



# Offshore Wind GE Renewable Energy

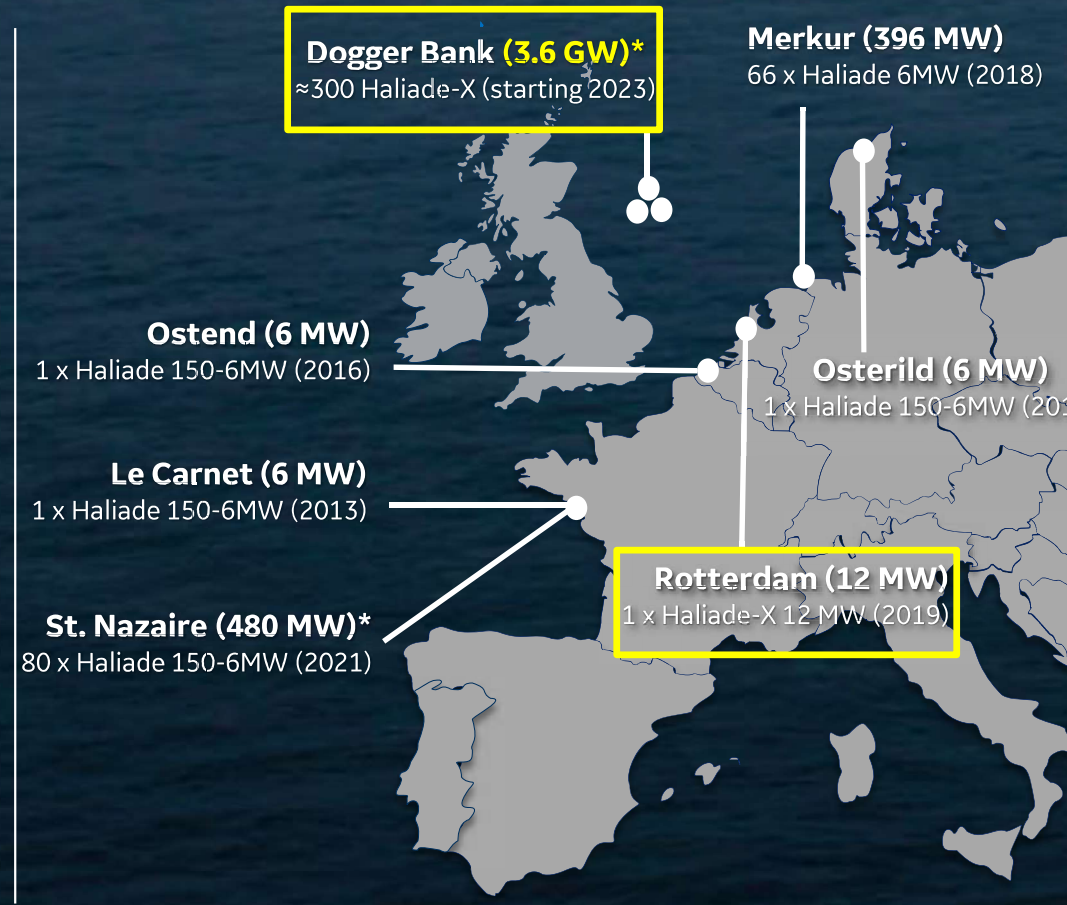
US Offshore Market Perspective



# Our Projects

Only OEM with projects in Europe, Asia and the Americas

\* Order backlog  
 □ Haliade-X Wind turbine



**Installed capacity: 474 MW | Order backlog: 5.3 GW (Haliade 6 MW + Haliade-X)**





# Haliade-X 12 MW...the world's most powerful offshore turbine

**12 MW** capacity

**67 GWh** gross AEP

**63%** capacity factor

**220-meter** rotor

**107-meter** long blades

**248 meters** high

**38,000 m<sup>2</sup>** swept area

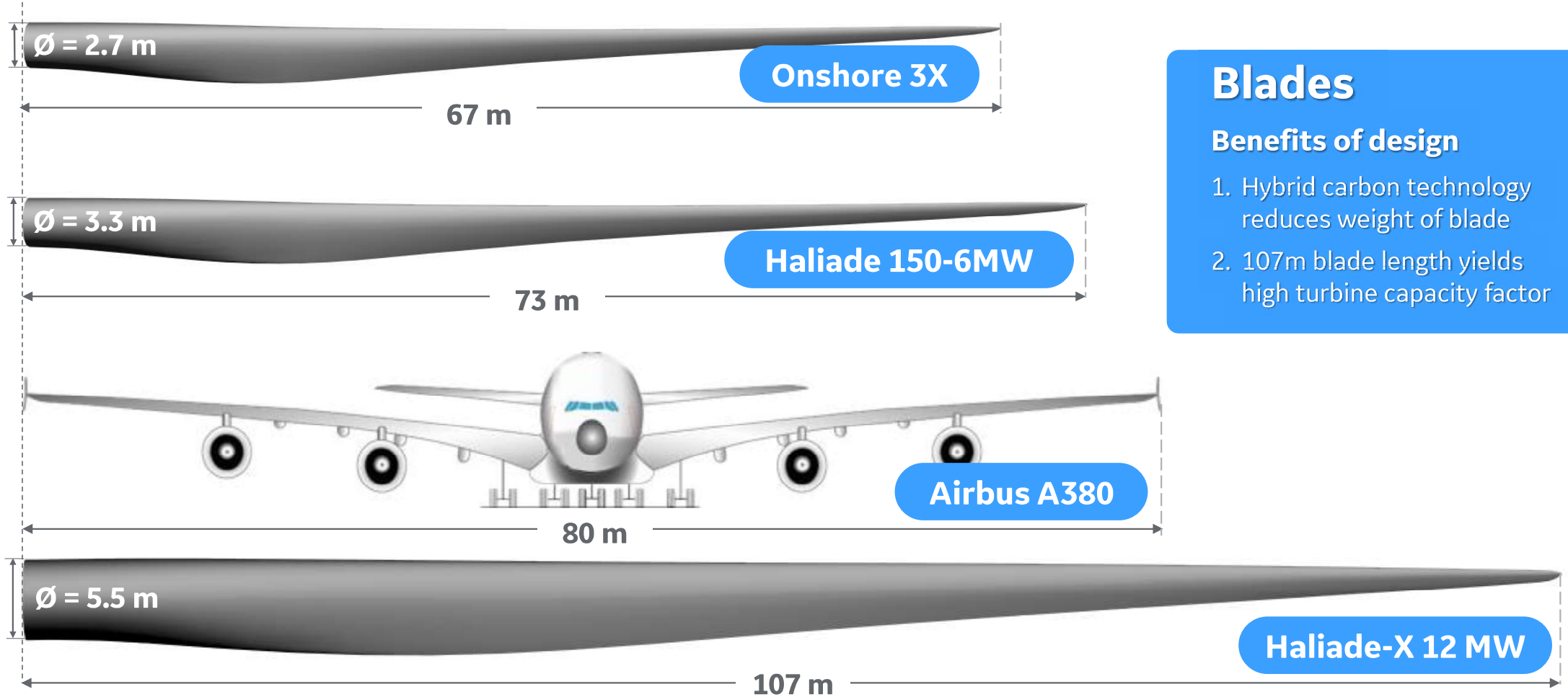
One Haliade-X 12 MW turbine can **power up to 16,000\* European households** and save up to **42,000 metric tons of CO<sub>2</sub>**, which is the equivalent of the **emissions generated by 9,000 vehicles** in one year

