



DP ENERGY



TRUE.
BLUE.
TRANSITION.



Floating Offshore Wind

*Positioning ports in value chain
for seamless execution*

JR. Fournier
Offshore Wind R&D Forum
Halifax, November 2024

Novaeastwind.ca



Provence Grand Large



SIEMENS Gamesa
 RENEWABLE ENERGY

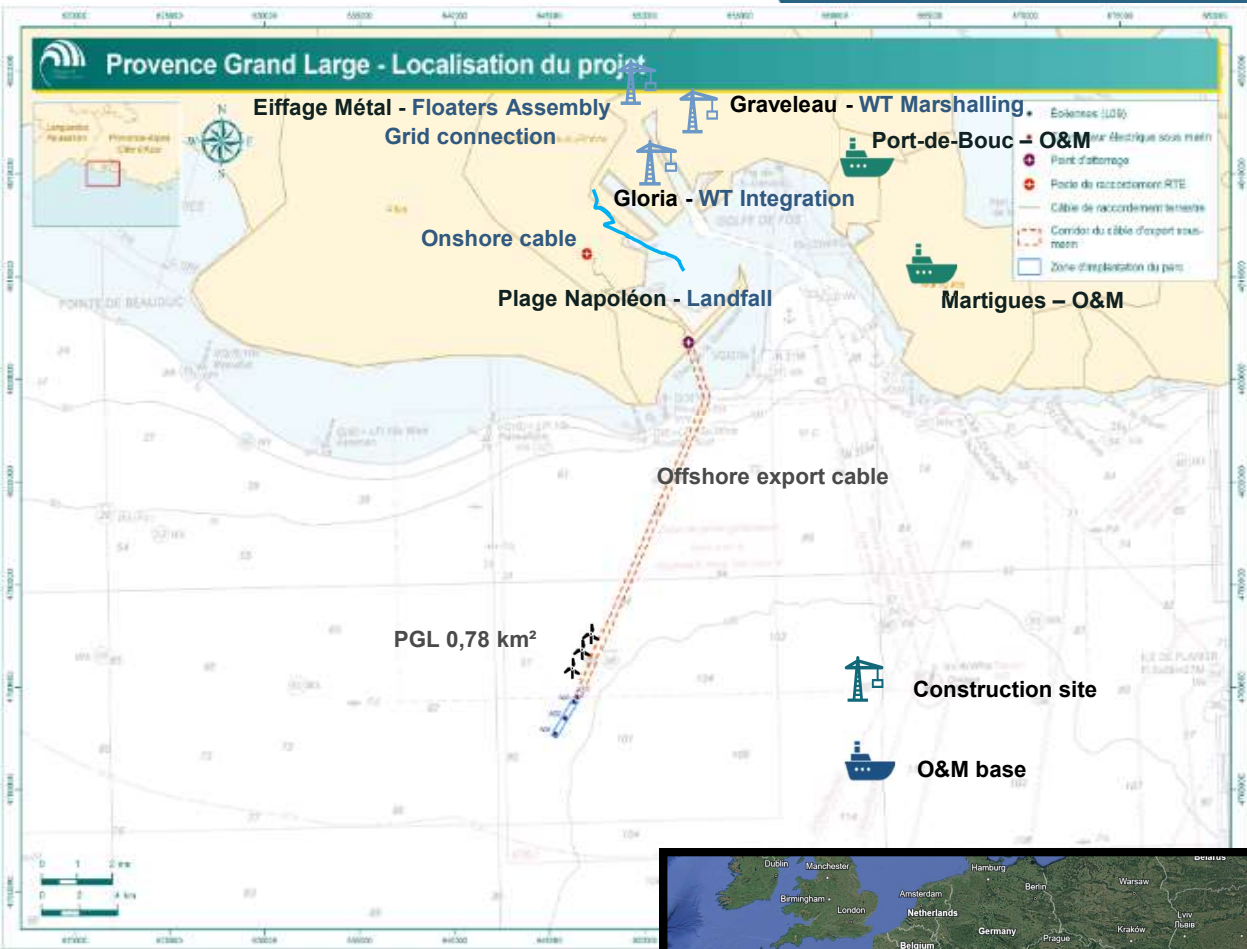
Floater & Mooring EPC
 FOW Installation



Floater Assembly



66 kV cable





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Floater assembly

- Modular by design
- Worldwide sourcing
- Storage management
- Interface welds automation
- Modular scaffolding
- Numerical twin
- Resources management





