

Statement of Project Objectives**Budget Period 1 - Planning and Design**

**Includes High-Level Project Goals and Objectives, Scope of Work, Detailed Tasks
and Milestones**

[Award Number] [Mod Number]

[Recipient Organization Name]

[Project Title]

**[The instructional red and blue text and attachments below should be removed in the final
version of the SOPO]**

Formatting

If you are copying and pasting content from another Word document into this template, please follow the below tips for best results.

- *Content should be pasted into a page with a similar orientation.*
 - *Content with a portrait orientation should be pasted before the template content beginning on page 1.*
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- *When deleting the original template content, be mindful to not delete the section break (found at the end of page 6). Section breaks allow for multiple orientations within the same document. Deleting this section break will create challenges with the orientation and associated headers/footers. To see the section break, click on the 'Home' tab within the ribbon, then select the ¶ icon within the 'Paragraph' group. The section break will show as "=====."*

*All of the information to be included in the SOPO must be consistent with the Application and any Negotiation Strategies upon which the award was selected. The SOPO should accurately define **what** work is to be done and the expected progress to be achieved. The SOPO shall not exceed 10 Pages.*

The following items should not be included in the SOPO:

- *Dollar amounts.*
- *Specific dates (only include general time frames (i.e. Demonstrate XYZ result by Month 3, not Demonstrate XYZ by June 8th, 2013).*
- *Subcontractors, vendors or individuals by name. The award is with the prime and, as such, the SOPO should not generally reference the subcontractors.*

Intellectual property information and other aspects of the project that could be considered proprietary or business confidential should be clearly marked in the final version of the SOPO. The SOPO must be marked as follows and identify the specific pages containing confidential, proprietary, or privileged information: If applicable, please use the following:

Notice of Restriction on Disclosure and Use of Data:

Pages [list applicable pages] of this document may contain confidential, proprietary, or privileged information that is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes or in accordance with a financial assistance agreement between the submitter and the Government. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source.

The header and footer of every page that contains confidential, proprietary, or privileged information must be marked as follows: "Contains Confidential, Proprietary, or Privileged Information Exempt from Public Disclosure."

In addition, every line and paragraph containing proprietary, privileged, or trade secret information must be clearly marked with double brackets or highlighting.

A. Project Objectives

Budget Period 1 - Planning and Design

Note: This content must be consistent with the "Workplan" section of the Project Narrative submitted by the Applicant.

Provide a clear and concise (high-level) statement of the goals and objectives of the project as well as the expected outcomes. If the award is to be structured in Budget Periods, include the objective(s) for each Budget Period.

EXAMPLE: Project Objective Budget Period 1: Design a new geothermal heating and cooling system in ABC U.S. community. Coalition XYZ will devise plans to develop, design, and install a geothermal heating and cooling system that will satisfy at least 25% of the heating or heating and cooling demand in ABC community with high energy costs and where current fuel used to heat homes and businesses results in decreased air quality and increased CO₂ emissions.

B. Project Scope of Work Summary

Note: This content must be consistent with the "Workplan" section of the Project Narrative submitted by the Applicant.

Provide a summary description of the overall work scope and approach to achieve the objective(s). The work scope description needs to be divided by Budget Periods. The applicant should describe the specific expected end result of Budget Period 1.

EXAMPLE: Budget Period 1 – Planning and Design: Coalition XYZ will work to: finalize a site location and footprint; assess the geothermal resource; analyze environmental and permitting needs; assess planned usage; conduct techno-economic feasibility analysis and local stakeholder engagement; and identify workforce and training development needs.

C. Tasks To Be Performed

Note: This content must be consistent with the Project Narrative submitted by the Applicant.

The section should describe the specific activities to be conducted during Budget Period 1. This section provides a summary of the planned approach to this project and should clearly articulate what work must be accomplished to execute the project scope and thus meet the established project objectives.

Each task and/or subtask is to have a unique number and title and an indication of the approximate duration of the task or subtask in months. Each task and/or subtask is to have a task summary that describes the objectives, what work is to be accomplished, and relationship to project deliverables or expected results. Appropriate milestones should be incorporated into the task and subtask structure.