*\* Based on wind conditions on a typical German North Sea site*

*\*\* According to EPA Greenhouse gas equivalencies calculator*



# Haliade-X 12 MW blade comparison



## Blades

### Benefits of design

1. Hybrid carbon technology reduces weight of blade
2. 107m blade length yields high turbine capacity factor





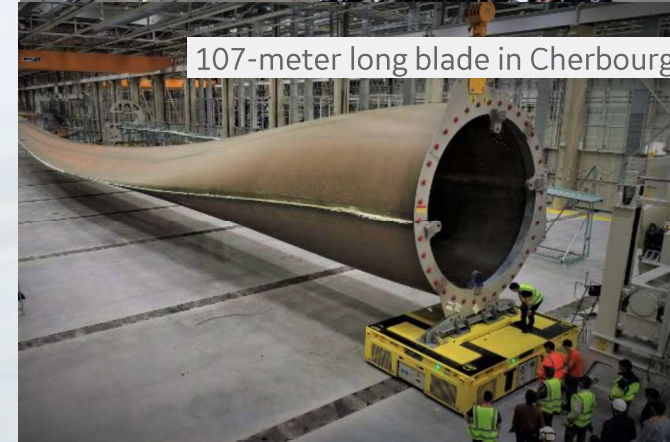
# Haliade-X 12 MW, Netherlands

The world's most powerful wind turbine

**Developer:** Future Wind (JV - Pondera and SiF Holding)  
**Demo Project:** 1 Haliade-X 12 MW  
**Location:** Maasvlakte-Rotterdam (NL)  
**Site:** on-shore for easy access during test activities  
**Scope:** 5-years testing & 15-years full service O&M



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# Partnering with Ørsted to drive the growth of US Offshore Wind



