

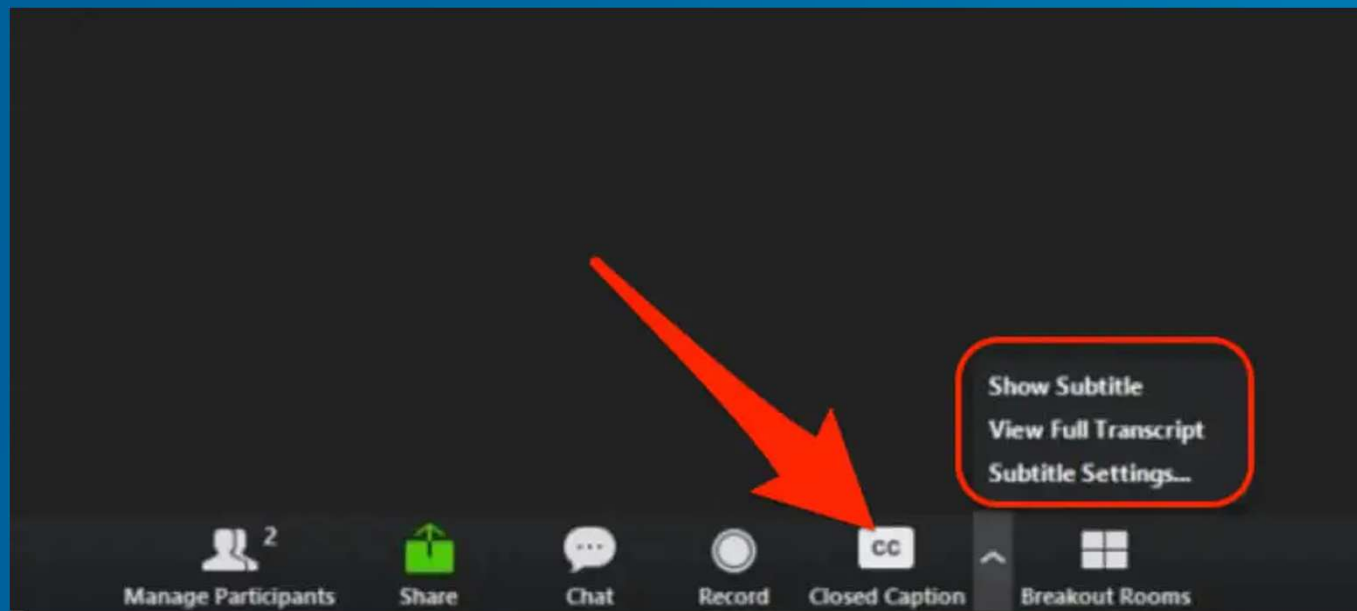
# Offshore Wind Power 101: Industry Update and the Project Development Process



March 26, 2024



# Closed Captions



# Please drop questions Q&A

Here, your questions won't get lost and are most likely to get answered.



# Speakers



MODERATOR

**Anne Reynolds**

Vice President, Offshore Wind  
*American Clean Power  
Association*



**Jennifer Garvey**

Head of New York  
Market Strategy  
*Ørsted*



**Brian Krevor**

Senior Director,  
Offshore Permitting and  
Environmental Policy  
*American Clean  
Power Association*



**Claire Richer**

Senior Director, Offshore Wind  
*American Clean Power  
Association*



# U.S. Offshore Wind Industry: Under Construction



# Global Offshore Wind Installations

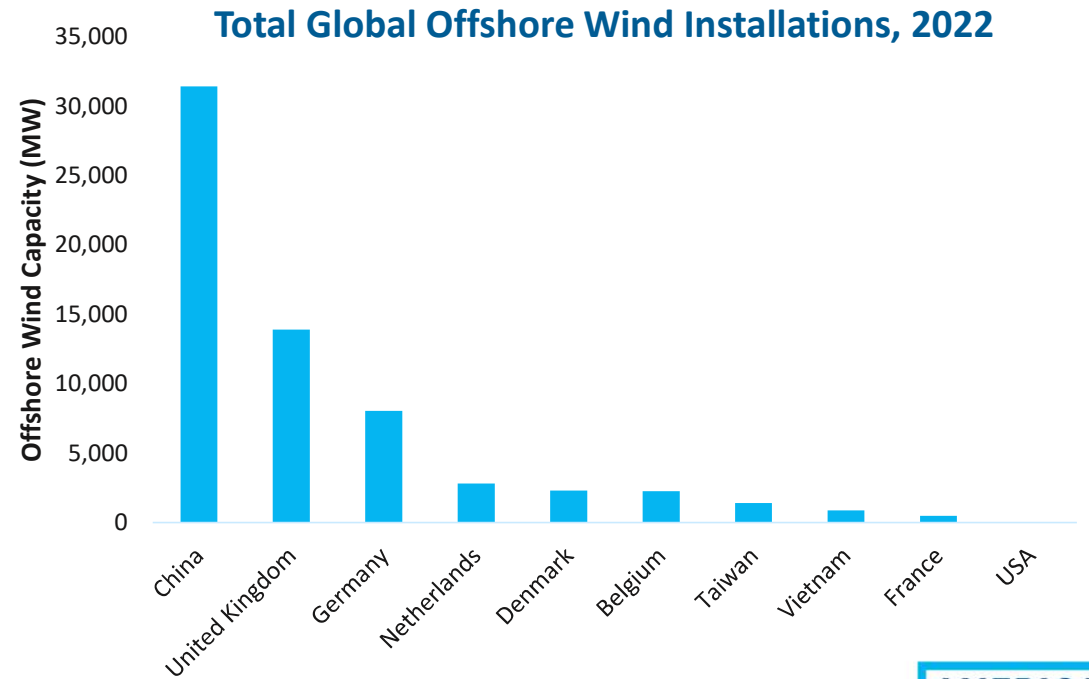
## U.S. lags the rest of the world in offshore wind

**64,320 MW of global installations at end of 2022**

- 34,006 MW in Asia-Pacific
- 30,272 MW in Europe
- **42 MW in U.S.**

### 2022 Additions

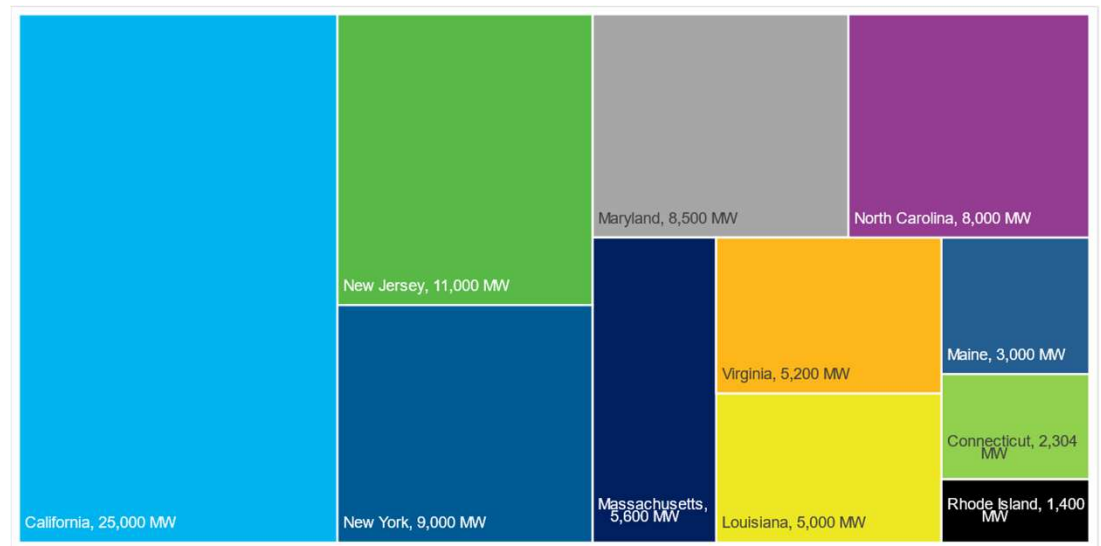
- 5,052 MW in China
- 1,179 MW in United Kingdom
- 1,175 MW in Taiwan
- **0 MW installed in U.S.**



# States are Driving Demand

States have established over 84 GW of offshore wind procurement targets through legislation, conditional targets, or executive orders

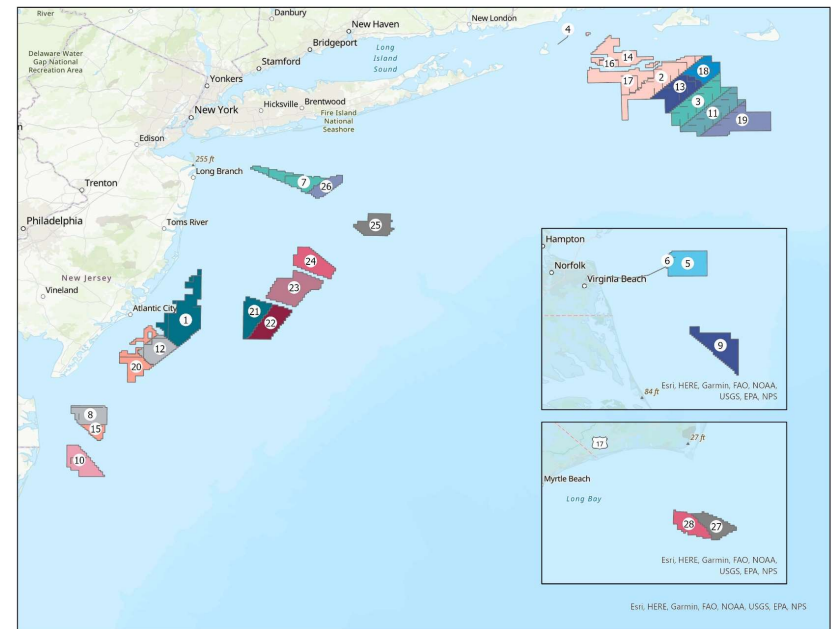
- **New York:** 9,000 MW by 2035
- **New Jersey:** 11,000 MW by 2040
- **Virginia:** 5,200 MW by 2034
- **Massachusetts:** 1,600 MW by 2027
  - Authorized additional 4,000 MW by 2035
- **Connecticut:** 2,000 MW by 2030, plus 304 MW purchased in 2018
- **Maryland:** 8,500 MW by 2031
- **Rhode Island:** 400 MW purchased in 2018, plus legislation for RFP up to 1,000 MW of additional capacity in 2022
- **North Carolina:** 8,000 MW by 2040 (2,800 MW by 2030)
- **Louisiana:** 5,000 MW by 2035
- **California:** 2,000 – 5,000 MW by 2030, 25,000 MW by 2045



# East Coast Leases

## Federal leases and projects currently in development

- Two operating projects in the U.S. (42 MW)
  - Block Island Wind Farm (30 MW)
  - Coastal Virginia Offshore Wind Pilot Project (12 MW)
- South Fork Wind (NY) and Vineyard Wind 1 (MA) have achieved first power
- In total, there are 28 leases in active development on the East Coast
- 16 projects totaling nearly 14.8 GW have secured a buyer, primarily through state solicitations
- February 2022 lease sales in the NY Bight have over 7 GW of potential
- Carolina Long Bay lease sales have over 1.3 GW of potential



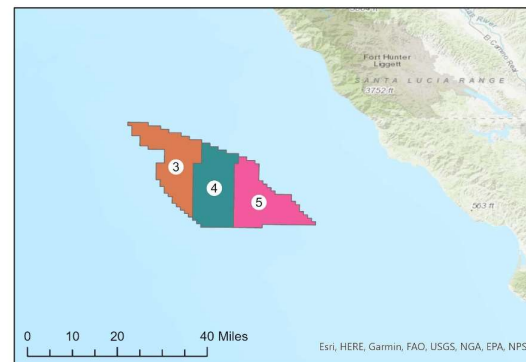
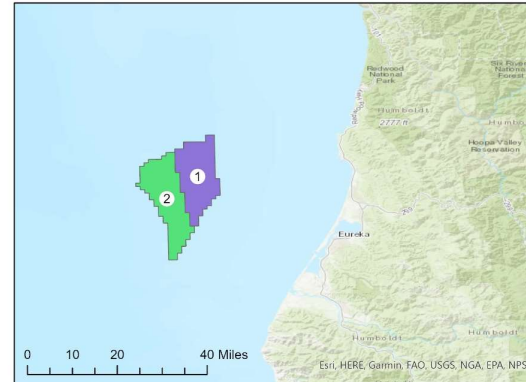


# West Coast Leases

## Federal leases and projects currently in development

- There are now five leases on the West Coast following the December 2022 lease auction.
- Two leases in Northern California, off Humboldt Bay.
- Three leases in Central California, off Morro Bay.

Label	Project	Developer(s)
1	Canopy Offshore Wind Farm	RWE
2	TBD	CIP
3	Atlas Wind	Equinor
4	Golden State Wind	EDP, ENGIE, Canadian Pension Plan Investment Board
5	Even Keel Wind	Invenergy



# Gulf of Mexico

BOEM held the first offshore wind lease sale in the Gulf of Mexico on August 29, 2023.

- RWE won the Louisiana lease with an installation capacity of over 1,200 MW.
- This could power over 435,000 homes
- Currently in a comment period for the second Proposed Sale notice for the Gulf of Mexico with four areas offshore Louisiana and Texas, with the potential to power 1.2 million homes.



