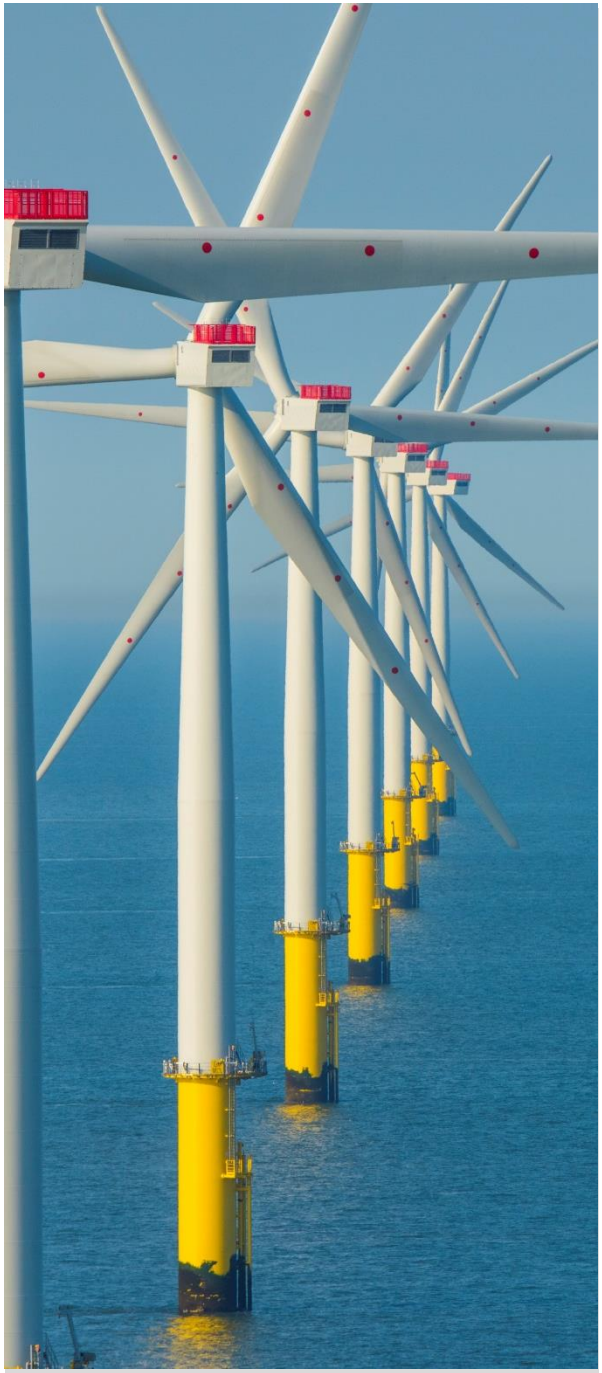
Offshore Wind Potential New Leasing Market Engagement Event 25th July 2018



Welcome

This presentation is provided for information purposes only. No party is entitled to rely on its contents. The Crown Estate makes no representation, assurance, undertaking or warranty in respect of the information in this presentation.

For the avoidance of doubt, please note that The Crown Estate's management duties in Scotland have been transferred to Scottish Government. The information contained within this presentation therefore relates to the potential leasing of new offshore wind projects in England, Wales and Northern Ireland only.

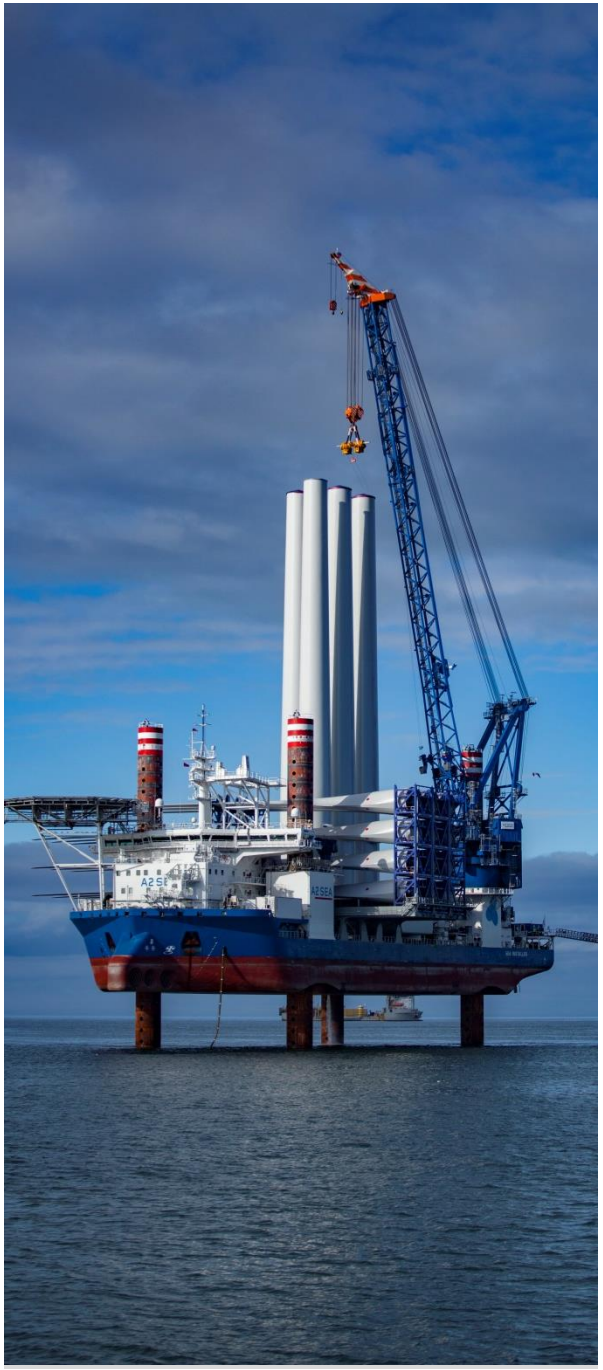
A potential new leasing round

We have not yet decided to proceed with a leasing round, but we are actively exploring options to inform a future decision.

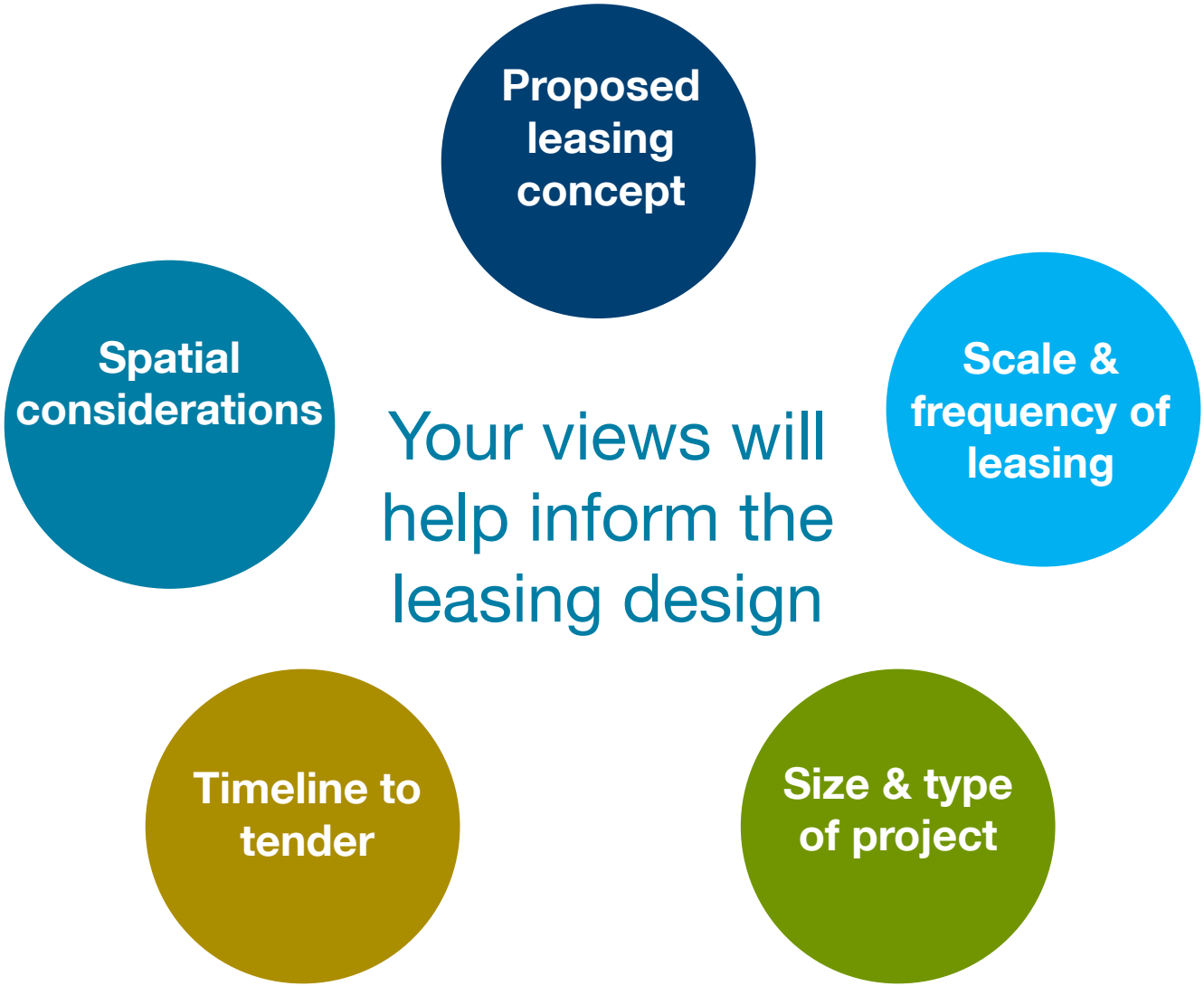
Any future leasing process and tender design should be fair, transparent and responsible, and balance a range of different interests.

We are keen to seek both market and stakeholder views on the potential scale, location and nature of any new rights before proceeding further.

Today, & the feedback that follows, mark critical steps in our process.



Engagement themes



Policy context

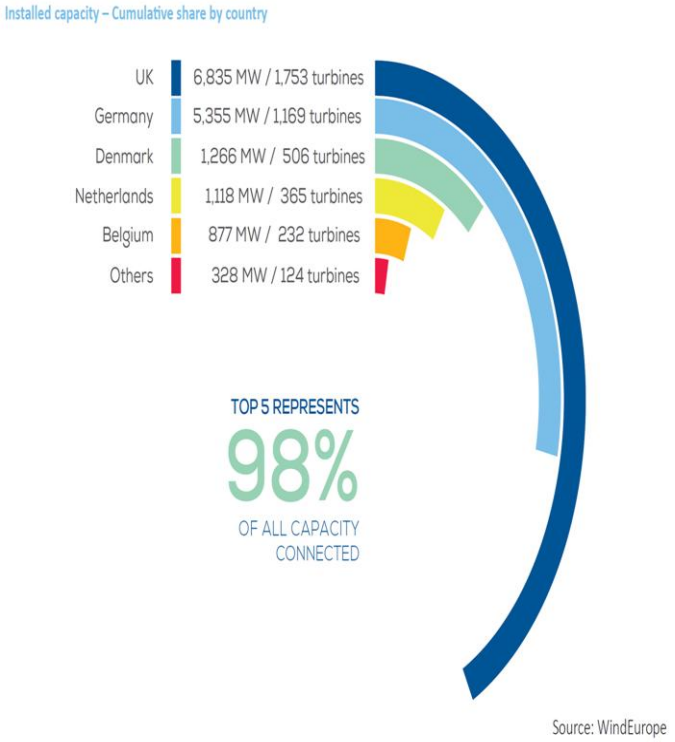
Yuen Cheung

BEIS

Department for Business, Energy & Industrial Strategy

Offshore Wind Policy Context

- UK world leader
- Provided 6.2% of UK generation in 2017
- Integral part of electricity mix and strategy to decarbonise the economy
- From one of the most expensive renewable technologies to cost competitive / "subsidy free"
- Next auction in 2019



Department for
Business, Energy
& Industrial Strategy

Offshore Wind Policy Context

- 48% UK content
- Jobs and growth in coastal communities – Hull, Lowestoft, Grimsby, Belfast, Great Yarmouth, Barrow-in-Furness
- Manufacturing – Siemens Hull, MHI Vestas IoW

INDUSTRIAL STRATEGY

Department for
Business, Energy
& Industrial Strategy

Offshore Wind Policy Context

- OW will be key technology in helping to meet decarbonisation goals.
- CGS said 10GW new capacity in 2020s, more if cost effective.
- Sector says they can deliver more if needed.
- In 2016 BEIS tested market appetite for future offshore wind in UK – results were very positive

Department for
Business, Energy
& Industrial Strategy

Offshore Wind Policy Context

Priorities

- Costs continue to come down for consumers.
- Competitive auctions require new players and new projects.
- Offshore wind deployed in sustainable way.
- New UK manufacturing.
- Higher UK content.
- UK supply chain becomes more internationally competitive as offshore wind becomes global.

