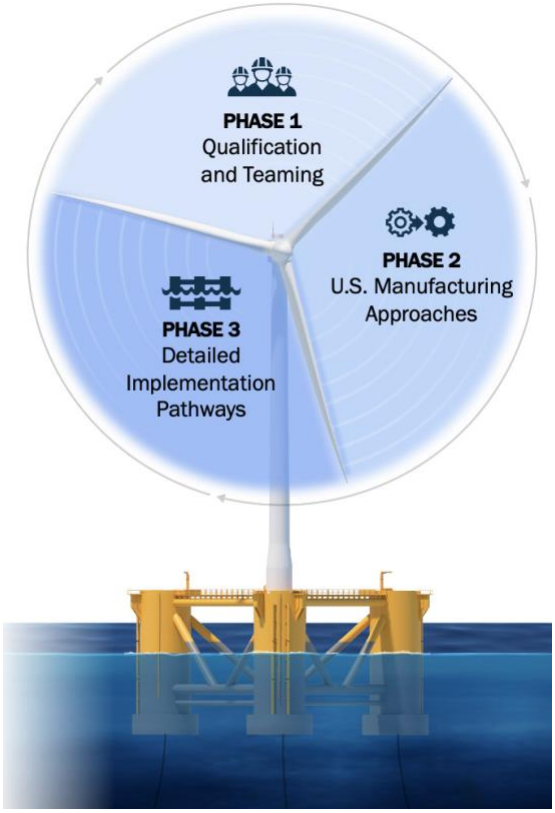
FLoating Offshore Wind ReadINess (FLOWIN) Prize

Request for Comments on Draft Phase Two and Phase Three Evaluation Criteria



Contents

List of Tables

1 Introduction

Phase one of the FLoating Offshore Wind ReadINess (FLOWIN) Prize was announced by the Department of Energy's (DOE's) Wind Energy Technologies Office (WETO) on September 12, 2022, with submittals from competitors due on January 13, 2023. Phase two of the prize is anticipated to open in March 2023. This document provides the technical evaluation criteria and content expectations for review and comment. These criteria, content expectations, and comments from the public may be incorporated into the full rules documents for Phase two and Phase three.

The purpose of providing this draft for public review is to solicit comments on its content from the prize competitors, floating offshore wind industry, and other stakeholders. See the section "Questions for Respondents" below. All responses will be considered the viewpoint of the individual or organization that submitted them. Consensus is not being sought, and feedback may or may not be incorporated entirely at the discretion of WETO and the prize administrators.

For reference, the FLOWIN Phase one Rules Document may be found here: https://americanmadechallenges.org/challenges/flowin/docs/FLOWIN_Official_Prize_Rules.pdf Details on the background and intended focus areas for FLOWIN competitors, the criteria for Phase one, and topics not of interest are provided in that document and will not change in the subsequent phases. A glossary of key terms used in the document is also included in the Phase one Rules Document.

General information on the prize competition, including frequently asked questions, may be found at https://www.herox.com/FLOWIN/faq

1.1 Questions for Respondents

WETO is interested solely in feedback on draft materials for the Phase two and Phase three competitions. WETO is not soliciting input on the overall focus of the prize or on other possible prizes or focus areas for research and development funding. Comments that make a "pitch" for a specific floating platform design or company without responding to all evaluation criteria are not of interest and will be disregarded.

WETO welcomes informed responses to the following questions regarding the draft criteria tables and supporting information provided in this request for comments.

1. Are the content expectations for competitors clearly stated and realistic for each of the criteria?
2. If not, are there particular criteria that you would reword, add, or remove? Provide rationale.
3. Is the reasoning behind each of the four categories clear, with limited overlap and redundancy? Are there criteria that you would add or delete within a category?
4. Do the progressions within individual criteria between phases appear to be logical? If not, please specify.
5. Is the clarifying information provided in the appendix of the draft rules document helpful?
6. Do the guidelines and expectations for estimating costs, domestic content, and cost reduction potential appear reasonable and useful?
7. Are there any other comments that you would like to make?

1.2 Context: FLOWIN Prize Structure

The FLOWIN Prize will have three phases with a total prize pool of $5.75M, plus at least $1.1M in vouchers for technical support from DOE national laboratories. Prizes will be divided among multiple awardees. The potential cumulative cash award value to any one awardee through the three phases is $1.45M, plus at least $175k in vouchers. The structure of the prize awards is provided here:

	Cash Prize per Awardee	Voucher Value per Awardee	Anticipated Number of Awards
Phase One	$100,000	$75,000	8
Phase Two	$450,000	$100,000	5
Phase Three	$900,000	-	3

Under a prize structure, funding awards are made on the merits of completed work and may be used to offset the costs of further work. There are no restrictions on how winners use the cash prizes. Awards will be made for each phase, and only the winning teams of each phase will be eligible to compete for the next phase.

Vouchers are funds that must be expended at DOE national laboratories. DOE will not take any interest in intellectual property developed by competitors under this prize. However, any intellectual property developed at a national lab will be subject to the terms of the agreement between the competitor and the national lab. There are several types of agreements possible between competitors and labs. Lab contracting staff will negotiate appropriate agreements with voucher recipients. Agreements for Commercializing Technology (ACTs) are agreements that labs can make with third parties that have less administrative burden than Cooperative Research and Development Agreements (CRADAs).

1.3 Context: Anticipated Prize Schedule

Competitors will have approximately 8 months to complete Phase two submittal packages after the opening date and 9 months for Phase three.