# Industry Dedicated to Providing Good Jobs

Offshore Industry has committed to partner with labor unions. Agreements have already been signed with (sampling):

*“This is an opportunity to develop good union jobs in an emerging industry. With the announcement of finalized contracts, we have taken another historic step.”*

- John R. Durso, President of the Long Island Federation of Labor, AFL-CIO



- North America’s Building Trades Unions
- Rhode Island Building and Construction Trades Council
- New London Building and Construction Trades Council
- Southeastern Massachusetts, Cape Cod and Islands Building Trades Council
- Nassau Suffolk Building and Construction Trades Council
- South Jersey Building and Construction Trades Council
- Massachusetts Building Trades Council
- Virginia State Building and Construction Trades Council
- Fairfield Building Trades Council
- Utility Workers of America
- International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers
- International Brotherhood of Electrical Workers
- Laborer’s International Union of North America (LiUNA!) Mid-Atlantic Region
- Eastern Atlantic States Regional Council of Carpenters
- International Union of Operating Engineers Local 825,
- Ironworkers International
- Baltimore-D.C. Building Trades (BDCBT)
- United Steelworkers

# Infrastructure and Investment

## U.S. offshore wind means U.S. jobs, manufacturing, and infrastructure

### Industry committing billions of dollars to U.S. jobs, manufacturing, and infrastructure. Examples include:

- Ørsted and Eversource have signed an \$86 million supply chain contract with Riggs Distiler & Company, Inc. to construct advanced foundation components for wind turbines at the Port of Coeymans in New York.
- Wind tower manufacturers Welcon and Marmen are planning a manufacturing facility to build towers and fixed and floating foundations in a new factory in Albany, New York.
- Ørsted, PSEG, and steel pipe manufacturer EEW have broken ground on a monopile manufacturing facility at the Port of Paulsboro Marine Terminal in New Jersey.
- Vineyard Wind partnering with Marmon Utility to establish capabilities at CT facility for manufacturing Kerite cables for inter-array cable cores and investing \$10 million toward MA supply chain development.
- Nexans to manufacture the first U.S. subsea high voltage export cables in Goose Creek, S.C. to be used at several East Coast projects. Nexans is investing \$310 million in this project.
- US Wind facilitating the investment of an incremental \$150 million to develop a new steel monopile fabrication factory at Sparrows Point, Maryland at the former home of Bethlehem Steel.
- Prysmian Group is moving ahead with its project for a new submarine power cable plant in Massachusetts. Prysmian Group's total investment to build the new plant will amount to around \$200 million.
- Community Offshore Wind, a joint venture between RWE and National Grid, has come to an agreement with four unique steel fabricators and manufacturers to establish a statewide steel consortium in New York, supporting nearly 300 jobs in steel fabrication and processing.



# Offshore Wind Investments in U.S.-flagged Vessels

The offshore wind industry is already investing in almost 40 new offshore wind vessels. Investments include 26 Crew Transfer Vessels (CTV), 7 Service Operation Vessels (SOV), 2 different types of installation vessels, and 2 tugs and barges.

Vessel Type	Vessel Name	Status	Location	Manager
Rock Installation	Great Lakes Rock Installation	Under Construction	Philly Shipyard, PA	Great Lakes Dredge and Dock
SOV	Eco Edison	Under Construction	Edison Chouest, LA	Edison Chouest Offshore
SOV	Cade Candies	Retrofit	Candies Shipbuilders, LA	GE/Otto Candies
SOV	Hornbeck SOV	Retrofit	Allanton Shipyard, FL	Hornbeck Offshore Services
SOV	North Star Navigator	Retrofit	North Star Marine, NJ	North Star Marine
SOV	Paul Candies	Retrofit	Candies Shipbuilders, LA	Siemens Gamesa/Otto Candies
SOV	CREST SOV	Ordered	Fincantieri, WI	Crowley/ESVAGT
SOV	Equinor SOV	Ordered	Edison Chouest, LA	Edison Chouest Offshore
Tug/Barge	Kirby Tug/Barge 1	Ordered	U.S.	Kirby Offshore Wind
Tug/Barge	Kirby Tug/Barge 2	Ordered	U.S.	Kirby Offshore Wind
Wind Turbine Installation Vessel	Charybdis	Under Construction	Keppel AmFELS, TX	Dominion Energy

Vessel Type	Vessel Name	Status	Location	Manager
CTV	AWT CTV 3	Under Construction	St. Johns Ship Building, FL	Atlantic Wind Transfers
CTV	ECO Edison Mini-CTV	Under Construction	Edison Chouest, LA	Edison Chouest Offshore
CTV	PATRIOT CTV	Under Construction	Gladding-Hearn Shipbuilding, MA	Patriot Offshore Maritime
CTV	WINDEA CTV 5	Under Construction	St. Johns Ship Building, FL	Windea
CTV	AOS CTV 1	Ordered	Blount Boats, RI	American Offshore Services
CTV	AOS CTV 2	Ordered	Blount Boats, RI	American Offshore Services
CTV	AOS CTV 3	Ordered	Blount Boats, RI	American Offshore Services
CTV	AOS CTV 4	Ordered	Blount Boats, RI	American Offshore Services
CTV	AOS CTV 5	Ordered	Blount Boats, RI	American Offshore Services
CTV	AOS CTV 6	Ordered	Blount Boats, RI	American Offshore Services
CTV	AWT CTV 4	Ordered	St. Johns Ship Building, FL	Atlantic Wind Transfers
CTV	AWT CTV 5	Ordered	St. Johns Ship Building, FL	Atlantic Wind Transfers
CTV	AWT CTV 6	Ordered	St. Johns Ship Building, FL	Atlantic Wind Transfers
CTV	AWT CTV 7	Ordered	St. Johns Ship Building, FL	Atlantic Wind Transfers
CTV	AWT CTV 8	Ordered	St. Johns Ship Building, FL	American Offshore Services
CTV	Windserve CTV 2	Ordered	Senesco Marine, RI	Windserve Marine
CTV	Windserve CTV 3	Ordered	Senesco Marine, RI	Windserve Marine
CTV	Windserve CTV 4	Ordered	Senesco Marine, RI	Windserve Marine
CTV	TBD	Ordered	Platypus Marine, WA	TBD
CTV	Atlantic Endeavor	In Service	Blount Boats, RI	Atlantic Wind Transfers
CTV	Atlantic Pioneer	In Service	Blount Boats, RI	Atlantic Wind Transfers
CTV	WINDEA Courageous	In Service	St. Johns Ship Building, FL	Windea
CTV	WINDEA Intrepid	In Service	Gulf Craft, LA	Windea
CTV	Windserve Odyssey	In Service	Senesco Marine, RI	Windserve Marine
OSV/CTV	Gaspee	In Service	Providence, RI	McAllister Towing
OSV/CTV	Roger Williams	In Service	Providence, RI	McAllister Towing

# Recent Negative Headlines

**Bloomberg**

## US Offshore Wind Chiefs Blast Barriers to Progress

With projects crippled by soaring costs, developers are calling on the government for more support.



Newsweek

+ Follow

U.S. Offshore Wind Industry Is Off to a Turbulent Start in the New Year

THE WALL STREET JOURNAL

business U.S. Politics Economy Tech Finance Opinion Arts & Culture Lifestyle Real Estate Personal Finance

8 days ago ★

## Another Big Write-Down for Offshore Wind Projects



By David Uberti, Reporter

## Offshore wind faces more financial turbulence in 2024

By Heather Richards | 01/08/2024 06:20 AM EST



The New York Times

Account

## What Ails Offshore Wind: Supply Chains, Ships and Interest Rates

Government officials and energy developers misjudged the difficulty of building huge clean energy projects in the United States, which has built very few of them.



# Project Challenges

High inflation & interest rates, supply chain costs, and permitting/interconnection challenges are pushing developers to renegotiate offtake agreements.

- **High Inflation & Interest Rates**

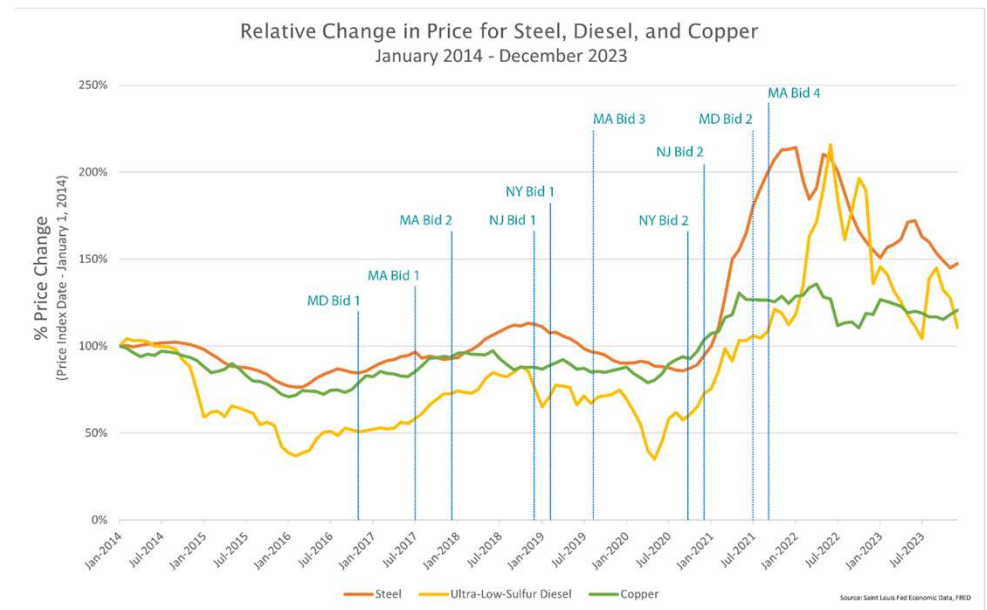
- Consumer Price Index averaged 1.8% before COVID-19 when many of the first projects got offtake. It peaked at 9% in 2022
- Although inflation has come down from peak in 2022, still more than double than when projects were awarded
- Offshore Wind Costs have increased much more than CPI or the Producer Price Index (PPI)

- **Supply Chains**

- Steel, resin, copper, and other raw material prices jumped
- Vessel availability

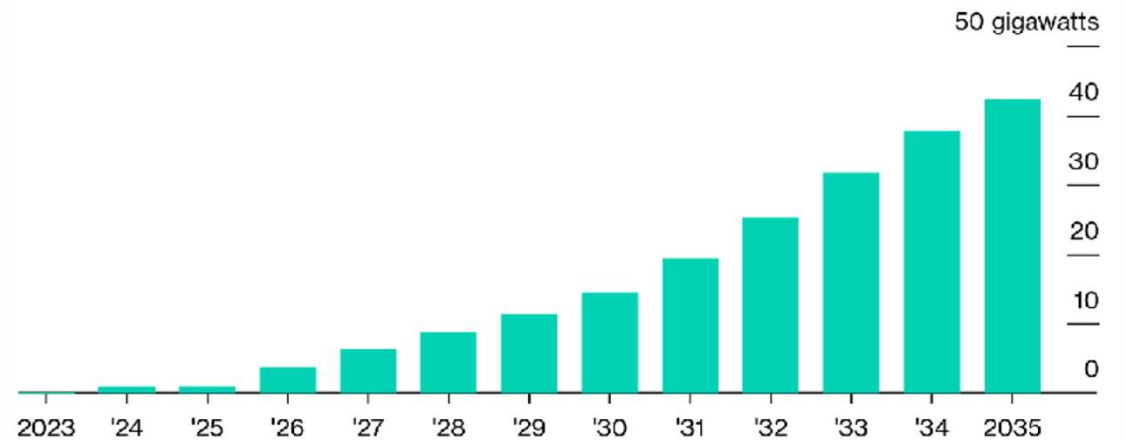
- **Permitting & Interconnection**

- Projects can take at least 8 years from inception to commissioning



The offshore wind industry faces challenges, but they are not insurmountable

**US Offshore Wind Outlook is Promising Despite Hurdles**  
Cumulative US offshore wind installation forecast



Source: BloombergNEF

BloombergNEF



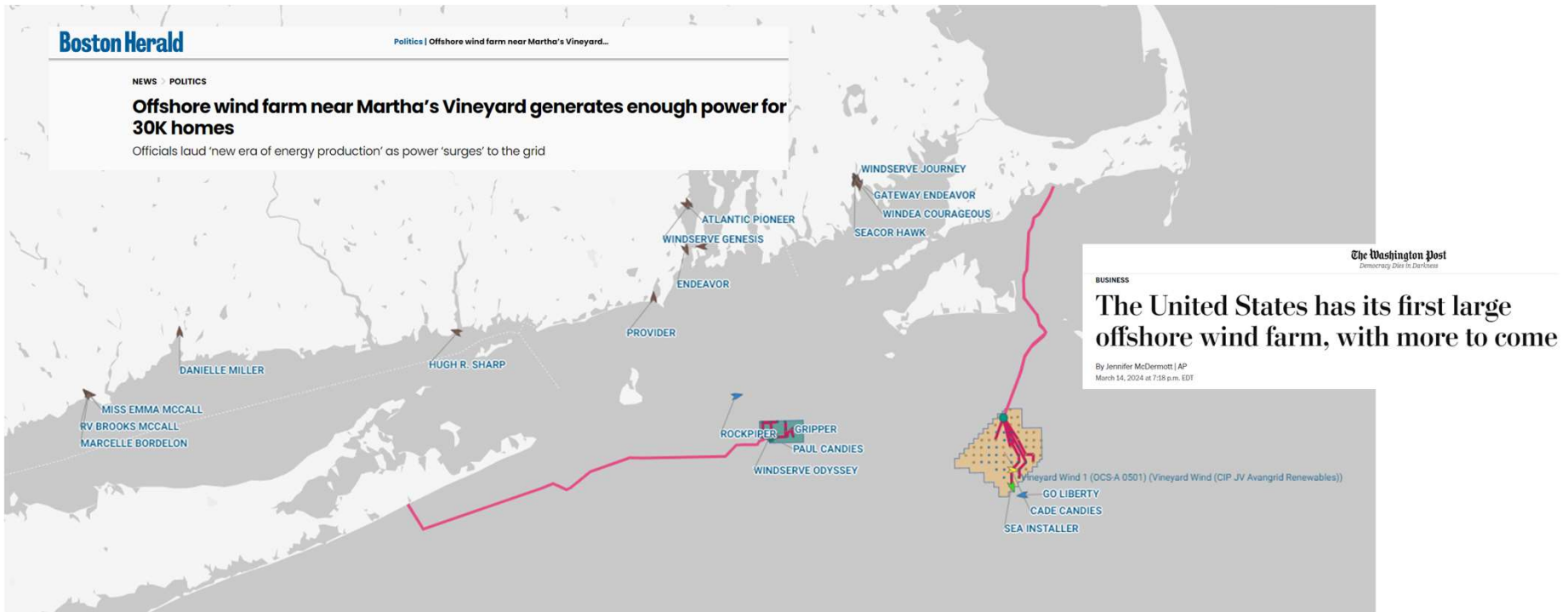
# Solicitations

## NY and MA/CT/RI are expected to make new awards in the first half of 2024

- **MA, CT, and RI** released RFPs to coincide with offshore wind RFP procurement efforts in each state, driving economies of scale.
- **In July 2023, Maine's** governor signed a bill requiring an offshore wind RFP by January 2026 or 3 months after a BOEM lease auction in the region
- **In California**, recently signed AB1373 authorizes central procurement of clean energy resources, including offshore wind, enabling future solicitations.

