FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT

U.S. Department of Energy
Energy Efficiency and Renewable Energy
Golden Field Office

U.S. Offshore Wind: Advanced Technology Demonstration Projects

Funding Opportunity Announcement Number: DE-FOA-0000410
Announcement Type: Amendment 000001
CFDA Number: 81.087

Issue Date: 03/06/2012

Letter of Intent Due Date: **03/30/2012, 11:59 PM Eastern Time**

Application Due Date: **05/31/2012, 11:59 PM Eastern Time**

Department of Energy
Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

DE-FOA-0000410
Amendment 000001

DATE: March 6, 2012
FROM: Pamela Brodie, Contracting Officer
TO: All Prospective Applicants

SUBJECT: Amendment 000001 to Announcement DE-FOA-0000410, "U.S. Offshore Wind: Advanced Technology Demonstration Projects"

The purpose of this modification is to:

1) Reformat the Funding Opportunity Announcement to align with the government-wide standard format

The content of the Funding Opportunity Announcement is unchanged.

TABLE OF CONTENTS

REGISTRATION REQUIREMENTS

There are several one-time actions before submitting an Application in response to this Funding Opportunity Announcement (FOA), as follows:

Register and create an account on EERE Exchange at https://eere-exchange.energy.gov/.
This account will then allow the user to register for any open EERE FOAs that are currently in EERE Exchange. It is recommended that each organization or business unit, whether acting as a team or a single entity, use only one account as the contact point for each submission.

The applicant will receive an automated response when the [Letter of Intent or] Application is received. This will serve as a confirmation of receipt. Please do not reply to the automated response. The applicant will have the opportunity to re-submit a revised [Letter of Intent or] Application for any reason as long as the relevant submission is submitted by the specified deadline. The Users' Guide for Applying to the Department of Energy EERE Funding Opportunity Announcements is found at https://eere-exchange.energy.gov/Manuals.aspx.

The EERE Exchange registration does not have a delay; however, the remaining registration requirements below could take several weeks to process and are necessary in order for a potential applicant to receive an award under this FOA. Therefore, although not required in order to submit an Application through the EERE Exchange site, all potential applicants lacking a DUNS number, or not yet registered with CCR or FedConnect should complete those registrations as soon as possible.
Questions related to the registration process and use of the EERE Exchange website should be submitted to: EERE-ExchangeSupport@hq.doe.gov

Obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number
(including the plus 4 extension, if applicable) at http://fedgov.dnb.com/webform

Register with the Central Contractor Registry (CCR) at https://www.ccr.gov/.
Designating an Electronic Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in CCR registration. Please update your CCR registration annually.

Register in FedConnect at https://www.fedconnect.net/. To create an organization account, your organization's CCR MPIN is required. For more information about the CCR MPIN or other registration requirements, review the FedConnect Ready, Set, Go! Guide at https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf

Register in Grants.gov to receive automatic updates when Amendments to this FOA are posted. However, please note that applications will not be accepted through Grants.gov. http://www.grants.gov/

SECTION I – FUNDING OPPORTUNITY DESCRIPTION

Background

In developing a national energy strategy, the United States (U.S.) has a number of objectives, including increasing economic growth, improving environmental quality, and enhancing national energy security. Wind power contributes to these objectives through the deployment of clean, affordable, reliable, and domestic energy. To achieve U.S. wind generation objectives, multiple goals must be met, such as:

- Reducing the cost of wind energy compared to current non-renewable sources of U.S. energy production –fossil fuels and nuclear;
- Providing efficient and reliable delivery of electric power systems adding transmission capacity where needed;
- Leveraging diverse wind energy sources and geographic distributions reflected in utility scale land-based wind, offshore wind, and distributed wind;
- Inspiring scientific and engineering innovation at system, component, and operational levels;
- Reducing or eliminating barriers including radar interference, environmental impacts, siting conflicts, and redundant permitting or approval processes;
- Attracting investment with stable policies that promote equitable subsidization with other power sources and recognition of total carbon costs; and
- Understanding and addressing the public's concerns and issues with renewable energy sources.

In FY 2011, the Wind and Water Power Program within the Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy (EERE) released a formal Offshore Wind Innovation and Demonstration (OSWInD) Initiative, consistent with the goals listed above, to promote and accelerate responsible commercial offshore wind development in the U.S.

With over 4,000 gigawatt (GW) of gross potential that is relatively close to key load centers, offshore wind energy can help the nation reduce its greenhouse gas emissions, diversify its energy supply, provide cost-competitive electricity to key coastal regions, and stimulate economic revitalization of key sectors of the economy. However, if the nation is to realize these benefits, key challenges to the development and deployment of offshore wind technology must be overcome, including the relatively high current cost of energy, technical challenges surrounding installation and grid interconnection, and the permitting or approval processes.

OSWInD Objectives

On February 7, 2011, DOE, in partnership with the Department of the Interior (DOI), released the National Offshore Wind Strategy. The Strategy addresses two critical objectives in pursuit of overcoming the aforementioned barriers:

- Reducing the cost of energy through technology development to ensure competitiveness with other electrical generation sources; and
- Reducing deployment timelines and uncertainties limiting U.S. offshore wind project development.

To realize these objectives, OSWInD activities have been planned in the following focus areas:

- Research Addressing Market Barriers in order to facilitate deployment and reduce technical challenges facing the entire industry;
- Technology Research and Development that will reduce cost of offshore wind energy through innovation and testing;
- Advanced Technology Demonstration Projects that verify innovative designs and technology developments and validate full performance and cost under real operating and market conditions.

Activities have been initiated and are on-going in the first two focus areas. Under this Funding Opportunity Announcement (FOA), DOE is seeking applications under the third focus area listed above – Advanced Technology Demonstration Projects.

Scope

DOE seeks to provide support for regionally-diverse Advanced Technology Demonstration Projects through collaborative partnerships.

The primary goals of the Advanced Technology Demonstration Projects are to:

- Install innovative offshore wind systems in U.S. waters in the most rapid and responsible manner possible; and
- Expedite the development and deployment of innovative offshore wind energy systems with a credible potential for lowering the levelized cost of energy (LCOE) below 10 ¢/kWh or the local "hurdle" price at which offshore wind can compete with other regional generation sources without subsidies.

Secondary goals are numerous and include but are not limited to:

- Establishing world-class demonstration and test capabilities in conjunction with commercial developments to support validation of innovative technology , installation methods, and operation and maintenance strategies;
- Establishing and validating the infrastructure required for offshore wind plant installation and operation;
- Supporting development of a world-leading domestic offshore wind industry utilizing innovative technologies adapted to the North American environment and operating parameters,
- Evaluating current siting and approval processes and identifying opportunities for improvement; and
- Addressing public concerns associated with the concept of offshore wind.

By providing funding, technical assistance, and government coordination to accelerate deployment of these demonstration projects, DOE can help eliminate uncertainties, mitigate risks, and support the private sector in creating a robust U.S. Offshore Wind Energy Industry.

Given these goals, DOE seeks technology demonstration projects that combine innovation with pathways for substantial cost reduction opportunities. DOE will review all viable applications, including high innovation concepts, but an emphasis will be put on Technology Readiness.

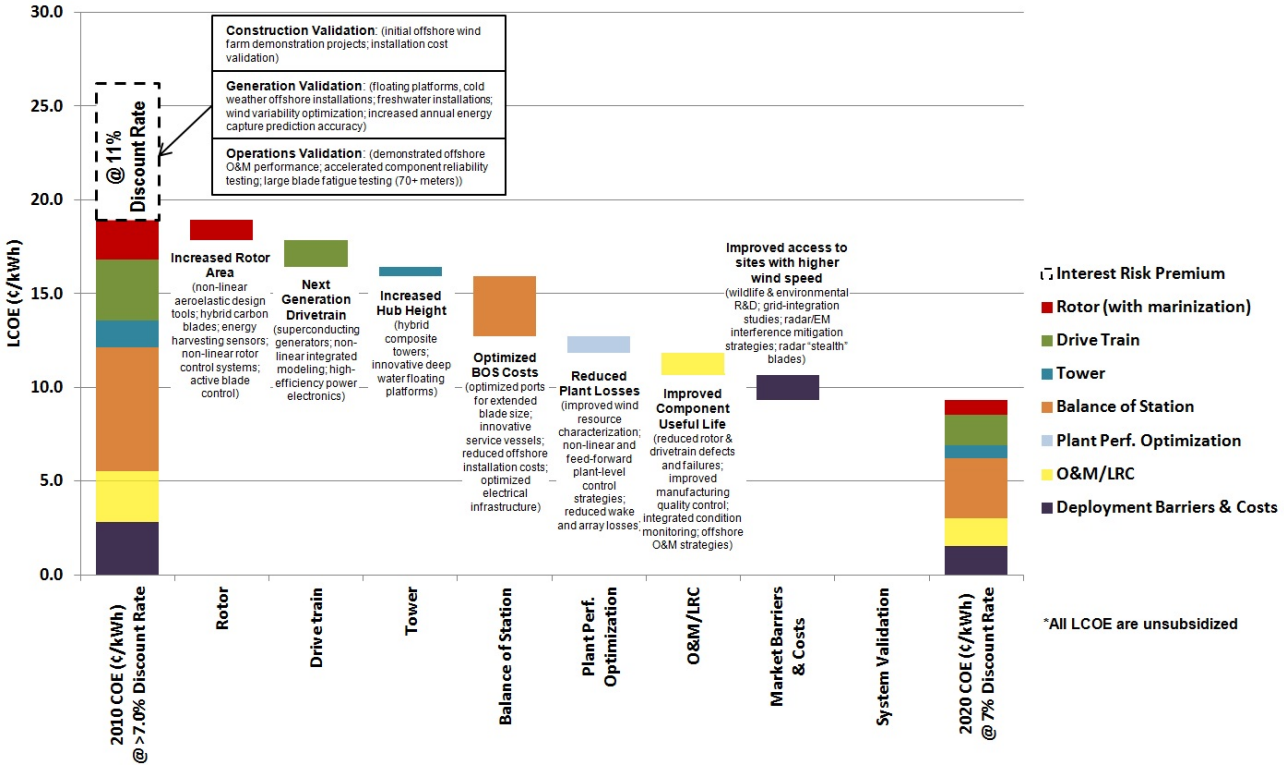
This FOA is focused solely on offshore wind energy projects. Applications for marine and hydrokinetic (MHK) energy sources, whether stand-alone or combined with offshore wind turbine support structures, will be considered nonresponsive to the FOA and will not be reviewed.

Significant innovations must be realized in the U.S. marketplace in order for an economically-viable offshore wind industry to develop in this country. The DOE has a goal to reduce the national average LCOE of offshore wind plants below 10 ¢/kWh by 2020 with further improvements beyond 2020 needed to compete with conventional generation on an unsubsidized basis. DOE will use projects under this FOA to assess progress towards these national-scale goals. DOE believes it is critical to validate cost and performance of new technology in order to address barriers associated with access to affordable financing in the GW-scale commercial deployment. Figure 1 shows a potential roadmap to cost competitiveness. As shown below, the Offshore Wind Cost Reduction Cascade requires attention to the following two key areas:

The validation of construction, generation and operating expenses to reduce financing costs.

The development of innovative turbine architectures and advanced wind plant infrastructure to reduce plant costs and increase efficiency.

Figure 1: Offshore Wind Cost Reduction Cascade



Given the previously-stated goals and two key areas for LCOE reduction, DOE is seeking partnerships for projects within the two Topic Areas delineated in Sections II and III of this FOA.

Topic Area 1: "Accelerating Pilot Deployment"
The demonstration project funded under Topic Area 1 will be a "fast track" pilot project targeted for commissioning by the end of calendar year 2014. Therefore significant planning, preparation and permitting activities by the applicant are highly desirable.

Topic Area 2: "Innovating Commercial Viability"
Topic Area 2 technology demonstration projects will typically be broader in scope and of longer duration, and will focus more on bringing technological innovation to market. Topic Area 2 will be executed in several budget periods with a down-select process in between budget periods 1 and 2.

Applicants are invited to submit responses under one or both of the Topic Areas. Separate applications must be submitted for each Topic Area. The same project can be proposed for each Topic Area; however, that project can only be selected for an award under one Topic Area.

Within these Topic Areas, applicants will be asked to indicate how DOE funds would be used within the partnership and specifically how the funds will lead to installation of the demonstration project. Uses of DOE funds could include but are not limited to:

- Demonstrating full-scale, innovative wind turbine technology that will be used in commercial offshore wind farm deployments. "Full Scale" is defined as a wind turbine or turbines and related site infrastructure, including electrical grid connection, at a commercial utility class (multi-megawatt scale);

- Improving innovative engineering and related support activities for offshore foundations, electrical systems, facility infrastructure, operation, and installation systems and methods in commercial projects;
- Addressing specific non-technical barriers, such as environmental or socioeconomic issues or efficiency in Federal, State, or local permitting, planning and approval processes as they relate to the proposed project;
- Collecting and analyzing performance, engineering, environmental monitoring, operations, and cost data of novel technologies used as part of the deployment strategy for up to five years.

DOE may fund specific technical research, engineering, and planning activities that demonstrably enhance the timely execution of innovative commercial offshore wind energy projects and ultimately lead to project installation within the desired timeline. DOE funds may also support capital expenditures within these projects for materials or equipment that are clearly necessary to achieve the technology demonstration benefits of the project.

Projects will be considered from all geographical regions, water depths, and technology areas, including innovative technologies. Applicants are encouraged to convey how project success will advance industry expertise in engineering, facility design, installation, performance evaluation and will help improve efficiencies in key Federal, State, or local siting, permitting, and environmental compliance processes such as the National Environmental Policy Act (NEPA). Examples should be provided which convey how the project will reduce risk and uncertainty to the key institutions, such as the finance industry. Examples of potential candidate projects include, but are not limited to, a stand-alone single turbine, multiple turbines from one or more turbine manufacturers, or turbines that are a first phase of a planned larger commercial project.

It should be understood that all performance, engineering, environmental monitoring, operations, and cost data gathered by efforts supported under this FOA will be used by DOE to further the existing knowledge-base for the benefit of the wind industry. All data will be provided to DOE and will be treated as set forth in Section VIII.

DOE or other Federal Agencies could assist the proposed project with non-monetary assistance, such as obtaining research leases in Federal Waters. DOE has no preference for whether an applicant chooses a site or sites in State or Federal Waters, or under a commercial, limited or research lease.

Deployment Timeline

DOE expects Topic Area 1 project applicants to present a credible timeline leading to commissioning by the end of calendar year 2014. For Topic Area 2, commissioning is expected to occur between 2015 and 2017. See Sections II and III for specific Topic Area deliverables and schedule expectations. The schedule should include feasible, innovative, and collaborative solutions to addressing current market barriers to deployment. It is understood that many factors beyond the applicant's control will affect the deployment timeline for any given project. Successful applicants must clearly convey an understanding of the relevant barriers, a plan for overcoming those barriers, and the extent to which the DOE funding and participation on the project can contribute to reducing the barriers.

Teaming

DOE encourages applications which present an integrated set of activities undertaken by broad teams or consortia of organizations with world-class capabilities and resources. The membership of such a team or consortium must be able to execute these complex projects from the time of award and examples of membership include: an experienced energy project developer, a research organization specializing in development of wind power, a power purchaser, the regional transmission or independent system operator as appropriate, an original equipment manufacturer (OEM) team capable of manufacturing a complete offshore wind system, and installation specialists with experience in the marine operating environment. While the specific makeup of the proposed team is at the discretion of the applicant, the applicant must

provide supporting evidence that the team is highly qualified, experienced, and capable of performing all aspects of the proposed work scope and fulfilling the objectives of the FOA. It is understood that the consortium members will have varying levels of commitment and engagement within the team, varying from full partners to occasional contributors, and this involvement must be explicitly stated in the application.

Environmental Review in Accordance with National Environmental Policy Act (NEPA)

The federal funds distributed under this FOA are subject to the National Environmental Policy Act [42 United States Code (U.S.C.) 4321 et seq.; NEPA]. NEPA requires federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions. A project may require a lease, permit, and/or plan approval from multiple Federal agencies depending on the location, activities, and facilities being proposed. DOE will work closely with other Federal agencies to combine NEPA reviews when possible. For additional background on NEPA, please see DOE's NEPA website, at: http://nepa.energy.gov/."

While NEPA compliance is a Federal agency responsibility and the ultimate decisions remain with the federal agency, all projects selected for an award will be required to assist in the timely and effective completion of the NEPA process in the manner most pertinent to their proposed project. This includes submitting the following information: a detailed description of all activities and facilities proposed; a detailed description of the affected environment, which includes the project site, onshore support facilities, and areas transited by associated vessel traffic; and best management practices and measures to be implemented to reduce or eliminate impacts to environmental and socioeconomic resources and conflicts with other uses of the area.

The Bureau of Ocean Energy Management (BOEM) is the lead agency for NEPA with respect to wind project leases and other related approvals on the Outer Continental Shelf. BOEM's environmental review processes thoroughly analyze all aspects of deployment, installation, construction, operation, maintenance, and decommissioning of a proposed project. In conducting these processes BOEM may engage in extensive public outreach to determine the full impacts and/or conflicts with competing offshore uses and resources. DOE would cooperate with BOEM on these NEPA activities.

