Solicitation 4.0 - Request for Proposals

I. Introduction

The National Offshore Wind Research and Development Consortium (NOWRDC) is a nationally focused, independent, not-for-profit consortium of key offshore wind industry stakeholders. NOWRDC is dedicated to managing industry-prioritized offshore wind research and development to maximize economic benefits for the United States.

NOWRDC seeks to support the Biden Administration's goal to deploy 30 gigawatts (GW) of offshore wind capacity by 2030, 15 GW of floating offshore wind capacity by 2035, and establish a pathway to deploying 110 GW or more of offshore wind capacity by 2050. To achieve this vision, NOWRDC supports identification of the technology innovations needed to address challenges and lower costs in all U.S. offshore regions. The necessary cost reductions can be realized in part through targeted research and development that removes or reduces technological and supply chain barriers to deployment and lowers development risk to investors. NOWRDC envisions this research being conducted through desktop studies, design development, and computer analysis, as well as hardware development with supporting demonstration and validation activities.

In June 2023, NOWRDC released its "Research and Development Roadmap 4.0" (Roadmap) to advance offshore wind technology, drive wind technology innovation, and combat climate change. Incorporating industry-led feedback, the Roadmap presents a long-term vision for innovative offshore wind technology development in the United States and identifies key priorities for establishing the industry as a leading national clean energy sector. Proposers are encouraged to review the Roadmap which is available for download at NOWRDC's Resource Page - https://nationaloffshorewind.org/resources/

Focusing on the research and development priorities identified in the Roadmap, NOWRDC drafted and refined the following challenge areas through literature review and subject matter expert and stakeholder input. The Topic Areas identified for competitive funding in this solicitation are:

1. Innovations in ports and vessels to support floating offshore wind installation;
2. Floating offshore wind transmission technology advancement; and
3. Uncrewed underwater technology evaluations for environmental monitoring around floating offshore wind development infrastructure.

This Solicitation was created with funding from the California Energy Commission (CEC) and leverages funding from the U.S. Department of Energy (DOE), the U.S. Department of the Interior's Bureau of Ocean Energy Management (BOEM), the New York State Energy Research and Development Authority (NYSERDA), the Massachusetts Clean Energy Center (MassCEC), and NOWRDC. This unique collaboration maximizes leveraged funding opportunities for the greatest number of high-impact projects.

NOWRDC intends to support projects in partnership with the best research and innovation organizations to achieve maximum impact. Proposals are welcomed from all geographic locations within the United States, with additional eligibility parameters outlined in Section V. Project Eligibility and Requirements. NOWRDC reserves the right to add or remove funding from any topic area.

All prospective applicants for this solicitation are encouraged to seek input from, or partner with, an offshore wind developer or a U.S. offshore wind materials or services supplier, or include an advisory group of industry and/or state experts to ensure the direction of the project and outcomes can be commercially applied. Additionally, proposals should demonstrate knowledge of prior research, and/or identify partners who have been working on this challenge in order to demonstrate that the proposed research will further the overall state-of-the-art. Projects proposed under this solicitation should focus on novel solutions and knowledge advancement to fill gaps not being addressed by other public funding or developer-specific initiatives.

II. Solicitation Topic Areas

A. Topic Area 1: Innovations in Ports and Vessels to Support Floating Offshore Wind Deployment

Total Funding Available: Up to $2,026,000

Purpose

This topic area is specifically designed to spur innovation in the vessels and port infrastructure required to facilitate floating offshore wind development. Project emphasis should be on novel and adaptable port and vessel innovations that can accelerate floating system assembly and deployment timelines. Innovations should increase process efficiency and cost effectiveness and be versatile and adaptable to various platform and turbine designs and sizes. The scope does not include the actual design or engineering of floating offshore wind turbine platforms or substructures themselves.

Background

Floating offshore wind projects demand specialized logistical infrastructure for the assembly, transportation, and installation of floating structures estimated to have hub heights of 118-150m.[1] [2] The current U.S. infrastructure cannot accommodate the scale and complexity of these projects and will require new facilities/vessels as well as upgrades to existing ports and vessels. In addition, future upsizing or variations in the design of floating wind systems may impose new infrastructure and vessel requirements over time. High costs and long timelines of developing new purpose-built infrastructure could hinder the industry's growth.

This topic area supports key goals within the interagency Floating Offshore Wind Shot, notably reduction of costs through manufacturing and logistics innovations and development of supply chain to enable deployment at-scale.[3]

Justification

The U.S. has a need for new, expanded and upgraded facilities because existing ports and vessels are inadequate to support the planned build-out of commercial scale floating wind energy projects. The investment required for improving port infrastructure and vessel fleets will be substantial, but the potential economic returns are compelling.[4]

To maximize efficiency and cost reductions for commercial-scale deployments, some manufacturing and assembly needs to take place at suitable port facilities designed for safe and

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[1] The Cost of Floating Offshore Wind Energy in California Between 2019 and 2032 - https://www.nrel.gov/docs/fy21osti/77384.pdf
[2] Floating Offshore Wind Turbines Port Requirements for Construction - https://journals.sagepub.com/doi/full/10.1177/14750902221078425
[3] DOE Floating Offshore Wind Shot - https://www.energy.gov/eere/wind/floating-offshore-wind-shot
[4] NREL West Coast Ports Strategy Study - https://www.nrel.gov/docs/fy23osti/86864.pdf

efficient storage and movement of heavy and large components.[5] Major offshore wind components (such as blades, nacelles, towers, and floating platforms) are so large that they need to be fabricated or assembled at port sites because they cannot be transported overland. Offshore wind components are also expected to continue growing in scale, and floating offshore wind port development could benefit from proactively incorporating future ready approaches that can accommodate upsizing. Modular or adaptable designs and upgrades can enable flexibility to adjust port facilities to accommodate various turbine component sizes and changes in assembly and installation practices, as well as better integration of floating platform assembly and installation-specific infrastructure within pre-existing port infrastructure that is also used for other purposes. Adaptable approaches, such as temporary or movable work areas, may also enable shorter, simpler permitting pathways and be lower cost than traditional port upgrades.

