ScotWind 1 Leasing Round

Scottish Clusters Membership Briefing

27th of January

FORTH & TAY OFFSHORE

DeepWind

North of Scotland Offshore Wind Cluster

Shona Clive

INDUSTRIAL STRATEGY CLUSTER

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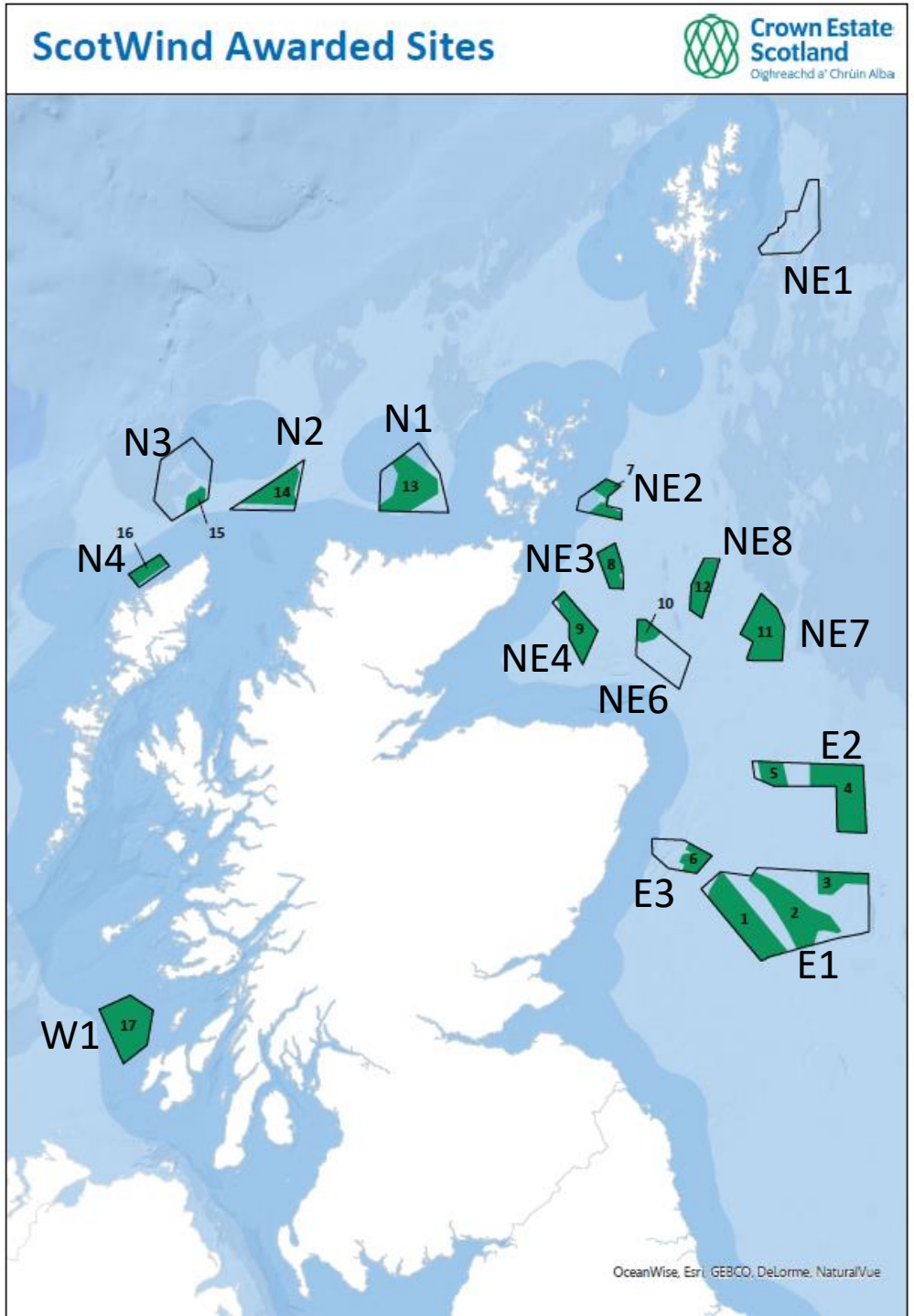
DeepWind
North of Scotland Offshore Wind Cluster



INDUSTRIAL STRATEGY CLUSTER

Programme

11.15am – Introduction from, Shona Clive, **Forth & Tay Offshore**
11.20am - ScotWind Briefing- Paul O'Brien, **DeepWind**
11.40am – Developer View – Vicky O'Connor, **Northland Power**
11.55am – ScotWind timelines – Hannah Collings, **Cluster Builder**
12.05pm – Q&A session - Speakers joined by Ian McDonald, **SOWEC**
12.15am - End of webinar

FORTH & TAY OFFSHORE

DeepWind
North of Scotland Offshore Wind Cluster

Paul O’Brien

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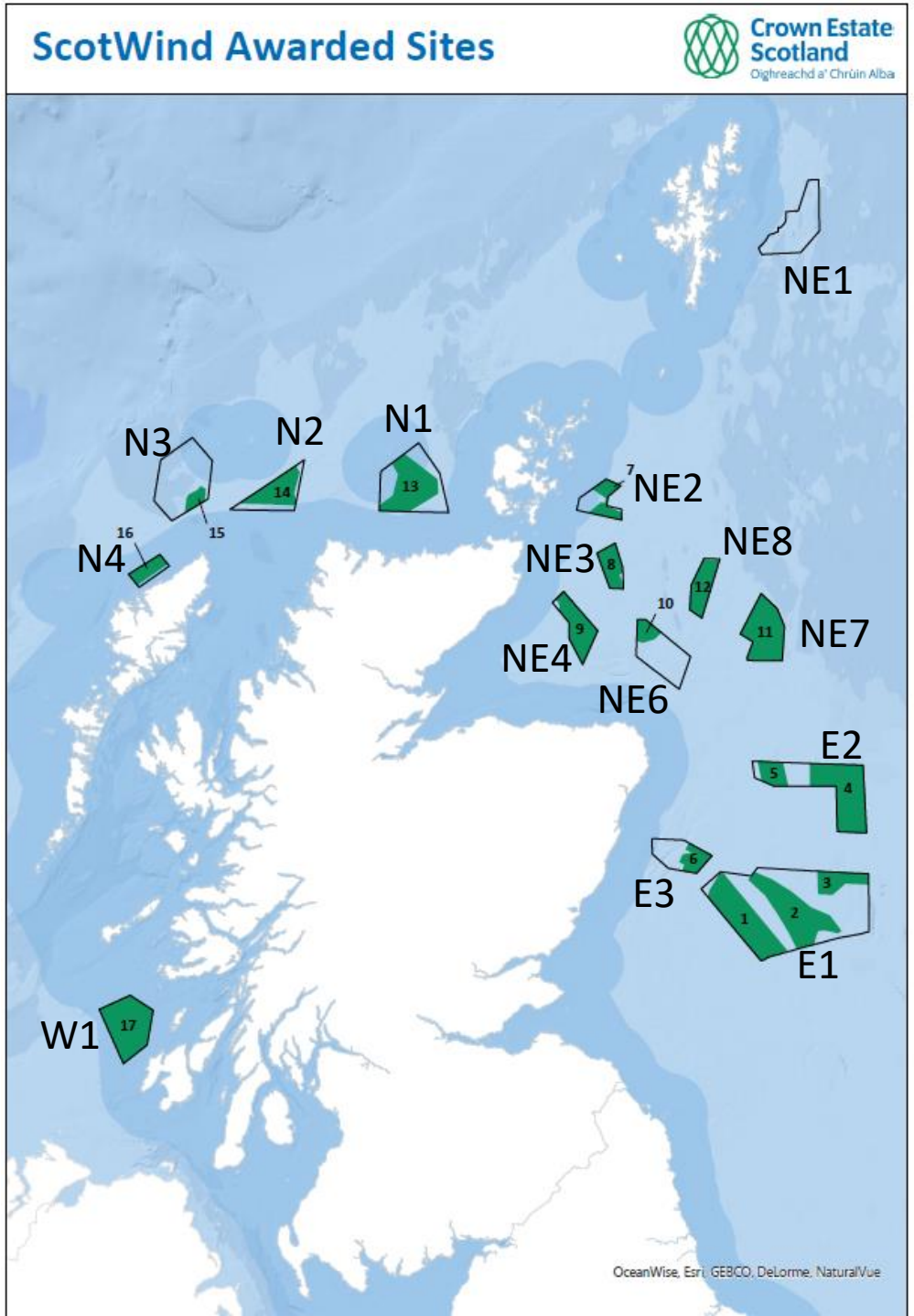
DeepWind

North of Scotland Offshore Wind Cluster

Briefing Contents

- List of successful developers and map
- Floating wind project summary
- Developers and their projects
- Supply chain opportunities
- Still to come – INTOG round



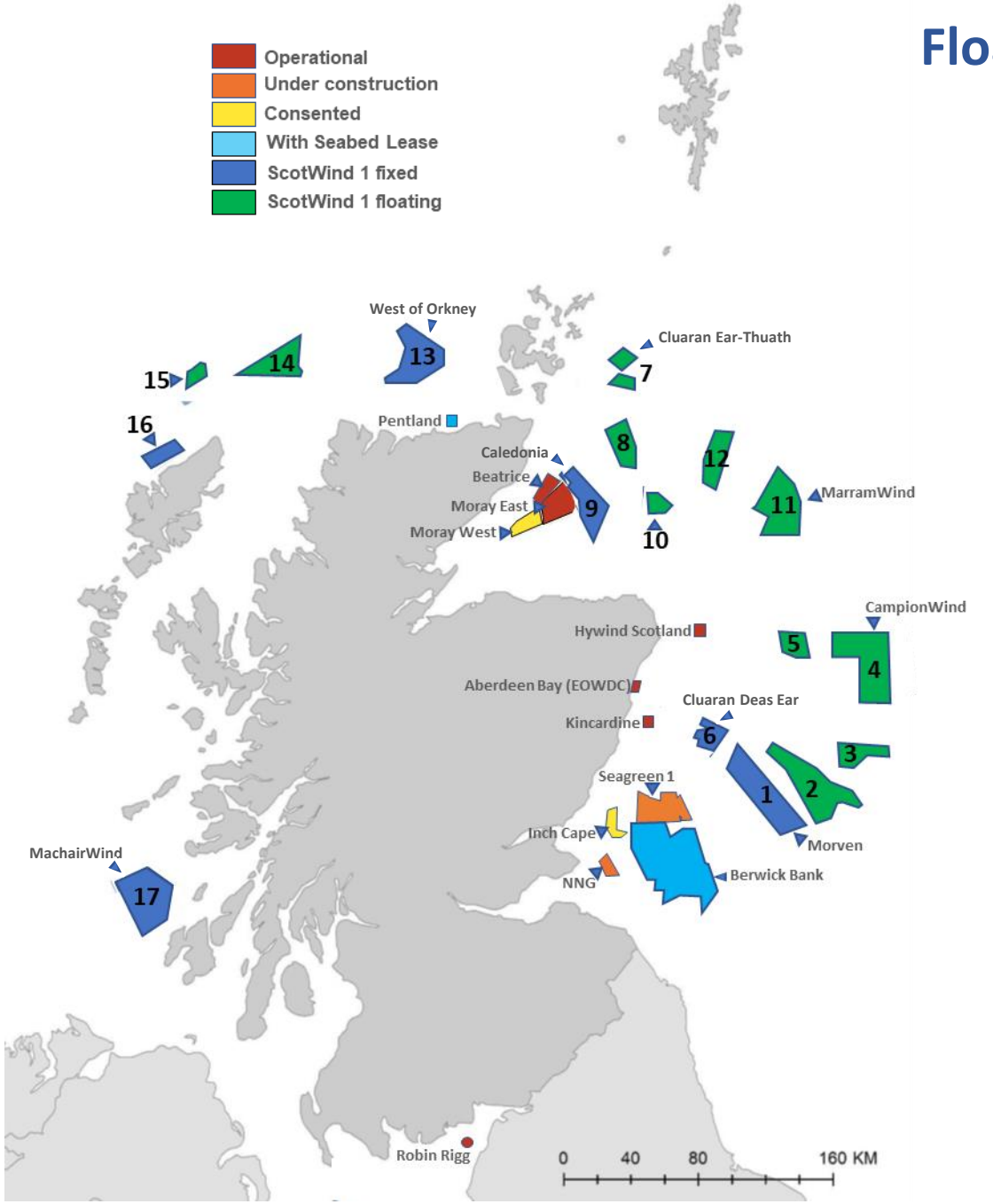
Site	Developer/Consortia	Installed Capacity
1 – E1	**BP and EnBW**	2,907MW
2 – E1	**SSE Renewables, CIP and Marubeni**	**2,610MW**
3 – E1	**Falck Renewables and BlueFloat Energy**	**1,200MW**
4 – E2	**Shell and ScottishPower Renewables**	**2,000MW**
5 - E2	**Vattenfall and Fred Olsen Renewables**	**798MW**
6 – E3	**DEME, Aspiravi and Qair**	1,008MW
7 - NE2	**DEME, Aspiravi and Qair**	**1,008MW**
8– NE3	**Falck Renewables, Orsted and BlueFloat Energy**	**1,000MW**
9 –NE4	**Ocean Winds**	1,000MW
10- NE6	**Falck Renewables and BlueFloat Energy**	**500MW**
11- NE7	**Shell and ScottishPower Renewables**	**3,000MW**
12- NE8	**Floating Energy Allyance (Baywa r.e., Elicio and BW Ideol)**	**960MW**
13 -N1	**RIDG, GIG and TotalEnergies**	2,000MW
14 -N2	**Northland Power**	**1,500MW**
15 -N3	**Magnora ASA and Technip UK**	**495MW**
16- N4	**Northland Power**	840MW
17 -W1	**ScottishPower Renewables**	2,000MW