Description of Topic Area 1: "Accelerating Pilot Deployment"

To accelerate the deployment of offshore wind technology in the United States, Topic Area 1 of the Advanced Technology Demonstration Projects FOA seeks to support installation of one or more offshore wind systems in U.S. waters in the most rapid and responsible manner possible. The intent is to reduce uncertainty with respect to the future of the offshore wind industry in the United States, while evaluating technology options targeted at improving the cost-effectiveness of future offshore wind systems; setting an example for full scale commercial offshore wind farms with respect to permitting, approvals, and environmental reviews; establishing a baseline LCOE; reducing financing risk; addressing issues raised by the public; beginning the establishment of infrastructure for offshore wind installation, operations and maintenance; and contributing to the evaluation of offshore wind technology and economic potential in the U.S.

One award is anticipated for Topic Area 1 for the installation of one or more offshore wind turbines in State or Federal waters. The award is open to all geographic regions (e.g., Atlantic, Great Lakes, Pacific, and Gulf of Mexico) and all water depths. Applicants with locations that are currently planned for commercial development and that have leases and environmental reviews in place or substantially complete are highly encouraged to apply.

The full wind plant facilities proposed under Topic Area 1 are expected to demonstrate a high level of technical readiness for deployment, while incorporating innovative elements that will cost effectively adapt common international offshore industry practices and system configurations to the U.S. operating environment. Offshore wind facilities are complex integrated systems with a number of critical

components. Innovation may be considered in the combination of various components (e.g., blades, balance of turbine system, foundation and support structures, electrical subsystems, etc.), as well as in critical processes such as installation methods, that offer substantive advantages in cost of energy, performance and reduction of risk over other currently available options.

Appendix G includes background information on the Technology Readiness Levels (TRL) that will be used to evaluate system maturity, including details of the TRL self-assessment to be included in the applicant's proposal. Rationale and evidence must be provided to support the conclusion that the proposed wind energy facility will be ready for integrated pilot system demonstration within the proposed schedule, and that all major system elements are TRL 7 (Integrated Pilot System Demonstration) or higher, with no more than one major component at TRL 7, by the completion of 100% front-end engineering design (FEED).

Submitted project descriptions are to be for complete offshore wind plants including one or more multi-megawatt turbines and all electrical cabling between turbines and shore, electrical substations and connection to a grid. The project plans must clearly illustrate that all relevant scheduling and permitting factors have been considered, supporting the conclusion that the wind turbine(s) can be installed and commissioned no later than the end of calendar year 2014, and generating power to a grid, barring any delays not under control of the applicant. In the event that no project applications credibly demonstrate a high likelihood of completion by the end of 2014, DOE reserves the right to select the project that, in its estimation, present the highest potential to achieve a completion date closest to this target.

Revenue from electricity generation will belong to the recipient and shall not be used in the calculation of cost share. Fees to capture fair return for generation on Outer Continental Shelf (OCS) leases may be charged by Bureau of Ocean Energy Management (BOEM) , and a portion of such revenue may be shared with eligible coastal states (see 30 CFR 585, Subpart E). Meteorological and oceanographic (metocean), environmental monitoring, turbine, structural response, system performance, cost, and any other data collected will be provided to DOE. This data will be protected as defined in Section VIII.

Applicants are encouraged to indicate in their applications how DOE or other Federal Agencies could apply non-monetary assistance in supporting the project established regulatory guidelines.

Proof of financial viability including an Income Statement, Balance Sheet, and Operating Cash Flow Statement should be included with applications as detailed in Part VI, the "Content and Form of Application" section of this FOA.

Description of Topic Area 2: "Innovating Commercial Viability"

Significant innovations must be realized in the U.S. marketplace in order for an economically-viable offshore wind industry to develop in this country. A holistic systems design approach addressing all aspects of hardware cost, performance, deployment, operability, and maintenance will be necessary to attain demonstrable step changes in offshore wind LCOE. Individual turbine technology evolution must consider multiple elements including: total wind plant capital cost relative to rated capacity, installation and deployment processes, reduced Operations & Maintenance (O&M) through improved reliability and serviceability, increased energy capture, as well as the benefits achieved through economies of scale.

Topic Area 2 of the Advanced Technology Demonstration Projects FOA is designed to expedite the development and deployment of these innovative offshore wind systems. Applicant systems may leverage innovations in fabrication, installation methodology, O&M, or components without compromising technical viability and project timeline. The most promising applications will find and exploit synergies between these categories of cost improvement, thereby both lowering the overall system-level LCOE and ensuring relevance to near term industry deployment.

Specifically in Topic Area 2, DOE or other Federal Agencies could apply non-monetary assistance in supporting the project, such as utilization of Research Leases in Federal Waters. DOE has no preference for whether an applicant chooses a site or sites in State or Federal Waters, or under a commercial, limited or

research lease.

In Topic Area 2, multiple awards are anticipated for offshore wind plants optimized for specific geographic areas around the country. DOE is looking for projects that display an understanding of the concept of a local "hurdle" price, or the price at which offshore wind will be able to compete with other regional generation sources. Final awards may include a variety of geographic regions (e.g., Atlantic, Great Lakes, Pacific, and Gulf of Mexico) and varying site-specific characteristics including water depth, bathymetry, metocean conditions, and other critical design criteria. Technical solutions may include bottom-fixed, deepwater floating, and freshwater systems, all optimized for the proposed site conditions in a given region. For example, projects proposed in the Great Lakes must address icing and those in the Gulf of Mexico, hurricanes. DOE is looking for projects that document a feasible pathway to a competitive unsubsidized LCOE for the technical solutions that are proposed as being optimal.

The intent is to assess a range of offshore wind plant systems utilizing innovative technologies that are optimized for locations and where future development has the highest probability of commercial viability.

The final technology deployed should demonstrate a maturation level consistent with an Integrated Pilot System Technology Readiness Level (TRL) of 7 - inclusive of the appropriate design verification and validation data - as reflected in the self-assessment of TRL described in Appendix G and to be included in the applicant's proposal. Rationale and evidence must be provided supporting the conclusion that the proposed wind energy facility will be ready for integrated pilot system demonstration at the completion of 100% front-end engineering design (FEED). The activities comprising 50% and 100% front-end engineering design will result in design and development of a prototype system encompassing innovative technologies that will be verified in an operational environment during Budget Periods 3-5.

In order to help facilitate the use of innovative technology without compromising commercial success, activities under Topic Area 2 of this FOA may include validation of advanced concepts at the pre-commercial prototype scale as part of the project development and engineering process. The final turbine design deployed is expected to be compliant with the appropriate IEC standards as specified in IEC 61400-22.

DOE is seeking projects that include instrumentation and collection of metocean, turbine, structure and integrated wind plant system engineering, performance, environmental monitoring, operations and cost data to validate design and operation in a field environment. The specific data required will depend upon the maturity of the proposed hardware with more innovative concepts requiring a more comprehensive data set. The DOE is interested in collecting and analyzing data that would help to better understand turbine-to-turbine interaction. A priority for DOE is projects which include collecting the field test data required to achieve type certification (if not already certified) as well as turbine and system performance data for a period of five (5) years after installation. Data collection will be in accordance with the relevant certification standards and requirements as specified in IEC 61400-22. All data will be provided to DOE, and will be treated as defined in Section VIII. Data acquired from OCS leases will additionally be subject to BOEM public disclosure regulations 30 CFR 585.113.

Topic Area 2 will be executed in five Budget Periods per Table 1:

Budget Period 1: DOE anticipates five projects will be selected for Budget Period 1. The period of performance is approximately one year. The outcomes of Budget Period I will be:

- A 50% front-end engineering design (FEED) up to and including preliminary vendor quotes.
- Preliminary installation methods and identification of operating and maintenance systems suited to the site.
- Initiation of all permitting or approval studies and illustration of a clear and realistic path to regulatory compliance and project completion including support for NEPA review.
- Initiation of all necessary grid interconnection requirements, as well as any needed power off-take agreements. These include any applicable FERC interconnection requirements as well as any utility specific requirements.

Note: A down select to three projects will be performed at the end of Budget Period 1.

Budget Period 2: Up to three projects will be selected for Budget Period 2. The period of performance for Budget Period 2 is one year. The outcomes of Budget Period 2 will be:

- A 100% front-end engineering design (FEED) up to and including full vendor quotes from all suppliers and independent verification of all capital, O&M and regulatory costs and proposed schedule from a DOE-approved and applicant-financed third party.
- Detailed installation methods and identification of operating and maintenance systems suited to the site.
- Completion of Federal agency NEPA process(es), and approval of a Construction and Operations Plan (COP) or equivalent in State Waters.
- Completion of all necessary grid interconnection requirements, as well as any needed power off-take agreements. These include any applicable FERC interconnection requirements as well as any utility specific requirements.

Note: A project review will be performed at the end of Budget Period 2.

Budget Periods 3-5: Includes fabrication, installation and commissioning stages of the project and validation of operating performance, reliability and O&M costs. At the end of Budget Period 5, a project will be generating power and delivering it to an electric power grid. Revenue from electricity generation will belong to the recipient and shall not be used in the calculation of cost share. The period of performance shall not exceed three years for Budget Periods 3 through 5.

SECTION II – AWARD INFORMATION

A. Type of Award Instrument

DOE anticipates awarding cooperative agreements under this Funding Opportunity Announcement.

B. Estimated Funding

Approximately $180,000,000 in DOE funding is expected to be available for new awards under this FOA, subject to Congressional appropriations.

C. Maximum and Minimum Award Size

A breakdown of the anticipated maximum award size for each of the Topic Areas is shown in Table 1. There is no minimum.

D. Expected Number of Awards

DOE anticipates selecting one (1) award for Topic Area 1 and five (5) awards for Topic Area 2 in Budget Period I as shown in Table 1.

E. Anticipated Award Size

The anticipated total Federal award size for Topic Area 1 and Topic Area 2 are shown in Table 1.

F. Period of Performance

The Period of Performance for Topic Area 1 is anticipated to be September 2012 through September 2014 and Topic Area 2 is September 2012 through September 2017 as shown in Table 1.

G. Type of Application

DOE will accept only new applications under this FOA (i.e., applications for renewals of existing DOE funded projects will not be considered).

Table 1: Summary of Topics, Funding, Duration and Cost Share*

(in millions USD)	Length (months)	No. of awards	2012	2013	2014	2015	2016	2017	Funding Per Award	Total Federal Funding	Required Cost Share
Topic Area 1											
Budget Period	24	1	$15	$5					$20	$20	50%
Topic Area 2											
Budget Period 1	12	5	$5	$15					$4	$20	20%
Budget Period 2	12	3			$20				$6.7	$20	20%
Budget Period 3	12	3				$40			$13.3	$40	50%
Budget Period 4	12	3					$40		$13.3	$40	50%
Budget Period 5	12	3						$40	$13.3	$40	50%
						Total Federal Funding				$180	
						Total Funding (including cost share)				$330	

*The Government reserves the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this FOA and will award that number of financial assistance instruments which serves the public purpose and is in the best interest of the Government. All DOE funding is subject to annual Congressional appropriations.

SECTION III – ELIGIBILITY INFORMATION

A. Eligible Applicants

The following entities are eligible to apply for this announcement: (1) institutions of higher education; (2) nonprofit and for-profit private entities; (3) state and local governments; and (4) consortia of entities (1) through (3). All types of domestic entities are eligible to apply as prime applicants, excluding DOE Federally Funded Research and Development Center Contractors (FFRDC), other Federal agencies, non-DOE FFRDCs, and nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995.

Foreign entities are not allowed to apply as prime applicants. However, foreign entities may be a team member or participant on a domestic entity's application, provided that the Federal funding for the work to be performed by foreign entities does not exceed 50% of the total Federal funding requested for the project. Applicants with foreign team members must explain how U.S. interest will be maintained. It is anticipated that U.S. interests will be maintained by the selection of offshore demonstration site(s) in U.S. waters, by the use of U.S.-produced goods and services to the fullest extent practicable, and by dissemination of the results and lessons learned of the project to domestic stakeholders in the offshore wind industry.

B. Cost Sharing

Minimum Non-Federal Cost Share Requirements are as follows:

Topic Area 1	at least 50%
Topic Area 2	
Budget Period 1	at least 20%*
Budget Period 2	at least 20%*
Budget Period 3,4,5	at least 50%

Non-Federal Cost Share Requirements represent a percentage of total allowable project costs and must come from non-Federal sources unless otherwise allowed by law.

The total allowable cost of a project is defined as the sum of the Government share, including FFRDC contractor costs if applicable, and the recipient share of allowable costs. (See 10 CFR Part 600 and Appendix C for applicable cost sharing requirements and information.)

*Activities in Budget Periods 1 and 2 of Topic Area 2 will consist of applied research, design and development of a prototype system encompassing innovative technologies that will be verified in an operational environment during Budget Periods 3 – 5.

C. Other Eligibility Requirements

Federally Funded Research and Development Center (FFRDC) Contractors:

A DOE/NNSA National Laboratory Contractor is eligible to be proposed as a team member or sub-recipient (not as a lead applicant) under this FOA if its cognizant Contracting Officer provides written authorization and this authorization is submitted with the application. If a DOE/NNSA National Laboratory Contractor is selected for participation in an award, the proposed work will be authorized under the DOE work authorization process and performed under the laboratory's Management and Operating (M&O) contract. The following wording is acceptable for the authorization:

"Authorization is granted for the [_____] Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complementary to the missions of the laboratory, and will not adversely impact execution of the DOE assigned programs at the laboratory."

A Non-DOE FFRDC contractor is also eligible for funding as a team member on another entity's application (not as a lead applicant). If a non-DOE FFRDC is selected for participation in an award, the proposed work will be authorized through an Interagency Agreement. The Federal agency sponsoring the FFRDC contractor must authorize in writing the use of the FFRDC contractor on the proposed project and this authorization must be submitted with the application. The use of a FFRDC contractor must be consistent with the contractor's authority under its award. The following wording is acceptable for this authorization:

"Authorization is granted for the _____ Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complementary to the missions of the laboratory and will not adversely impact execution of the DOE assigned programs at the laboratory. THIS LABORATORY IS AUTHORIZED TO PERFORM THE WORK PROPOSED IN THE APPLICATION SUBMITTED UNDER DOE FUNDING OPPORTUNITY ANNOUNCEMENT # DE-FOA-xxxxxx BY THE FOLLOWING STATUTORY AUTHORITY [insert Statute name, citation, and section] _____."

Value/Funding. The value of, and funding for, the FFRDC contractor portion of the work will not normally be included in the award to a successful applicant. Usually, DOE will fund a DOE/NNSA FFRDC contractor through the DOE field work proposal system and other FFRDC contractors and Federal agencies through an interagency agreement with the sponsoring agency.

Cost Share. The applicant's cost share requirement will be based on the total cost of the project, including the applicant's and the FFRDC contractor's portions of the effort.

FFRDC Contractor Effort:

The scope of work to be performed by the non-DOE FFRDC contractor may not be more significant than the scope of work to be performed by the applicant.

Responsibility: The applicant, if successful, will be the responsible authority regarding the settlement and satisfaction of all contractual and administrative issues, including but not limited to, disputes and claims arising out of any agreement between the applicant and the FFRDC contractor.

Please be advised that those entities that form teams with National Laboratories in which the Laboratory has sub-recipients, will be required to enter into subcontracts with the Laboratory. As such, the terms and conditions of the Management and Operating contract between the Laboratory and the Department of Energy will be in effect for any subcontracts, and not the traditional provisions associated with a financial assistance award. National Laboratories that have sub-recipients must make all applicable terms and conditions available to their subcontractors prior to submission of their applications. Any entities considering such teaming arrangements should request the Laboratory to provide the applicable terms and conditions prior to the Prime Recipient submitting a response to this FOA.

Team Arrangements:

Entities proposing as a team or consortium must designate a lead organization, with strong scientific leadership and a clearly defined central location. Applications must be submitted, on behalf of the team members, by the lead organization and DOE will enter into a prime award relationship with the designated lead organization. The designated lead organization (i.e., the prime applicant) must perform a greater percentage of the effort than any other institution that is part of the team or any proposed team member or subrecipient. This is based on dollar value and will be determined by a review of the budget. If an application is received in which the prime applicant is not performing a greater percentage of the effort than that of any individual team member or subcontractor, the application will be deemed non-responsive and rejected without further review.

Multiple Principal Investigators

The assignment and use of multiple Principal Investigators (PIs) in projects awarded under this FOA is allowed. The applicant must indicate in the Project Narrative File (see Section VI.C.3) if the project will include multiple PIs. The decision to use multiple PIs for a project is the sole responsibility of the applicant.

SECTION IV – APPLICATION AND SUBMISSION INFORMATION

A. Address to Request Application Forms

The Application forms and instructions are available on EERE Exchange. To access these materials, go to https://eere-exchange.energy.gov/ and select the appropriate funding opportunity number.

B. Letter of Intent

A Letter of Intent is required.

Applicants are required to submit a Letter of Intent prior to application submission. Letters of Intent will be used by DOE to plan for the merit review. The letters should not contain any proprietary or sensitive business information. The letters will not be used for down-selection purposes, and do not commit an applicant to submit an application. However, applicants must submit a Letter of Intent by the due date to be eligible to submit an Application. If an applicant is applying for more than one Topic Area, a separate letter of intent must be submitted for each Topic Area. A control number will be issued when an Applicant begins the Letter of Intent submission process. This control number must be included with the Application documents, as described in Section C. below.