Milestones: The SOPO should identify appropriate milestones throughout the project to demonstrate success. A milestone may be either a progress measure (which can be activity based) or a SMART technical milestone. SMART technical milestones should be **S**pecific, **M**easurable, **A**chievable, **R**elevant, and **T**imely, and must demonstrate a technical achievement rather than simply completing a task. Unless otherwise specified in the FOA, the minimum requirement is that each project must have at least one milestone per quarter for the duration of the project with at least one SMART technical milestone per year (depending on the project, more milestones may be necessary to comprehensively demonstrate progress). The Applicant should also provide the means by which the milestone will be verified. In addition to describing milestones in the SOPO text, the milestones should be included in the Milestone Summary Table below. The Summary Table below includes three general examples

End of Budget Period 1 Goal: The SOPO should include one SMART Budget Period 1 goal. The Applicant should also provide the means by which the goal will be verified. In addition to describing the end of Budget Period 1 goal in the SOPO text, the end of Budget Period 1 goal should be included in the Milestone Summary Table below.

Below is an example of a typical task structure. While the example illustrates five tasks and three subtasks, the specific project work scope will dictate the appropriate number of tasks and subtasks:

Budget Period 1 [Enter Title] –

Task 1.0: Distinctive Title [*Optional: Date range of the task in months (M1-M4)*]

EXAMPLE: Task 1.0 Technical and Economic Assessment

Task Summary: Task summaries shall explicitly describe what work is to be accomplished, identify the project objectives/outcomes being addressed and provide a concise statement of the objectives of that task. In addition, the description should indicate the project deliverables or expected results that this task will help achieve.

Milestone 1.1 (if applicable)

Milestone 1.2 (if applicable)

Etc.

EXAMPLE: Milestone 1.1. Coalition meeting to assess technical and economic objectives for geothermal system

Subtask 1.1: Title [*Optional: Date range (M1-M2)*]

Subtask Summary: Describe the specific and detailed work efforts that go into achieving the higher-level tasks.

EXAMPLE: Subtask 1.1 Finalize site and footprint quantitative analysis defined in the preliminary Technical and Economic Concept Description

Milestone 1.1.1 (if applicable)

Milestone 1.1.2 (if applicable)

Etc.

Subtask 1.2: Title [*Optional: Date range (M3-M4)*]

Subtask Summary: Describe the specific and detailed work efforts that go into achieving the higher-level tasks.

EXAMPLE: Subtask 1.2 Create technical design for the planned geothermal heating and cooling system

Subtask 1.3: Title [*Optional: Date range (M3-M4)*]

Subtask Summary: Describe the specific and detailed work efforts that go into achieving the higher-level tasks.

EXAMPLE: Subtask 1.3 Develop a maintenance plan for the planned geothermal heating and cooling system

Milestone 1.3.1 (if applicable)

Milestone 1.3.2 (if applicable)

Etc.

EXAMPLE: Milestone 1.3.1 Consultation with four teams who operate similar existing geothermal systems

(Continue until all Task 1 subtasks are listed)

Task 2.0: (continue in the format above until all tasks and subtasks are listed)

Task Summary: Task summaries shall explicitly describe what work is to be accomplished, identify the project objectives/outcomes being addressed and provide a concise statement of the objectives of that task. In addition, the description should indicate the project deliverables or expected results that this task will help achieve.

EXAMPLE: Task 2.0 Workforce Transition Analysis

EXAMPLE: Milestone 2.1 Local stakeholder engagement workshop, including a minimum of two local trade schools or training centers

Subtask 2.1: Title, Date range, Subtask Summary Description

Subtask Summary: Describe the specific and detailed work efforts that go into achieving the higher-level tasks.

EXAMPLE: Subtask 2.1 Identify and catalogue workforce-specific needs related to developing, installing, and operating geothermal heating and cooling systems

Milestone 2.1.1 (if applicable)

Milestone 2.1.2 (if applicable)

Etc.

(Continue until all Task 2 subtasks are listed)

Task 3.0: Distinctive Title [*Optional: Date range of the task in months (M12-M14)*]

Task Summary: Task summaries shall explicitly describe what work is to be accomplished, identify the project objectives/outcomes being addressed and provide a concise statement of the objectives of that task. In addition, the description should indicate the project deliverables or expected results that this task will help achieve.