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Floater load-out

- Supports design
- Berth & ballast strategy
- Tide regime
- Float-off depth requirements
- Marine ops coordination
- Floaters batch load-out sequence of activities
- Dry & wet storage





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Turbine Integration & FOWT Hook-up

- Anchors & mooring pre-lay
- Integrated quayside & offshore operation cycle
- Continuous operations over seasonal window
- Weather downtime criteria
- Asset usage optimization
- Operational weather window risk management
- SIMOPS management





Apply pilot lessons learnt on Nova East commercial farm

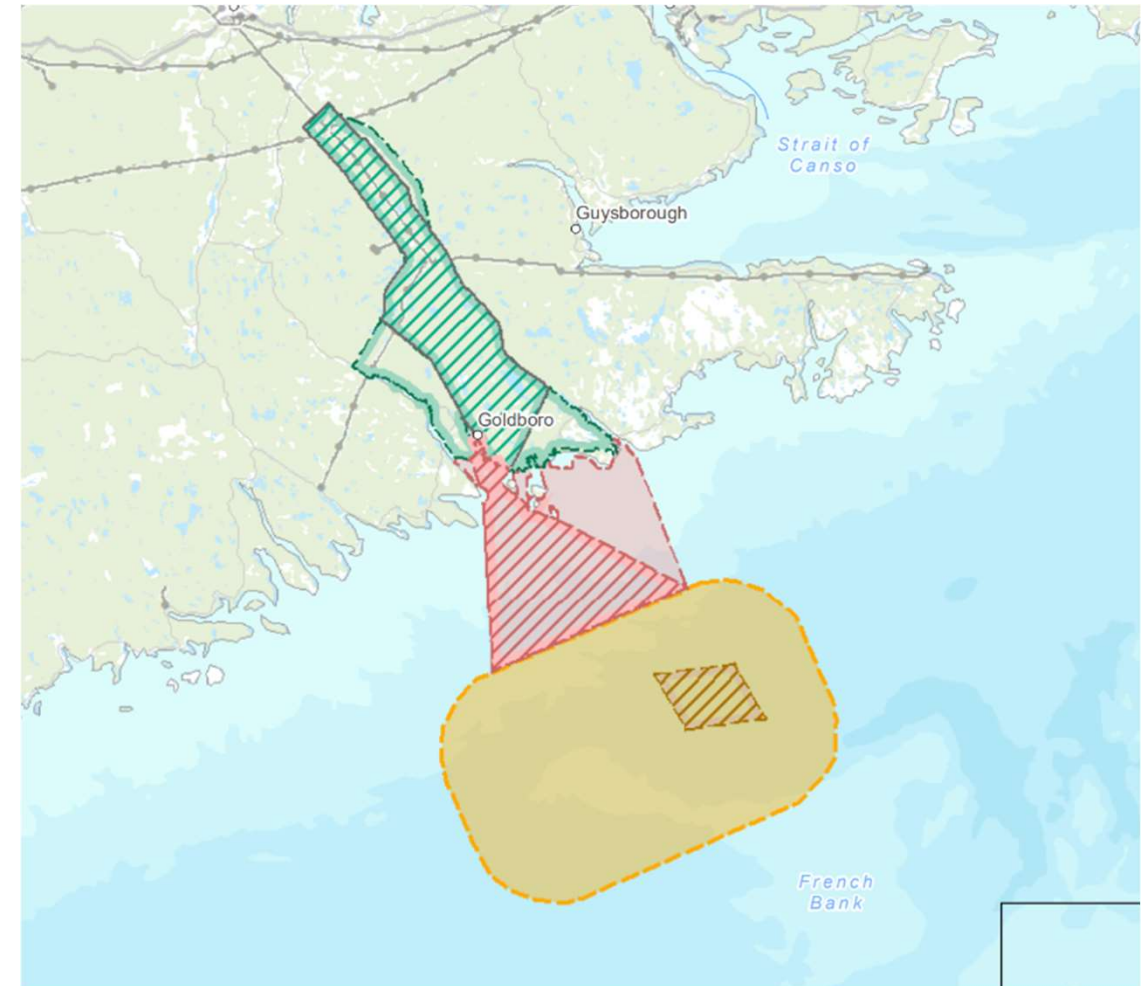
- Modular approach
- Optimized logistic scheme
- Infrastructure upgrade for assembly sequence
- Integrated operations – Deliver Assemble Install
- Resources & schedule risk management