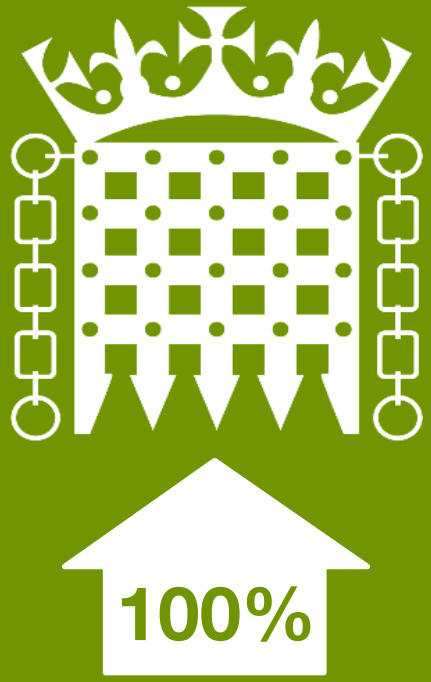
INDUSTRIAL STRATEGY

Potential new leasing:

Offshore wind portfolio context

Will Apps

The Crown Estate is an independent, commercial business created by Act of Parliament



Net revenue profit

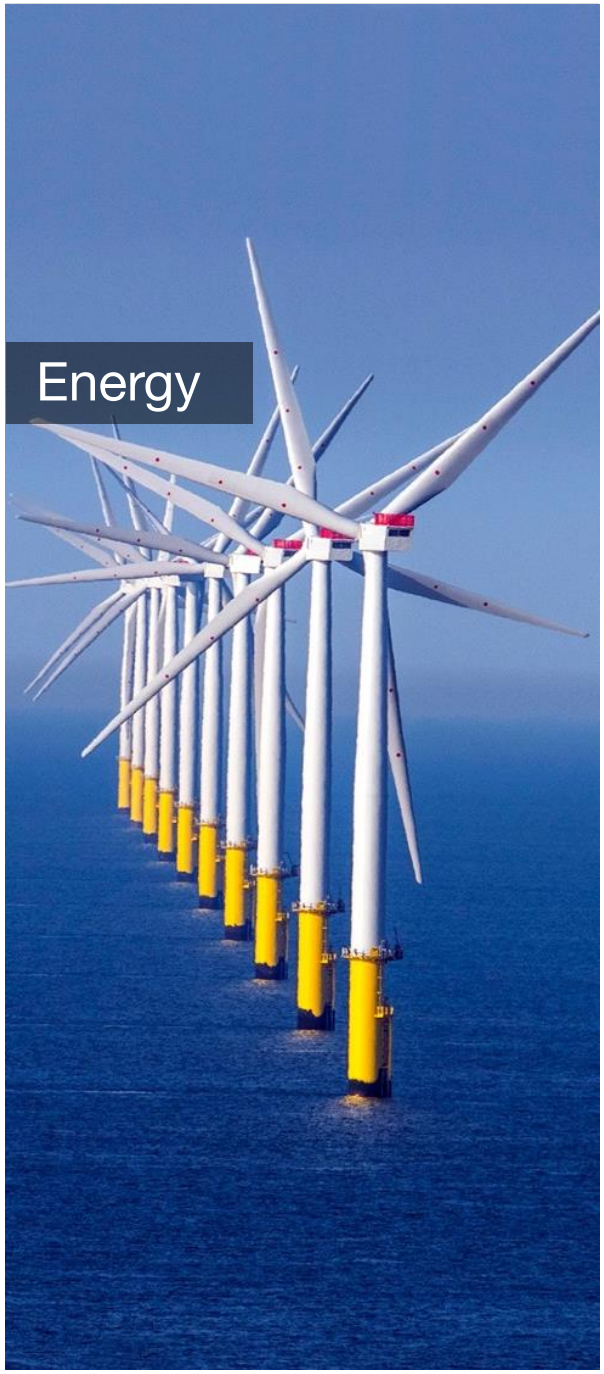
£329.4m

2017/18

Capital value

£14.1bn

2017/18

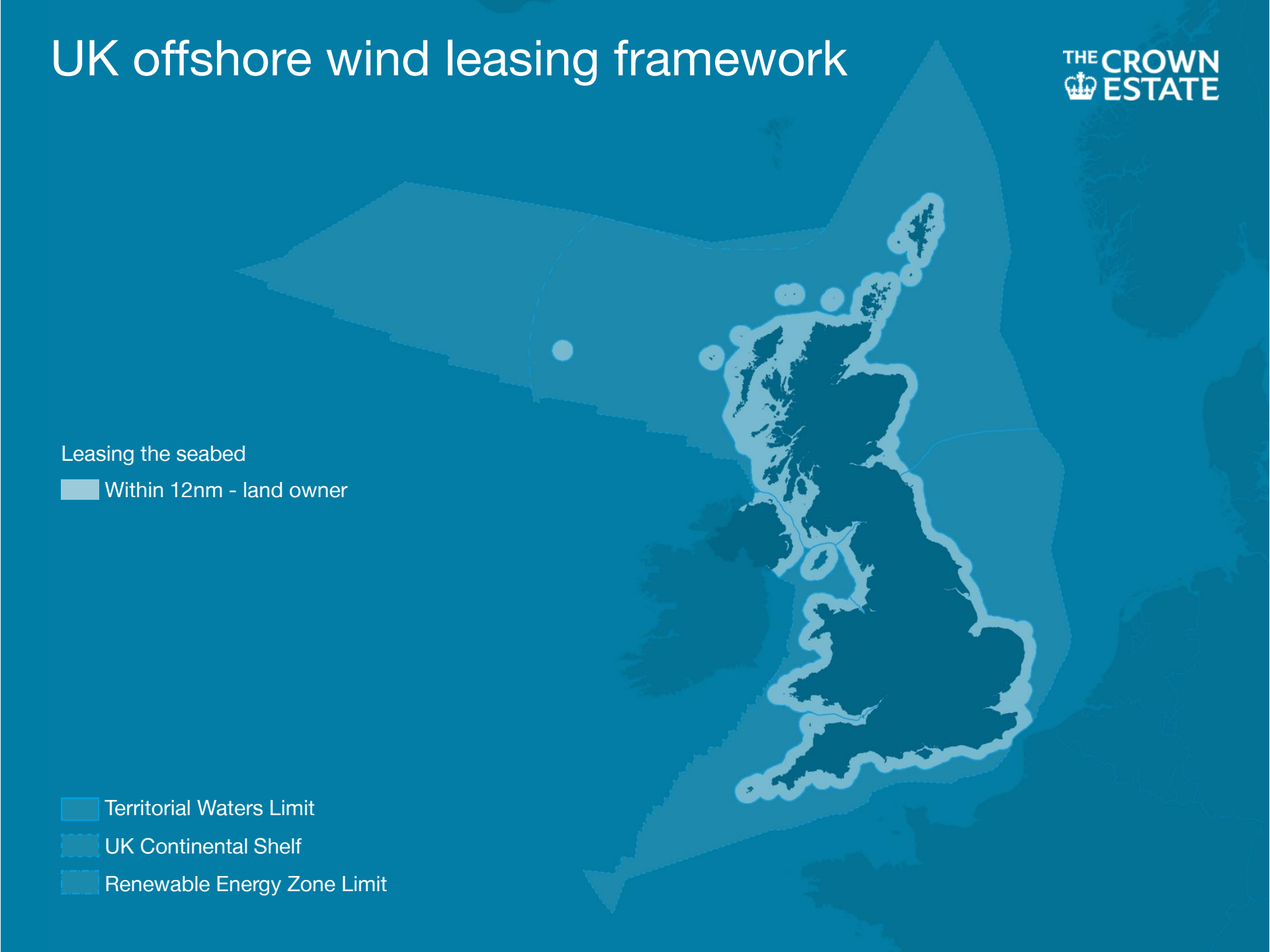

Energy


Minerals
SAND


Infrastructure

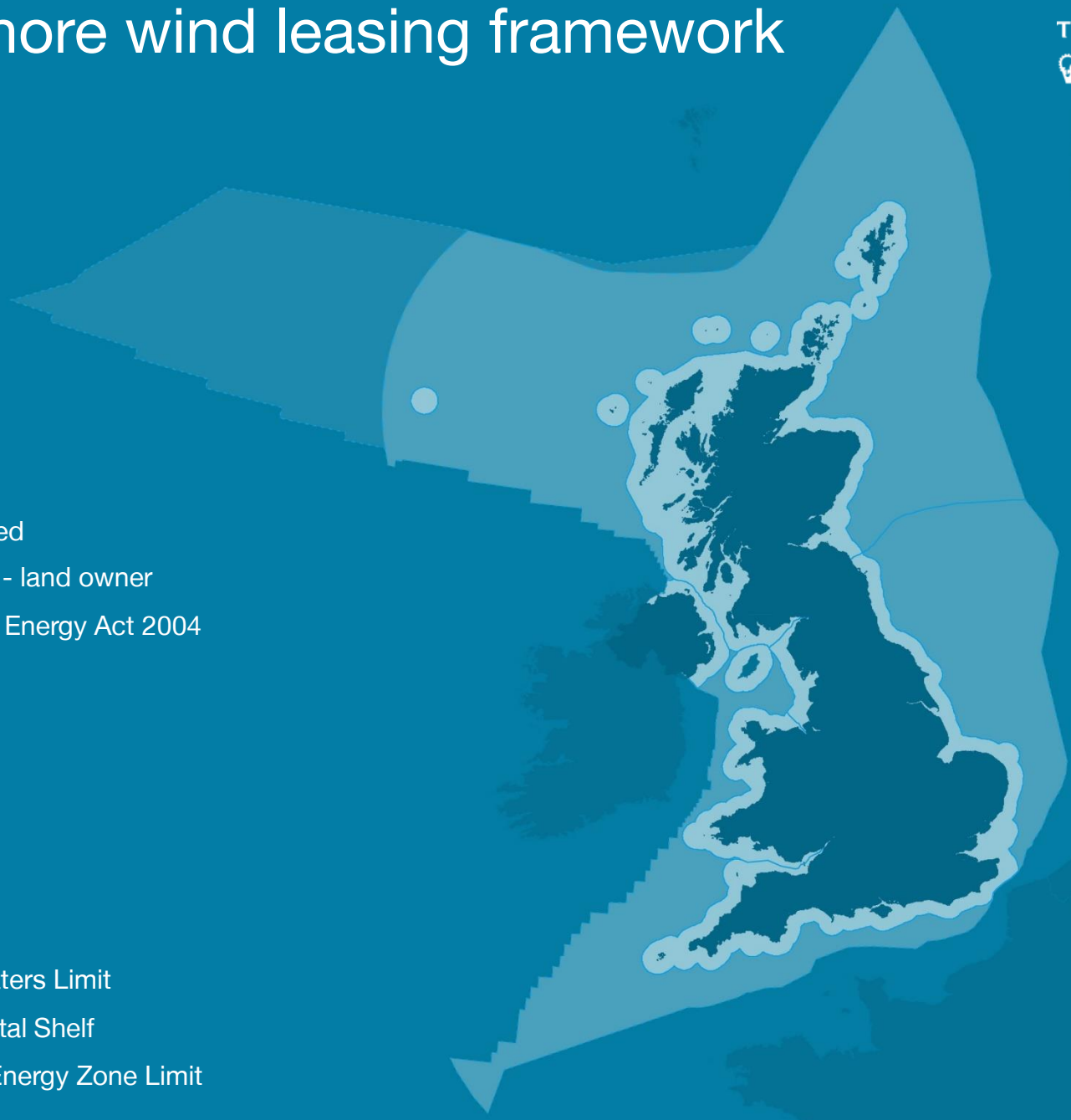
UK offshore wind leasing framework

THE CROWN ESTATE



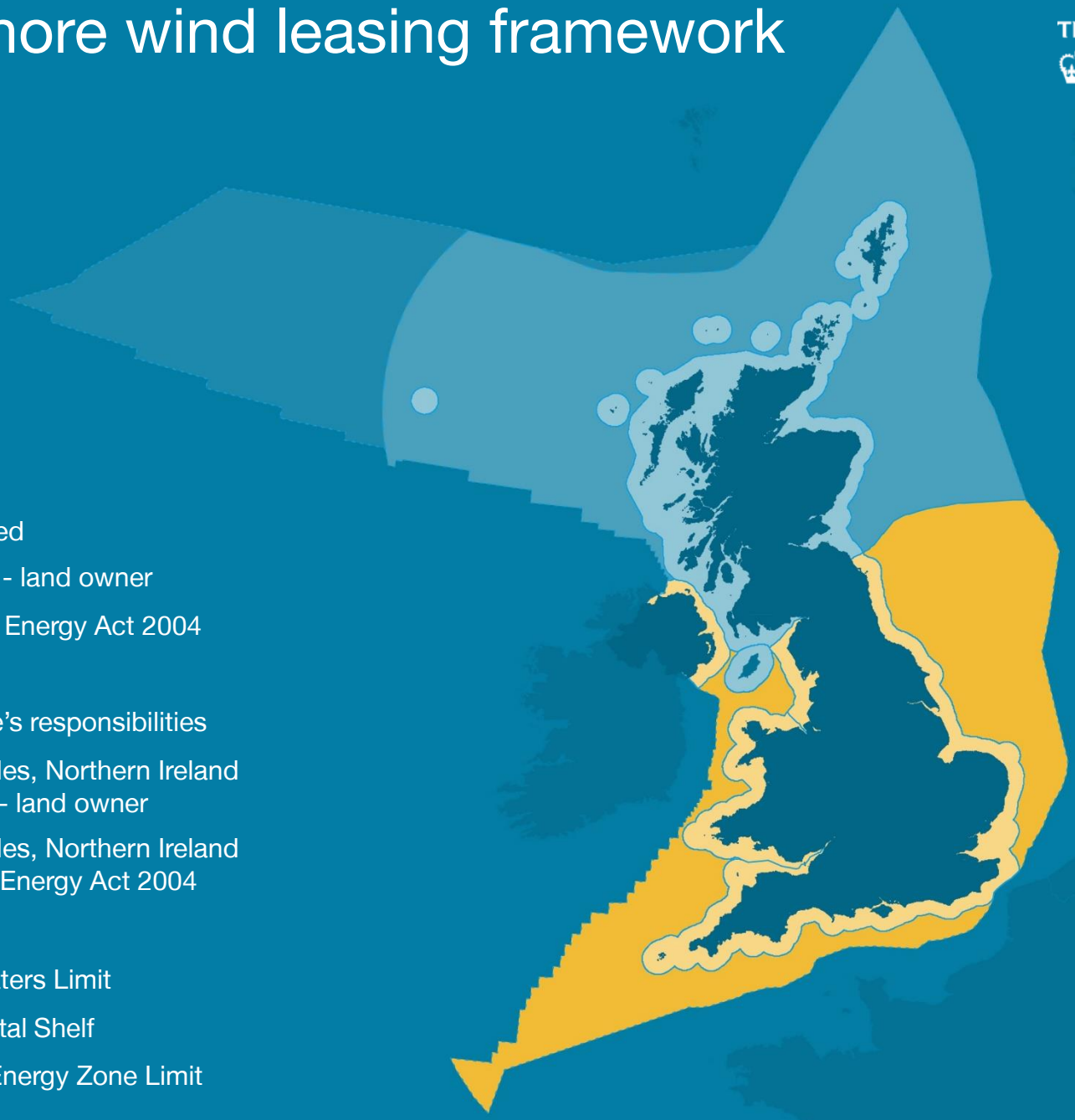
UK offshore wind leasing framework

THE CROWN ESTATE



UK offshore wind leasing framework

THE CROWN ESTATE



Leasing the seabed

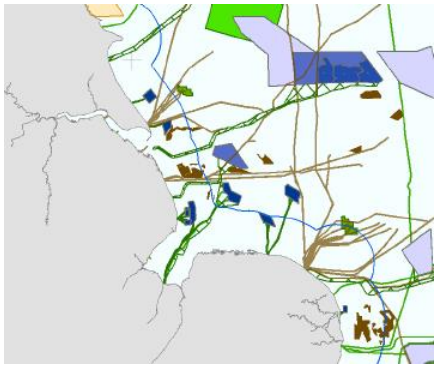
- Within 12nm - land owner
- Within REZ - Energy Act 2004

The Crown Estate's responsibilities

- England, Wales, Northern Ireland within 12nm - land owner
- England, Wales, Northern Ireland within REZ - Energy Act 2004

- Territorial Waters Limit
- UK Continental Shelf
- Renewable Energy Zone Limit

UK regulatory setting: offshore renewables

Land rights	Consents to build and operate	Transmission	Auctions for support
			
The Crown Estate (TCE) & Crown Estate Scotland (CES) • Leasing rounds • Statutory obligations • Stakeholder interests • Active management of seabed	**Government** • Planning authorities • Regional marine plans • Statutory advisors	**OFTO / Ofgem** • Electrical infrastructure • Developer or Generator build • OFTO auctions • System Operator • Onshore grid integration	**Government** • Energy Policy objectives • Competitive tender for Contracts for Difference (CfDs)

Compete for sites → Obtain consents → Grid connection → Compete for contracts

Private Sector / Developers

Climate Change Act & Carbon Budgets

Committee on Climate Change scenarios – July 2018

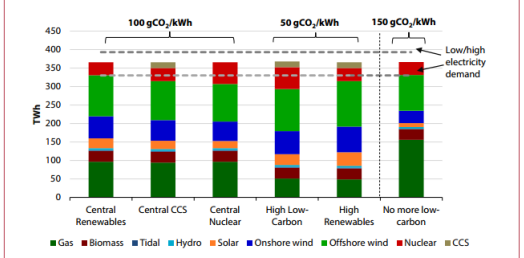
100gCO_2/kWh by 2032

28 – 34 GW by 2030

Table 2.5. Capacity and generation by technology in the CCC's new power scenarios

Technology	Central Renewables (GW (TWh))	Central CCS (GW (TWh))	Central Nuclear (GW (TWh))	High Low-Carbon (GW (TWh))	High Renewables (GW (TWh))
