

A photograph of an offshore wind farm with several white wind turbines on yellow foundations in the blue ocean under a clear blue sky. A small boat is visible near the base of the largest turbine in the foreground.

\$100 Billion Offshore Wind Industry and its Benefits to New England Businesses



CHAMBERS FOR
INNOVATION &
CLEAN ENERGY

Thank you to our co-hosts



CHAMBER *of* COMMERCE
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BRIDGEPORT
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BUSINESS COUNCIL
Where Commerce & Community Connect



Today's Presenters

- **Bruce Carlisle**
 - Managing Director Offshore Wind, Massachusetts Clean Energy Center
- **Nate Mayo**
 - Director of Public Affairs, Vineyard Wind
- **Jennifer Cullen**
 - Manager of Workforce and Supply Chain Development, Vineyard Wind
- **Rick Kidder**
 - Co-CEO, One SouthCoast Chamber



Offshore Wind in Massachusetts



Overview



- MassCEC - offshore wind
- OSW and energy generation
- MA procurements
- Ports and infrastructure
- Workforce
- Supply chain
- Research and innovation
- Gulf of Maine

Massachusetts Clean Energy Center

Our Mission: Grow the state's clean energy industry while helping to meet the Commonwealth's clean energy, climate and economic development goals.

INVEST

Invest in programs that increase **clean energy adoption** by residents, businesses and communities.

CONNECT

Connect employers, job seekers, students, communities and investors within and across the clean energy industry.

INNOVATE

Help to spur innovation through **infrastructure, funding and technology development support.**

MassCEC - offshore wind

Advance and support the responsible development of offshore wind and increase local jobs and economic activity.

PLANNING, ANALYSIS & ENGAGEMENT

Technical projects and stakeholder engagement on marine wildlife, fisheries, habitat, met-ocean, and transmission.

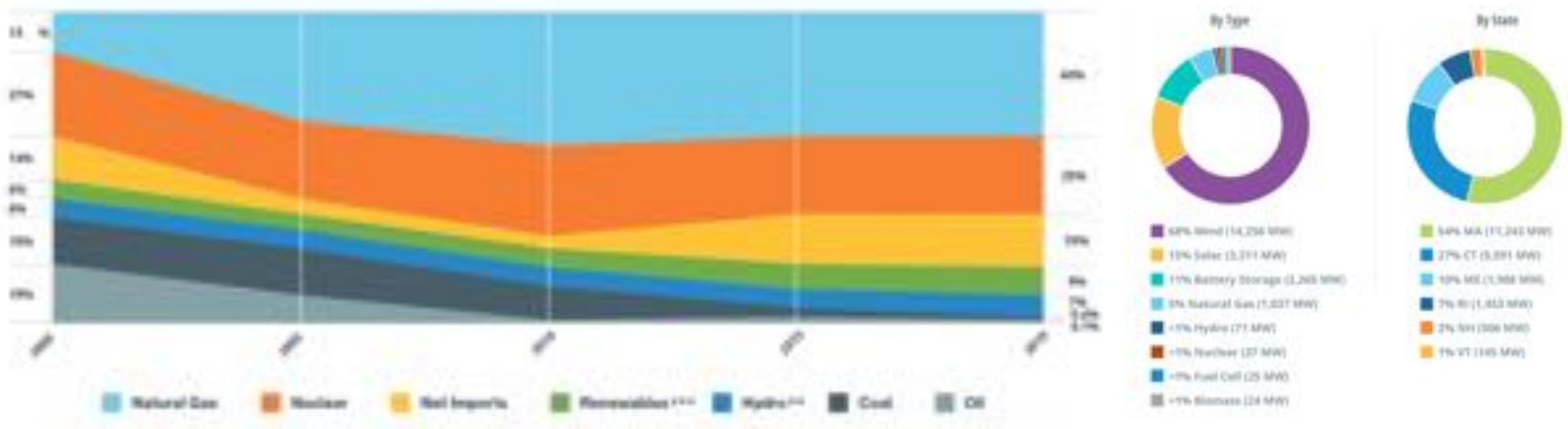
SECTOR DEVELOPMENT

In coordination with partner agencies, expand manufacturing, suppliers, services, infrastructure and grow a well-trained and highly-skilled workforce .

RESEARCH & INNOVATION

Support for and collaboration with institutions, industry, and government to advance technology innovation, learn from early deployments, and expand offshore energy research in the Commonwealth.