The Letter of Intent should include the following information:

1. Applicant Name
2. Title of the project
3. One or two paragraph description of the project
4. Identification of the Topic Area to which applicant is applying
5. Estimated total DOE funding request
6. Point of Contact

FOR TOPIC AREA 1 APPLICANTS ONLY:
The following requested information will be used by DOE for planning purposes only and for this purpose may be shared with other Government Agencies and non-Federal personnel that have signed conflict of interest and non-disclosure agreements prior to reviewing the information. This preliminary information submitted with the Letter of Intent will not be used in the merit review process and must be included in greater detail with the Application:

a. The site location.
b. A list of current, pending and future permits, leases and/or approvals required for the project including a copy of the permit or approval with the following information:
    i. Permit/Approval Name
    ii. Issuing Agency, Contact Name, Title and Phone Number
    iii. Description and/or Action
    iv. Status/General Information (completed, pending, date approved, estimated date of decision, application date, etc…)
    v. Date Expires/Renewal date
c. A copy of any applicable draft or final Environmental Assessment or Environmental Impact Statement that has been conducted.

Letter of Intent due date and time: March 30, 2012 at 11:59 PM Eastern Time.

Save the information in a single file titled "Control#_Institution_LOI.pdf". Letters of Intent must be submitted via EERE Exchange at https://eere-exchange.energy.gov/.

C. Content and Form of Application

You must complete the following application forms found on the EERE Exchange website at https://eere-exchange.energy.gov/, in accordance with the instructions. Applicants will receive a Control # once they "Apply to this FOA" on the EERE Exchange website and should include the application Control # in the file name, as indicated below.

1. **SF-424 – Application for Federal Assistance**
   Complete all required fields in accordance with the instructions on the form. The list of certifications and assurances in Field 21 can be found at http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms, under Certifications and Assurances. Note: The dates and dollar amounts on the SF 424 are for the complete project period and not just the first year, first Budget Period or other subset of the project period. Save the information in a single file titled "Control#_Institution_Application.pdf".

2. **Project Summary/Abstract File**
   The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and major participants (for collaborative projects). This document must not include any proprietary or sensitive business information, as the Department may make it available to the public if an award is made. The project summary must not exceed 1 page when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left and right), single spaced, with font not smaller than 11 point. Save the information in a single file titled "Control#_Institution_Summary.pdf".

3. **Project Narrative File**
   The project narrative must not exceed 50 pages, including cover page, table of contents, charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right), single spaced. EVALUATORS WILL REVIEW ONLY THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE. The font must not be smaller than 11 point. Do not include any Internet addresses (URLs) that provide information necessary to review the application. See Section VIII.D for instructions on how to mark proprietary application information. Save the information in a single file titled "Control#_Institution_Project.pdf".

   The project narrative must include:
   - Project Objectives
     This section should provide a clear, concise statement of the specific objectives/aims of the proposed project.

   - Merit Review Criterion Discussion
     This section should be formatted to address each merit review criterion and sub-criterion listed in Sections II and/or III of this FOA. Provide sufficient information so that reviewers will be able to evaluate the application in accordance with these merit review criteria. DOE WILL EVALUATE AND CONSIDER ONLY THOSE APPLICATIONS THAT SEPARATELY ADDRESS EACH MERIT REVIEW CRITERION AND SUB-CRITERION.

- Federal Resources and Coordination
  This section should explain how DOE or other Federal Agencies could assist the proposed project with non-monetary assistance, such as obtaining research leases in Federal Waters. DOE has no preference for whether an applicant chooses a site or sites in State or Federal Waters, or under a commercial, limited or research lease.

- Data Collection Requirements
  This section should explain the applicant's plan to collect metocean, turbine, structure and integrated wind plant system engineering, performance, environmental monitoring, operations and cost data to validate design and operation in a field environment. The specific data required will depend upon the maturity of the proposed hardware with more innovative concepts requiring a more comprehensive data set. The DOE is interested in collecting and analyzing data that would help to better understand turbine-to-turbine interaction. A priority for DOE is projects which include collecting the field test data required to achieve type certification (if not already certified) as well as turbine and system performance data for a period of five (5) years after installation. Data collection will be in accordance with the relevant certification standards and requirements as specified in IEC 61400-22. All data will be provided to DOE, and will be treated as defined in Section VIII. Data acquired from OCS leases will additionally be subject to BOEM public disclosure regulations 30 CFR 585.113.

- Relevance and Outcomes/Impacts
  This section should explain the relevance of the effort to the objectives in the funding opportunity announcement and the expected outcomes and/or impacts. The justification for the proposed project should include a clear statement of the importance of the project in terms of the utility of the outcomes and the target community of beneficiaries.

- Roles of Participants
  For multi-organizational or multi-investigator projects, describe the roles and the work to be performed by each participant/investigator, business agreements between the applicant and participants, and how the various efforts will be integrated and managed.

- Facilities and Other Resources
  Identify the facilities (e.g., office, laboratory, computer, etc.) to be used at each performance site listed, and, if appropriate, indicate their capacities pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Provide any information describing the other resources available to the project, such as machine and electronics shops.

- Equipment
  List important items of equipment already available for this project, and if appropriate, note the location and pertinent capabilities of each. If you are proposing to acquire equipment, describe comparable equipment, if any, already at your organization and explain why it cannot be used.

- Bibliography and References, if applicable
  Provide a bibliography for any references cited in the Project Narrative section. This section must include only bibliographic citations.

All the components of your Project Narrative must be within the Narrative page limit described above. Documents listed below may be included as clearly marked appendices to your Narrative and will not count towards the Project Narrative page limit. Please note that some of the required documents listed below may have their own page limits to which you must adhere.

4. Resume File

Provide a resume for each key person proposed, including subawardees and consultants if they meet the definition of a key person. A key person is any individual who contributes in a substantive,

measurable way to the execution of the project. The biographical information for each resume must not exceed 3 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right), single spaced, with font not smaller than 11 point and should include the information below, if applicable. Save the information in a file titled "Control#_Institution_Resume.pdf". The resume file does not have a page limitation.

- Education and Training
  Undergraduate, graduate and postdoctoral training; provide institution, major/area, degree and year.

- Professional Experience
  Beginning with the current position list, in chronological order, professional/academic positions with a brief description.

- Publications
  Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address, if available electronically.

  Patents, copyrights and software systems developed may be provided in addition to, or substituted for, publications.

- Synergistic Activities
  List no more than 5 professional and scholarly activities related to the effort proposed.

Of the key personnel identified in this file, indicate the Principal Investigator(s) (PI(s)).

For Multiple Principal Investigators:
The applicant, whether a single organization or team/partnership/consortium, must indicate if the project will include multiple PIs. The decision to use multiple PIs for a project is the sole responsibility of the applicant. If multiple PIs will be designated, the application must identify the Contact PI/Project Coordinator and provide a "Coordination and Management Plan" that describes the organization structure of the project as it pertains to the designation of multiple PIs. This plan should, at a minimum, include:

- Process for making decisions on scientific/technical direction;
- Publications;
- Intellectual property issues;
- Communication plans;
- Procedures for resolving conflicts; and
- PIs' roles and administrative, technical, and scientific responsibilities for the project.

5. Budget File

SF 424 C Excel, Budget Information – Construction Programs File
You must provide a separate budget for each year of support requested and a cumulative budget for the total project period. Use the SF 424 C Excel, "Budget Information – Construction Programs" form on DOE Financial Assistance Forms Page at http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms. The SF424A provides columns for each individual budget-year as well as the cumulative project-budget.

You may request funds under any Cost Classification as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this FOA (see Section IV, G). Save the information in a single file titled: "ControlNumber_LeadOrganization_SF424C"

6. Letters of Commitment

If cost share is required, you must have a letter from each third party contributing cost share (i.e., a party other than the organization submitting the application) stating that the third party is committed to providing a specific minimum dollar amount of cost share. All Letters of Commitment must be attached as an Appendix to the Project Narrative File. Identify the following information for each third party contributing cost share: (1) the name of the organization; (2) the proposed dollar amount to be provided; (3) the amount as a percentage of the total project cost; and (4) the proposed type of cost share – cash, services, or property. Letters of Commitment from parties participating in the project, exclusive of vendors, who will not be contributing cost share, but will be integral to the success of the project must be included as part of this Appendix to the Narrative. Letters of Commitment will not count towards the Project Narrative page limit.

7. Subaward Budget File(s)

You must provide a separate budget (i.e., budget for each budget year and a cumulative budget) for each subawardee that is expected to perform work estimated to be more than $100,000 or 50 percent of the total work effort (whichever is less). Use the SF-424C Excel for Construction Programs. This form is found on the DOE Financial Assistance Forms Page at http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms. Save each Subaward budget in a single file titled "Control#_Subawardee_SF424C.xls".

8. Budget for DOE/NNSA Federally Funded Research and Development Center (FFRDC) Contractor File, if applicable

If a DOE FFRDC contractor is to perform a portion of the work, you must provide a DOE Field Work Proposal (FWP) in accordance with the requirements in DOE Order 412.1 Work Authorization System. The DOE Order 412.1, Work Authorization System and the DOE O 412.1, Field Work Proposal form are available at the following link, under "DOE Budget Forms": http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms. Save the Field Work Proposal in a single file titled "Control#_Institution_FFRDC_FWP.pdf".

9. Authorization for non-DOE or DOE FFRDCs

Save the Authorization for non-DOE or DOE FFRDCs, as specified in Section III.C. Other Eligibility Requirements, in a single file titled "Control#_Institution_FFRDC_Auth.pdf".

10. Environmental Checklist

You must provide answers to all the questions in the environmental checklist in Appendix E. Please save your responses to the checklist itself in a single file titled "Control#_Institution_Env_List.pdf". Any additional documentation should be uploaded as an "Other" file using the following naming format: "Control#_Env_X_X.pdf"; where "X_X" is the number of the question (e.g., 5.4) in the checklist.

11. SF-LLL Disclosure of Lobbying Activities

Complete the SF- LLL. Applicability: If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying." Save the SF-LLL in a single file titled "Control#_Institution_SF-LLL.pdf.

12. Project Management Plan

The Project Management Plan includes WBS, RLS, and Gantt chart and Risk Management Plan. See below for submission instructions for each element.

a. Work Breakdown Structure (WBS) and Resource Loaded Schedule (RLS)

All applicants must include a product-oriented Work Breakdown Structure (WBS) and a WBS

dictionary. In addition, a complete Resource Loaded Schedule (RLS) that integrates the work scope, budget, and a time-phased schedule must also be included.

- For Topic Area 1, the WBS and RLS should encompass the entire project.
- For Topic Area 2, the WBS and RLS should encompass Budget Periods 1 and 2 only.

It is recommended this deliverable is submitted in Excel format with the following tabs:

- "WBS" – A product-oriented WBS with the task number, title, work description, responsible party, and key milestone dates.
- "RLS" – Using the same WBS tasks, report the planned monthly spending anticipated through the entire project lifetime.

Other formats like MS Project are also allowed provided it contains the elements requested. See Appendix D for additional guidance and examples.

Submit the information in a single file named "Control#_Institution_WBS-RLS.xls".

b. Gantt Chart

Applications must also include a Gantt chart which uses the same Work Breakdown Structure tasks and contains the following information:

- Beginning and ending task dates
- Milestone dates, both overall and for individual tasks where appropriate
- Interdependencies between tasks
- Critical path tasks of the project

It is recommended that MS Project be used for this deliverable, but other common tools like Excel will be accepted provided it contains all requested information.

- For Topic Area 1, the Gantt chart should encompass the entire project.
- For Topic Area 2, the Gantt chart should encompass Budget Periods 1 and 2 only.

Submit the information in a single file named "Control#_Institution_Gantt.pdf".

c. Risk Management Plan (RMP)

Applicants shall provide a Risk Management Plan (RMP) and a summary of the applicant's contingency planning that encompasses all types of risk, including financial, technical, schedule, etc.

The RMP summary should describe the project's risk management process, including methodology and a summary of risk analysis results. Describe how future unknown risks will be identified, ranked, and managed throughout the life of the project. The RMP background section should include the following categories, representing (typically) sequential risk management steps:

- Risk identification
- Risk impact analysis and quantification
- Risk mitigation strategies development
- Risk monitoring
- Risk documentation

The RMP should be organized by the project WBS, and each identified risk should be tied to specific WBS elements and include a risk rank, likelihood, severity, mitigation strategy, and any associated contingency funds budgeted.

Submit the information in a single file named "Control#_Institution_RMP.pdf".

13. Technology Readiness Assessment

This section, described in Appendix G of the FOA, includes a self-categorization of the proposed demonstration project technology into the appropriate Technology Readiness Levels.

Submit the information in a single file named "Control#_Institution_TRL.pdf"

14. Proof of Financial Viability

Proof of financial viability including cost share, to demonstrate the applicant's ability to complete the project, must be provided with application materials. For public companies, this must include a Balance Sheet (B/S), Income Statement (I/S), and Cash Flow Statement (CFS) from latest quarter and year. For private companies, this must include statements prepared internally for tax purposes, etc. For both public and private companies, these documents must be certified by a CPA or other appropriate authority. DOE retains the right to retain independent financial consultant(s) to analyze the information provided by the applicant. The independent financial consultant(s) will not rate the financial viability, but simply provide an analysis of the financial viability of the applicant for consideration by the Selection Official.

Please annotate this information as "Sensitive" or "Confidential", if necessary. Limit this attachment to 5 pages.

Submit the information in a single file named "Control#_Institution_FinV.pdf"

Summary of Required Forms/Files

Your application must include the following documents:

Name of Document	Format	File Name
SF 424 - Application for Federal Assistance	PDF	Control#_Institution_Application.pdf.
Project Summary/Abstract File	PDF	Control#_Institution_Summary.pdf
Project Narrative File, including required appendices	PDF	Control#_Institution_Project.pdf
Resume File	PDF	Control#_Institution_Resume.pdf
SF 424C Excel – Budget Information for Construction Programs File	Excel	Control#_Institution_SF424C.xls
Subaward Budget File(s), if applicable	Excel	See Instructions
Budget/FWP for Federally Funded Research and Development Center (FFRDC) Contractor File, if applicable	PDF	Control#_Institution_FFRDC_FWP.pdf
Authorization from cognizant Contracting Officer for FFRDC, if applicable	PDF	Control#_Institution_FFRDC_Auth.pdf
Environmental Checklist	PDF	See Instructions in Appendix E
SF-LLL Disclosure of Lobbying Activities	PDF	Control#_Institution_SF-LLL.pdf
Work Breakdown Structure (WBS) and Resource Loaded Schedule (RLS)	Excel	Control#_Institution_WBS-RLS.xls
Gantt Chart	PDF	Control#_Institution_Gantt.pdf
Risk Management Plan (RMP)	PDF	Control#_Institution_RMP.pdf
Technology Readiness Assessment	PDF	Control#_Institution_TRL.pdf
Proof of Financial Viability	PDF	Control#_Institution_FinV.pdf

D. Submissions from Successful Applicants

If selected for negotiation of award, DOE reserves the right to request additional or clarifying information for any reason deemed necessary, including, but not limited to:

- Indirect cost information
- Budget Justification
- Commitment Letter from Third Parties Contributing to Cost Share, if applicable
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)
- Representation of Limited Rights Data and Restricted Software, if applicable
- Environmental impact information

E. Submission Dates and Times

1. Letter of Intent Due Date

Letters of intent must be received by March 30, 2012, not later than 11:59 PM Eastern Time. You are encouraged to transmit the Letter of Intent well before the deadline. **LETTERS OF INTENT MUST BE SUBMITTED VIA EERE EXCHANGE AT** https://eere-exchange.energy.gov/. Applicants must submit a Letter of Intent by the due date to be eligible to submit an Application.

2. Application Due Date

Application Due Date and Submission Time
Applications must be received by May 31, 2012, not later than 11:59 PM Eastern Time. You are encouraged to transmit your application well before the deadline. **APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.**

F. Intergovernmental Review

This program is not subject to Executive Order 12372 – Intergovernmental Review of Federal Programs.

G. Funding Restrictions

- Cost Principles
  Costs must be allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600. The cost principles for commercial organizations are in FAR Part 31.

- Pre-award Costs
  Recipients may charge to an award resulting from this FOA pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 10 CFR part 600. Recipients must obtain the prior approval of the contracting officer for any pre-award costs that are for periods greater than this 90 day calendar period.

  Pre-award costs are incurred at the applicant's risk. DOE is under no obligation to reimburse such costs if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

  If recipients are State or Local Governments, they may not incur pre-award costs prior to award, without prior approval of the DOE contracting officer.

- National Environmental Policy Act (NEPA) Requirements
  The federal funds distributed under this FOA are subject to the Council on Environmental Quality Regulations for Implementing NEPA and DOE's NEPA Implementing Procedures (40 CFR Parts 1500-1508 and 10 CFR Part 1021 respectively). Applicant should carefully consider and should seek legal counsel or other expert advice before taking any action related to the proposed project that would have an adverse affect on the environment or limit the choice of reasonable alternatives prior to DOE completing the NEPA review process.

  For projects proposed on the Outer Continental Shelf, BOEM will conduct the appropriate NEPA analysis necessary for the lease issuance. At the same time BOEM may conduct the NEPA review for all activities that will occur on the lease. If all of the information is not available for a complete review of all activities contemplated at the time of lease issuance, BOEM may also choose to do multiple NEPA reviews. Each project may have additional project-specific requirements for compliance with NEPA that must be met prior to issuance of a lease. See Appendix F page F-2 (5) for additional details.