Nuclear	4 (35)	4 (35)	7 (59)	7 (59)	4 (35)
Onshore wind	25 (60)	24 (56)	22 (53)	26 (62)	29 (70)
Offshore wind	31 (111)	29 (106)	28 (102)	31 (114)	34 (123)
CCS	0 (0)	2 (16)	0 (0)	2 (16)	2 (16)
Solar	32 (27)	27 (23)	23 (20)	35 (29)	43 (37)
Tidal	1 (2)	1 (2)	1 (2)	1 (2)	1 (2)
Biomass	7 (29)	7 (29)	7 (29)	7 (29)	7 (29)
Hydro	2 (5)	2 (5)	2 (5)	2 (5)	2 (5)

Figure 2.7. The CCC's new power scenarios for 2030



Notes: 'No more low-carbon' is not a CCC scenario, but is used to illustrate a higher-carbon pathway for the power sector in 2030, assuming no more low-carbon generation is deployed beyond current commitments.

Future Energy Scenarios

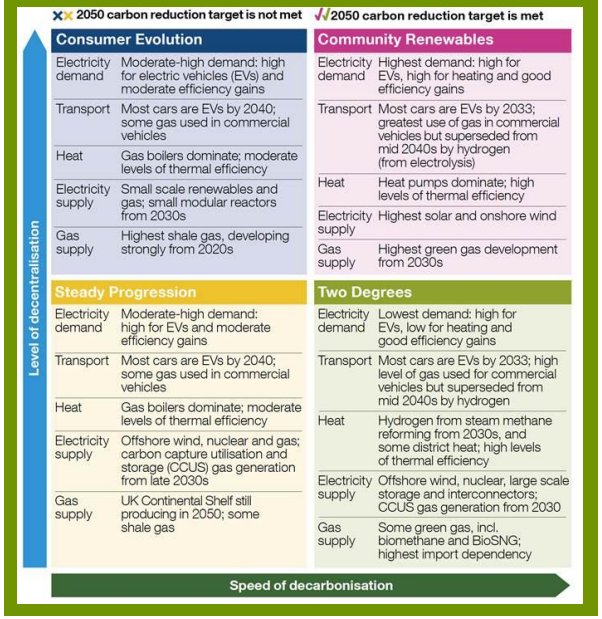
National Grid – July 2018

Community Renewables: 23.6GW

Two Degrees: 29.9GW

Steady Progression: 24.8GW

Consumer Evolution: 16.8GW



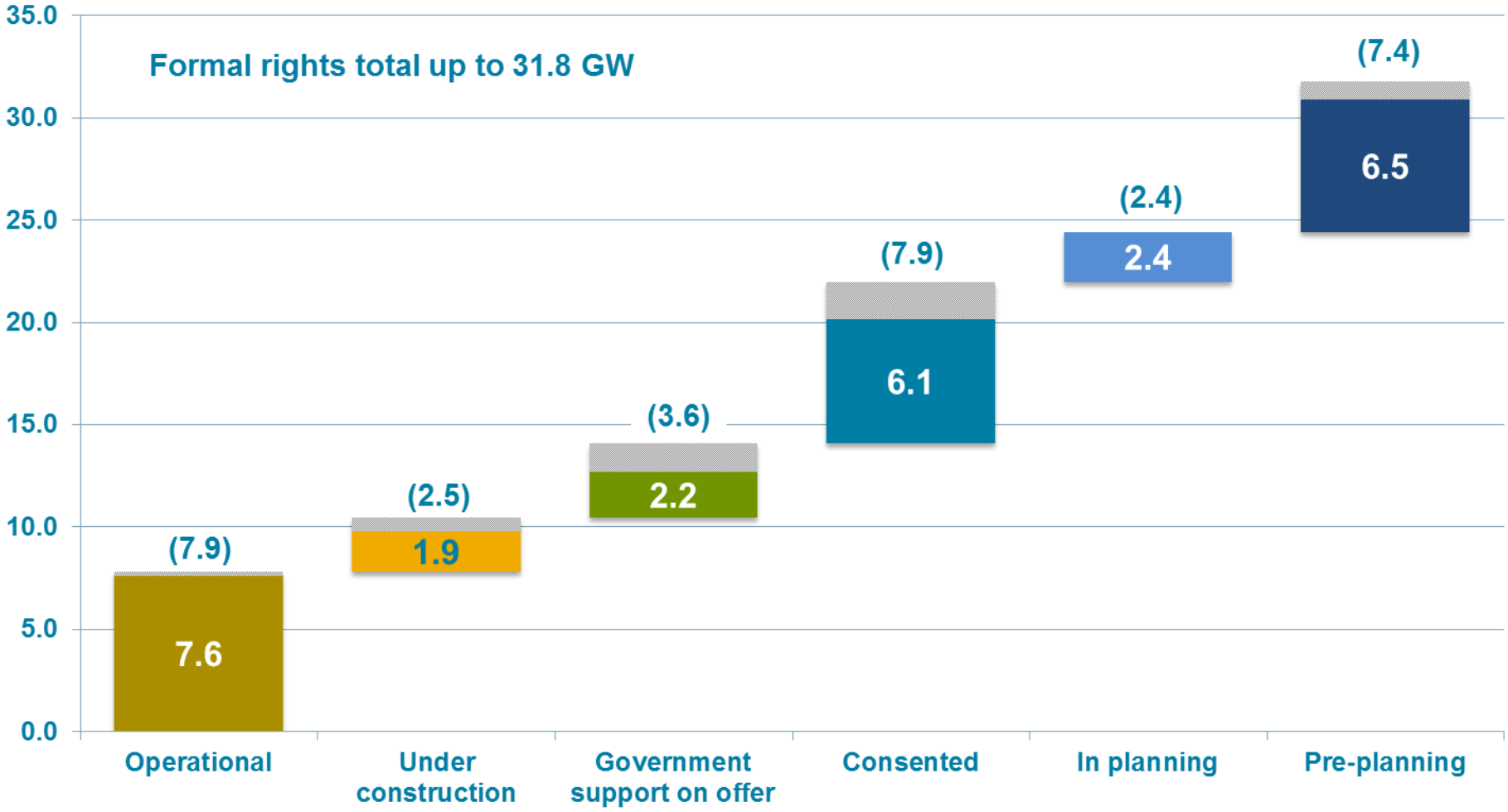
Sector Deal

Industry aims to generate one third of the UK's electricity from offshore wind by 2030… more than double its capacity from 14GW deployed or contracted today, to 30GW by 2030

- £48 billion infrastructure investment
- Five-fold increase in export value, to £2.6 billion /year
- 27,000 skilled jobs
- £2.4 billion/year reduction in total electricity system costs

UK Offshore Wind Industry Reveals Ambitious 2030 Vision, Feb 2018

Existing UK Portfolio



Key

= Projects located in Scotland and managed by Crown Estate Scotland (CES)

(1.0) = *Numbers in brackets represent total UK pipeline, including Scotland, at each stage of development*

The consequential need for new seabed rights

Our task - proportionate and responsible release of sufficient development opportunity to support UK's energy security and clean energy ambitions out to 2030

Q: What will the current UK portfolio ultimately provide?

Q: What will 2017 Extensions & portfolio growth provide?

Q: What deployment scenario does the UK portfolio need to satisfy?

Q: What new capacity is required – The Crown Estate & Crown Estate Scotland?

