Request for Information DE-FOA-0003302
Offshore Wind National and Regional Research and Development Priorities

DATE: January 18, 2024
SUBJECT: Request for Information (RFI)

Description and Background

This is a Request for Information issued by the U.S. Department of Energy's (DOE) Wind Energy Technologies Office (WETO) on behalf of the Office of Energy Efficiency and Renewable Energy (EERE). The goal of this RFI is to solicit information to inform future funding efforts aimed at addressing offshore wind research and development (R&D) and deployment needs that are national and regional in focus, including needs relevant to the Atlantic, Pacific, Great Lakes, and Gulf of Mexico.

DOE's 2022 Offshore Wind Energy Strategies report defined regional and national strategies to accelerate and maximize the effectiveness, reliability, and sustainability of U.S. offshore wind energy deployment and operation. DOE's 2023 Advancing Offshore Wind Energy in the United States, presents a comprehensive summary of DOE's role in the nationwide effort to deploy 30 gigawatts (GW) of offshore wind energy by 2030 and set the nation on a pathway to 110 GW or more by 2050. Building off these strategies, EERE is considering funding to address offshore wind research priorities for floating and fixed foundations, to develop tools to monitor flying wildlife around turbines, to connect domestic manufacturing and supply chain assets to the U.S. and global offshore wind development pipeline, and to address the needs and timing of offshore wind workforce development. This RFI seeks to inform EERE on the six specific categories listed below.

Respondents are encouraged to respond to as many or few of the categories as they choose. Within each category, respondents are also encouraged to respond to as many or few of the specific questions posed as they choose.

Purpose

The purpose of this RFI is to solicit feedback from industry, academia, research laboratories, government agencies, project financiers and insurance providers, community organizations, workforce development and labor organizations, and other stakeholders on issues related to offshore wind and research and development (R&D) and deployment needs that are national

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and regional in focus, including needs relevant to the Atlantic, Pacific, Great Lakes, and Gulf of Mexico. EERE is specifically interested in information as identified in the "Request for Information Categories and Questions" section of this document. This is solely a request for information and not a Funding Opportunity Announcement (FOA). EERE is not accepting applications.

Disclaimer and Important Notes

This RFI is not a Funding Opportunity Announcement (FOA); therefore, EERE is not accepting applications at this time. EERE may issue a FOA in the future based on or related to the content and responses to this RFI; however, EERE may also elect not to issue a FOA. There is no guarantee that a FOA will be issued as a result of this RFI. Responding to this RFI does not provide any advantage or disadvantage to potential applicants if EERE chooses to issue a FOA regarding the subject matter. Final details, including the anticipated award size, quantity, and timing of EERE funded awards, will be subject to Congressional appropriations and direction.

Any information obtained as a result of this RFI is intended to be used by the Government on a non-attribution basis for planning and strategy development; this RFI does not constitute a formal solicitation for proposals or abstracts. Your response to this notice will be treated as information only. EERE will review and consider all responses in its formulation of program strategies for the identified materials of interest that are the subject of this request. EERE will not provide reimbursement for costs incurred in responding to this RFI. Respondents are advised that EERE is under no obligation to acknowledge receipt of the information received or provide feedback to respondents with respect to any information submitted under this RFI. Responses to this RFI do not bind EERE to any further actions related to this topic.

Confidential Business Information

Pursuant to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit via email, postal mail, or hand delivery two well-marked copies: one copy of the document marked "confidential" including all the information believed to be confidential, and one copy of the document marked "non-confidential" with the information believed to be confidential deleted. Submit these documents via email or on a CD, if feasible. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

Evaluation and Administration by Federal and Non-Federal Personnel

Federal employees are subject to the non-disclosure requirements of a criminal statute, the Trade Secrets Act, 18 USC 1905. The Government may seek the advice of qualified non-Federal personnel. The Government may also use non-Federal personnel to conduct routine,

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nondiscretionary administrative activities. The respondents, by submitting their response, consent to EERE providing their response to non-Federal parties. Non-Federal parties given access to responses must be subject to an appropriate obligation of confidentiality prior to being given the access. Submissions may be reviewed by support contractors and private consultants.

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Request for Information Categories and Questions

Category 1: Floating Offshore Wind Platform Research and Development

EERE is interested in information that can spur innovation, lower costs, and enhance the readiness of the nascent U.S. floating offshore wind industry. Significant engineering research, design, and validation advancements are required to adapt current technology approaches to the deployment of large offshore wind turbines and to manufacture the platforms serially for utility-scale arrays.