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300-400MW floating offshore wind farm
20-25 x 15MW turbines



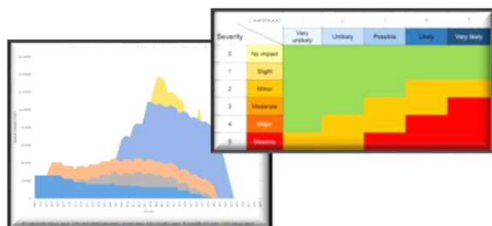
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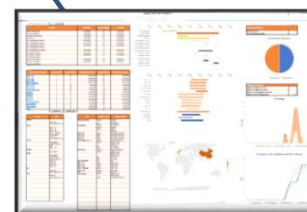
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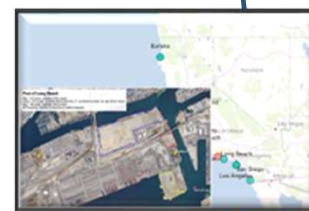
9/ Stocks, space utilization,
manpower requirements,
R&O matrix



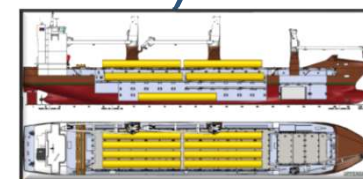
1/ Fulfillment, Supplier &
Yards



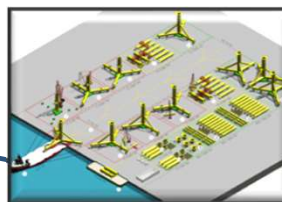
2/ Project
Line Of Balance



3/ Port
Infrastructure



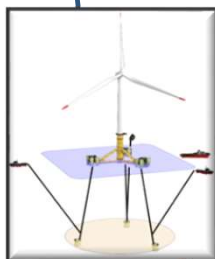