DOE does not guarantee or assume any obligation to reimburse costs where the recipient incurred the costs prior to receiving from the DOE Contracting Officer a written authorization. If the applicant carries out activities that may have an adverse affect on the environment or limit the choice of reasonable alternatives prior to receiving such written authorization from the DOE Contracting Officer, the applicant is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share. Likewise, if a project is selected for negotiation of award, and the recipient moves forward with activities that are not authorized for Federal funding by the DOE Contracting Officer in advance of the NEPA determination, the recipient is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share. Nothing contained in the pre-award cost reimbursement regulations or any pre-award costs approval letter from the DOE Contracting Officer override these NEPA requirements to obtain the written authorization from the DOE Contracting Officer regarding a final NEPA determination prior to taking any action that may have an adverse affect on the environment or limit the choice of reasonable alternatives.

H. Submission and Registration Requirements

1. Where to Submit

LETTERS OF INTENT AND APPLICATIONS MUST BE SUBMITTED UNDER THIS ANNOUNCEMENT THROUGH EERE EXCHANGE at https://eere-exchange.energy.gov/ TO BE CONSIDERED FOR AWARD. You cannot submit a Letter of Intent or an application through EERE Exchange unless you are registered. Please read the registration requirements below carefully and start the process immediately. Letters of Intent or Applications submitted by any other means will not be accepted.

If you have problems completing the registration process or submitting your application, send an email to the EERE Exchange helpdesk at EERE-ExchangeSupport@hq.doe.gov.
It is the responsibility of the applicant to verify successful transmission, prior to the Application due date and time.

2. Registration Process Requirements

There are several one-time actions that must be completed before submitting an Application in response to this Funding Opportunity Announcement (FOA), as follows:

- Register and create an account on EERE Exchange at: https://eere-exchange.energy.gov/. This account will then allow the user to register for any open EERE FOAs that are currently in Exchange. It is recommended that each organization or business unit, whether acting as a team or a single entity, use only one account as the appropriate contact point for each submission.

The applicant will receive an automated response when the Letter of Intent or Application is received. This will serve as a confirmation of receipt. Please do not reply to the automated response. The applicant will have the opportunity to re-submit a revised Letter of Intent or Application for any reason as long as the relevant submission is submitted by the specified deadline. The Users' Guide for Applying to the Department of Energy EERE Funding Opportunity Announcements is found at https://eere-exchange.energy.gov/Manuals.aspx.

The EERE Exchange registration does not have a delay; however, the remaining registration requirements below could take several weeks to process and are necessary in order for a potential applicant to receive an award under this FOA. Therefore, although not required in order to submit an Application through the EERE Exchange site, all potential applicants lacking a DUNS number, or not yet registered with CCR or FedConnect should complete those registrations as soon as possible. Questions related to the registration process and use of the EERE Exchange website should be submitted to: EERE-ExchangeSupport@hq.doe.gov

- Obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number (including plus-4 extension, if applicable) at http://fedgov.dnb.com/webform

- Register with the Central Contractor Registry (CCR) at: https://www.bpn.gov/ccr/default.aspx. Designating an Electronic Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in CCR registration. Please update your CCR registration annually.

- Register in FedConnect at https://www.fedconnect.net/. To create an organization account, your organization's CCR MPIN is required. For more information about the CCR MPIN or other registration requirements, review the FedConnect Ready, Set, Go! Guide at https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf

3. Electronic Authorization of Applications and Award Documents

Submission of an application and supplemental information under this FOA through electronic systems used by the Department of Energy, including EERE Exchange, constitutes the authorized representative's approval and electronic signature.

Submission of award documents, including modifications, through electronic systems used by the Department of Energy, including FedConnect, constitutes the authorized representative's approval and acceptance of the terms and conditions of the award. Award acknowledgement via FedConnect constitutes the authorized representative's electronic signature.

SECTION V – APPLICATION REVIEW INFORMATION

A. Criteria

1. Merit Review Criteria for Topic Area (TA) 1

The following merit review evaluation criteria will be used in the comprehensive evaluation of applications for Topic Area 1. For each criterion, the weighting (out of a total of 100%) is indicated to show its relative importance.

TA 1, Criterion I: Schedule and Scheduling Factors (Weight 30%)

- The degree to which documented progress has already been made in siting, permitting, approval processes, environmental compliance, grid connection and public acceptance, including evidence that the responsible Federal, State, and local Authorities Having Jurisdiction (AHJs) are aware of the project and are in the process of evaluating any other necessary authorizations;
- The degree to which progress has already been made in selecting equipment and installation vendors and documenting all costs including turbines, towers, foundations or platforms and mooring systems, electrical cabling between turbines and to shore, electrical substation, port, vessel and mobilization costs;
- The thoroughness and feasibility of the overall project and schedule, including the clarity, adequacy and timing of major milestones; and
- The degree to which credible evidence is presented indicating that the project will be commissioned no later than end of calendar year 2014.

TA 1, Criterion II: Technical Concept and Impact (Weight: 20%)

- The overall relevance and applicability of the technical concept and approach in addressing the specific innovation objectives of the FOA;
- The rationale and evidence provided supporting the conclusion that the proposed wind energy facility is ready for integrated pilot system demonstration, and that all technical components are TRL 7 or higher with no more than one major component at TRL 7;

- Demonstration that the proposed site is at or near a location planned for commercial development of offshore wind and has proximity to necessary manufacturing, ports, and vessels to be used in the project;
- The extent to which the application has characterized the installation and operational environment at the proposed site including, but not limited to, at least one year of measured metocean data as well as extreme events, e.g., 50 year wave and inflow events that are site specific or extrapolated by an acceptable methodology from other sources;
- Suitability of the technical and performance specifications for the turbine to be used;
- Level of technical details provided for the proposed transmission scheme to include voltage, AC or DC, location of substation, and grid integration;
- Level of detail on port facilities and vessels to be used for installation, operation and maintenance including information on vessel mobilization;
- Likelihood that proposed project will lead to commercial development, including commercialization in the U.S. of the turbine and other technical solutions proposed for the project; and
- Adequacy of the proposed data collection and performance validation plan to achieve IEC type certification (if applicable) and quantify turbine and system technical and economic performance for a five (5) year period from commissioning.

TA 1, Criterion III: Reduction in Cost of Energy (Weight: 20%)

- Extent to which a detailed cost of energy (LCOE) analysis, including all assumptions, calculations, and sources used to calculate the impact of the proposed design on LCOE, is presented for the proposed project with rigor, clarity, transparency and completeness; See Appendix H for example and calculation template to be submitted; and
- Extent to which the LCOE analysis for proposed project can be projected to show a clear path from the demonstration-scale to cost-effective commercial-scale deployment below 10 ¢/kWh or the local "hurdle" price at which offshore wind can compete with other regional generation sources without economic support.

TA1, Criterion IV: Work Plan (Weight: 10%)

- The relevance and clarity of the goals and objectives of the project;
- The clarity and adequacy of the product-oriented work breakdown structure including detailed task descriptions and resource loaded schedule;
- The clarity and adequacy of project deliverables including:
  a. The specific end result;
  b. The proposed methods for publicly disseminating project-generated information, including but not limited to, the final report, to the domestic offshore wind industry, and to related stakeholder sectors;
  c. Long term project ownership and management plan; and
  d. Inclusion of a health and safety plan.

TA 1, Criterion V: Project Management (Weight: 10%)

- The knowledge and experience in project management techniques, methods, and practices to successfully complete the project scope on budget and on schedule;
- The project management practices that will be fully integrated with financial and business systems to measure project progress and enhance the probability of successful completion;
- The identification and consideration of risk, and the use of effective risk management and change control systems that will be put into full effect early in the project and used to mitigate impacts; and
- The approach to managing the team and ensuring communication among team members.

TA 1, Criterion VI: Team Qualifications (Weight: 10%)

- The capability of the proposed team to address all aspects of the proposed work;
- The clarity and appropriateness of the roles of the team members;
- The relevant experience of each organization on the proposed team in performing similar projects and the allocation of responsibility commensurate with this experience;
- The adequacy of the education, professional training, technical skills, and work experience of the Principal Investigator (PI) and other key personnel, including personnel from team member organizations; and
- The level and reasonableness of the time commitment of the PI and other key personnel, including personnel from team member organizations.

2. Criteria for Topic Area (TA) 2

The following merit review evaluation criteria will be used in the comprehensive evaluation of applications. For each criterion, the weighting (out of a total of 100%) is indicated to show the relative importance.

TA 2, Criterion I: Technical Concept and Impact (Weight: 30%)

- The overall relevance and applicability of the technical concept and approach in addressing the specific innovation objectives of the FOA;
- The rationale and evidence provided supporting the conclusion that the proposed wind energy facility will be ready for integrated pilot system demonstration at the end of Budget Period V;
- Degree of innovation for the proposed approach and the extent to which the proposed concept offers advantages over other solutions or approaches from a cost of energy perspective;
- The potential of the proposed concept to advance the state of the art and the knowledge base of the industry;
- Likelihood that proposed project will lead to commercial development, including commercialization in the U.S. of the turbine and other technical solutions proposed for the project; and
- Proposed testing, data collection and performance validation plan to achieve IEC-like type certification; and quantify turbine and system technical and economic performance for 5 years after commissioning.

TA 2, Criterion II: Reduction in Cost of Energy (Weight 30%)

- Extent to which a detailed cost of energy (LCOE) analysis, including all assumptions, calculations, and sources used to calculate the impact of the proposed design on COE, is presented for the proposed project with rigor, clarity, transparency and completeness. See Appendix H for example and calculation template to be submitted; and
- Extent to which the LCOE analysis for proposed project can be projected to show a clear path from the demonstration-scale to cost-effective commercial-scale deployment at 10 ¢/kWh or the local "hurdle" price at which offshore wind can compete with other regional generation sources without subsidizes.

TA 2, Criterion III: Team Qualifications (Weight: 10%)

- The extent to which the team includes demonstrated capacity to advance technology and identify and incorporate lessons learned from international offshore wind projects;
- The capability of the proposed team to address all aspects of the proposed work;
- The clarity and appropriateness of the roles of the team members;
- The relevant experience of each organization on the proposed team in performing similar projects and the allocation of responsibility commensurate with this experience;

- The adequacy of the education, professional training, technical skills, and work experience of the Principal Investigator (PI) and other key personnel, including personnel from team member organizations; and
- The level and reasonableness of the time commitment of the PI and other key personnel, including personnel from team member organizations.

TA 2, Criterion IV: Schedule and Scheduling Factors (Weight 10%)

- The feasibility of the overall project schedule, both with respect to technical milestones and to permitting and environmental review that may be required, including evidence that the applicants have formally initiated the appropriate permitting and environmental review processes with the relevant authorities having jurisdiction; and
- The degree to which credible evidence is presented indicating that the project will be commissioned no later than end of calendar year 2017.

TA 2, Criterion V: Project Management (Weight 10%)

- The knowledge and experience in project management techniques, methods, and practices to successfully complete the project scope on budget and on schedule;
- The project management practices that will be fully integrated with financial and business systems to measure project progress and enhance the probability of successful completion;
- The identification and consideration of risk, and the use of effective risk management and change control systems that will be put into full effect early in the project and used to mitigate impacts;
- The identification of logical points in the schedule for critical project management decisions, including the qualitative and quantitative criteria for how these decisions will be made. (This project management requirement is different from the DOE down-select decisions that will take place between Budget Periods); and
- The approach to managing the team and ensuring communication among team members.

TA 2, Criterion VI: Work Plan (Weight: 10%)

- The relevance and clarity of the goals and objectives of the project;
- The clarity and adequacy of the product-oriented work breakdown structure including detailed task descriptions and resource loaded schedule (for only budget periods 1 and 2);
- The clarity and adequacy of project deliverables including:
  a. The specific end result;
  b. The proposed methods for publicly disseminating project-generated information, including but not limited to, the final report, to the domestic offshore wind industry, and to related stakeholder sectors;
  c. Long term project ownership and management plan; and
  d. Inclusion of a health and safety plan.

B. Review and Selection Process

1. Review and Selection Process for Topic Area 1

a. Initial Compliance Review for Topic Area 1

Prior to a comprehensive merit evaluation, DOE will perform an initial compliance review to determine that (1) letter of intent was submitted; (2) the applicant is eligible for an award; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of this FOA. If an application fails to meet these requirements, it may be deemed non-responsive and eliminated prior to Merit Review.

b. Application Submission and Merit Review TA 1, Step 1: Application and Evaluation
See Section VI for APPLICATION AND SUBMISSION INFORMATION, including information on forms.

Applications that pass the Initial Compliance Review will be evaluated by the Federal Merit Review Panel in accordance with EERE's Notice of Objective Merit Review Procedure (76 Fed. Reg. 17846, March 31, 2011) and the guidance provided in the "Department of Energy Merit Review Guide for Financial Assistance" which is available at: http://energy.gov/sites/prod/files/meritrev.pdf. A third party review of certain aspects of the applications, at DOE's expense, will be included in Merit Review Step 1.

It is very important that documents submitted as part of the application do not contain any Personally Identifiable Information as described in Appendix B.

Upon completion of Step 1, applications that are deemed technically acceptable will be recommended for the Merit Review Step 2: Facilities Visit which includes an oral presentation. Those applicants recommended for Step 2 of the merit review process will receive a formal invitation from the Federal Merit Review Manager. Those applicants not selected for Merit Review Step 2 will be notified by the Federal Merit Review Manager upon completion of Step 1.

c. Selection for Merit Review TA 1, Step 2: Facilities Visit
Upon completion of Step 1, DOE intends to formally invite successful applicants to participate in Step 2: Facilities Visit. Applicants will be notified by the Federal Merit Review Manager to prepare for and schedule the Facilities Visit in July or August 2012. Selection for participation in the Facilities Visit does NOT signify that applicants have been selected for negotiation of award. As a part of Step 2, DOE will ask the applicants to respond to pre-selection clarification questions provided in advance. The Facilities Visit will include the following actions:

i. Oral presentation. Conducted at the applicant's place of business, an oral presentation of the written responses to DOE's pre-selection clarification questions will be presented by the applicant to the DOE Merit Review Panel (MRP). The applicant's written responses to the pre-selection clarification questions will be incorporated into the application and will be evaluated by the MRP as part of the application.

ii. Q&A session. The oral presentation will be followed by a question and answer (Q&A) session conducted by the DOE MRP. The purpose of the oral presentation and the Q&A session is to ensure that the MRP fully understands the details of the proposed project and has an opportunity to ask clarifying questions of the applicants. Applicant responses during the Q&A session will be recorded in written form and incorporated into the application and will be evaluated by the MRP. Applicants will be given an opportunity to review the written product to ensure its accuracy.

iii. Tour of applicant's facilities.

d. Selection for Topic Area 1
The Selection Official may consider the Merit Review Panel's recommendations, program policy factors, and the amount of funds available in making selection decisions. Applicants that are selected for negotiation of an award will be notified by the Contracting Officer.

The selection official may consider the following program policy factors for Topic Area 1 in the selection process:

- Balance of complementary technologies to meet Program goals.
- Comparatively significant benefits for the amount of funding requested.
- Greatest commercial potential for gigawatt-scale deployment in the US market.
- Greatest advancement of the national knowledge base.

- Highest long-term impact on the US offshore wind industry while ensuring that a majority of the Federal funding remains in the US.
- Robustness of the proposed pathway to commercial viability.

e. Negotiations and Award for Topic Area 1

Government Negotiations with Applicant: The Government may enter into negotiations with a selected applicant for any reason deemed necessary, including but not limited to: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 10 CFR part 600; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

2. Review and Selection Process for Topic Area 2

a. Initial Compliance Review for Topic Area 2

Prior to a comprehensive merit evaluation, DOE will perform an initial compliance review to determine that (1) letter of intent was submitted; (2) the applicant is eligible for an award; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of this FOA. If an application fails to meet these requirements, it may be deemed non-responsive and eliminated prior to Merit Review.

b. Application Submission and Merit Review TA 2, Step 1: Application and Evaluation

See Section VI for APPLICATION AND SUBMISSION INFORMATION, including information on forms.

Applications that pass the Initial Compliance Review will be evaluated by the Federal Merit Review Panel in accordance with EERE's Notice of Objective Merit Review Procedure (76 Fed. Reg. 17846, March 31, 2011) and the guidance provided in the "Department of Energy Merit Review Guide for Financial Assistance". This guide is available at: http://energy.gov/sites/prod/files/meritrev.pdf. A third party review of certain aspects of the applications, at DOE's expense, will be included in Merit Review Step 1.

It is very important that documents submitted as part of the application do not contain any Personally Identifiable Information as described in Appendix B.

Upon completion of Step 1, applications that are deemed technically acceptable will be recommended for the Merit Review Step 2: DOE Headquarters (HQ) Visit. Those applicants recommended for Step 2 of the merit review process will receive a formal invitation from the Federal Merit Review Manager. Those applicants not recommended for Step 2 will be notified by the Federal Merit Review Manager upon completion of Step 1.

3. Selection for Merit Review TA 2, Step 2: DOE Headquarters (HQ) Visit

Upon completion of Step 1, DOE intends to formally invite successful applicants to participate in Step 2: DOE HQ Visit. Invited applicants will be notified by the Federal Merit Review Manager to prepare for and schedule an DOE HQ Visit in July or August 2012 in Washington, D.C. at DOE headquarters. Applicants are responsible for travel expenses to DOE. Selection for participation in the DOE HQ Visit does NOT signify that Applicants have been selected for negotiation of award. As a part of Step 2, DOE will ask the applicants to respond to pre-selection clarification questions from the MRP. The DOE HQ Visit will include the following actions:

i. Oral presentation. An oral presentation of the applicant's written responses to DOE's pre-selection clarification questions will be presented by the applicant to the DOE Merit Review Panel (MRP). The applicant's written responses to the pre-selection clarification

questions will be incorporated into the application and will be evaluated by the MRP as part of the application.

ii. Q&A session. The oral presentation will be followed by a question and answer (Q&A) session conducted by the DOE MRP. The purpose of the oral presentation and the Q&A session is to ensure that the MRP fully understands the details of the proposed project and has an opportunity to ask clarifying questions of the applicants. Applicant responses during the Q&A session will be recorded in written form and incorporated into the application and will be evaluated by the MRP. Applicants will be given an opportunity to review the written product to ensure its accuracy.

