



Exceptional service in the national interest



2024 Sandia Blade Workshop

September 16-20, 2024
Albuquerque, NM

PRESENTED BY: David Maniaci, General Chair

SAND2024-12254C

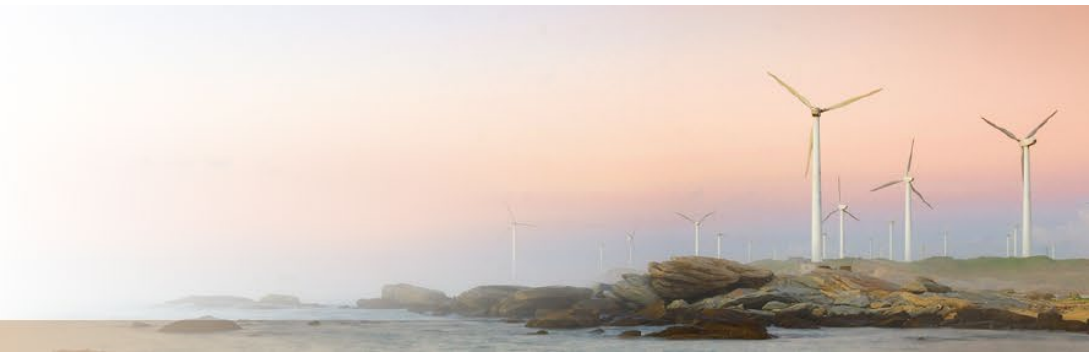


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High Level Agenda

Monday		Tuesday		Wednesday		Thursday		Friday	
AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Side Meetings		Main Blade Workshop				Side Meetings		Side Meetings	
pyNuMAD Training	EEEJ Workshop	Panels		Technical Sessions		IEC O&M Standard			
Sandia Blade Reliability	ESIG/EPRI Blade Workshop					Leading Edge Erosion Special Session	IEA Task 46 Plenary		
		Networking Reception							



SANDIA BLADE WORKSHOP

20 years since the first workshop!

2004 vs 2024

What's Changed?

- Onshore U.S. Capacity >20x greater than in 2004
- Offshore Global Capacity ~100x than in 2004
- Rotor size
 - Onshore (U.S.): 2x diameter (higher capacity factor)
 - Offshore (Global): 3x diameter
- Materials: Carbon Fiber, Leading Edge Protection
- Hybrid Plants

What's The Same?

Blades still need to be repaired and maintained!