State	Submission Date	Award Date
NY	January 2024	February 2024
MA/CT/RI	March 2024	August 2024
NJ	Q 1/2 2024	TBD
MD	July 2024	TBD
ME	2026	TBD
CA	TBD	TBD

# Current Construction

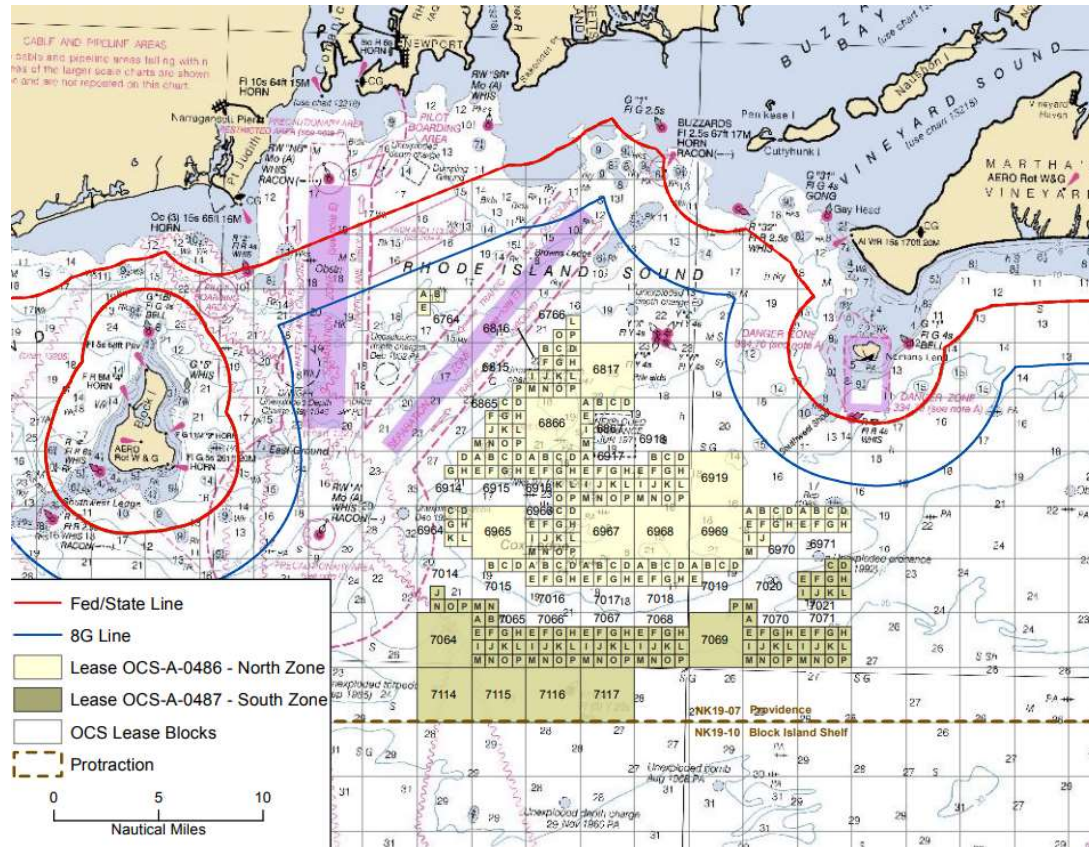


# Offshore Wind Development Phases

- Lease
- Electrical Offtake Agreement
- Interconnection
- Surveying
- Permitting
- Construction
  - Export & Array Cable Installation
  - Foundation Installation
  - Turbine Installation



# Leasing



# Offtake Agreements

In accordance with Public Service Commission Orders, eligibility is limited to projects that:

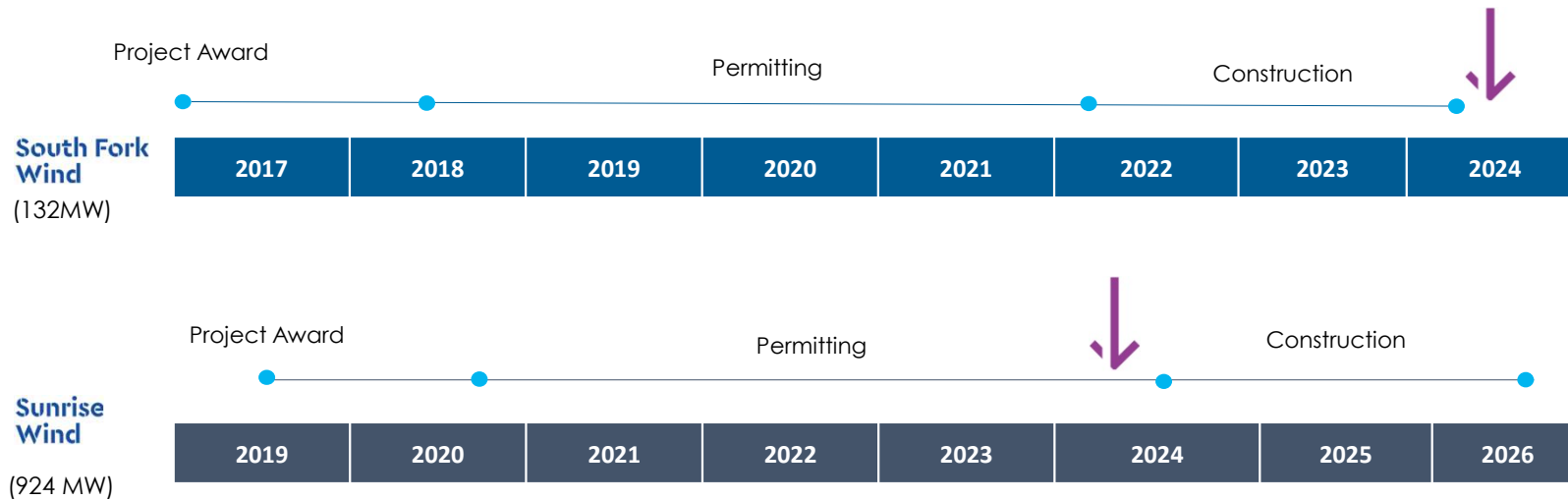
- Are located off the coast of the United States
  - Become operational on or after January 1, 2015
  - Demonstrate delivery of electricity into New York
  - Have obtained a lease (executed or provisional) from the Bureau of Ocean Energy Management (BOEM), and
  - (New in ORECRFP22-1)** Include Supply Chain Investment Plans that will utilize up to \$300 million in New York State funding to localize component manufacturing and critical offshore wind staging, assembling, maintenance and operations ports
  - (New in ORECRFP22-1)** Must be Meshed Ready (in accordance with the specifications noted in Appendix G) and they must utilize HVDC technology for the radial export cable
  - (New in ORECRFP22-1)** Stakeholder Engagement Plans and New York Workforce and Jobs Plans
- This RFP supports the responsible and cost-effective development of offshore wind by requiring proposers to:
- Include commitments to negotiate project labor agreements, labor peace agreements and prevailing wages
  - Submit environmental and fisheries mitigation plans describing development practice that will minimize impacts to fisheries and the environment
  - Participate in New York State's offshore wind technical working groups: Environmental, Commercial Fishing, Jobs and Supply Chain, and Maritime
  - Consult with relevant State agencies around fishing, wildlife, and the environment
  - Make environmental data collected during site assessment publicly available
  - Implement lighting controls to minimize nighttime visibility
  - Minimize visual impacts

## Evaluation Criteria

The Public Service Commission Orders prescribe the evaluation of proposals to be based upon an ultimate weighting of 70% price considerations, 20% economic benefits to New Yorkers, and 10% project viability.