4. Selection for Topic Area 2

The Selection Official may consider the Merit Review Advisory Report recommendations, program policy factors, and the amount of funds available when making selections. Applicants that are selected for negotiation of an award will be notified by the Contracting Officer.

The selection official may consider the following program policy factors for Topic Area 2 in the selection process:

- Balance of complementary technologies to meet Program goals.
- Comparatively significant benefits for the amount of funding requested.
- Geographic diversity.
- Greatest commercial potential for gigawatt-scale deployment in the US market.
- Greatest advancement of the national knowledge base.
- Highest long-term impact on the US offshore wind industry while ensuring that a majority of the Federal funding remains in the US.
- Robustness of the proposed pathway to commercial viability.

5. Negotiations and Award for Topic Area 2

Government Negotiations with Applicant The Government may enter into negotiations with a selected applicant for any reason deemed necessary, including but not limited to: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 10 CFR part 600; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

C. Anticipated Notice of Selection and Award Dates

a. Notice of Selection and Award Dates Topic Area 1

DOE anticipates notifying the applicant selected for negotiation of an award by August 31, 2012 and making an award by September 30, 2012 subject to the availability of Congressional appropriations.

b. Anticipated Notice of Selection and Award Dates for Topic Area 2

DOE anticipates notifying applicants selected for negotiation of an award by August 31, 2012 and making awards by September 30, 2012, subject to the availability of Congressional appropriations.

SECTION VI - AWARD ADMINISTRATION INFORMATION

A. Award Notices

1. Notice of Selection

DOE will notify applicants selected for negotiation of award. This notice of selection is not an authorization to begin performance. (See Section VI.G with respect to the allowability of pre-award costs.)

Organizations whose applications have not been selected will be advised as promptly as possible. This notice will explain why the application was not selected.

2. Notice of Award

A Financial Assistance Award issued by the Contracting Officer is the authorizing award document. It normally includes, either as an attachment or by reference: (1) Special Terms and Conditions; (2) Applicable program regulations, if any; (3) Application as approved by DOE; (4) DOE assistance regulations at 10 CFR part 600; (5) National Policy Assurances To Be Incorporated As Award Terms; (6) Budget Summary; and (7) Federal Assistance Reporting Checklist, which identifies the reporting requirements; and (8) Statement of Project Objectives.

For grants and cooperative agreements made to universities, non-profits and other entities subject to OMB Circular A-110, the Award also includes the Research Terms and Conditions and the DOE Agency Specific Requirements located at: http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp.

B. Administrative and National Policy Requirements

1. Administrative Requirements

The administrative requirements for DOE grants and cooperative agreements are contained in Title 2 CFR (See: http://ecfr.gpoaccess.gov). Grants and cooperative agreements made to universities, non-profits and other entities subject to Title 2 CFR are subject to the Research Terms and Conditions located on the National Science Foundation web site at: http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp.

DUNS and CCR Requirements

Additional administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR, Part 25 (See: http://ecfr.gpoaccess.gov). Prime awardees must keep their data at CCR current. Subawardees at all tiers must obtain DUNS numbers and provide the DUNS to the prime recipient before the subaward can be issued.

Subaward and Executive Reporting

Additional administrative requirements necessary for DOE grants and cooperative agreements to comply with the Federal Funding and Transparency Act of 2006 (FFATA) are contained in 2 CFR, Part 170. (See: http://ecfr.gpoaccess.gov). Prime awardees must register with the new FSRS database and report the required data on their first tier subawardees. Prime awardees must report the executive compensation for their own executives as part of their registration profile in the CCR.

2. Special Terms and Conditions and National Policy Requirements

The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at: http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms.

The National Policy Assurances To Be Incorporated as Award Terms are located at http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms

By submitting an application in response to this FOA the Applicant certifies that:
It is not a corporation that has been convicted (or had an officer or agent of such corporation acting on behalf of the corporation convicted) of a felony criminal violation under any Federal law within the preceding 24 months,

It is not a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability,

If the Applicant's financial assistance application is chosen for award and the award is in excess of $1,000,000, the applicant will, by the end of the fiscal year, upgrade the efficiency of their facilities by replacing any lighting that does not meet or exceed the energy efficiency standard for incandescent light bulbs set forth in Section 325 of the Energy Policy and Conservation Act (42 U.S.C. 6295).

3. Intellectual Property Provisions

The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms

4. Statement of Substantial Involvement

DOE will have substantial involvement in the projects funded under Topic Area 1 and Topic Area 2. DOE's substantial involvement will include technical assistance, formal peer review, DOE coordination with Federal, State and local Authorities Having Jurisdiction (AHJs) for siting, permitting, and environmental compliance, and detailed stage gate analysis. DOE's involvement will also include the right to intervene in the conduct or performance of project activities for programmatic reasons. Intervention includes the interruption or modification of the conduct or performance of project activities.

In addition, all projects funded under Topic Area 2 will be required to undergo a formal go/no-go review to be conducted by the Department of Energy between each Budget Period of the project. To assist with the decision-making process, DOE may use both Federal and non-Federal experts to provide independent evaluation and advice. The Department of Energy will then provide guidance to recipients on how the projects should proceed during the subsequent Budget Periods and may redirect part or all of a project's scope of work as a result of the go/no-go decision process.

C. Reporting

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement.

Specific reporting requirements for all awards resulting from this FOA will include the following:

- Quarterly updates to the Resource Loaded Schedule by updating each WBS element with:
  - Percent of work progress (both quarterly and cumulative % progress to date)
  - Costs incurred (both quarterly and cumulative to date)
  - Estimated total cost and final completion date (if different than original plan)
- Quarterly Technical Progress Reports
- Annual presentations at DOE Wind and Water Power Program Review Meetings
- Annual submissions to the DOE Wind and Water Power Program's Annual Progress Report

- Detailed cost analyses, including Levelized Cost of Energy (LCOE), both interim (at the time of a relevant stage gate) and final[1]
- Turbine performance data and other system operating data as requested by DOE[1]
- Final Technical, Schedule, and Cost Report

SECTION VII – QUESTIONS/AGENCY CONTACTS

Questions regarding the content of this FOA must be submitted to: oswdemo@go.doe.gov not later than 3 business days prior to the application due date.

All questions and answers related to this FOA will be posted on EERE Exchange at: https://eere-exchange.energy.gov/. Please note that you must first select this specific FOA Number in order to view the questions and answers specific to this FOA. DOE will attempt to respond to a question within 3 business days, unless a similar question and answer has already been posted on the website.

Questions related to the registration process and use of the EERE Exchange website should be submitted to: EERE-ExchangeSupport@hq.doe.gov

SECTION VIII - OTHER INFORMATION

A. Amendments

Amendments to this announcement will be posted on the EERE EXCHANGE web site and the Grants.gov system. However, you will only receive an email when an amendment or an announcement is posted on these sites if you register for email notifications for this FOA in Grants.gov. DOE recommends that you register as soon after the release of the FOA as possible to ensure you receive timely notice of any amendments or other announcements.

B. Government Right to Reject or Negotiate

DOE reserves the right, without qualification, to reject any or all applications received in response to this FOA and to select any application, in whole or in part, as a basis for negotiation and/or award.

C. Commitment of Public Funds

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by other than the Contracting Officer, either explicit or implied, is invalid.

D. Proprietary Application Information

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, disclosure of which may harm the applicant, should be included in an application only when such information is necessary to convey an understanding of the proposed project. The use and disclosure of such data may be restricted, provided the applicant includes the following legend on the first page of the project narrative and specifies the pages of the application which are to be restricted:

[1] It is understood that certain cost and performance data may be business sensitive or proprietary. Such data delivered to DOE should be clearly marked as such and will only be used by and handled within DOE, subject to the Special Data Protection Statutes described in Section VII.F.

"The data contained in pages _____ of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the government's right to use or disclose data obtained without restriction from any source, including the applicant."

To protect such data, each line or paragraph on the pages containing such data must be specifically identified and marked with a legend similar to the following:

"The following contains proprietary information that (name of applicant) requests not be released to persons outside the Government, except for purposes of review and evaluation."

E. Evaluation and Administration by Non-Federal Personnel

In conducting the merit review evaluation, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing an application. Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

F. Intellectual Property Developed under this Program

Patent Rights. The government will have certain statutory rights in an invention that is conceived or first actually reduced to practice under a DOE award. 42 U.S.C. 5908 provides that title to such inventions vests in the United States, except where 35 U.S.C. 202 provides otherwise for nonprofit organizations or small business firms. However, the Secretary of Energy may waive all or any part of the rights of the United States subject to certain conditions. (See "Notice of Right to Request Patent Waiver" in paragraph G below.)

Rights in Technical Data. Normally, the government has unlimited rights in technical data created under a DOE agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE's own needs or to insure the commercialization of technology developed under a DOE agreement.

Special Protected Data Statutes. This program is covered by a special protected data statute. The provisions of the statute provide for the protection from public disclosure, for a period of up to five (5) years from the date of its development, of first-produced data that would be trade secret, or commercial or financial information that is privileged or confidential, if the information had been obtained from a non-Federal party. Generally, the provision entitled, Rights in Data – Programs Covered Under Special Protected Data Statutes, (10 CFR 600 Appendix A to Subpart D), will apply to an award made under this FOA. This provision will identify data or categories of data first produced in the performance of the award that will be made available to the public, notwithstanding the statutory authority to withhold data from public dissemination, and may also identify data that will be recognized by the parties as protected data. For National Laboratories and FFRDCs, the data rights clause in Applicant's Management and Operating (M&O) Contract will apply.

Department of Interior Lessees. Awardees which sign leases with the Department of Interior for space on the Outer Continental Shelf will be subject to the Department of Interior's data release regulation found at 30 C.F.R. 585. This regulation will govern those data that Awardees provide to BOEM in connection with leasing sites.

G. Notice of Right to Request Patent Waiver

Applicants may request a waiver of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of an agreement as a result of this FOA, in advance of or within 30 days after the effective date of the award. Even if such advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the award. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784.

Domestic small businesses and domestic nonprofit organizations will receive the patent rights clause at 37 CFR 401.14, i.e., the implementation of the Bayh-Dole Act. This clause permits domestic small business and domestic nonprofit organizations to retain title to subject inventions. Therefore, small businesses and nonprofit organizations do not need to request a waiver.

H. Notice Regarding Eligible/Ineligible Activities

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.

I. Notice of Right to Conduct a Review of Financial Capability

DOE reserves the right to conduct an independent third party review of financial capability for applicants that are selected for negotiation of award (including personal credit information of principal(s) of a small business if there is insufficient information to determine financial capability of the organization).

J. Notice of Potential Disclosure under Freedom of Information Act

Applicants should be advised that identifying information regarding all applicants, including applicant names and/or points of contact, may be subject to public disclosure under the Freedom of Information Act, whether or not such applicants are selected for negotiation of award.

K. Availability of Funds

Awards resulting from this Funding Opportunity Announcement will be subject to the availability of appropriated funds.

SECTION IX – Appendices/Reference Material

Appendix A – Definitions

"Amendment" means a revision to a Funding Opportunity Announcement.

"**Applicant**" means the legal entity or individual signing the application. This entity or individual may be one organization or a single entity representing a group of organizations (such as a team or consortium) that has chosen to submit a single application in response to a Funding Opportunity Announcement.

"**Application**" means the documentation submitted in response to a Funding Opportunity Announcement.

"Authority Having Jurisdiction (AHJ)" is a governmental agency or sub-agency that regulates the construction process.

"Authorized Organization Representative (AOR)" is the person with assigned privileges who is authorized to submit grant applications through Grants.gov on behalf of an organization. The privileges are assigned by the organization's E-Business Point of Contact designated in the CCR.

"**Award**" means the written documentation executed by a DOE Contracting Officer, after an applicant is selected, which contains the negotiated terms and conditions for providing financial assistance to the applicant. A financial assistance award may be either a grant or a cooperative agreement.

"**Budget**" means the cost expenditure plan submitted in the application, including both the DOE contribution and the applicant cost share.

"Central Contractor Registration (CCR)" is the primary database which collects, validates, stores and disseminates data in support of agency missions. Funding Opportunity Announcements which require application submission through FedConnect or Grants.gov require that the organization first be registered in the CCR at http://www.grants.gov/CCRRegister.

"Commissioning" means when a system is generating electricity to the grid.

"**Consortium (plural consortia)**" means the group of organizations or individuals that have chosen to submit a single application in response to a Funding Opportunity Announcement.

"**Contracting Officer**" means the DOE official authorized to execute awards on behalf of DOE and who is responsible for the business management and non-program aspects of the financial assistance process.

"**Cooperative Agreement**" means a financial assistance instrument used by DOE to transfer money or property when the principal purpose of the transaction is to accomplish a public purpose of support or stimulation authorized by Federal statute, and substantial involvement (see definition below) is anticipated between DOE and the applicant during the performance of the contemplated activity.

"**Cost Sharing**" means the respective share of total project costs to be contributed by the applicant and by DOE. The percentage of applicant cost share is to be applied to the total project cost (i.e., the sum of applicant plus DOE cost shares) rather than to the DOE contribution alone.

"Data Universal Numbering System (DUNS) Number" is a unique nine-character identification number issued by Dun and Bradstreet (D&B). Organizations must have a DUNS number prior to registering in the CCR. Call 1-866-705-5711 to receive one free of charge.
http://www.grants.gov/applicants/request_duns_number.jsp

"E-Business Point of Contact (POC)" is the individual who is designated as the Electronic Business Point of Contact in the CCR registration. This person is the sole authority of the organization with the capability of designating or revoking an individual's ability to conduct CCR transactions.

"E-Find" is a Grants.gov webpage where you can search for Federal Funding Opportunities in FedGrants. http://www.grants.gov/search/searchHome.do

"**Financial Assistance**" means the transfer of money or property to an applicant or participant to accomplish a public purpose of support authorized by Federal statute through grants or cooperative agreements and sub-awards. For DOE, it does not include direct loans, loan guarantees, price guarantees, purchase agreements, Cooperative Research and Development Agreements (CRADAs), or any other type of financial incentive instrument.

"FedConnect" is where federal agencies post opportunities and make awards via the web. Any applicant can view public postings without registering. However, registered users have numerous added benefits including the ability to electronically submit applications / responses to the government directly through this site. https://www.fedconnect.net/FedConnect/

"Federally Funded Research and Development Center (FFRDC)" means a research laboratory as defined by Federal Acquisition Regulation 35.017.

"Front-end Engineering and Design (FEED)" means technical concept definition, project standards, common functional design criteria and generic equipment specifications. A 100% FEED is a full design including all cost aspects of the project verified by a third party. A 100% FEED is not a final design.

"Funding Opportunity Announcement (FOA)" is a publicly available document by which a Federal agency makes known its intentions to award discretionary grants or cooperative agreements, usually as a result of competition for funds. Funding opportunity announcements may be known as program announcements, notices of funding availability, solicitations, or other names depending on the agency and type of program.

"**Grant**" means a financial assistance instrument used by DOE to transfer money or property when the principal purpose of the transaction is to accomplish a public purpose of support or stimulation authorized by Federal statute, and no substantial involvement is anticipated between DOE and the applicant during the performance of the contemplated activity.

"Grants.gov" is the "storefront" web portal which allows organizations to electronically find grant opportunities from all Federal grant-making agencies. Grants.gov is the single access point for over 900 grant programs offered by the 26 Federal grant-making agencies. http://www.grants.gov

"Indian Tribe" means any Indian tribe, band, nation, or other organized group or community, including Alaska Native village or regional or village corporation, as defined in or established pursuant to the Alaska Native Claims Settlement Act (85 Stat. 688)[43 U.S.C. § 1601 et seq.], which are recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

"**Key Personnel**" mean the individuals who will have significant roles in planning and implementing the proposed project on the part of the applicant and participants, including FFRDCs.

"**Marine Hydrokinetics (MHK)"** is defined as a complete device that is capable of capturing and converting hydrokinetic energy (wave, current, or tidal) with the purpose of generating electricity for the grid, either via a single unit or configured in an array.

"Marketing Partner Identification Number (MPIN)" is a very important password designated by your organization when registering in CCR. The E-Business Point of Contact will need the MPIN to assign privileges to the individual(s) authorized to perform CCR transactions on behalf of your organization. The MPIN must have 9 digits containing at least one alpha character (must be in capital letters) and one number (no spaces or special characters permitted).

"**Participant**" for purposes of this Funding Opportunity Announcement only, means any entity, including team or consortium members, or other business arrangement (including all parties to the application at any tier), responding to the Funding Opportunity Announcement.

"Principal Investigator" refers to the technical point of contact/Project Manager for a specific project award.

"**Project**" means the set of activities described in an application or other document that is approved by DOE for financial assistance (whether such financial assistance represents all or only a portion of the support necessary to carry out those activities).

"Proposal" is the term used to describe the documentation submitted in response to a Funding Opportunity Announcement. Also see Application.

