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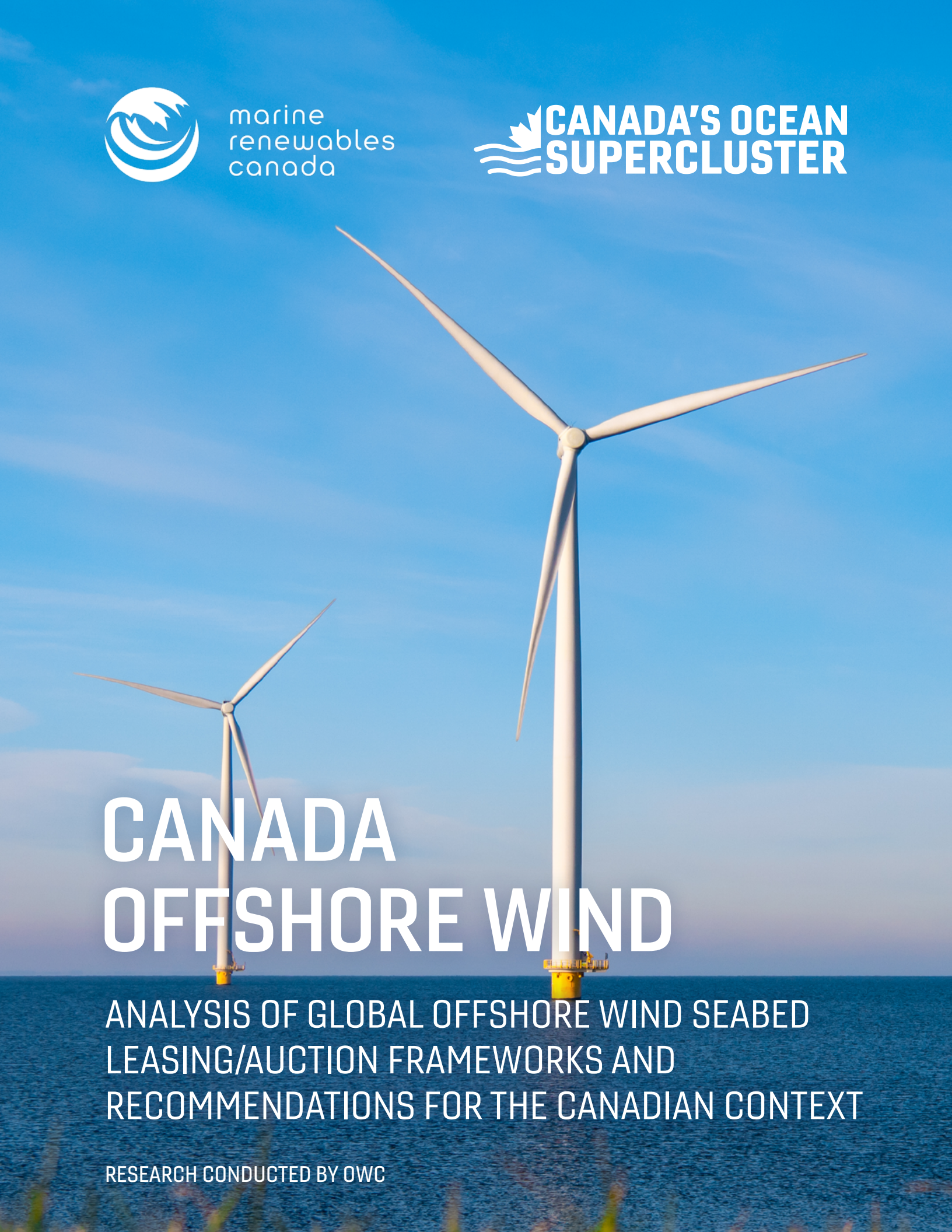
CANADA'S OCEAN SUPERCLUSTER



CANADA OFFSHORE WIND

ANALYSIS OF GLOBAL OFFSHORE WIND SEABED LEASING/AUCTION FRAMEWORKS AND RECOMMENDATIONS FOR THE CANADIAN CONTEXT

RESEARCH CONDUCTED BY OWC

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GROWING CANADA'S OCEAN ECONOMY BY 5X TO $220B BY 2035

In 2016, the OECD evaluated the growth of the global ocean economy, projecting it would double in size by 2030 to $4 trillion dollars Canadian and outpace the broader economy's growth by 20 per cent. In the context of this global ocean potential and in developing ocean solutions that are urgently needed, Canada can achieve transformative growth with significant opportunities for Canadian businesses and workers from coast-to-coast-to-coast. This requires a collective approach and being bold in our ambition.

