Marine Insurance Issues Seminar 2021

Unmasking Marine Insurance

Emerging Technologies

US OFFSHORE WIND

Today's Presenter

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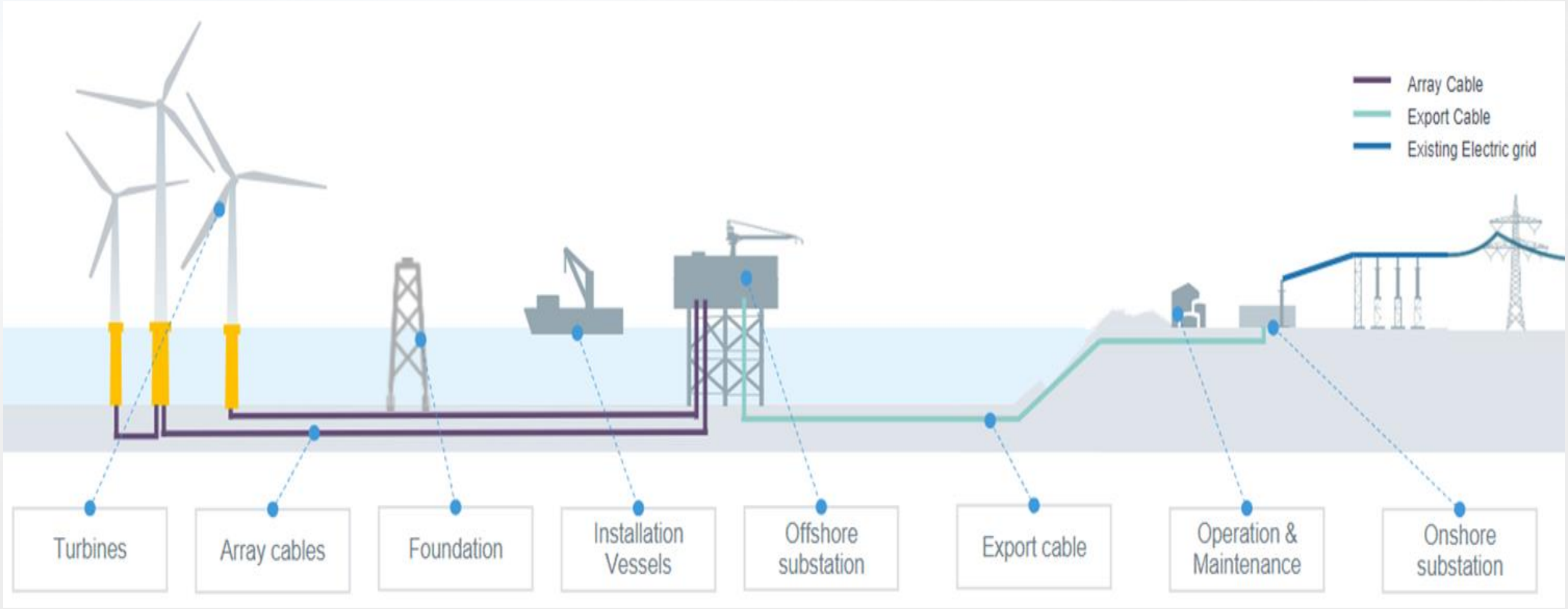
Agenda/Outline

- What is Coming?
- Anatomy of a Wind Farm
- Windfarm Processes
  - Transportation and Installation
  - Terminal Management
  - Offshore Wind Vessels
- The Future of Offshore Wind – Floating Wind
- Risk Management

A New Industry is Coming to the U.S.

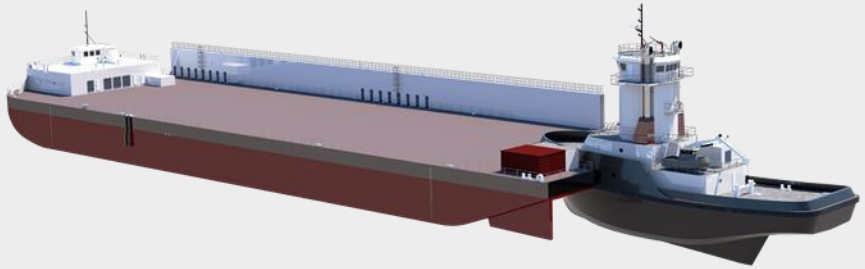
- In 2021, only 7 offshore turbines exist producing 0.042 gigawatts (GW) of power.
- US East Coast state mandates to buy offshore wind power developed a pipeline of 32 GW to be constructed between 2023 and 2035, powering up to 10 million homes.
- 11.6 GW contracted with developers requiring estimated $39 billion in capex and $1.2 billion per year in opex
- Remaining 20.4 GW requires additional $70-80 billion in capex and $2-3 billion per year in opex to be contracted between now and 2035
- Biden Administration has accelerated this industry's prospects by setting the goal of 30 GW installed by 2030

