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Supply Chain Considerations for Offshore Wind Energy in the United States

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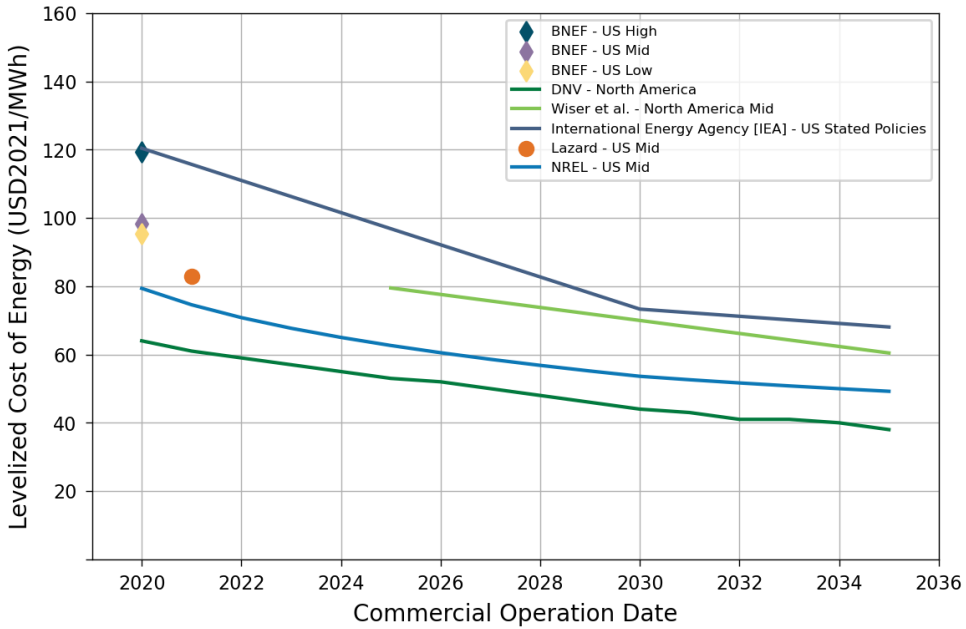
Background and scope

The role of cost, supply chain, and infrastructure assessments in offshore wind planning

- Recent decreases in levelized cost of energy (LCOE) have contributed to expanded offshore wind deployment
- Expanding global pipelines mean that **supply chain and infrastructure constraints need to be considered along with LCOE**