**BLOCK ISLAND (30 MW)**

*Off the coast of Rhode Island  
Haliade 150-6MW, commissioned 2016*

**OCEAN WIND (1,100 MW)**

*Off the coast of New Jersey  
Haliade-X 12 MW, expected commissioning 2024*

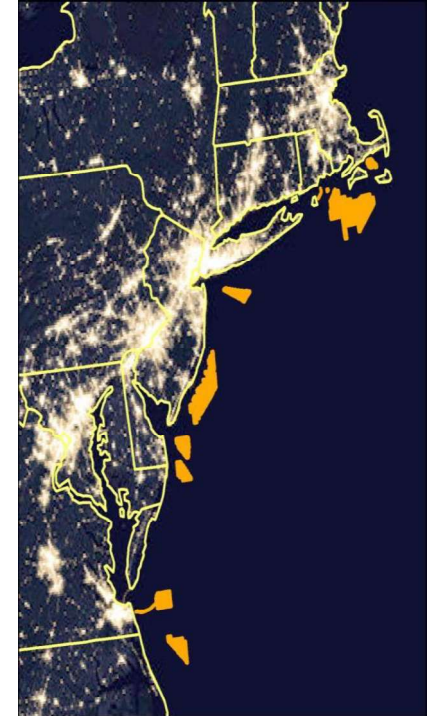
**SKIPJACK (120 MW)**

*Off the coast of Maryland  
Haliade-X 12 MW, expected commissioning 2022*



# United States Offshore Wind Market Drivers

- Population/electricity demand concentration along coasts: Highest in North-East
- Fuel volatility and distance to generation drives power prices
- Solid Wind Resource: Strongest in Northeast Coast 9-10 m/s
- Federal & State Agencies supporting development, leases, technology development
- Land constraint to onshore wind and solar renewable alternatives
- Mature European industry allows US market start w/Advanced Technology, experienced developers, established supply base
- State by State Legislation establish offshore targets and volumes in Maryland (2 GW), Massachusetts (3.2 GW), New Jersey (7.5 GW), New York (9 GW), Connecticut (2GW)
- States seeking coastal infrastructure and supply chain investments and jobs via local content / net economic benefit
- Offshore PPA's at around 8 US cents /kWh



Source: BOEM

Strong Market Fundamentals & Government Support



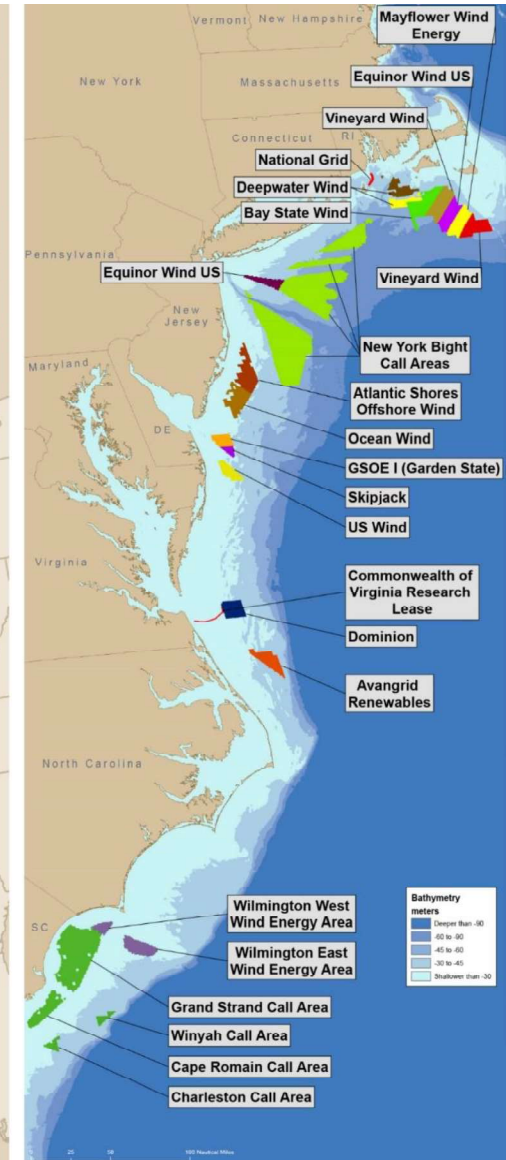


## US Offshore Wind Market by the Numbers

Current U.S. offshore wind pipeline : 29 GW

- 30 MW of installed capacity at Block Island (GE)
- 12 MW in Construction in Virginia (research lease)
- >20 GW Capacity in development w/ site control (lease areas)
- 6.4 GW of capacity in permitting with offtake awarded
- 8-10 GW of Additional potential capacity in wind energy areas in NY, SC pending lease auctions
- 2,350 MW of potential capacity in unsolicited floating project applications (Pacific region)

20 GW in development by 2035





# Market Development Challenges /Opportunities

- 70+ Bn to be invested in active projects, ports, vessels, local content
- Logistics: Northeast Coastal Infrastructure in need of development, upgrades to ports, supporting industries
- Installation: Vessel regulations (Jones Act) limit European Vessel Use and will require barges
- Service vessels and competencies: SOVs and CTVs needed as well as trainers and experienced personnel
- Local content / Net economic benefit formulas favor those who offer local investment, Jobs, local economic activity
- Local content: Nascent local supply chain needs visibility and volume to establish locally

French companies with specialized technology, know-how, experience, skills and willingness to invest, can secure business if they are willing to establish locally either solo or in a JV or partnership



A large group of approximately 100 GE employees, mostly wearing blue shirts and hard hats, are posed for a group photo on an asphalt tarmac. Behind them are four large GE jet engines mounted on blue transport cradles. The engines are white with red accents and the GE logo. The background shows an industrial airfield with various structures and equipment under a clear sky.

# Thank You!





