

Development of OSW ports in Atlantic Canada

September 24, 2025



moffatt & nichol

net
zero
atlantic

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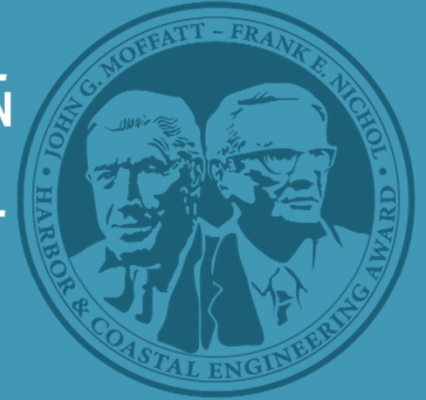


14,000+
PROJECTS COMPLETED



FOCUSED ON PORTS
& MARITIME
PLANNING AND
DESIGN

AMERICAN
SOCIETY OF CIVIL
ENGINEERS JOHN
G. MOFFATT-
FRANK E. NICHOL
HARBOR AND
COASTAL
ENGINEERING
AWARD



FOUNDED IN

1945

50+
OFFICES



80%
REPEAT BUSINESS



1,200+
EMPLOYEES



Moffatt & Nichol OSW Port Experience



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- Ports & Maritime Consultancy with 80 years of experience
- Dedicated division that deals exclusively with OSW ports
 - Site selection
 - Feasibility studies
 - Planning
 - Logistical Modeling
 - Detailed Design
- **20+ OSW port feasibility studies**
- **10+ Detailed designs for OSW ports**
- **Continuous contact with OSW Developers & OEMs**



How I got Here

- M&N awarded NZA Atlantic Assessment of Atlantic Canadian Ports to Support OSW Development
- Establish Criteria for required for ports required to service the industry
- Ports to support both fixed bottom and floating OSW
- Focus on large marshalling and staging & integration ports
- Canadian and US OSW roll outs
- Port Layouts and Cost Estimates



To lead applied research and contribute to projects that enable the transition of Atlantic Canada's energy system to a carbon-neutral future through collaboration with academia, governments, private sector, Indigenous Peoples and other non-government organizations.

Project Funders



Nova East Wind



CANADA'S OCEAN
SUPERCLUSTER

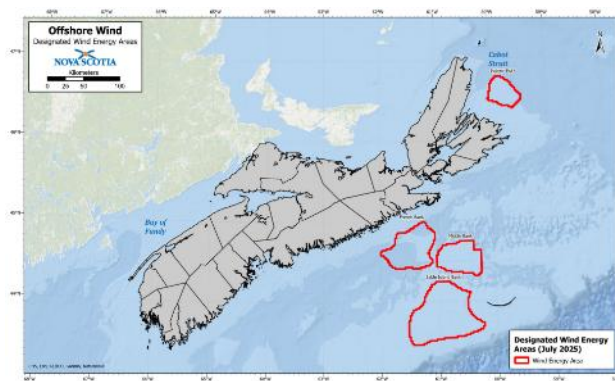


OSW Atlantic Canada

why are we here

Best in World Wind Resource

- Nova Scotia 5 GW of leases by 2030
- Four Nova Scotia Wind Energy Areas identified
- Nova Scotia call for Bids end of 2025
- New Brunswick, Newfoundland and Labrador developing OSW plan



Four OSW Power Delivery Models

1. Power Atlantic Canada
2. Power greater Canada (east-west transmission)
3. Power US East Coast (north-south transmission)
4. Green Hydrogen Exports (commoditize OSW)



Rules of Presentation

- Lots of numbers and stated criteria
- These should be considered recommendations and not absolute minimums
- Port requirements
- Required CAPEX
- Demand on larger marshalling and staging & integration ports is significant
- These are specialty ports and quite often purpose built
- Highest port loading capacity in the world

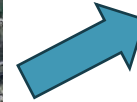
INDUSTRY WILL ADAPT (SOMEWHAT) TO WHAT IS MADE AVAILABLE



The Basics



NO OSW PORTS = NO
OSW



OSW Port Design Drivers

OSW port Design Drivers(15-20 MW)



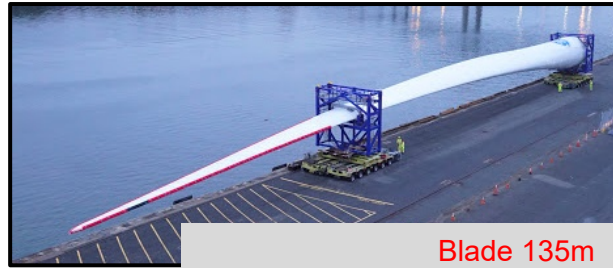
Nacelle 1200 tons



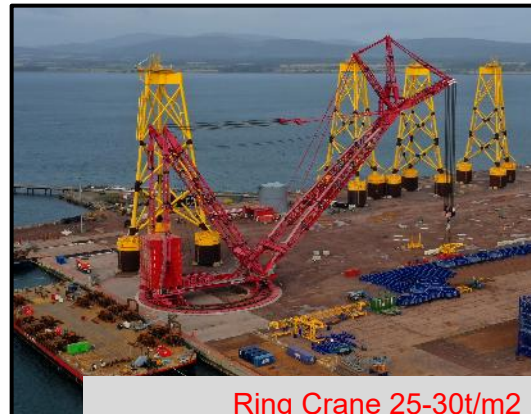
Foundation Installation Vessel
LOA 216m, Draft 12m