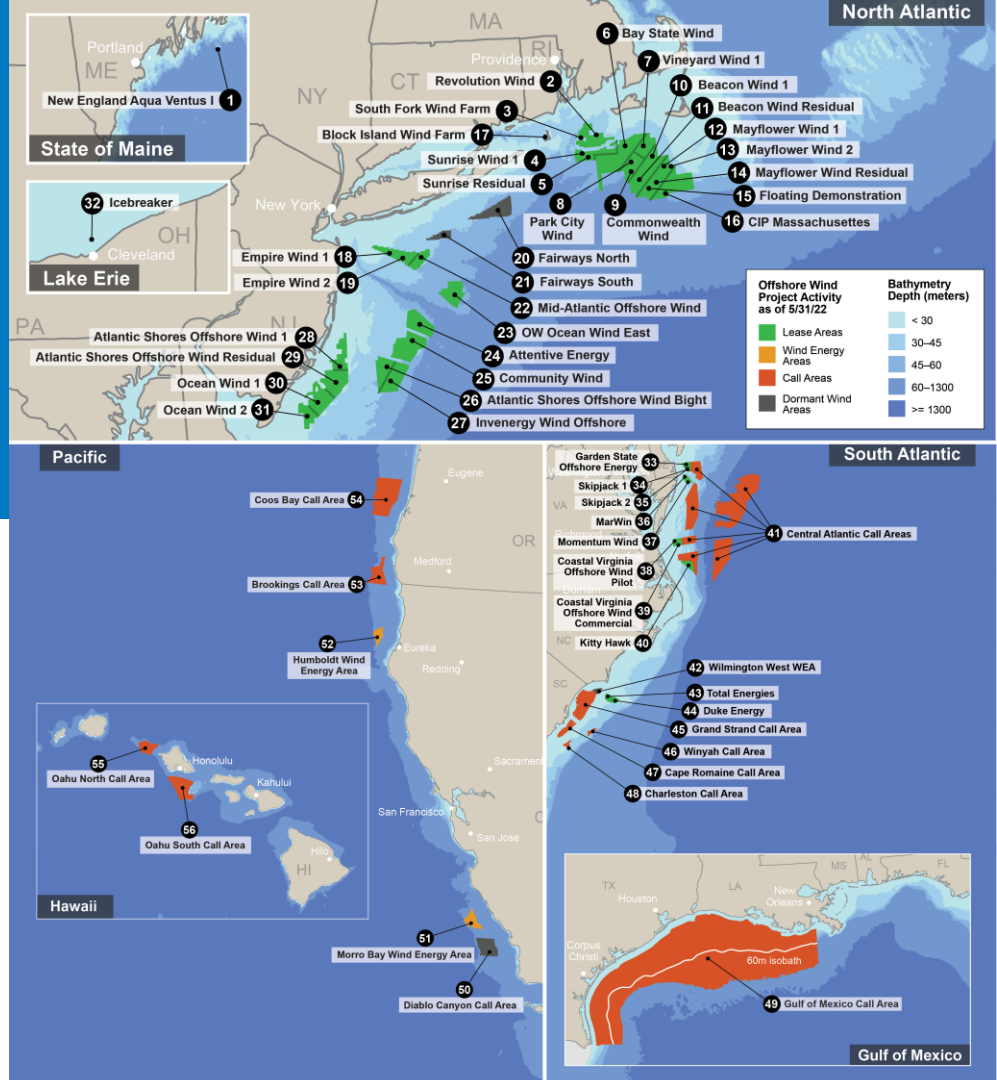


Historic and projected fixed-bottom offshore wind LCOE (Musial, et al 2022)

U.S. Offshore Wind Industry Market as of May 31, 2022, Shows Strength in Essential Economic and Policy Areas, Indicating Accelerated Growth

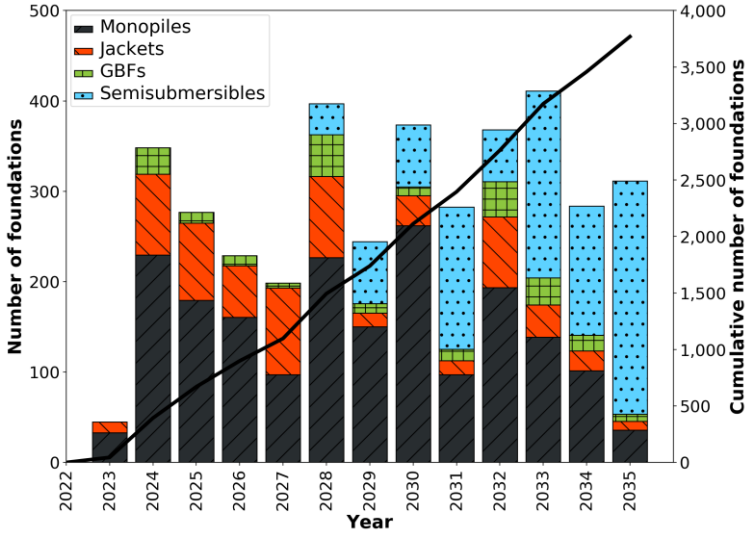
- U.S. Offshore Wind Target set in March 2021 for **30 gigawatts (GW) by 2030** with pathway to 110 GW by 2050
- **39,322 megawatts (MW) of policy commitments** from eight eastern states
- **40,083 MW estimated in total project pipeline**
- 42 MW installed

Source: Musial et al. (2022) – update coming in August 2023



The Demand for a Domestic Offshore Wind Supply Chain in the United States

- Achieving the Biden Administration's 30 GW by 2030 offshore wind target will require over **2,000 wind turbines** to be installed in U.S. waters
  - Anticipated capital expenditures of over $100 billion (SIOW, 2021)
- Global supply chains are already **at or near capacity** to meet European demand
- Domestic manufacturing and installation infrastructure are **nascent and unprepared to meet the U.S. demand**



Annual and cumulative demand for fixed-bottom and floating foundations in the U.S. offshore wind industry. Shields, et al (2022)

Achieving sustainable offshore wind growth and maximizing the associated economic benefits requires near-term planning and investment to develop a domestic supply chain

Envision a domestic supply chain by 2030

Barriers
Gaps
Potential solutions

Manufacturing
(Major components and supporting supply chain)