Refinement and Innovation in Floating Platform Design, Manufacturing, and Deployment

1. Design Refinement: What R&D is needed to adapt platform designs to reduce the fabrication and deployment costs and timelines?
2. Manufacturing: What research is needed to advance manufacturing processes to expand supply chain opportunities across the United States, and to maximize the use of existing, underutilized industrial bases in areas such as the Great Lakes?
3. Assembly and Installation: What targeted research related to port facilities and vessel adaptation could enable more efficient assembly and installation of floating offshore wind systems, reducing both time and cost?
4. Support for Standards: Which national and international industry standards and best practices are most critical to the success of floating offshore wind systems? How can their effectiveness be enhanced through additional data and research?
5. Industry Collaboration: Are there specific research collaboration topics where commercial organizations (e.g., technology vendors, project developers) would be interested in participating to benefit the industry as a whole, and what confidentiality/anonymity clauses would be required?

Next-Generation Integrated Floating Offshore Wind Turbine/Platform Technologies

6. To what extent and on what potential timeframe should novel integrated floating turbine/platform configurations be considered or targeted as viable opportunities to reduce costs or increase deployments?

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7. What is the highest priority for research into integrated turbine/platform designs to enable deployment at utility-scale for systems that have lower lifecycle costs, to enhance power production, or to reduce impact to the environment and other marine users?

8. What specific research topics could accelerate the development of the types of integrated turbine/platform designs that have the greatest potential to achieve commercially viable utility-scale deployment in the next couple of decades?

Broader Considerations in Floating Offshore Wind Development

9. What requirements from financing and insurance companies need to be met to secure long-term investment and increase confidence in emergent floating technologies, and how can research or other potential DOE support inform or help meet these requirements?

10. How can innovation in floating platform verification and validation methods reduce the requirements for full-scale technology demonstrations?

Category 2: Alternative Fixed-Bottom Offshore Wind Foundation Types and Installation Techniques

EERE is interested in gathering information about fixed-bottom offshore wind foundations that enable deployment in areas where monopiles present technical and logistical challenges. EERE is seeking to understand the opportunities for non-monopile foundations and identify the R&D needed to enable deployment in a variety of sediment types, and transitional depths (greater than approximately 160ft in depth, where the economics shift between fixed and floating foundations), as well as to address vessel, transportation, and logistics concerns associated with fixed-bottom offshore wind developments. EERE is interested in technologies and methodologies that lower costs and increase throughput to achieve utility-scale deployment.

EERE has a current open Funding Opportunity Announcement (DE-FOA-0003121) that is intended to develop and validate alternative fixed-bottom foundation types and installation techniques to reduce installation noise. The intent of this category is to understand and elicit other motivations to deploy alternative fixed-bottom foundation types and installation techniques and to what extent those other motivations drive additional research needs.

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Offshore Wind Fixed-Bottom Turbine Structures and Foundations

1. What technology advances would enable more widespread deployment of non-monopile foundations in utility-scale developments? For example, this could include but not be limited to innovations that improve deployment throughput, ease of manufacturing, use of existing infrastructure, ease of installation, or reduction of vessel requirements.
2. What technology innovation could enable the deployment of higher-capacity offshore wind turbines in regions where there are currently physical or environmental constraints to the size of turbine that can be deployed?
3. What research is needed to address seabed (or lakebed) preparation challenges for non-monopile foundations?
4. What research is needed to diversify the range of materials that can be used for non-monopile foundations and how can this strengthen the domestic supply chain for offshore wind foundations overall? For instance, this can consider aspects such as emissions reductions, local sourcing, and overall cost.
5. What research is needed to minimize contaminated sediment dispersion, for example, related to foundation and cable installations?

Vessels, Infrastructure, and Deployment

6. What vessel and infrastructure innovation could alleviate constraints to deploying non-monopile foundations? This could include:
    - Vessel innovation associated with handling, transporting, and installing non-pile foundations
    - Novel port designs, capabilities, or configurations
    - Novel installation and assembly methods (such as float-out)
7. What novel vessels, or vessel adaptation, are required for specific regions?

Design to Commercialization Process

8. What additional testing and modelling capabilities are needed to quantify ice-related and sediment contamination issues related to offshore wind deployment?
9. What are the requirements from financing and insurance companies that need to be met to secure long-term investment and increase confidence in non-monopile foundation technologies, and how can specific research activities support these?