1.4 Context: Overall Scope of Phases 2 and 3

Phase Two: U.S. Manufacturing Approaches

During Phase two, teams will research and develop plans to transition their floating platform technologies from proven designs to serial production for deployment in gigawatt-scale wind farms. These plans should identify the required subcomponents and specifically emphasize activities such as U.S. manufacturing and supply chain development, material handling and tooling requirements, limitations in existing infrastructure (e.g., ports and vessels), and potential design engineering refinements to lower cost and increase domestic content. Submissions should show an understanding of a realistic progression of development and phasing of deployment to achieve the installation of gigawatt-scale wind farms.

Phase Three: Detailed Implementation Pathways

The activities evaluated in Phase three will be related to the completion of a detailed, highly credible implementation plan for U.S. manufacturing and deployment of the subject floating technology. Competitors will need to establish an industrialization pathway leading from their current stage of technology development to its deployment in gigawatt-scale wind farms in U.S. waters. All aspects of the process will need to be addressed, including the expected contribution of U.S. suppliers, fabrication facility and tooling plans, specific port accommodations, and how vessel requirements will be met. This plan should also identify current limitations that might hinder increased use of the U.S. supply chain as well as recommended solutions.

2 Phase Two and Phase Three Evaluation Criteria

The tables that follow provide draft content expectations and evaluation criteria for judges. There is one table for each of the four categories listed here:

- **Evaluation Category 1: Platform Design Status and Suitability for Purpose**

Intent: Establish that the floating platform design is fit for the intended purpose, has been tailored to facilitate mass manufacturing for large-scale floating wind farms, and has been suitably vetted for structural integrity, reliable operation when supporting a wind turbine, and survivability in harsh marine environments.

- **Evaluation Category 2: U.S. Production Planning**

  Intent: Establish manufacturing, supply chain, and deployment plans to achieve gigawatt-scale production of the floating platform and assess related costs and domestic content.

- **Evaluation Category 3: U.S. Location Considerations**

  Intent: Identify locations where the floating platform could be assembled and deployed, indicate how workforce needs could be met, and address potential environmental and ocean co-use effects.

- **Evaluation Category 4: Commercialization Pathway and Execution Plan**

  Intent: Outline how the anticipated progression from current product status to commercial wind-farm-scale sales and serial production capabilities will be managed; assess risks and mitigation measures.

2.1 Technical Narrative

In each phase, competitors will be required to submit a Technical Narrative that provides information that is responsive to the content expectations and evaluation criteria of each category. Scoring of entries will be based on that narrative and any supporting information provided in an appendix. The total length of the Technical Narrative cannot exceed 15,000 words in Phase two and 20,000 words in Phase three. Graphics and figures may be included in the narrative without the text within them or their captions being included in the word count. Competitors may also include an appendix with up to 20 pages of supporting material not in narrative format that is referenced in the Technical Narrative, such as additional graphics and/or tables, spreadsheets, calculations, and letters of support.

> **Important Note Regarding Expected Content**
>
> The same information may be incorporated into the narrative for more than one phase of the Prize, provided it has been updated to reflect progress made, and remains responsive to evaluation criteria of the subsequent phase. Reviewers will NOT be familiar with the material submitted in prior phases.

2.2 Check-In Meetings

WETO will request status meetings with individual competitors at 3 and 6 months after a phase opens to answer questions and gauge progress toward the submittal package for that phase. These meetings will not impact prize scoring or judging.

2.3 Scoring Methodology

The Technical Narrative and other submission materials will be assessed based on a series of scoring statements, described in Table 3; each statement will be scored from 1 to 6, as shown in Table 1, depending on how well the materials address the scoring criteria. Table 2 explains how the scores for each submission will be calculated.

Table 1. Scoring Criteria Descriptions

1	2	3	4	5	6
Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree

Table 2. Scoring Methodology

Phase Two Categories	Scored Statements	Percentage of Total Score	Total Possible Points
Category 1: Platform Design Status and Suitability for Purpose	4	26.7%	24
Category 2: U.S. Production Planning	5	33.3%	30
Category 3: U.S. Location Considerations	3	20%	18
Category 4: Commercialization Pathway and Execution Plan	3	20%	18
TOTAL	**15**	**100%**	**90**

Phase Three Categories	Scored Statements	Percentage of Total Score	Total Possible Points
Category 1: Platform Design Status and Suitability for Purpose	2 (one is double-weighted)	20%	18
Category 2: U.S. Production Planning	5	33.3%	30
Category 3: U.S. Location Considerations	3	20%	18
Category 4: Commercialization Pathway and Execution Plan	3 (one is double-weighted)	26.7%	24
TOTAL	**13**	**100%**	**90**

Table 3. Suggested Technical Narrative Content and Scored Statements for Phases 2 and 3

Evaluation Category 1: Platform Design Status and Suitability for Purpose

Intent: Establish that the floating platform design is fit for the intended purpose, has been tailored to facilitate mass manufacturing for large-scale floating wind farms, and has been suitably vetted for structural integrity, reliable operation when supporting a wind turbine, and survivability in harsh marine environments.