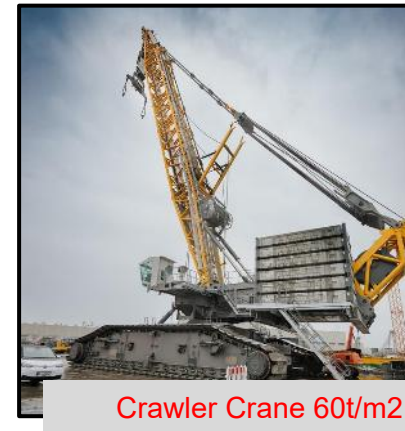
WTIV Jack up Pad at Berth



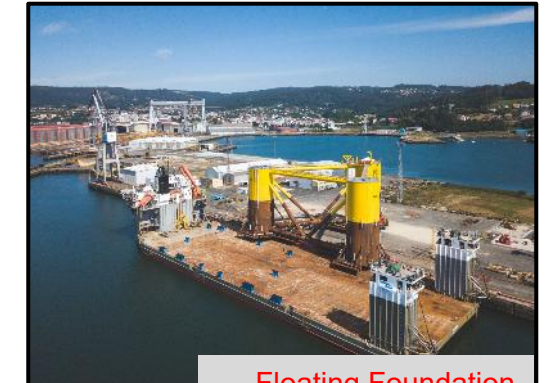
Blade 135m



Ring Crane 25-30t/m²



Crawler Crane 60t/m²



Floating Foundation
4000 – 30000 tons



SPMT 15t/m²

OSW Port Criteria

Fixed vs. Floating Criteria

FIXED BOTTOM CRITERIA	VALUE
Wharf Length	400m
Wharf Bearing Capacity	25-30 T/m ²
Uplands Area	14 to 20 ha
Uplands Bearing Capacity	15 T/m ²
Draft at Berth (MLLW)	11m
Air Draft	Unlimited
Channel Width	115-225m

*Two Distinct Berths for Optimal Operations
Delivery, Install



Port of Eemshaven, Netherlands



Port of Nigg, Scotland

FLOATING CRITERIA	VALUE
Wharf Length	600m+
Wharf Bearing Capacity	25-30 T/m ²
Uplands Area	35 to 55 ha
Uplands Bearing Capacity	15 T/m ²
Draft at Berth (MLLW)	11m
Air Draft	Unlimited
Channel Width	150-200m
Wet Storage Area	8-20 ha

*Three Distinct Berths for Optimal Operations
Delivery, S&I, Foundation Launch



Humboldt Harbor District OSW Port, CA, USA

Atlantic Canada OSW Ports

Study Driven vs Market Driven

Study Driven



- Identifies potential ports and establishes feasibility of ports to service the OSW industry
- Raises awareness of critical role of OSW ports (no OSW ports = no OSW)
- Industry
- Government
- Establishes high order of magnitude costs to bring OSW ports online
- Not meant to grade or contrast ports

Market Driven



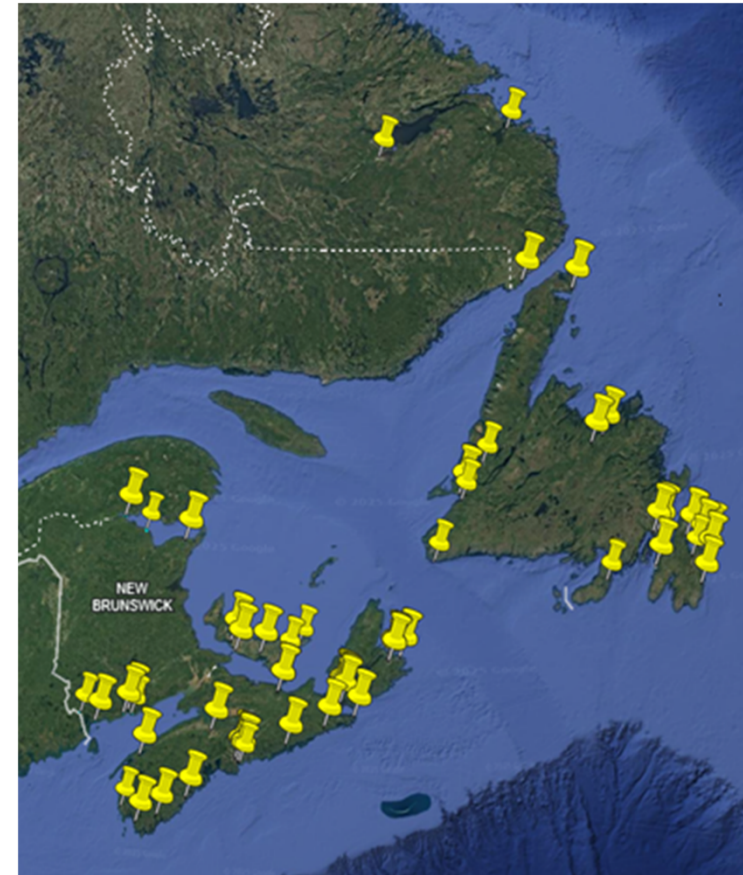
- Canada will award leases
- OSW developers that win leases will begin to plan proposed projects
- Each OSW developer will have market driven reasons for port selection
 - Proximity to lease
 - Capabilities of port
 - Timeline to operational
 - Cost to occupy port
 - Workforce