Total = 24,826MW

Fixed Wind = 9,755MW

Floating Wind = 15,071MW

Floating Wind in Scotland



SITE	DEVELOPERS	CAPACITY
1	BP and EnBW	2,907MW
2	SSE Renewables, CIP and Marubeni	2,610MW (FOW)
3	Falck Renewables and BlueFloat Energy	1,200MW (FOW)
4	Shell and ScottishPower Renewables	2,000MW (FOW)
5	Vattenfall and Fred Olsen Renewables	798MW (FOW)
6	DEME, Aspiravi and Qair	1,008MW
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15	Magnora ASA and Technip UK	495MW (FOW)
16	Northland Power	840MW
17	ScottishPower Renewables	2,000MW

Total = 24,826MW
Floating Wind = 15,071MW (60%)

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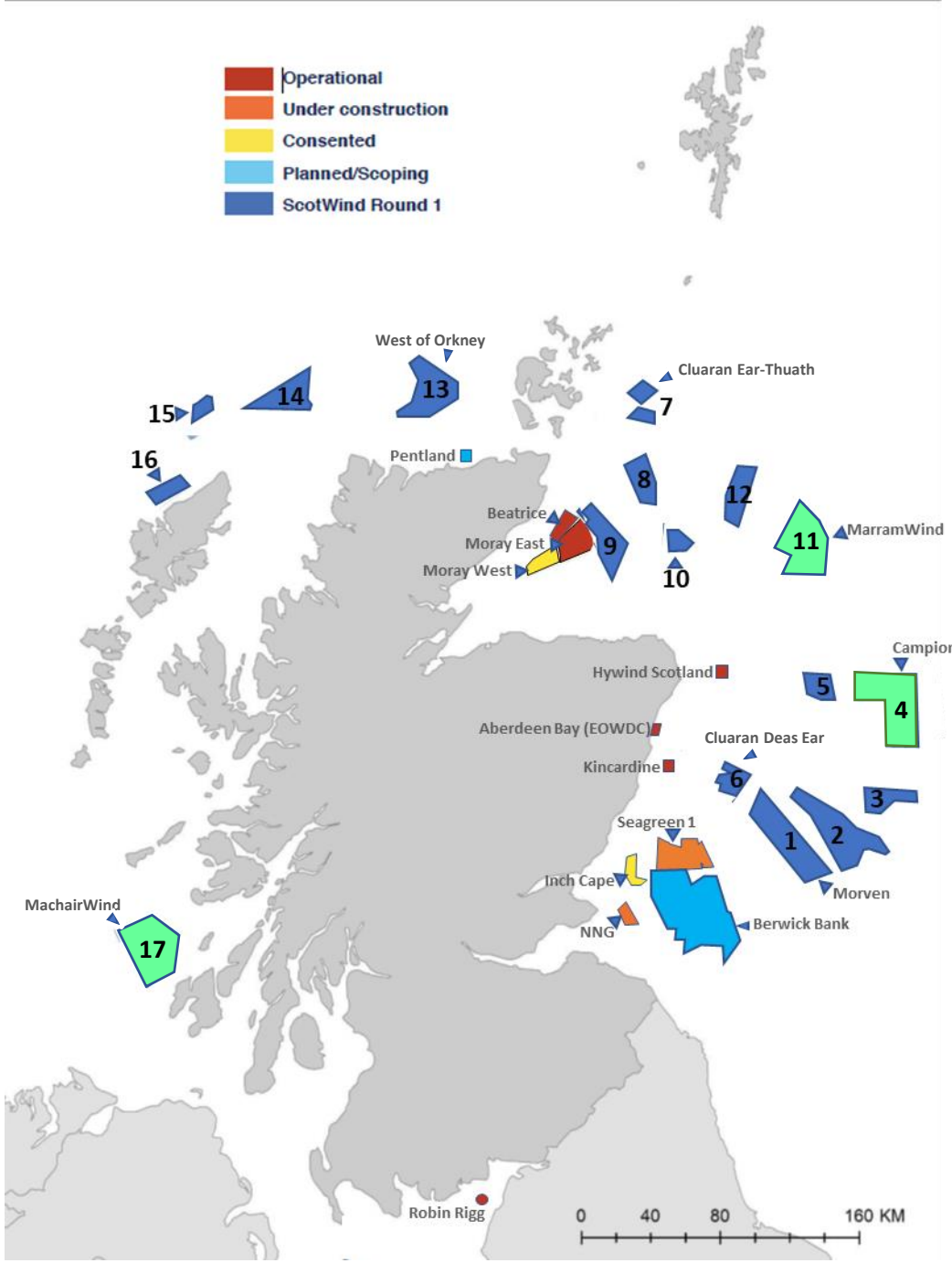
North of Scotland Offshore Wind Cluster



INDUSTRIAL STRATEGY

SCOTTISHPOWER RENEWABLES

Site 4 CampionWind

Developer – **Shell** and **ScottishPower Renewables**
Name – CampionWind
Capacity – 2,000MW
Area – 860km^2
Depth – 77m
Type - Floating
Substructure –????
Turbine Size – 20MW (100)

Site 17

Developer – **ScottishPower Renewables**
Name – MachairWind
Capacity – 2,000MW
Area – 754km^2
Depth – <60m
Type - Fixed
Substructure – Jackets?
Turbine Size – 20MW (100)

Site 11 MarramWind

Developer – **Shell** and **ScottishPower Renewables**
Name – MarramWind
Capacity – 3,000MW
Area – 684km^2
Depth – 100m
Type - Floating
Substructure –????
Turbine Size – 20MW (150)

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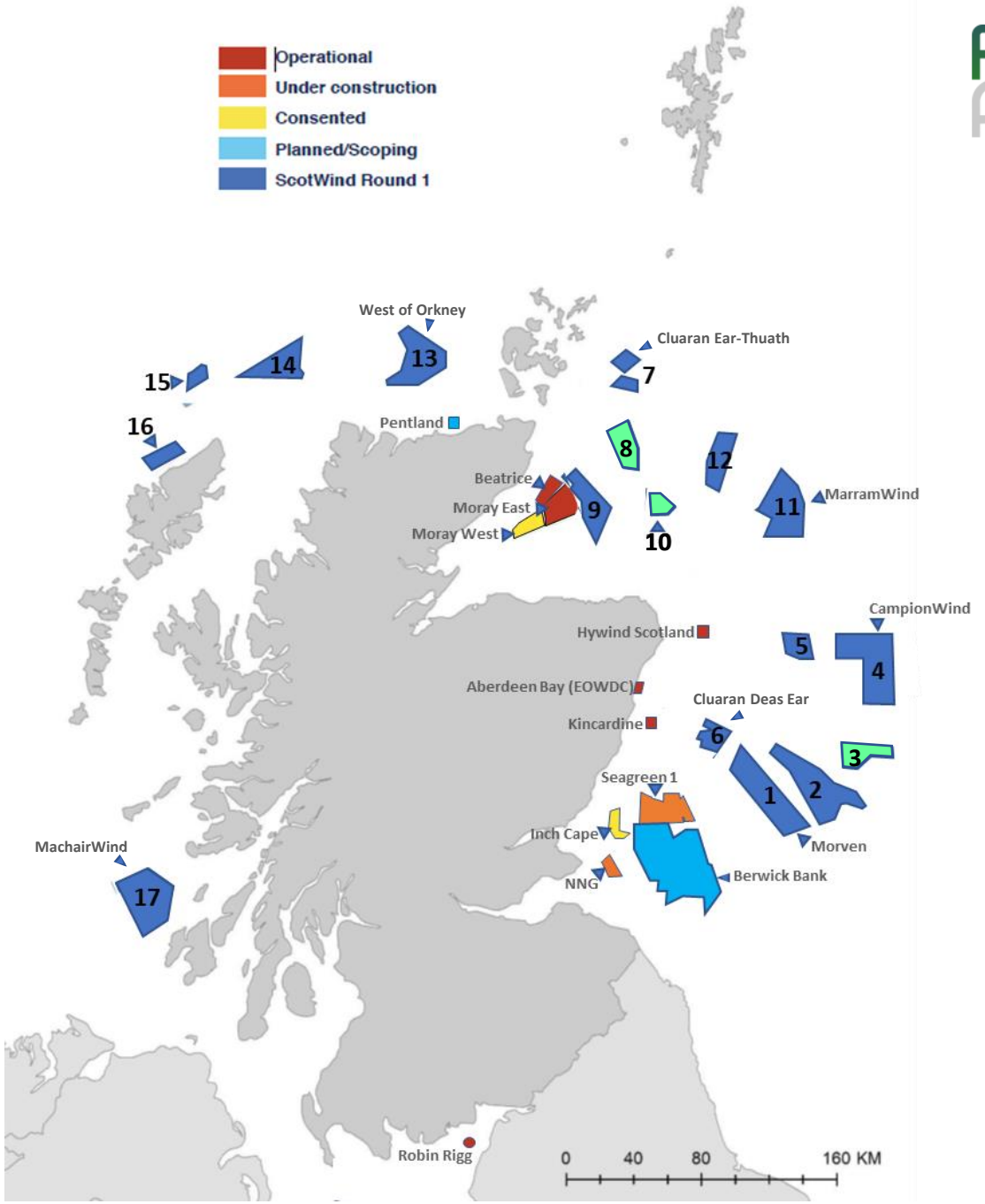
North of Scotland Offshore Wind Cluster



Site 3

Developer – **Falck Renewables and BlueFloat Energy**

Name – E1-C

Capacity – 1,200MW

Area – 280km^2

Depth – 70-100m

Type - Floating

Substructure - OO-Star Wind Floater

Turbine Size – 20MW (60)

Site 10

Developer – **Falck Renewables and BlueFloat Energy**

Name – NE6

Capacity – 500MW

Area – 134km^2

Depth – 60-100m

Type - Floating

Substructure – OO-Star Wind Floater

Turbine Size – 20MW (25)

Site 8

Developer – **Falck Renewables, BlueFloat Energy and Orsted**

Name – NE3

Capacity – 1,000MW

Area – 256km^2

Depth – 60-100m

Type - Floating

Substructure – OO-Star Wind Floater

Turbine Size – 20MW (50)

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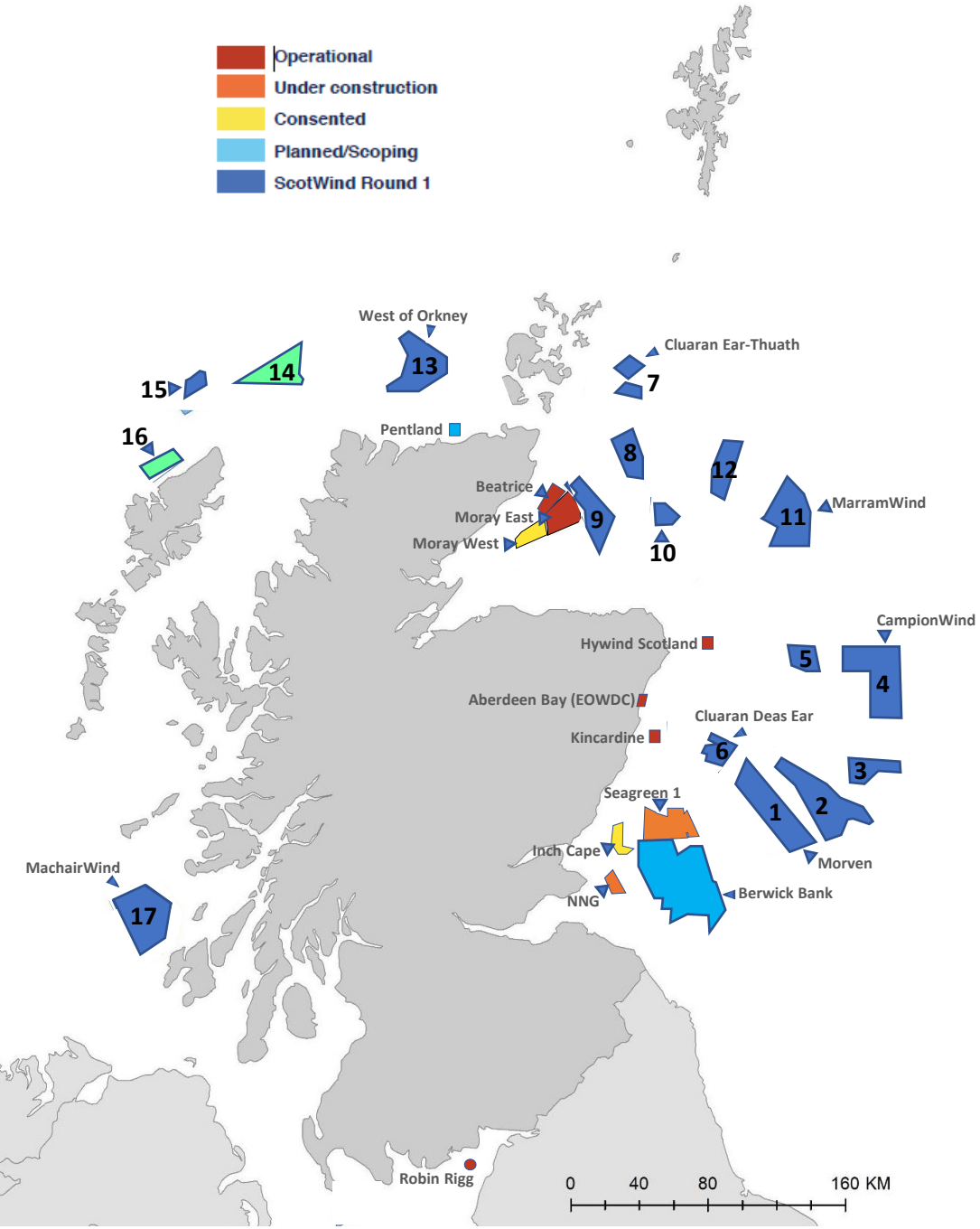