Developing floating offshore wind manufacturing and assembly capabilities in domestic ports also presents opportunities for reduced transportation costs, greater supply chain resiliency, local workforce opportunities, and opportunities for greater capitalization on tax incentives from the Inflation Reduction Act (including the Domestic Content Bonus and the Advanced Manufacturing Production Tax Credit).[6]

The need for upgrades and investment also applies to vessels. New, repurposed, and multi-purpose vessels are needed that are capable of supporting the assembly, transport, and installation of the different types of large-scale floating substructures and turbines.[7] [8] For situations when turbine assembly from a shore based crane is not an option, specialized installation vessels will be required to assemble and install the floating turbines at their designated locations. Other types of vessels needed to support installation are not yet available with adequate capacities or in numbers to support the planned floating offshore construction activities and timelines.

1. Heavy Lift Crane Vessels (HLCVs): HLCVs are large vessels equipped with heavy-lift cranes capable of lifting and installing the main turbine components including the turbine tower, nacelle, and blades. These vessels need to have large deck spaces, high load capacities, and advanced dynamic positioning systems to accurately place their loads. Differing from jack-up wind turbine installation vessels used in fixed bottom wind farm installations, these vessels rely on large displacements, motion compensation systems, and other methods to provide stability for lifting operations.

2. Offshore Support Vessels: Any of the many other vessel types involved in the construction operations for floating wind projects, including but not limited to: Cable Lay Vessels, Feeder Barge/Vessel, Service Operation Vessels (SOVs), Crew Transfer Vessels (CTVs), Anchor Handling Supply Vessels (AHSVs), and Scour Protection Vessels.

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[5] BOEM Determining the Infrastructure Needs to Support Offshore Floating Wind and Marine Hydrokinetic Facilities on the Pacific West Coast and Hawaii - https://espis.boem.gov/final%20reports/5503.pdf.
[6] NREL West Coast Ports Strategy Study (n 1)
[7] The Cost of Floating Offshore Wind Energy in California Between 2019 and 2032 (n 2)
[8] NREL - A Supply Chain Road Map for Offshore Wind Energy in the United States - https://www.nrel.gov/docs/fy23osti/84710.pdf

As highlighted by NREL as a key action item to meet the Biden Administration's 30 GW by 2030 goal, "a system of ports and vessels that can support annual deployment without creating significant delays" is needed.[9] Optimizing ports and vessels to suit the unique requirements of floating offshore wind projects within U.S. infrastructure constraints will streamline logistics, reduce the need for extensive modifications to existing facilities, and enhance overall project efficiency.[10] By investing in innovations that specifically address the challenges posed by current infrastructure limitations as well as proactively planning for variability in component and system sizing, this Topic Area can result in novel port and vessel designs to better meet the near and long term demands of the floating offshore wind industry.

Many companies, research universities, and organizations may already be looking into technical solutions that fit under this Topic Area. Proposals may leverage completed or ongoing efforts, but should propose specific new work that would advance previous work on innovations in terms of technical and commercial readiness, or to carry out assessments of economic and supply chain impact of such innovations that have not yet been undertaken.

Proposed Innovation

Projects funded under this initiative will propose innovations addressing one of the following technical subject areas:

1. Port Infrastructure: Explore concepts for modular or flexible work areas to accommodate the floating offshore wind system manufacturing, assembly, maintenance, wet storage, and transportation processes. Develop innovations that can supplement or be easily integrated into existing facilities, minimizing the need for extensive modifications and relieving space constraints. Concepts may also advance load-handling capabilities to enable efficient loading, unloading or placement of large and heavy components while enhancing precision, safety, and speed, and reducing downtime. Innovations should have applicability in multiple regions of the U.S.
2. Installation Vessels and Installation Support Vessels: Research and development of novel vessel concepts or upgrades to existing Jones Act compliant vessels to support floating offshore wind fabrication and installation demands. Incorporate advanced lifting and positioning technologies – including innovations in crane systems and vessel or load stability control. Advance innovations for offshore component transfer, and for vessels suited to all aspects of the assembly and installation (e.g., anchor handling, mooring installation, and cable installation as well as the transport and handling of platform and turbine structures).

Example Projects

- *Floating or other temporary or flexible work areas that can support fabrication or assembly activities quayside, in sheltered waters, or at sea.*
- *New crane or lifting technologies (e.g. dynamic load handling) with capacity and reach for quayside assembly and turbine installation.*

[9] Ibid
[10] The University of Edinburgh - Offshore Logistics: Scenario Planning and Installation Modeling of Floating Offshore Wind Projects - https://api.semanticscholar.org/CorpusID:257351845

- *Climbing cranes that can support turbine installation quayside or on-site in the lease areas.*
- *Repurposing existing Jones Act compliant vessels to floating wind installation vessels (e.g., the NOWRDC-funded 2022 project by Exmar: Feasibility of a Jones Act Compliant WTIV Conversion[11]).*
- *Vessel designs or features that expand weather windows and improve stability during platform tow-out and installation or large component installation and replacement.*

Projects Not of Interest

- *Floating offshore wind turbine platform design and engineering efforts.*
- *Operations assessments or feasibility studies of existing vessels and applications without technology innovation.*
- *Designs or constructability studies applicable to only one specific port or location.*

B. Topic Area 2: Floating Offshore Wind Transmission Technology Advancement

Total Funding Available: Up to $5,831,000

Purpose

Projects that conduct feasibility analysis, product design, or demonstration/piloting of High-Voltage Direct Current (HVDC) dynamic cables and substations for floating offshore wind could de-risk transmission development and accelerate delivery of mature technology solutions to floating offshore wind markets.