PHASE TWO		PHASE THREE	
Content Expectations	**Scored Statements**	**Content Expectations**	**Scored Statements**
Technical Feasibility: a) Provide an up-to-date overview of the floating platform concept and key aspects of the design, including any active buoyancy or station-keeping control functions. Provide illustrations. b) Summarize progress of the Front-End Engineering and Design (FEED) process and the status of completed or planned platform engineering validation reviews, component and material tests, tank or field testing, and demonstrations to establish that the design is robust and ready to be considered for large-scale manufacturing and commercial investment. c) Indicate any key remaining design challenges and unknowns, and how the competitor proposes to address them through engineering and analysis. See concept maturity criteria outlined in Appendix 1.	The engineering and validation information provided supports the assertion that the competitor's floating platform design is suitable for deployment and operation in large-scale wind farms. Plans for addressing remaining design refinement and technical validation needs are appropriate.	**Technical Design Maturity**: a) Provide up-to-date information on the design configuration. b) Update the status of the detailed engineering process, including further plans for realizing validation milestones such as model testing, full-scale demonstration, and certification by an independent entity. c) Confirm that the technical design parameters are compatible with any newly available data on metocean conditions at site(s) the team has targeted for commercial development of floating wind farms (per case study under Category 3). d) Update previously submitted information detailing the physical and electrical integration of the floating platform into the balance of the wind farm, including attachment points, overall system control, and dynamic considerations during operation.	Based on the information provided, the competitor has established that their floating platform design is technically mature and suitable for deployment and operation in large-scale offshore wind farms at U.S. sites. **This statement is double-weighted.**
Design Site Characteristics: Provide an updated list of the range of meteorological ocean (metocean) conditions and specifications to which the floating platform has been designed. Indicate to what extent the design is tailored or targeted for specific regions or site parameters. See Appendix 1 for typical parameters.	The competitor's product design parameters demonstrate an understanding of and compatibility with the characteristics of likely or targeted floating offshore deployment sites in U.S. waters.		

Integration with Turbine and Balance of Plant: Based on latest design refinements, including changes made or proposed to facilitate manufacturing, update the approach to ensuring compatibility of the floating platform design with other necessary wind farm components (e.g., turbine, mooring) and processes (e.g., installation), including engineering for attachment, lifting and towing points, design loads, and harmonic considerations. Include information illustrating how the design is compatible with or adaptable to specific currently available and anticipated next-generation offshore wind turbines, including interaction of control strategies and functions, as appropriate.	The narrative demonstrates continued implementation of a logical and informed technical approach to integrating the floating platform design with the balance of offshore wind system components during deployment and operation, including the interface requirements of specific and next-generation turbines.		
Optimization of Design for U.S. Mass Manufacturing and Deployment: Provide the rationale behind design features and proposed changes intended to reduce cost, complexity, and increase throughput of serial production and deployment, and/or enable U.S. manufacture. Show that feedback from supply chain and deployment assessments (Evaluation Category 2 below) has been integrated in the platform design.	The competitor has demonstrated that they have thoroughly assessed the manufacturability of the platform design with relevant experts and have provided the rationale behind specific design features or adaptations proposed to date that optimize its suitability for domestic mass manufacturing and deployment.	**Final Manufacturability Assessment**: Provide an update to the manufacturability of the design investigation and conclusions provided in Phase two. Describe any additional design refinements being considered for cost reduction and enabling mass manufacturing and deployment in designated regions of the U.S. Indicate the steps and timeline for engineering and validating them within the overall platform design. Indicate any future design changes that could be considered to further reduce cost and manufacturing throughput.	The competitor's design has been well vetted to confirm its suitability for serial production and wind farm deployment in the U.S., resulting design refinements have been made, and potential future refinements have been identified.

Evaluation Category 2: U.S. Production Planning

Intent: Establish manufacturing, supply chain, and deployment plans to achieve gigawatt-scale production of the floating platform and assess related costs and domestic content.

PHASE TWO		PHASE THREE	
Content Expectations	**Scored Statements**	**Content Expectations**	**Scored Statements**
Preliminary U.S. Platform Manufacturing Plan: Provide a draft manufacturing plan for the updated floating platform design that includes key materials and quantities required; fabrication requirements; specialized processes and tooling; primary outsourced components; transportation and handling needs; and steps leading to final platform assembly. Identify remaining gaps, barriers, and unknowns to be resolved, along with proposed solutions that could be addressed through technology.	The manufacturing plan covers the range of inputs, procedures, and direct sources required to fabricate, transport, and assemble the subject platform design. The processes identified are realistic, and the potential solutions to gaps and barriers are feasible.	**U.S. Platform Manufacturing Plan**: Finalize the manufacturing plan that includes the key materials required, the availability of major components, and the companies that can supply them to the point of assembly based on the supply chain assessment. Detail any specific manufacturing capabilities such as fabrication facilities, processes, and specialized tooling that need to be developed, which companies could provide them, and where they could be located. Identify supply chain uncertainties (such as potential raw material shortages), contingencies, and possible new opportunities or solutions that may be incorporated as expanded U.S. capabilities become available.	The manufacturing and supply chain plan covers the full range of inputs and procedures required to build, transport, and assemble the floating platform components for an offshore wind farm, with key suppliers and fabrication processes identified.
U.S. Supply Chain Assessment: Provide an assessment of how to most effectively meet the supply, services, and fabrication requirements listed in the manufacturing plan and how to maximize domestic content. Include candidate supply chain companies and partnerships. Include an analysis identifying U.S. supply chain constraints and gaps such as lack of domestic availability, uncompetitive costs, or	The supply chain assessment shows congruity with the platform design details and the preliminary manufacturing plan. It is thorough in scope, identifies potential suppliers and partners, and recognizes gaps and constraints. The potential solutions to addressing known gaps are feasible. Efforts to maximize		