INDUSTRIAL STRATEGY

NORTHLAND POWER

Site 14
Developer – **Northland Power**
Name – N2
Capacity – 1,500MW
Area – 390km^2
Depth – 70-100m
Type - Floating
Substructure –????
Turbine Size – 20MW (75)

Site 16
Developer – **Northland Power**
Name – N4
Capacity – 840MW
Area – 161km^2
Depth – <60m
Type - Fixed
Substructure – Jackets?
Turbine Size – 20MW (42)

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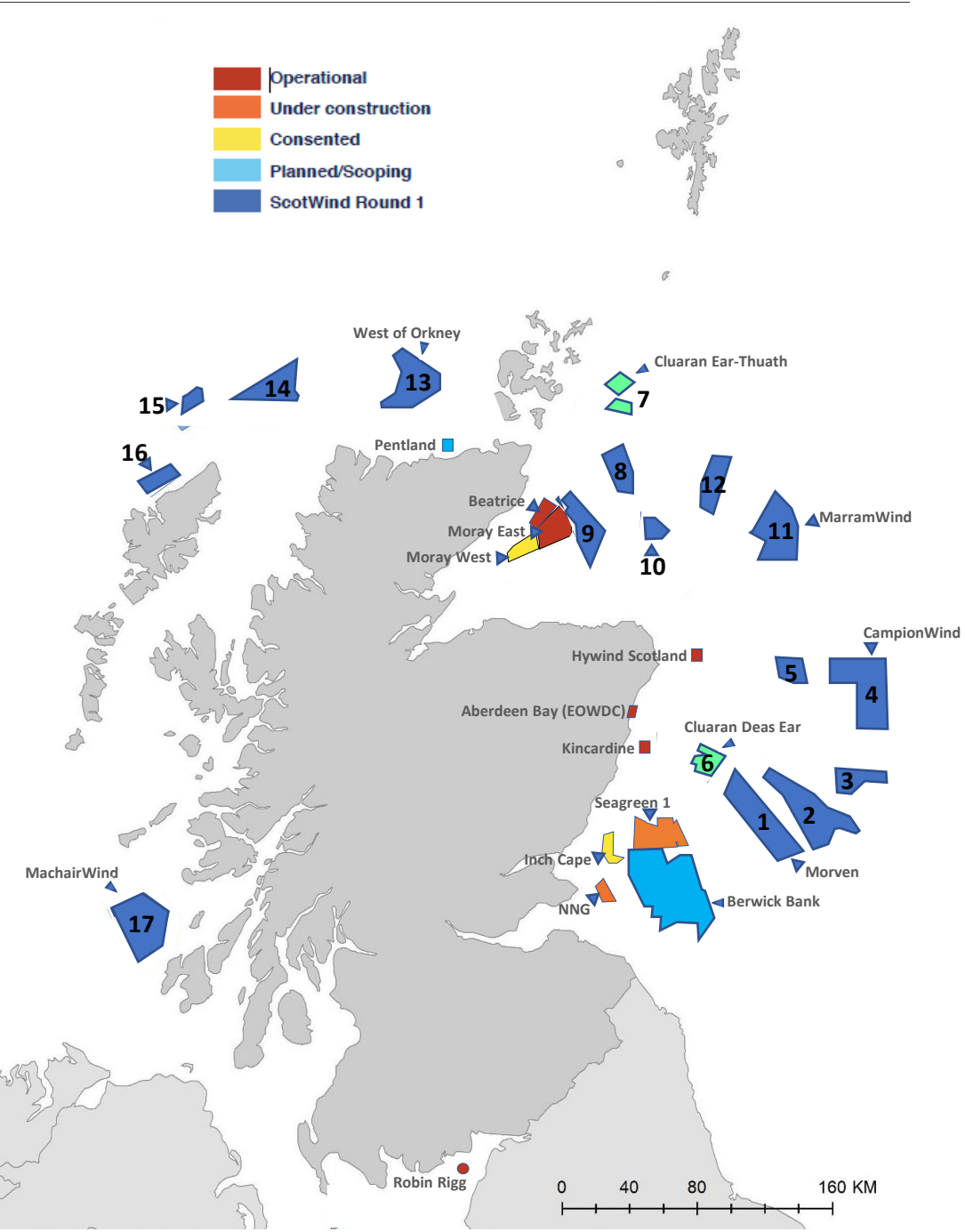
DeepWind
North of Scotland Offshore Wind Cluster

Thistle Wind Partners (TWP)



Site 6

Developer – **Thistle Wind Partners**
Name – Cluaran Deas Ear
Capacity – 1,008MW
Area – 187km^2
Depth – <60m
Type - Fixed
Substructure – Mono/Jackets?
Turbine Size – 18MW (56)

Site 7

Developer – **Thistle Wind Partners**
Name – Cluaran Ear-Thuath
Capacity – 1,008MW
Area – 201km^2
Depth – 60-100m
Type - Floating
Substructure – ????
Turbine Size – 18MW (56)

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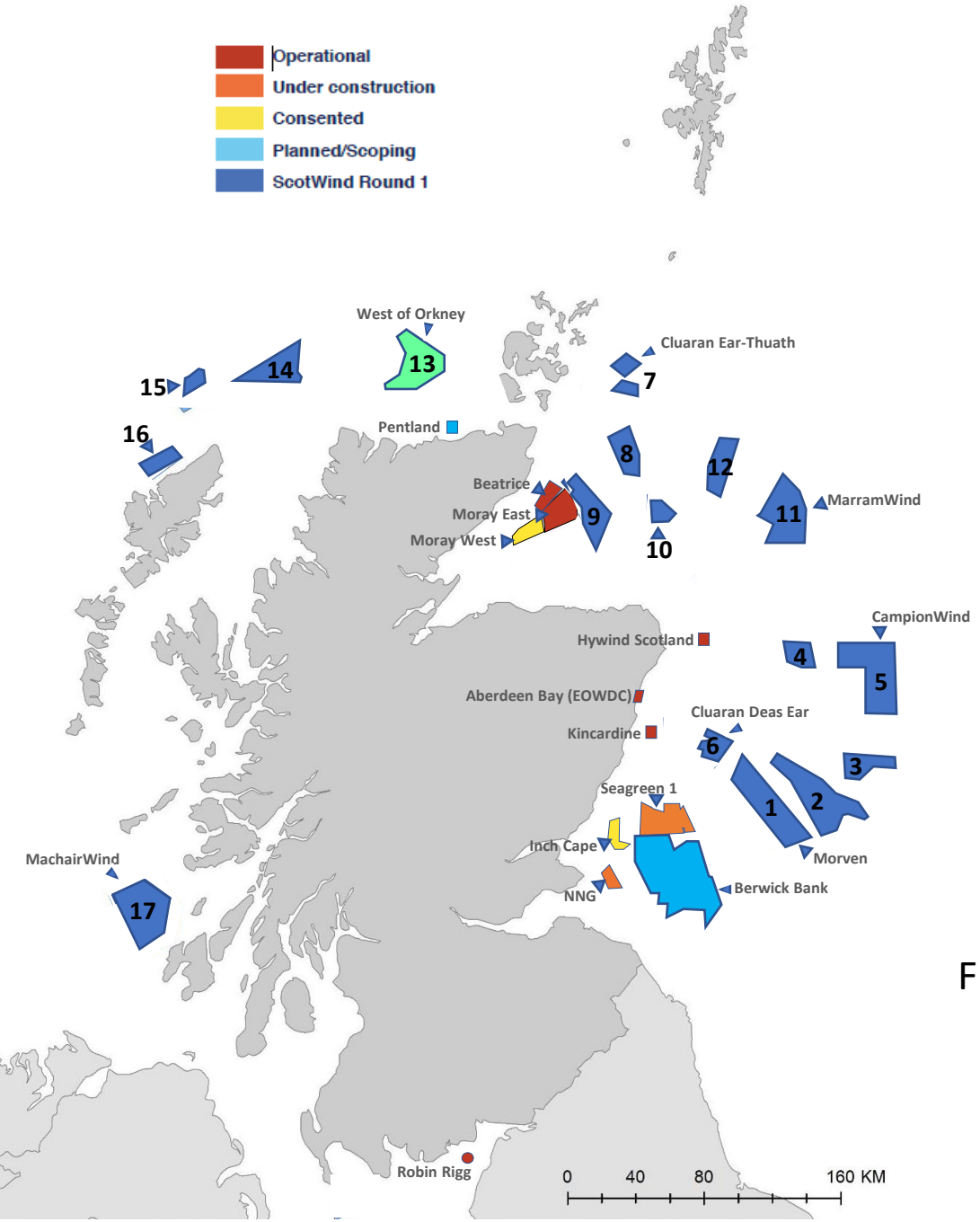
North of Scotland Offshore Wind Cluster

Offshore Wind Power



Site 13

Developer – **GIG, RIDG and TotalEnergies**

Name – West of Orkney

Capacity – 2,000MW

Area – 657km^2

Depth – <60m

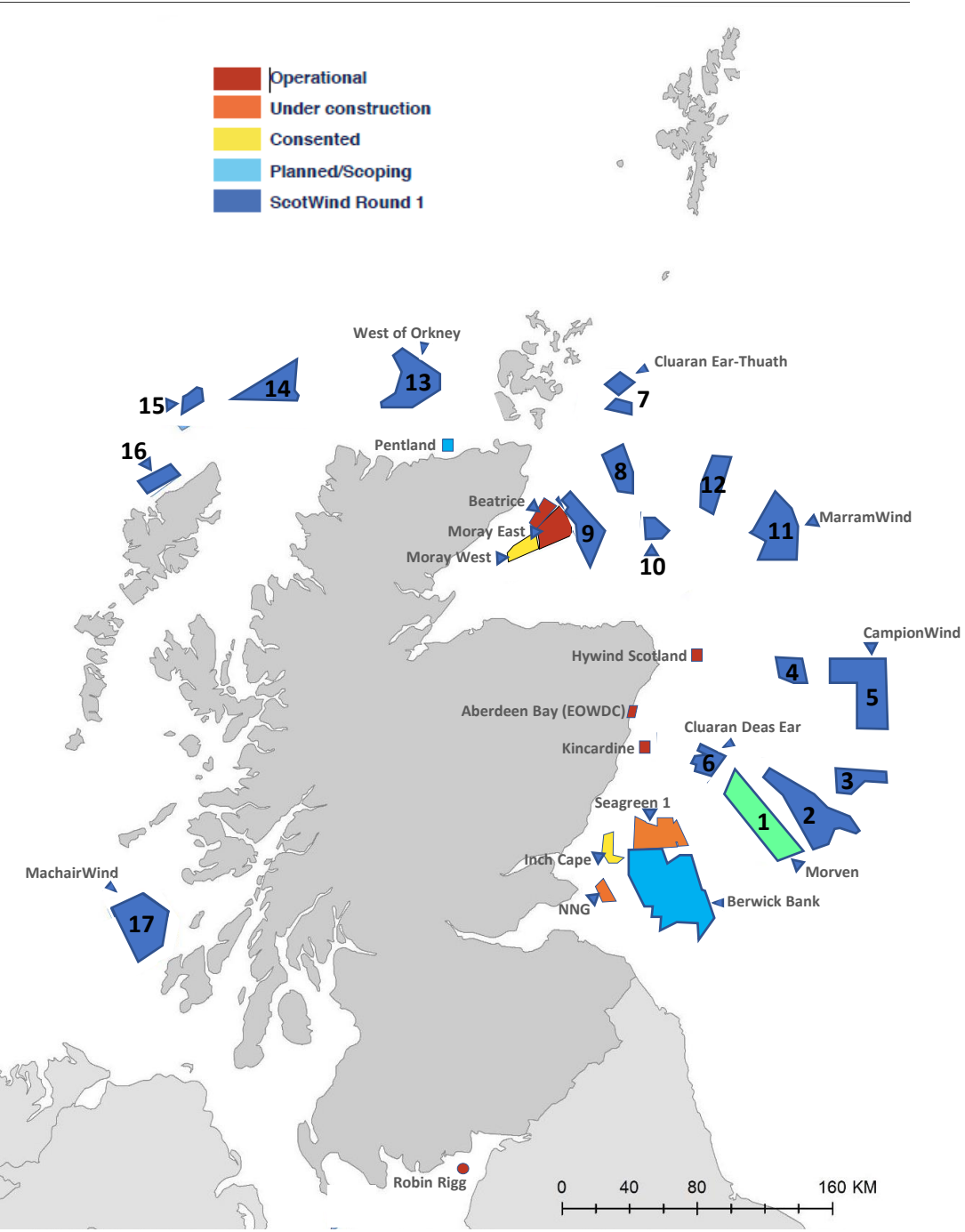
Type - Fixed

Substructure – Mono/Jackets?