			25	30	35	2030 deployment scenario
		(GW)	3	3	3	Buffer for competition
Current UK Portfolio	**2017 Extensions & Portfolio Growth**	**Available UK Portfolio**	28	33	38	Required portfolio
Low Attrition (30)	High (5)	35	0	0	3	Additional UK capacity required through new leasing
	Low (2)	32	0	1	6	
High Attrition (24)	High (5)	29	0	4	9	
	Low (2)	26	2	7	12	

Portfolio priorities

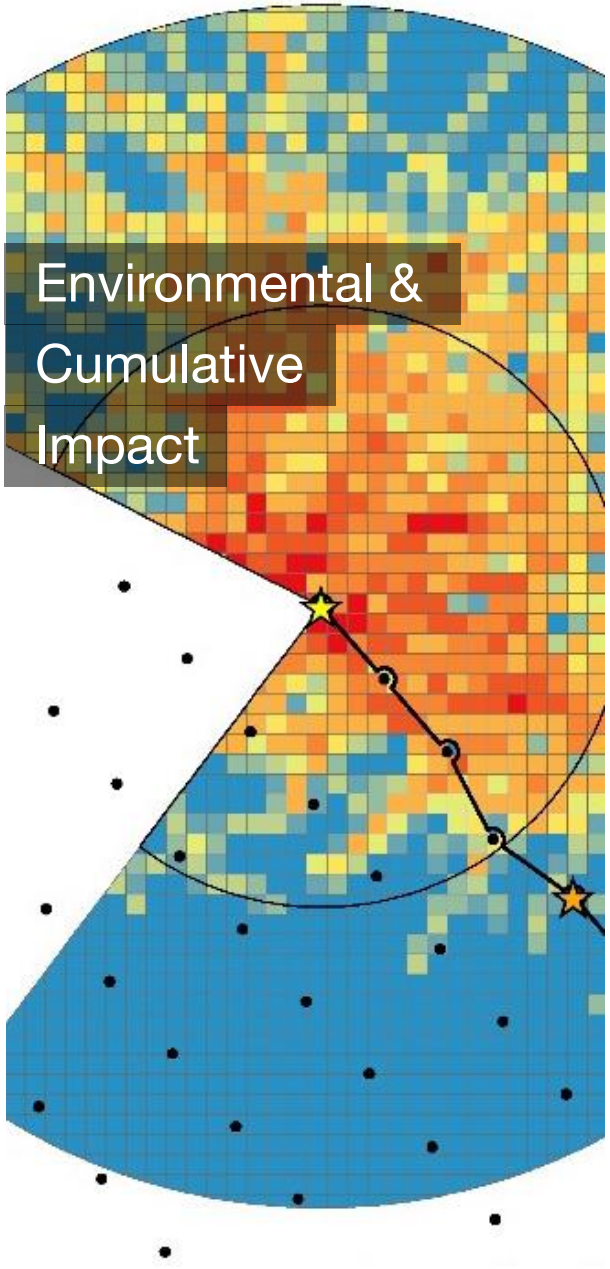
2017 Extensions – application assessment and habitats regulations assessment

Development portfolio – new consents, Contracts for Difference process, new leases

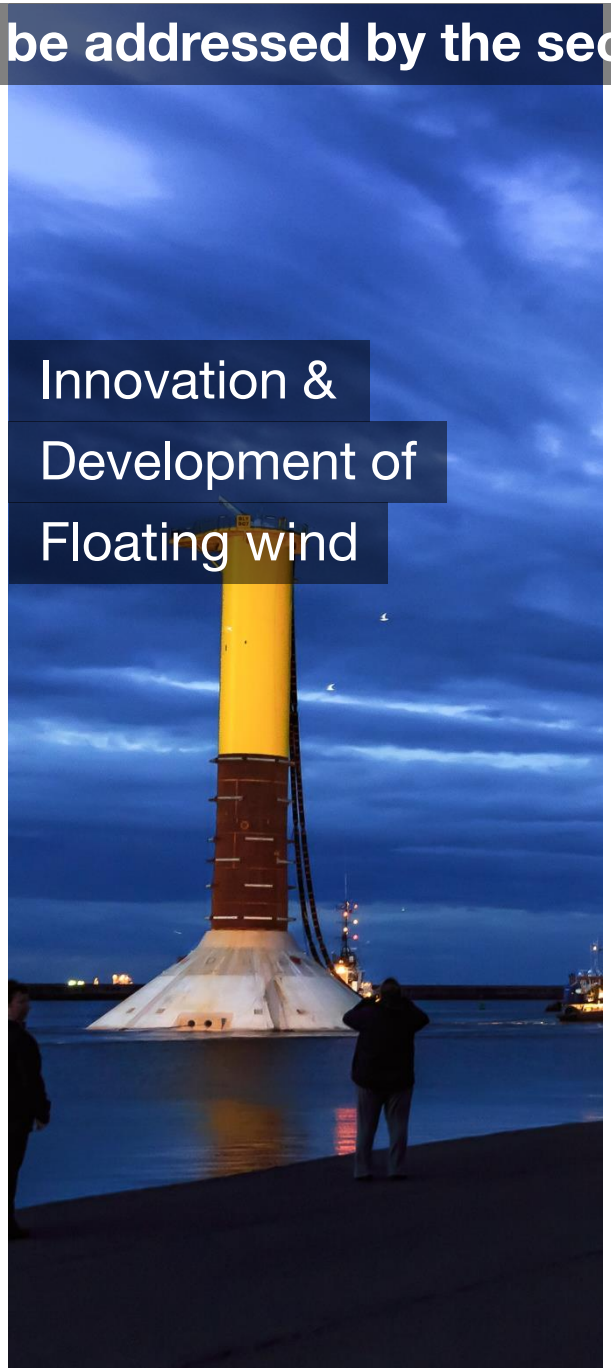
Advancement programme – proportionate and responsible impact assessment and evidence base, the wider energy system

Asset portfolio – operational performance, life-extensions, decommissioning

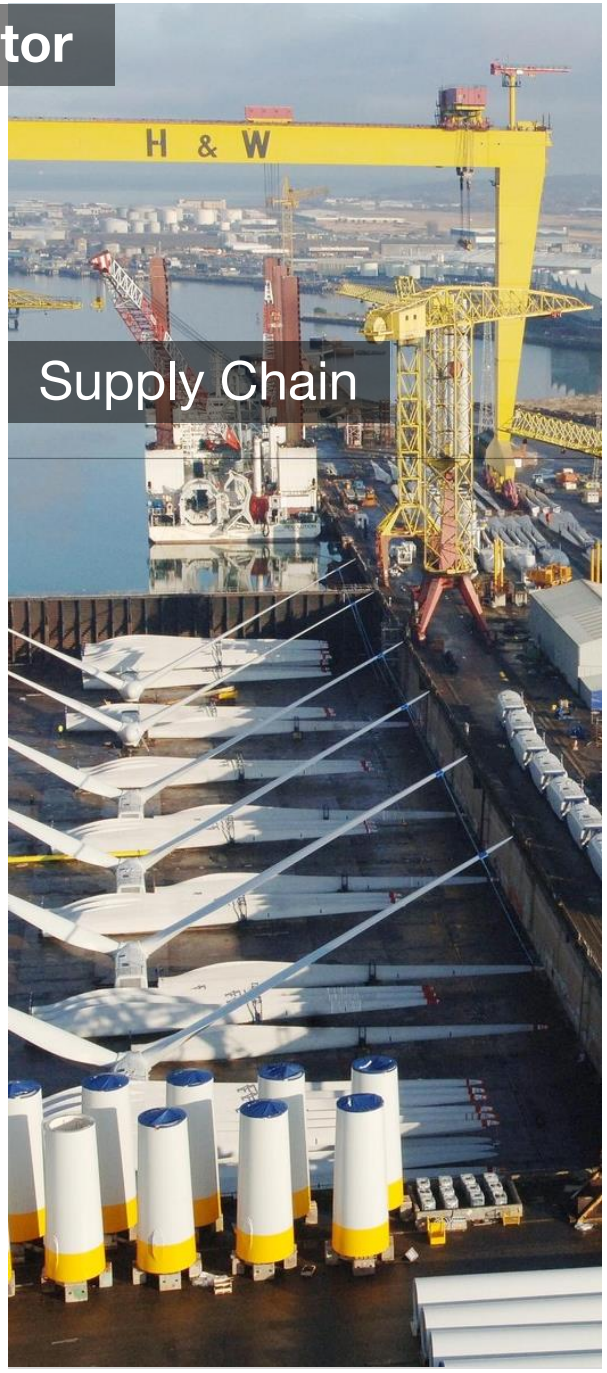
Key strategic issues to be addressed by the sector



Environmental & Cumulative Impact



Innovation & Development of Floating wind



Supply Chain

Image Credit: EDF Renewables

Potential new leasing: Other considerations

Helen Elphick

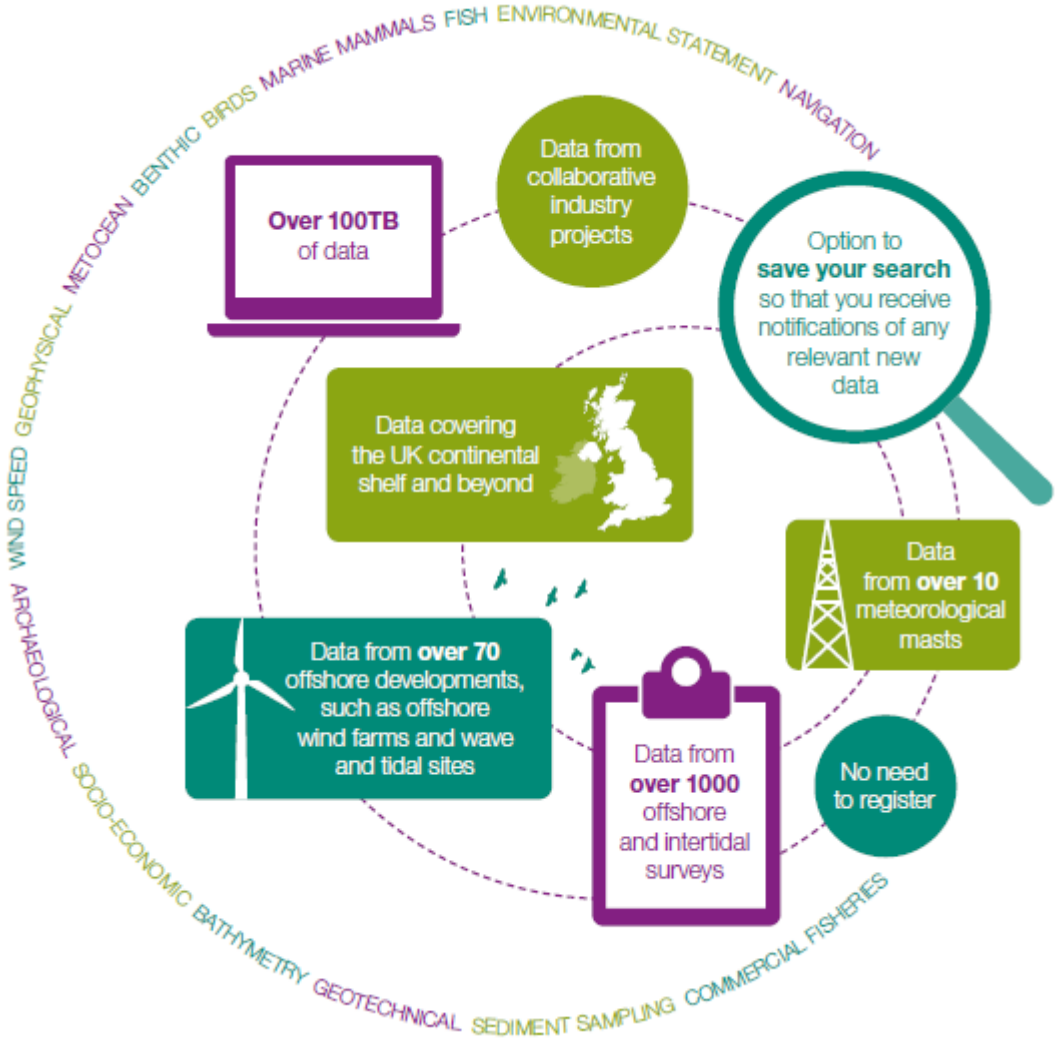
Statutory Obligations

- Competent Authority: plan-level Habitats Regulations Assessment (HRA).
- Public Authority duties under various Acts (e.g. Marine and Coastal Access Act 2009, the Marine Act (Northern Ireland) 2013, Wildlife and Countryside Act 1981 and NI equivalent).
- Contribute to the marine planning processes for England, Wales and Northern Ireland.