In the fall of 2022, Canada's Ocean Supercluster (OSC) released a discussion document introducing Ambition 2035 - a 5X growth potential for Canada's ocean economy by 2035. Informed by more than 400 stakeholders and leaders from across the country as well as economists, it was developed to provide an ambition for all of Canada's ocean network to rally behind and consider the role they play in delivering on it.

Following the discussion document in May of 2023, more than 200 leaders in ocean came together in Ottawa with a shared ambition to grow Canada's ocean economy to $220 billion by 2035.

Canada's achievement of this goal will require innovation in new sectors and the growth and evolution of existing industries. This report provides a context for the discussion around the successful development of renewable energy in Canada, and Canada's participation in the Global Offshore Wind market.

WE HAVE BIG AMBITION FOR OCEAN IN CANADA

$220 BILLION

5X GROWTH

BY 2035

SUMMARY

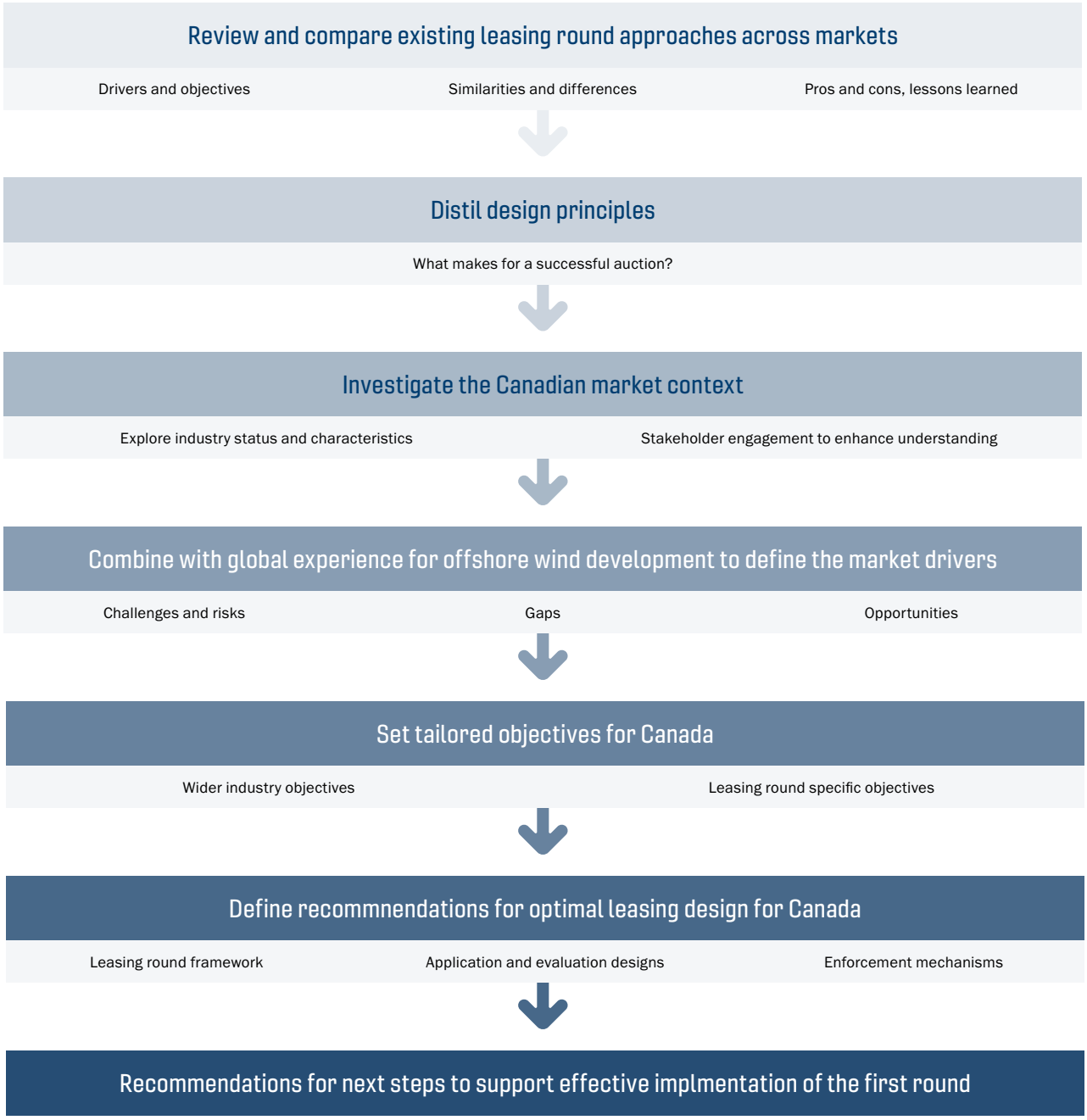
Canada's Ocean Supercluster and Marine Renewables Canada commissioned OWC, a specialist global offshore wind consultancy, to prepare a detailed report on how seabed leasing rounds for offshore wind projects may be structured, designed and implemented for the Canadian market.