Turbine Size – 20MW (100)

Flotta Hydrogen Hub - Hybrid grid/hydrogen project

DeepWind
North of Scotland Offshore Wind Cluster



INDUSTRIAL STRATEGY

bp

EnBW

Site 1

Developer – **bp and EnBW**

Name – Morven

Capacity – 2,907MW

Area – 859km^2

Depth – 65-75m

Type - Fixed

Substructure – Jackets

Turbine Size – 19MW (153)

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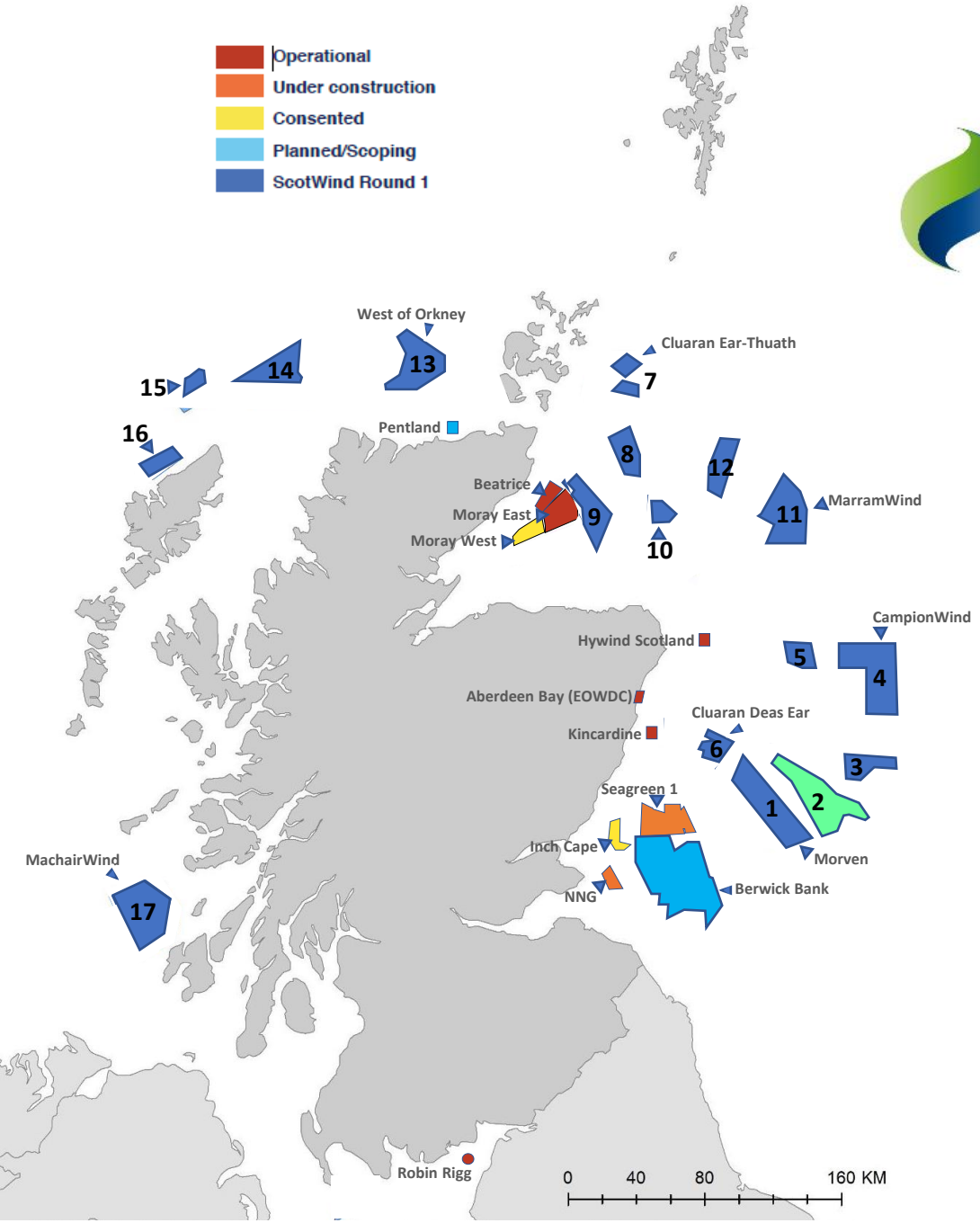

INDUSTRIAL STRATEGY

sse Renewables Marubeni CIP Copenhagen Infrastructure Partners

Site 2

Developer – **SSE Renewables, Marubeni and CIP**

Name – E1-B

Capacity – 2,610MW

Area – 859km^2

Depth – 70-100m

Type - Floating

Substructure – ????

Turbine Size – 18MW (145)

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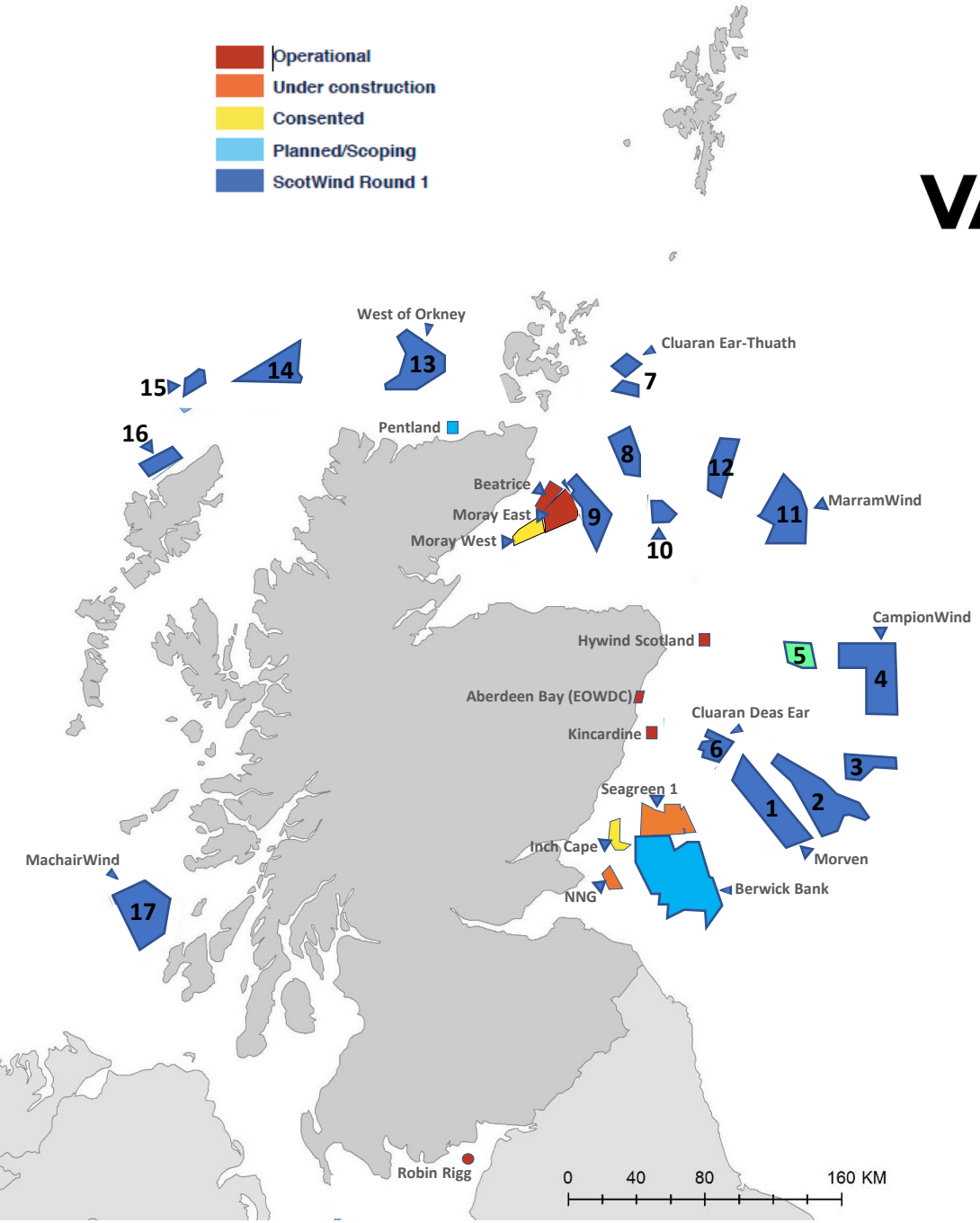
DeepWind North of Scotland Offshore Wind Cluster



INDUSTRIAL STRATEGY

VATTENFALL

Fred. Olsen Renewables

Site 5

Developer – **Vattenfall and Fred Olsen Renewables**

Name – E2-B

Capacity – 798MW

Area – 200km^2

Depth – 70-100m

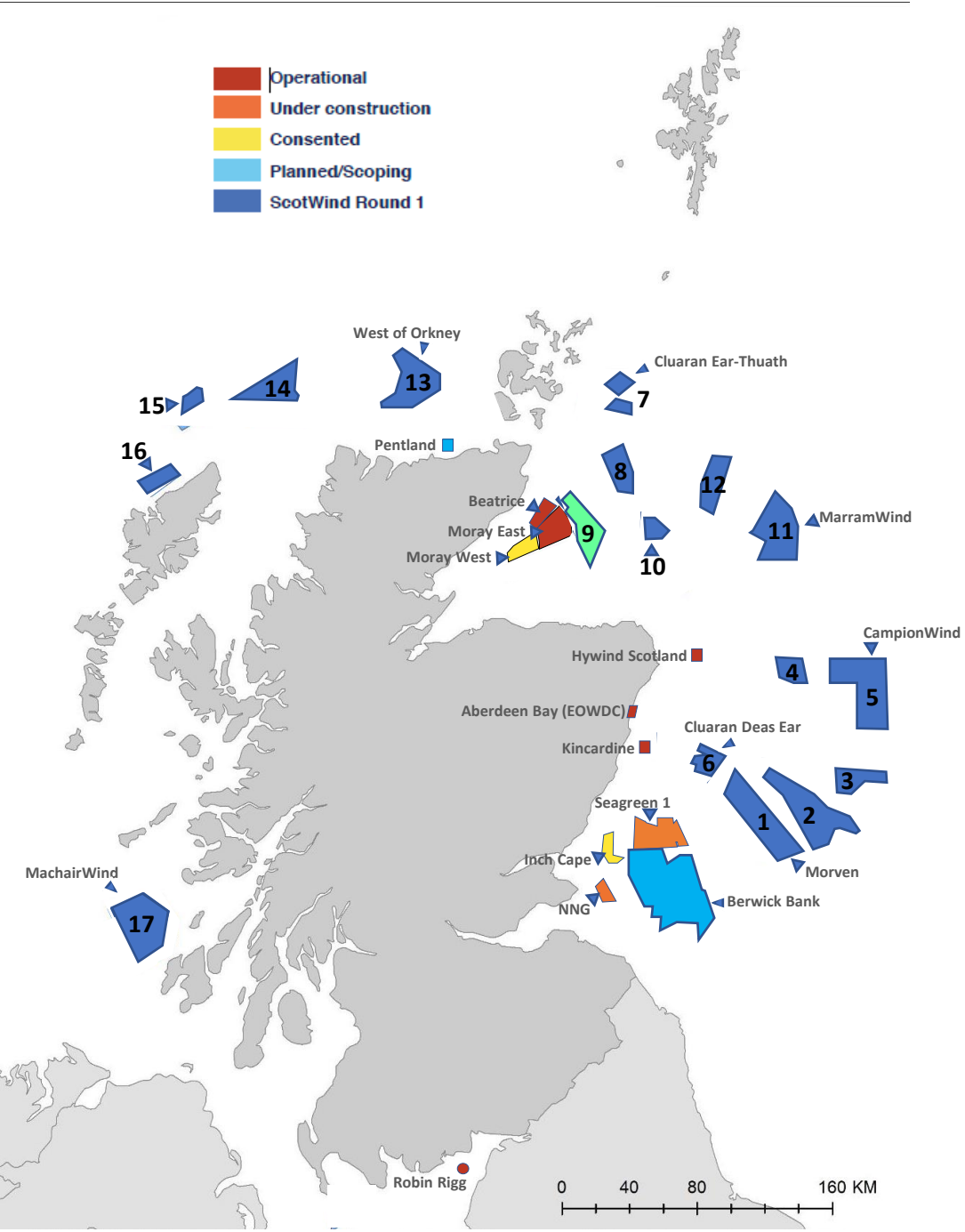
Type - Floating

Substructure – ????