Background

For floating offshore wind transmission, both High-Voltage Alternating Current (HVAC) and HVDC transmission technologies are viable for the current lease area distances ranging from 40 to 110 kilometers from the shore. Future lease areas will be farther from shore and transmission over longer distances will be more economical with HVDC cables. Fixed substation platforms are suitable for water depths up to 100 meters, but economically infeasible in deeper waters such as in California, necessitating floating infrastructure and dynamic power cables which are still in developmental stages.[12] Future Wind Energy Areas may have water depths up to 2,600 meters[13], presenting new technological challenges where modern transmission technology has not yet been proven.

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[11] NOWRDC Project Overview, Exmar Offshore Company, Feasibility of a Jones Act Compliant WTIV Conversion - https://nationaloffshorewind.org/projects/feasibility-of-a-jones-act-compliant-wtiv-conversion/

[12] Maine OSW Analysis – OSW Transmission Technical Review - https://www.maine.gov/energy/sites/maine.gov.energy/files/inline-files/Maine%20OSW%20DNV%20Offshore%20Wind%20Transmission%20Technical%20Review%20Final%20Report.pdf

[13] Jones, Melissa, Jim Bartridge, and Lorelei Walker. 2024. Assembly Bill 525 Offshore Wind Energy Strategic Plan. California Energy Commission. Publication Number: CEC-700-2023-009-V2-CMF.

As summarized by Guidehouse in their "OSW Transmission Technologies Assessment" report developed for the California Energy Commission:[14]

- Dynamic cables are not yet available at the level of capacity or voltage rating necessary for California offshore wind. Dynamic cabling technology exists for lower voltage HVAC applications, but HVDC dynamic cables do not yet exist in any form.
- There is limited precedence for floating substations. Existing offshore wind substations thus far have all been fixed bottom, with the exception of one floating offshore substation that was demonstrated as part of the Fukushima FORWARD project in Japan but was decommissioned in 2021.
- DNV has a floating substation Joint Industry Project that is making progress on supporting the scaling of floating wind through robust guidelines.

Justification

HVDC dynamic cables and floating offshore substations are currently not commercially available, but are nevertheless required for floating offshore wind development in deep water. One of the primary challenges lies in the dynamic nature of offshore environments, where traditional static cables and substations are insufficient. Dynamic HVDC cables must be developed to withstand the complex and unpredictable movements of floating structures, ensuring continuous and reliable power transmission.[15] Research and development projects addressing these technical gaps help de-risk the deployment of floating offshore wind farms, while also establishing a foundation for enhanced efficiency, reduced maintenance costs, and increased energy production.

Proposed Innovation

1. Design and test innovative solutions for floating substation platform station keeping challenges, including active control systems and mooring load reduction devices.
2. Design and test HVDC dynamic power cables for floating substations, including innovative solutions for dynamic cable connections to floating platforms and static export cables.

Example Projects

- *Feasibility analysis and product development for floating substation platform design, in a floating offshore wind development context. The project would identify and address technical challenges, refine designs, and validate the performance of novel designs in deep water oceanographic conditions. U.S. manufacturing, port, and vessel supply chain considerations would also be taken into account. This design iteration and de-risking process would be conducted with investor and industry collaboration to build technology credibility, lower financing costs, and accelerate the deployment of mature, proven substation solutions.*

[14] OSW Transmission Technologies Assessment - https://efiling.energy.ca.gov/GetDocument.aspx?tn=250520
[15] Reliability Analysis of Floating Wind Turbine Dynamic Cables under Realistic Dynamic Loads - https://www.sciencedirect.com/science/article/pii/S0029801823009782

- *Design and test HVDC dynamic cables for floating offshore substations. The project will conduct rigorous testing and validation processes in a controlled laboratory environment to ensure the cables' reliability and performance under dynamic conditions. Through advanced simulations and physical testing, the project seeks to optimize cable designs, assess their durability in varying environmental conditions, and ultimately demonstrate the feasibility of deploying these cables for real-world floating offshore wind substations.*

C. Topic Area 3: Evaluating Uncrewed Underwater Vehicles for Environmental Monitoring Around Floating Offshore Wind Development Infrastructure

Total Funding Available: Up to $2,801,000

Purpose

This topic area is specifically designed to spur innovation in uncrewed underwater vehicles (UUVs) that can facilitate sustainable floating offshore wind development along the U.S. West Coast. Project emphasis should be on 1) analyses to inform a regulatory strategy that incorporates UUVs in order to streamline floating system permitting timelines, or 2) technological advancements to enable the use of UUVs in floating offshore wind deployments. Innovations should enable environmental data collection to support evaluations of impacts of floating offshore wind development such as physical oceanography, marine mammals, and benthic habitats. This may also include ways to mitigate or minimize impacts to National Oceanic and Atmospheric Administration (NOAA) Fisheries scientific surveys.

Background

Responsible floating offshore wind energy development hinges on a multi-phase environmental review process that is implemented before, during, and after construction. However, environmentally responsible development requires long-term monitoring to be in place to identify and document environmental changes or impacts. Successful development and deployment of floating offshore wind infrastructure will require innovative and adaptive technologies and strategies, such as the incorporation of UUVs for environmental monitoring. By acting prior to construction, these strategies will inform which existing autonomous underwater technologies may be appropriate for testing/validation and identify current gaps for future development.