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10. How can the perspectives and unique requirements from the investment sector and permitting agencies be better integrated at the start of the research process and site development process to allow for a more efficient path to utility-scale deployment?

Category 3: **Technology Advancement for Bird and Bat Research Offshore**

As deployment of offshore wind energy expands into new regions, wind energy regulators, developers, and operators will need to ensure that development of offshore wind does not pose a concerning risk to birds or bats. In-depth studies in Europe have examined both collision risk and changes in use patterns. However, currently there are little data available in the U.S. indicating the exact nature (magnitude and extent) of offshore wind energy's impact on birds and bats. This uncertainty can be attributed to the limited deployment of offshore wind in the U. S. as well as the challenges associated with monitoring birds and bats in the offshore environment. Addressing these issues in the early phases of offshore wind deployment will help determine whether approaches to minimize or mitigate impacts are necessary and may lower barriers to offshore wind deployment in all U.S. regions including the Atlantic, Pacific, Great Lakes, and Gulf of Mexico.

In order to understand risks to birds and bats, research is needed to address two central concerns: (1) Turbine collision risk and (2) Changes to foraging and use patterns by birds and bats (via avoidance, displacement, and habitat changes that affect food availability). Different technologies and methodologies can be used based on the research concern. To understand changes to foraging and use patterns, it is our understanding that researchers rely primarily on digital aerial transect surveys to characterize abundance of various species spatially and temporally before and after construction. For collision risk, the primary methods include documenting collisions directly, measuring avoidance at multiple scales, and collecting data to input into collision risk models, using a range of technologies and tools including thermal, infrared and visual cameras, vibration sensors, radar, tag data, and human observers. Currently, it is difficult to monitor direct collision offshore. Therefore, advancements in technologies and integrated instrumentation packages are needed to better monitor avoidance behavior and estimate exposure to the rotor swept area.

EERE is interested in advancing the development of technologies and tools to aid in bird and bat monitoring to understand both collision risk and changes to foraging and use patterns from offshore wind deployment. EERE is interested in understanding where technology investments are most needed to address research priorities and data gaps related to the impact of offshore wind on birds and bats.

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Research & Data Collection

Turbine collision risk

1. What existing or emerging monitoring technologies (single technologies or multi-sensor systems) are most likely to improve our understanding of collision risk offshore and why (*e.g.*, cameras, LiDAR, radar, strike indicators, telemetry, etc.)?
2. Are additional technology advancements in monitoring necessary to improve collision risk models? If yes, please describe necessary technology and monitoring data needed (i.e., technologies to better monitor *e.g.*, flight height distributions, speeds, density, and/or measured avoidance rates).
3. To what extent are real-time collision detection technologies (i.e., strike detectors) a practical, near-term solution to refine our understanding for collision risk of birds and bats offshore in the context of standard project monitoring regimes? In the context of research campaigns? Are there barriers to deploying these technologies, and if so, what are the barriers?
4. Which individual technologies (*e.g.*, radar, cameras, telemetry), current or emerging, have the most promise to measure avoidance behavior at various scales in various conditions to estimate collision risk?
    a) What are the biggest performance challenges when using these technologies to monitor avoidance behavior (*e.g.*, speciation challenges, limited monitoring range, fixed platform needs, energy demands, data transmittal constraints, cyber security risks, tag weights, 3-D positioning uncertainty, etc.)?
    b) What are the appropriate detection probabilities and distances necessary to monitor micro-, meso-, and macro-scale bird avoidance behavior at offshore wind farms? What technologies can operate at this scale?
    c) For micro- and meso-scale avoidance, what technologies can, or have the potential to, capture 24/7 monitoring coverage in a wide range of meteorological conditions offshore?
    d) For macro-scale avoidance, what monitoring technologies can, or have the most potential to, capture necessary coverage at a reasonable cost?

e) When combining technologies, which pairings have the most promise to measure avoidance behavior to estimate collision risk, and why? What considerations should be made when developing multi-system technologies?

5. Are current advancements in radio tags and antennas, such that they can provide 3D location information, likely to improve our ability to estimate collision risk offshore?

Understanding changes to foraging and use patterns by birds and bats (via avoidance, displacement, and habitat changes that affect food availability)

6. What monitoring technologies are best used to understand changes to foraging and use patterns by bird and bats around offshore wind farms? At what scale do these monitoring technologies need to perform?

7. Which technologies are in most need of advancements to improve our understanding of changes to foraging and use patterns? (e.g. telemetry, radar, camera systems)

    a) Are there benefits from combining these into multi-sensory technologies? If so, which ones? What considerations should be made when considering multi-system technologies?

    b) What advancements are most needed to improve the use of telemetry technologies to understand changes to foraging and use patterns by birds and bats offshore?