logistics difficulties. Elaborate on potential solutions such as using different processes or components, partnering to build necessary capabilities, or design modifications to inform the optimization for the manufacturing process (Evaluation Category 1).	domestic content have been summarized.		
Preliminary Integration and Deployment Plan: Update the preferred approach for final assembly and deployment of the platforms at gigawatt wind farm scale, including on-site or quay-side integration with turbines and other components and maintaining stability during platform tow out and anchoring. Include required lifting and handling capacities, laydown areas and soil bearing capacities, wet and dry assembly areas, and vessel needs. Identify constraints currently limiting implementation of the approach at gigawatt scale in the U.S. and/or regionally and recommend potential solutions. See Appendix 1 for recommended port and vessel infrastructure information.	The approach to product assembly and deployment is well thought out and feasible. Potential constraints on implementing the approach have been articulated and effective solutions have been proposed.	**Integration and Deployment Plan**: Complete a plan for final assembly and deployment of the platforms at wind farm scale, including on-site integration with turbines and other components and maintaining stability during towing and anchoring. Address key requirements such as lifting and handling capacities, laydown areas and soil bearing capacities, wet and dry assembly areas, and vessel needs. Provide examples of existing facilities, including necessary product-specific modifications and upgrades that could typically be required.	The approach to product assembly and deployment has considered all key operations, infrastructure, and equipment requirements. The plan is technically and logistically achievable, and examples of facilities have been provided, including necessary product-specific modifications and upgrades.
Production Rate: Estimate the floating platform fabrication and installation cycle time and facility throughput in terms of megawatts per month. Indicate key assumptions related to tooling and facilities. Provide a preliminary plan for reducing cycle time and increasing throughput, including the rationale and feasibility of those reductions. Indicate whether	The competitor has carried out a credible fabrication and installation estimation process to arrive at unit cycle time and throughput and has a preliminary plan to reduce cycle time and/or increase facility throughput to meet deployment targets.	**Production Rate:** Complete a detailed fabrication and assembly production rate estimate demonstrating the reduction in floating platform cycle time and increase in total facility throughput in megawatts per month. The estimate should quantify the improvements from changes in platform design and changes to supply chain, manufacturing and assembly methods, or facilities.	The competitor has demonstrated a full understanding of fabrication processes and rates and approaches to accelerating timelines to support higher volumes and more rapid deployment.

improvements will arise from changes in platform design and/or changes in supply chain, manufacturing and assembly methods, or facilities.			
Capital Costs: Estimate the capital costs of mass-producing the floating platform design for a commercial scale wind farm project, including mounting the turbines and installation on the project site, based on a bill of materials and required investment in facilities, tooling, and other equipment. Ensure that there is consistency between cost assumptions and details provided in response to other prize criteria (e.g., manufacturing plan, supply chain assessment, commercialization pathway), particularly with regard to timelines. Indicate per line item what goods and services (or portions thereof) are domestically sourced. Provide a preliminary plan for achieving the total estimated capital costs, including assumed reductions from the currently verifiable pricing with rationale as to why those reductions are feasible. Indicate sensitivities potentially impacting costs such as price volatility and lack of optimal port facilities or other infrastructure and how those could be overcome. Indicate what assumed cost improvements may arise from changes in platform design, changes in mass manufacturing	The competitor has carried out credible cost analyses in the specified format, has developed a preliminary plan to realize the estimated costs, including reductions from currently verifiable costs and sources, and has demonstrated that the proposed approaches to cost savings are feasible.	**Capital Costs:** Complete a detailed cost plan for floating platform manufacturing, turbine assembly, and site installation based on a bill of materials and required investment in facilities, tooling, and other equipment. Indicate per line item whether goods and services are domestically sourced. Address potential impacts of and responses to volatility in the price of goods and to market demands for floating platform price reductions. The estimate should quantify the reductions in cost to be realized from changes in platform design and changes in mass manufacturing methods or logistics processes. See Appendix 1 for information on cost analysis approach and format.	The competitor has demonstrated a full understanding of costs and areas to save money in serial production through potential improvements to the design, processes, supporting infrastructure, and/or supply chain capacities.

methods or logistics, and/or supply chain maturity. See Appendix 1 for information on cost analysis approach and format, and availability of assistance from NREL analysts.			
		Domestic Content: Summarize benefits to the U.S. economy stemming from the floating platform production process. Within the capital costs spreadsheet, tally the costs for domestically sourced goods and services and compare them to the overall projected costs on a percentage basis (see example in Appendix A). In the narrative, provide relevant information on the origin of key materials and components. If components or materials are purchased from a U.S. company but originate overseas with little or no work on them being carried out by the U.S. entity, they are considered non-domestic content. If, for instance, the raw materials are of foreign origin but significant work on a component is done in the U.S., domestic content can be calculated as a portion of the value of that component. Discuss ways in which the production process will enhance U.S. industrial capabilities. Identify any obstacles to U.S. sourcing and how they could be overcome in the future to maximize domestic content and economic benefit.	The domestic economic benefits analysis demonstrates that the planned production process will increase U.S. manufacturing and supply chain capabilities and contribute to economic growth. The planned domestic content percentage is substantial, and the competitor has conveyed they have realistic plans to maintain or increase that content as production volume grows.

Evaluation Category 3: U.S. Location Considerations

Intent: Identify locations where the floating platform could be assembled and deployed, indicate how workforce needs could be met, and address potential environmental and ocean co-use effects.