Ports and vessels

Workforce

Equity

Key findings

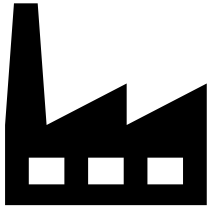
A Supply Chain Road Map for Offshore Wind in the United States

Pathways to developing a domestic supply chain

Short-term actions (2023-2024)

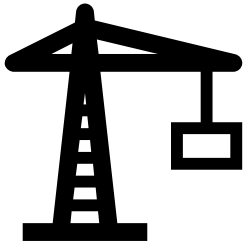
Major barriers to supply chain development

Investment risk

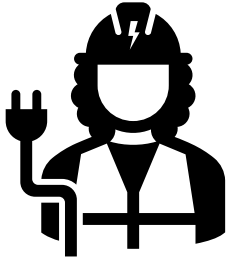


Siting and technology challenges

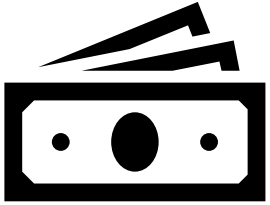
Limited supplier networks



Insufficient port and vessel infrastructure



Limited domestic workforce

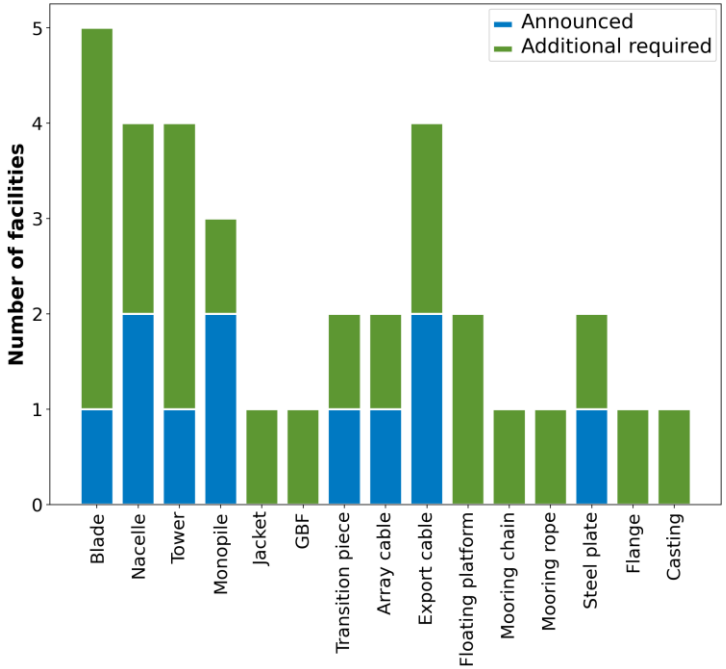


Cost competitiveness

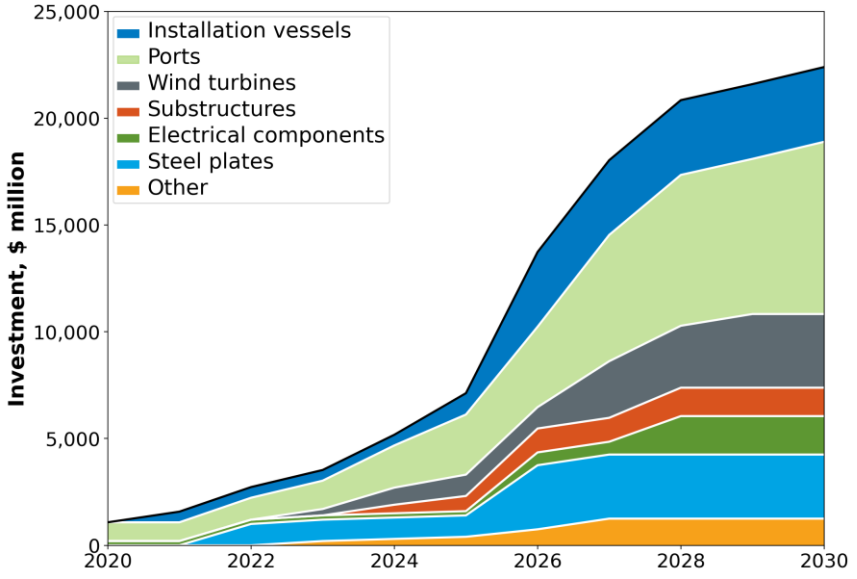
Incorporating equity and sustainability

A domestic supply chain that can manufacture all major offshore wind components needed to install 4 – 6 GW per year could require $22.4 billion and 6-9 years to develop