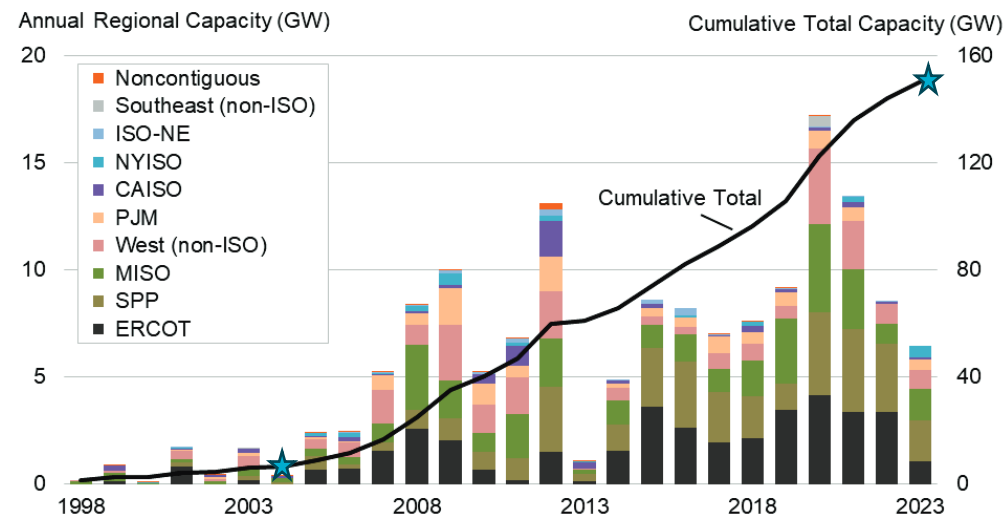


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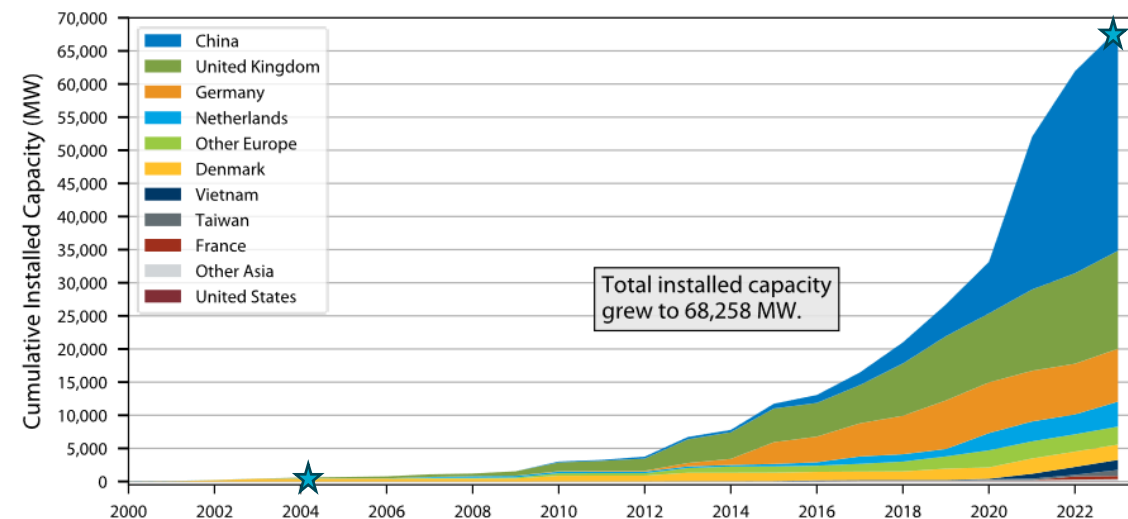
Land-Based Cumulative Installed Capacity

Land-Based Wind Market Report: 2024 (LBNL)