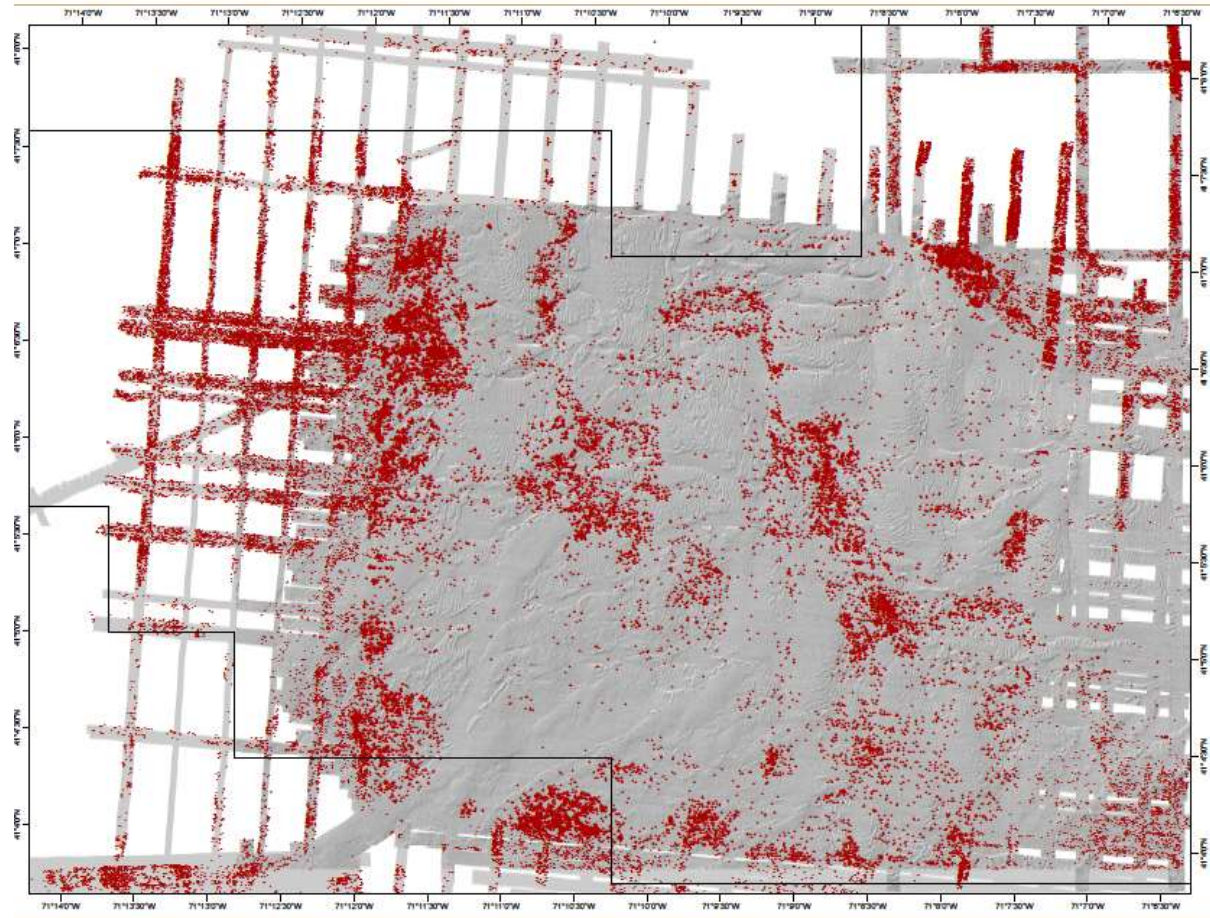


# Project Timelines

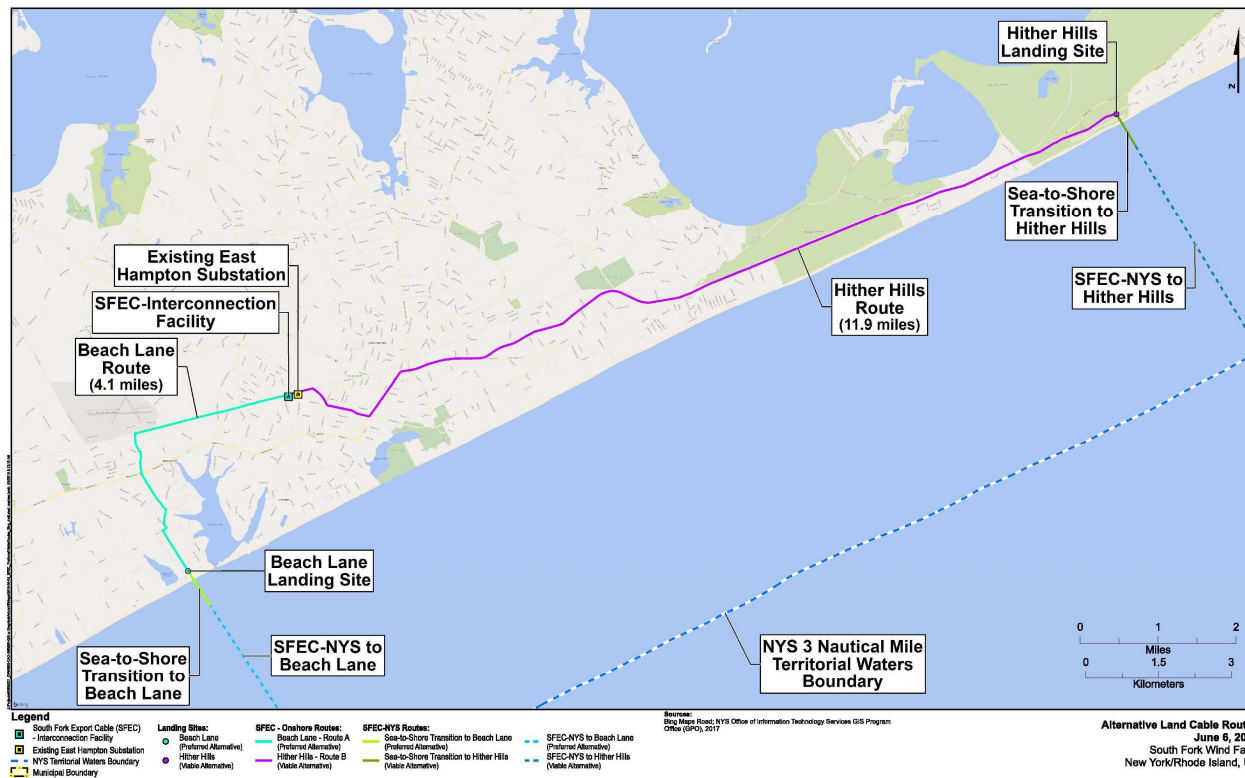


# Surveying

Geophysical Survey  
Results of South Fork  
Wind Farm Area



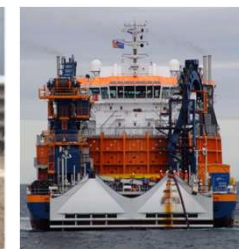
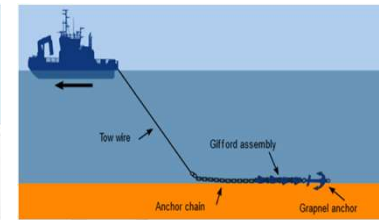
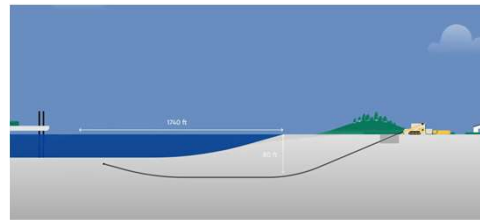
# Interconnection, Permitting and Real Estate





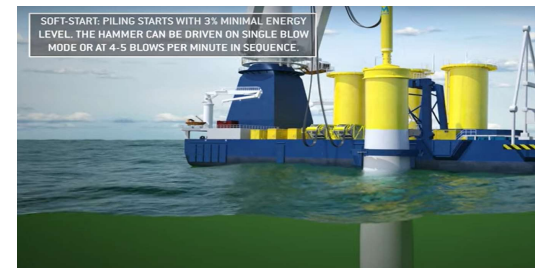
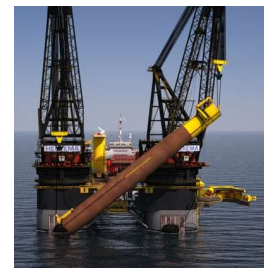
# Offshore Construction: Cable Installation

- Landfall ([video](#))
- Pre Cable-lay Activities
- Offshore Cable Installation Crossing and Secondary Protection
  - Many different types
- Spare Cable in case of repairs



# Offshore Construction: Foundation Installation

- Different types of foundations
  - Monopiles & Platform Jackets are most common
- Installation: Feederling, Offshore Transfer, upending and Driving



# Turbine Installation

Turbine installation at  
South Fork Wind



# Thank You!



MODERATOR

## Anne Reynolds

Vice President, Offshore Wind  
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[areynolds@cleanpower.org](mailto:areynolds@cleanpower.org)



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## Claire Richer

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# Women in Leadership

March 28, 1pm – 2pm ET

- **NEW!** Filmed before a live studio audience at our headquarters in Washington, D.C., and streamed globally for virtual attendees.
- **Discussion Topics include:**
  - Rarity and parity of women in clean power industry
  - Personal journeys of top female executives
  - Allyship and leadership styles
  - Open Q&A with the Members and NonMembers
  - [Women in Clean Power | ACP](#)

**Moderator**

**Kelly Veney Darnell**  
COO  
ACP

**Sarah Slusser**  
CEO, ACP Board Member  
Cypress Creek  
Renewables

**Serena Rwejuna**  
Partner  
White & Case

**Theresa Eaton**  
CEO, Owner  
WECS Renewables

**Kristina Costa**  
Deputy Assistant to the  
President for Clean Energy  
Innovation &  
Implementation  
The White House



# Please Complete Our Exit Survey



## ACP PowerCasts Exit Survey

🔒 Anonymous • 6 questions

1. Overall, how satisfied were you with this PowerCasts program? \*

0: Dissatisfied, 5: Very Satisfied

0 1 2 3 4 5

2. I gained knowledge, skills or understanding relevant to my job and/or my understanding of the clean power industry. \*

- Strongly Agree
- Somewhat Agree
- Neutral
- Somewhat Disagree
- Strongly Disagree

# Thank you!

**Example:**

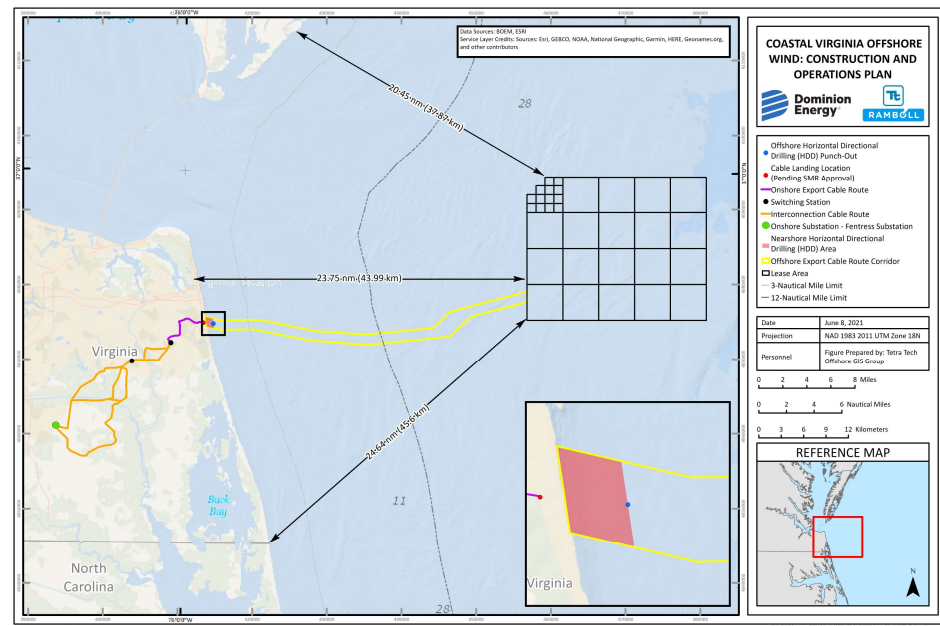
# **CVOW Commercial Monopile Installation Sequence**

- Current as of February 2023
- May be further refined
- Other construction activities will be occurring through all months

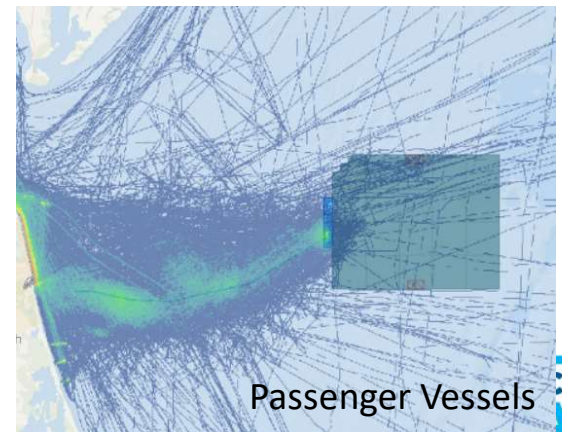
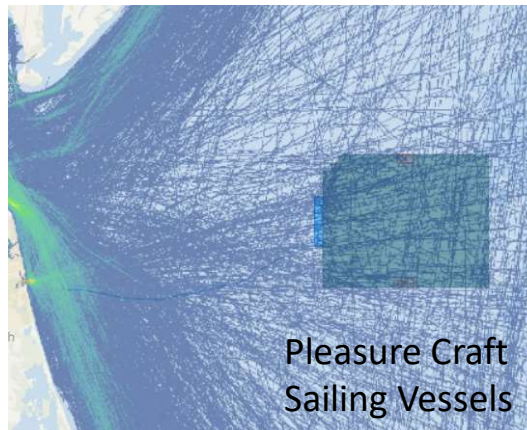
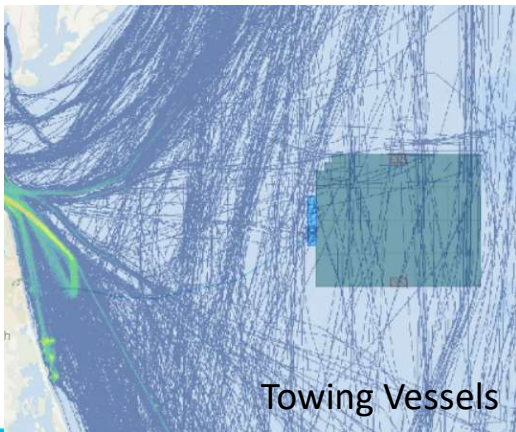
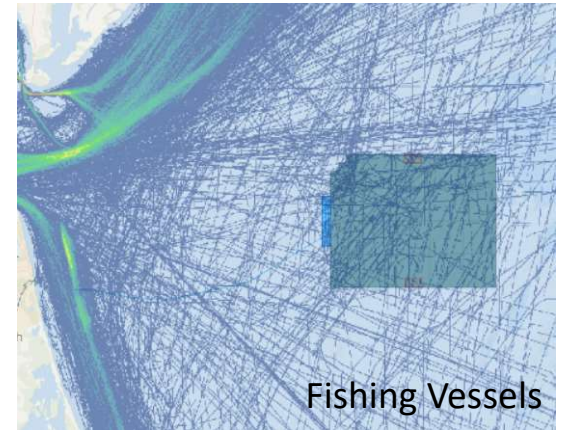
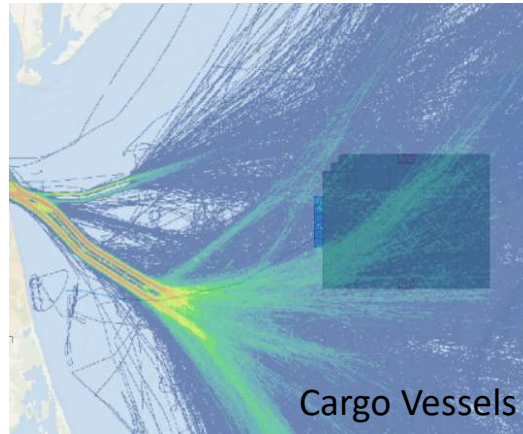
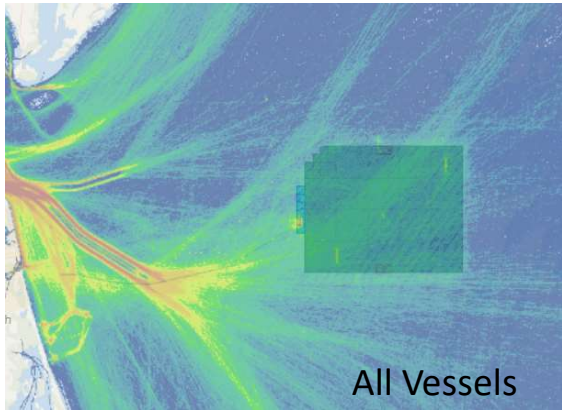


# Coastal Virginia Offshore Wind: Commercial Project

- Largest offshore wind project under development in the United States
- Located 27 to 42 miles offshore VA
- Lease is ~ 15 x 12 miles or 176 sq miles
- 176 turbines and 3 offshore substations
- Distance between turbines is 1.1 miles (0.93 NM) in the N-S direction, and 0.9 miles (0.75 NM) in the E-W direction