A domestic offshore wind energy supply chain designed to meet the annual demand for major components in 2030 would require at least 34 new manufacturing facilities

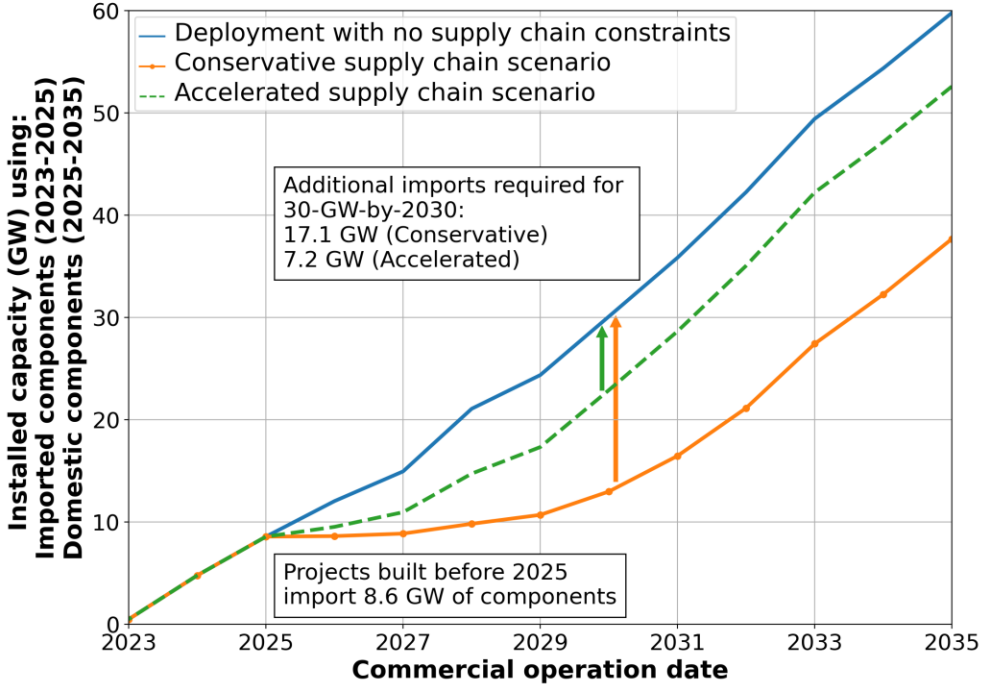


A domestic offshore wind energy supply chain designed to meet the annual demand for major components in 2030 would require an investment of at least $22.4 billion