There is growing awareness across markets that seabed leasing (and auction) processes can significantly influence industry direction. The aim of this report is, therefore, to make recommendations as to how to maximise this opportunity to use the leasing round as a mechanism to positively shape the industry as it matures in Canada, and conversely, ensure pitfalls that have been highlighted in other jurisdictions are avoided.

The intended aaudience for this report is primarily the government, regulatory bodies, and industry organizations that have roles to play in providing strategic direction and/or designing the leasing round itself. However, it is also intended for a wider audience across the stakeholder groups, as a useful resource on the intricacies of leasing round design to promote better understanding of the issues and help support more meaningful future engagement activities.

STUDY APPROACH

The approach followed to undertake this study is summarised below.



GLOBAL COMPARISON

To create a strong evidence base for the recommendations set out in this report, OWC began by completing a thorough review of seabed leasing and auction processes in different jurisdictions. The OWC team has extensive experience working with regulators and with developers to design and navigate a wide variety of leasing formats within very different market contexts.

The comparison focuses on the US, UK, French and Dutch markets as these cover the full spectrum of approaches from price focused to experience and capability based. This set also captures some of the earlier design approaches and the progression of these in the most established offshore wind markets, enabling more extensive insights to be offered. The core comparison is complemented by the inclusion of specific details from other jurisdictions, where these have employed interesting alternative or additional requirements, such as in Australia, Germany and Norway.

The comparison explores the market context and how these steer key drivers depending on the policy/regulatory, site/physical, supply chain, social, environmental and economic characteristics of the market, that in turn shape the objectives for the industry and for the leasing round. Objectives across the markets covered a wide range of aspects as follows:

INDUSTRY OBJECTIVES FROM A VARIETY OF MARKET CONTEXTS:

- Fully establish an offshore wind industry
- Be a leader in floating wind
- Ensure projects actually get built
- Demonstrate profitability of offshore wind
- Showcase feasibility of short timeline implementation
- Stimulate economic growth and create jobs
- Kick-start supply chain development
- Strengthen local supply chain
- Foster innovation for floating wind
- Encourage ecological innovation and minimise impact
- Enhance energy security

RANGE OF ASSOCIATED LEASING ROUND OBJECTIVES:

- Ensuring an attractive offering to developers and investors/generating interest in the market
- Generating a strong pipeline of projects
- A process that is transparent, objective and fair for applicants
- Be open to new market entrants
- Demonstrate technical feasibility and financial viability of offshore wind
- Fast-track projects
- Identifying and mitigating project risk
- Realising value inherent in the seabed asset

GLOBAL COMPARISON

Components of the leasing/auction round frameworks were then considered, including the timing, duration and integration with other aspects of the project development process including route to market/subsidies, grid connection and environmental consenting. The steps in the application process were detailed, including qualification and eligibility requirements, award method, balance between price and non-price based criteria, site boundary selection process and level of competitiveness of the round. Key similarities and differences between the approaches are discussed.

The application designs in terms of the specific questions and content were reviewed and summarised into common themes alongside their more specific criteria. Similarly, the evaluation methods and key T&Cs are discussed to capture the range of approaches and reasoning for these.

he comparison concludes with analysis of the outcomes of the leasing rounds, whether these met the objectives set out for the round, key pros and cons of the designs and lessons learned:

AIGNMENT WITH OBJECTIVES

Yes, except for:

- UK – unlikely to meet targets on time due to the long duration of the leasing round and consenting processes, and project delays relating to grid connection dates and supply chain constraints
- US – Supply chain development has not been as successful as hoped
- US – Profitability of projects has not been demonstrated

PROS

- Some rounds were particularly attractive for developers with high levels of participation
- Qualitative evaluation approach encourages developers to be more thoughtful and critical about their development strategy
- Provision of clear guidance and consultation with developers in some rounds
- Tailoring of the round to the current global technoeconomic climate
- An established process that is consistent over multiple rounds