Methodology



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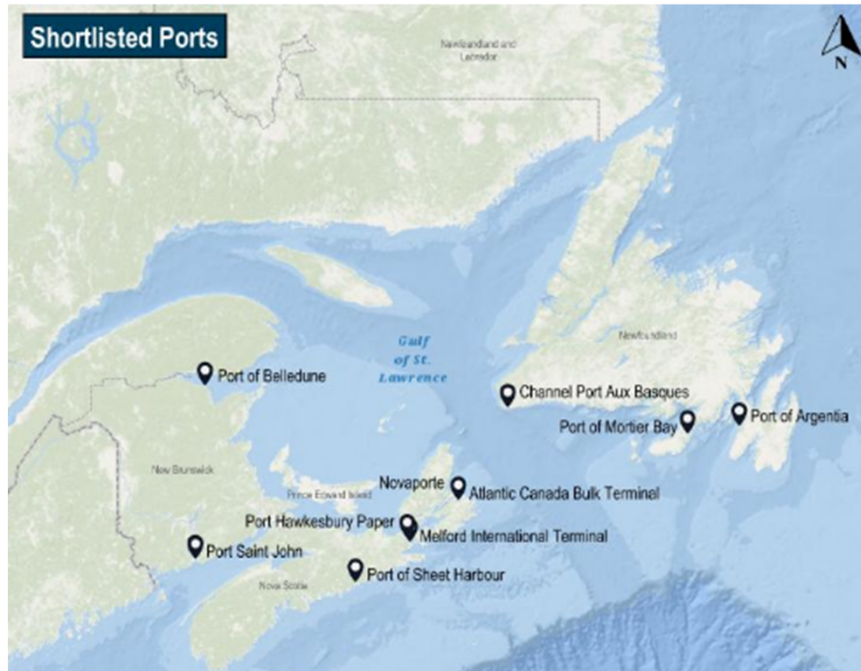
- Establish Criteria
 - Create Long List (77 ports)
 - Red Flag analysis (26 Ports)
 - Outreach to 25 Ports
 - Selection of Shortlist (10 Ports)
 - Met requirements and agreed to participate
 - Gap Analysis
 - Creation of Cost Estimate (ROM)
 - Time to Become Operational
 - Port Layouts
-
- Estimate # of ports required for varying OSW rollout scenarios
 - Infrastructure buildout (# ports) should match OSW roll out (GWs)



Results



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- Three selected ports have already supported OSW Activities
 - Argentina
 - ACBT
 - Sheet Harbor

Port Name	Region	Fixed Marshalling	FLOW Staging & Integration	FLOW Foundation Assembly	FLOW Combined
Port of Belledune	New Brunswick	Y	N	N	N
Port Saint John	New Brunswick	Y	Y	N	N
Channel Port aux Basques	Newfoundland & Labrador	Y	N	N	N
Port of Argentina	Newfoundland & Labrador	Y	Y	Y	Y
Port of Mortier Bay	Newfoundland & Labrador	Y	Y	Y	Y
Atlantic Canada Bulk Terminal	Nova Scotia	Y	Y	Y	Y
Melford International Terminal	Nova Scotia	Y	Y	Y	Y
Novaport	Nova Scotia	Y	Y	Y	Y
Port of Sheet Harbour	Nova Scotia	Y	Y	Y	Y
Port Hawkbury Paper	Nova Scotia	Y	Y	N	N

Source: Moffatt & Nichol

- CAPEX (Class 5 estimate)
 - \$8.8 - \$964 million
 - US OSW CAPEX \$250-\$870 million
- Development Timeline
 - 21-109 months
- Operational / Existing Port / Green Field

OSW Port Funding and Revenue

Funding and Revenue

(Not part of NZA study)



Funding

Public funding

- a) Large portion of required funds comes from government
- b) This is government contribution to bring green energy to the country
- c) Large initial CAPEX outlay

Revenue Backstop

- a) Private equity for funding
- b) Government provides revenue guarantees for holes in port usage
- c) Contribution is spread out over time



Revenue

- Short projects (leases) with unknown follow-on projects can make revenue projections difficult.
- OSW port revenue is very different than container or bulk revenue generation
- OSW port revenue is driven by lease \$/ha/year vs. tonnage over the quay.
- Scarcity of resource should be considered

Thank you

Moffatt & Nichol OSW Ports

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