Turbine Size – 19MW (42)

DeepWind

North of Scotland Offshore Wind Cluster



Moray Offshore Renewable Power

Site 9

Developer – **Ocean Winds**

Name – Moray Mhor East

Capacity – 1,000MW

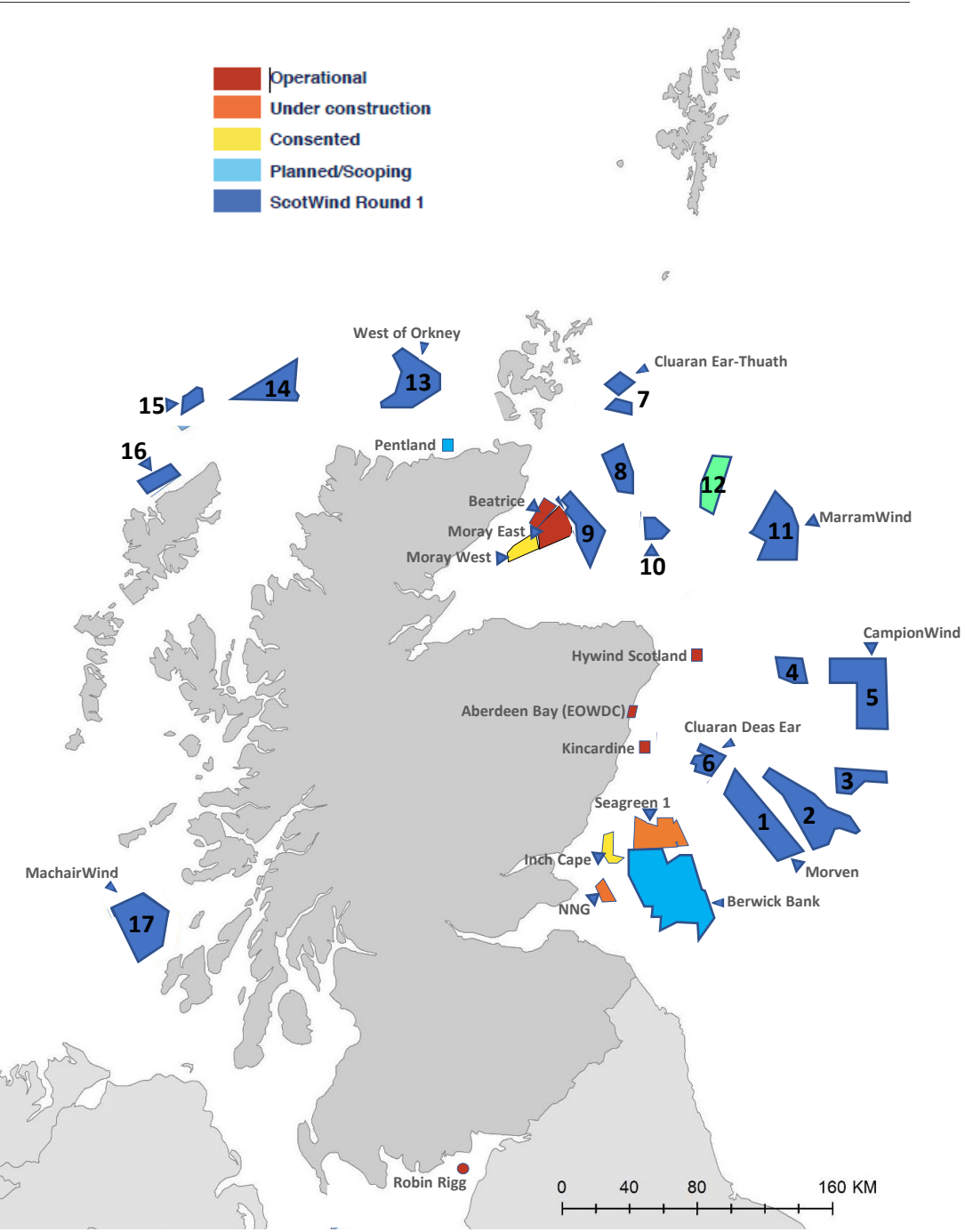
Area – 429km^2

Depth – <60m

Type - Fixed

Substructure – Mono/Jacket

Turbine Size – 20MW (50)



INDUSTRIAL STRATEGY

Floating Energy Allyance

BayWa r.e. élicio BW ideol

Site 12

Developer – **Floating Energy Allyance**

Name – NE8

Capacity – 960MW

Area – 330km^2

Depth – 60-100m+

Type - Floating

Substructure – BW Ideol – Concrete barge

Turbine Size – 20MW (48)

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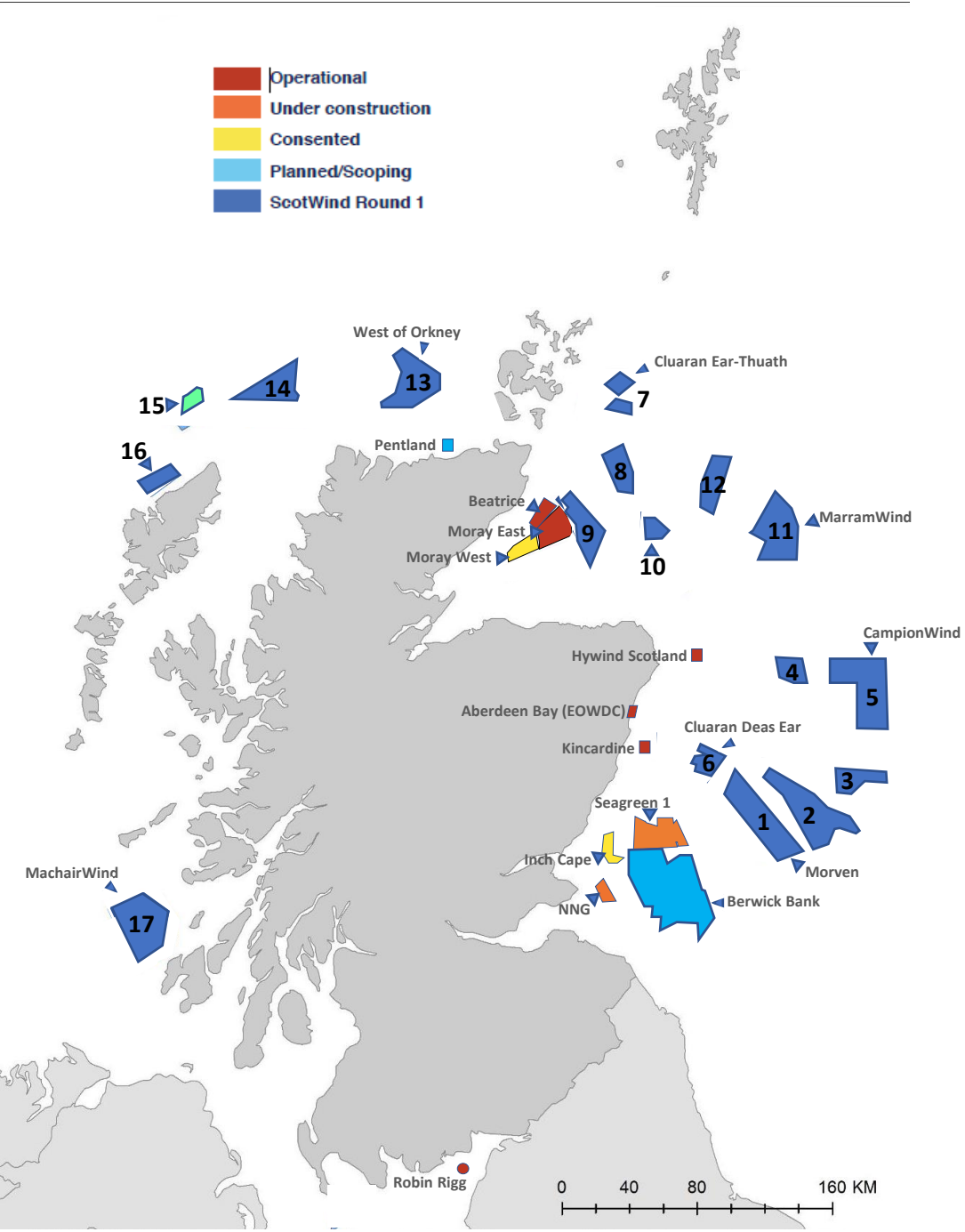
Magnora Offshore Wind



MAGNORA ASA

TechnipFMC

Site 15

Developer – **Magnora and TechnipFMC**

Name – N3

Capacity – 495MW

Area – 103km^2

Depth – 106-125m

Type - Floating

Substructure – Concrete semi-sub

Turbine Size – 15MW (33)

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Scottish Offshore Wind Strategic Investment Assessment Report and it's 5 recommendations

Priority recommendations being actioned:

1) **Offshore Wind Collaborative Framework** – to encourage the developers, ports and supply chain to come together and work collectively to support the delivery of offshore wind projects from ScotWind. To be led by the ScotWind developers and agreed before April 2022

2) **Scottish Floating Offshore Wind Port Cluster**
Cabinet Secretary for Net Zero, Energy and Transport Michael Matheson on 18th of January
"We will work closely with SOWEC to implement the five key recommendations in the SIA, starting with the creation of a Scottish Floating Offshore Wind Port Cluster, with ports acting in partnership to provide the required infrastructure area and capability needed to attract manufacturers to invest in Scotland"

Supply Chain - Substructures

Floating

Steel or Concrete?

Site no	No of substructures
2	145
3	60
4	100
5	42
7	56
8	50
10	25
11	150
12	48
14	60
15	33
Total	**769**

Concrete = 216

Fixed

Jackets or Monopiles?

Site no	No of substructures
1	153
6	56
9	50
13	100
16	60
17	100
Total	**519**

Turbines, towers and blade sets for all 1,288 systems

15-20MW turbine range

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Supply Chain - Ports

Securing port infrastructure for manufacture, assembly or marshalling will be high on the ScotWind 1 developers shopping lists as well as selecting O&M bases. Some of the developers have already given indications of which ports they are going to work with and these are shown below

Site	Manufacturing Ports	Marshalling Ports	O&M Ports
1 – bp and EnBW	???	Forth Ports Leith	?
12 – Floating Energy Allyance	Ardersier	Port of Cromarty Firth?	?
13 – Offshore Wind Power	???	Scapa??	Scrabster?
15 – Magnora Offshore Wind	Kishorn	Stornoway	Stornoway

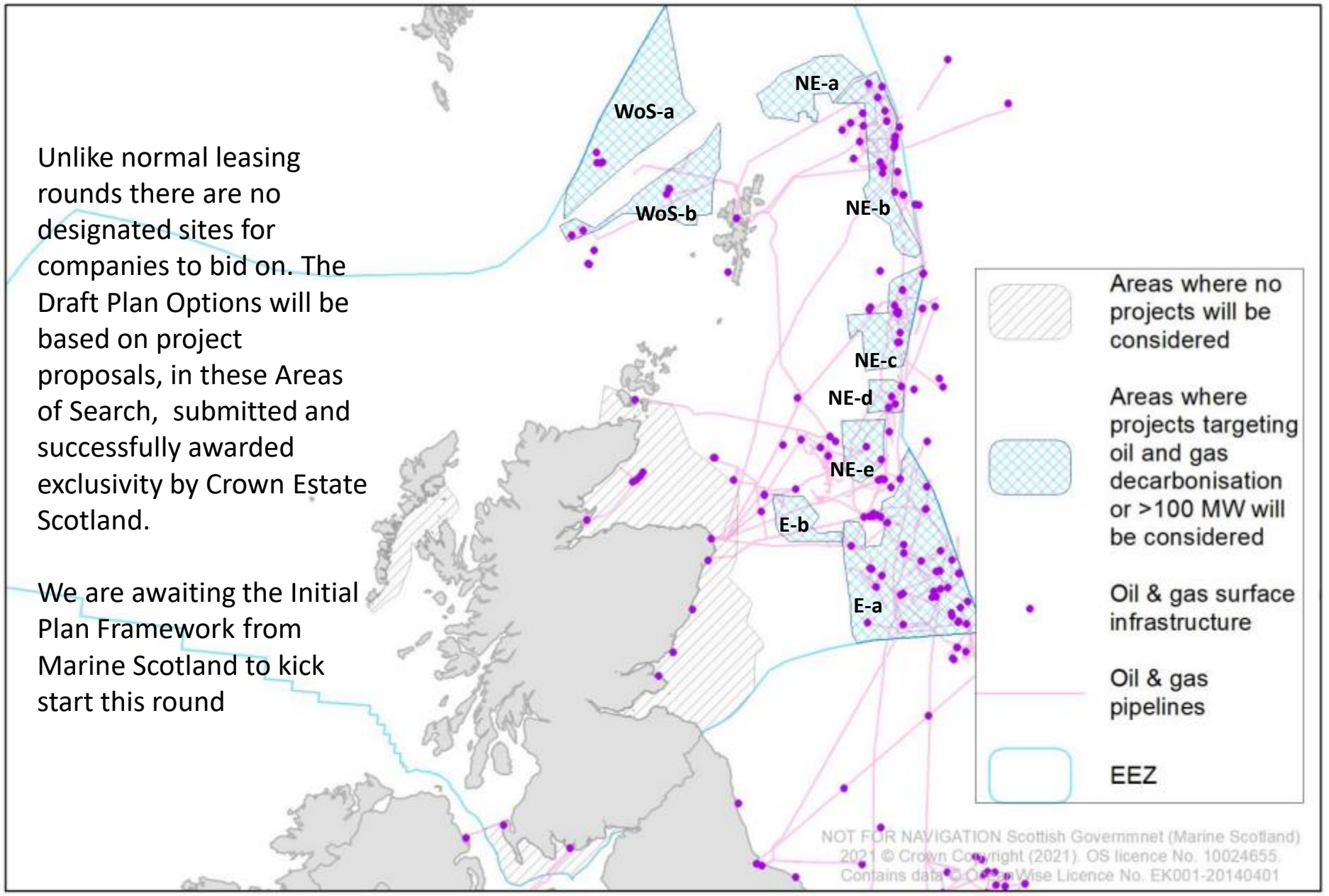
O&M - Ports

With 17 new sites it is likely that we will have a number of new O&M bases being developed as part of the support infrastructure for ScotWind 1. We are predicting up to 10 new O&M bases with some existing bases picking up more work as well as new ones serving more than one project.