4/ Logistics
Plan



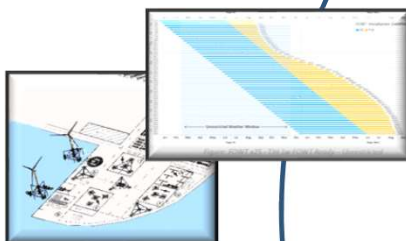
5/ Construction
& Assembly sequence



6/ Anchor
Installation



7/ Floater Hook-up



FOW EPCI



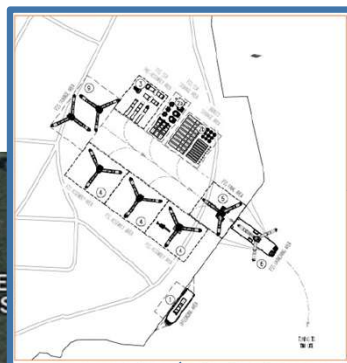
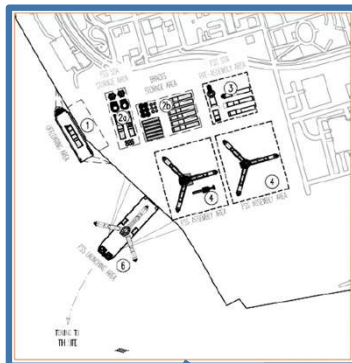
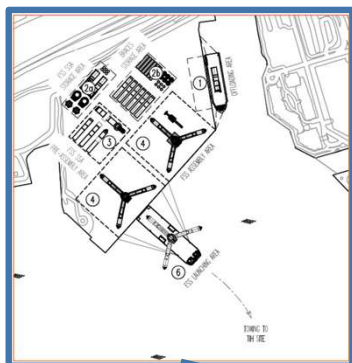
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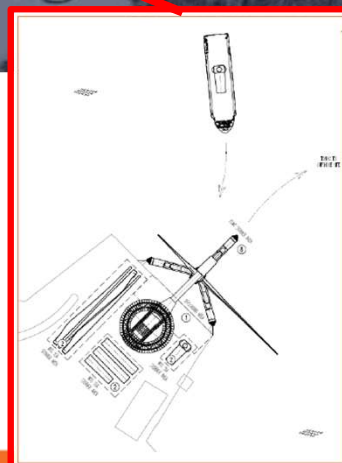
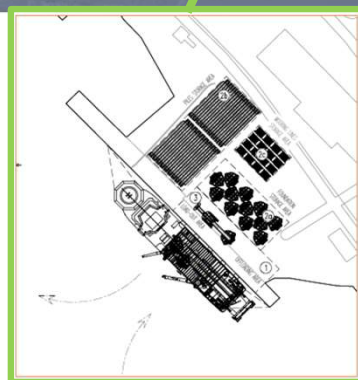
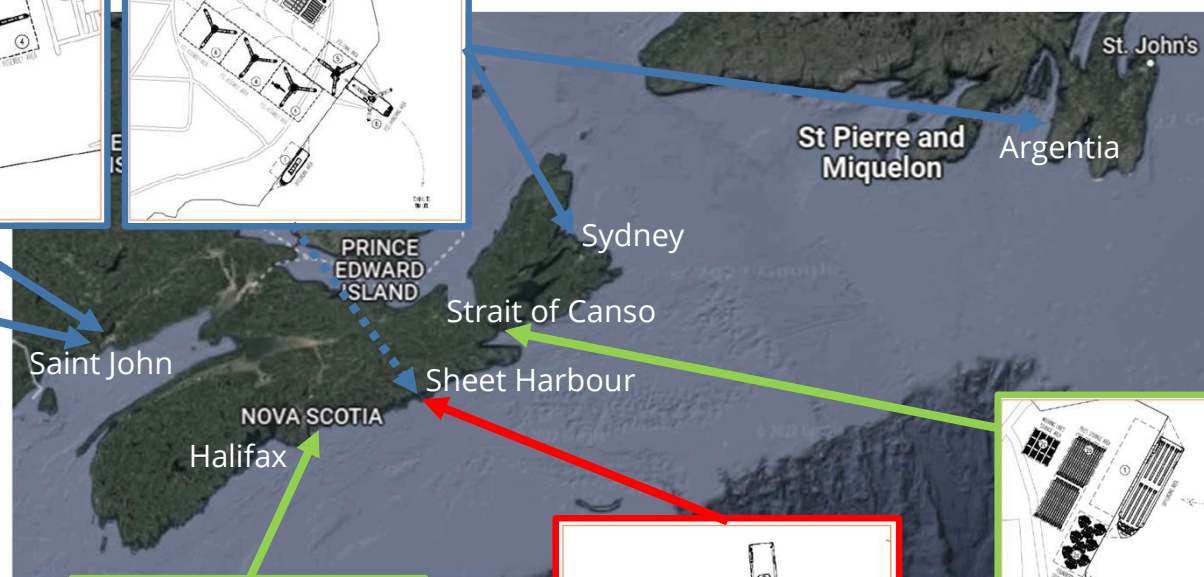
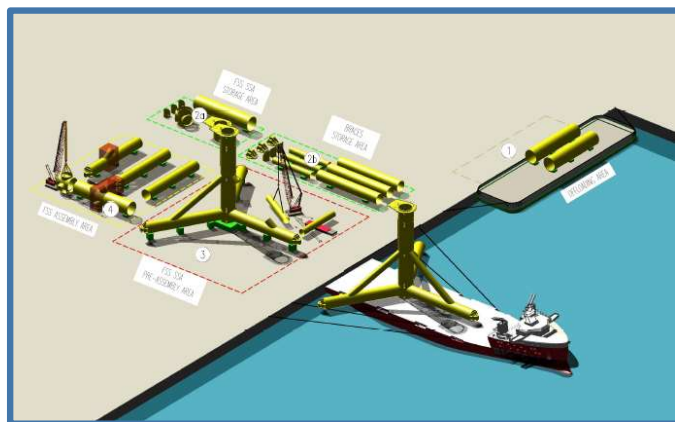
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Onshore construction & logistic screening