PHASE TWO		PHASE THREE	
Content Expectations	**Scored Statements**	**Content Expectations**	**Scored Statements**
Candidate Deployment Site(s) and Port(s): Provide scenarios identifying a potential offshore wind energy area or multiple areas where deployment of a gigawatt-scale floating wind farm is likely and identify potential ports and vessel types that could support assembly and installation of the floating platform design. Confirm that the deployment sites fall within the parameters established in the "Design Site Characteristics" criterion. Based on the requirements provided in response to the criterion "Preliminary Integration and Deployment Plan," indicate to what extent the potential ports and vessel types meet the requirements for carrying out the final assembly and installation approach, and identify any gaps, modifications, or upgrades that would need to be addressed for the proposed ports and vessels.	The competitor has identified one or more sites where gigawatt-scale floating wind farms may be developed, along with ports and vessels that could support floating platform assembly and deployment for those areas. They have confirmed that the site characteristics fall within the design parameters of their floating platform. They have shown to what extent the ports and vessels meet the criteria indicated in the "Preliminary Integration and Deployment Plan" and have identified practical modifications or upgrades that could be made where necessary.	**Deployment Site and Port**: As a case study focusing on a specific wind energy area where deployment of gigawatt-scale floating wind farm is likely, identify one or more ports to meet the facility requirements for platform assembly and installation in accordance with the "Integration and Deployment Plan." Identify partner or subcontractor companies to provide fabrication and or installation services. Indicate the results of investigations into how infrastructure gaps and shortcomings could be overcome, including evidence of interaction on these matters with port authorities, operators, and other relevant parties. Assess how the needs for suitable support vessels could be met in that area.	The competitor has identified a specific wind energy area as well as port(s) to support assembly and deployment; provided information on meeting key facilities, vessel types, and subcontract services needs; and investigated how gaps could be met through modifications, upgrades, or new builds for the proposed ports and vessels or other related infrastructure.
Workforce and Community Considerations: Provide a preliminary plan quantifying likely labor needs for meeting full-scale production requirements, and how those needs could be met directly by the lead company and/or at major suppliers.	The preliminary workforce plan is realistic in quantifying production labor and skill needs and how they could be met. It identifies potential impacts of extended large-scale production on local communities, including benefits to disadvantaged and underserved groups.	**Workforce and Community Considerations**: Focusing on the subject area for the case study under "Deployment Site and Port," complete a workforce plan, using specific organizations and communities that will be involved, the nature of training	The workforce plan is appropriate to the scale of the proposed operations, with locations and engaged organizations and communities identified, and specifically identifies the potential to benefit

Identify approximate number of workers, necessary skills, potential training needs, and methods for promoting workforce diversity, including organized labor groups. Consider potential impacts, positive or negative, on communities and infrastructure where production processes may be carried out over extended periods of time, and how disadvantaged or underserved groups may benefit. See Appendix 1 for additional information.		required, and time scale for a prepared workforce. Indicate how these specific plans with communities and organizations meet the objectives of the Biden administration's Justice40 Initiative by benefiting disadvantaged and underserved communities. See Appendix 1.	disadvantaged groups and local communities.
Environmental and Co-Use Management Plan: Provide an assessment of potential environmental and ocean co-use impacts related to manufacturing, installation, or operation of the subject platform design. Identify an approach to establishing best practices for evaluating, avoiding, and mitigating concerns. See Appendix 1 for additional details.	The competitor is aware of potential environmental and ocean co-use concerns and has identified an approach to establishing best practices for evaluating, avoiding, and mitigating these issues.	**Environmental and Co-use Management Plan**: Provide an environmental management plan relevant to the deployment site and port identified in the criterion above to address potential concerns that have been identified and actions to reduce, mitigate, or manage these. Topics should include emissions, ecological and social impacts, and ocean co-use considerations. Please prepare this information in anticipation of potential National Environmental Policy Act (NEPA) analysis and other Bureau of Ocean Energy Management environmental requirements. See Appendix 1 for additional details.	The competitor demonstrates a good understanding of potential environmental and ocean co-use concerns and has a detailed management plan for managing and mitigating these issues at a candidate site.

Evaluation Category 4: Commercialization Pathway and Execution Plan

Intent: Outline how the anticipated progression from current product status to commercial wind-farm-scale sales and serial production capabilities will be managed; assess risks and mitigation measures.

PHASE TWO		PHASE THREE	
Content Expectations	**Scored Statements**	**Content Expectations**	**Scored Statements**
U.S. Commercialization and Production Readiness Pathway: Present an up-to-date overview of the planned steps, activities, and opportunities leading from the current technical readiness level of the floating platform to achieving product commercialization in a competitive market, and wind-farm-scale U.S. supply chain and production capabilities. Incorporate key steps and milestones indicated in responses to other evaluation criteria. Identify any planned phasing of investments, costs, or facilities being considered. Include statements of support from potential customers, partners, suppliers, local jurisdictions, and other entities whose collaboration will be needed to achieve those goals.	The steps and milestones within the planned progression from current technical development status to securing large-scale commercial contracts and building supply chain and serial production capabilities in the U.S. are well thought out and realistic; competitor shows evidence of doing extensive customer and stakeholder discovery; evidence of industry support indicates a high likelihood of success.	**U.S. Commercialization Plan**: Update the plan for achieving production readiness and commercialization of the floating platform as a product sold into a very competitive large-scale offshore wind farm equipment market. Identify any planned phasing of investments, costs, or facilities being considered. Include the names of companies committed to the process and timing of each step. Mention areas of uncertainty and/or alternative pathways to meeting specific needs.	The steps within the planned progression from current technical development status to commercial sales and serial production are realistic and achievable. Other companies have been engaged to confirm feasibility of the approach and the timeline. Competitor shows evidence of doing extensive customer and stakeholder discovery. **This criterion is double-weighted.**
Execution Plan: Provide details on the overall organizational approach to achieving the objectives articulated in the other evaluation categories. Include information on program management; lead competitor's experience and qualifications; team composition and qualifications; and a diversity, equity and inclusion plan. See Appendix 1 for additional suggestions on content.	The competitor's plan reflects a coordinated and thorough management approach conveying confidence that their U.S. manufacturing and supply chain development objectives have a high likelihood of success. The team structure and level of expertise are appropriate to address the range of multi-year program needs, and there is	**Management and Execution Plan**: Provide a detailed plan for managing the full implementation of building the supply chain and enabling mass manufacturing to reach gigawatt-scale deployment. Include information on program management; communication; lead competitor's experience and qualifications; team composition and qualifications; and a diversity, equity and	The competitor has in place a coordinated and thorough management approach and team, conveying confidence that the mass manufacturing and supply chain development planning has a high likelihood of success.