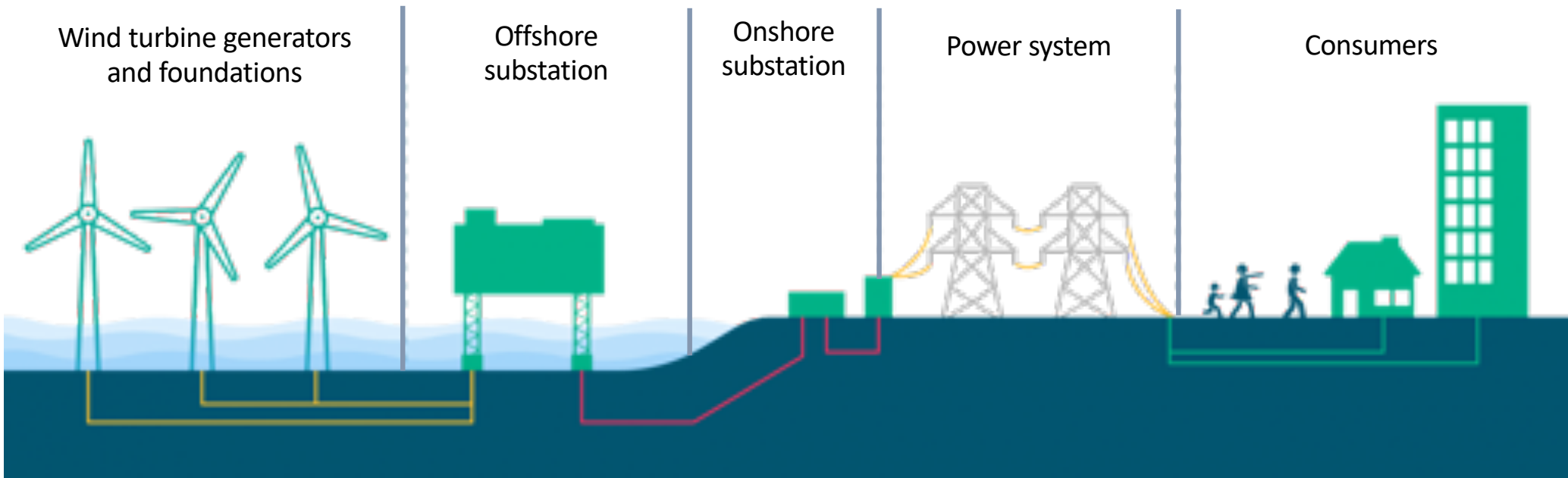
Energy mix for New England



- Since 2000, energy resource mix for NE has shifted away from coal and oil to low or non-carbon sources
- State policies are driving investments in renewable energy, including GHG emission reduction goals and Renewable Portfolio Standards

Source: ISO-NE

Offshore wind: system overview



- Turbines generate energy: factor of turbine size, wind speeds, time in operation
- Lower voltage energy from array is collected at offshore substation
- High voltage export cables transmit energy to onshore substation
- Distributed to power system

Offshore wind: local energy resource solution



- Significant renewable energy resource, very close to “load” (energy consumption)
- Regional energy generation retirements
 - Salem Station (coal)
 - Brayton Point Station (coal)
 - Plymouth Station (nuclear)
 - Mystic Station (oil and natural gas)
- Highly competitive pricing
 - Major cost reductions in last 2-3 years
- Production profile coincident with winter peak demand

Offshore wind: climate and economic benefits



- Essential to meeting our GHG reduction and net-zero carbon goals
- Significant economic benefits
 - \$70B supply chain opportunity for US
- 2018 MA assessment - 1,600 MW of OSW:
 - 2,000 to 3,000 direct job years
 - \$675M to \$800M economic impact
- Vineyard Wind and Mayflower Wind projects:
 - Eliminate 3.36M tons CO2 annually (750,000 cars/year)
 - \$7.4B in energy related savings

WIND TECHNOLOGY TESTING CENTER



NEW BEDFORD MARINE COMMERCE TERMINAL



Block Island Wind Farm



- 7 LEASE AREAS
- 1,418 MILES²
- 4 DEVELOPER TEAMS
- 6 PROJECTS SELECTED
- 4,110 MW CONTRACTED

- Orsted
- Vineyard Wind
- Equinor Wind US
- Mayflower Wind Energy

Massachusetts OSW procurements



- 2016 statute – DOER and utilities to solicit 1,600 MW of *cost-effective* offshore wind
- 2017/2018 – 1st RFP long-term contracts for offshore wind energy
 - Vineyard Wind 800 MW project
 - 8.4 cents/kWh
- 2019/2020 – 2nd RFP long-term contracts for offshore wind energy
 - Mayflower Wind 800 MW project
 - 7.8 cents/kWh

US offshore wind market

	State target (MW)	MW selected (offtake)
Maine	-	~10
Massachusetts	3,200	1,600
Rhode Island	430	430
Connecticut	2,000	1,100
New York	9,000	1,826
New Jersey	7,500	1,100
Maryland	1,200	368
Virginia	5,200	2,652
Total	28,530	9,086

Massachusetts future procurements



- 2018 statute – Increase OSW goal to 3,200 MW, pending study on necessity, benefits and costs
- DOER may require utilities to solicit and procure independent offshore wind transmission
- DOER study released May 2019 recommended:
 - Moving forward with additional 1,600 MW
 - Predictable procurements 24-30 months apart
 - Potential for separate solicitation for independent transmission in 2020