FLOATER ASSEMBLY



ANCHORS & LOGISTICS

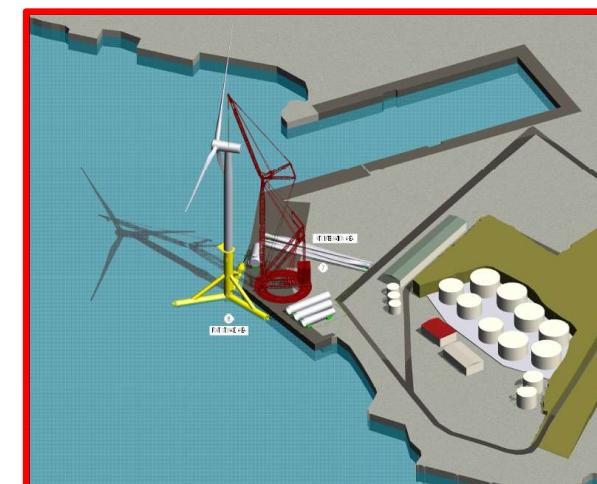
TURBINE

FLOATER

MOORING



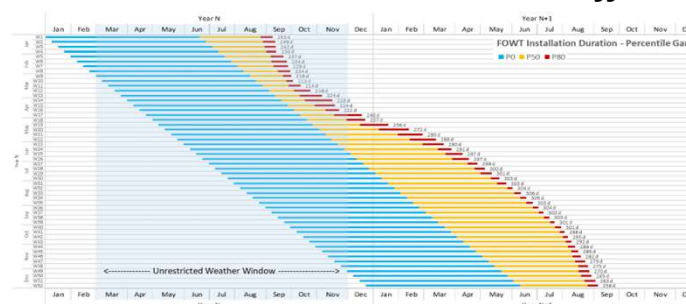
TURBINE INTEGRATION



Dynamic planning and Wait-on-Weather calculation

- Offshore weather impact assessment
- Dynamic simulations from assembly to offshore installation
- Resources and equipment optimization
- Manpower histograms for local assembly site

Onshore / Offshore simulations with WoW

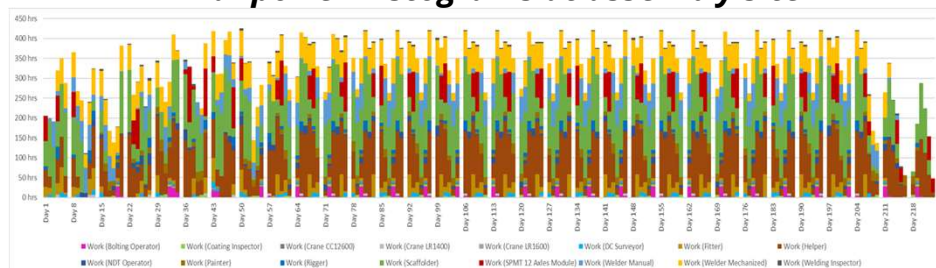


FOWT x15

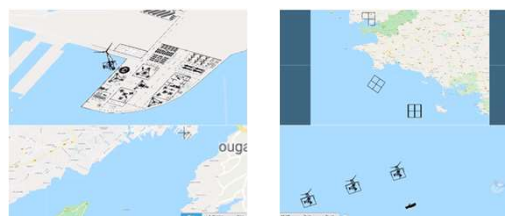
Duration [days]	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
P0 = 115.3d												
P10	134	126	120	117	116	117	125	137	163	163	154	144
P20	137	129	121	117	116	118	132	156	171	172	159	152
P30	149	133	123	118	118	121	137	166	177	177	168	159
P40	153	137	127	120	118	122	142	169	190	185	178	164
P50	155	140	129	121	119	123	144	180	200	193	193	175
P60	162	145	130	122	119	126	147	190	210	208	198	183
P70	165	148	134	123	121	127	157	202	216	216	204	188
P80	170	151	136	125	124	130	164	216	222	222	210	191
P90	177	156	139	129	127	139	184	228	230	226	213	197
P100	198	171	149	142	135	155	231	241	245	239	230	212