2020 AIS Data from MARCO Data Portal

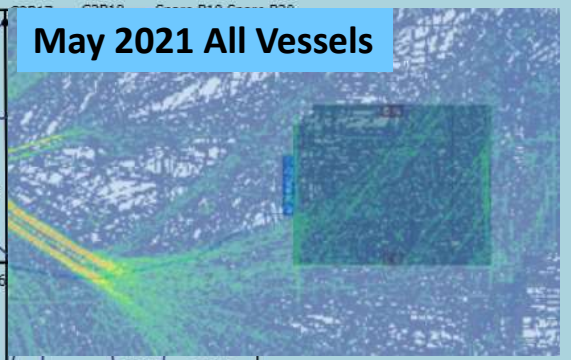
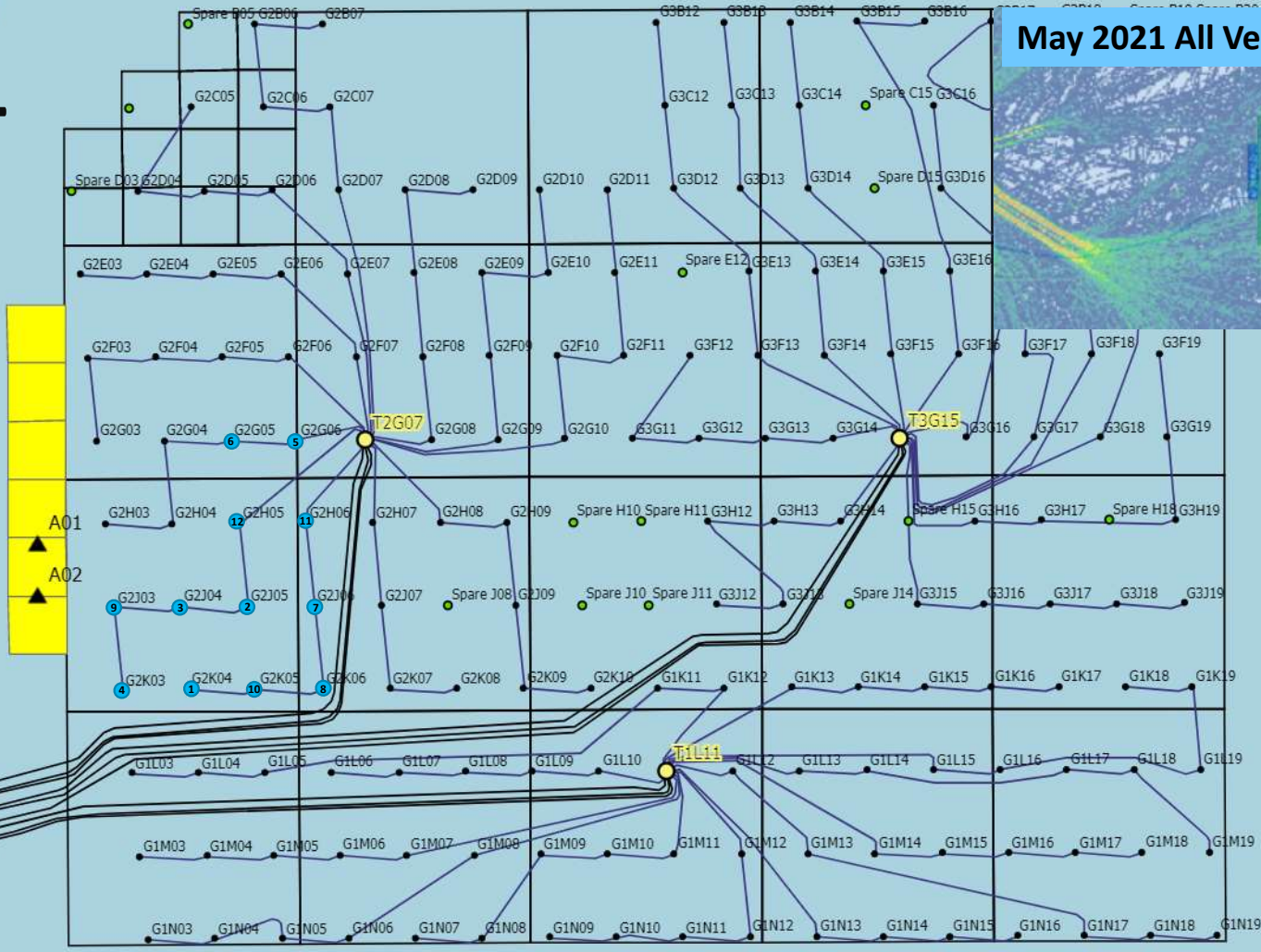


# CVOW Commercial – Monopile Installation Sequence

Find address or place

# May 2024

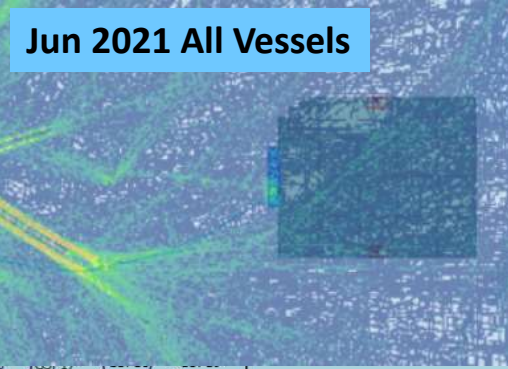
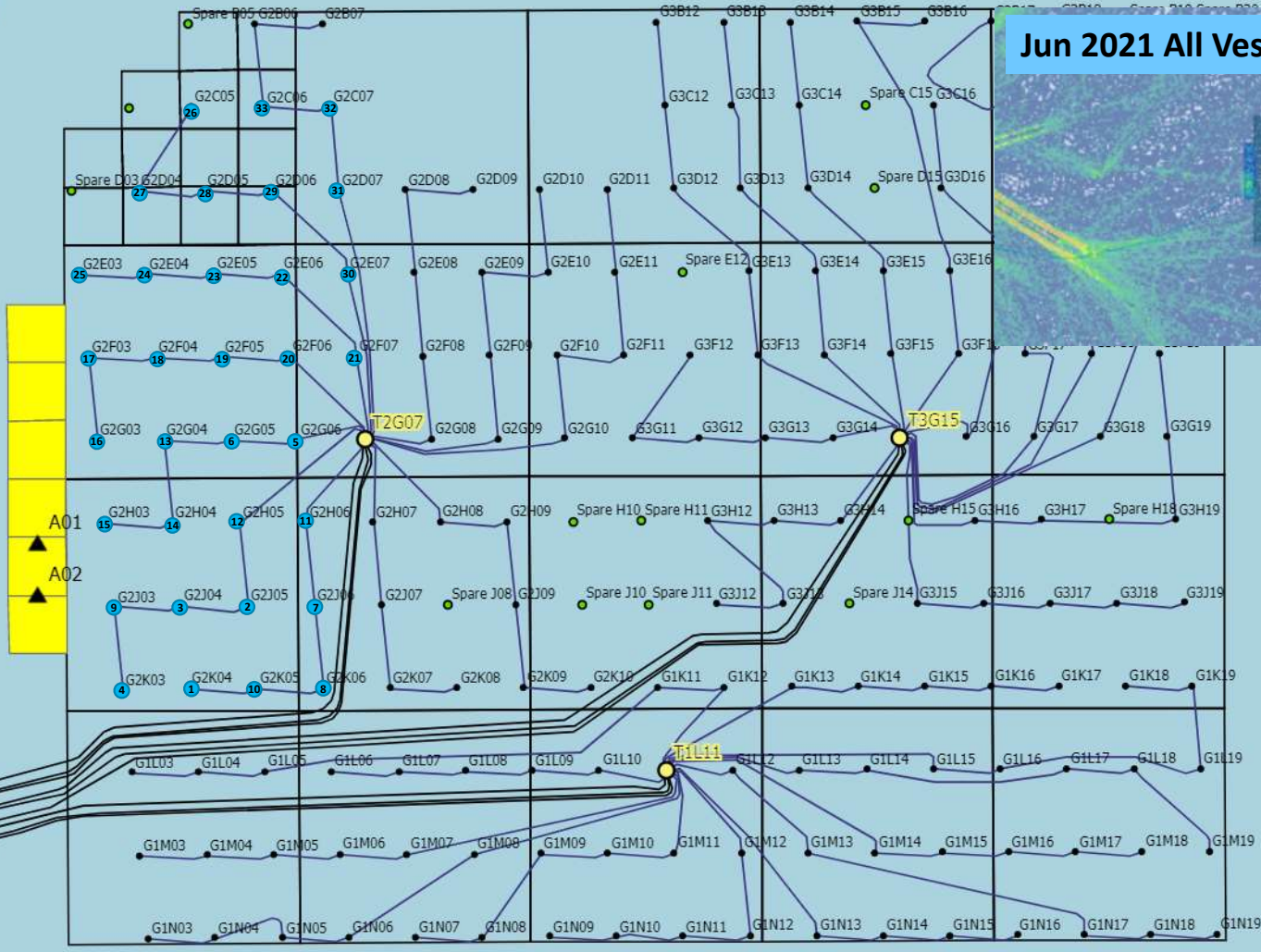
- 12 MPs



# CVOW Commercial – Monopile Installation Sequence

## Jun 2024

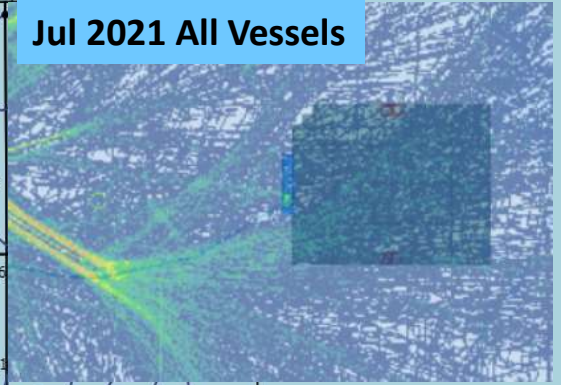
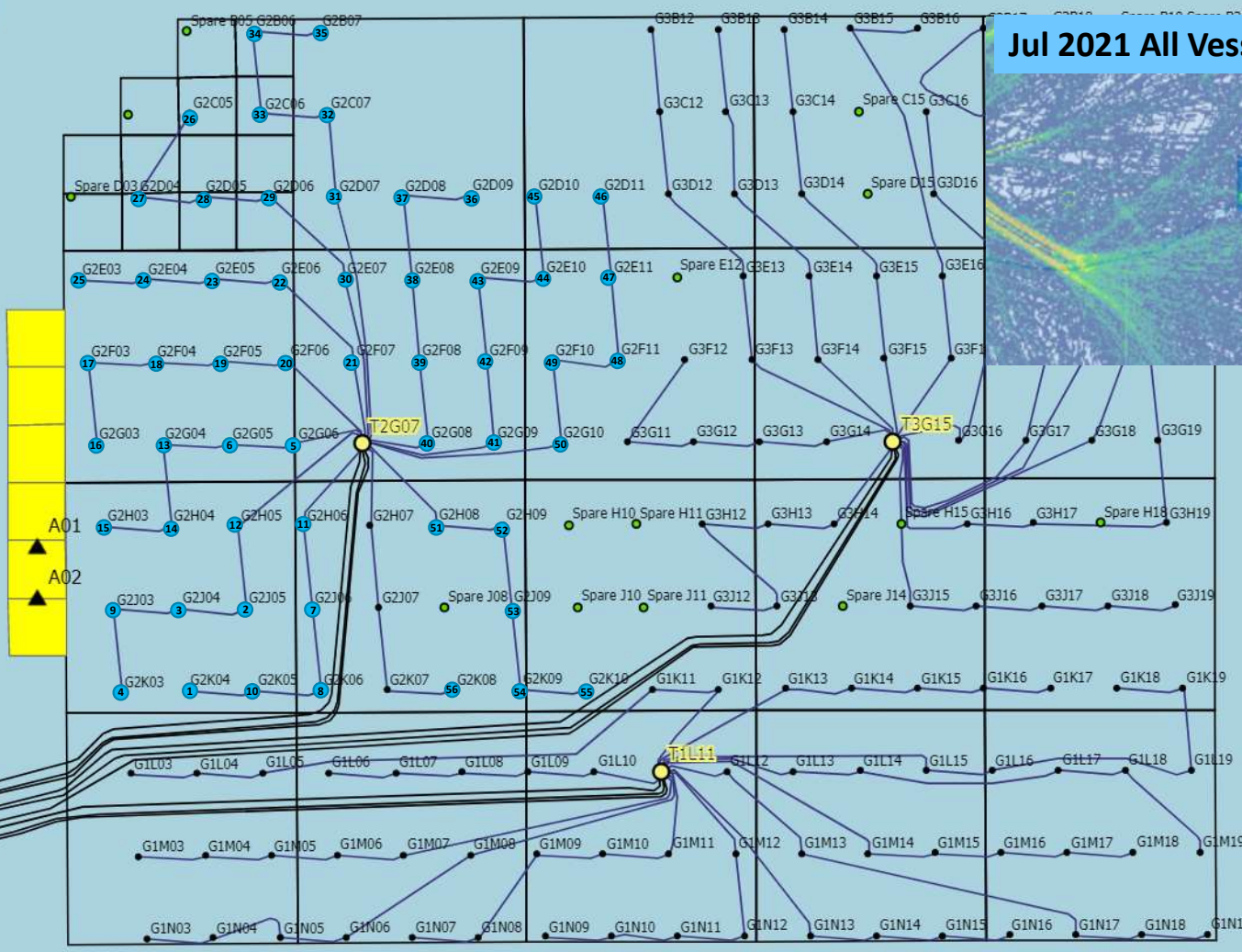
- 21 MPs
- 33 total