Ports and infrastructure



- MassCEC study to evaluate existing port and waterfront infrastructure as potential locations
- 19 South Coast and Boston sites evaluated:
 - Engineering assessment
 - Redevelopment scenarios and reuse cases
 - Permitting, regulatory processes, and timelines
 - Limitations and conditions
- North Shore sites to be added:
 - Initial focus on construction base port and manufacturing / production locations
 - 20 acres or greater

Workforce

- 2018 OSW Workforce Assessment
 - Target priority occupations: skilled trades, water transportation, O&M technicians
- MassCEC FY19 OSW/workforce grant awards – in progress
 - GWO safety and technical training
 - Education programs and certificates
- MassCEC FY20 workforce grant solicitation
 - Partnerships with offshore wind industry
 - Expanding access to OSW jobs
 - OSW program development
- Community of practice



BRISTOL
COMMUNITY COLLEGE



University of
Massachusetts
Amherst



Supply chain

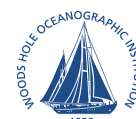


- Massachusetts OSW Supply Chain Directory
 - New platform: directory.masscec.com
 - Inventory of business information, capabilities, contacts, opportunities
- Forums, “Meet the Buyer” events, and specific assistance to connect OSW industry with local services and suppliers
 - IPF and USOW20 conferences
 - MA, RI and CT forum TBD
- MassCEC OSW supply chain assessment RFP
 - Analysis of MA and regional OSW supply chain
 - Technical and engagement support for supply chain development activities

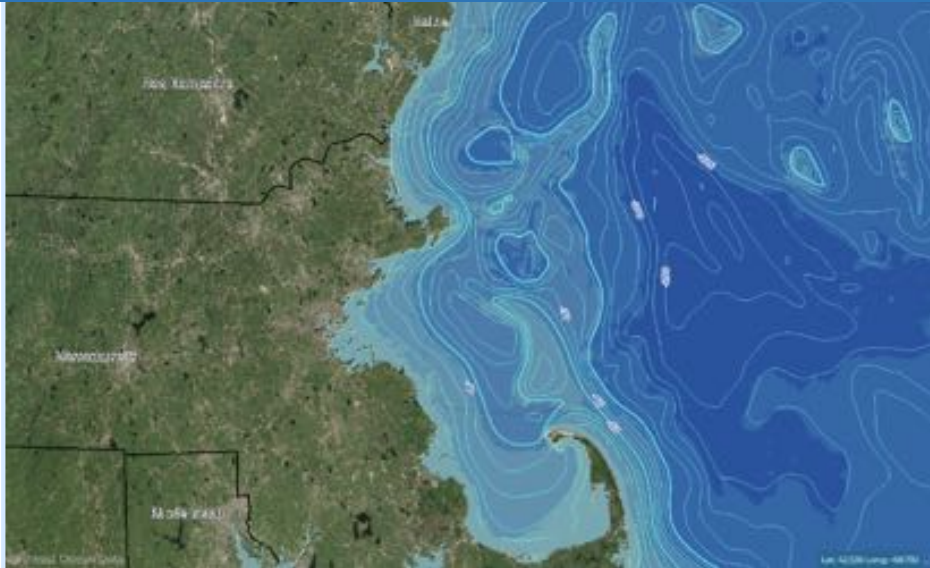
Research and innovation



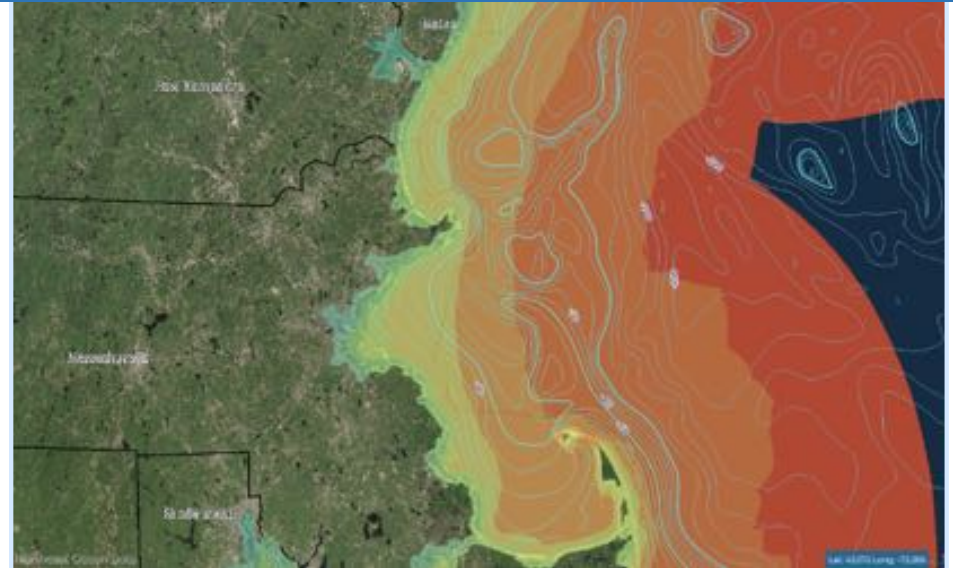
- National Offshore Wind Research and Development Consortium
 - Announcement in June
 - 12 awarded proposals - \$10.3M
- MassCEC joins Offshore Wind Challenge
 - Vineyard Wind and Greentown Labs
 - Innovations to improve real-time marine mammal monitoring data and analysis
- Massachusetts Research Partnership