INTOG – Innovation and Targeting Oil and Gas

Unlike normal leasing rounds there are no designated sites for companies to bid on. The Draft Plan Options will be based on project proposals, in these Areas of Search, submitted and successfully awarded exclusivity by Crown Estate Scotland.

We are awaiting the Initial Plan Framework from Marine Scotland to kick start this round



Innovation

Projects of <100MW with an expected total of 500MW capacity available for such projects

Oil and Gas

Decarbonisation of the production energy for oil and gas assets in the North Sea must be the main purpose of the projects.

No upper project limit has been set other than an expected capacity of around 4GW

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Did you know.....

England and Wales - project pipeline still to be built out

= 26,884MW (including Round 4)

Scotland - project pipeline still to be built out

= 31,292MW (not including INTOG)

Scotland is now the premier offshore wind market in the UK based on future project construction and related supply chain opportunities

RoUK Project Pipeline (26,884MW)

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Thank you

Email: paul.obrien@hient.co.uk
www.offshorewindscotland.org.uk

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Pacific Orca at Beatrice Project, source – HIE

Vicky O’Connor

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NORTHLAND POWER

DeepWind
North of Scotland Offshore Wind Cluster

NORTHLAND POWER

Northland Power

DeepWind Webinar

27 January 2022

MEMBER OF scottish renewables 2020-2021

renewableUK Company Member

CATAPULT Offshore Renewable Energy

A Member of DeepWind North of Scotland Offshore Wind Cluster

Partner of Choice

"With a proven track record of 30+ years of development, we know that flexible, respectful and synergetic partnerships – with investors, businesses, governments and the community – are at the core of a project's success."

David Povall, Executive Vice-President, Development, Northland Power

1

WE KNOW WIND

Decades of experience developing wind, with over 400 turbines in operation, both onshore/offshore.

2

WE ARE COMMITTED

Safety, Honesty & Integrity, Respect, Commitment, Collaboration, and Creativity are core to our approach.

3

WE STAY

With an owner's mindset from the outset of development, we take a long-term view in our decision-making.

4

WE CONSULT & COMMUNICATE

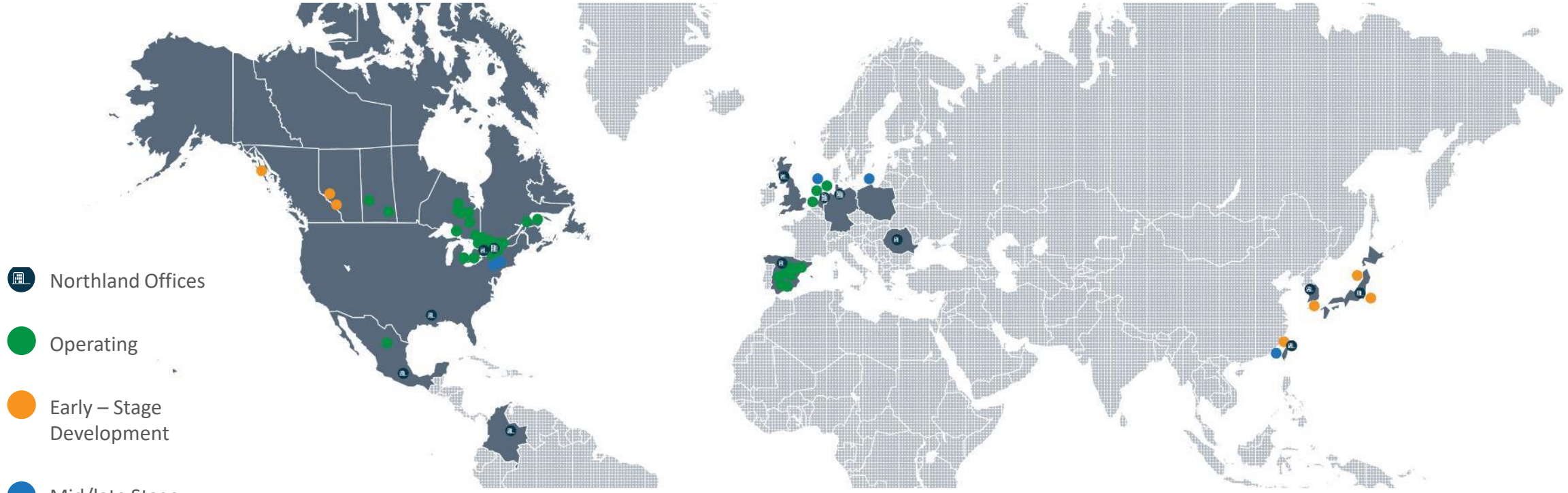
We are committed to open and transparent communication and to building projects that work for the community.

5

WE INVEST IN COMMUNITIES

As a committed community partner, we understand the importance of investing into local initiatives and ideas.

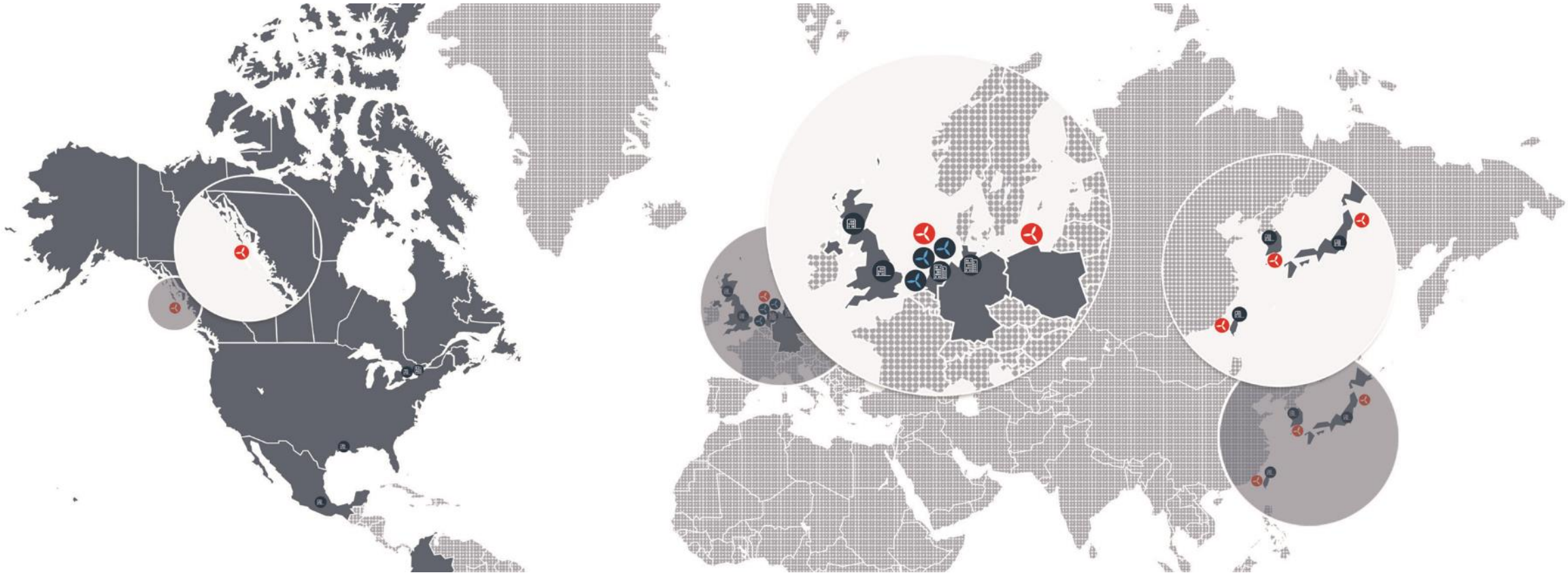
Northland's Global Reach



- Northland Offices
- Operating
- Early – Stage Development
- Mid/late Stage Development/ Construction

- Global developer, owner and operator of sustainable infrastructure assets with over 34 years of experience.
- Well-diversified, modern fleet of high-quality assets. **Power Generating Assets: 3.2+ GW global operating fleet** and 4-5GW visible development portfolio.
- **+27 projects worldwide; offices in 12 countries** across 4 continents; Northland is one of the largest and most diversified Canada-based independent power producers.
- Significant development opportunities across multiple jurisdictions and technologies. Especially in Europe.
- Plans to **invest 7-10 billion €** ($10-14B CAD) **in new renewable projects over the next 5 years**.

Northland's Global Reach – Offshore Wind Success



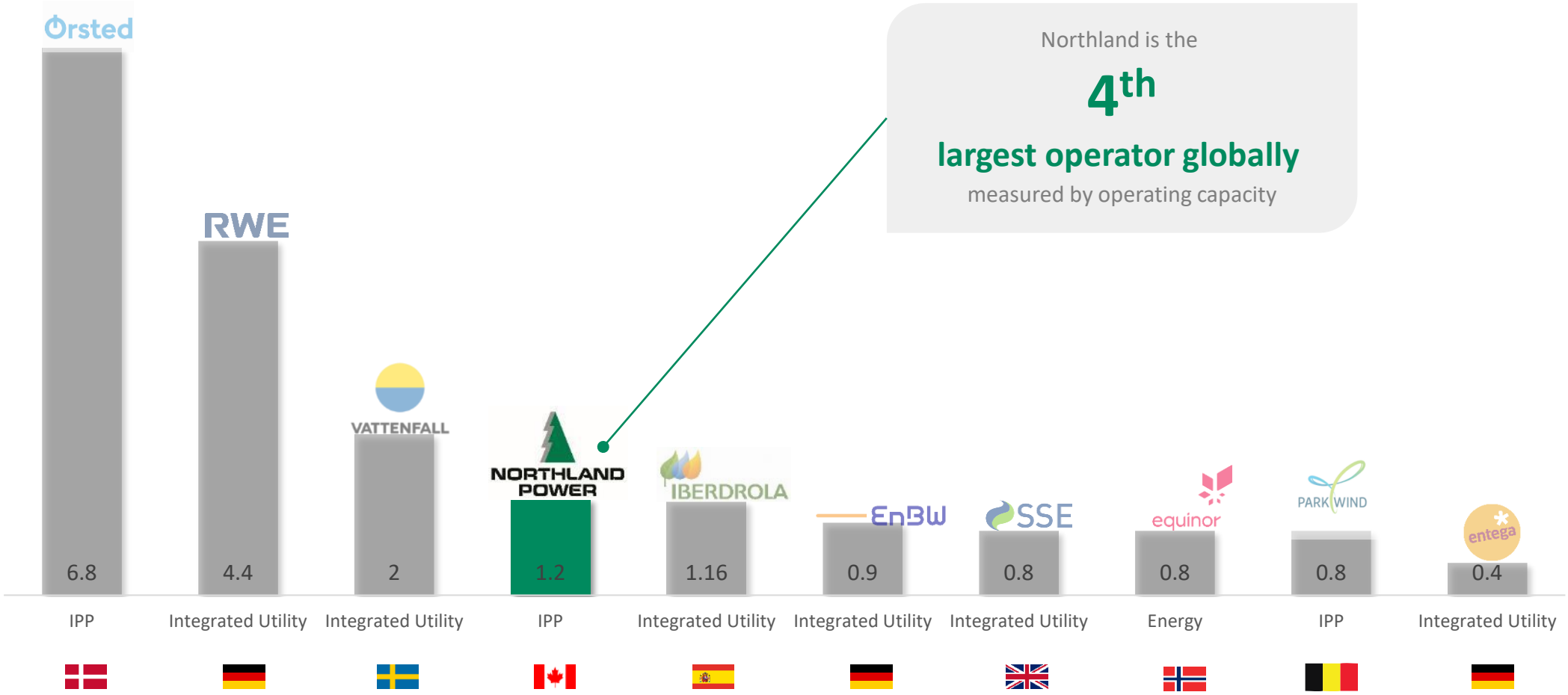
Today, Northland is actively developing projects and new offshore wind opportunities in Europe, Asia and Canada, including:

- 1,300 MW offshore wind development in Germany (Nordsee Two & Three & Delta)
- 1,200 MW in mature development in Poland (Baltic Power)
- 400 MW partnership in Canada (Hecate Straight)
- 1,044 MW secured in Taiwan under FIT and competitive auction (Hai Long) and 1,800 MW early-stage opportunities under upcoming Taiwanese zonal round
- 1,000 MW early-stage opportunity in South Korea (Dado Ocean)
- 600 MW partnership in Japan (Shizen Energy)

Offshore Wind – Operations

Installed Capacity by GW

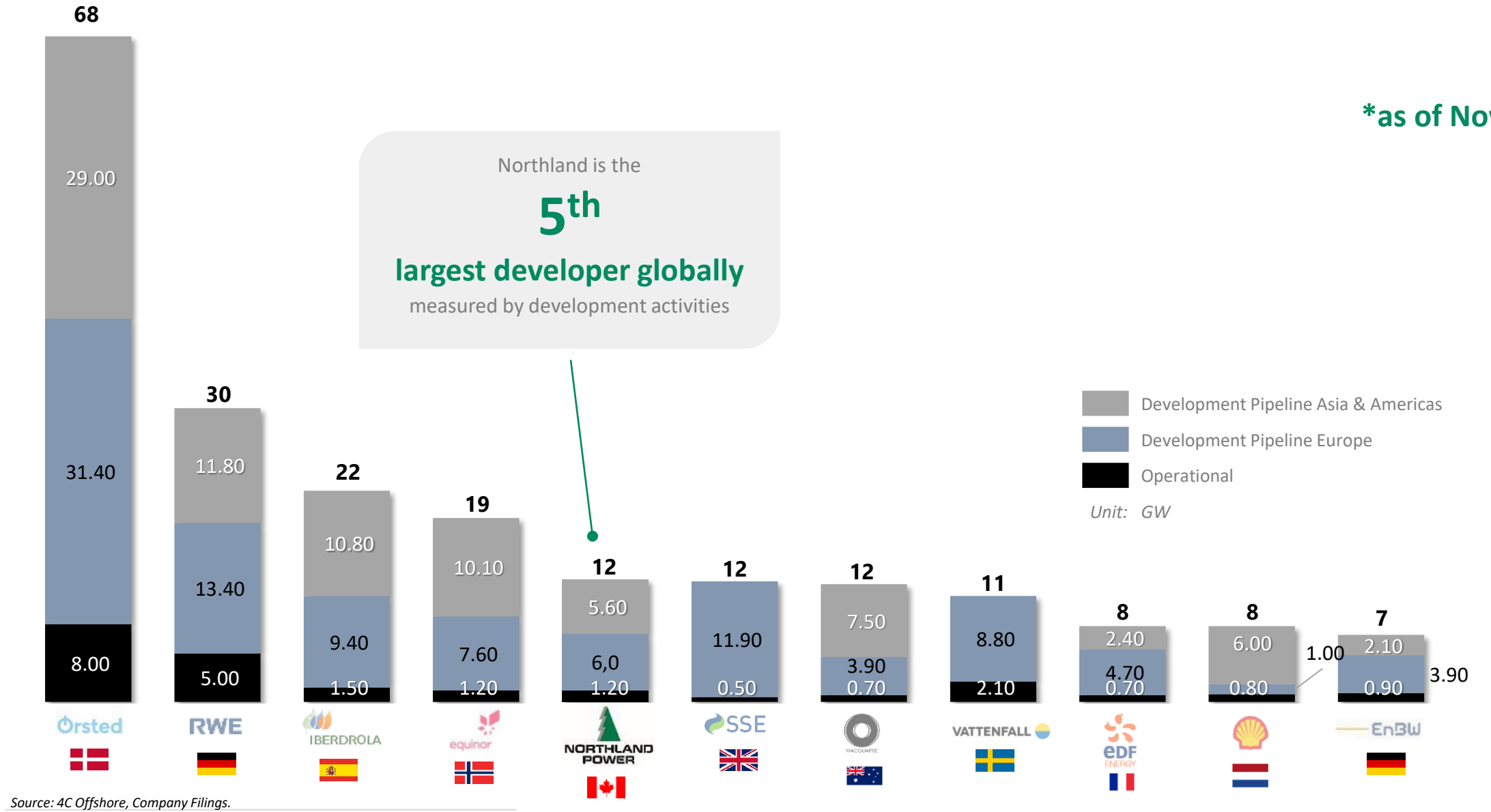
*as of Nov 2021



Source: 4C Offshore, Company Filings.

Offshore Wind – Development

*as of Nov 2021

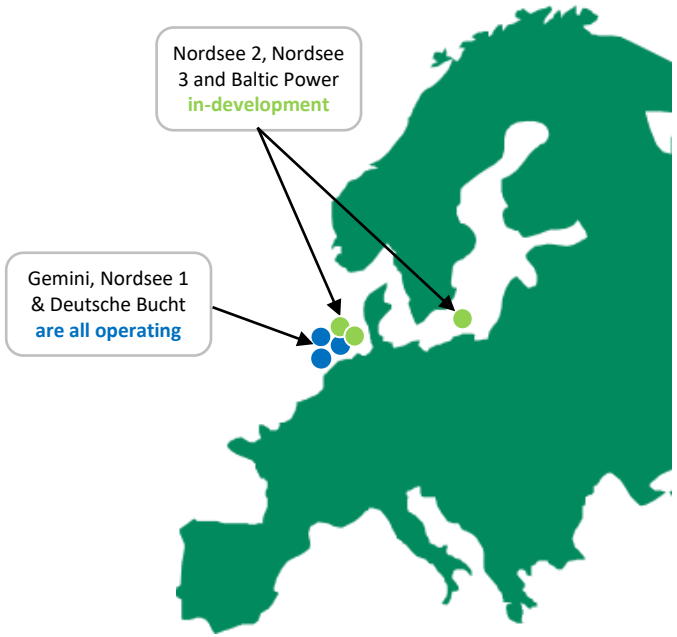


Source: 4C Offshore, Company Filings.

Offshore Wind Success – Europe

3.3 GW[1]

European Offshore Wind Power



Owner and operator of some of the **world's largest offshore wind farms** with an active development pipeline of scale.

Northland has successfully constructed offshore wind facilities **totaling 1.2 GW of gross capacity** in Europe.

Continue to own and operate assets long-term, **extensive experience in O&M and local job creation.**

Newly partnered with **PKN Orlen for the 1.2 GW Baltic Power** project in Poland.

Exercised step-in rights for **Nordsee Two**. Developing c. +1.3 GW OFW capacity in partnerhip with **RWE.**

Offshore wind center of excellence in Hamburg providing guidance and centralised services.

NETHERLANDS 600 MW

GEMINI
Equity share: 60%, partners include Siemens
Operation started in April 2017

GERMANY 1,900 MW

NORDSEE 1 (332 MW)
Equity share: 85%, partnered with RWE
Operation started in December 2017

DEUTSCHE BUCHT (252 MW)
Equity share: 100%
Operation started in March 2020

NORDSEE 2 & 3 & DELTA (1,300 MW)
Equity share: 49%, partnered with RWE
Operations expected 2026 and 2028

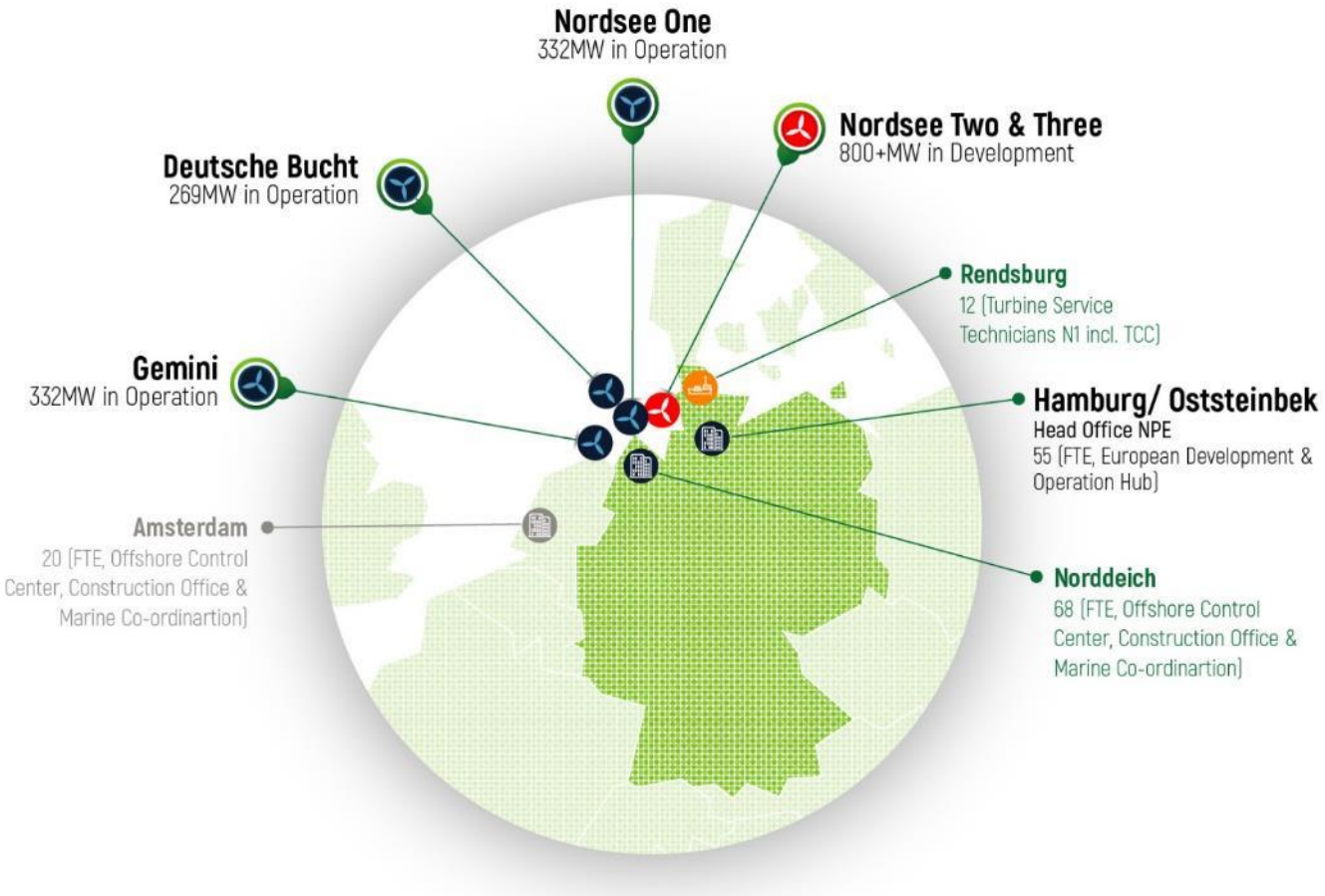
POLAND 1,200 MW

BALTIC POWER
Equity share: 49%, partnered with PKN Orlen
Operations expected 2026

In Europe, we are members of national associations:

1. *Represents total gross operating capacity constructed and in-development pipeline*

Northland in Germany – Example of Development and Operations Investment



+135

FTEs across 3 German offices

Additional headcount is planned for 2021, to support Northland's maturing development portfolio in Germany and around the world.

>€2.7B

Capital invested to date

Northland's contributions to salaries and taxes contribute millions more to the local economy each year.