The Marine Data Exchange

The Marine Data Exchange provides **free access** to survey data and reports collected throughout the lifetime of an offshore project - from pre-construction through to decommissioning - by working closely with our offshore customers to capture and advocate the sharing of survey data.

www.marinedataexchange.co.uk



Other leasing processes

Marine Aggregate Tender

- Tender for new marine aggregate licences around England, Wales and NI

- Invitation to Tender (ITT) is open with submission deadline 31st October 2018

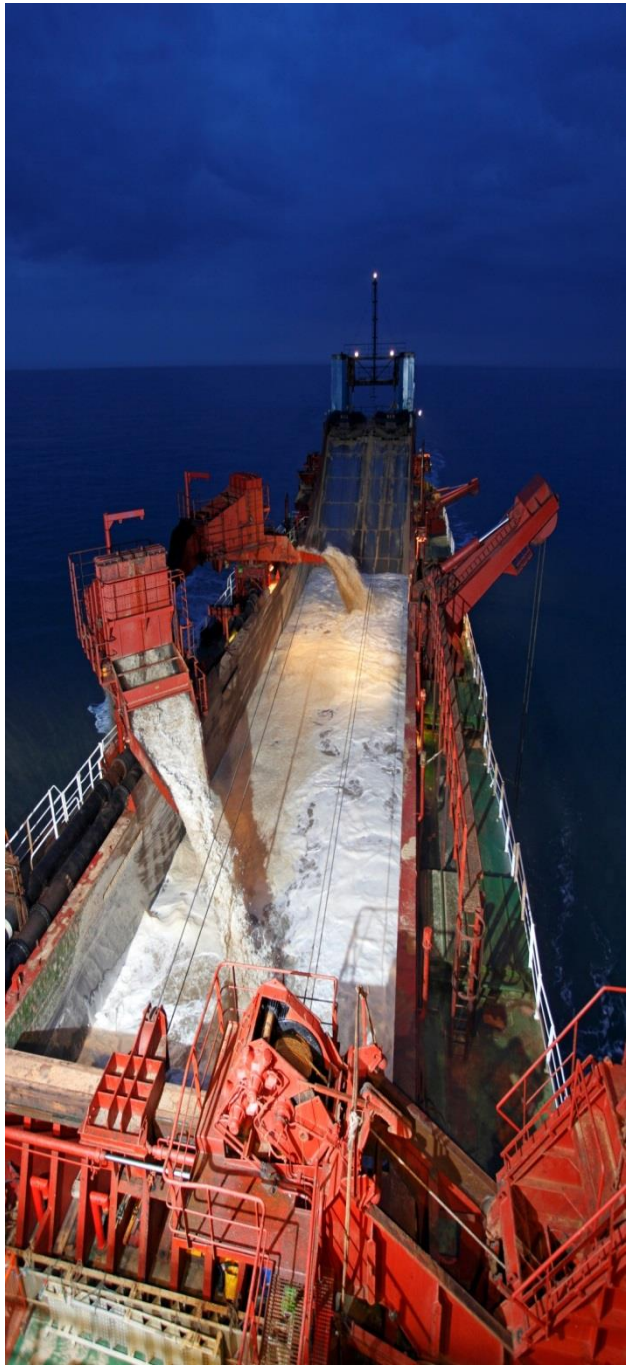
Other Marine Minerals Tender

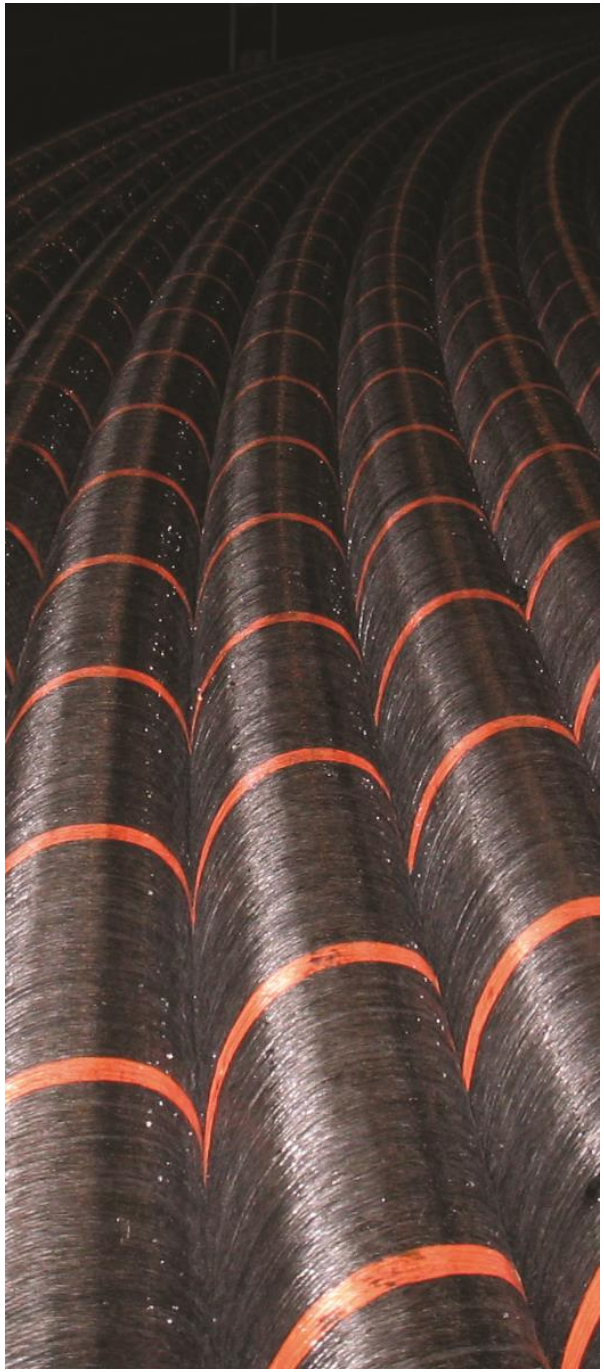
- Increased market demand due to rising metal prices e.g. tin.

- Tender offer - waters inside 12nm off the coast of Cornwall reflecting extent of geographic interest

- Currently at pre-qualification stage

Rights for both could be awarded in 2019, subject to HRA and would initially provide the opportunity to explore the potential resources.





Other leasing processes

Offshore wind extensions

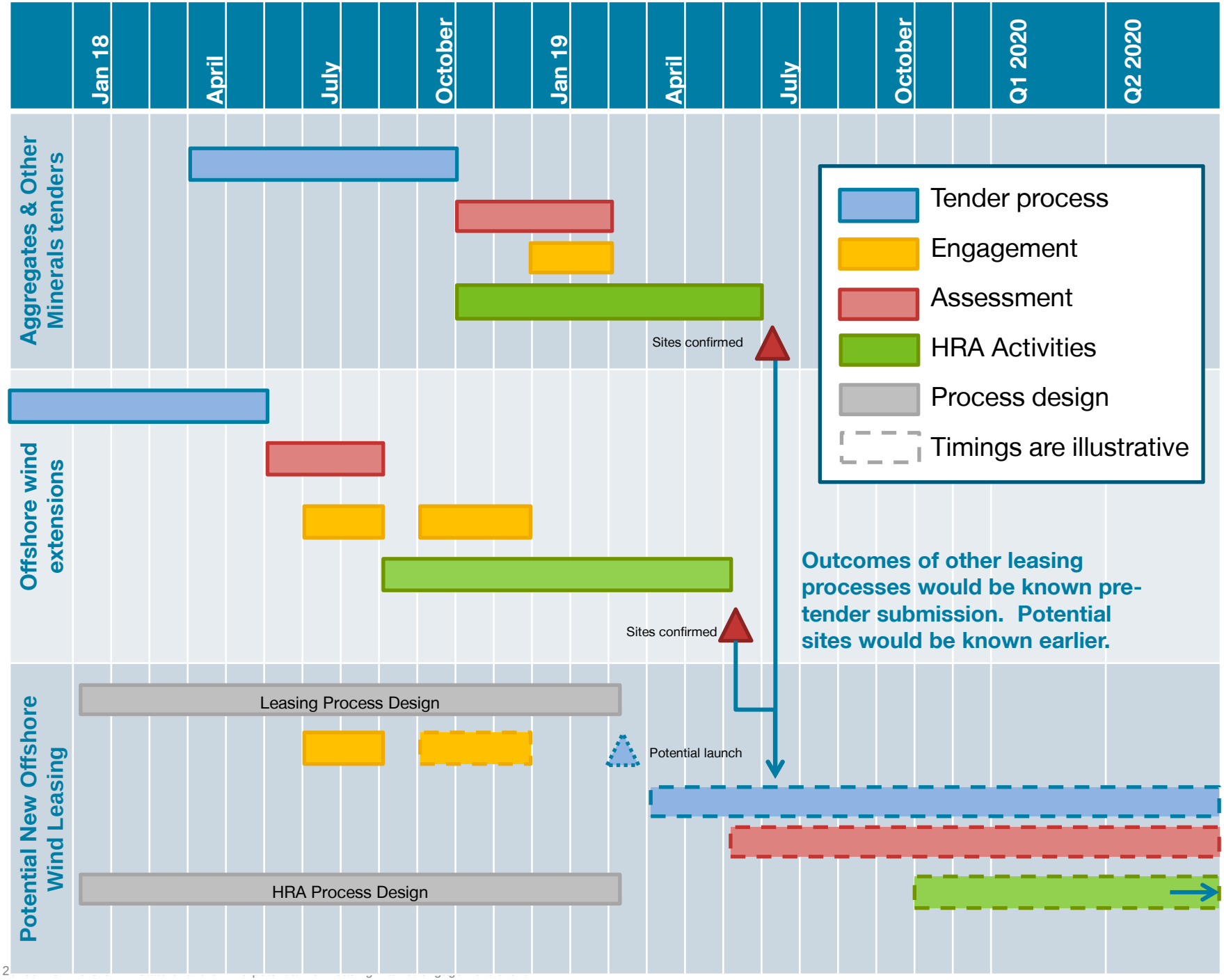
- Application process for offshore wind farm extension projects opened in February 2017 and closed at the end of May 2018.

- 8 applications received in total with potential for 3GW of new capacity on the seabed around England and Wales. Assessment underway.

Ad hoc applications - Ongoing

- We also have process to allow ad hoc applications to be made in the following sectors:

  - Interconnectors
  - Telecoms cables
  - Pipelines
  - Aquaculture
  - Wave energy devices (up to 3MW)
  - Tidal current (up to 30MW)
  - Offshore wind test and demo (up to 100MW)


Jan 18
April
July
October
Jan 19
April
July
October
Q1 2020
Q2 2020
Aggregates & Other Minerals tenders
Offshore wind extensions
Potential New Offshore Wind Leasing
Tender process
Engagement
Assessment
HRA Activities
Process design
Timings are illustrative
Sites confirmed
Sites confirmed
Outcomes of other leasing processes would be known pre-tender submission. Potential sites would be known earlier.
Leasing Process Design
Potential launch
HRA Process Design

Potential new leasing: Overview of proposed approach

Jonny Boston

Potential New Leasing Project Team

Jonny Boston
Programme Manager

Helen Elphick
Portfolio & Technical

Nathalie Angliss
Project Manager

Olivia Thomas
Head of Marine Planning

Mark Hazelton
Optimisation & Evidence

Rosie Kelly
Marine Planning & specialist stakeholders

Ben Barton
Commercial

Zee Mughal-Ryan
Engagement & Communications

Ed Salter
Consenting & HRA

Richard Clay
Energy Policy & Procurement

Cliff Solomons
Project Document Co-ordinator

Potential New Leasing Project Team

Commercial adviser

KPMG

Technical adviser

rcg Renewables Consulting Group

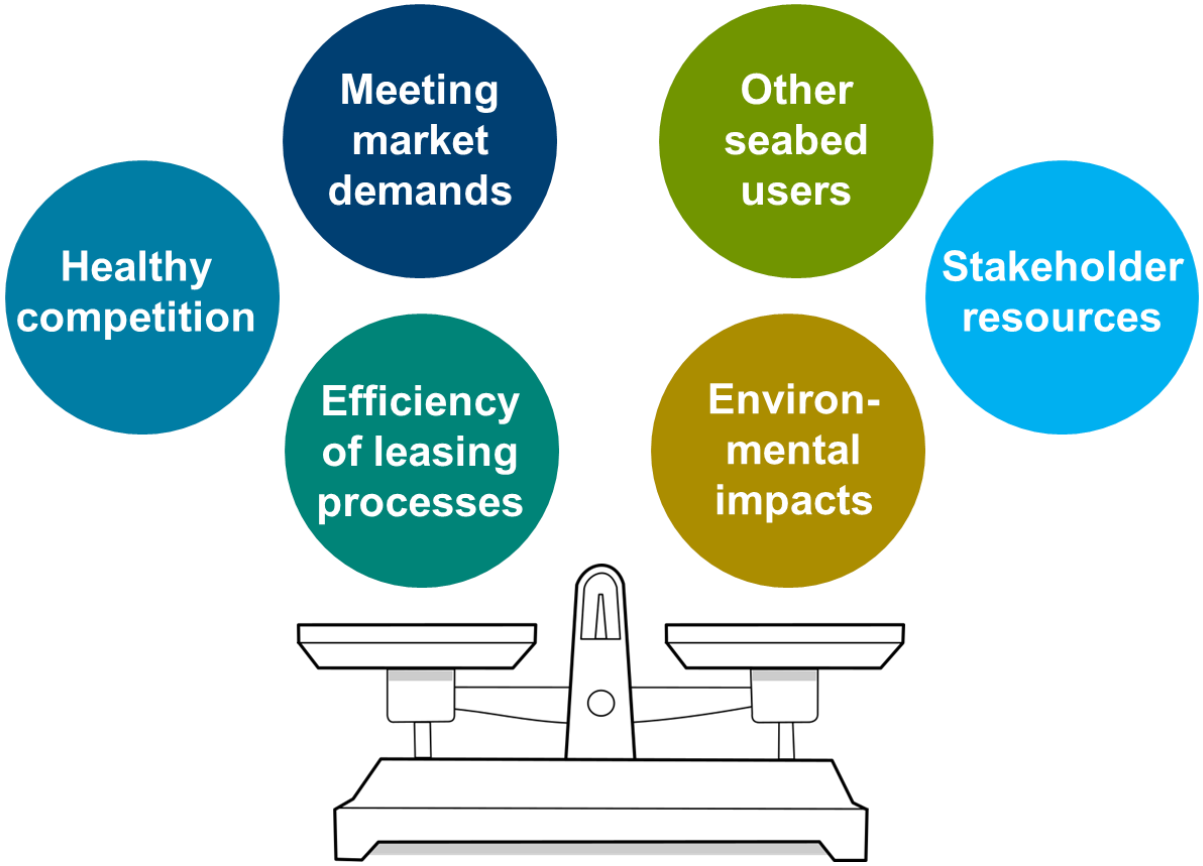
HRA Adviser

NIRAS

Legal Adviser

Hogan Lovells

Key considerations



A successful leasing round will balance these factors and deliver:

- A fair and transparent process
- Efficient use of seabed
- Value for The Crown Estate

Reflections from previous leasing rounds

We are using the feedback we received and our experience from previous leasing activity to inform the approach to potential new leasing.