Gulf of Maine



- BOEM formation of the Gulf of Maine Renewable Energy Task Force
- Representatives from MA, NH, ME, federal agencies and municipalities
- 1st Task Force meeting December 2019
- Deeper waters: 50m to 200m



- Greater wind resource farther offshore
- Floating wind technology
- Next Task Force meeting – TBD (Fall?)
- Phased, multi-year process from planning to leasing

Thank you



Visit us at www.MassCEC.com/offshore-wind

Sign up for our Daily News Digest,
Events Newsletter and more!
masscec.com/email-updates



Follow us on social media





VINEYARD WIND



Chambers for Innovation & Clean Energy

June 23, 2020

OFFSHORE WIND TODAY

Mature Technology

- **20+ year history in Europe** (4000+ turbines, Over 22 GW)
- **Massive Potential** in the northeast: 22GW in ten years; 25x VW1/PCW
- **Main source of new energy:** local and renewable



Governments Leading

- Major State policies across east coast
- Vineyard Wind 1 selected by MA 2018; **construction 2021**
- Park City Wind selected by CT in 2019 **construction 2023**

EACH project:

- Energy for 400K homes and businesses from each project
 - PCW will provide 14% of CT's energy
- **Cost competitive:** (VW1: \$1.2B ratepayer savings)
- Emissions Reductions: (VW1: 1.6M tons/yr)
- Major local infrastructure and workforce investments



YEARS OF STAKEHOLDER WORK

Siting:

- Gov't led process to identify areas
- Area reduced by ~60%: birds, fishing, navigation, whales

Environmental Protection

- Extensive survey, research, public/private collaboration
- Consultation and agreements with environmental groups

Community Engagement

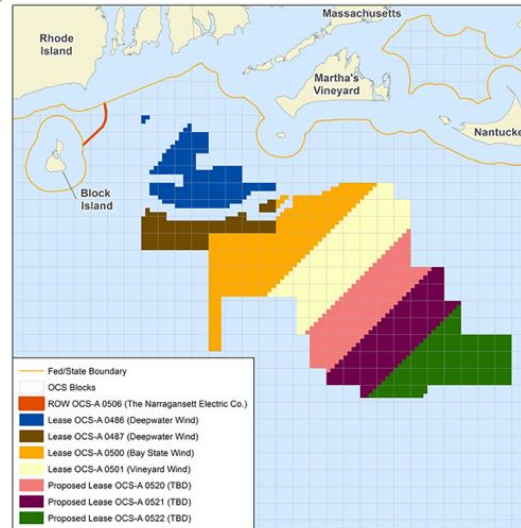
- Local, neighborhood level
- Community Benefit and Host Community Agreements

Fisheries

- Early/often communication
- Major design concessions (1x1nm spacing)
- \$ Tens of millions in mitigation funding
- Extensive, ongoing fisheries research

Active, Ongoing Consultation

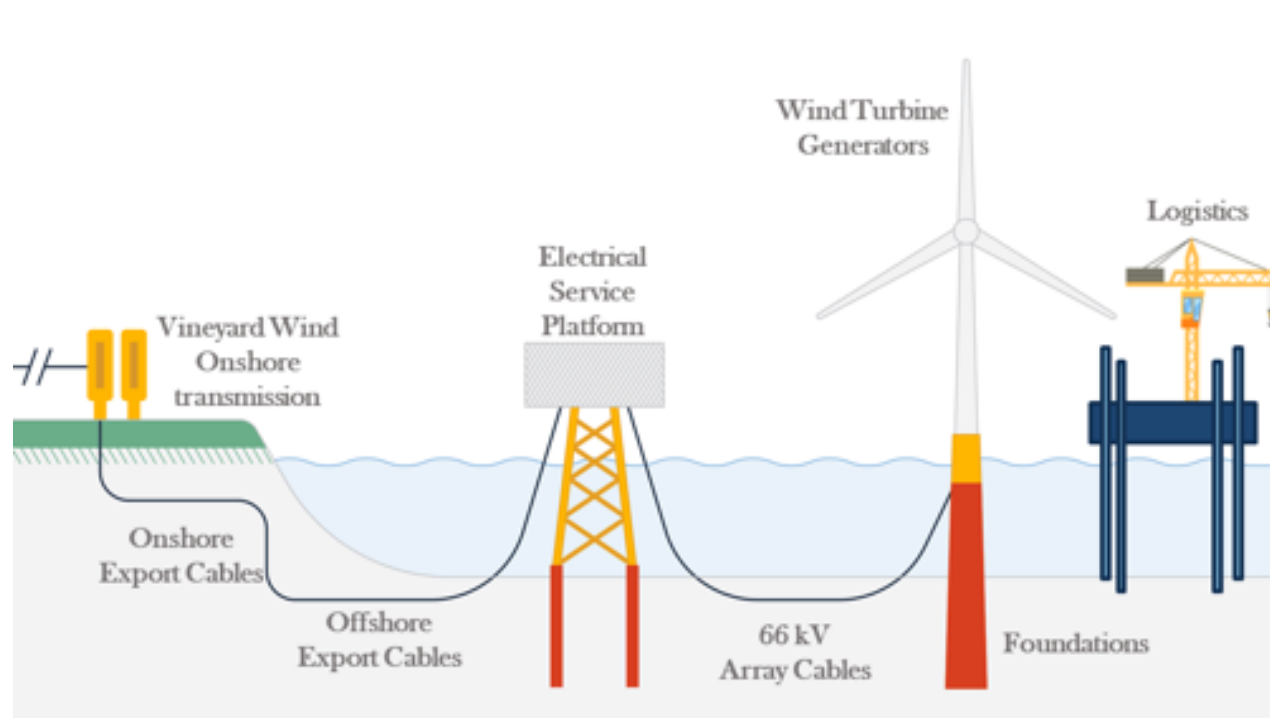
- Extensive work with indigenous nations, historic impact review, local planning, community meetings
- Dozens of permits at all levels of gov't for each project