EXAMPLE: Task 3.0 Create environmental assessment and permitting plan

Subtask 3.1: Title, Date range, Subtask Summary Description

Subtask Summary: Describe the specific and detailed work efforts that go into achieving the higher-level tasks.

EXAMPLE: Subtask 3.1 Analyze environmental and permitting needs

Milestone 3.1.1 (if applicable)

Milestone 3.1.2 (if applicable)

Etc.

EXAMPLE: Milestone 3.1.2 Publication of a schedule to develop the geothermal heating and cooling system, including permitting
(Continue until all Task 3 subtasks are listed)

Task 4.0: (continue in the format above until all tasks and subtasks are listed)

EXAMPLE: Task 4.0 Prepare deliverables and submit down-selection documentation

Task Summary: Task summaries shall explicitly describe what work is to be accomplished, identify the project objectives/outcomes being addressed and provide a concise statement of the objectives of that task. In addition, the description should indicate the project deliverables or expected results that this task will help achieve.

Milestone 4.1 (if applicable)

Milestone 4.2 (if applicable)

Etc.

EXAMPLE: Milestone 4.1 Submission of all required documentation for down selection to Budget Period 2

Subtask 4.1: Title, Date range, Subtask Summary Description

Subtask 4.2: Title, Date range, Subtask Summary Description

(Continue in the format above until all tasks and subtasks are listed)

D. Project Management and Reporting

This section should briefly describe relevant project management and reporting activities during budget period 1, including any special reporting requirements or deliverables.

Reports and other deliverables will be provided in accordance with the Federal Assistance Reporting Checklist following the instructions included therein.

Additional deliverables as indicated in the task/subtask descriptions include the following:

Note: If items other than those identified on the "Federal Assistance Reporting Checklist" will be delivered to DOE, these deliverables will be identified within the text of the Statement of Project Objectives and should be identified here. See the following examples:

- 1. Subtask 1.1 - (Topical Report or Item (e.g., hardware for testing) Description)*
- 2. Task 2 - (Topical Report or Item (e.g., hardware for testing) Description)*

Milestone Summary Table							
Recipient Name:		[Enter Recipient Name]					
Project Title:		[Enter Project Title]					
Task Number	Task or Subtask (if applicable) Title	Milestone Type (Milestone or Go/No-Go Decision Point)	Milestone Number* (Go/No-Go Decision Point Number)	Milestone Description (Go/No-Go Decision Criteria)	Milestone Verification Process (What, How, Who, Where)	Anticipated Date (Months from Start of the Project)	Anticipated Quarter (Quarters from Start of the Project)

See Milestone Summary Table examples in Attachment 1 below

Note: This content must be consistent with the “Milestone Details” section of the Work Plan submitted by the Applicant.

** Milestone numbering convention should align with Task and Subtask numbers, as appropriate. For example, M1.1, M3.2, etc.*

Note 1: It is required that each project has at least one milestone per quarter for the entire project duration. It is required that each project have at least one SMART technical milestone per year. It is not necessary that each task have one milestone per quarter.

Attachment 1 – Example Milestone Summary Table

Below are three examples of Milestone Summary Tables.

Example 1 is a milestone table for the examples shown in this document

Example 2 is a milestone table for an offshore wind demonstration project that will complete the initial engineering design, as well as initiation of all permitting or studies required for regulatory compliance and the NEPA review process, with a DOE down-select of funded projects at the end of the first budget period.

Example 3 is a milestone table for an Integrated Bio-Refinery (IBR) demonstration project.