The project(s) funded under this solicitation will complement an ongoing effort funded by the Ocean Protection Council (OPC) and conducted by the California Marine Sanctuary Foundation (CMSF). The OPC-funded project is developing a comprehensive guidance document focused on current environmental monitoring methods and technologies that should be used to collect the critical information necessary to support the permitting of floating offshore wind infrastructure.[16] This solicitation seeks to support the OPC-CMSF effort by addressing information and technology gaps specific to uncrewed underwater vehicles, including sensors and data transmission.

[16] State of California - Offshore Wind Environmental Monitoring Guidance Grant Awarded - https://opc.ca.gov/2023/10/offshore-wind-environmental-monitoring-guidance-request-for-proposals/

Justification

Permitting floating offshore wind energy areas will require considerable data and high-fidelity sampling that is initiated well in advance of construction. Novel technologies are needed to collect data from in and around floating offshore wind farms once the infrastructure is installed. UUVs have been identified as a cost-effective method of addressing such challenges, while having the potential to navigate harsh offshore conditions. These mobile systems can be outfitted with multiple sensors/instruments that collect meteorological, oceanographic, geophysical, and acoustic data as well as images, which could capture regional- to turbine-scale changes in the environment.

Despite the promise of these autonomous systems, many have yet to be tested in the depths and conditions associated with floating offshore wind infrastructure planned off the U.S. West Coast. The feasibility and practicality of using autonomous systems to replace longstanding conventional monitoring regimes such as wildlife/fisheries surveys also remain underexplored. Further assessment and testing of UUVs is a critical step towards a more comprehensive and practical approach to monitoring the environmental impacts of floating offshore wind farms. Additionally, the use of UUVs as an environmental monitoring tool has not been incorporated into regulatory guidance frameworks and questions remain about what systems can satisfactorily meet resource management and regulatory requirements.

Proposed Innovation

Projects funded under this initiative will propose innovations addressing one of the following areas, as they relate to U.S. West Coast floating offshore wind energy development:

1) Uncrewed Underwater Vehicles (UUV) Portfolio Innovation: Conduct an integrated systems analysis that evaluates the role of UUVs in supporting environmental monitoring of floating offshore wind energy areas and incorporation into regulatory strategy. The analysis should consider three different component levels (i.e., autonomous platform to carry sensors, sensor technology to collect environmental data, data processing and data transmission) and how they need to work together as one system. This analysis should include recommendations for how a network or suite of complementary UUVs can be appropriately outfitted and incorporated into a practical and cost-effective environmental monitoring strategy to assess potential changes in midwater and benthic habitats.
2) Innovative UUV Technology Advancement: Develop and/or demonstrate enhanced UUV capability to address midwater or benthic monitoring challenges specific to floating offshore wind. Proposed novel innovations should integrate vehicle platform/type, sensor technology, and data transmission suitable for floating offshore wind energy areas.
3) Projects addressing one or more of these areas will be considered. Priority innovation themes for this topic include precise and safe UUV navigability in the vicinity of anticipated floating offshore wind infrastructure, and technology development and testing of systems that may be able to mitigate or minimize anticipated impacts by floating offshore wind development to one or more ongoing scientific surveys (e.g., protected species, fisheries, physical oceanography). Please see Topic Area 3 section of Attachment A for guidance about engaging with NOAA Fisheries.

Example Projects

1. *Design of a practical and cost-effective floating offshore wind monitoring effort for central California using a suite of complementary UUVs, such as AUVs, or landers, to monitor marine mammals (including beaked whales), potential benthic impacts, and hydrodynamics offshore. If there are information gaps that UUVs cannot practically address, system design may consider the role of supplemental devices, such as moored underwater device or sensor and systems installed on floating offshore wind infrastructure.*
2. *Development and demonstration of a low-cost, controlled-altitude camera system to acquire high-quality benthic images. The project would develop and test an untethered benthic imaging system that could safely operate in close vicinity to floating offshore wind infrastructure. The system would serve dual purposes: 1) assess benthic habitat impacts from floating offshore wind infrastructure and 2) help fill gaps in benthic fisheries surveys created by installation of floating offshore wind infrastructure.*

III. Funding Categories

Project Categories:

A. Technical Feasibility Studies:

Funding Limit: Funding for projects in this category will be limited to $450,000.
Duration Limit: 6-18 months
Feasibility studies that conduct preliminary research into the concepts underlying new products, systems, strategies or services as a first stage of development. These studies are necessary precursors to ultimate product development and commercialization. Feasibility studies may include conceptual design, technology and market assessments, and similar early-stage studies. It is expected that all proposals will include a budget that is commensurate with the proposed project plan and proposers will justify their proposed budget in terms of reasonable costs and scope.

B. New Product, Systems, Service or Strategy Development:

Funding Limit: Funding for projects in this category will be limited to $1,000,000.
Duration Limit: 18-30 months
Technical and commercial development tasks, such as lab testing, modeling, market research, etc., that are crucial to the development of a marketable product, system, strategy or service and any testing or validation of an innovation that is not already commercially available. It is expected that all proposals will include a budget that is commensurate with the proposed project plan and proposers will justify their proposed budget in terms of reasonable costs and scope.

C. Demonstration of Technologies, Systems or Services:

Funding Limit: Funding for projects in this category will be limited to $2,000,000.
Duration Limit: Negotiated based on the scope and goals of the project.
Demonstrating and testing innovative offshore wind technologies, systems, strategies or services that have undergone product development and require testing to reach commercialization or are already commercially available but have not yet been sufficiently demonstrated in the U.S. to gain industry acceptance. This includes hardware, software, and market development initiatives. It is recognized that some demonstration projects, particularly large-scale demonstrations, may require additional funding. As such, proposers are encouraged to seek additional funds, in-kind contributions or access to facilities from various offshore wind stakeholders. It is expected that all proposals will include a budget that is commensurate with the proposed project plan and proposers will justify their proposed budget in terms of reasonable costs and scope. *Important note for Category C: To be eligible for the CEC portion of Solicitation 4.0 funding, field demonstrations proposed under Category C must take place in California.