Anatomy of a Wind Farm



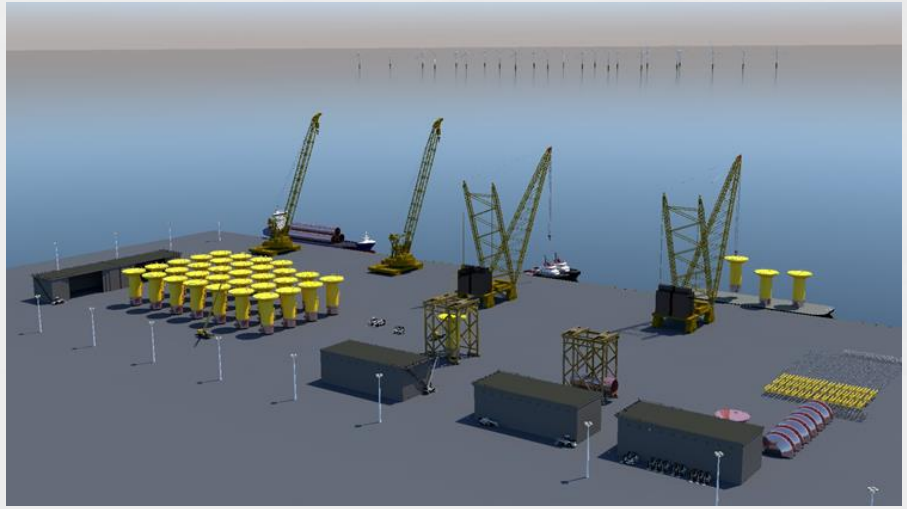
Transportation and Installation

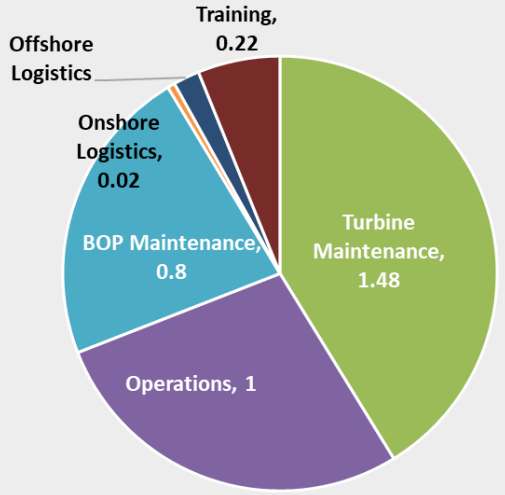
- Installation in two methods
  - WTIV
  - Feedering with tugs & barges
- First planned installation
  - Vineyard Wind (MA) 2023
  - Equinor and Orsted to follow
- Challenges
  - Jones Act
  - Limited amount of WTIVs, tugs, & barges
  - Cost of capital
  - Keeping up with technology



Terminal Management & Logistics

- Long term play for offshore wind (25 years)
- Leveraging existing ports, brownfield, and greenfield opportunities to support
- Strong reliance upon landside/marine logistics & local supply-chain management
- Working in conjunctions with CTVs and SOVs to provide O&M to the fields
- Emphasis on digitalization to monitor vessels/technicians and manage the efficiency of the turbines





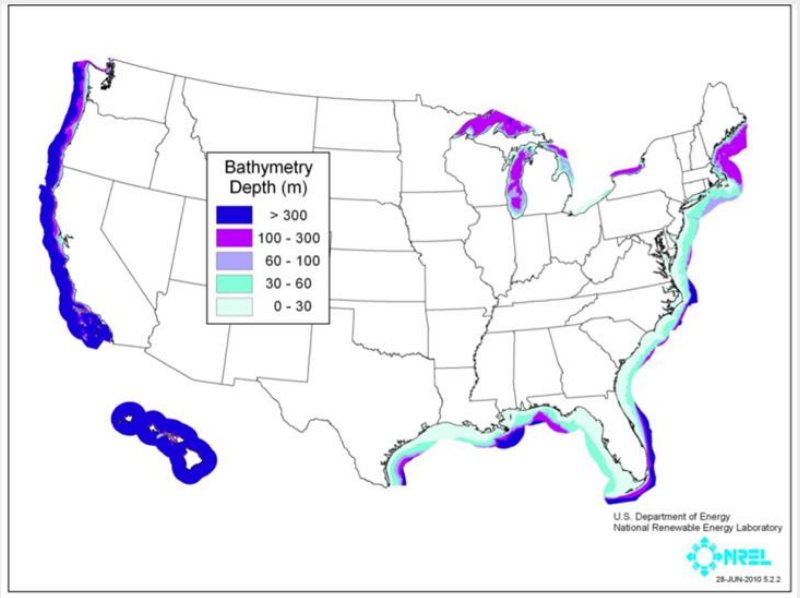
Total Market in $Billions/year, 2035

Offshore Wind Vessels

- Crew Transfer Vessels (CTVs)
- Service Operation Vessels (SOVs)
- Construction Service Operation Vessels (CSOV)
- Scour Protection Vessels
- Cable Lay Ships
- Near shore cable lay barges

Floating Wind

- Floating wind farms are turbines mounted on structures that enable wind power to be generated in water depths where fixed foundations are not feasible
    - Increase sea areas for services
    - Reduces visual pollution
    - Better accommodations for fisherman and shipping lanes
    - Stronger and consistent winds
- Hywind (Scotland) and Windfloat Atlantic (Portugal) are the first two operational floating wind farms in the world
- 1st floating wind farm in US will be NEAV in Maine
- Developers
    - Equinor
    - Principle Power
    - Shell
    - Saipem
    - Total
- Estimated growth of floating wind after 2030
    - 2030 = 10-15 GW worldwide
    - 2040 = 100 GW worldwide
    - 2050 = 150 GW worldwide
- CAPEX for floating wind
    - 750 units projected to be online between 2025-2026;
        - Asia/Pacific $25.2 billion
        - Northern Europe $11.3 billion
        - USA-Pacific $6.2 billion
        - Southern Europe $2.4 billion
        - USA-Atlantic $300 million.



Risk Management

- The electricity grid in coastal areas simply cannot handle the enormous power generation ability that offshore wind will bring onshore; the grid was only designed to bring the small amounts of power needed by local shore communities to homes
- Standards for maritime & landside safety in around wind turbines and terminals needs to be established
- Limited assets could delay the start of commissioning and installation
- Current feedering solutions, while performed in the O&G industry, are new in the offshore wind sector
- Lack of proper infrastructure could delay development of US supply chain solutions

Questions