VINEYARD WIND PROJECTS



SUPPLY CHAIN



- Create the right supply packages
- Select the right supply chain partners
- Help our suppliers find partners and the right sub-contractors

SUPPLY CHAIN TIERS



Main packages:

- Foundation supplier
- WTG supplier
- ESP supplier
- Cable suppliers
- Installation contractors

Examples:

- Secondary steel fabrication
- Tower manufacturing
- Electrical components
- Cable Protection
- Crane suppliers

Examples:

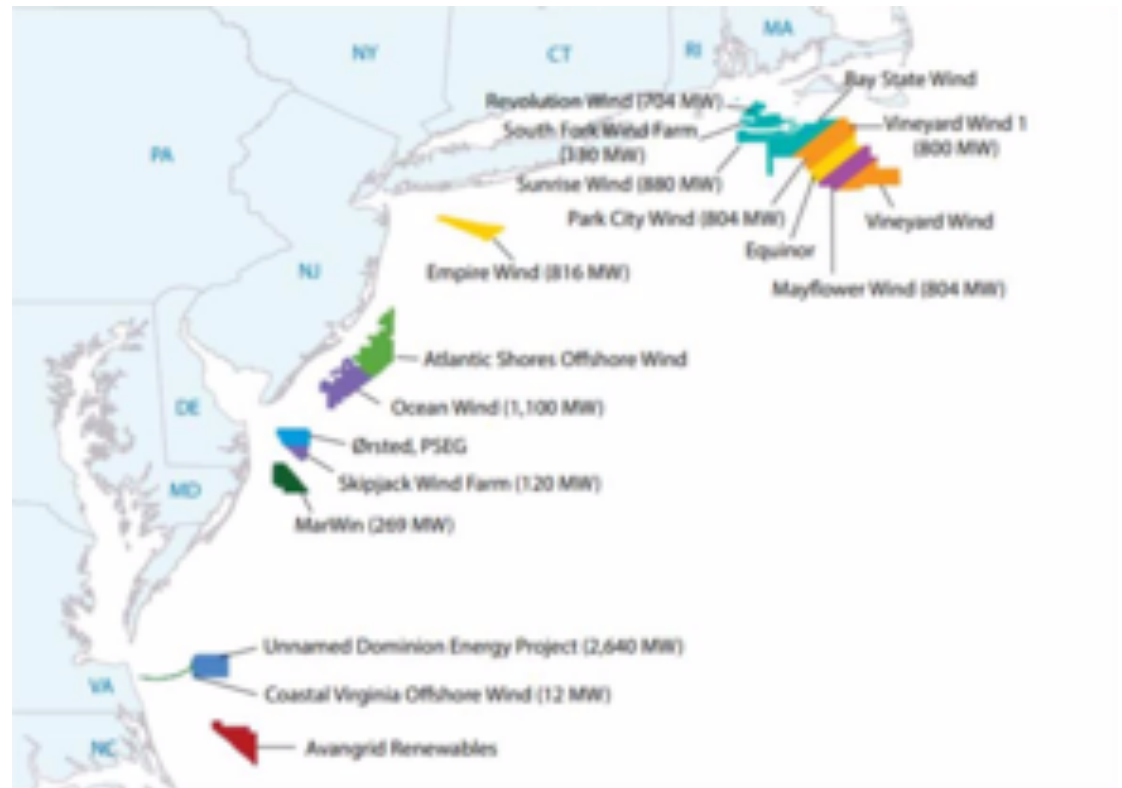
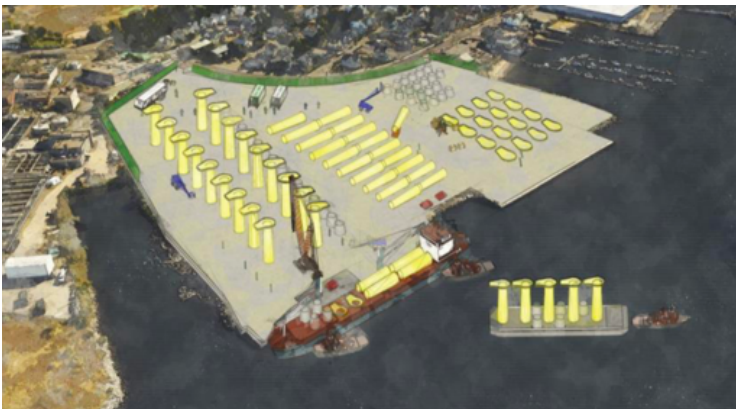
- Maritime and port services
- Tools, fuel, supplies
- Support vessels
- Training and engineering
- Support services