Example 1 is a milestone table for the *EXAMPLES* shown in this document

Milestone Summary Table							
Recipient Name:		Coalition XYZ					
Project Title:		New Geothermal Heating and Cooling System for ABC U.S. Community					
Task Number	Task or Subtask (if applicable) Title	Milestone Type (Milestone or Go/No-Go Decision Point)	Milestone Number* (Go/No-Go Decision Point Number)	Milestone Description (Go/No-Go Decision Criteria)	Milestone Verification Process (What, How, Who, Where)	Anticipated Date (Months from Start of the Project)	Anticipated Quarter (Quarters from Start of the Project)
<u>1.0</u>	<u>Technical and Economic Assessment</u>	<u>Milestone</u>	<u>1.1</u>	<u>Coalition meeting to assess technical and economic objectives for geothermal system</u>	<u>In-person meeting to present preliminary result and task planning of each coalition role</u>	<u>2</u>	<u>1</u>
<u>1.3</u>	<u>Develop a maintenance plan for a new geothermal heating and cooling system</u>	<u>Milestone</u>	<u>1.3.1</u>	<u>Consultation with four teams who operate similar existing geothermal systems</u>	<u>Submission of summary report to DOE, with documentation and conclusions.</u>	<u>3</u>	<u>1</u>
<u>2.0</u>	<u>Workforce Transition Analysis</u>	<u>Milestone</u>	<u>2.1</u>	<u>Local stakeholder engagement workshop, including a minimum of two local trade schools or training centers</u>	<u>Final workshop report, including participation list, goals, and action items</u>	<u>6</u>	<u>2</u>
<u>3.1</u>	<u>Analyze environmental and specifics permitting needs</u>	<u>Milestone</u>	<u>3.1.1</u>	<u>Publication of a schedule to develop the geothermal heating and cooling system, including permitting</u>	<u>DOE project officer review of progress towards permitting and regulatory compliance, verifying all requirements</u>	<u>9</u>	<u>3</u>
<u>4.0</u>	<u>Prepare deliverables and submit down selection documentation</u>	<u>Milestone</u>	<u>4.1</u>	<u>Submission of all required documentation for down selection to Budget Period 2</u>	<u>DOE verification of application submission</u>	<u>11</u>	<u>4</u>

Example 2: Milestone Summary Table for an offshore wind demonstration project that will complete the initial engineering design, as well as initiation of all permitting or studies required for regulatory compliance and the NEPA review process, with a DOE down-select of funded projects at the end of the first budget period.

Milestone Summary Table							
Recipient Name:		ABC Wind Company					
Project Title:		Offshore Wind Demonstration Project					
Task Number	Task or Subtask (if applicable) Title	Milestone Type (Milestone or Go/No-Go Decision Point)	Milestone Number* (Go/No-Go Decision Point Number)	Milestone Description (Go/No-Go Decision Criteria)	Milestone Verification Process (What, How, Who, Where)	Anticipated Date (Months from Start of the Project)	Anticipated Quarter (Quarters from Start of the Project)
1	Engineering Design	Milestone	M1.1	Selection of foundation type, support structure and tower design	Verification of the foundation selection process and selected foundation reviewed by DOE and NREL personnel. If DOE project manager deems it necessary, DOE will convene a critical design review with third-party experts.	4	2
1	Engineering Design	Milestone	M1.2	Completion of scale model testing of platform in wind/wave basin to verify model performance/results	Verification of data collection and experiment execution through testing report and/or site visit during test period.	4	2
1	Engineering Design	Milestone	M1.3	Foundation certification	Certification for foundation design from third party verification agency (i.e., ABS or DNV). Verification of certificate from third party agency.	9	3
2	Site Characterization	Milestone	M2.1	Geotechnical studies of site to inform	DOE project manager verification of collection and analysis of at	2	1

				anchor/mooring design. Identification of at least three viable anchor sites per turbine.	least one core sample at each potential turbine site to inform foundation/anchor design. Verification completed through report review.		
2	Site Characterization	Milestone	M2.2	Geophysical mapping of potential mooring corridor obstructions	DOE project manager verification of complete side-scan sonar of entire field, with focus and higher resolution for mooring corridors. Verification of a complete geophysical map of entire wind turbine site to appropriate resolution to document seabed conditions and identify any objects of interest. Verification conducted through report review and site visits.	2	1
3	Metocean and Environmental Monitoring	Milestone	M3.1	Collection of site-specific data including wind, current, wave data	DOE project manager verification that instrumented buoy(s) are deployed at project site through quarterly reporting or site visit.	5	2
3	Metocean and Environmental Monitoring	Milestone	M3.2	Completed avian monitoring study	Traditional thermal imaging (FLIR) and near infra-red (NIR) video systems to assess the presence and behavior of avian and bat species around offshore wind turbine site. Verification that instruments are deployed and collecting data.	9	3
4	Turbine testing	Milestone	M4.1	Certification of turbine	Verification that testing will be performed in accordance with International Electrotechnical Commission (IEC) 61400-22 through review of type certification report.	12	4
5	Regulatory Approvals and Permitting	Milestone	M5.1	Initiated process for all required permits and regulatory approvals for	DOE project manager review of report on progress towards permitting and regulatory	12	4