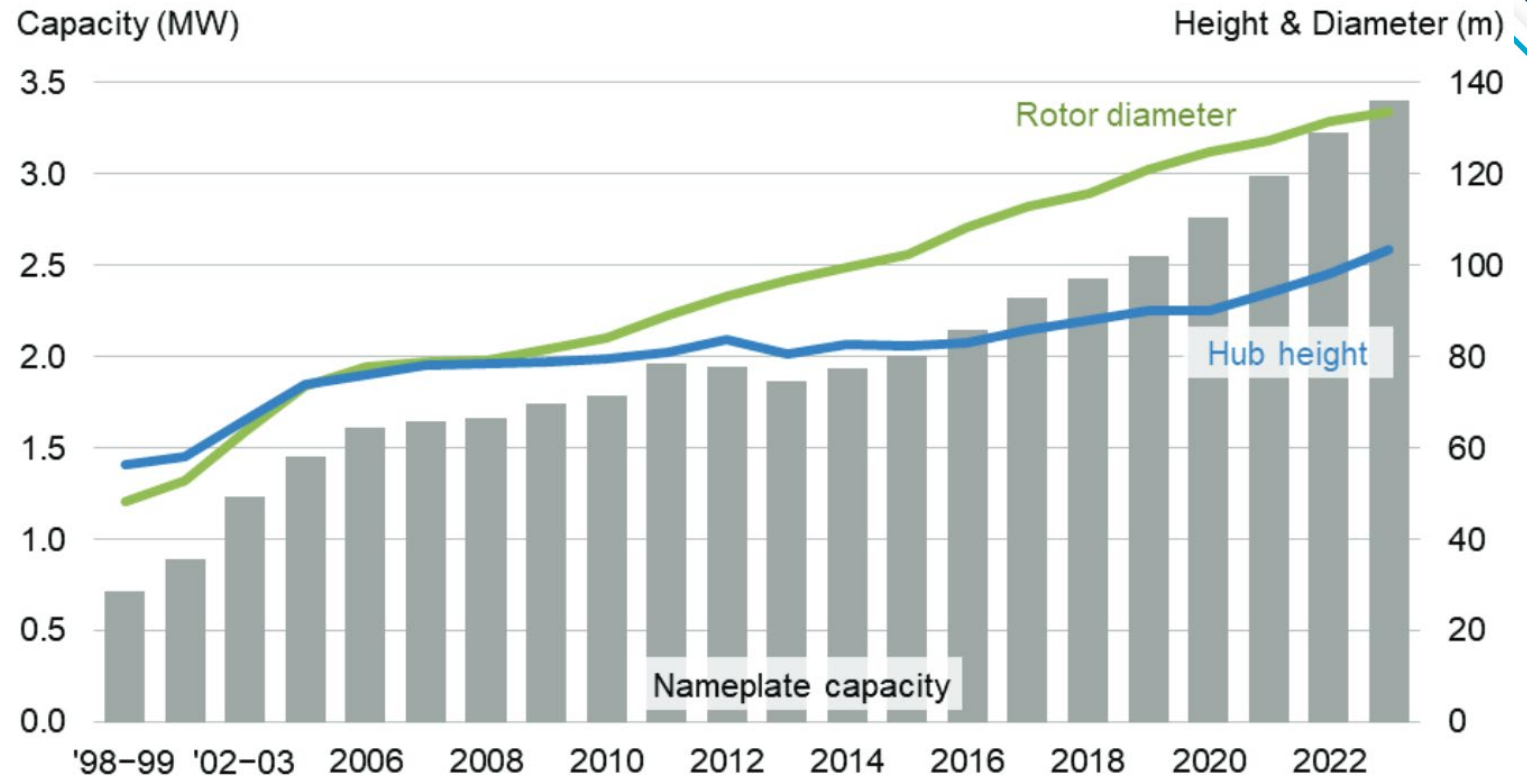
Offshore Cumulative Installed Capacity

Offshore Wind Market Report, 2024 (NREL)



WIND BLADE TRENDS

- Onshore rotor diameter, hub height, and nameplate capacity continue increasing.
- Widespread deployment of low-specific-power turbines
- Trend for taller towers
- Repowering tends to feature larger rotors and lower specific power