Engagement

- There is benefit in early engagement with statutory and wider stakeholders regarding spatial constraints
- It is helpful to engage with industry on the leasing offer prior to the formal tender process

Site selection

- Sharing The Crown Estate's knowledge and data may improve site selection
- Including a mechanism to allow boundary adjustments can save time later

Scale

- Leasing rounds should be designed to provide projects in accordance with market conditions
- The size of project areas should balance the need to minimise uncertainty for other seabed users, with the need to optimise economic viability

Process

- Plan-level Habitat Regulations Assessment (HRA) is on the critical path to awarding rights
- It is important to provide clear timescales at the outset of formal leasing

In response to these reflections

We are using the feedback we received and our experience from previous leasing activity to inform the approach to potential new leasing.

Engagement

- We are engaging now with industry and statutory stakeholders on the 'what' and the 'where'
- We will be engaging in more detail on the leasing process itself (the 'how'), likely in autumn 2018

Site selection

- We think there would be value allowing developers to identify their own sites, but would intend to share our data (including a new consent constraint model) to help this
- We propose that initial Agreements for Lease (AfLs) are large enough to allow refinement, with such refinement needing to take place prior to consent application

Scale

- Our current thinking is that for a leasing round designed to enable the 2030 position, circa 6GW would be an appropriate scale
- We are not proposing a zonal model – rather we propose a project based model, with the tender process leading to a set of project specific AfLs

Process

- We would engage on the approach to plan-level HRA prior to launch
- We would set a clear timeline at the start of the tender process
- We may release further opportunities in the future, but believe there is value in a sufficient gap (circa 4 years) to allow initial projects to get into planning

The purpose of engagement

Stakeholders

- Explain the context for potential new offshore wind leasing
- Validate spatial analysis and characterisation area reports
- Seek views on the potential scale, location and nature of new rights
- Seek stakeholder feedback to share with potential bidders
- Provide updates on how our proposals evolve through the engagement process

Stage One: Market

- Validate market demand for new rights
- Seek views on the potential scale, location and nature of new rights

Stage Two: Market

- Share key themes from stakeholder and market feedback
- Set out further details of the tender process

Proposed approach to leasing

Prior to launch

- Through a process of engagement and seeking to balance a range of interests, TCE determines the regions of seabed to be included and available to bid projects into.

Tender launch

- TCE shares its data in relation to these regions, including: GIS constraint model output, a qualitative assessment of constraints, and stakeholder views.

Bid

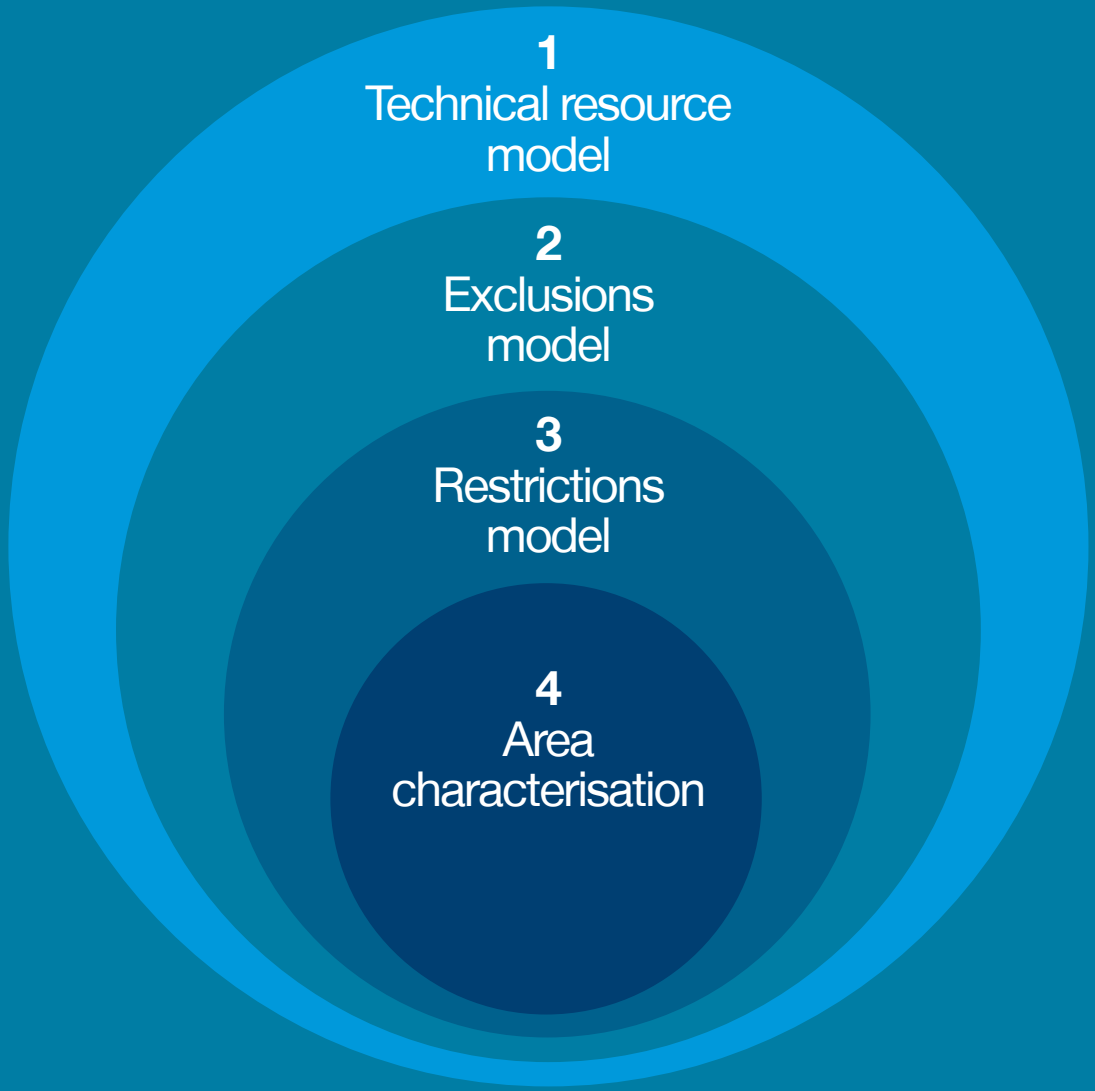
- Developers identify and propose sites within available regions of seabed.

Bid review

- Through a transparent assessment methodology, TCE selects projects, undertaking a plan-level HRA prior to Agreements for Lease being awarded.*

*** We will engage on the assessment methodology and approach to plan-level Habitats Regulations Assessment during the next stage of engagement**

Approach to spatial considerations

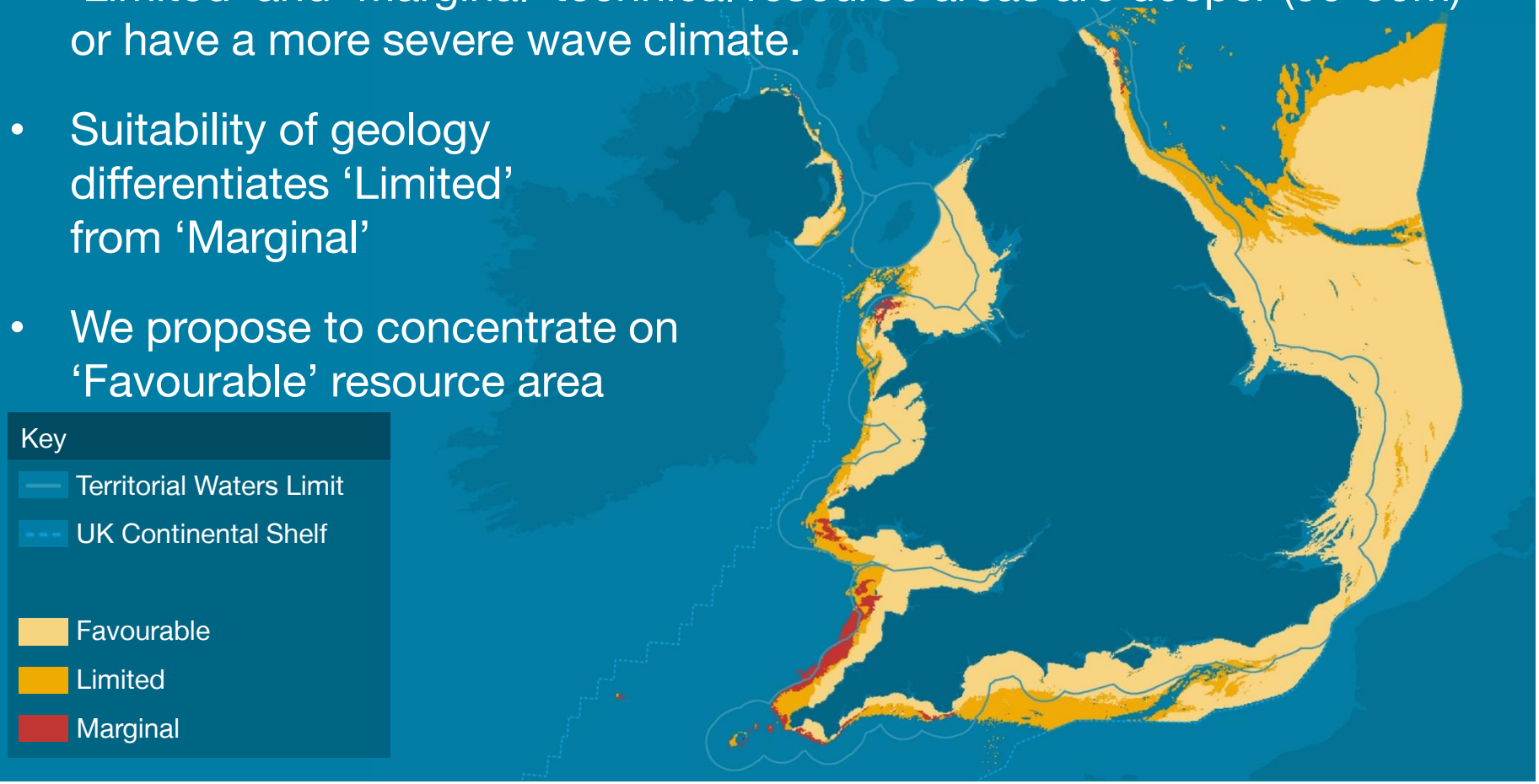


Technical resource model

- Our analysis to date is focussed on the technical resource area for fixed foundation offshore wind
- We anticipate that this will deliver the most viable projects within current policy context and therefore be the focus of market demand
- We are seeking to validate this analysis with the market

Technical resource model

- ‘Favourable’ technical resource area for fixed foundation offshore wind, defined by water depths 5-50m and good accessibility (>80%@2.5m Hs)
- ‘Limited’ and ‘Marginal’ technical resource areas are deeper (50-60m) or have a more severe wave climate.
- Suitability of geology differentiates ‘Limited’ from ‘Marginal’
- We propose to concentrate on ‘Favourable’ resource area