				wind farm site, interconnection, rights of way	compliance, verifying that all requirements have been initiated.		
6	Vendor Request for Proposals	Milestone	M6.1	Receipt of vendor quotes	DOE personnel review of vendor quotes and verification for legitimacy.	11	4
7	Economic Analysis	Milestone	M7.1	Refined levelized cost of energy (LCOE) estimates based on engineering design. The proposed design must meet the local hurdle price of \$0.10/kWh.	Verification of submitted LCOE estimates through third party independent review during down select review process.	11	4
		Down- Selection	D1	DOE will select up to three projects to proceed to Budget Period 2, based on the following down- selection criteria: 1) Budget Period 1 technical performance and progress towards stated project objectives 2) Innovations and their potential reductions on the cost of energy (LCOE), and 3) Likelihood of project success, advancement of the national knowledge base and commercial impact in the U.S.	Independent cost analysis, design analysis, and permitting progress conducted by DOE, Lab, and third-party subject matter experts.	13	5
8	Budget Period 2 Tasks and milestones to be negotiated after down selection process completed.			TBD	TBD	15	5

Example 3: Milestone Summary Table for an Integrated Bio-Refinery (IBR) demonstration project.

Milestone Summary Table							
Recipient Name:		Biofuels Maker					
Project Title:		250 Ton/Day Biofuel Demonstration Facility					
Task Number	Task or Subtask (if applicable) Title	Milestone Type (Milestone or Go/No-Go Decision Point)	Milestone Number* (Go/No-Go Decision Point Number)	Milestone Description (Go/No-Go Decision Criteria)	Milestone Verification Process (What, How, Who, Where)	Anticipated Date (Months from Start of the Project)	Anticipated Quarter (Quarters from Start of the Project)
1	Budget Period 1 Planning Activities	Milestone	M1.1	Critical Decision-2 Approve Performance Baseline (DOE Core)	DOE (with consultation from DOE's Independent Engineer) and Recipient Agreement to Performance Baseline for Project		
2.1	Engineering and Environmental - NEPA	Milestone	M2.1	NEPA Approval to Proceed Detailed Design and Construction (DOE Core)	NEPA decision issued. Current schedule assumes Environmental Assessment with associated Finding of No Significant Impact Issued by DOE. If determined that an EIS is required, NEPA scope and associated baseline will be revised through change control process.		
2.4	Engineering and Environmental - External Independent Review	Go/No-Go Decision Point	GN2.2	DOE Preliminary Design Review and Approval to Continue Project	Recipient submission of all preliminary engineering, design, cost models, sites studies, etc. to DOE's Independent Engineer and Risk Analyst as specified in the EIR-1 guidelines. The Independent Engineer and Risk Analyst will submit independent reports to DOE. Recipient must adequately address all deficiencies and risk items to DOE's satisfaction before the project will be authorized to continue.		

2.6	Engineering and Environmental - Equipment Specification	Milestone	M2.6	Completion of Equipment Specification Data Sheets	Equipment Data Sheets provided to DOE's Independent Engineer for verification of completion and adequacy. Data sheets must meet the requirements of Recipients data sheet definitions, as defined in the PMP.		
2.8	Engineering and Environmental - Building Design	Milestone	M2.8	Completion of building design specifications	Building design, specifications, and detailed costing data provided to DOE's Independent Engineer for review and verification against all applicable building codes and architectural standards.		
2.12	Engineering and Environmental - Permitting	Milestone	M2.12	Approval of Construction Permit	All required construction permits obtained and verified on site by DOE's Independent Engineer.		
2.12	Engineering and Environmental - Permitting	Milestone	M2.13	Approval of Operating Permit	All required operating permits (including Title V, water use, and sewer discharge) obtained and verified on site by DOE's Independent Engineer.		
2.14	Engineering and Environmental - External Independent Review, Detailed Review	Milestone	M2.14	Submission to and Approval by the DOE (EIR-2)	Recipient submission of all detailed engineering, design, cost models, sites studies, etc. to DOE's Independent Engineer as defined in the EIR-2 guidelines. The Independent Engineer will submit an independent report to DOE. Recipient must adequately address all deficiencies and risk items to DOE's satisfaction before the project will be authorized to continue.		
3	Final Optimization of Operating Parameters at Pilot Scale	Milestone	M3.1	Hydrolysis, Fractionation & Purification Optimization (xx C5 and XX C6 sugar yield per lb/feedstock with	Recipient completing triplicate reproduction of data for a minimum of xx hours. All data will be provided to DOE. DOE will be on site for at least one run.		