Briefly describe how the prize money will positively impact progress in the U.S. toward manufacturing and deployment of floating offshore wind.	a credible plan in place to promote diversity and inclusivity of team personnel. The statement on anticipated benefits of the prize funds for the floating offshore wind industry is insightful and realistic.	inclusion plan. See Appendix 1 for additional suggestions on content.	
Risk Assessment: Draft a risk assessment matrix for the process of scaling the floating design for serial production and commercial deployment, including risk description, likelihood, and consequences. Include risks identified in or related to other evaluation criteria such as technical development, supply chain, price volatility, assembly and operations, suitability of available ports, commercialization hurdles, etc. Discuss potential mitigation measures to lower or eliminate the identified risks.	The risk assessment covers critical factors with a justifiable approach to likelihood and consequences, and the mitigation measures are appropriate.	**Risk Management Plan**: Complete a full risk assessment and management plan expanding on the work done in Phase two.	The risk management plan covers the appropriate risks, and suitable management practices are in place.

Appendix 1 Technical Clarifications

The following notes provide clarifications and additional information on desirable content for the Technical Narrative. The sections below indicate the categories and evaluation criteria to which they pertain. When issued with the actual rules document for Phase two, and later for Phase three, these clarifications will likely be modified to focus only on the recommended content and evaluation criteria designated for each phase.

Important Notes:

- Clarifications are provided here only for those categories and subcategories for which specific reference to this appendix is made in the criteria (Table 3).
- These notes are supplemental to and should be consulted only in conjunction with the content recommendations and scoring criteria provide in Table 3.
- The same information may be incorporated into the narrative for more than one phase of the Prize, provided it has been updated to reflect progress made and remains responsive to evaluation criteria of the subsequent phase. It should not be assumed that reviewers will be familiar with the material submitted in prior phases.

A.1.1 Category 1: Platform Design Status and Suitability for Purpose

A1.1.1 Criterion: Technical Feasibility

Background

The intent of the FLOWIN Prize is to support the development of plans for producing floating offshore wind substructures. Therefore, it is assumed that the plans put forth by competitors for consideration will be based on floating substructure (referred to herein as the floating platform) designs that have reached a certain demonstrable level of maturity. Early-stage design concepts will not be of interest to the prize evaluators.

It is expected that a Front-End Engineering and Design (FEED) process for a full-scale design has been completed or is in process. FEED is an engineering design approach used to control expenses and thoroughly plan a project or product before detailed design and engineering. The FEED process should focus on technical requirements, initial cost estimates for the project or product, and identifying and evaluating potential risks.

For the purposes of this prize, “full scale” refers to floating designs able to support commercial turbines of at least 12-MW rating for general utility-scale applications. Designs to support smaller, utility-scale turbines for specific locations or applications (e.g., the Great Lakes) may be included if convincing rationale is provided. Support for development of novel floating wind turbine design concepts linked to a given floating substructure is not within the scope of this prize.

Recommended Technical Feasibility Content

To enable the evaluators to understand and assess the technical feasibility and maturity of the floating substructure design, it is recommended that competitors include the following information in their technical narrative, as relevant to their product development status. Where similar in content to prior phases, the information should be updated based on progress made since those submittals.

- Include basic design drawing(s) sufficient to illustrate the architecture and key features of the product
- Describe the status of testing and validation to date, including subscale testing/prototyping, full-scale operating prototype(s), and validation of integrated turbine/floating structure system
- Summarize status and/or summarize results of the FEED process, including determination of operational stability, load response and other key performance indicators

- Summarize status and/or results of any engineering reviews conducted by independent certification bodies, verification agents, or others that may have conducted technical due diligence
- Indicate any key remaining design challenges and unknowns, and how competitors propose to address them through engineering and analysis.

A1.1.2 Criterion: Design Site Characteristics

Background

The intent of this criterion is to have competitors describe the site characteristics that they have considered during the system design process, particularly in terms of key threshold parameters, and to demonstrate their awareness that those design parameters are suitable for U.S. waters where gigawatt-scale floating wind farms are likely to be deployed.

Recommended Site Characteristics Content

Table A-1 lists data categories that are typically considered during the process of designing structures for the marine environment. Competitors may use this table or another format to convey the design envelope and parameter values that they have considered to date in the floating product engineering process, and that those parameters are relevant to a representative site or sites in U.S. waters. Indicate to what extent the design is tailored or targeted for specific geographic regions or site parameters. Categories may be added to best support statements made regarding suitability of the design for U.S. conditions.

Table A-1. Key Site Parameters Determining Design Suitability (Nonexhaustive List)

Category	Parameter	Product Design Range or Limits	Applicability to Potential U.S. Sites
Water and wave data	Water depth (suitable range)		
	Extreme water levels (highest tides, etc.)		
	Average annual significant wave height		
	50-year extreme wave height		
	Wind/wave misalignment		
Wind data	Turbine wind class to which the product has been engineered		
Other factors	For example, hurricanes, seismic events, or other environmental considerations		

A.1.2 Category 2: U.S. Production Planning

A1.2.1 Criterion: Integration and Deployment Plan

Background

The requirements of port facilities and vessels for fabricating, assembling, holding, and deploying floating offshore systems will vary with substructure configuration and size. In responding to this criterion, the competitor should illustrate that they have considered and quantified key port factors and vessel types that will enable or constrain these

functions based on their unique platform design. As stated elsewhere, the design under consideration should be sized for turbines of at least 12-MW rating unless otherwise justified.

Recommended Port and Vessel Infrastructure Content

List the key base port requirements and optimal vessel capabilities for carrying out at least the functions listed above to the extent they are relevant to the subject design configuration and provide suitable parameters for each based on serial production planning. Add other categories and parameters as appropriate to help illustrate the thoroughness of the team's assembly and installation planning.