Proposers must select at least one (1) funding category per proposal, which must be indicated in the proposal. Proposals that do not identify a funding category may not be reviewed. If the funding category selected does not match the scope of the project, NOWRDC may at its discretion evaluate the project in terms of a category that in its determination better matches the proposed scope. If such a proposal is selected for award, it will be subject to the requirements of the funding category to which it has been assigned.

Projects are expected to begin as soon as feasibly possible.

Multi-phase project proposals (i.e. a single project that spans more than one funding category) will be considered. For example, a proposed project may include Category B Product Development (Phase I) followed by a Category C Product Demonstration (Phase II). Each proposed project Phase must adhere to the requirements of the appropriate funding category for that Phase including required documentation and recommended maximum funding levels. NOWRDC may, at its discretion, select one or more phases for award without selecting other proposed phases. With respect to the proposal requirements (see Section V. Project Eligibility and Requirements), multi-phase project proposals must submit all required attachments and fill out all required sections of the Proposal Forms for each phase per the instructions of Attachment A.

All multi-phase projects must include Go/No-Go decision points following each Phase. To proceed to the next Phase the Applicant must demonstrate its progress in meeting the technical and commercial milestones of the prior Phase. The Applicant will not be permitted to proceed to the next Phase or submit invoices for work performed in that Phase without written approval, which may be granted or withheld at NOWRDC's sole discretion.

Similarly, Go/No-Go decision points will be required within each project Phase or at one or more points within a single-phase project, typically after each approximate $250,000 allotment of NOWRDC funding. The exact placement of Go/No-Go decisions is decided during the agreement development phase, in which NOWRDC works with the PI to place Go/No-Go decisions approximately after the allotment of $250,000 in funding, and/or before or after important milestones that validate the value of technical innovation being developed in the project.

The proposed Statement of Work is subject to negotiation and NOWRDC may offer to fund any of the proposal's phases therein at a lower level than that requested, such as by offering to fund a feasibility study rather than a proposed prototype development effort. In such cases, NOWRDC will attempt to reach agreement on a reduced Scope of Work commensurate with available funding.

IV. Solicitation Release and Notification Process

Solicitation Stage	Date	Notifications Issued
Topic area preview released	June 17, 2024	Email, LinkedIn
Full solicitation released, application period open	August 14, 2024	Email, LinkedIn
Informational webinar	September 10, 2024	LinkedIn
Deadline for Written Questions	September 17, 2024	LinkedIn
Anticipated Distribution of Questions and Answers	October 1, 2024	Email, LinkedIn
Proposal Submissions Due	November 14, 2024 by 3pm PDT	Email, LinkedIn
Award Notifications Issued	Anticipated February 2025	Email, LinkedIn
Anticipated Energy Commission Business Meeting Date for Award Approval of CA-Funded Projects	Anticipated May 2025	Email, LinkedIn

Notifications for will be published via:

1. Emails sent to NOWRDC's notification enrollment subscribers. Enroll for NOWRDC emails here: https://nationaloffshorewind.org/notifications
2. NOWRDC's LinkedIn. Follow NOWRDC's LinkedIn page and sign up for post notifications here: https://www.linkedin.com/company/national-offshore-wind

Once a proposal has been submitted, award notification emails will be sent from contracts@nationaloffshorewind.org to the contact email listed in the proposal submission.

V. Project Eligibility and Requirements

Proposals are subject to the requirements detailed in this section, as well as the Application Screening and Selection Criteria detailed in Section VII. The mandatory proposal package must be submitted by 3:00PM PST on November 14, 2024.

Incomplete proposals may be subject to disqualification. It is the proposer's responsibility to ensure that all pages have been included in the proposal and have been timely submitted in accordance with appropriate due dates and times.

The proposer must submit a proposal using the instructions and attachments listed below. The goal should be to concisely present the information needed to fully address the Application Screening and Selection Criteria (Section VII). Proposals that exceed the word limits or fail to follow the format guidelines will be rejected as non-responsive. Applications can be subject to public records requests under the Freedom of Information Act and the California Public Records Act (Cal. Gov. Code sections 7920.000 et al.) and applicants should consider this ahead of including confidential information in their application. Attachments beyond those requested will not be considered. Each page of the Full Proposal should state the name of the proposer, the project title, and the page number.

Any individual or entity qualified in the solicitation topic matter is welcome and encouraged to submit a proposal for consideration. Note:

- Prior or current awardees under NOWRDC solicitations are welcome to submit concepts intended to continue their awarded work to date, provided said concepts meet the general criteria of the solicitation, including subject matter.
- Proposers may submit a maximum of three proposals as a prime applicant in any single NOWRDC solicitation. There are no such limitations for project partners or sub-awardees (non-prime).
- All proposals must include, at minimum, the following documents, which are found in Appendix A:
    - Attachment A: Proposal Narrative (with required attachments)
    - Attachment B1: Statement of Work and Schedule
    - Attachment B3: TRL/CRL Calculator
    - Attachment C1: Milestone Payment Schedule
    - Attachment C2: Budget Justification
    - Attachment D: Applicant Assumption of Risk Form

Proposals may need to submit the following additional documents:

- Att. B2: Business Model Canvas Template (required for funding categories B and C)
- Att. B4: Three-year Financial Projection Worksheet (required for funding categories B and C)

- Att. E: CEQA Compliance Form (required for applicants proposing projects located in California, including off the coast of California, or projects proposing 60% or more of grant funds spent in California.)

Instructions for all proposal attachments are provided in the Attachment A: Proposal Narrative file.