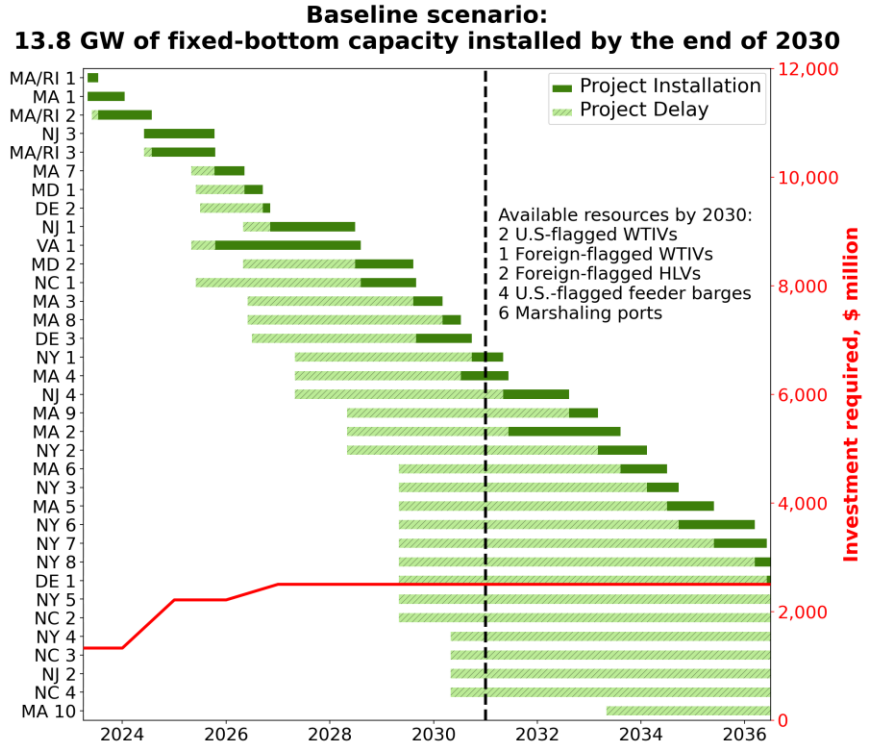


The supply chain can become more self-reliant and cost competitive even as near-term projects import components

Offshore wind projects will need to import components while the domestic supply chain develops. Global supply bottlenecks could limit deployment if U.S. projects cannot source a sufficient number of these components.



The offshore wind sector likely needs to invest around $6 billion in marshalling ports and large installation vessels to deploy 30 GW by 2030



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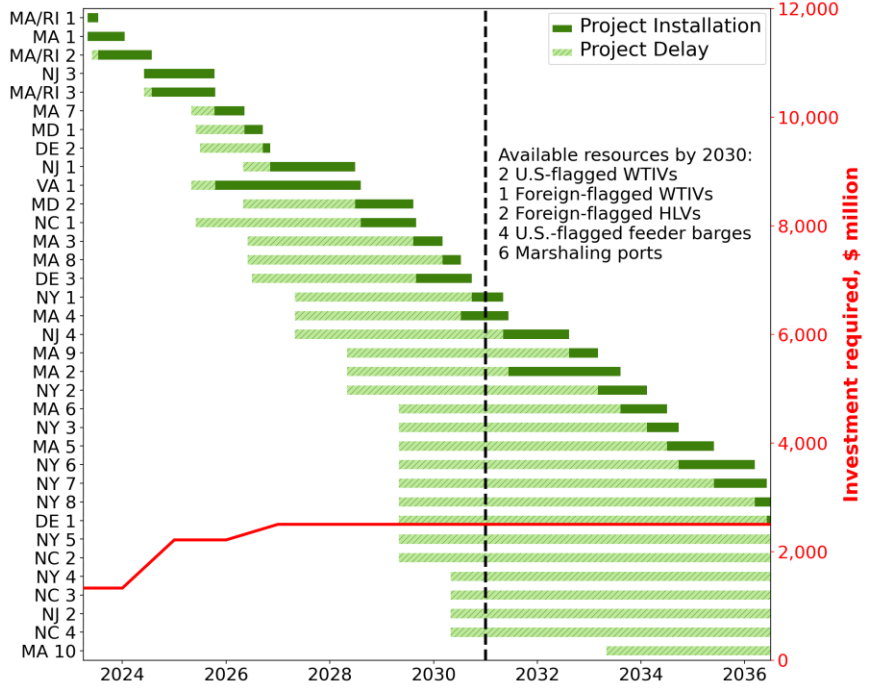
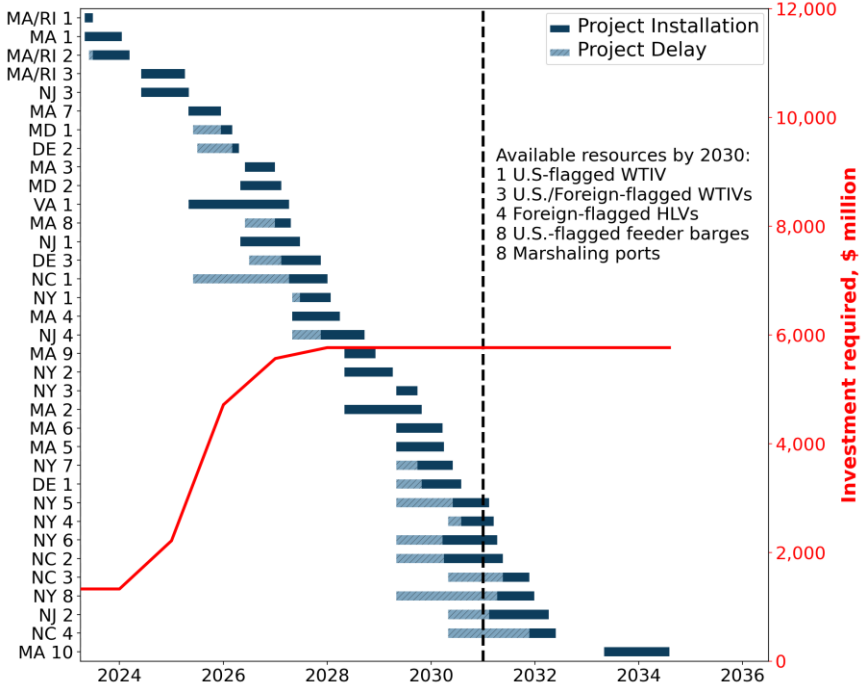
Baseline scenario:
13.8 GW of fixed-bottom capacity installed by the end of 2030