~€1.1B

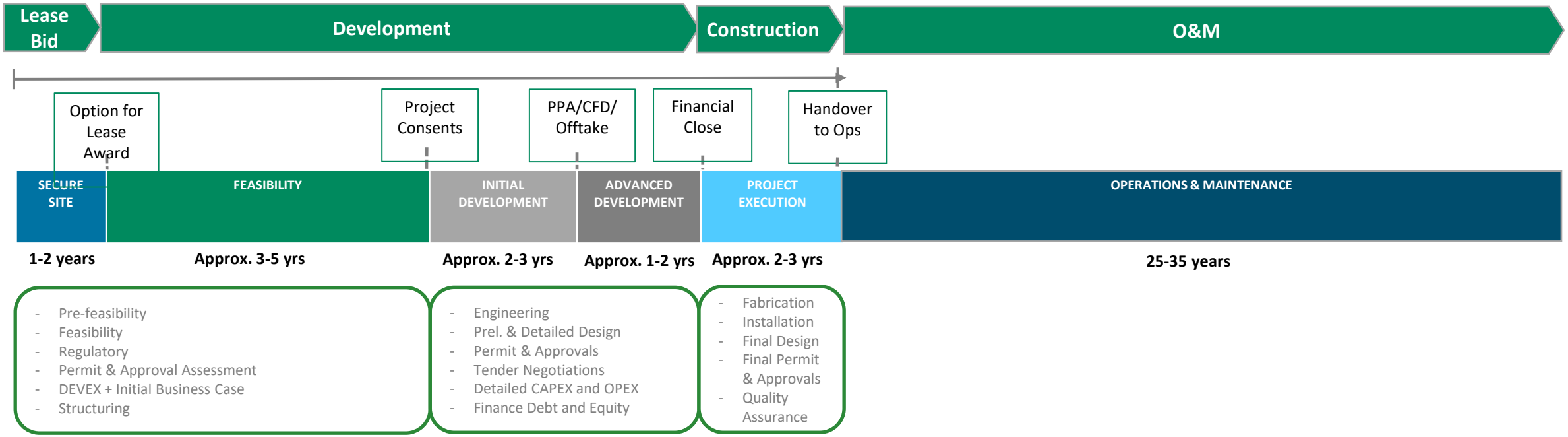
Additional capital expected at N2 & N3

Northland's *Offshore Wind Centre of Excellence*, centred in Hamburg, is designed as a virtual support team to our Regional Development Offices and technical teams in markets around the world

Northland Approach to Scotwind

- Bid applications are assessed on basis of:
  - The applicant's demonstrable prior offshore wind experience and capability to deliver the project
  - The applicant's best use of the seabed, to the wider benefit of Scottish decarbonisation, and commitment to Scottish supply chain development
- Bid evaluation structure plays to **NPI's experience and long-term owner approach**, and our chosen development projects are aligned to wider Scottish drivers including;
  - Net Zero by 2045
  - Decarbonisation of heat and transport
  - Alleviating fuel poverty
  - Increased local jobs, preventing depopulation of rural areas
  - Energy transition of jobs from oil and gas
- Feasibility analysis was undertaken as part of the bid process, including **70+ technical studies and input from 56 area experts**
- The selected sites offer a combination of
  - A mixture of sea bed depths, allowing for both fixed and floating foundation technologies (no hybrid sites)
  - Strong wind resource, providing above average capacity factors and higher yield
  - Mixture of near shore and further from shore sites

Project Lifecycle for Scottish Offshore Wind



Typically it takes from 8-10 years to develop and construct a offshore wind farm.

- The early stages are focused on understanding the site conditions offshore and onshore, as key input to feasibility of design and business case and meeting needs for the consenting process.
- The first major milestone is receiving project consents, which unlocks the ability to progress design and procurement in earnest, providing confidence in spending further DEVEX
- The next major milestone is winning a CfD offtake, project team and contractors ramp up to, to ensure a bankable business case for bidding, while retaining flexibility to react to the results.
- Progress with contracts to finalisation, detailed design, due diligence to reach Financial Close
- Construction and ops contracts entered into at FC at which point construction begins.

Northland in Action

Videos of some of our project highlights available at www.vimeo.com/northlandpower

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Hannah Collings

XODUS

DeepWind
North of Scotland Offshore Wind Cluster

XODUS

OFFSHORE WIND CLUSTER BUILDER

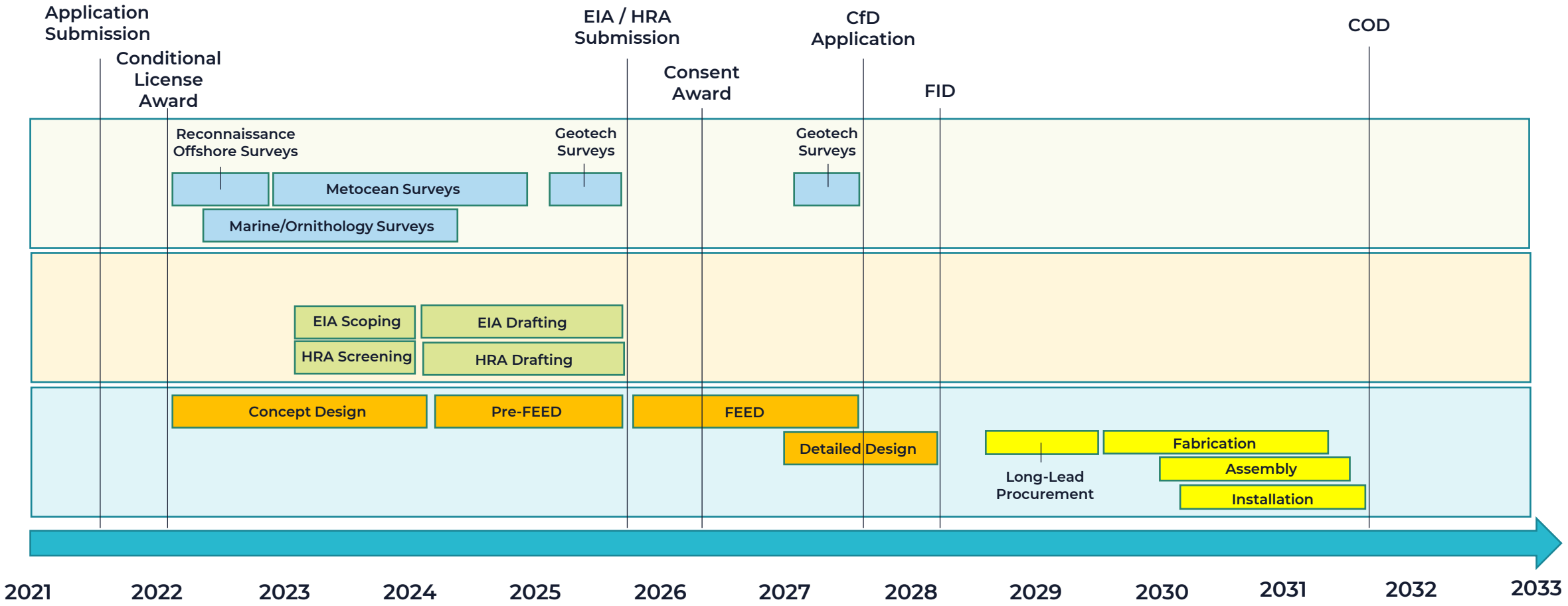
ScotWind Winners Timeline

European Union
gov.scot
EUROPE & SCOTLAND
European Regional Development Fund
Investing in a Smart, Sustainable and Inclusive Future
Scottish Enterprise
DeepWind
North of Scotland Offshore Wind Cluster
FORTH & TAY OFFSHORE

WWW.XODUSGROUP.COM

ScotWind Project Timeline

- Estimated timeline for 2027 CfD Application. 2029 CfD schedule also possible.



ScotWind Project Pipeline

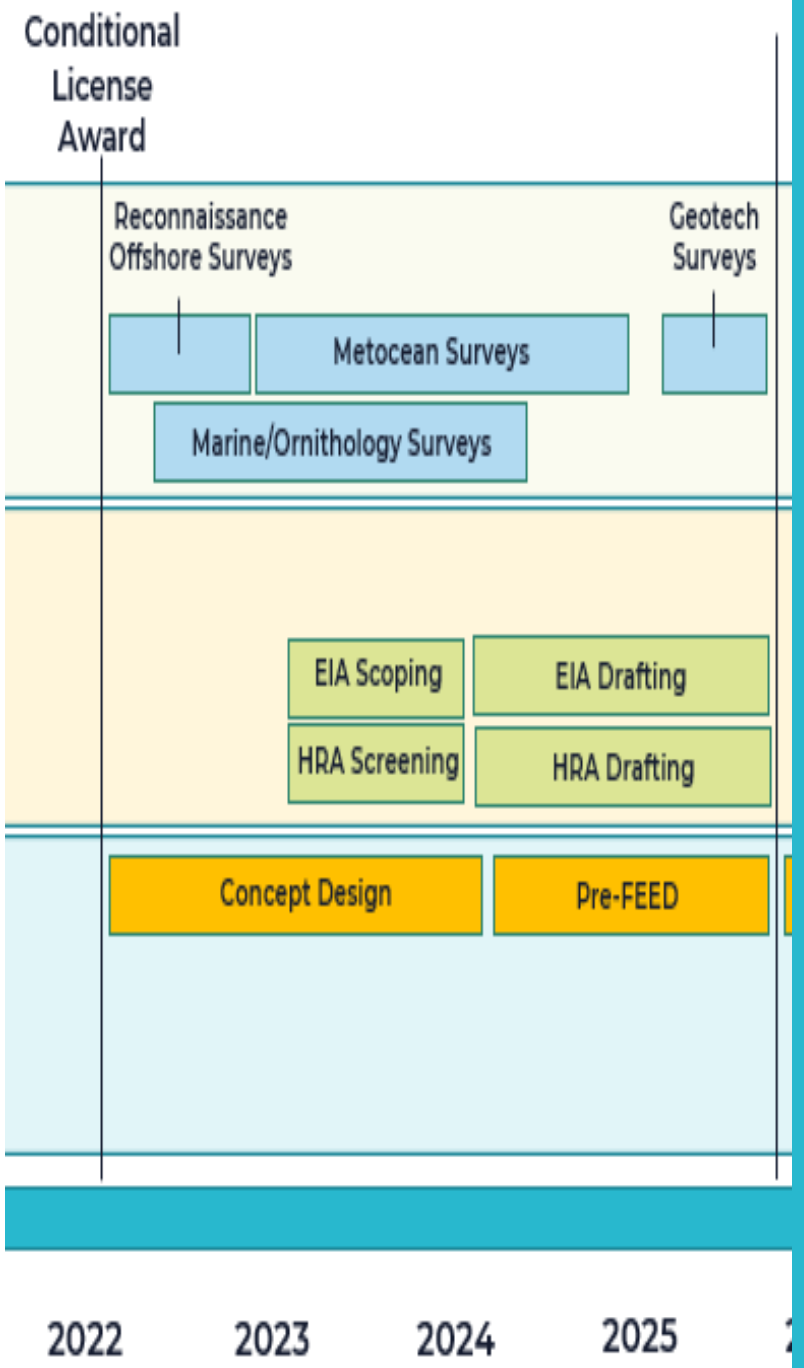
Wind farm	Location	Capacity (MW)	Year Operational (Estimated)	Foundation		No. of Turbines	Developers
				Fixed	Floating		
Morven	Scotland, East	2,907		•			BP Alternative Energy Investments
ScotWind E1	Scotland, East	2,610			•		SSE Renewables
ScotWind E1	Scotland, East	1,200			•		Falck Renewables Wind
CampionWind	Scotland, East	2,000			•		Shell
ScotWind E2	Scotland, East	798			•		Vattenfall
Cluaran Deas Ear	Scotland, East	1,008		•			DEME Concessions Wind NV
Cluaran Ear-Thuath	Scotland, North East	1,008			•		DEME Concessions Wind NV
ScotWind NE3	Scotland, North East	1,000			•		Falck Renewables Wind
Caledonia Offshore Wind Farm	Scotland, North East	1,000	2028	•			Moray Offshore Renewable Power
ScotWind NE6	Scotland, North East	500			•		Falck Renewables Wind

ScotWind Project Pipeline

Wind farm	Location	Capacity (MW)	Year Operational (Estimated)	Foundation		No. of Turbines	Developers
				Fixed	Floating		
MarramWind	Scotland, North East	3,000			•		Scottish Power Renewables
ScotWind NE8	Scotland, North East	960			•		BayWa r.e. UK
The West of Orkney Wind Farm	Scotland, North	2,000	2030	•			Offshore Wind Power
ScotWind N2	Scotland, North	1,500			•		Northland Power
ScotWind N3	Scotland, North	495	2030	•	•		Magnora ASA
ScotWind N4	Scotland, North	840		•			Northland Power
Machairwind	Scotland, West	2,000		•			Scottish Power Renewables

What to expect from ScotWind?

- Too early for project timelines for most ScotWind projects
- Near future requirements will be focused on Project Development services
- Construction procurement not be until CfD, expected 2027 depending on developers level of ambition
- 25GW pipeline could be the tipping point to support new local manufacturing facilities
- Huge demand for O&M services once projects are operational



How to find out more?

- Look out for events organised by DeepWind & FTO
- Sign up for Offshore Wind Export Support from Scottish Enterprise – contact Ian.McDonald@scotent.co.uk
- Sign up for WEST with Offshore Wind Growth Partnership- Next Wave Application closure date: 25th February 2022 https://owgp.org.uk/about/business-transformation-programmes/
- Cluster Builder 121 sessions – available Tuesday afternoons through out February 2022

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European Union gov.scot

EUROPE & SCOTLAND
European Regional Development Fund
Investing in a Smart, Sustainable and Inclusive Future

Offshore Wind Growth Partnership

Q&A Session

Speaker Panel

Shona Clive – Forth and Tay Offshore
Vicky O'Conner – Northland Power
Ian McDonald – SOWEC
Hannah Collings – Cluster Builder