"Recipient" means the organization, individual, or other entity that receives a financial assistance award from DOE, is financially accountable for the use of any DOE funds or property provided for the performance of the project, and is legally responsible for carrying out the terms and condition of the award.

"**Selection**" means the determination by the DOE Selection Official that negotiations take place for certain projects with the intent of awarding a financial assistance instrument.

"Selection Official" means the DOE official designated to select applications for negotiation toward award under a subject Funding Opportunity Announcement.

"**Substantial Involvement**" means involvement on the part of the Government. DOE's involvement may include shared responsibility for the performance of the project; providing technical assistance or guidance which the applicant is to follow; and the right to intervene in the conduct or performance of the project. Such involvement will be negotiated with each applicant prior to signing any agreement.

"**Total Project Cost**" means all the funds to complete the effort proposed by the applicant, including DOE funds (including direct funding of any FFRDC) plus all other funds that will be committed by the applicant as cost sharing.

"Tribal Energy Resource Development Organization or Group" means an "organization" of two or more entities, at least one of which is an Indian Tribe (see "Indian Tribe" above) that has the written consent of the governing bodies of all Indian Tribes participating in the organization to apply for a grant or loan, or other assistance under 25 U.S.C. § 3503.

Appendix B – PERSONALLY IDENTIFIABLE INFORMATION

In responding to this announcement, applicants must ensure that Protected Personally Identifiable Information (PII) is not included in the following documents: Public Abstract, Project Narrative, Resumes or Budget. These documents will be used by the Merit Review Committee in the review process to evaluate each application. PII is defined by the Office of Management and Budget (OMB) and DOE as:

Any information about an individual maintained by an agency, including but not limited to, education, financial transactions, medical history, and criminal or employment history and information that can be used to distinguish or trace an individual's identity, such as their name, social security number, date and place of birth, mother's maiden name, biometric records, etc., including any other personal information that is linked or linkable to an individual.

This definition of PII can be further defined as: (1) Public PII and (2) Protected PII.

a. **Public PII:** PII found in public sources such as telephone books, public websites, business cards, university listing, etc. Public PII includes first and last name, address, work telephone number, email address, home telephone number, and general education credentials.

b. **Protected PII:** PII that requires enhanced protection. This information includes data that if compromised could cause harm to an individual such as identity theft.

Listed below are examples of Protected PII that applicants must not include in the files listed above to be evaluated by the Merit Review Committee.

- Social Security Numbers in any form
- Place of Birth associated with an individual
- Date of Birth associated with an individual
- Mother's maiden name associated with an individual
- Biometric record associated with an individual
- Fingerprint
- Iris scan
- DNA
- Medical history information associated with an individual
- Medical conditions, including history of disease
- Metric information, e.g. weight, height, blood pressure
- Criminal history associated with an individual
- Employment history and other employment information associated with an individual
- Ratings
- Disciplinary actions
- Performance elements and standards (or work expectations) are PII when they are so intertwined with performance appraisals that their disclosure would reveal an individual's performance appraisal
- Financial information associated with an individual
- Credit card numbers
- Bank account numbers
- Security clearance history or related information (not including actual clearances held)

Listed below are examples of Public PII that applicants may include in the files listed above to be evaluated by the Merit Review Committee:

- Phone numbers (work, home, cell)
- Street addresses (work and personal)
- Email addresses (work and personal)

- Digital pictures
- Medical information included in a health or safety report
- Employment information that is not PII even when associated with a name
- Resumes, unless they include a Social Security Number
- Present and past position titles and occupational series
- Present and past grades
- Present and past annual salary rates (including performance awards or bonuses, incentive awards, merit pay amount, Meritorious or Distinguished Executive Ranks, and allowances and differentials)
- Present and past duty stations and organization of assignment (includes room and phone numbers, organization designations, work email address, or other identifying information regarding buildings, room numbers, or places of employment)
- Position descriptions, identification of job elements, and those performance standards (but not actual performance appraisals) that the release of which would not interfere with law enforcement programs or severely inhibit agency effectiveness
- Security clearances held
- Written biographies (e.g. to be used in a program describing a speaker)
- Academic credentials
- Schools attended
- Major or area of study
- Personal information stored by individuals about themselves on their assigned workstation or laptop unless it contains a Social Security Number

APPENDIX C – COST SHARE INFORMATION

Cost Sharing or Cost Matching

The terms "cost sharing" and "cost matching" are often used synonymously. Even the DOE Financial Assistance Regulations, 10 CFR Part 600, use both of the terms in the titles specific to regulations applicable to cost sharing. DOE almost always uses the term "cost sharing," as it conveys the concept that **non-federal share is calculated as a percentage of the Total Project Cost.** An exception is the State Energy Program Regulation, 10 CFR Part 420.12, State Matching Contribution. Here "cost matching" for the non-federal share is calculated as a percentage of the federal funds only, rather than the Total Project Cost.

How Cost Sharing Is Calculated

As stated above, cost sharing is calculated as a percentage of the Total Project Cost. Following is an example of how to calculate cost sharing amounts for a project with $1,000,000 in federal funds with a minimum 20% non-federal cost sharing requirement:

Formula: Federal share ($) divided by Federal share (%) = Total Project Cost
Example: $1,000,000 divided by 80% = $1,250,000

Formula: Total Project Cost ($) minus Federal share ($) = Non-federal share ($)
Example: $1,250,000 minus $1,000,000 = $250,000

Formula: Non-federal share ($) divided by Total Project Cost ($) = Non-federal share (%)
Example: $250,000 divided by $1,250,000 = 20%

See the sample cost share calculation for a blended cost share percentage below. **Keep in mind that FFRDC funding is DOE funding.**

What Qualifies For Cost Sharing

While it is not possible to explain what specifically qualifies for cost sharing in one or even a couple of sentences, in general, if a cost is allowable under the cost principles applicable to the organization incurring the cost and is eligible for reimbursement under a DOE grant or cooperative agreement, then it is allowable as cost share. Conversely, if the cost is not allowable under the cost principles and not eligible for reimbursement, then it is not allowable as cost share. In addition, costs may not be counted as cost share if they are paid by the Federal Government under another award unless authorized by Federal statute to be used for cost sharing.

The rules associated with what is allowable as cost share are specific to the type of organization that is receiving funds under the grant or cooperative agreement, though are generally the same for all types of entities. The specific rules applicable to:

- Institutions of Higher Education, Hospitals, and Other Nonprofit Organizations are found at 10 CFR600.123;
- State and Local Governments are found at 10 CFR600.224;
- For-profit Organizations are found at 10 CFR600.313.

In addition to the regulations referenced above, other factors may also come into play such as timing of donations and length of the project period. For example, the value of ten years of donated maintenance on a project that has a project period of five years would not be fully allowable as cost share. Only the value for the five years of donated maintenance that corresponds to the project period is allowable and may be counted as cost share.

Additionally, DOE generally does not allow pre-award costs for either cost share or reimbursement when these costs precede the signing of the appropriation bill that funds the award. In the case of a competitive award, DOE generally does not allow pre-award costs prior to the signing of the Selection Statement by the DOE Selection Official.

Following is a link to the DOE Financial Assistance Regulations. You can click on the specific section for each Code of Federal Regulations reference mentioned above.

DOE Financial Assistance Rules (10 CFR 600)

As stated above, the rules associated with what is allowable cost share are generally the same for all types of organizations. Following are the rules found to be common, but again, the specifics are contained in the regulations and cost principles specific to the type of entity:

(A) *Acceptable contributions.* All contributions, including cash contributions and third party in-kind contributions, must be accepted as part of the recipient's cost sharing if such contributions meet all of the following criteria:

(1) They are verifiable from the recipient's records.

(2) They are not included as contributions for any other federally-assisted project or program.

(3) They are necessary and reasonable for proper and efficient accomplishment of project or program objectives.

(4) They are allowable under the cost principles applicable to the type of entity incurring the cost as follows:

(a) *For-profit organizations.* Allowability of costs incurred by for-profit organizations and those nonprofit organizations listed in Attachment C to OMB Circular A–122 is determined in accordance with the for-profit costs principles in 48 CFR Part 31 in the Federal Acquisition Regulation, except that patent prosecution costs are not allowable unless specifically authorized in the award document.

(b) *Other types of organizations.* Allowability of costs incurred by other types of organizations that may be subrecipients under a prime award is determined as follows:

(i) *Institutions of higher education.* Allowability is determined in accordance with 2 CFR 220 Cost Principles for Educational Institutions

(ii) *Other nonprofit organizations.* Allowability is determined in accordance with 2 CFR 230 Cost Principles for Nonprofit Organizations

(iii) *Hospitals.* Allowability is determined in accordance with the provisions of Title 45 Appendix E to Part 74—Principles for Determining Costs Applicable to Research and Development Under Grants and Contracts With Hospitals

(iv) *Governmental organizations.* Allowability for State, local, or federally recognized Indian tribal government is determined in accordance with PART 225—Cost Principles for State, Local, and Indian Tribal Governments (OMB Circular A–87)

(v) Commercial Organizations. Allowability is determined in accordance with FAR Subpart 31.2—Contracts with Commercial Organizations

(5) They are not paid by the Federal Government under another award unless authorized by Federal statute to be used for cost sharing or matching.

(6) They are provided for in the approved budget.

(B) *Valuing and documenting contributions*

(1) *Valuing recipient's property or services of recipient's employees.* Values are established in accordance with the applicable cost principles, which mean that amounts chargeable to the project are determined on the basis of costs incurred. For real property or equipment used on the project, the cost principles authorize depreciation or use charges. The full value of the item may be applied when the item will be consumed in the performance of the award or fully depreciated by the end of the award. In cases where the full value of a donated capital asset is to be applied as cost sharing or matching, that full value must be the lesser or the following:

(a) The certified value of the remaining life of the property recorded in the recipient's accounting records at the time of donation; or
(b) The current fair market value. If there is sufficient justification, the contracting officer may approve the use of the current fair market value of the donated property, even if it exceeds the certified value at the time of donation to the project. The contracting officer may accept the use of any reasonable basis for determining the fair market value of the property.

(2) *Valuing services of others' employees.* If an employer other than the recipient furnishes the services of an employee, those services are valued at the employee's regular rate of pay, provided these services are for the same skill level for which the employee is normally paid.

(3) *Valuing volunteer services.* Volunteer services furnished by professional and technical personnel, consultants, and other skilled and unskilled labor may be counted as cost sharing or matching if the service is an integral and necessary part of an approved project or program. Rates for volunteer services must be consistent with those paid for similar work in the recipient's organization. In those markets in which the required skills are not found in the recipient organization, rates must be consistent with those paid for similar work in the labor market in which the recipient competes for the kind of services involved. In either case, paid fringe benefits that are reasonable, allowable, and allocable may be included in the valuation.

(4) *Valuing property donated by third parties.*

(a) Donated supplies may include such items as office supplies or laboratory supplies. Value assessed to donated supplies included in the cost sharing or matching share must be reasonable and must not exceed the fair market value of the property at the time of the donation.

(b) Normally only depreciation or use charges for equipment and buildings may be applied. However, the fair rental charges for land and the full value of equipment or other capital assets may be allowed, when they will be consumed in the performance of the award or fully depreciated by the end of the award, provided that the contracting officer has approved the charges. When use charges are applied, values must be determined in accordance with the usual accounting policies of the recipient, with the following qualifications:

(i) The value of donated space must not exceed the fair rental value of comparable space as established by an independent appraisal of comparable space and facilities in a privately-owned building in the same locality.

(ii) The value of loaned equipment must not exceed its fair rental value.

(5) *Documentation.* The following requirements pertain to the recipient's supporting records for in-kind contributions from third parties:

(a) Volunteer services must be documented and, to the extent feasible, supported by the same methods used

by the recipient for its own employees.

(b) The basis for determining the valuation for personal services and property must be documented..

APPENDIX D – WORK BREAKDOWN STRUCTURE (WBS) AND RESOURCE LOADED SCHEDULE (RLS) GUIDANCE

Below are examples of a 1) Work Breakdown Structure (WBS) with a WBS dictionary, and 2) a Resource Loaded Schedule (RLS).

For the WBS, applicants are encouraged to use the categories and format provided below while adding additional sub-categories (at level 3 and below) as necessary where indicated. Other product-oriented WBS formats are allowed, but if selected for award the finalized WBS will be negotiated by DOE and the applicant.
The Dictionary fields should focus mainly on products and outcomes rather than on the process to achieve them
Any budgeted contingency funds should be broken out as a separate WBS element but only applied to the system or sub-system level identified as containing high-risk elements
For general WBS guidance, definitions, and best practices, refer to the 2011 Department of Defense (DOD) MIL-STD-881 Rev. C at http://www.everyspec.com/MIL-STD/MIL-STD+(0800+-+0899)/download.php?spec=MIL-STD-881C.037590.pdf

For the RLS, the tasks should be identical to those in the WBS and include with a monthly time-phased budget profile.

WBS #	Level 1	Level 2	Level 3	Level 4	Work Description	Responsible Party (Prime or Sub)	Key Milestones and Dates
1	Project Title						
1.1		Permits				Prime	
1.1.1			State Permits		[Specify key applicable permits]	Prime	Q3 2013: Obtain all state permits
1.1.2			Federal Permits		[Specify key applicable permits]	Prime	Q4 2013: Obtain all federal permits, including….
1.2		Design				Prime	
1.2.1			System Design & Engineering			Prime	
1.2.1.1				[Applicable SD&E elements added here]	System-level design elements that are not applicable to any particular sub-system(s)	Prime	Q3 2013: Complete all system design & engineering
1.2.2			[Specific system/component with design work] #1 (Ex: tower)		Sub-contractor xyz will design a composite tower for selected turbine and platform	Sub - company xyz	Q2 2013: Begin design of composite tower Q4 2013: Complete design, submit to fabricator
1.2.3			[Specific system/component with design work] #2		[Enter work scope description here]	Sub - company xyz	[Enter milestones & dates here]
1.3		Procurement, Fabrication, and Construction			[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.1			Rotor and Controls		[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.1.1				Blades	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.1.2				Pitch Mechanism & Bearings	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.1.3				[Additional sub-system components added here]	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.2			Drive Train and Nacelle		[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.2.1				Gearbox	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.2.2				Generator	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.2.3				Variable Speed Electronics	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.2.4				Main Frame	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.2.5				[Additional sub-system components added here]	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.3			Tower		[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.3.1				Tower Structure	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.3.2				Maintenance Cranes	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.3.3				[Additional tower equipment elements added here]	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.4			Foundation		[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.4.1				Structure	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]

1.3.4.2	Erosion Control	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.4.3	[Additional sub-system components added here]	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.5	Floating Platform [if applicable]	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.5.1	Structure Shell (TLP, Semi-sub, etc)	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.5.2	[Additional sub-system components added here]	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.6	Mooring System [if applicable]	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.6.1	Anchors	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.6.2	Tendons	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.6.3	[Additional sub-system components added here]	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.5	Interconnection Equipment	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.5.1	Substations, Grid Mimic System, etc	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.5.2	Cables	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.5.3	[Additional sub-system components added here]	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.6	Support Equipment & Facilities	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.6.1	General Support Vessels for Platform Access	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.6.2	Specialized Vessel Type #1	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.6.3	Specialized Vessel Type #2	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.6.5	[Additional Equipment and Materials added here]	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.6.6	[Applicable Testing, Storage, etc Facilities added here]	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.7	Integration, Assembly, Test and Checkout	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.7.1	System-Level Integration & Assembly	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.7.2	Land-based Commissioning Testing	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.7.3	Offshore Testout	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.7.4	Re-work Associated With Overall System Interconnection	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.3.7.5	[Applicable IATC elements added here]	[Enter work scope description here]	[prime/sub]	[Enter milestones & dates here]
1.4	Project Management	[Enter work scope description here]	Prime	[Enter milestones & dates here, if applicable]
1.4.1	Staff	[Enter work scope description here]	Prime	[Enter milestones & dates here, if applicable]
1.4.2	Materials/Supplies	[Enter work scope description here]	Prime	[Enter milestones & dates here, if applicable]
1.4.3	Travel	[Enter work scope description here]	Prime	[Enter milestones & dates here, if applicable]
1.4.4	Education and Outreach	[Enter work scope description here]	Prime	[Enter milestones & dates here, if

applicable]

Example of product-oriented Work Breakdown Structure & WBS Dictionary

Example of a Resource Loaded Schedule (RLS)

WBS #	Title	Planned Spending ($K)								
		FY 2013								
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	…
1	Project Title	$200	$300	$475	$495	$550	$500	$75	$50	
1.1	Permitting									
1.1.1	State Permits	$50	$50	$100	$100	$100	$125	$75	$50	
1.1.2	Federal Permits	$100	$100	$150	$150	$200	$150			
1.2	Design									
1.2.1	System Design & Engineering									
1.2.1.1	[Applicable SD&E elements added here]	$50	$50	$100	$100	$100	$50			
1.2.2	[Specific system/component with design work] #1 (Ex: tower)		$75	$75	$120	$150	$175			
1.2.3	[Specific system/component with design work] #2		$25	$50	$25					
1.3	Procurement, Fabrication, and Construction									
1.3.1	Rotor and Controls									
1.3.1.1	Blades									
1.3.1.2	Pitch Mechanism & Bearings									
1.3.1.3	[Additional sub-system components added here]									
1.3.2	Drive Train and Nacelle									
1.3.2.1	Gearbox									
1.3.2.2	Generator									
1.3.2.3	Variable Speed Electronics									
1.3.2.4	Main Frame									
1.3.2.5	[Additional sub-system components added here]									
1.3.3	Tower									
1.3.3.1	Tower Structure									

1.3.3.2	Maintenance Cranes									
1.3.3.3	[Additional tower equipment elements added here]									
1.3.4	Foundation									
1.3.4.1	Structure									
1.3.4.2	Erosion Control									
1.3.4.3	[Additional sub-system components added here]									
1.3.5	Floating Platform [if applicable]									
1.3.5.1	Structure Shell (TLP, Semi-sub, etc)									
1.3.5.2	[Additional sub-system components added here]									
1.3.6	Mooring System [if applicable]									
1.3.6.1	Anchors									
1.3.6.2	Tendons									
1.3.6.3	[Additional sub-system components added here]									
1.3.5	Interconnection Equipment									
1.3.5.1	Substations, Grid Mimic System, etc									
1.3.5.2	Cables									
1.3.5.3	[Additional sub-system components added here]									
1.3.6	Support Equipment & Facilities									
1.3.6.1	General Support Vessels for Platform Access									
1.3.6.2	Specialized Vessel Type #1									
1.3.6.3	Specialized Vessel Type #2									
1.3.6.5	[Additional Equipment and Materials added here]									
1.3.6.6	[Applicable Testing, Storage, etc Facilities added here]									
1.3.7	Integration, Assembly, Test and Checkout									
1.3.7.1	System-Level Integration & Assembly									
1.3.7.2	Land-based Commissioning Testing									
1.3.7.3	Offshore Testout									
1.3.7.4	Re-work Associated With Overall System Interconnection									
1.3.7.5	[Applicable IATC elements added here]									
1.4	Project Management									
1.4.1	Staff	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
1.4.2	Materials/Supplies	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx

1.4.3	Travel	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
1.4.4	Education and Outreach	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Total				Total FY13 =		$2,645				

APPENDIX E– ENVIRONMENTAL CHECKLIST

Please answer the following questions with as much detail and information as is available. Consultation with experts or advisors in your organization to assist with this questionnaire is highly recommended. Please provide proper citations or supporting documentation where appropriate. Providing complete and accurate information in the Checklist will help facilitate DOE in completing a timely NEPA review and determination. The Environmental Checklist will be evaluated to: (1) ensure that the environmental factors are considered in the decision-making process; (2) determine adequacy and completeness of furnished data; and (3) assess the Applicant's awareness of project-related requirements, including requirements for mitigating any project-related adverse environmental risks and impacts; (4) contribute to the merit review evaluation and selection decision.