8. Are Global Positioning System (GPS) tags a potential near-term possibility to monitor small birds or bats offshore? What advancements, if any, would be needed to use them in the near term?

Research Project Parameters

For specific priority technology advancements referenced in your responses above,

9. What are the biggest deployment challenges (e.g., speciation challenges, limited monitoring range, motion compensation, sea clutter, fixed/stable platform needs, power demands, data transmittal constraints, cyber security risks, weatherization etc.) when using any of the technologies referenced above?

10. What concerns do you have regarding the cost-effectiveness of these existing or emerging technologies for monitoring either collision, avoidance, or behavior around wind farms? Are there technologies that are, or could prove to be, cost-effective as part of standard monitoring regimes?

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11. What Technology Readiness Level are any referenced technologies for project level monitoring, regional level monitoring, or as part of research projects? What level and type of validation is needed, if any, to bring these technologies into wide-spread use? What are critical performance criteria that should be considered (e.g., detection range, false positive rate), to bring these technologies into wide-spread use? What are critical performance criteria that should be considered (e.g., detection range, false positive rate)?
12. How many years and/or seasons of testing would be considered sufficient for developing and/or validating an individual technology and/or a combined system?
13. What would be the expected total annual budget and general scope for an R&D project to advance the referenced technology and/or combined technologies system?
14. Would regional differences influence the type of technology used in bird and bat monitoring? What region-specific considerations are needed to bring these technologies from regions where they are already being used (e.g., the Northeast United States) to other regions, like the Great Lakes? Can this technology be used on floating platforms and in deep waters?
15. With respect to the research need and relevant spatial and temporal scales, when is continuous 24/7 monitoring most appropriate versus short-term measurement campaigns? When should population-level data be collected versus individual survey techniques?
16. What species should be a primary focus for technology development around collision risk and changes in foraging and use patterns (based on e.g., vulnerability, protected status, or their utility as an indicator or surrogate species)?
17. Are there concerns outside turbine collision risk and changes to bird and bat foraging patterns that should be considered a research priority now? If so, what technologies and/or data could address that concern?

Category 4: **Understanding Specific Supply Chain Needs for Offshore Wind Deployment in the Great Lakes Region**

The Great Lakes region presents unique challenges to offshore wind from a supply chain perspective. For example, wind turbine installation vessels (WTIVs) that are used to install wind

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turbines in other markets are too large to pass through the system of locks that connect maritime traffic around the world to the region. DOE is interested in understanding these and other unique needs for the supply chain necessary to develop offshore wind in the Great Lakes region.

1. How will the unique infrastructure constraints (e.g., inability to utilize current WTIV fleet) and opportunities presented by offshore wind development drive novel and potentially divergent offshore wind technology deployed in the Great Lakes region?
2. What are the most promising wind technology, installation, supply chain, and infrastructure solutions to these Great Lakes-specific constraints? What specific challenges need to be overcome to achieve these solutions?
3. To what extent can existing supply chain assets, such as ports, vessels, and component factories, either within the Great Lakes region or elsewhere, meet demand for future offshore wind deployment in the Great Lakes given the unique needs identified above, assuming a significant market (e.g., hundreds of megawatts per year) develops?
4. What unique supply chain capabilities or assets will need to be developed, either in the region or elsewhere, to meet the unique needs of offshore wind deployment in the Great Lakes?

Category 5: Development of a Manufacturing and Supply Chain Offshore Wind Consortium Based in the Great Lakes Region

To meet the growth of the national and global offshore wind industry, participation in the supply chain will have to include expansion in regions currently underutilized. EERE and partners have engaged in supply chain and manufacturing development, coordination, and research for offshore wind on the East and West Coasts and are interested in learning about how other regions can support the industry. Different regions have different capabilities based on local and regional experience and needs. EERE is interested in information on existing industrial capabilities in the Great Lakes region, how the region currently organizes around manufacturing, and how stakeholders could best connect to the national and global offshore wind market.