VW & PCW PORTS

New Bedford Marine Commerce Terminal, MA



Barnum Landing, Bridgeport CT



ECONOMIC DEVELOPMENT INITIATIVES



Offshore Wind Industry Accelerator Fund

- \$10 million fund managed by the Massachusetts Clean Energy Center to accelerate the development of the offshore wind supply chain, businesses, and infrastructure in Massachusetts

MA Windward Workforce Program

- \$2 million program to recruit, mentor, and train residents of Massachusetts for careers in the offshore wind industry

Resiliency and Affordability Fund

- Partnership with Vineyard Power and Citizens Energy to support community-based energy storage projects and address energy affordability challenges in low-income communities on Cape Cod, Islands, and South Coast



Supply Chain Network Initiative

- Supply chain database
- Support for business development
- Meet the Buyer events
- Funding for ports investigation

CT Windward Workforce Program

- Safety and technical trainings
- Educational programs K-12, higher education, votech programs
- Labor and pre-apprenticeship programs

MEET THE BUYER

Connecting Local Companies with Vineyard Wind Suppliers

- Events to connect local businesses with VW and PCW suppliers
- Alongside MassCEC, Vineyard Wind has hosted three “Meet the Buyer” events to date
- Vineyard Wind is committed to hosting additional “Meet the Buyer” events with all projects’ major suppliers

MEET THE

BUYER



WORKFORCE DEVELOPMENT

1. Development

- Local teams
- Internship programs

2. Construction

- PLA
- Training programs/facilities

3. Operations and Maintenance

- Vineyard Wind 1: Vineyard Haven O&M
- Park City Wind: Bridgeport O&M

4. Supply Chain

- Meet the Buyer events
- Importance of local connections and resources
- Partnerships between European and US companies



GWO BASIC SAFETY TRAINING



EDUCATIONAL PROGRAMS

BRISTOL
COMMUNITY COLLEGE

NATIONAL OFFSHORE
WIND INSTITUTE



GWO CERTIFIED TRAINING PROGRAMS

All training delegates will have a WINDA profile and identification number. When delegates successfully complete GWO training courses, the NOWI uploads and verifies all training records and certificates for easy access by offshore employers.

Basic & Advanced Safety Training

NOWI offers basic safety courses including First Aid, Manual Handling, Fire Awareness and Working at Heights. The NOWI also offers courses in Advanced Rescue training as well as Enhanced First Aid training.

Basic Technical Training

NOWI offers three training modules including mechanical, electrical and hydraulics. Delegates that successfully complete the mechanical module can enroll in an additional installation training module.

Customized Training

Bristol Community College offers safety and technical training courses customized to meet current and future workforce needs.

Refresher Courses

To ensure that delegate certifications are current, NOWI offers refresher courses in Basic Safety Training, Advanced Rescue Training and Enhanced First Aid Training.

DEGREE & CERTIFICATE PROGRAMS

Bristol Community College is the only U.S. training provider that offers certificate and associate degree programs specifically in offshore wind power technology, augmented with GWO certificates.

The U.S. offshore wind industry is emerging in the North Atlantic near the Massachusetts coastline and Bristol Community College is leading the way in workforce development. Bristol's National Offshore Wind Institute offers basic and advanced safety and technical training programs to prepare workers for jobs in construction, deployment, operations and maintenance of offshore wind farms.

Bristol and its training partners provide delegates a state-of-the-art training experience leading to the safety and technical competency certificates required for careers in offshore wind.