Required sections of the Proposal Narrative differ according to the Funding Category being proposed. Additional attachments may also be required based on the proposed Funding Category or Categories.

	Funding Category A	Funding Category B	Funding Category C
Att. A.I – Executive Summary	✓	✓	✓
Att. A.II – Problem Statement and Proposed Solution	✓	✓	✓
Att. B1 – Statement of Work and Schedule	✓	✓	✓
Att. B2 – Business Model Canvas (Funding Category B & C Projects ONLY)		✓	✓
Att. A.III – State of Research and Technology Targets	✓	✓	✓
Att. B3 – TRL/CRL Calculator	✓	✓	✓
Att. A.IV – Commercialization Potential of Proposed Solution (Funding Category B & C Projects ONLY)		✓	✓
Att. B4 – Three-Year Financial Projections Worksheet (Funding Category B & C Projects ONLY)		✓	✓
Att. A.V – Demonstration Site and Product (Funding Category C Projects ONLY)			✓

Att. A.VI – Replication Potential of Proposed Demonstration (Funding Category C Projects ONLY)			✓
Att. A.VII – Feasibility Study Information (Funding Category A Projects ONLY)	✓		
Att. A. VIII – Impacts and Benefits for California Utility Ratepayers	✓	✓	✓
Att. A.X – Additional Project Benefits	✓	✓	✓
Att. C1 and C2 – Budget incl. Milestone Payment Schedule (Att. C1) & Budget Justification (Att. C2)	✓	✓	✓
Att. A.XII – Proposer Qualifications	✓	✓	✓
Att. A. XIII – Topic Area-Specific Questions	✓	✓	✓
Att. A.XIV – Letters of Support	✓	✓	✓
Att. A.XV – Applicant Assumption of Risk Form (Att. D)	✓	✓	✓
Att. A.XVI – Attachments	✓	✓	✓

Proposers must carefully review the Attachment A, Proposal Narrative to ensure that all required sections and attachments are submitted. Failure to do so may result in the proposal being rejected as non-responsive.

A. Geographic Eligibility

The lead applicant must be based in the geographic United States. For any subcontractors not based in the geographic United States, the applicant must justify why the proposed subcontractor scope is based abroad and how their work benefits a U.S.-specific offshore wind challenge.

B. Cost-Sharing

Proposers are not required to provide any form of cost-share. However, it is recognized that, for projects such as demonstration projects, project team members may wish to provide additional funding or in-kind contribution to maximize the benefit of the project. Proposers are encouraged to provide an indication of any additional funding or in-kind contribution that will be used to support the delivery of a project.

C. Annual Metrics Reports

If awarded, the proposer will be required to submit to NOWRDC on an annual basis a prepared analysis and summary of metrics addressing the anticipated energy, environmental, and economic benefits that are realized by the project. All estimates shall reference credible sources and estimating procedures, and all assumptions shall be documented. Reporting shall commence the first calendar year after the contract is executed. Reports shall be submitted by January 31st for the previous calendar year's activities (i.e. reporting period). The Applicant shall provide metrics in accordance with a web-based form, which will be distributed by NOWRDC. NOWRDC may decline to contract with awardees that are delinquent with respect to metrics reporting for any previous or active NOWRDC agreement.

D. Publication

The results of all research projects funded by NOWRDC must be published. If awarded, the proposer must agree to presentation of the results at symposia, national or regional professional meetings, and other forums, and to publication in journals, theses, or dissertations, the methods and results of all projects. Applicants are also encouraged to share their project data or findings in an open-access portal such as Tethys or the Wind Data Hub.

E. Additional Eligibility Criteria

Project duration and budget limits are outlined in Section III. Funding Categories.
For proposers unsure of the eligibility of their proposed project, reach out to info@nationaloffshorewind.org with any questions.

VI. Process for Submitting Applications

Proposers may submit up to three unique proposals as a prime applicant, provided that each proposal concerns a separate and distinct technology/innovation. Online submission is required. All application materials must be submitted through Fluxx at: https://nationaloffshorewind.fluxx.io/. Applicants will be required to create an account prior to submitting application materials. It is recommended that applicants create the account and ensure they are able to successfully upload applicable files well in advance of the application deadline. Proposers may submit Word, Excel, or PDF files (acceptable file formats include .csv, .doc, .docx, .gif, .jpeg, .jpg, .pdf, .png, .ppt, .pptx, .pps, .ppsx, .tif, .txt, .xls, .xlsx, and .zip).

Individual files should be 100MB or less in file size. Proposal PDFs should be searchable and should be created by direct conversion from MS Word, or other conversion utility. Files should not be scanned. For ease of identification, all electronic files must be named using the proposer's entity name in the title of the document.

No communication intended to influence the final decision of this procurement is permitted following submission of proposals. Technical, process, and policy questions regarding this Solicitation should be directed to info@nationaloffshorewind.org with the subject line "Solicitation 4.0 Inquiry." Contacting anyone other than that designated contact (either directly by the proposer or indirectly through a lobbyist or other person acting on the proposer's behalf): (1) may result in a proposer being deemed a non- responsible offeror, and (2) may result in the proposer not being awarded a contract. Emails will be reviewed daily, and responses provided as warranted.