U.S. Feeder scenario:
28.4 GW of fixed-bottom capacity installed by the end of 2030



A significant number of additional vessels will be required for construction (survey, guard, cable-lay) and operation (crew transfer, service operation) activities

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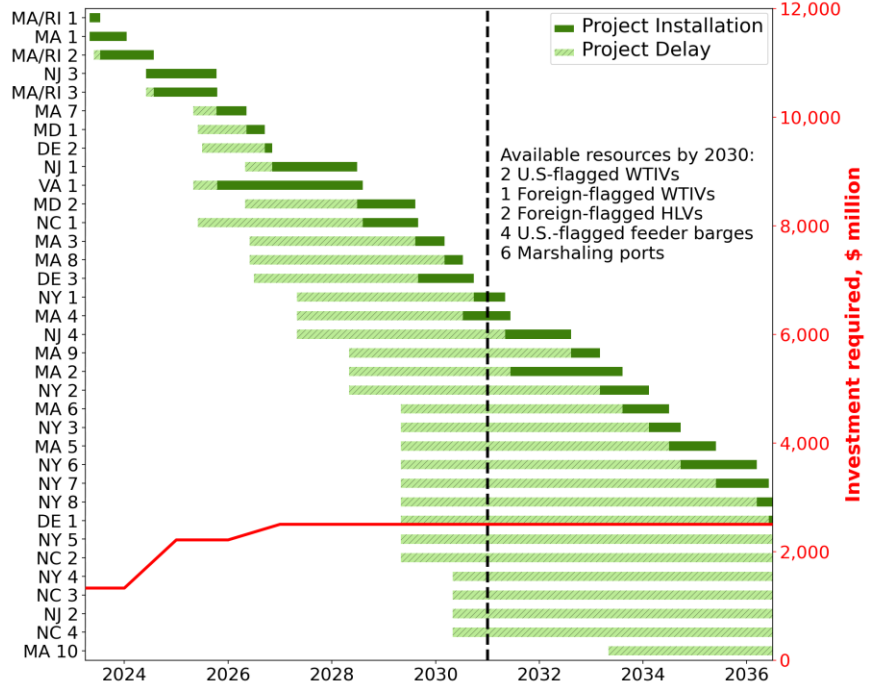