Port infrastructure considerations that may be relevant include but are not limited to:

- Depth capacity
- Laydown area space
- Wet storage space
- Assembly/installation area
- Quayside length
- Soil bearing capacities
- Lifting/handling capacities and specific equipment needs
- Channel draft
- Channel width
- Air draft restrictions.

A1.2.2 Criterion: Capital Costs

Background

The purpose of this criterion is to confirm that a credible, thorough capital cost analysis has been carried to form the basis of long-range financial planning and cost reduction efforts. DOE plans to have experienced offshore wind cost analysts at NREL available to assist competitors in carrying out cost analyses. NREL personnel will be under confidentiality agreements and "firewalled" from other NREL activities. It is expected that a draft spreadsheet of costs will be required from competitors for review and constructive critique after the competition has been open for 6 months.

Recommended Capital Costs Content

Provide information indicating that key capital cost categories of the subject floating substructure have been assessed, along with realistic potential cost reductions in each category due to factors such as increased levels of production, mature supply chain, refined production and installation processes, and design innovations. Other factors of the floating platform design configuration that relate to controlling or reducing overall wind farm project costs may also be discussed in the costs narrative, such as impact on operations and maintenance requirements.

Table A.2 provides a sample format that will be provided in spreadsheet format for competitors to fill in and adapt to their project. Categories may be added or deleted as appropriate to a competitors product details and production planning.

Assumptions:

- Competitors need to define a commercial-scale project capacity (plant capacity, turbine rating, and number of turbine/platform systems) as the basis for the summary bill of materials and costs for the relevant cost elements of the entire project.
- Focus on activities taking place at the integration/assembly port. Components produced at secondary sites should be listed as subcomponents with a total cost inclusive of labor, materials, and transport.
- The relevant components for the bill of materials include the floating platform, stationkeeping system, and associated subsystems. Turbine and cable costs/bills of materials are not required.

- Participants need to identify a baseline assembly port and provide upgrade costs to advance the port capabilities needed to build the floater.
- Participants need to provide a high-level estimate of wet tow time from the port to the project site but are not required to conduct a detailed weather window or vessel availability analysis.

Cost category descriptions (tentative):

- Raw materials, subcomponents, and subassemblies
  - *Definition*: Products that are brought into the final assembly port.
  - *Includes:* Procurement cost for each product, including labor, materials, transport to assembly port.
- Final platform assembly (labor, facilities, and equipment per assembly phase)
  - *Definition:* Labor required to assemble the floating platforms at the assembly port
  - *Includes:* Types of workers, person-hours, wages for each floating platform assembly phase. Hourly rental rates for facilities and specialized equipment. Rental rates can include equipment operator labor, or this labor can be included separately. Participants can define the process and cost phases appropriate to their concept. If necessary, one phase could be the transport to final integration port.
- Turbine integration (labor, facilities, and equipment per integration phase)
  - *Definition:* Labor required to assemble the turbine on the completed floating platform at the integration port (or wind farm site).
  - *Includes:* Types of workers, person-hours, wages for each phase of integrating the wind turbine with the completed floating platform. Hourly rental rates for facilities and specialized equipment. Rental rates can include equipment operator labor, or this labor can be included separately. Participants can define the phases for their concept.
- Transport, installation, and site preparation (vessel costs per phase)
  - *Definition:* Costs to transport/install all the integrated turbine/floating platforms to the project site.
  - *Includes:* Vessel costs, including charter rates, labor, and fuel, for all required installation vessels. Costs can be aggregated into a total day rate per vessel type (i.e., labor and fuel do not need to be itemized).
- Port upgrade costs (Phase three only)
  - *Definition:* Investments in port infrastructure capabilities required to upgrade the port from its existing baseline to the state needed for mass substructure production.
  - *Includes:* Major construction costs, including land clearing; berth/channel dredging; construction of new buildings, piers, berths; upgrades to existing buildings, piers, berths. Cost of manufacturing facilities for components other than floating platforms (blades, nacelles, mooring, etc.) should not be included.
- Source and U.S. Content
  - From a drop-down menu of domestic and global regions in the Source column, choose the one that best matches the location from which individual goods or services originate. If, for instance, components or materials are purchased from a U.S. company but originate from Asia without any work on them being carried out by the U.S. entity (i.e., a "pass-through"), source should indicate "Non US-Asia."
  - The U.S. Content column provides a means of tallying the costs of goods and services of U.S. origin and comparing them to the overall production costs. Enter the values from the Total Cost column that apply to items sourced in U.S. regions only.

*Table A-2. Capital Cost Bill of Materials – Floating Platforms for 75-Unit Wind Farm Project (**examples provided for illustrative purposes only**)*