VII. Application Screening and Selection Criteria

**All assumptions must be supported and justified using sources and evidence. Scoring will be based on the proposal team's ability to meet these criteria.*

A. Project Benefits and Value

- The proposed solution addresses a core technical barrier that is not being addressed by others and has the potential for wide-scale replicability.
- The proposed solution will bring economic benefits to the U.S. offshore wind industry in the form of manufacturing capability, supply chain development or technical services. U.S. jobs are expected to be created and/or retained as a result of this project.
- The proposed solution quantifiably lowers development risk and/or represents an enabling technology likely to increase offshore wind deployment in the U.S.
- Timeframes for the offshore wind industry to realize the benefits of the proposed solution are realistic and appropriate.
- The implementation strategy is well-conceived, appropriate for the current stage of development, and there is a sound plan for measuring progress and success.
- The proposed project scope makes a clear case that it can deliver significant benefits. Where necessary and appropriate, the proposer has secured a commitment for additional cost share.
- The proposer exhibits strong market demand for this solution and has already identified one or more commercialization partners.
- The proposed solution has potential to significantly reduce the Levelized Cost of Energy (LCOE). Components of LCOE include capital costs, operating costs and financing cost. Solutions that increase annual energy production without a commensurate increase in cost will also reduce LCOE.

B. Innovation, State of the Art and Technical Merit

- The proposal identifies a problem fully aligned and essential to the advancement, in the United States, of one of the identified Technical Challenge Areas.
- The proposer has demonstrated insightful understanding of the current state-of-the-art relative to the Challenge Area.
- The proposed project is technically sound, feasible, innovative, and superior to alternatives, and will make significant progress toward solving the identified problem.
- The proposed approach and scope of work are aimed at developing and commercializing a technology, as opposed to basic research and discovery.
- Technical assertions, such as assessments of performance relative to the state-of-the-art, are verified by rigorous analysis.
- The proposal demonstrates industry buy-in and validation of the proposed technical concept.
- The proposal has demonstrated why the innovation is uniquely relevant to the U.S. offshore wind industry or the development of its supply chain.

C. Project Plan, Scope, Risks and Challenges

- The proposed project plan is clearly defined, with fully developed tasks, subtasks, milestones and deliverables that will enable effective project management.
- The scope of work is fully appropriate to the selected problem and will be highly valuable towards meeting the goals of the Technical Challenge Area and the Roadmap.
- Technical and programmatic risks are clearly understood and fully disclosed, with well-considered mitigation plans that have a high probability of ensuring project success.
- The cost of the project is strongly justified with respect to the expected benefits and the potential market or deployment opportunity.
- The proposal outlines a detailed plan for pursuing additional funding and development support, if necessary, to bring the proposed solution to full commercialization.
- The proposed work can be accomplished within the amount of time, effort, and resources proposed.
- The selected Funding Category is appropriate for the proposed solution.
- The proposal provides letters of commitment from all outside organizations the proposal team will need to provide data, equipment, support, facilities, etc.
- The implementation strategy is well-conceived and appropriate for the current stage of development, with a sound plan for measuring progress and success.
- The proposal offers a compelling explanation of how it will address barriers to market entry and commercialization.
- The proposed plan is as efficient as possible with regards to resources and time, including maintaining as limited of an administrative budget as possible relative to overall project budget.

D. Team Experience and Capabilities

- The proposed team has the necessary expertise and resources to carry out the proposed work.
- The project team includes members with industrial and business experience as well as technical skill.
- The project team has successfully commercialized applicable products, deployed similar services or has completed a similar project.
- The proposal team has secured strong commitments from all essential team members and partners, including letters and has demonstrated strong support from necessary market actors.
- The proposal clearly demonstrates the team structure and staff responsibilities.

- For demonstration projects relying on entities and jurisdictional authorities such as a maritime agency, leaseholder, equipment manufacturer, etc., the project team has secured or has a plan to secure all the commitments necessary to execute the proposed project scope.

E. Program Scoring

Each proposal will be scored on a scale of 100 with the following weighting applied to each of the evaluation criteria:

1) Project Benefits and Value – 40%
2) Innovation, State of the Art, and Technical Merit – 30%
3) Project Plan, Scope, Risks and Challenges – 15%
4) Team Experience and Capabilities – 15%

Once scored, proposals are ranked from highest to lowest score by topic area. Proposers may be requested to interview with all or part of the Scoring Committee to provide clarification of information submitted in the proposals but may not submit new or supplemental information after the proposal due date. Proposers will be notified if they are requested to participate in an interview.

F. CEC-Specific Scoring Requirements for CEC Funding

The portfolio of awards may include projects that are funded by one or more of the contributing funders. For funding provided by CEC, additional criteria will be applied. The criteria outlined above will account for 70% of CEC's evaluation score. For the remaining 30% of CEC's evaluation score, it will utilize the following additional criteria to score section VIII of Attachment A.

Impacts and Benefits for California Investor-Owned Utility Ratepayers

This criterion will count for 20% of the scoring criteria.

1. Explains how the proposed project will benefit California Investor-Owned Utility (IOU) electricity ratepayers and provides clear, plausible, and justifiable (quantitative preferred) potential benefits. Estimates the energy benefits including:
    a. Annual electricity (kilowatt-hour and therms), energy cost reductions, peak load reduction and/or shifting, infrastructure resiliency, infrastructure reliability. In addition, estimates of the non-energy benefits including: GHG reductions, air emission reductions (e.g., NOx), water savings and cost reduction, and/or increased safety.
2. States the timeframe, assumptions with sources, and calculations for the estimated benefits, and explains their reasonableness. Include baseline or "business as usual" over timeframe.

3. Explains the path-to-market strategy including near-term (i.e., initial target markets), mid-term, and long-term markets for the technology, size and penetration or deployment rates, and underlying assumptions.
4. Identifies the expected financial performance (e.g., payback period, return on investment) of the demonstration at scale.