In many environments, consortium organizations have been proven to be effective stimulators of innovation and sustainable industry growth. The consortium structure provides a cooperative platform to stakeholders that share common goals, enabling interactions that spur learning through exposure to a diversity of perspectives, create mutual benefits through the sharing of existing strengths, and maximize the chances of success by identifying best fit

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approaches to challenges. In the Great Lakes region, there are multiple stakeholders who share mutual interest in advancing the region's ability to contribute to the domestic offshore wind supply chain, including industry, academia, government, labor and workforce organizations, and communities. DOE is seeking input on two groups of questions under this category. The first group of questions ask for contextual Great Lakes regional information. The second group of questions aims to gain insight on how to best organize industry and efforts in the Great Lakes region to participate in the offshore wind market.

Contextual Regional Information on Great Lakes Offshore Wind

1. Would a supply chain consortium with a focus on bolstering existing local manufacturing capability be of value to the Great Lakes region? Is there an alternative model to a consortium structure that would be preferable to connect the Great Lakes region to domestic and global offshore wind supply chain and manufacturing efforts? If so, please explain the alternative model and provide potential strengths and weaknesses.
2. What manufacturing and industry sectors in the Great Lakes region are currently engaged in the land-based wind domestic supply chain? Could these sectors be utilized in the domestic or global offshore wind supply chain development? If so, how?
3. Are there existing manufacturing and industry sectors in the Great Lakes region that are not currently engaged in wind energy supply chains, that could be relevant to the offshore wind supply chain?
4. What industry sectors in the Great Lakes region currently engage in the offshore wind supply chain and which sectors should be targeted to join as key players to facilitate growth of the national offshore wind industry?
5. Who are the leaders in the Great Lakes states that organize manufacturing and other industrial interests (e.g., Manufacturing Extension Partnerships, etc.)?
6. Who are the entities in the Great Lakes states that organize workforce development and other labor interests?

Great Lakes Supply Chain and Manufacturing Consortium

Objectives

7. What should the key objectives for a potential consortium be in terms of offshore wind supply chain development and manufacturing in the Great Lakes region?

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8. What types of training, education, and support services could a potential consortium provide to enhance the capabilities of the offshore wind supply chain in the Great Lakes region?
9. How could a potential consortium ensure that the benefits of offshore wind development, such as job creation and economic growth, are equitably distributed in line with Justice40 principals?

Members

10. What types of stakeholders (e.g., companies, communities, workforce organizations, institutions, NGOs, government, etc.) need to be involved in a consortium to effectively develop the offshore wind supply chain, and what roles should they play?
11. What strategies should a potential consortium use to attract and retain members? What best practices should be instituted to attract and retain minority-owned businesses and underserved stakeholders as consortium members?

Structure

12. Would the region be best served by the creation of one larger consortium, or several smaller hubs that focus on specific aspects of supply chain or stakeholder interests?
13. What governance structure would best suit a consortium to ensure effective decision-making and accountability?
14. What structural tools should be instituted to ensure that a consortium retains a focus on equity, justice, and sustainability as core principles as it seeks to pursue its goals?

Category 6: Offshore Wind Workforce Readiness

EERE is interested in gathering information about offshore wind workforce readiness and how EERE can best support education and training and their respective timing needs. In addition, EERE is interested in information it could use to help promote an employee-centered diverse and inclusive workforce that includes pathways to apprenticeship programs.

The Workforce Development and Education program of DOE's Wind Energy Technologies Office currently supports the offshore wind industry workforce through three primary means:

- Conducting analyses and other studies to assess existing and future workforce needs and ensure relevant stakeholders have access to this information.
- Convening relevant parties to ensure that employers and education and training providers understand each other's needs, to promote communication among education

providers to help align programming to areas of high-priority needs and gaps, and to promote knowledge sharing. Currently, DOE convenes labs, industry, higher education institutions, non-governmental organizations, and small businesses through workforce summits and working groups.

- Filling targeted gaps in student and educator training programs, largely with a focus on K-graduate level school and university programming, with less of a focus on technical training where industry and labor have historically led program development. For example, DOE currently supports KidWind Challenges and the REcharge Academy, an educator training program, in the K-12 education space. DOE uses funding to engage with higher education institutions by way of the Collegiate Wind Competition, the Offshore Wind Center of Excellence (resulting from a 2023 competitive funding opportunity announcement), and the North American Wind Energy Academy.