CONS

- Lack of non-price criteria in some rounds
- Lack of enforcement mechanisms
- Easily achievable non-price and price criteria in some rounds making it difficult to distinguish between applicants

LESSONS LEARNED

- Low price caps can be easily met and render a price criteria irrelevant
- Easily achievable non-price criteria result in these becoming requirements that all developers sign-up to and cannot be differentiated on
- Criteria enforcement is key to ensuring the accountability of applicants and ensure plans set out in the application are met
- Difficult to encourage supply chain development without clarity on project pipeline
- Auction (price) only formats do not allow the government to influence

GLOBAL COMPARISON

The conclusions were distilled into a set of requirements to drive successful leasing design regardless of the specific market context and objectives. Some key considerations reflecting the parameters that can be varied to shape the design are also offered, providing the basis from which recommendations for Canada can be confidently developed. A summary of the requirements and variables is as follows:

REQUIREMENTS FOR SUCCESS:

- Appropriate timing of the process with respect to the jurisdiction's economic climate
- A strong understanding of the current market context and future trends to derisk the application design
- Development of specific and strategic objectives is critical to ensuring that both the jurisdiction and the developer benefit from the seabed leasing round
- Designing a process that can definitively and appropriately differentiate between applicants
- Striking the right balance between price and nonprice elements
- A process that understands key risks across parties and seeks to support risk reduction
- Having a clear route to market in place and strong alignment with the permitting process

VARIABLES TO SHAPE THE DESIGN:

- Low bar versus high bar approach and thus how accessible the round is to new applicants as well as having the potential to promote differentiation between applicants
- Quantitative versus qualitative application and evaluation approaches
- Use of experts in the evaluation process
- Level of effort required in the application and evaluation
- Level of flexibility in the application and evaluation processes
- Level of transparency in the evaluation
- Putting in place suitable enforcement or monitoring mechanisms post-application to promote accountability

MARKET CONTEXT

The second element to developing strong recommendations with respect to an optimal leasing design for Canada was to develop a good level of understanding of the Canadian market context, including government policy, existing regulations, other offshore industries, site conditions, routes to market, grid and port infrastructure and supply chain constraints.

To enhance this understanding and delve deeper into the nuances of the industry and the challenges, risks and opportunities, a selection of stakeholders from key groups as well as rights holders were engaged with. A questionnaire was developed, tailored to each stakeholder group. The findings were collated to draw out common themes whilst maintaining confidentiality for the stakeholders. Note that this was not designed to be an exhaustive stakeholder mapping and engagement exercise. Instead, it should be viewed as an initial activity to help inform and validate the report findings.

Key themes were as follows:

- A real need to do everything possible to speed up (without compromising on quality) the development timeline to deployment of the first operational projects for Canada to maximise realisation of the opportunities available
- Concerns around route to market uncertainty and associated constraints for grid and PPAs, lack of maturity for hydrogen
- Developers are very keen to have input to site selection
- A general level of dissatisfaction with some international markets favouring applicants with the greatest financial means
- Clear legislation and subsidy support were identified as particular needs for developers
- Concerns around supply chain readiness and development needs to overcome constraints, strong preference for local content to maximise opportunities but in balance with cost effectiveness and international trade considerations
- Local benefits and compensation as a genuine opportunity for local groups, and as a mechanism for developers to promote project success with stakeholders
- A willingness by all stakeholder groups to be involved in the process, and a recognition that there will be challenges that need to be addressed with the support of key stakeholder groups

CHALLENGES AND OPPORTUNITIES

The Canadian context research, stakeholder engagement activity and the team's extensive prior experience with offshore wind developments in global markets were combined to define the main challenges and opportunities for Canada:

KEY CHALLENGES AND RISKS IN CANADIAN CONTEXT

- Presence of high uncertainty and risks throughout the development phase
- Developing and enacting effective risk mitigation strategies
- Lack of best practice and formal procedures to follow risking suboptimal project delivery
- Floating wind technology and industry maturity
- Designing appropriate fixed foundation solutions for large WTGs at shallow water sites in a harsh environment
- Supply chain capability and capacity building
- Grid constraints
- Establishing a route to market
- Complexity of logistics and installation for large components and projects, including navigating weather window constraints (especially important for geographies with strong metocean conditions)
- Major component replacement especially for floating wind, in strong metocean conditions