FOR MORE INFORMATION

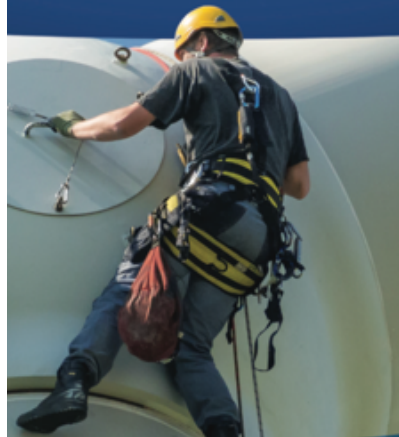
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FREE OFFSHORE WIND 101 COURSE

AT CAPE COD COMMUNITY COLLEGE

Explore the fundamentals of wind energy, how a new generation of local projects are positioned to succeed, and how to break into this emerging career path.



CAPE COD
COMMUNITY COLLEGE
Powerful Futures Start Here



capecod.edu/web/ccpe/courses

Want to be a certified wind tech?
Classes start in January!



ACE MV, BRISTOL COMMUNITY COLLEGE & VINEYARD POWER PRESENT

OFFSHORE WIND POWER TECHNICIAN

OPEN HOUSE

WED OCT 30 6PM AT MVRHS

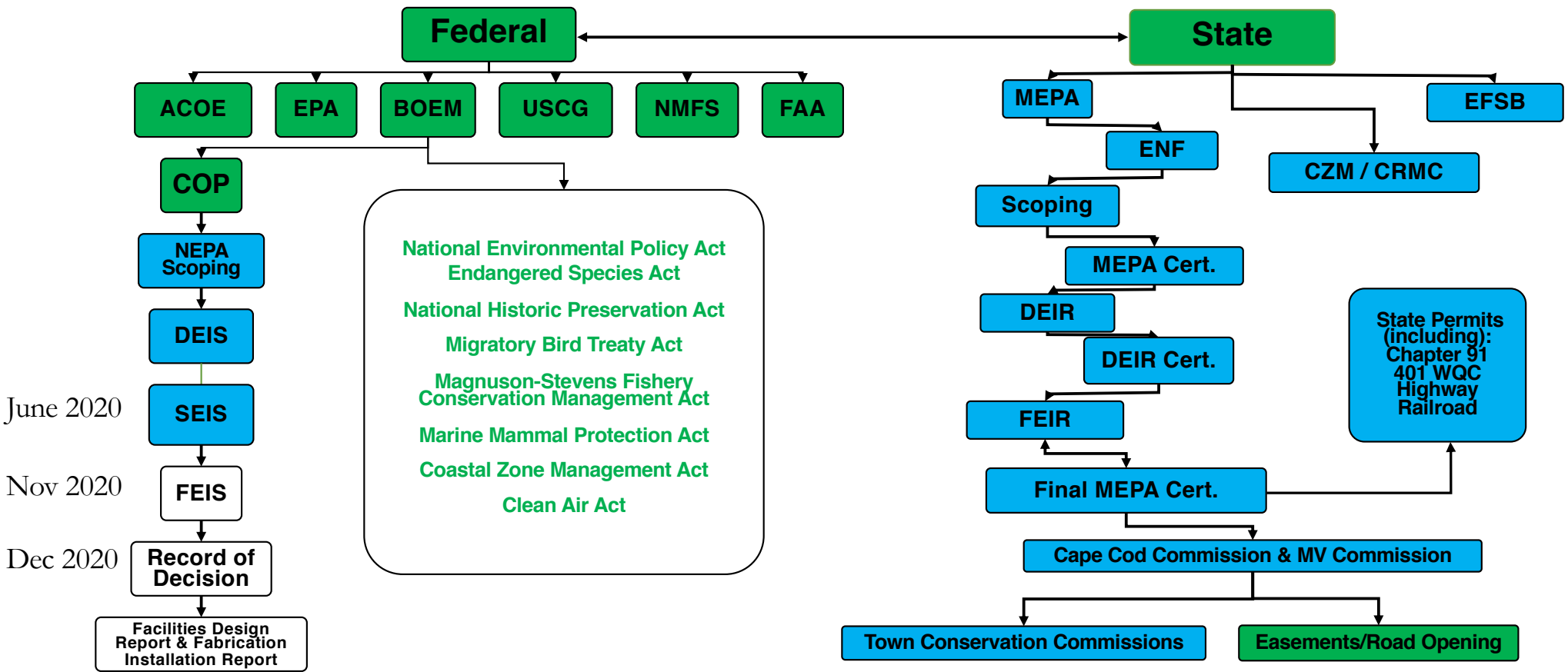
ALL ARE WELCOME!

Find out more about this growing field and the career opportunities available just for islanders!