# CVOW Commercial – Monopile Installation Sequence

## Jul 2024

- 23 MPs
- 56 total



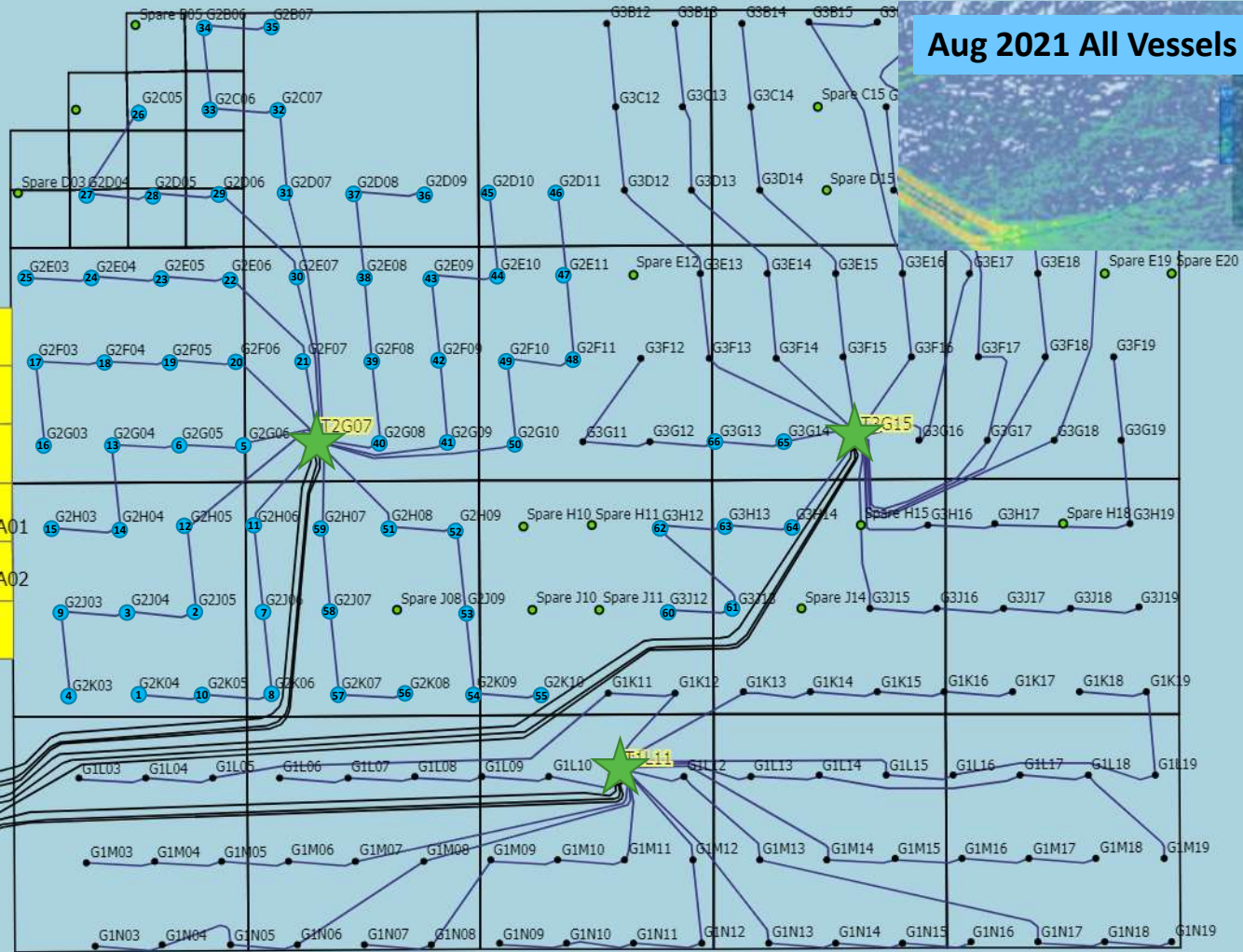
Find address or place

2mi  
36.886 Degrees

# CVOW Commercial – Monopile Installation Sequence

## Aug 2024

- 10 MPs
- 66 total
- 3 OSSs (pin piles)

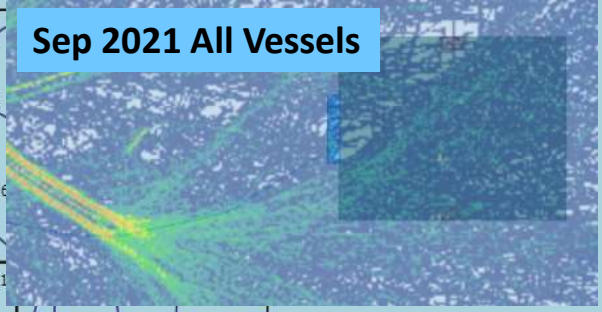
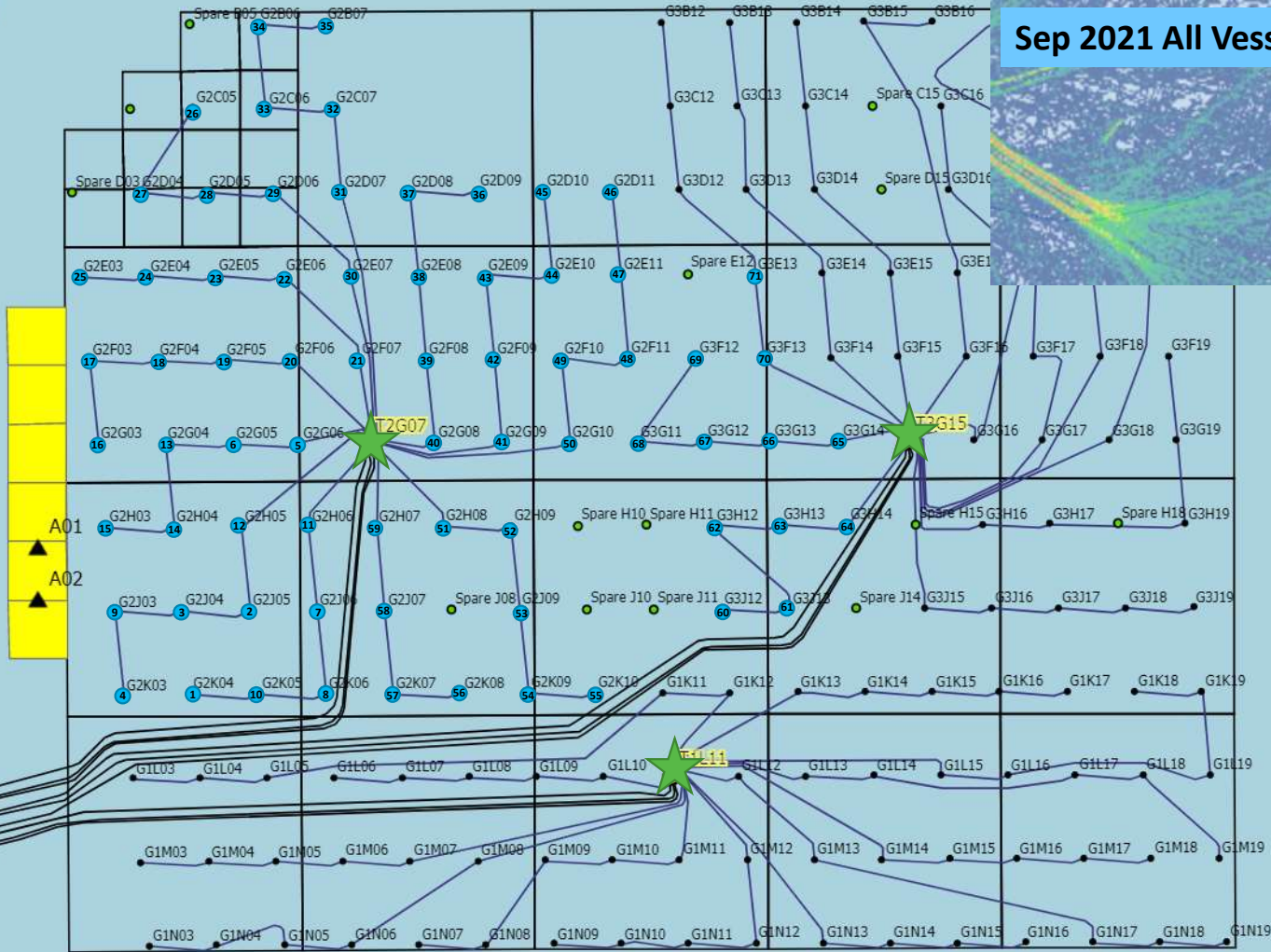