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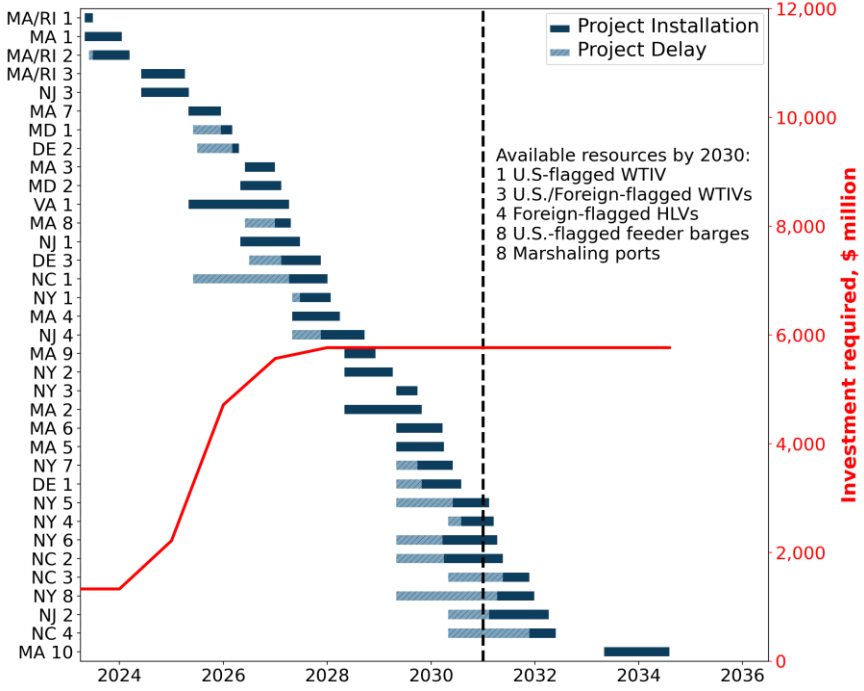
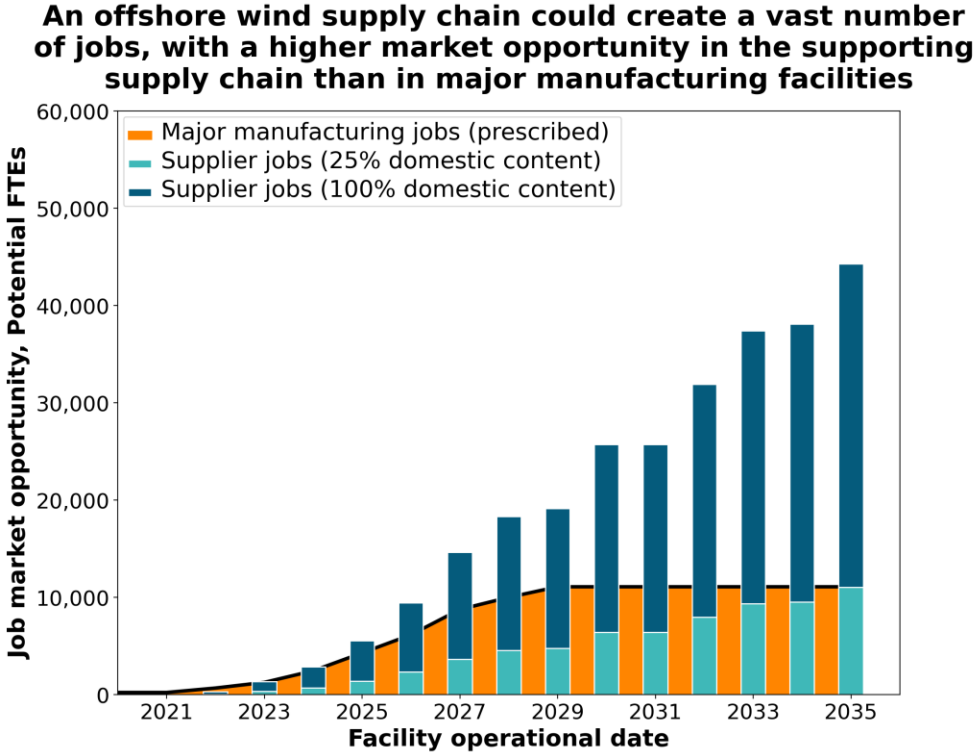
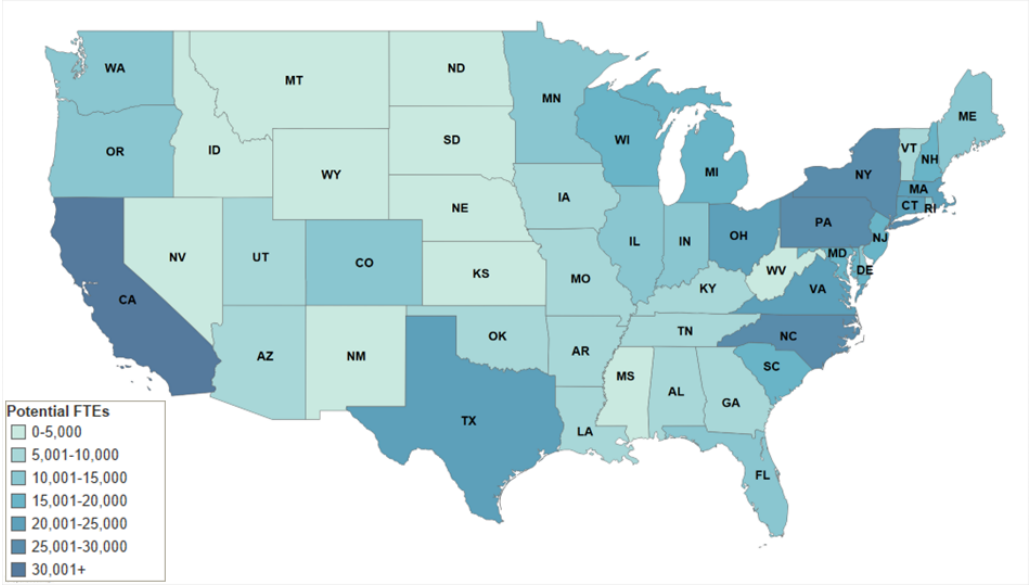