BROADER CHALLENGES AND RISKS TO TAKE INTO ACCOUNT

- Substantial project expenditure required prior to securing route to market
- Establishing effective resourcing plans given resource shortages in the industry
- Integration of supply chain, innovation plans and engineering/delivery strategy
- Achieving alignment and defining suitable decision making processes to avoid project delays/suboptimal delivery when working in Joint Ventures/partnerships
- Risks associated with not defining costs and developing a realistic cost reduction strategy early enough in the project
- Design challenges include strong environmental loading, designing with large WTGs, minimising foundation size/weight, assembly and integration challenges relating to floating wind level of maturity
- Lack of operational data for floating wind and for new WTG models increases operational risk

POTENTIAL OPPORTUNITIES OFFERED BY THE CANADIAN CONTEXT

- Good wind resource characteristics leading to high capacity factors
- Fairly extensive areas that are potentially technically suitable for development, possibly leading to sizeable market for Canada if route to market and other constraints/challenges can be overcome
- Opportunity to establish new approaches to developing projects more sustainably
- Opportunity to become an offshore wind hub including for floating wind and hydrogen (and/or derivatives) production
- Associated high potential for job creation and economic growth
- Opportunity for skills transfer from O&G, power line maintenance and onshore wind
- Export opportunities such as power to the US

OBJECTIVES

These act as the core drivers to feed the setting of objectives for the seabed leasing round, and OWC has developed a set of recommended objectives with respect to the aspirations for the industry as well as focused on the first leasing rounds, justified by the contextual analysis:

KEY OBJECTIVES FOR DEVELOPING AND ESTABLISHING AN OFFSHORE WIND INDUSTRY IN CANADA

- Utilise offshore wind as one of the key enablers to achieving Canada's climate targets (as part of a broader integrated energy strategy)
- Convert the potential opportunities for establishment of an offshore wind market in Canada in an optimal way
- Support growth of electrification and green hydrogen production
- Generate local development opportunities for communities and businesses
- Drive industry investment and growth
- Ensure a long-term economically and socially sustainable industry
- Develop an inclusive OSW industry in Canada

LEASING ROUND DESIGN SHOULD PROMOTE THE FOLLOWING TO ALIGN WITH THE OVERARCHING OBJECTIVES

- Inclusive, sustainable and collaborative development ethos
- Timely project delivery, taking into account appropriate management of the risks and external influencing factors
- Assured, competent and committed delivery
- Integrated industry development
- Proactive knowledge sharing
- Generate a strong level of interest in the seabed leasing round in Canada, leading to attractive applicants/bids

RECOMMENDATIONS

A set of recommendations for the process design, application content, evaluation method and enforcement measures were then developed to align with these objectives, bearing in mind the broader Canadian context and using the principles developed from the global leasing round review. These are supported by a set of recommended enabling actions that need to be completed to realise the full potential of the leasing round:

- Develop a vision for the industry to set expectations and guide developer decisions with respect to project concepts and timelines. This vision should accommodate a wide range of approaches given the current high levels of uncertainty in terms of the optimal direction for the market, and it should take into account supply chain capabilities and realistic growth projections as well as desired targets for offshore wind deployment numbers over time
- Develop holistic network plan for upgrades to accommodate grid connected projects
- Provide connection date and location to projects as soon as possible (where grid is to be the offtake)
- Develop plan for alternative offtakes to supplement domestic grid option
- Introduce a subsidy scheme (at least for the earlier projects in the pipeline)
- Combine this with guaranteed route to market (i.e. some form of PPA)
- Ensure regulatory system is clear and streamlined in terms of obtaining the necessary approvals (already being developed for NL and NS)
- Encourage efficient and pragmatic approach to environmental impact assessment and licencing requirements

PROCESS	APPLICATION	EVALUATION	ENFORCEMENT
GE-1: 2 stage process with separate seabed leasing round first followed by route to market auction later in the project development timeline to mitigate risk and encourage appropriate project timelines **GE-2:** A coordinated approach to defining a full pipeline of leasing rounds from the outset to enhance investor confidence **GE-3:** Striking the right balance between government, regulator and developer led activities to facilitate industry development	**AP-1:** Use a mix of tick box and written free text responses to reduce complexity where possible whilst supporting an effective evaluation method **AP-2:** Application structured into clearly demarcated sections with specific topic areas and evaluation objectives stated for each **AP-3:** Pragmatic approach to page limits across the application **AP-4:** Comprehensive guidance notes alongside the application form in support of an effective communication strategy	**EV-1:** Develop a clear and thorough evaluation process that promotes fair differentiation between applicants **EV-2:** Invest in independent, subject specialists to complete the evaluation of each application section **EV-3:** Use of simple pass/fail criteria to cover eligibility and due diligence elements of the application **EV-4:** Build in metric-based consistency and credibility checks across the application	**EN-1:** Stronger enforcement measures should be included in the T&Cs than have previously been seen in other jurisdictions' leasing rounds, but these must be cognisant of external factors **EN-2:** Use a competitive subsidy/route to market scheme later in the development process as a secondary enforcement measure to promote a sound delivery approach through construction and operation