‘Favourable’ resource area – potential regions

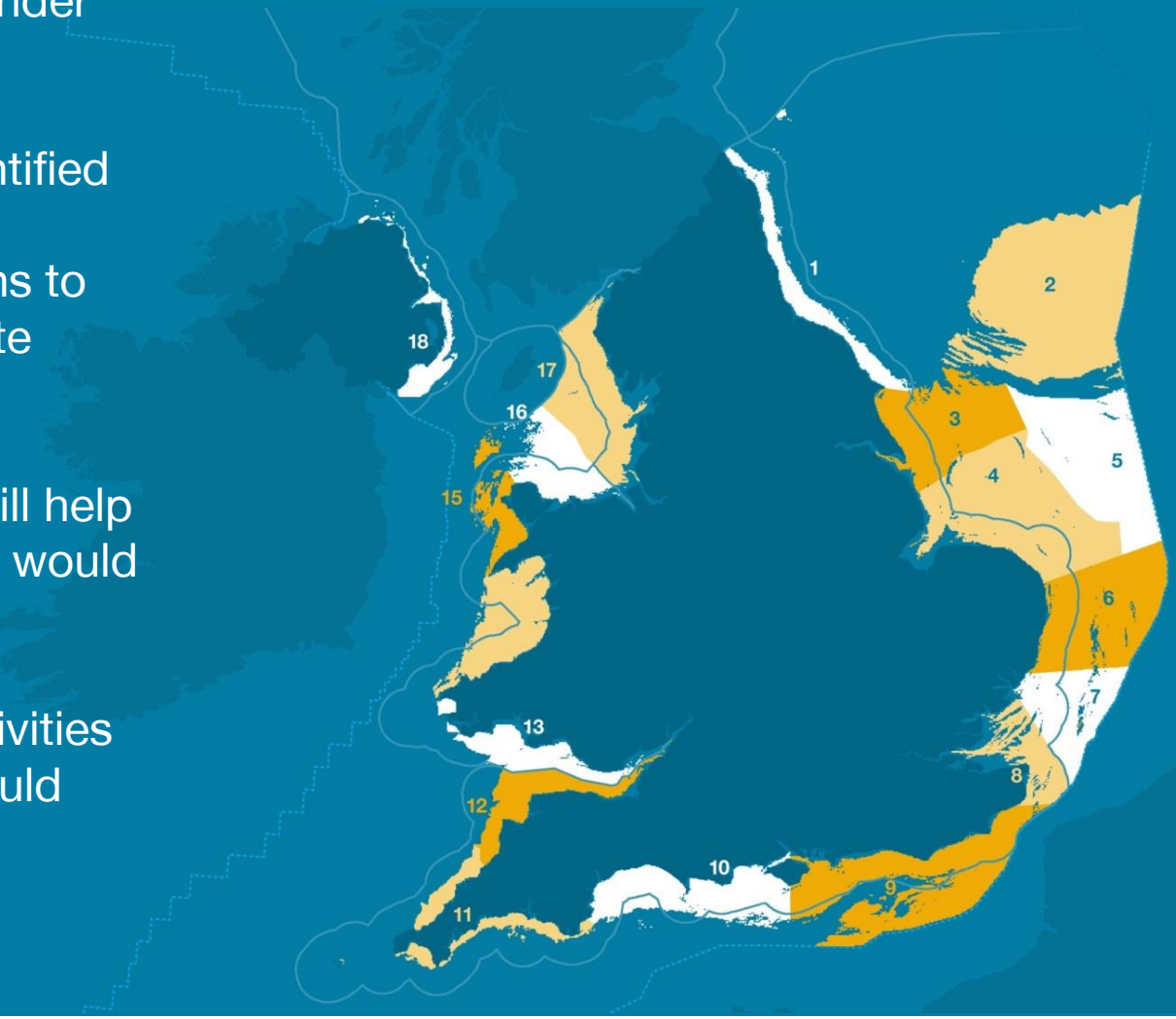
Regional approach to tender proposed

18 potential regions identified

We could open all regions to tender but some are quite constrained

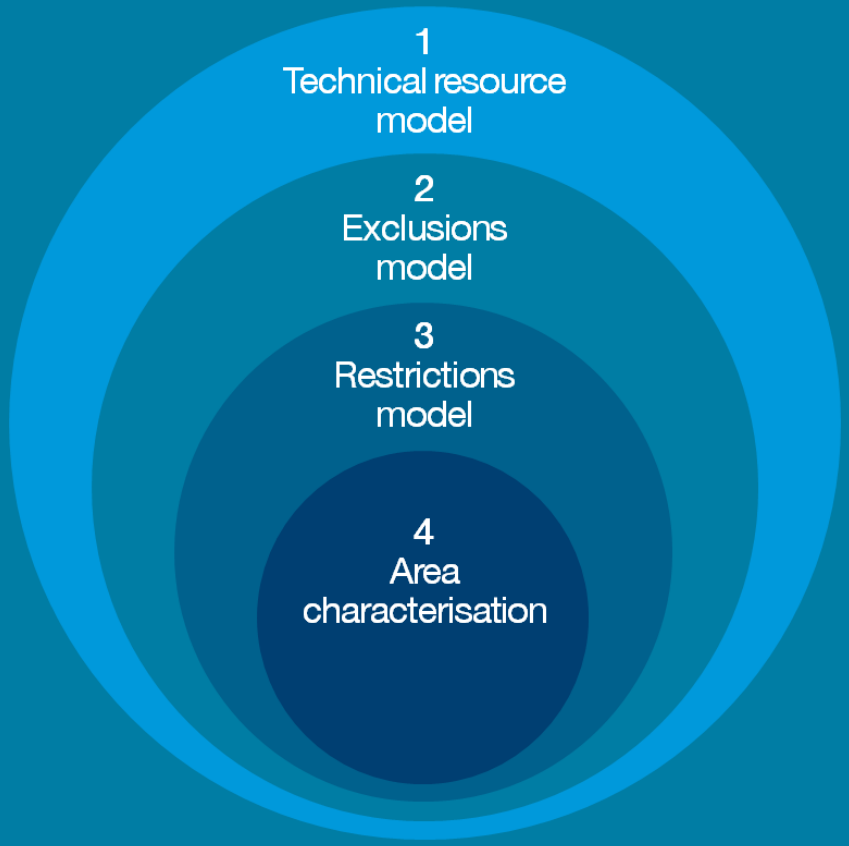
Stakeholder feedback will help us decide which regions would be open to tender

In any case, existing activities and hard constraints would need to be avoided



Approach to consenting issues

We are developing a constraints analysis in relation to consenting issues to help inform our selection of regions and developers' identification of sites.



This analysis would be captured in the Exclusions model, the Restrictions model and the Area Characterisation reports.

We would engage on this analysis at a later stage prior to launch.

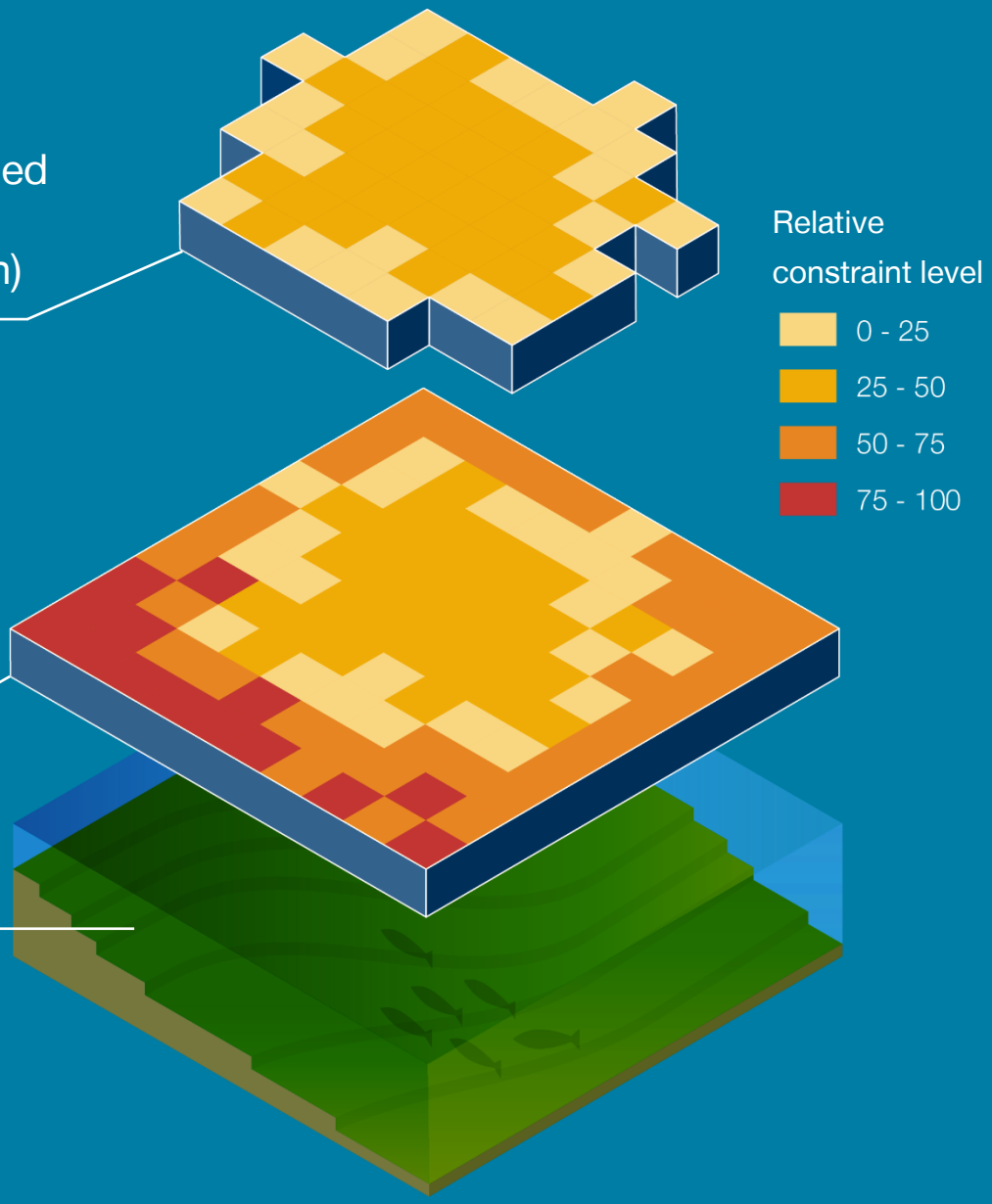
We are also considering how to approach constraints in relation to export cable connections. We will share our thoughts on this in due course.

Approach to leasing: summary

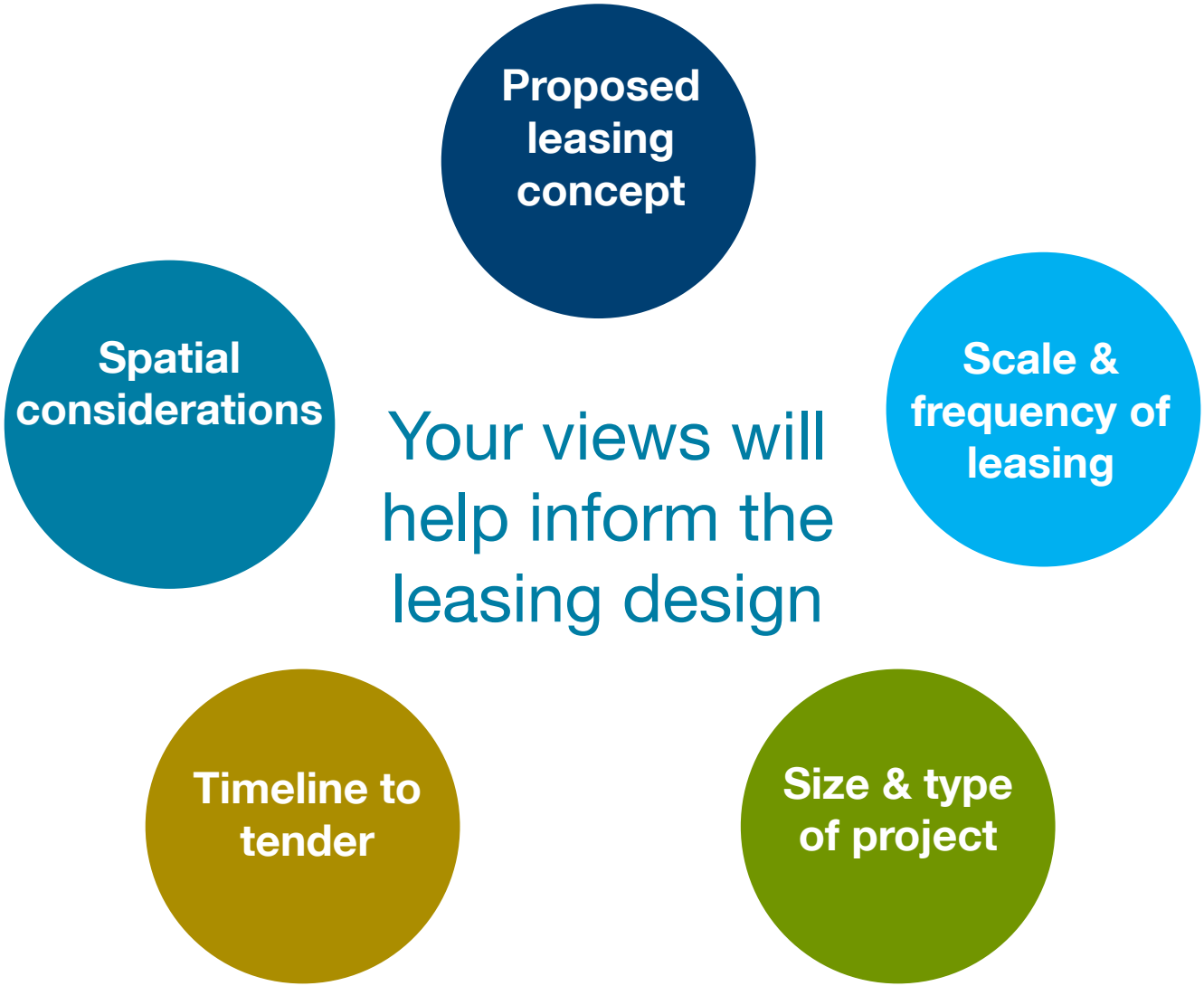
More detailed qualitative analysis provided within the ‘characterisation area’ (ie the least constrained (<50) part of the region)

Exclusions and restrictions model output provided across the whole region

Region of seabed open to tender



Engagement themes



Potential tender parameters: nature of leasing round

Parameter	Current thinking	Further details
Type of projects	We would lease single projects (rather than larger zones that would be developed in tranches over time) but recognise that flexibility may be required to allow phasing of construction.	Projects would need to make a single consent application. If they make multiple Contract for Difference applications and/or have phased investment decisions, the same overall option period would still apply.
Scale of leasing round	The leasing round would seek to achieve circa 6GW of new capacity.	The total capacity leased would range from circa 6 to 7.5GW, based on current proposals for max. project size (see next slide).

