliant WTIV, other options used by U.S. developers have been to transport turbine components from a more distant foreign port (e.g., in Canada) or to use U.S.-built barges to transport components out to a stationary WTIV. However, the barge-to-WTIV scenario may run contrary to the objectives of U.S. maritime policy such as the Jones Act: ships for overseas deployment in time of war and a fleet of "the best-equipped, safest, and most suitable types of vessels constructed in the United States." The Offshore Marine Service Association (OMSA) representing U.S.-built vessel owners has deployed the vessel *Jones Act Enforcer* to patrol wind farm construction sites, film any Jones Act violations (such as foreign WTIVs engaging in transportation), and submit any evidence to CBP.

DOE estimates that the United States needs four to six WTIVs to meet its wind-generation goals; there are no reports of a U.S. shipyard constructing a second WTIV (one order was cancelled). DOE also estimates the United States needs four to six general purpose *heavy-lift vessels*, similar in design to WTIVs.

Before a turbine is built, seafloor scouring around its base is prevented with a ring of rocks. This requires a *rock installation vessel* with a "fallpipe" to arrange the rocks on the seafloor. Construction of a rock installation vessel began at a Wisconsin shipyard in July 2023, with delivery expected in the mid-2020s. A second such vessel is needed, according to DOE, but no domestic construction plans have been announced.

Demonstrating that the Jones Act's applicability can be case specific, CBP has ruled that the initial trip of a fallpipe vessel need not be Jones Act compliant because the pristine seabed is not a U.S. point, but subsequent deliveries would have to comply with the act. That a "pristine seabed" is not a U.S. point is being challenged in court by OMSA and the Shipbuilders Council of America (SCA).

A *service operation vessel* (SOV) is a floating hotel for construction workers as well as a workshop and storage facility for spare parts. Since these vessels are engaged in transporting merchandise and passengers from a U.S. shore point to a wind farm, under the Jones Act they must be U.S.-built. Two SOVs are being constructed at Gulf Coast

shipyards by an offshore vessel supplier, with one expected to be delivered in 2024. Two more are being constructed at a Wisconsin shipyard with expected delivery in 2026. A fifth SOV is being converted from an offshore oil supply vessel at a Florida shipyard, to be completed in spring 2025. These vessels are to accommodate 60-90 workers each. DOE estimates a need for 11 SOVs.

Crew transfer vessels (CTVs) are used to transport construction workers from shore to a wind farm or between turbines. Since they are engaging in transportation between U.S. points, they must be U.S.- built. CTVs are relatively simple vessels that resemble a water taxi or small ferry, designed to transport about 25 workers. Several have already been built, and about 20 more are under construction at several U.S. shipyards. DOE estimates that 58 CTVs will be needed. Helicopters also can be used to transport construction crews. They have some advantages (e.g., speed) and disadvantages (e.g., cost) over vessels.

Other vessels needed for offshore wind energy production include *vessels that survey the seafloor* to identify exact locations for wind turbine foundations and *cable-laying vessels* to run subsea electric transmission lines to shore. Because CBP has determined that neither vessel type engages in transportation, they need not be U.S.-built. Nevertheless, a survey vessel specifically for offshore wind development on the East Coast was built by a Bellingham, WA, shipyard and delivered in 2023. The one U.S.-built cable-laying vessel is owned by the Navy for its own use.

Financial Support for Shipbuilding

Purchasers of many of the vessels discussed above have applied for federal loan guarantees under the Maritime Administration's "Title XI" program (46 U.S.C. Ch. 537). This program provides a federal government guarantee on a private sector loan so that the market participants can receive better financing terms. In June 2022, the agency announced that vessels supporting offshore wind energy production would receive priority consideration. Congress could increase the total amount of loan guarantees available by appropriating funds to the program.

Recent applications for Title XI loan guarantees include the builder of the rock installation vessel ($216 million), purchasers of three of the SOVs under construction (between $90 million and $146 million for each vessel), and a builder of 10 CTVs ($104 million). Another loan-guarantee applicant is proposing a modified WTIV design, called a WTIV "Light," as a response to the high cost of a domestically built WTIV. The WTIVL would be able to construct only the portion of a wind turbine above water. A second "pile installation" vessel, which could be a general purpose heavy-lift vessel, would install the base. Along with construction of two SOVs, this operator has applied for a $709 million loan guarantee covering all four vessels.

Tax incentives and grants also aim to help the domestic vessel market. Offshore wind support-vessel operators have taken advantage of the Capital Construction Fund (46 U.S.C. Ch. 535) whereby they can hold income in tax-free accounts if those funds are used for purchasing a U.S.-built vessel. The Inflation Reduction Act (P.L. 117-169, §13502) provided a 10% tax credit for shipyards on the sale price of offshore wind vessels. The small shipyard grant program (46 U.S.C. §54101), available for modernizing shipyards with less than 1,200 employees, has provided funds for some of the shipyards currently building offshore wind vessels. Congress determines the amount of grant funds available in the appropriations process.

Domestic Shipbuilding Capability

The United States in not a major commercial shipbuilder, accounting for 0.13% of gross tons of vessels built worldwide in 2022. China, Korea, and Japan account for nearly 95% of vessel construction. Europe accounts for most of the remainder. These countries build many ships for export; U.S. shipyards seldom do.

The U.S. offshore supply vessel sector, however, is more robust because of longstanding oil and gas development in the Gulf of Mexico. Jones Act rules apply to offshore oil and gas projects as they do to wind projects. Typically, the standard supply vessels for oil and gas are U.S.-built. However, the larger, more complicated vessels capable of heavy lifting in deeper water are often foreign-made. In waters too deep for jack up legs, anchors, or moorings, vessels are built with self-positioning propellers to keep them stationary while constructing oil and gas rigs. These vessels tend to work globally, as no single market has sufficient work to keep them employed long-term.

According to DOE, about 65% of U.S. offshore wind resource potential is in deeper water that will be exploited by floating turbines. Construction of these turbines could be too deep for jack up WTIVs, requiring self-positioning propellers. Developers are also designing offshore wind turbines that are 60% taller than the ones used today, requiring bigger crane WTIVs. Foreign-built vessels may fill this niche as they do in the oil and gas market.

Jones Act Modifications

For floating oil platforms using anchors or mooring devices, Congress allowed the specialized vessels that handle the anchors to be foreign-built (P.L. 109-241, §310) and might consider the same for floating wind turbines. Congress has occasionally enacted other exemptions from the Jones Act, such as for highly specialized vessels, to address a temporary demand surge or when it appeared that no U.S. operator was interested in providing the service. Although the foreign fleet is much greater in number, it is also in tight supply, as Europe and Asia have their own offshore wind-development targets.

Congress could clarify when the Jones Act applies to offshore energy development, as the statute dates to an earlier era. Due to the case-specific circumstances determining Jones Act applicability, developers have requested "letter rulings" from CBP, but these rulings are not legal precedent, and CBP has sometimes reversed prior decisions. CBP's definition of what constitutes "vessel equipment" that can be carried by foreign vessels as opposed to "merchandise" that must be carried by U.S.-built vessels is also being challenged in court by OMSA and SCA.

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