Sources: ACP, Berkeley Lab

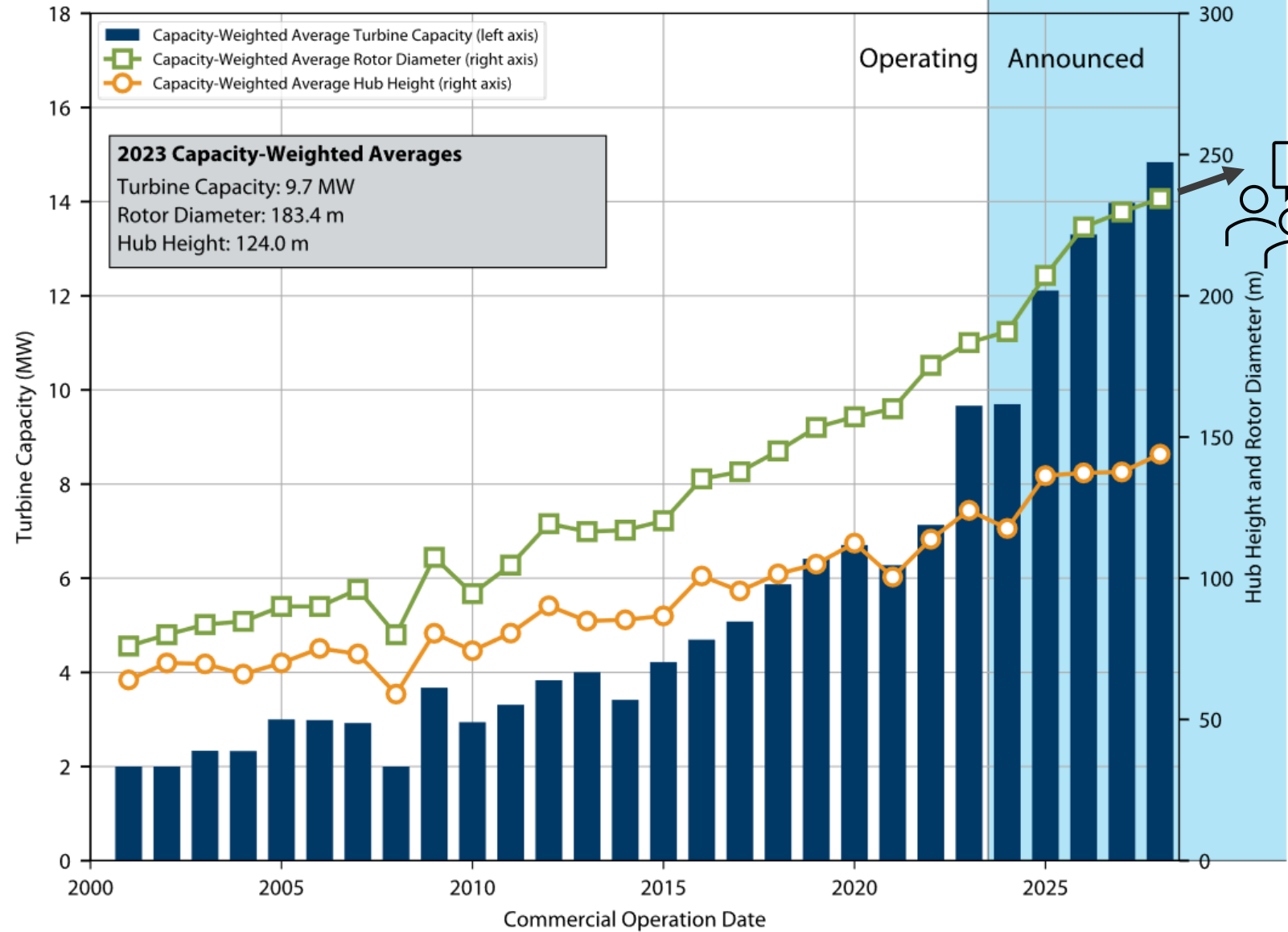
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WIND BLADE TRENDS

- Offshore turbine size has continued to increase
 - Capacity: 26% year/year
 - Diameter: 5% year/year
 - Hub height: 6% year/year
- Calls for pause in turbine upsizing

Offshore Turbine Trends



Offshore Wind Market Report, 2024 (NREL)

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WORKSHOP AGENDA



Tuesday, September 17th

Time	Session
08:30-10:00	Opening Session
10:30-12:00	Innovating Big Rotors for X
13:30-15:00	Growth vs. Reliability: What are the Tradeoffs?
15:30-17:00	Best Practices to Reliable Blade Operations
18:00-20:00	Networking Reception

Wednesday, September 18th

Time	Session
08:30-10:00	Design Methods for Blade Lifetime
08:30-10:00	Innovation in Materials and Manufacturing
10:30-12:00	Field Experiments and Measurements
10:30-12:00	Challenges for Offshore Blades
13:30-15:00	Control for Wind Farm Performance and Reliability
13:30-15:00	Leading Edge Erosion
15:30-17:00	Blade Reliability, Repairs, and Inspection
15:30-17:00	High Reynolds Number Aerodynamics

Thursday, September 19th

09:00-12:00	Leading Edge Erosion Special Session
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Thank you to all speakers, as well as the technical and administrative committees.

Thanks to tonight's networking reception sponsor:



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Thank you
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