Manufacturing major components could require 10,000 direct jobs – but there is an opportunity space for up to 5 times as many jobs in the supporting supply chain

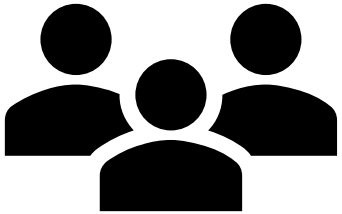


Many states have existing capabilities that can fill the manufacturing demand. Regional coordination could create a more efficient supply chain with broad benefits

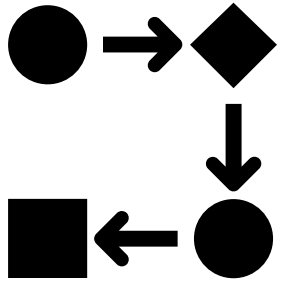
Job market opportunity space for major manufacturing and supporting supplier jobs by 2035



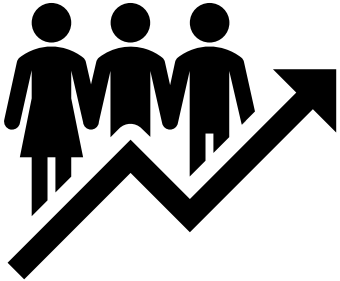
Supply chain investments will directly impact vulnerable (port) communities. Development should consider potential positive and negative impacts through a common framework of measurable indicators



Contextual



Procedural



Socioeconomic

Health, safety, environment

Extending analysis to the West Coast

West Coast Ports Strategy Study

West Coast Ports Strategy Study

Port investment

Deployment

Supply chain

Project cost

Energy justice

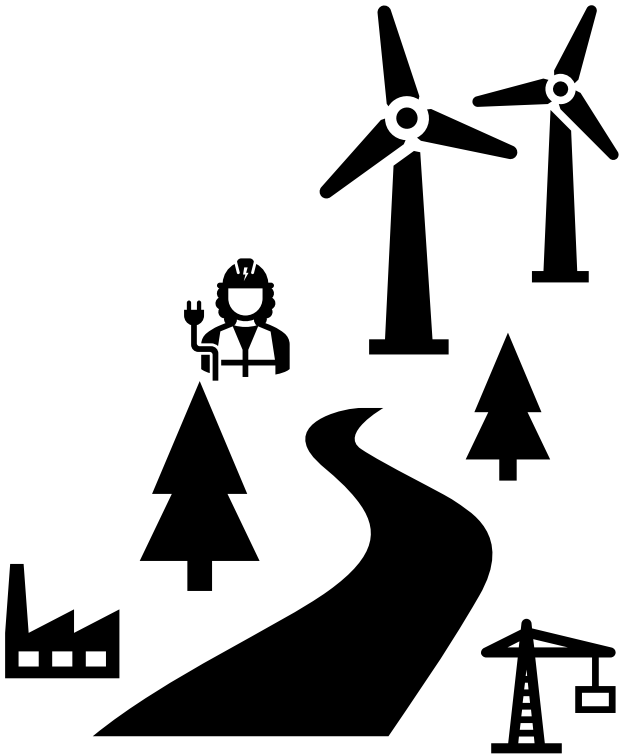
Gaps, challenges, and opportunities for developing a collaborative West Coast ports network

Photo courtesy of the Windfloat Atlantic project / Principle Power. Artist: DOCK90

Summary and next steps

Summary

- **We identified key barriers, impacts, and pathways to achieving a domestic supply chain**
- **Coordination throughout the offshore wind sector is one of the most impactful ways to overcome barriers**
  - Identify local strengths and resources
  - Define role for individual states and regions
  - Collaborate with existing businesses, including **ports and vessel operators**



Thank you!

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