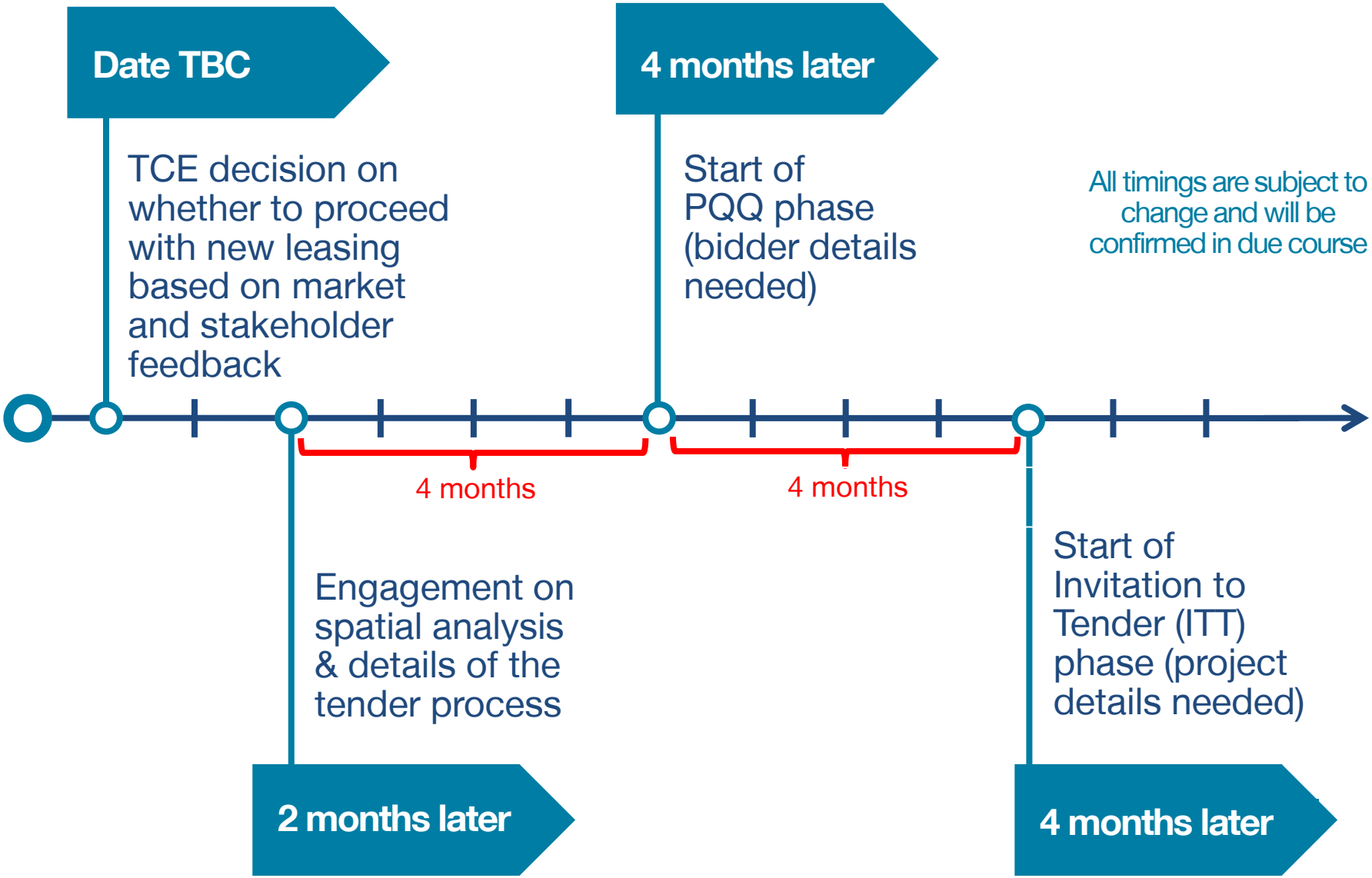
Potential tender parameters: project characteristics

Parameter	Current thinking	Further details
Project size	We are considering an upper limit on individual project size of circa. 1.5 GW	We are seeking to find an appropriate upper limit that is likely to enable economic projects whilst also enabling sufficient diversity of portfolio emerging from the process.
Hybrid projects	We are open to facilitating hybrid projects but they would need to fulfil the requirements of the tender process	We consider hybrid projects to be those that incorporate a second technology and/or revenue stream into the project design.

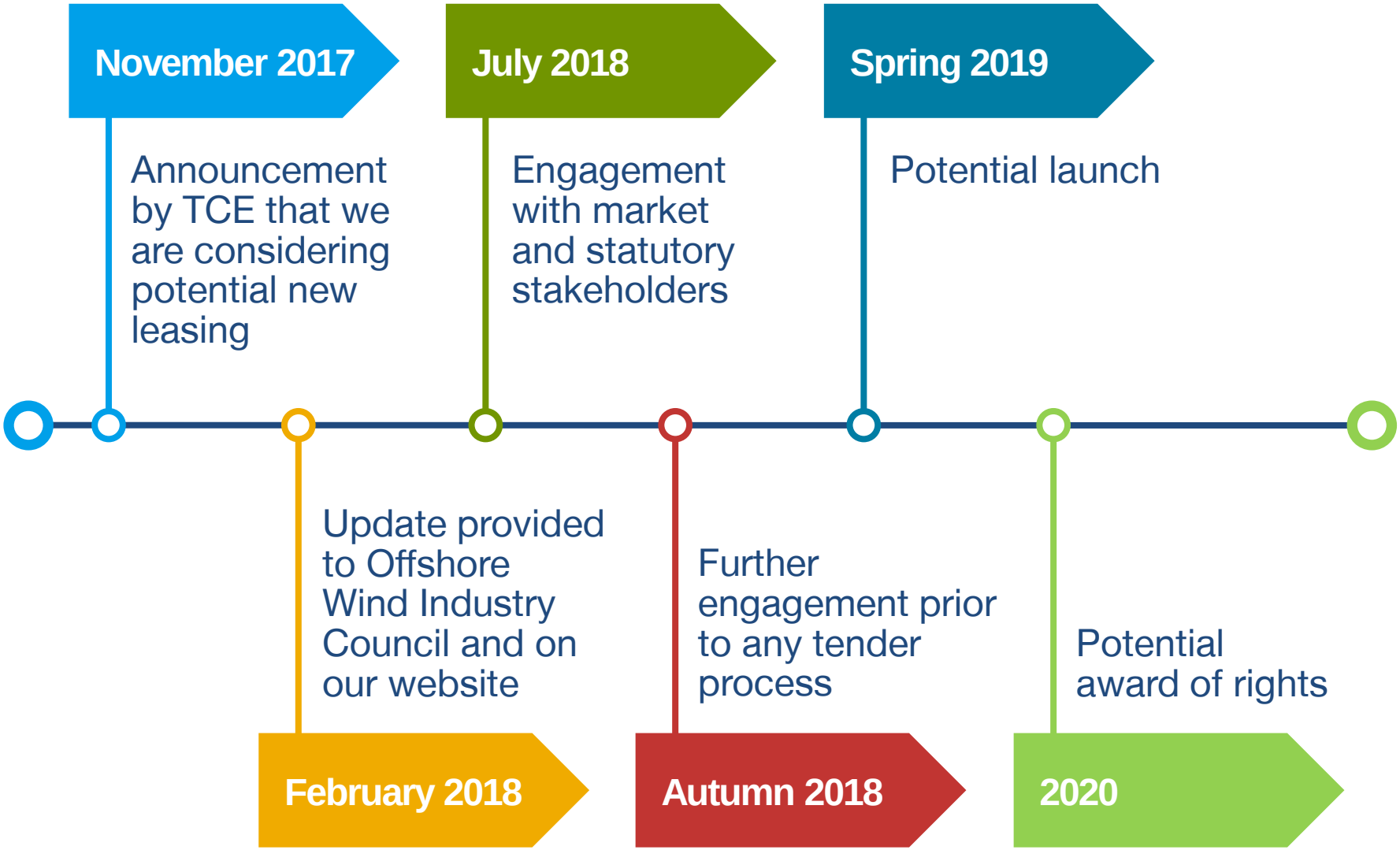
Potential tender parameters: bidders

Parameter	Current Thinking	Further details
Identity of bidders	The leasing process would be open to existing players and new entrants with relevant offshore consenting / development experience	Appropriate capability and experience of bidders would be a focus at pre-qualification (PQQ). We would not propose to ring-fence any capacity for particular types of bidder.
Bidding entities and consortia	The leasing process would be open to consortia bids, but any party would only be able to be part of one bidding entity (either sole bidder or a consortium member). Joint Ventures would need to be defined at PQQ	This would be to ensure the integrity of the leasing process.

Minimum timelines to tender



Timeline



Timings are subject to change and will be confirmed in due course

Summary

We have not yet decided to proceed with a leasing round, but are actively exploring options with a view to informing a future decision.

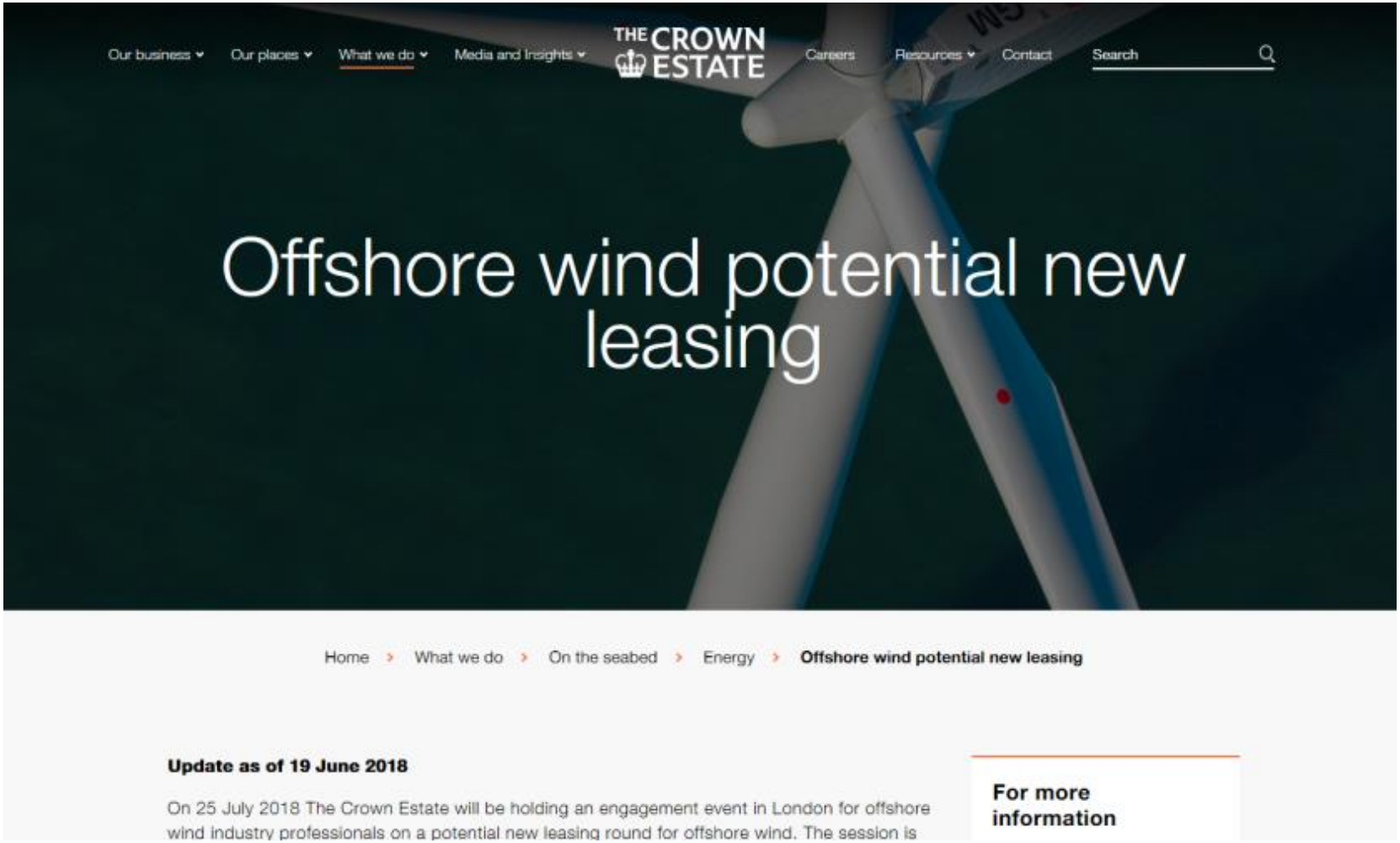
It is important to design and run a process that is fair, transparent and responsible, and that balances a range of different interests.

We have identified a proposed leasing model that we believe achieves this, but are engaging with market and stakeholders before a final decision is made.

We are planning to make constraint analysis available at a later stage to help inform site selection work.

Further engagement will follow in due course, setting out what has changed in light of feedback, and providing details of how the tender process would work.

Stay informed



To stay informed please visit our website: thecrownestate.co.uk/potentialnewleasing

Join our mailing list at: offshorestakeholder@thecrownestate.co.uk