Item	Description	Units	Unit cost	Qnty	Total cost	Source	U.S. Content	Basis of estimate (<100 words)
Raw materials, subcomponents, and subassemblies								
Steel plates (example)	Steel plates to be rolled into columns	#	2,000	5,000		Non US - Asia	-	(Steel to be procured in the finished columns)
Finished buoyant columns (example)	Rolled steel columns	#	500,000	150	75,000,000	US - Gulf of Mexico region	56,768,000	Total cost based on fabricator's best estimate. Steel sourced overseas is approximately 13% of total cost.
Tube steel (example)	Tubes formed into trusses	#	1,000	1,000	1,000,000	US - Gulf of Mexico region	1,000,000	
Ballast (example)	Slurry, iron ore, or other ballast materials	#	10	1,000	10,000	US - Gulf of Mexico region	10,000	
Mooring lines (example)	Steel chain for catenary lines	#	100	100,000	10,000,000	Non US - Europe	-	
Anchors (example)	Steel drag embedment anchors	#	100	100	10,000	Non US - Europe	-	
Final platform assembly (labor, facilities, and equipment per assembly phase)								
Welder (example)		hours/FTEs	100	50,000	5,000,000	US - West Coast region	5,000,000	
Manager (example)		hours/FTEs	75	2,000	150,000	US - West Coast region	150,000	
Painter (example)		hours/FTEs	90	10,000	900,000	US - West Coast region	900,000	
Gantry crane (example)	Assemble floater	$/day	10,000	75	750,000	US - West Coast region	750,000	
Dry dock (example)	Space for floater assembly	$/day	5,000	75	375,000	US - West Coast region	375,000	
SPMT (example)	Onsite transportation of subassemblies	$/day	3,000	75	225,000	US - West Coast region	225,000	
Turbine integration (labor, facilities, and equipment per integration phase)								
Technician/welder		hours/FTEs	100	700	70,000	US - West Coast region	70,000	
Manager (example)		hours/FTEs	75	200	15,000	US - West Coast region	15,000	
Materials/Hrdwre		#	7,500	75	562,500	US - Gulf of Mexico region	562,500	
Ring crane (example)	Integrate turbine onto finished floater	$/day	20,000	75	1,500,000	US - West Coast region	1,500,000	
SPMT (example)	Onsite transportation of subassemblies	$/day	3,000	75	225,000	US - West Coast region	225,000	
Transport, installation, and site preparation								
Anchor handling tug vessel (example)	Wet tow to project site	$/day	2,500	150	375,000	US - West Coast region	375,000	
Anchor handling tug vessel (example)	Anchor installation	$/day	2,500	300	750,000	US - West Coast region	750,000	
Support tugs (example)	Wet tow to project site		100	150	15,000	US - West Coast region	15,000	
				Total Estimated Cost of Platforms($)	96,932,500	**Est. Domestic Content ($)**	68,690,500	
				Unit Cost (75)	1,292,433	**Est. Domestic Content (%)**	71%	
Port upgrade costs (amortized over multiple projects)								
Construct new wharf (example)	High bearing capacity wharf for turbine integration	$/ft	5,000	15,000	75,000,000	US - West Coast region	75,000,000	
Upland area clearing (example)	Prepare upland area for component storage	$/acre	1,000	50	50,000	US - West Coast region	50,000	

A.1.3 Category 3: U.S. Location Considerations

A1.3.1 Criterion: Workforce and Community Benefit

Background

The objective of the Biden administration's Justice40 Initiative is to ensure that all Americans benefit from investments made toward the nation's clean energy transition. This includes providing pathways for job and enterprise creation in underserved and disadvantaged communities, as well as broad access to clean energy sources and reduction of environmental exposure and climate change impacts.

The definitions of underserved and disadvantaged communities are broad with many different interpretations. For the purposes of this prize, consider factors such as but not limited to: high unemployment and underemployment; lack of access to training resources; stressed neighborhoods; loss of former industrial employers or facilities; jobs lost through the energy transition; high transportation cost burden and/or low transportation access.

Recommended Workforce and Community Benefit Content

Update projections of long-range work force needs to meet serial production targets, including types of skills and training likely to be required. Indicate how these needs could be met through either direct employment or supply chain partners. Include potential opportunities to train and employ individuals in typically underserved and disadvantaged communities. Also indicate potential opportunities to help revitalize former or under-utilized industrial sites and adjacent communities.

A1.3.2 Criterion: Environmental and Co-Use Considerations

Background

All structures and related activities have some impact on their natural environment as well as the potential for effects on activities being carried out in their vicinity by others. The intent of this criterion is to establish that the competitor has considered the range of potential impacts related to their design and evaluated whether negative impacts could be reduced and positive impacts enhanced.

Recommended Environmental and Co-Use Consideration Content

The current legislation governing identification and assessment of environmental effects is provided on the Bureau of Ocean Energy Management website here. The site also provides examples of assessments for existing offshore wind farms.

For Phase two, the narrative should include the approach to addressing this impact assessment. Prize competitors need to focus their responses only on the environmental assessment factors of wind farm installation and operation that pertain to the floating platform and its associated elements such as mooring anchors and cables. It is not anticipated that the data will be available for undertaking the assessment, but a summary of how the assessment will be done, and potential areas of concern where mitigation and management may be necessary should be discussed.

Phase three will require an environmental management plan relevant to the deployment site and port identified under other criteria that addresses potential concerns that have been identified and actions to reduce, mitigate, or manage these. Topics should include emissions, ecological and social impacts, and ocean co-use considerations.

A.1.4 Category 4: Commercialization Pathway and Execution Plan

A1.4.1 Criteria: U.S. Commercialization and Production Readiness Pathway, Execution Plan, Risk Assessment

Background

There is an ongoing and dynamic interplay between the relative levels of technical readiness, manufacturing readiness, and commercial readiness as a product progresses toward market. The intent of this category is to describe and evaluate how realistic progress will be made in these areas toward receiving floating platform sales commitments and attaining serial production capabilities, including details on management approach, team capabilities, and risk mitigation.

Recommended Content on Commercialization Pathway and Execution

An effective narrative should provide information such as:

- An overview of how implementation of long-range product technical testing and validation, supply chain, and manufacturing plans will be executed, including funding option
- Roadmap for commercialization and investment
- Reference to similar past development activities with successful outcomes
- Confirmations of commercial interest including letters of support or interest from key stakeholders and potential customers
- A broad assessment of risks that could impede progress toward the end goals, and how those risks will be mitigated. The format of the risk assessment is at the discretion of the competitor but should be based on established industry practices.

See also content specific recommendations and scoring criteria in Table 3.