1. Please provide the coordinates and general description of the proposed site for your project including distances from the nearest coast and the mainland.
2. Please indicate in the table below if any coordination or discussions have been initiated with the listed agencies. If documentation of these coordinations are available, please attach it to your application in Exchange and note the file name in the "Attachment(s)" column in the table. If coordinations have not been initiated, please indicate when coordinations will begin or why coordinations are is not required in the "Explanation" column in the table.

#	Agency Coordination	Yes / No	Explanation	Attachment(s)
2.1	U.S. Coast Guard			
2.2	U.S. Army Corps of Engineers			
2.3	National Marine Fisheries Service			
2.4	U.S. Fish and Wildlife Service			
2.5	State Historic Preservation Officer			
2.6	Tribal Historic Preservation Officer			
2.7	Federal Aviation Administration			
2.8	Department of Defense Notification			

3. Have discussions been initiated with stakeholders, local organizations, and/or non-profit organizations? If yes, please discuss with whom and the outcome of these discussions. If not, please explain why stakeholders have not been engaged, when contact is planned to occur, and a description of the stakeholder engagement strategy.
4. Please indicate in the table below if any of the following studies, reviews, and/or plans have been completed for the proposed project. If documentation of these studies/reviews/plans is available, please attach it to your application in Exchange and note the file name in the "Attachment(s)" column in the table. If studies/reviews/plans have not been completed, please indicate when they

will begin or why they are not required in the "Explanation" column in the table.

#	**Studies, Reviews and Plans**	**Yes / No**	**Explanation**	**Attachment(s)**
4.1	Avian Studies			
4.2	Bat Studies			
4.3	Noise Studies			
4.4	Visual Studies			
4.5	Electromagnetic Fields (EMF)			
4.6	Hydro-acoustic			
4.7	Marine Vibration			
4.8	Contingency and Response Plan			
4.9	Salvage Plan			

5. Have considerations for the items listed in the table below been incorporated into your project? For all that apply, please provide a brief explanation in the "Narrative" column in the table. Add any considerations, as necessary to the bottom of the list (for example, recreational resources, transmission and grid connection points, etc.). If any documentation is available to support the information provided in this table, please attach it to your application in Exchange and note the file name in the "Attachment(s)" column in the table.

#	**Environmental Statutes and Considerations**	**Narrative**	**Attachment(s)**
5.1	Magnuson-Stevens Fishery Conservation and Management Act		
5.2	Migratory Bird Treaty Act		

5.3	Marine Mammal Protection Act		
5.4	Clean Water Act		
5.5	River and Harbors Act		
5.6	Ports and Waterways Safety Act		
5.7	National Historic Preservation Act		
5.8	Coastal Zone Management Act		
5.9	Bald and Golden Eagle Protection Act		
5.10	Estuaries		
5.11	Benthic Resources		
5.12	Marine Sanctuaries		
5.13	Wildlife Refuges		
5.14	State-listed Threatened or Endangered Species		
5.15	Federal-listed Threatened or Endangered Species		
5.16	Historic Resources (visual or sunken bodies)		
5.17	Commercial Fishing		
5.18	Recreational Fishing		

APPENDIX F – ADDITIONAL SITING CONSIDERATIONS

DOE recognizes that siting, permitting and approval processes pose the greatest risks to achieving the proposed timeline for Topic Area 2 of this FOA. Completing a new project sited in Federal Waters, outside the Department of the Interior's designated Wind Energy Areas (WEAs) will be particularly challenging in the timelines proposed here. A project sited in Federal Waters will require a lease – whether commercial, limited, or research – and other approvals in accordance with 30 CFR Part 585. DOE is working closely with the Bureau of Ocean Energy Management (BOEM) and other federal agencies in order to mitigate these risks and presents the following considerations to potential applicants as a means to ensure that proposals have the highest probability of success in the proposed timeline. Applicants are also encouraged to heed the following suggestions to help future collaborative and permitting processes run as efficiently as possible.

Although the suggestions provided below are written with leases in Federal waters in mind, much of the information will be of value to all applicants in ensuring and conveying to DOE a thorough and efficient permitting and approval process for their project, regardless of location. The Environmental Checklist in Appendix E is intended as a tool to assist DOE and applicants in addressing these considerations.

1.) A project should propose a primary site, along with a prioritized set of alternate sites, recognizing that even some well-vetted sites may become unviable due to obstacles unforeseen at the application stage.

2.) The size of the project, and thus a proposed primary or alternate site, should be no larger than one 3 nm^2 lease block. This allows for a maximum of between 9 and 12 turbines, assuming 200 m rotor diameter and approximately 1 nm spacing between foundations, depending upon project orientation.

3.) DOE strongly encourages early and frequent pre-consultation with all applicable Federal, Tribal, State, and Local Authorities Having Jurisdiction (AHJ). DOE further encourages applicants to seek out and propose improvements to advance the project review process, in coordination with other efforts such as Federal-State partnerships that may already be underway. Finally, agencies such as the Department of Defense, NOAA and the U.S. Fish and Wildlife Service have a wealth of knowledge of existing resources and uses of the ocean and other US waters and submerged lands that will be highly relevant to siting proposed projects.

4.) As stated in Appendix E, applicants should undertake a thorough review of all relevant Federal, State, and Local statutory and regulatory authorities. Knowledge of these authorities and associated processes will aid applicants in developing their proposed projects both in the application and award phases. Relevant federal statutes and authorities include but are not limited to: Endangered Species Act (ESA); Marine Mammal Protection Act (MMPA); Outer Continental Shelf Lands Act (OCSLA); National Marine Sanctuaries Act; Energy Policy Act of 2005; National Environmental Policy Act; State Environmental Policy Act (SEPA); Coastal Zone Management Act (CZMA); Ocean Dumping Act (Marine Protection, Research and Sanctuaries Act of 1972); National Historical Preservation Act (NHPA), including Native American Tribal rights; Paleontological Resources Preservation Act; Migratory Bird Species Act; Golden and Bald Eagle Protection Act; Clean Air Act; Clean Water Act; Rivers and Harbors Act; Magnuson-Stevens Fishery Conservation and Management Act; etc.

5.) DOE also strongly encourages applicants to include in their proposals frequent and extensive consultation with local stakeholders with a potential interest in the proposed site(s). Such consultation could provide multiple benefits. First, it may aid NEPA-mandated public processes by broaching potential issues early and often. Additionally, pre-consultation will help establish if multiple use conflicts exist and how to best resolve or mitigate conflicts at the earliest stage possible. Where possible, applicants and awardees are encouraged to seek win-win solutions to conflict that benefit multiple interests. Finally, such consultation may help the industry advance in the future by gaining a better understanding of what these conflicts are and how to deal with them.

For instance, the interactions between fisheries and other competing use issues and offshore wind remain relatively unexplored.

6.) Several publicly available sources of data related to multiple use, environmental, and permitting considerations in coastal and offshore areas exist that will be of benefit to applicants as they evaluate potential sites. Where possible, you are encouraged to work with relevant agencies to explore access to information that has already been collected. Such sources include (this list is indicative and not intended to be exhaustive):

- a. Federal Resources
  - i. Ocean Data.gov
    1. http://www.data.gov/ocean
  - ii. Multipurpose Marine Cadastre
    1. http://www.marinecadastre.gov/default.aspx
  - iii. NOAA Data Centers
    1. National Geophysical Data Center
       - a. http://www.ngdc.noaa.gov/
    2. National Climactic Data Center
       - a. http://www.ncdc.noaa.gov/oa/ncdc.html
    3. National Oceanographic Data Center
       - a. http://www.nodc.noaa.gov/
    4. National Data Buoy Center
       - a. http://www.ndbc.noaa.gov/
  - iv. US Integrated Ocean Observing System (IOOS)
    1. http://www.ioos.gov/
- b. State Resources such as Coastal Atlases:
  - i. A full listing is available through the Multipurpose Marine Cadastre
    1. http://www.marinecadastre.gov/default.aspx
  - ii. Washington State Coastal Atlas hosted by the Department of ecology
    1. https://fortress.wa.gov/ecy/coastalatlas/
  - iii. Oregon Coastal Atlas
    1. http://www.coastalatlas.net/
- c. Regional Resources such as:
  - i. West Coast Governors Alliance on Ocean Health
    1. http://www.westcoastoceans.org/
  - ii. Federal-State Taskforces on Offshore Renewable Energy Development
    1. http://www.boemre.gov/offshore/RenewableEnergy/StateActivitiesProjects.htm

7.) As mentioned elsewhere in this FOA, there is a substantial opportunity to use projects awarded under this FOA to capture environmental data of benefit to regulatory agencies and the industry as a whole. Applicants should provide in their proposals plans for monitoring their sites and the environmental effects of their projects from site assessment through commissioning and beyond.

8.) For projects proposed in federal waters, every effort should be made to ensure that a Determination of No Competitive Interest (DONCI) can be granted for the proposed project sites in a timely fashion.

APPENDIX G – TECHNOLOGY READINESS LEVELS

Technology readiness, and associated Technology Readiness Levels (TRLs) are used by numerous federal agencies (including the U.S. Department of Defense (DoD) and the National Aeronautics and Space Administration (NASA)) and many private sector companies, as a measure to assess the maturity of evolving technologies. The use of TRLs enables consistent, uniform, discussions of technical maturity across different types of technologies.
In this FOA, TRL's will be used to assess the readiness of major components and subsystems to be deployed as part of fully integrated offshore wind energy facilities that will meet the stated objectives of the Advanced Technology Demonstration Projects.
The summary TRL definitions that apply to this FOA are provided below.

	Technology Readiness Level Definition
TRL 1	**Basic Research:** Initial scientific research begins. Principles are qualitatively postulated and observed. Focus is not on applications.
TRL 2	**Applied Research:** Initial practical applications are identified. Potential of material or process to satisfy a technology need is confirmed.
TRL 3	**Critical Function or Proof of Concept Established:** Applied research continues and early stage development begins. Studies and initial laboratory measurements to validate analytical predictions of separate elements of the technology.
TRL 4	**Lab Testing/Validation of Alpha Prototype Component/Process:** Design, development and lab testing of components/processes. Results provide evidence that performance targets may be attainable based on projected or modeled systems.
TRL 5	**Laboratory Testing of Integrated/Semi-Integrated:** System Component and/or process validation in relevant environment.
TRL 6	**Prototype System Verified:** System/process prototype demonstration in an operational environment (beta prototype system level).
TRL 7	**Integrated Pilot System Demonstrated:** System/process prototype demonstration in an operational environment (integrated pilot system level).
TRL 8	**System Incorporated in Commercial Design:** Actual system/process development is complete and system is qualified (while in TRL 8) through test and demonstration (pre-commercial demonstration).
TRL 9	**System Proven and Ready for Full Commercial Deployment:** Actual system is proven (while in TRL 9) through successful operations in operating environment to be ready for full commercial sales and deployment.

Applicants are expected to include a TRL assessment with their applications. At a minimum, the complete TRL assessment package should include separate assessments of the following major system elements:
1. Turbine and tower
2. Foundation platform and anchoring system
3. Electrical interconnect system (major components including subsea cabling)

4. Turbine installation equipment

Where innovation or first time use in the marine environment is proposed for a component or subsystem of the major elements above, including for instance a new turbine rotor or tower, a separate assessment should be provided for that component.

In the assessment, major components that are commercially available (i.e. TRL descriptions of research and development stages no longer apply) should be designated as such.

For components that are not currently commercially available, justification of the assumed TRL level must be provided. Sufficient justification is viewed as an applicant's ability to provide substantial and substantiated detail regarding research, development, and demonstration (RD&D) efforts that (a) have already been undertaken and (b) will be undertaken to advance the technology to the required TRL level prior to deployment as part of an Advanced Technology Demonstration Project.

Information regarding technology readiness should be provided in a format similar (but not necessarily identical) to the format provided here:

TECHNOLOGY READINESS ASSESSMENT

Assessment #_____ of _____
Major System Element: _____
TRL Level (if not fully commercial): _____
Manufacturer or Source (if commercially available): _____
Substantiating Information (may be attached): _____
_____
_____

APPENDIX H –LEVELIZED COST OF ENERGY CALCULATION

Overview

This attachment describes the methods, assumptions and approaches that shall be used to define and support economic figures of merit prepared in response to the *U.S. Offshore Wind: Advanced Technology Demonstration Projects FOA* activities described in Topic Areas 1 & 2. The figure of merit is Levelized Cost of Energy (LCOE), calculated using assumptions for conditions at a reference site specified by the applicant. This method provides a means to evaluate design options that offer significant innovation in wind technology to reduce capital cost, increase energy capture, and improve reliability. LCOE provides a merit criterion integrating both cost and performance and reflects an approach based on previous work conducted by NREL on low wind speed (LWS) technologies[2] and adapted here for offshore wind turbine and wind plant innovations.

It is not DOE's intent to prescribe specific set point design criteria for FOA respondents. Rather, the approach and methods indicated provide a guide to help evaluate proposed technology innovations in a systematic manner accepted by manufacturers and the financial community. In the following tables and figures a representative project with 3.6 MW turbines has been provided **as a guide only**. The associated data do not reflect a commercial product and should be used only as an example demonstrating the calculations.

It is important to evaluate the impact of proposed innovations from an integrated systems perspective. For example, a novel concept increasing turbine rotor diameter and/or tower height in order to improve capacity factor and annual energy production will certainly affect the cost of both subsystems. These changes may, however, also increase turbine loads, dynamic response, and fatigue, and thereby adversely impact the foundation, control algorithms, actuator duty cycle, etc. Thus, any proposed innovation should be evaluated in the context of potential effects on all impacted subsystems.

The LCOE analysis method "book keeps" impacts from a cost and performance perspective. It is incumbent upon the applicant to 1) provide the analysis method, approach and results quantifying impacts, enhancements, and detriments, 2) translate this information into the cost and performance differences shown in the comparison tables below, and 3) explain the resulting advantages in terms of cost, performance and reliability over existing technology and/or approaches.

The innovations proposed will determine the level of analysis and fidelity required. In Tables 2, 3 and 4, the three analysis levels (summary line, level-1, and level-2) reflect increasing fidelity and typical design and analysis categories that need to be considered. The extent to which each level is applicable to a specific analysis depends upon the innovation proposed and is at the discretion of the applicant.

For example, a proposed innovation in electrical distribution installation would most likely affect only some of the elements in the balance of system summary section. Analyses would focus only on the relevant items in that section, and if the section lacks sufficient clarity and detail, the applicant would supplement the table as necessary by adding the required fidelity (table rows) as necessary to compare proposed innovations with existing commercial baselines. In this particular case, it may not be necessary to address other sections (e.g., AEP or Turbine Capital Cost) unless they are also impacted. Again, the focus should be on fully describing the impact relative to the proposed innovation with levels of analyses: 1) deemed necessary and sufficient by the applicant, and 2) that facilitate an evaluation by a knowledgeable professional familiar with wind energy technology.