Ratepayer benefits can include:

- Reduced risks and uncertainty related to environmental impacts and technology development by filling critical knowledge gaps for environmental permitting;
- Increased reliability by decreasing turbine downtime due to understanding or mitigating environmental impacts or component failure or improving and validating technological maturity and performance;
- Lowered costs, such as costs for permitting or improving the manufacturability or installation efficiency of components;
- Increased safety by improving installation, operations and maintenance strategies, or remote monitoring capabilities to reduce exposure of personnel to ocean conditions; and
- Increased environmental sustainability by developing and implementing strategies that minimize impacts to ocean environments or marine life or designing components that minimize end-of-life challenges and reduce waste.
- Increased energy equity through the fair distribution of benefits and burdens from energy production and consumption.

Project Funds Spent in California

This criterion will count for 10% of the scoring criteria.

- Projects that maximize the spending of funds under this solicitation in California will receive points as indicated in the table below.

Percentage of funds spent in California vs total NOWRDC funds requested (Derived from budget Attachment)	**Percentage of possible points**
>60%	20%
>65%	30%
>70%	40%
>75%	50%
>80	60%
>85%	70%
>90%	80%
>95%	90%

>98%	100%

- "Funds Spent in California" means that:
    - (1) Funds in the "Direct Labor category and all categories calculated based on
    - direct labor (e.g., fringe benefits, indirect costs and profit) are paid to individuals that pay California state income taxes on wages received for work performed under the Agreement. Payments made to out-of-state workers do not count as “funds spent in California.” However, funds spent by out-of-state workers in California (e.g., hotel and food) can count as “funds spent in California.”; AND
    - (2) Business transactions (e.g., material and equipment purchases, leases, and rentals) are entered into with a business located in California.
    - (3)Total should include any applicable subcontractors.
- Airline ticket purchases for out-of-state travel and payments made to out-of-state workers are not considered funds “spent in California.” However, funds spent by out-of-state workers in California (e.g., lodging) and airline travel originating and ending in California are considered funds “spent in California.” A business located in California means: 1) businesses registered with Secretary of State AND 2) transaction is with a location in California that is directly related to the grant project (e.g., direct purchase of material and equipment to be used in the grant) and results in the support of California business and jobs.
    - Example 1: Grant funds will be spent on temperature sensors. The temperature sensors are manufactured in Texas. The recipient orders the temperature sensors directly from a California based supply house. The invoice shows that the transaction occurred with the California based supply house. This transaction is eligible and can be counted as funds spent in California.
    - Example 2: Grant funds will be spent on temperature sensors. The temperature sensors are manufactured in Texas. The recipient orders the temperature sensors directly from Texas. The manufacturer has training centers in CA that instructs purchasers on how to use the sensors. The invoice shows that the transaction occurred in Texas. This transaction is not eligible and cannot be counted as funds spent in California.

G. Program Policy Evaluation Factors

NOWRDC reserves the right to reject proposals based on the following policy factor(s) in conjunction with scoring results:

1) The degree to which the proposed project optimizes the use of available funding to achieve programmatic objectives.
2) The degree to which the proposal expands the geographic diversity of NOWRDC’s R&D efforts.

3) The degree to which the proposal expands the technical portfolio of NOWRDC.
4) Past performance of the proposer on other projects with NOWRDC and NOWRDC Member organizations.

H. Application Debriefing

Award notifications will be sent via email by contracts@nationaloffshorewind.org. For applicants that are awarded, the subrecipient management process is outlined in the following section. For applicants that are not awarded, the notification email will include instructions on how applicants can request a virtual debrief meeting. Debrief meetings are led by NOWRDC program management staff and include a summary of the scoring committee feedback on the proposal. For preservation of the competitive solicitation process and scorer confidentiality, NOWRDC does not publish proposal scores or the identity of individuals appointed to scoring committees.

VIII. NOWRDC In-Kind Resources and Services Available to Support Awarded Projects

1. **Advisory Boards**

NOWRDC strongly recommends external/industry advisory boards for each project, typically comprised of 4-6 subject matter experts appointed by NOWRDC's member organizations. NOWRDC runs quarterly advisory board meetings, in which the awardee presents project progress and gathers strategic input from the advisory board. The advisory boards are intended to ensure that the project outcomes are steered by industry needs, help channel project results from the project team to industry and project-focused end users, and, when requested, provide technical insight to assist the NOWRDC Program Manager in Go/No-Go decisions, deliverable assessment, etc. Essentially, the advisory board helps verify that the project is progressing in a technically valuable direction and fulfilling the scope of work.

2. **NOWRDC's Research and Development Committee (R&D Committee)**

NOWRDC projects present kickoff, update, and closeout presentations to its R&D Committee. The R&D Committee is comprised of technical representatives appointed by NOWRDC's Board of Directors. The R&D Committee provides a forum for projects to present progress, gather feedback, and share key results directly to offshore wind industry and government officials.

3. **Leadership Team**

The Leadership Team for Solicitation 4.0 is comprised of NOWRDC, CEC, DOE, NYSERDA, MassCEC, and BOEM. The Leadership Team makes executive decisions on go/no-go decisions during projects and proposed project scope modifications. The Leadership Team can also serve as a resource for resolving project challenges, and may steer the project in a useful direction.

4. **Annual National Offshore Wind R&D Symposium**

The annual National Offshore Wind R&D Symposium is a hybrid conference that showcases NOWRDC's project portfolio. All active NOWRDC projects are invited to present their project alongside similarly focused projects. The event typically has 150 in-person attendees, and up to 1,000 virtual attendees. The principal purpose is to provide projects the opportunity to share their findings with industry, and to learn from similarly focused offshore wind researchers and industry innovators.

5. **Promotion and Information Sharing on NOWRDC's Website, Newsletters, and LinkedIn**

NOWRDC's marketing platform is comprised of its website, email newsletters, and LinkedIn, and can be considered a resource for amplifying key findings from its R&D project portfolio. NOWRDC makes strategic use of each of these mediums to announce project kickoffs, key project updates, and, when applicable, project deployments in the industry.