	TIH Pace	IV Limits	Max FOWT per Season		Percentile Level per Starting Week																														
					January										March										May										July
								February										April										June							
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29				
Batch#4	TIH 1w	Hs < 2m - Wind < 12m/s	FOWT x26	FOWT x21									P50	P50	P50	P40	P30	P20	P20																
	TIH Auto	Hs < 2.5m - Wind < 12m/s	FOWT x31	FOWT x28									P90	P90	P90	P90	P90	P80	P80	P80	P60	P30	P10												
	TIH 1w	Hs < 2.5m - Wind < 12m/s	FOWT x31	FOWT x28									P90	P90	P90	P90	P90	P90	P80	P80	P60	P30	P10												
	TIH 101h	Hs < 2.5m - Wind < 12m/s	FOWT x38	FOWT x36									P90	P90	P90	P90	P90	P90	P90	P90	P90	P90	P90	P90	P90	P90	P90	P60	P40	P10					
	No TIH	Hs < 2.5m - Wind < 12m/s	FOWT x38	FOWT x36									P90	P90	P90	P90	P90	P90	P90	P90	P90	P90	P90	P90	P90	P90	P90	P90	P90	P90	P70	P50	P20		

Manpower histograms at assembly site



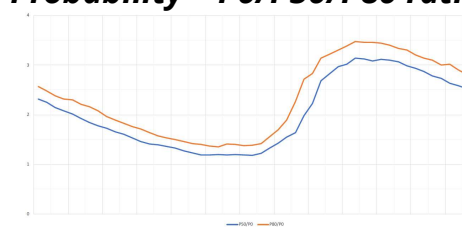
Visualization



Tasks execution



Probability - P0/P50/P80 ratios





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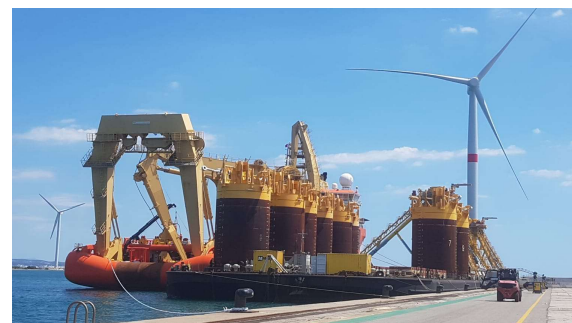
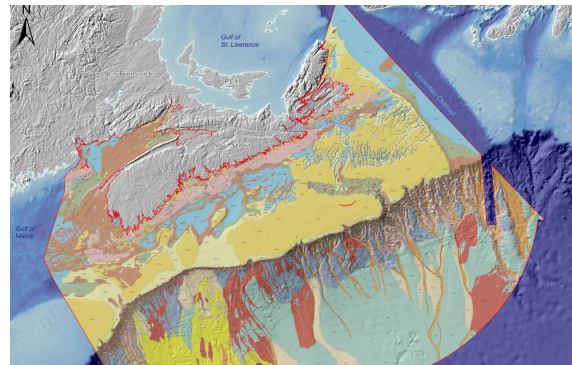
Port & supply chain opportunities for Atlantic cluster

Development Phase 2023-2027

- Vessel operators to support site resource and environmental characterization
- Ecological Knowledge Study
- Visualization and engagement tools
- Geophysical and Geotechnical program operations
- Yard Development – heavy civil construction jobs, yard construction
- Wind Resources and Metocean studies
- Environmental Consultant(s)

Construction Phase 2027-2031

- Construction of the land assets (e.g., road building, site levelling, power line installation, substation assembly, etc.)
- Anchor assembly and logistics.
- Assembly of the Floating structure. Welding, Mechanical and Electrical trades, Painting, Scaffold and Labour.
- Logistics services to move the large and small component.
- Yard security and yard support services.
- Installation of the cables, anchors and turbines offshore.
- Tugs and Vessels for towing Floaters to offshore and nearshore movements.





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Port & supply chain opportunities for Atlantic cluster



Operations Phase 2031 - 2061

- Labour to support the ongoing operations and maintenance of turbines, mechanical, electrical and instrument
- Vessel support crews
- Wind farm operations
- Inspection contractors
- Asset Integrity
- Marine Base
- Logistics
- Environmental Monitoring
- Office Based team – PM, Procurement, Logistics, HSE/Regulatory.



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