---

[2] Schreck, S.; Laxson, A. (2005). Low Wind Speed Technologies Annual Turbine Technology Update (ATTU) Process for Land-Based, Utility-Class Technologies. 29 pp.; NREL Report No. TP-500-37505

Applicants are highly encouraged to use and provide all of the following tables for LCOE calculations to be submitted with their applications. The information provided in these tables should provide the basis used by the applicant in justifying the enhancements to current technology given the innovations proposed. LCOE information provided by the applicant should include adequate detail and explanation to ensure that all assumptions and calculations may be checked in the Merit Review process.

Applicants are asked to provide three (3) LCOE calculations. The first calculation should reflect the costs of the proposed project. The second LCOE calculation should be for an approximately 500MW wind farm that includes only innovations and advances expected to be derived from the results of the proposed project. For example, if the proposed project is for an innovative turbine, this second calculation should show the cost savings due to mass producing the turbine as well as the saving of installing multiple units in a farm, but not include cost savings that may come from a new installation vessel that is not part of the proposed project. In the third LCOE calculation, savings due to incorporating assumed innovations and general industry advance by others such as new installation vessel or advanced electrical substation may be included. Explanations should be provided to justify the cost reduction from the *Proposed Project* to the *500MW Farm with Proposed Project Innovations Only* and then to the *500MW Farm with Proposed Project and Other Industry Innovations*.

Assumptions
Certain assumptions must be made about the design site conditions under which a wind turbine or wind plant is operating. Table 1 lists the operating parameters for a 3.6MW turbine example. Applicants should fill out their own site and configuration details for their proposed project for the three (3) LCOE calculations requested, along with justification for any differences.

Table 1. Description Operating Parameters for the Turbine & Wind Plant

Description	***3.6 MW Turbine Example***	***Proposed Project***	***500 MW Farm with Proposed Project Innovations Only***	***500 MW Farm with Proposed Project and Other Industry Innovations***
Wind Plant Rating	360 MW			
Number of Turbines	100			
System Design Life	20 years			
Turbine Rating	3600 kW			
Rotor Diameter	107 m			
Hub Height	90 m			
Gearbox Type	3-stage geared			
Generator	Asynchronous			
Foundation Type	Monopile			
Distance to Shore	20 km			
Water Depth	15 m			
Wind Speed @ Hub Height	8.9 m/s			
Weibull K Factor	2.1			
Base Wind Shear	0.1			
Air Density	1.225 kg/m^3			
Max Rotor Cp	0.47			
Tip Speed Ratio at Max Cp	90 m/s			
$V_{cut\text{-}in}$	3			
$V_{cut\text{-}out}$	25			
Losses (from Eqn. 6)	10%			

Availability (from Eqn. 6)	95%			

Cost of Energy
The primary figure-of-merit is the levelized cost of energy (LCOE), which is to be provided in constant, January 2012 dollars. LCOE is calculated for a wind power plant, with an expected operating life of 20 years, using the following equation:

(1)	LCOE	=	$\frac{(DR+IWF) \times ICC + LRC + O\&M}{AEPnet}$
where:	LCOE	≡	Levelized Cost of Energy ($/kWh) (constant dollars)
	DR	≡	Discount Rate (1/yr)
	IWF	≡	Insurance, Warranty and Fees (1/yr)
	ICC	≡	Initial Installed Capital Cost ($)
		≡	$TUR_{CC} + BOS_{CC}$
	TUR_{CC}	≡	Turbine Capital Cost ($)
	BOS_{CC}	≡	Balance of System Capital Cost ($)
	LRC	≡	Levelized Replacement/Overhaul Cost ($/yr)
	O&M	≡	Levelized O&M Cost ($/yr)
	AEPnet	≡	Net Annual Energy Production (kWh/yr)

Initial Capital Cost
The Initial Capital Cost is the sum of the Turbine System Capital Cost (TUR_{CC}) and the Balance of System Capital Cost (BOS_{CC}). Neither cost should include construction financing or financing fees, because these are calculated and added separately.

The Turbine System Capital Cost shall be supported by a tabular listing of component costs and weights listed in Table 2. Costs shall be based on a manufacturing volume of 500 MW per year or as applicable to the analysis. For sites where the turbine type, number and wind plant capacity are already known, the known values should be used. In estimating the cost of components manufactured in-house, assembly labor and manufacturing overhead shall be included. Thus, the stated cost should be the same as that developed in a "buy/make" analysis.

The list of capital cost components provided in Table 2 is representative and may not be inclusive; applicants are encouraged to modify the table as necessary to: 1) reflect and highlight their design innovations over the baseline, and 2) provide total LCOE of the total wind plant (full systems analysis). It is important that the total impact on the overall wind plant LCOE be included as part of the final analyses and justification.

A weight summary for the primary components as provided in Table 2b should also be provided. Component weights may be used in the Merit Review process to help substantiate component and installation costs.

Table 2. Initial Capital Cost of Wind Energy Systems

Analysis Level	***Representative Categories***	***3.6 MW Turbine***	***Proposed Project***	***500 MW Farm with Proposed***	***500 MW Farm with Proposed***

		Example ($/kW)	*($/kW)*	*Project Innovations Only ($/kw)*	*Project and Other Innovations ($/kw)*
Turbine Capital Cost					
TURBINE CAPITAL COST, TUR_{CC}		**1,789**			
1	**Turbine:**	1,789			
2	Rotor	*Incl*			
2	Drive train, nacelle	*Incl*			
2	Tower	*Incl*			
Balance of System Capital Cost					
BALANCE OF SYSTEM CAP COST, BOS_{CC}		**3,648**			
1	**Development:**	58			
2	Permits	*Incl*			
2	Engineering	*Incl*			
2	Site Assessment	*Incl*			
1	**Project Management**	117			
1	**Support Structure:**	1,021			
2	Foundation (fixed or floating)	*Incl*			
2	Transition Piece (if applicable)	*Incl*			
2	Secondary Steel (decks, j-tubes...)	*Incl*			
2	Anchoring System (if applicable)	*N/A*			
1	**Port and Staging**	73			
1	**Transportation:**	*Incl in Install*			
2	Turbine	*Incl*			
2	Substation/Interconnection	*Incl*			
2	BOS Hardware	*Incl*			
1	**Installation:**	1,109			
2	Turbine Installation	*Incl*			
2	Cable Installation	*Incl*			
2	Substation Installation	*Incl*			
2	Scour Protection	*Incl*			
1	**Electrical Infrastructure:**	540			
2	Array Cables	*Incl*			
2	Offshore Substation	*Incl*			
2	Export Cable(s)	*Incl*			
2	Onshore Substation and Transmission Facilities	*Incl*			
1	**Other:**	0			
2	Control, Safety System, and Condition Monitoring	0			
2	Personal Access Equipment	0			

1	**Soft Costs:**	730			
2	Insurance	94			
2	Surety Bond (Decommissioning, 3% of ICC)	165			
2	Contingency	471			

Table 2b. Weight Summary of Wind Energy Systems

Analysis Level	***Representative Categories***	***3.6 MW Turbine Example (kg/kW)***	***Proposed Project (kg/kW)***	***500 MW Farm with Proposed Project Innovations Only (kg/kw)***	***500 MW Farm with Proposed Project and Other Innovations (kg/kw)***
WEIGHT TOTAL					
1	**Turbine:**				
2	Rotor				
2	Drive train, nacelle				
2	Tower				
1	**Support Structure:**				
2	Foundation (fixed or floating)				
2	Transition Piece (if applicable)				
2	Secondary Steel (decks, j-tubes...)				
2	Anchoring System (if applicable)				

Levelized O&M Cost

Operations and Maintenance Cost (O&M) is a significant component of annual operating expenses; especially for offshore systems. The O&M Cost should reflect the unique service and operational constraints of the proposed innovation. This list is representative and may not be inclusive; applicants are encouraged to modify the table as necessary to reflect their design innovations and/or unique conditions at the proposed site. Because O&M is tax deductible, the final O&M value should be multiplied by 60% (1 – 40%, where 40% is the combined federal-state tax rate). Thus, the levelized O&M Cost calculation is:

(2)	O&M	=	First Year O&M Cost (in 2010 dollars) x 0.60

Table 3. Operations and Maintenance Costs of Wind Energy Systems

Analysis Level	***Representative Categories***	***3.6 MW Turbine Example ($/kW)***	***Proposed Project ($/kW)***	***500 MW Farm with Proposed Project Innovations Only ($/kw)***	***500 MW Farm with Proposed Project and Other Innovations ($/kw)***
Operations & Maintenance Cost					
OPERATIONS & MAINTENANCE, O&M		**96**			
2	General Maintenance	75			
2	Bottom Lease	21			
2	Plant Operations Cost	*Incl*			
2	Scheduled Turbine Maintenance (labor, parts and supplies)	*Incl*			

2	Unscheduled Turbine Maintenance (labor, parts and supplies)	*Incl*			
2	Equipment & Facilities Maintenance (labor, parts and supplies)	*Incl*			
2	Administration and support	*Incl*			

Levelized Replacement/Overhaul Cost

Levelized Replacement/Overhaul Cost distributes the cost of major replacements (such as gearboxes, blades and other high cost components) and overhauls over the life of the wind turbine. Downtime during replacements and overhauls shall also be included in the determination of overall turbine availability when calculating AEP in Equation 6. In the pro forma cash flow model, one "saves" for replacements and overhauls with deposits to a reserve fund in the years preceding the maintenance event. The repair is then depreciated using a straight-line convention. Consequently, both of these items – the major maintenance reserve fund and the repair depreciation – shall be incorporated into the calculation of Levelized Replacement/ Overhaul Costs. If maintenance reserve fund payments will be used, the following calculations shall be performed.

Use the following equation to determine the Present Value of each stream of reserve fund deposits incurred for each discrete replacement and overhaul event:

(3)	$PV(n)$	=	$PVF(n_{mp}) \times RC(2012) \times (1.03)n$
where:	$PV(n)$	≡	Present Value of annual stream of reserve fund for event occurring in year (n)
	$PVF(n_{mp})$	≡	Present Value Factor for mid-point year of reserve fund payment stream
		=	$(1 + i)\text{-}n_{mp}$
	i	≡	Nominal discount rate = (0.0925)
	$RC(2012)$	≡	Replacement/Overhaul Cost in year 2012
	Note: in the formula above, 1.03n is an inflation factor		

For example, if a replacement is made in year 10, the mid-point year (n_{mp}) is 5, because reserve fund payments are made from years 1 through 10. If second identical replacement follows in year 20, the mid-point year for that event is 15, because the reserve fund payments for that replacement were made from years 10 through 20. However, if replacement is made only in year 20, the mid-point year is 10.

Calculate the Levelized Replacement/Overhaul Cost (in constant dollars) by multiplying the sum of present values of the reserve fund payment streams by the Capital Recovery Factor:

(4)	LRC	=	$0.8 \times CRF \times \sum PV(n)$
where:	CRF	≡	Capital Recovery Factor
		≡	$i_{const} / (1-(1+ i_{const})^{-30}) = 0.073$

and where:	i_{const}	≡	Constant dollar discount rate = 0.0607
			Note: the factor 0.80 accounts for depreciation of each replacement (this factor was derived from a utility-scale finance model[3].

Table 4. Levelized Replacement Costs for Wind Energy Systems

Analysis Level	*Representative Categories*	*3.6 MW Turbine Example ($/kW)*	*Proposed Project ($/kW)*	*500 MW Farm with Proposed Project Innovations Only ($/kw)*	*500 MW Farm with Proposed Project and Other Innovations ($/kw)*
Levelized Replacement Cost					
LEVELIZED REPLACEMENT COST, LRC		40			
2	Blades	*Incl*			
2	Electrical Components	*Incl*			
2	Drivetrain	*Incl*			
2	Other	*Incl*			

Discount Rate and Insurance, Warranty and other Fees:
The discount rate (DR) reflects finance charges, debt or equity repayment, construction financing, and the cost of capital. It requires assumptions regarding inflation rates and tax protection benefits among other factors. The discount rate is generally representative of a specific ownership and cash flow structure and may vary over time. However, a fixed value is required for comparisons across technologies and a composite or average DR may be used to represent an array of financing structures. Due to the diversity of financing structures applied by the wind industry today, the DR used in this analysis is not indicative of one particular financing approach in particular; rather it is a composite of possible financing terms, investor strategies and market wide influences. The discount rate for the purposes of these cost comparisons will be fixed at **7% for a 20 year project life**.

In addition to the discount rate, there are additional finance charges due to insurance, warranty and other fees (IWF) over the life of a project. For the purposes of these cost comparisons, the insurance, warranty and fees are estimated at **1%**.

Net Annual Energy Production

The Net Annual Energy Production shall be calculated using wind-turbine performance specifications, estimated energy losses, and turbine availability. AEP calculations shall be supported by a tabular listing of the parameters in Table 1. Actual wind speed resource data is of course preferable, but most likely unavailable. The following methodology assumes knowledge of the average wind speed at turbine hub height and a Rayleigh wind distribution.
Generic Annual Energy Production shall be calculated using the methodology described in the latest draft[4]

[3] George, K.; Schweitzer, T. (2006). Primer: The DOE Wind Energy Program's Approach to Calculating Cost of Energy. ; NREL/SR-500-37653.

[4] IEC 61400-12-1, Wind Turbines, Part 12-1: Power performance measurements of electricity producing wind turbines, 2005

of the International Electrotechnical Commission (IEC) Standard 61400-12-1. For calculations of LCOE, the wind speed range should be divided into 0.5 m/s bins as specified in the IEC standard. If actual data do not exist, the following equations can be used.

(5)	AEP_i	=	$[F(Vi) - F(Vi\text{-}1\ \text{-}1)] * [(Pi + Pi\text{-}1) / 2]$
	AEPtot	=	$Nh * \sum_{i=1}^{N} AEP_i$
where:	AEPtot	≡	Annual Energy Production (kWh/yr/turbine)
	Nh	≡	Number of hours in one year (8760)
	N	≡	Number of wind speed bins
	Vi	≡	Normalized and averaged wind speed in bin (i) (m/s)
	Pi	≡	Normalized and averaged power output in bin (i) (kW)
and:	F(V)	=	$1- \exp [-\pi/4 \times (V/V_{hub})^2]$
	F(V)	≡	Rayleigh cumulative probability distribution function for wind speed
	V	≡	Actual wind speed (m/s)
	Vhub	≡	Annual average wind speed at hub height (m/s)

Turbine performance shall be tabulated as electrical power output at the bus bar versus wind speed at hub height in Table 5. The table shall show power output for wind speeds from 0 to 30 m/s in 0.5 m/s increments starting with 0.5 m/s. If the table is based upon measurements, normalizations and averaging using the IEC methodology, it shall identify which bins include "measured" data (based on three, 10-minute data sets) and which bins are extrapolations of measured data. If the table is based on projected performance, the rotor configuration and analysis method (e.g. PROP) shall be clearly stated.

Net Annual Energy Production shall account for energy losses and availability as follows.

(6)	AEPnet	=	AEPtot x (1 - EL) x Availability
where:	EL	≡	Product of individual energy losses (% losses expressed as a decimal)
		≡	1 - (1 - Lsoiling) x (1 - Lcontrol) x (1 - Lcollect) x …..
	Lsoiling	≡	Blade soiling losses
	Lcontrol	≡	Controls and miscellaneous losses
	LDT	≡	Drivetrain Mechanical Losses
	LPE	≡	Drivetrain Electrical System Losses
	Lcollect	≡	Collection system losses from the turbines to the substation
	Ltrans	≡	Collection system losses from substation to grid
	Lother	≡	Other losses specifically defined
	Availability	≡	Annual hours system is capable of operating / 8760 hours

Energy Losses and Availability shall be specified in Table 6. Availability is the ratio of the number of hours that the turbine was capable of operating during a certain period (excludes the number of hours that it could not operate because of maintenance or fault situations) to the total number of hours.

Table 5. Turbine Power Curve and Site Specific Wind Speed

		Proposed Project		
Bin	**V (m/s)**	**P (kW)**	**Cp**	**AEP (kWh)**

(7)	C_P	=	$P / (0.5 * Rho * A*V^3)$
Where:	C_P	≡	Turbine Power Output Coefficient
	P	≡	Bin averaged power output (kW)
	Rho	≡	Reference air density
	A	≡	Rotor swept area (m^2)
	V	≡	Bin averaged wind speed (m/s)

Table 6. Annual Energy Wind Farm Production Summary

Representative Categories	***3.6 MW Turbine Example***	***Proposed Project***	***500 MW Farm with Proposed Project Innovations Only***	***500 MW Farm with Proposed Project and Other Innovations***
Total Installed Capacity (MW)				
AEP_{TOT} (MWh/y)				
EL (total losses %)				
Availability (%)				
AEP_{NET} (MWh/y)				
Capacity Factor: AEP_{NET}/(Rated Power *8760 hours)				

Summary

The costs from the major categories should be summarized in Table 7 by dividing the total costs of each category by the net Annual Energy Production to obtain a Levelized Cost of Energy. For the Balance of System and Turbine Capital Cost categories, the discount rate (DR) and insurance, warranty and fees (IWF) should be used to calculate the final LCOE.

Table 7. Wind Energy Systems LCOE Summary

Representative Categories	***3.6 MW Turbine Example ($/kWh)***	***Proposed Project ($/kWh)***	***500 MW Farm with Proposed Project Innovations Only ($/kWh)***	***500 MW Farm with Proposed Project and Other Innovations ($/kWh)***
Turbine Capital Cost*				
Balance of System Cost*				
Operations & Maintenance Cost				
Levelized Replacement Cost				
Total System:				

*These categories should be multiplied by the DR and IWF to obtain LCOE.