STATUS OF VINEYARD WIND 1

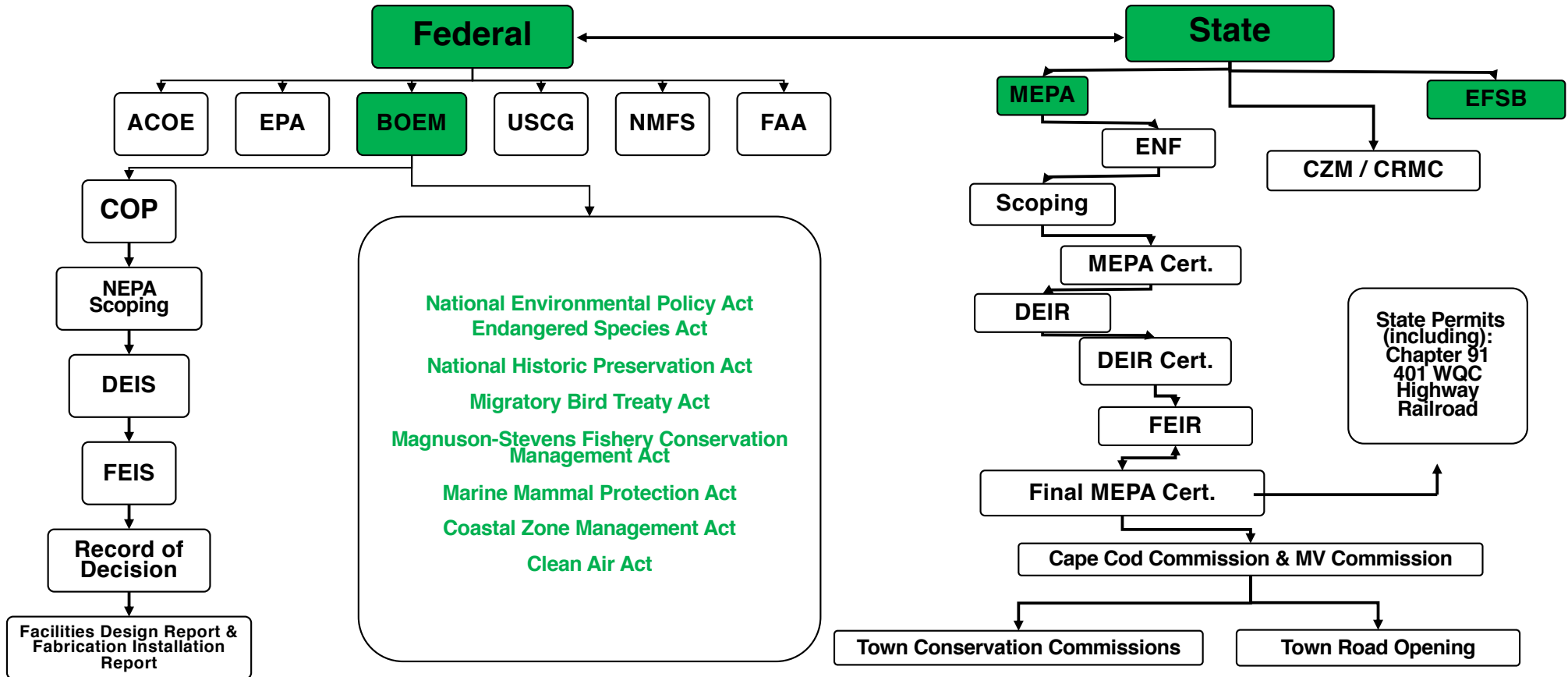
Permitting Begun **Permitting Complete**



STATUS OF PARK CITY WIND

Permitting Begun

Permitting Complete



UPCOMING: FEDERAL HEARINGS

Permitting timeline

- VW1 Submitted federal permits in 2017
- “NEPA” process: Environmental Impact Statement to assess project impacts
- Result is “Record of Decision” from Dept of Interior
- August 2019: Project delayed for “Cumulative Impacts Assessment”
- June 2020: Supplemental EIS released for public comment
- **“Cumulative Impacts Analysis” focused on offshore wind development in general**
- **Outcome of SEIS process will influence future of US offshore wind**
- **Public comment and advocacy is critical**

Virtual public hearings: June 26-July 9

HEARING PROCEDURE

Public Comment period ends July 27

Virtual public hearings: June 26-July 9

SIGNUP: <https://www.boem.gov/Vineyard-Wind-SEIS-Virtual-Meeting>

- To sign up for live video comment during hearing: click on “registration”
- Participants are asked to sign up for a specific public meeting time; times are as follows:
 - **Friday, June 26, 5PM*****
 - **Tuesday, June 30, 1PM*****
 - Thursday, July 2, 5PM
 - Tuesday, July 7, 1PM
 - Thursday, July 9, 5PM

***Note, earlier hearings are the highest priority

- BOEM will update the webinar links and will be following up with participants
- It is anticipated that the agency will establish a queue and notify speakers when their window is eminent.
- Follow up with written comment via BOEM Portal:

<https://www.regulations.gov/document?D=BOEM-2020-0005-0001>



- Offshore wind is our region’s best opportunity for new sources of energy
- Projects will bring significant economic development and workforce growth in our region, providing affordable energy and local benefit
- Further delay or additional layout restrictions will impede industry growth, threaten viability of projects, and increase ratepayer costs and environmental impact
- Delay will continue to challenge our businesses and workers from building this \$100 billion dollar industry, and leave our environmental and energy policies in flux

QUESTIONS?

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Chamber & Business Support

- Rick Kidder
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