RECOMMENDATIONS

PROCESS	APPLICATION	EVALUATION	ENFORCEMENT
GE-4: A coordinated approach to site boundary specification that offers freedom to developers to optimise projects whilst promoting efficient use of the seabed **GE-5:** Provide upper and lower bounds to project capacities but maintain flexibility for applicants to select the remaining project characteristics **GE-6:** Include non-price criteria as a major component in the seabed leasing application process as these provide a key opportunity to direct industry progression, which is especially important in a new market **GE-7:** Price should be used at most only as a secondary differentiator in the application and should be capped **GE-8:** Ensure the application process is reasonably simple and concise to improve attractiveness and prevent delay to the project development timeline **GE-9:** Provision of comprehensive information on the process, structure, requirements and dates as early as possible **GE-10:** Encourage diversity of applicants and awards in support of lowering overall development risk **GE-11:** Review and revision of objectives and approach for future leasing rounds	**AP-5:** Succinct reporting of basic information to give confidence in compliance with rules and eligibility requirements from the outset of the application **AP-6:** Inclusion of project description to underpin the subsequent application sections rather than as a direct differentiator between applicants **AP-7:** Inclusion of a section about the applicant's development ethos, with sustainability, collaboration, ethics, equity and co-use principles rewarded **AP-8:** Inclusion of section that assesses ability to deliver an efficient project timeline with strong awareness of risks and effective mitigation planning **AP-9:** Inclusion of section to assess competence of the applicant as a critical aspect to meeting the timely delivery objective within a new market **AP-10:** Include section that assesses commitment to delivering the project to provide assurance that the developer will go through with their delivery plan **AP-11:** Include section on contribution to industry development, with benefits to the project as well as to the wider industry being demonstrated **AP-12:** Include section on knowledge sharing and lessons learned, rewarding applicants that demonstrate a proactive approach	**EV-5:** Use a weighting system across the application sections to establish the desired balance and make clea **EV-6:** Use a relative ranking system between applicants to promote a fairer assessment **EV-7:** Create a detailed marking system to evaluate application responses and support the ranking process **EV-8:** Eliminate the possibility of ties in the process which lead to arbitrary resolution and selections **EV-9:** Quality assurance and ensuring consistency in marking is critical to the approach being accepted by the industry **EV-10:** A balanced approach to transparency with respect to the information about the evaluation methodology that is supplied to applicants	

NEXT STEPS

Finally, the critical next steps were identified to support effective implementation of the first leasing round:

1. Set clear objectives for the industry and consequently for the first leasing round
2. If the opportunities that are offered through collaboration on data collection are to be realised (especially with respect to the long duration aerial surveys for ornithology and marine mammals), the relevant stakeholders need to proactively engage and develop the details of the site survey specifications and requirements as soon as possible
3. Early and extensive engagement with all stakeholder groups prior to the leasing round to ensure stakeholders have the right tools to be able to properly engage. This should reduce the risk of delays during the seabed leasing round and set a precedent for positive engagement during the project developments in the longer term
4. Development of overarching supply chain plan, including capacity assessment and capacity building projections. Use this to help determine a suitable size (in terms of total capacity) and timeline for the first and subsequent leasing rounds
5. Assessment of LCoE/project economics across the RA areas, review of seabed pricing trends in other jurisdictions and impact assessment of different fees and fee structures on projects to select preferred pricing model.
6. The Federal Government Directive on the first seabed leasing round should be drafted and provided as soon as possible so that the relevant entities (e.g. local govt departments, Regulator) have enough time to input to, design and implement an effective seabed leasing round. Seek specialist advice on application and evaluation designs.
7. Detailed mapping and options analysis to develop viable route to market(s) options for the full project pipeline and development of strategy and implementation plan (e.g. considering alternative offtakes such as export to US, hydrogen/derivatives production)
8. Grid strategy development and implementation plan ensuring a coordinated approach to defining capacity targets, connection locations and timelines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