2mi  
36.886 Degrees

# CVOW Commercial – Monopile Installation Sequence

## Sep 2024

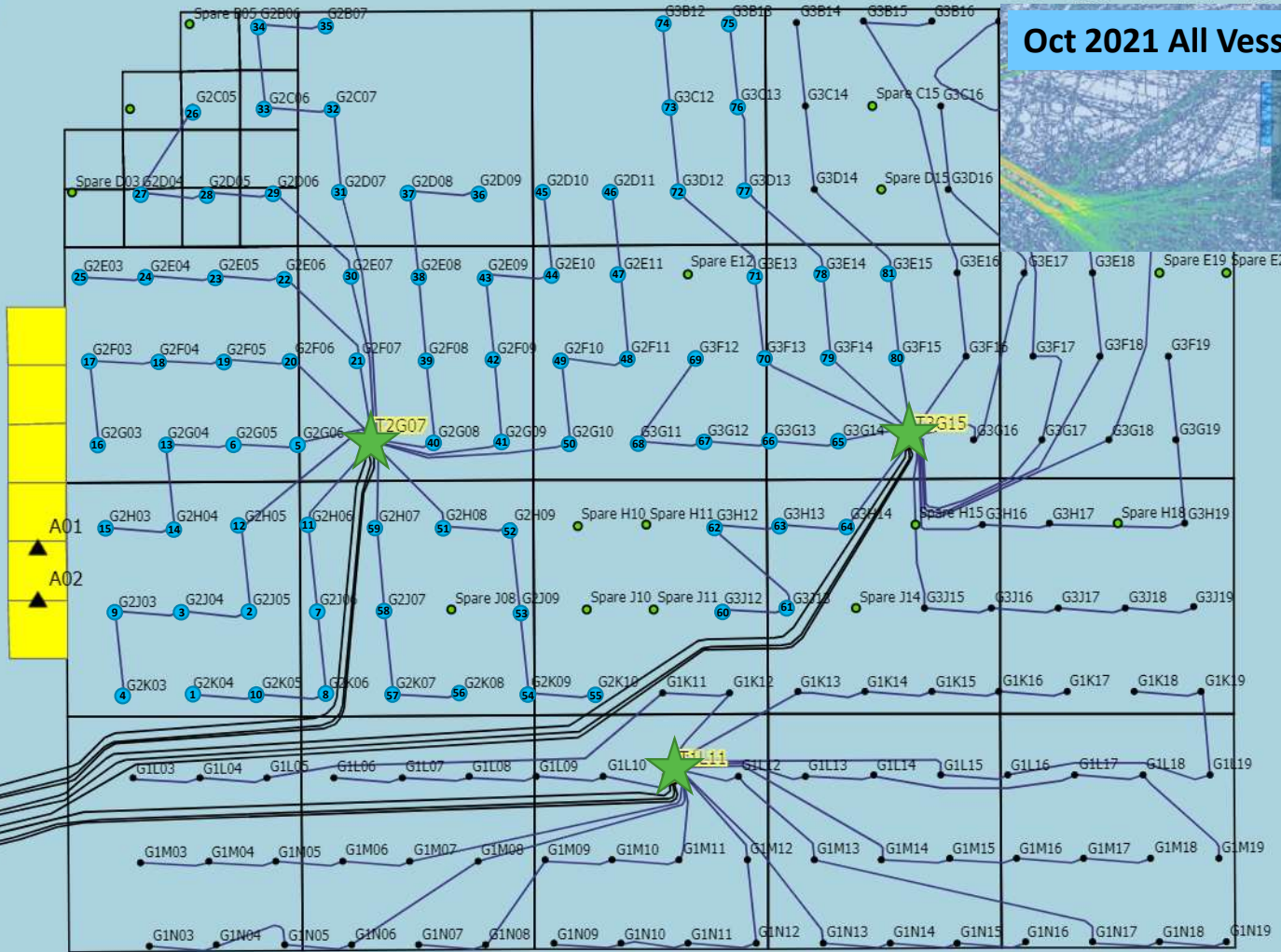
- 5 MPs
- 71 total



# CVOW Commercial – Monopile Installation Sequence

## Oct 2024

- 10 MPs
- 81 total



2mi  
36.886 Degrees



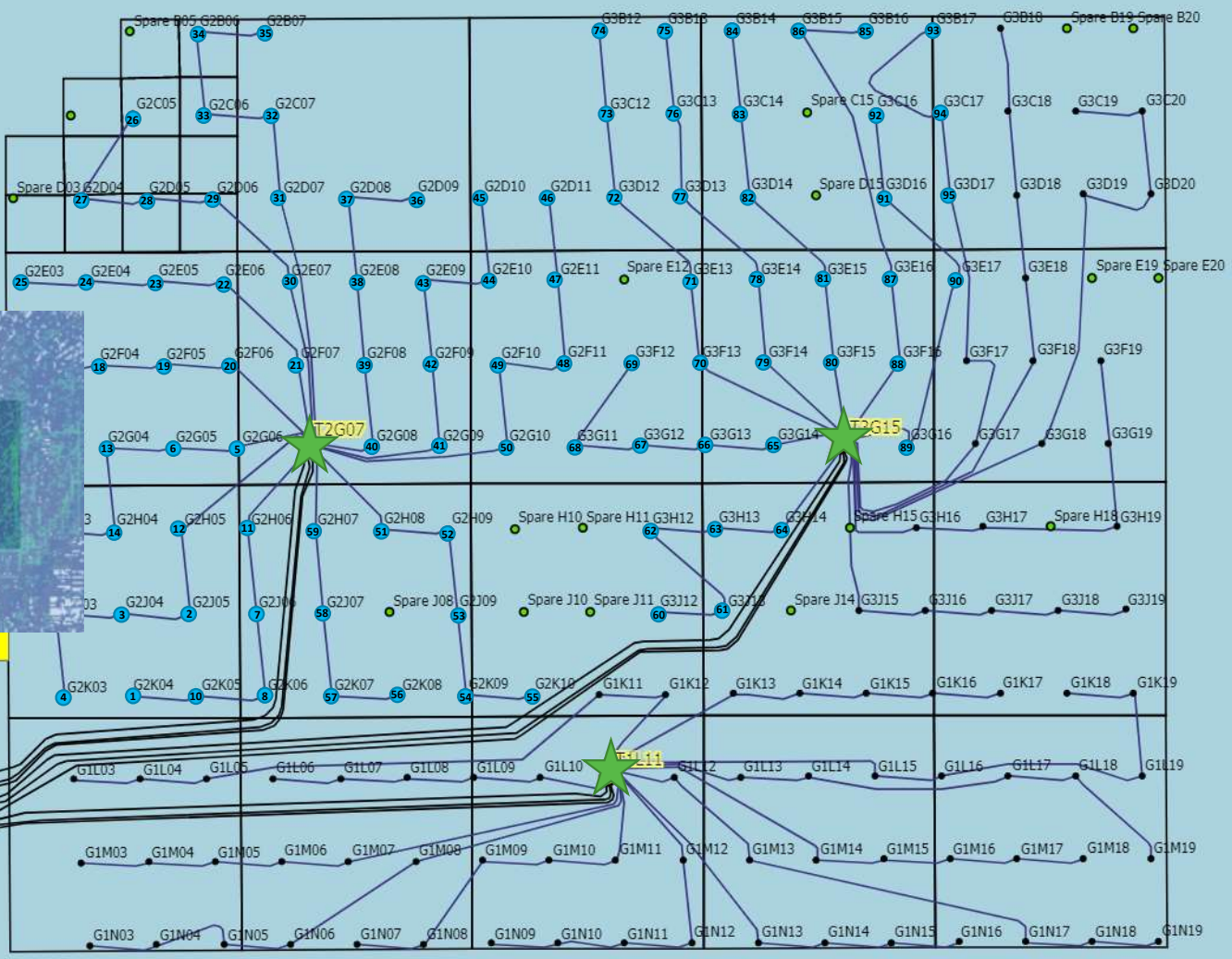
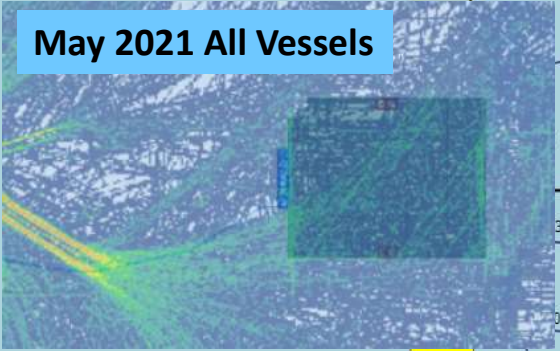
No foundation installation  
November 2024 - April 2025.  
Other construction activities  
continue.

# CVOW Commercial – Monopile Installation Sequence

Find address or place

## May 2025

- 14 MPs
- 95 total

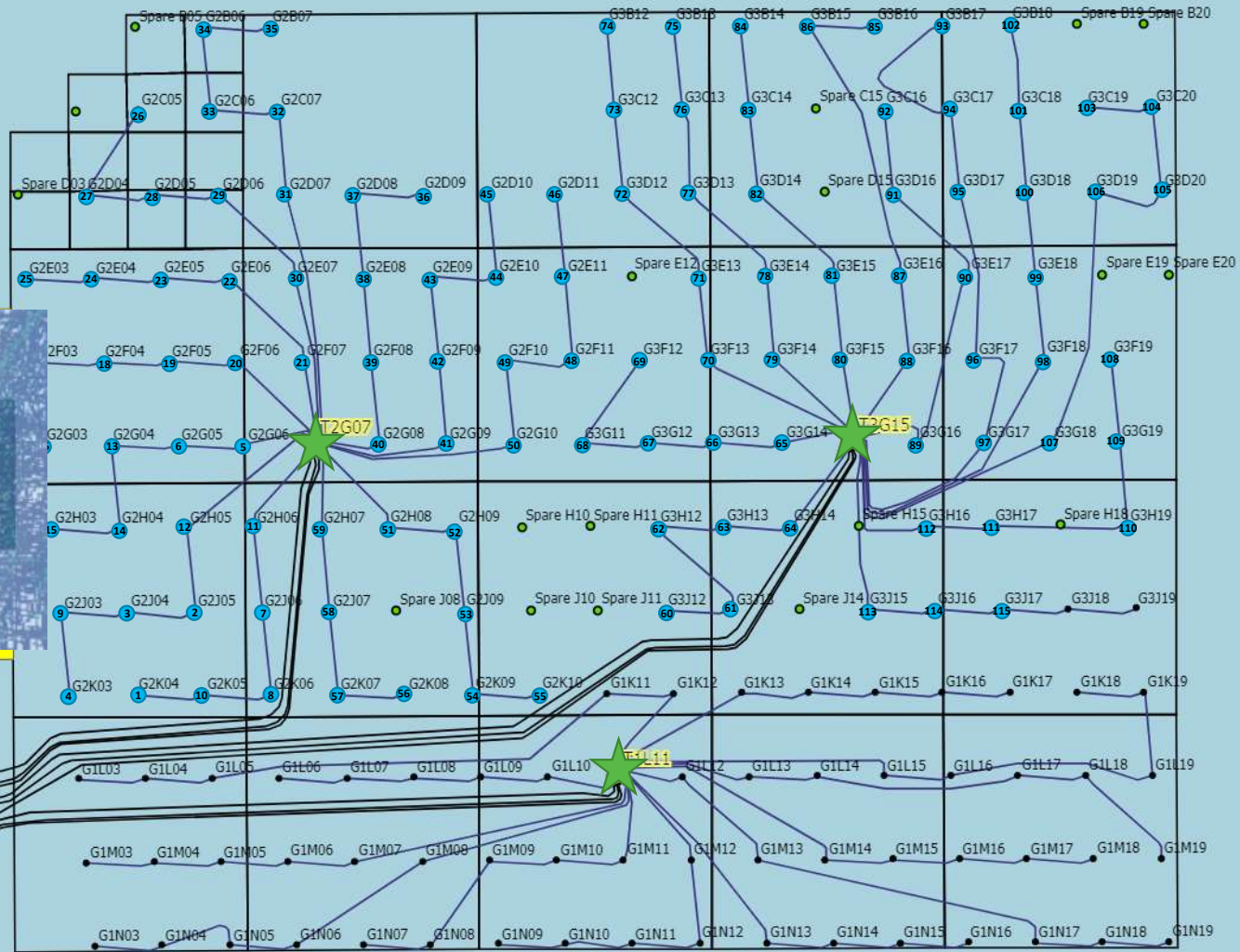
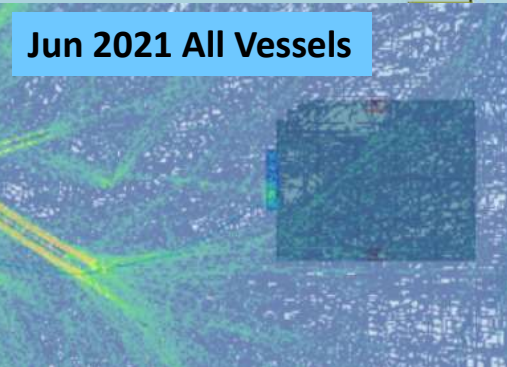


2mi  
36.886 Degrees

# CVOW Commercial – Monopile Installation Sequence

## Jun 2025

- 20 MPs
- 115 total



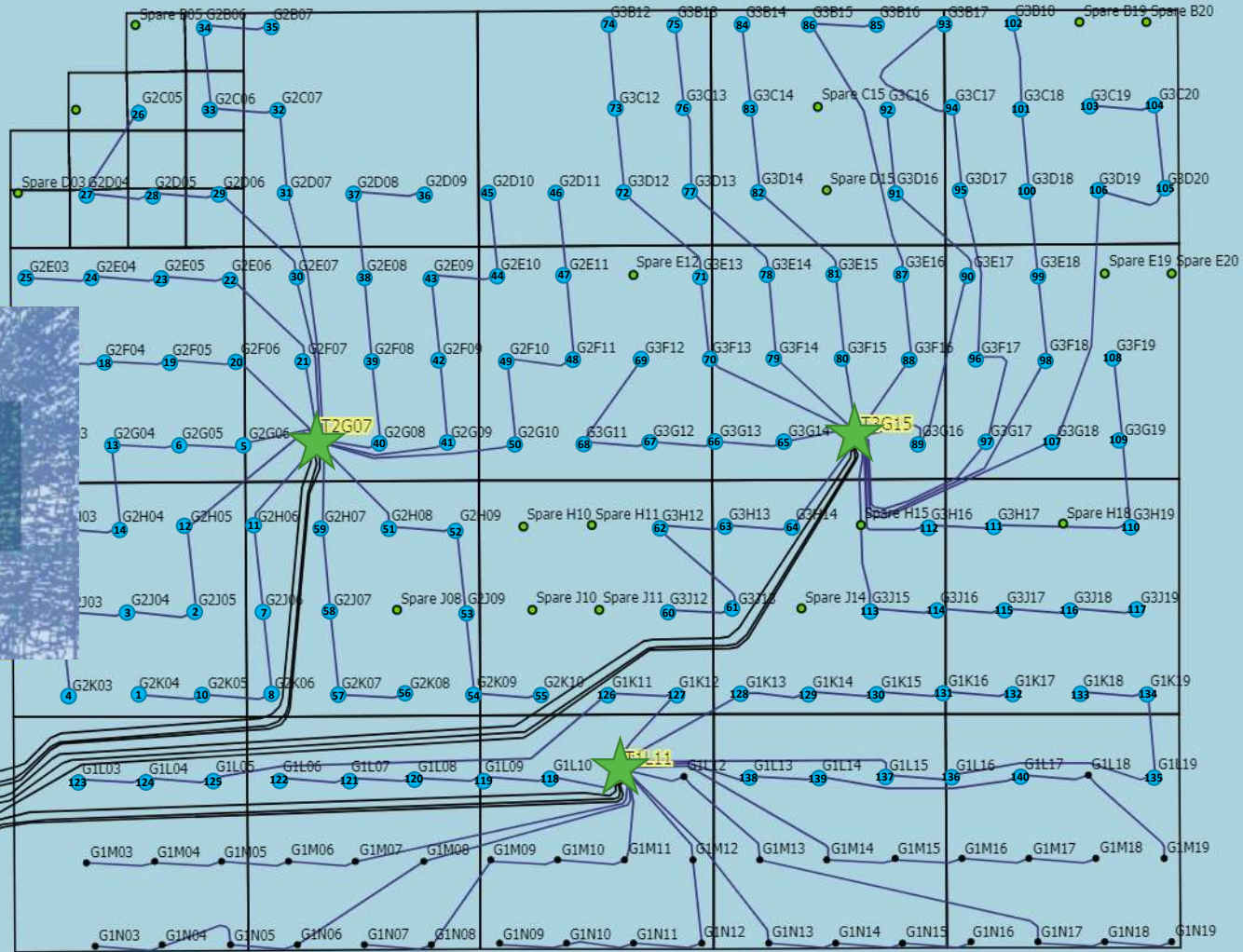
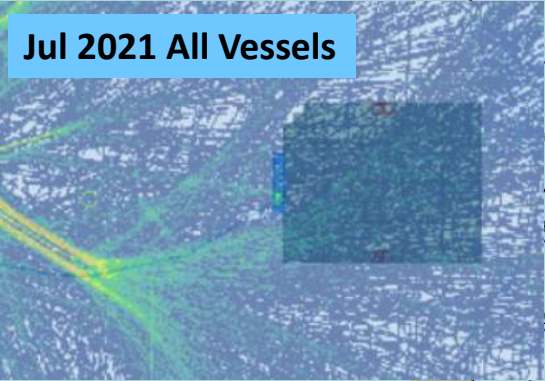
2mi  
36.886 Degrees