				contamination levels below those specified in the lab data report x-x). Process set points are determined.			
3.4	Biocatalyst operation optimization	Milestone	M3.4	x % v/v fuel titer at xx hours with a x% weight yield. Process setpoints determined.	DOE's National Laboratory Designee on site for minimum of two runs. Data for at least three runs provided to National Lab for review.		
3.5	Co-product catalyst optimization	Milestone	M3.5	Demonstration of x cycles with x% original catalyst activity. Process setpoints determined.	Full data report provided to DOE's technical expert for review and validation.		
4.6	Pre-construction: Risk Mitigation Plan Refinement	Milestone	M4.6	DOE Approval of final risk mitigation plan	Recipient providing final risk mitigation plan to DOE for review and approval.		
4.7	Pre-construction: EPC	Milestone	M4.7	EPC Contract Finalized and Signed - (DOE Core)	DOE's Independent Engineer verification that the EPC contract is fully executed.		
4.8	Pre-construction: Finances	Milestone	M4.8	Financial Closing or Financial Commitment Letter - (DOE Core)	Recipient sending DOE all financial closing documentation.		
4.11	Pre-construction: Operations Definitions	Milestone	M4.11	Define Commissioning Criteria (DOE Core)	DOE (with consultation from its Independent Engineer) and Recipient agreeing to final commissioning criteria.		
4	Pre-construction	Go/No-Go Decision Point	GN4.16	Critical Decision-3 Approval to Start of Construction (DOE Core)	DOE and Recipient making go/no-go decision to enter construction. DOE's decision is based on CD-3 criteria, including EIR-2, provided to Recipient at kickoff. Recipient is responsible to deliver any outstanding items identified in the CD-3 guidelines.		

5.2	Pilot Plant Construction	Milestone	M5.2	Construction Contractors Selected by Recipient and Approved by DOE	All major contractors selected, and budgets and scopes of work submitted to DOE for approval.		
5.4	Commission and Start-up	Go/No-Go Decision Point	GN5.4	Mechanical completion verified	DOE's Independent Engineer verification that mechanical completion is reached as defined in Recipient's construction and commissioning plan.		
5.7	Commission and Start-up	Milestone	M5.7	Commissioning complete. All criteria in commissioning plan achieved.	DOE's Independent Engineer performing site visit and reviewing Recipient's logs and data to verify.		
5.8	Commission and Start-up	Go/No-Go Decision Point	GN5.8	CD-4 Start of Operational Approval - Initiate Shakedown (DOE Core)	DOE review of project reports, financial reports, and Independent Engineer reports to make a go/no go decision for operations.		
6.4	Operations-Performance Test	Milestone	M6.4	Performance Test Completed	Recipient running demonstration facility in accordance with performance test plan (approved by DOE) for a minimum of 40 hours. DOE and DOE's Independent Engineer are on site for portions of the test and Recipient delivers all data logs outlined in the performance test plan.		
6.5	Operations-Continued Long-Term Optimization	Milestone	M6.5	Recipient completing 1,500 hours of continuous operation with x% uptime, x conversion of biomass to fuel, at a minimum of 250 tons/day of feedstock.	Recipient providing summary reports as defined in deliverables requirements. DOE and DOE's Independent Engineer randomly sample data logs at Recipient site.		
7	Final Economic and Commercial Validation	Milestone	M7	Final Report Delivered to DOE	After xxx months of operation, Recipient providing final report to include updated economic models, life cycle analysis, and plant		

					performance (inputs, outputs, yields, etc.) as defined in the deliverable requirements		
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