Workforce Needs for the Offshore Wind Industry and Associated Supply Chain (For Employers)

1. What job categories in the offshore wind industry are the most in-demand (i.e., the types of jobs you hire most frequently)? What job categories are the hardest to find qualified candidates for (i.e., the types of jobs most difficult to fill)? What are the qualification—educational background, experience, training, skills, and/or certification—necessary to fill these positions? Given the expected rapid growth of the workforce, what roles do you anticipate being the hardest to fill as the industry grows?
2. Which job categories exhibit high degrees of under-representation with respect to workers' demographic characteristics (e.g., race, ethnicity, gender, ability, veteran status, etc.)? What solutions are needed to overcome these challenges (e.g., more accessible training and education programs, higher wages and benefits, better defined career pathways, etc.)? Is there any support DOE could provide that would encourage your company to take those steps?
3. Does your company employ labor union-affiliated workers? What factors did you consider as you made that decision?
4. How does your company recruit for open jobs?

Workforce Development Strategies Supporting the Offshore Wind Industry (For All Stakeholders)

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5. What do you see as the biggest needs and gaps in the offshore wind workforce? How could DOE help to further identify these needs and gaps?
6. What would be the most effective use of DOE funding or resources in supporting the offshore wind workforce, including to promote diversity, equity, inclusion, and accessibility (DEIA) within this workforce? When would any new programming need to be available, and for how long, to maximize impact?
7. How could DOE funding be used to support continued education, training, job placement, and wrap-around needs of the clean energy workforce and ensure that workers have pathways for growth, and well-paying careers, within the offshore wind industry?
8. Different geographic regions of the United States have different workforce needs within the offshore wind industry. What region are you in and what are the distinct needs of your region?
9. Do you know of pre-apprenticeship programs that expose job seekers to the offshore wind industry? If yes, do you feel this is a replicable model for expansion?
10. Are there questions you feel are missing from the questions in category 6? If yes, please ask and answer them.

Request for Information Response Guidelines

Responses to this RFI must be submitted electronically to windenergyrfi@ee.doe.gov no later than 5:00pm (ET) on February 20, 2024. Responses must be provided as attachments to an email. It is recommended that attachments with file sizes exceeding 25MB be compressed (i.e., zipped) to ensure message delivery. Responses must be provided as a Microsoft Word (.docx) attachment to the email, and no more than 10 pages in length, 12-point font, 1-inch margins. Only electronic responses will be accepted.

Please identify your answers by responding to a specific question or topic if applicable. Respondents may answer as many or as few questions as they wish.

EERE will not respond to individual submissions or publish publicly a compendium of responses. A response to this RFI will not be viewed as a binding commitment to develop or pursue the project or ideas discussed.

Respondents are requested to provide the following information at the start of their response to this RFI:

- Company / institution name;

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- Company / institution contact;
- Contact's address, phone number, and e-mail address.

Background and Resources

Listed below are background resources that may help inform responses.

DOE's Strategic Approach to Offshore Wind Development

Offshore Wind Energy Strategies

Advancing Offshore Wind Energy in the United States

Category 1: Floating Offshore Wind Platform Research and Development
Floating Offshore Wind Shot | Department of Energy

Offshore Wind Market Report: 2023 Edition | Department of Energy

Category 2: Alternative Fixed-Bottom Offshore Wind Foundation Types and Installation Techniques

Funding Opportunity Announcement - DE-FOA-0003121: Installation Noise Reduction and Reliable Moorings for Offshore Wind and Marine Energy

Offshore Wind Market Report: 2023 Edition | Department of Energy

Category 3: **Technology Advancement for Bird and Bat Research Offshore**

Advancing Offshore Wind Energy in the United States, U.S. Department of Energy Strategic Contributions Toward 30 Gigawatts and Beyond

Bat and Bird Interactions with Offshore Wind Energy Development | Tethys (pnnl.gov)

ORJIP Bird Collision and Avoidance Study | Tethys (pnnl.gov)

Review of Methods and Techniques for Field Validation of Collision Rates and Avoidance Amongst Birds and Bats at Offshore Wind Turbines (pnnl.gov)

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Categories 4 & 5: Understanding Specific Supply Chain Needs for Offshore Wind Deployment in the Great Lakes Region & Development of a Manufacturing and Supply Chain Offshore Wind Consortium Based in the Great Lakes Region

Great Lakes Wind Energy Challenges and Opportunities Assessment (nrel.gov)

Justice40 Initiative | Department of Energy

Supply Chain Road Map for Offshore Wind Energy in the United States | Wind Research | NREL

Category 6: Offshore Wind Workforce Readiness

Gearing Up for 2030: Building the Offshore Wind Supply Chain and Workforce Needed to Deploy 30 GW and Beyond (nrel.gov)

Collegiate Wind Competition | Department of Energy

Funding Notice: Offshore Wind Centers of Excellence | Department of Energy

Home | NAWEA

KidWind — Teaching the World about Renewables

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