# CVOW Commercial – Monopile Installation Sequence

Find address or place

## Jul 2025

- 25 MPs
- 140 total



2mi  
36.886 Degrees

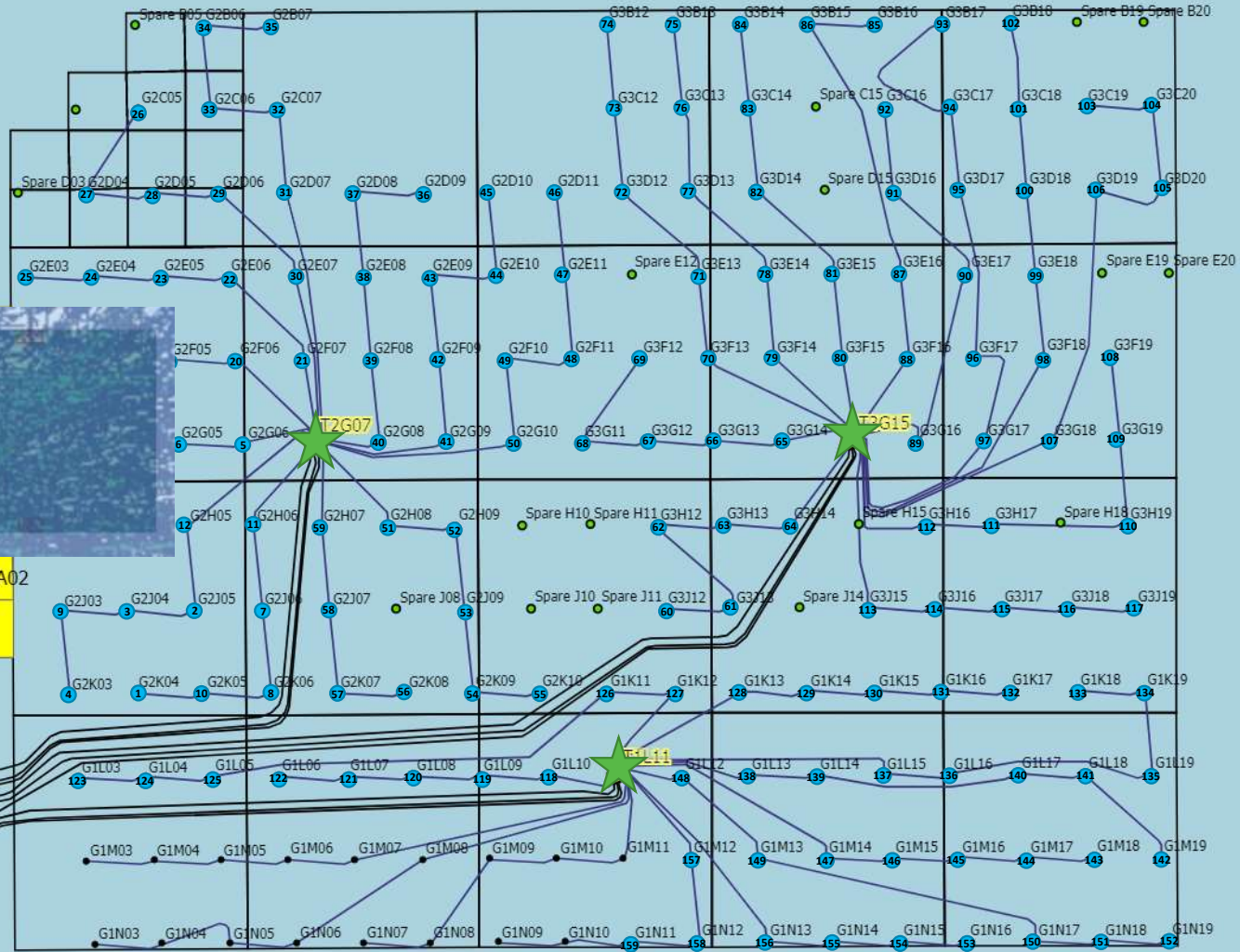
# CVOW Commercial – Monopile Installation Sequence

Find address or place

## Aug 2025

- 19 MPs
- 159 total

Aug 2021 All Vessels



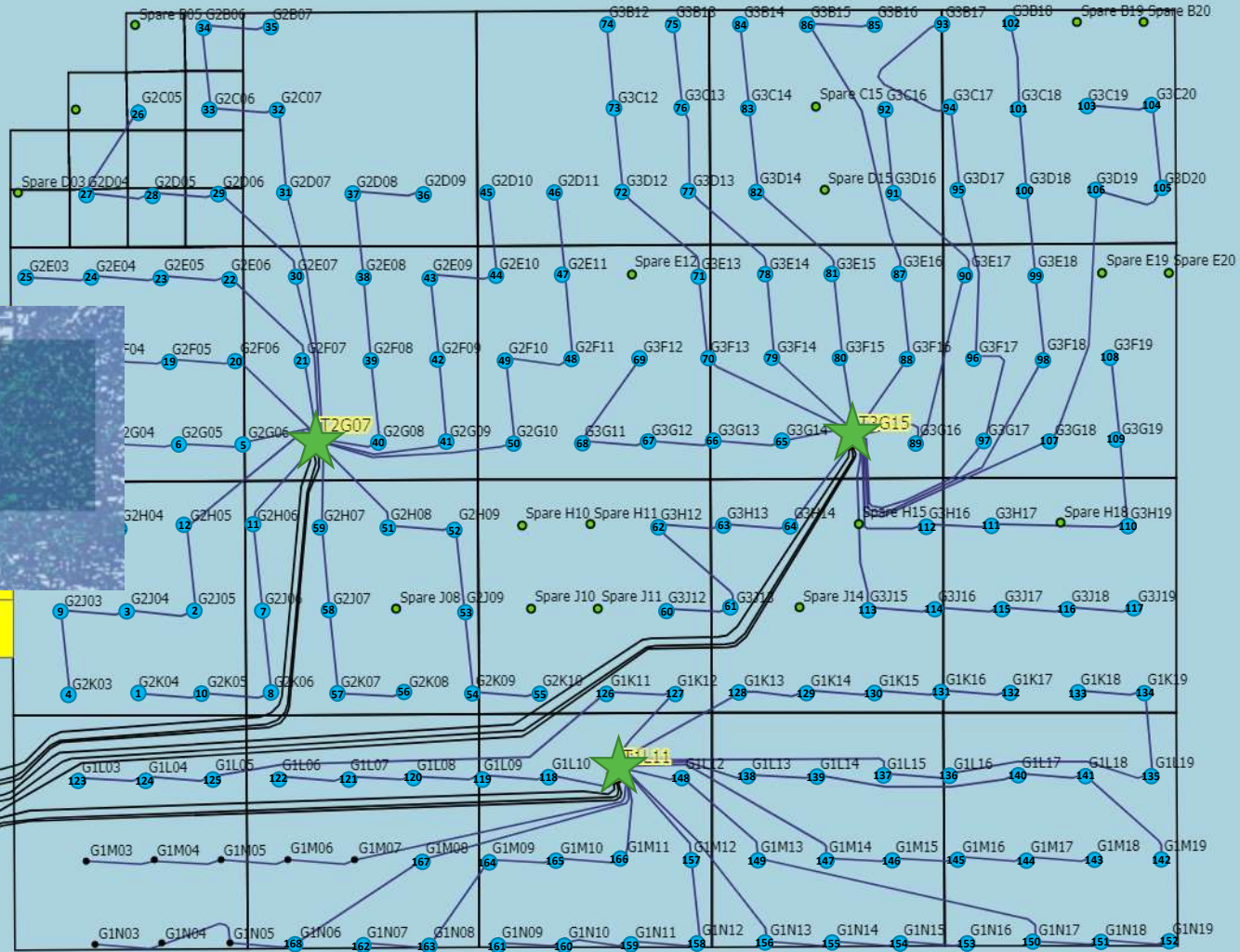
2mi  
36.886 Degrees

# CVOW Commercial – Monopile Installation Sequence

Find address or place

## Sep 2025

- 9 MPs
- 168 total



2mi  
36.886 Degrees

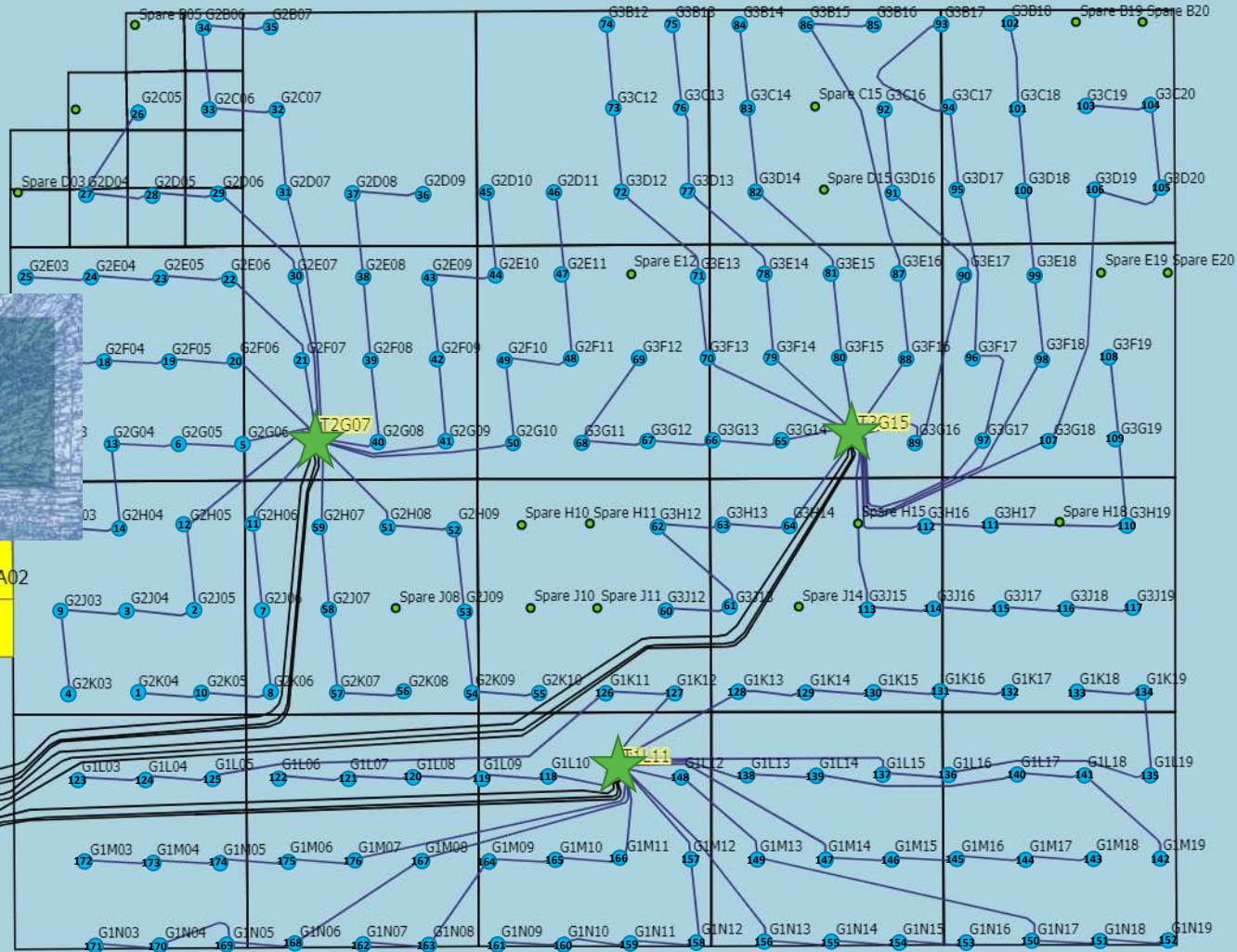
# CVOW Commercial – Monopile Installation Sequence

Find address or place

## Oct 2025

- 8 MPs
- 176 total

### Oct 2021 All Vessels



# East Coast Leases

Label	Lease	Project	Developer(s)
1	OCS-A 0499	Atlantic Shores	EDF, Shell
2	OCS-A 0500	TBD	Ørsted
3	OCS-A 0520	Beacon Wind	Equinor, bp
4	OCS-A 0506	Block Island Wind Farm	Ørsted
5	OCS-A 0483	Coastal Virginia Offshore Wind	Dominion Energy
6	OCS-A 0497	Coastal Virginia Offshore Wind Pilot	Dominion Energy
7	OCS-A 0512	Empire Wind 1	Equinor, bp
8	OCS-A 0482	TBD	Ørsted, PSEG
9	OCS-A 0508	Kitty Hawk Offshore	Avangrid
10	OCS-A 0490	MarWin; Momentum Wind	U.S. Wind
11	OCS-A 0521	South Coast Wind	EDP, ENGIE, Shell
12	OCS-A 0498	TBD	Ørsted
13	OCS-A 0534	Park City Wind; Commonwealth Wind	Avangrid
14	OCS-A 0486	Revolution Wind	Ørsted, Eversource

Label	Lease	Project	Developer(s)
15	OCS-A 0519	Skipjack Wind 1; Skipjack Wind 2	Ørsted
16	OCS-A 0517	South Fork Wind Farm	Ørsted, Eversource
17	OCS-A 0487	Sunrise Wind	Ørsted, Eversource
18	OCS-A 0501	Vineyard Wind	Avangrid, CIP
19	OCS-A 0522	Vineyard Northeast	CIP
20	OCS-A 0532	TBD	Ørsted
21	OCS-A 0541	Atlantic Shores Offshore Wind Bight	EDF, Shell
22	OCS-A 0542	Leading Light Wind	Invenergy, energyRe, Others
23	OCS-A 0539	Community Offshore Wind	RWE Renewables, National Grid
24	OCS-A 0538	Attentive Energy One	TotalEnergies, Rise Light & Power, Corio
25	OCS-A 0537	Bluepoint Wind	EDP, ENGIE, GIP
26	OCS-A 0544	Excelsior Wind	Vineyard Offshore
27	OCS-A 0546	TBD	Duke Energy
28	OCS-A 0545	TBD	TotalEnergies