**FCIC Industry Partnership Call Proposal Guidelines**

We provide guidelines below to help applicants prepare effective IPC proposals. Note that the three different topic areas have different page limits and scoring structures, as shown in the following table.

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| --- | --- | --- | --- |
|  | **Area 1: CRADA Partnerships**  | **Topic Area 2: Rapid Technical Assistance**  | **Topic Area 3:** **Biorefinery Technical Assistance** |
| Page Limit | 10 | 3 | 8 |
| Technical Approach  | 40% | 50% | 40%  |
| Potential for Impact  | 40% | 40% | 40%  |
| Appropriateness of Government Resources  | 10% | 10% | 10%  |
| Community Benefits, Engagement, and Outreach Plan  | 10% | NA | 10%  |

For all proposals, please be as succinct and specific as possible. For example, BETO and FCIC personnel understand the importance of the bioeconomy and the general risks associated with feedstock variability on biorefinery scale-up, so it is not necessary to address this general area. Please focus instead on your company’s specific activities, how feedstock and process variability represent a risk to your company’s technology, and how the proposed project will specifically address this risk.

Below are brief, specific, and quantitative examples of effective and ineffective responses to each section. Note that these examples are not meant to prescriptive and that full responses to each section should be much longer than presented here.

# Technical Approach

The “Reasons for Cooperation” section should explain why the applicant and national laboratory partner(s) make a compelling team, how their specific skills and competencies complement each other, and how the partnership will address a specific issue or problem faced by the applicant. Below are very brief examples of effective and ineffective responses.

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| --- | --- |
| **Examples of Effective Reasons for Cooperation** | **Examples of Ineffective Reasons for Cooperation** |
| Company ABC operates a biomass conversion reactor operating at pilot scale, with similar reactor designs operating successfully at demonstration and commercial scale around the world. The quality of the reactor products depends on feedstock properties and reactor conditions, and specific product quality parameters must be improved for wider commercial application. Laboratory XNL has substantial experience in biomass analysis and detailed analytical characterization of the products formed using Company ABC’s conversion reactor technology. Thus, a collaboration to understand the impact of variable biomass feedstock properties and reactor conditions on Company ABC’s conversion reactor product quality attributes applies a unique capability of Laboratory XNL to a critical need of Company ABC. | Each party brings specific technologies, technical expertise, and processing capabilities to the project. Further, each party shares the goal of supporting BETO’s goals of making biofuels commercially viable and competitive with gasoline and crude oil co-products.  |
| Company ABC is an industry leader in preprocessing equipment for woody biomass and has identified a common reliability issue in several of its products. Laboratory XNL has world-leading expertise in the causes of and potential solutions to this reliability issue across multiple industries and will apply specific characterization tools not widely available to help diagnose the root cause(s) of the specific reliability issue in Company ABC’s products and suggest potential mitigation strategies. | Company ABC has demonstrated expertise in multiple conversion technologies that can use biomass feedstocks. Laboratory XNL is a world-leader in biomass research. The proposed project will greatly benefit from XNL’s expertise and laboratory facilities.  |

## Technical Objective

The “Technical Objective” section can provide background information on the proposed work but should clearly and succinctly state the specific technical goal(s) of the project—what the project will accomplish. Below are very brief examples of effective and ineffective responses.

|  |  |
| --- | --- |
| **Examples of Effective Technical Objectives** | **Examples of Ineffective Technical Objectives** |
| This project will: * Identify chemical mechanisms causing thermal instability of reaction products produced from different biomass feedstocks
* Establish the chemical links between feedstock composition and reaction products stability
* Quantify the effect(s) of feedstock variability on reaction products stability.
 | This project will develop new methods to quantify biomass properties and convertibility using advanced tools and algorithms.  |
| This project will:* Examine current materials of construction for Company ABC’s reactor
* Propose candidate materials of construction likely to show improved performance
* Perform sample exposure tests on candidate materials under conditions similar to those in Company ABC’s reactor
* Perform prospective TEA analyses based on these results.
 | This project will develop a better understanding of the impact of feedstock variability on Company ABC’s biomass conversion process. |
| This project will evaluate the impact of four different comminution technologies on the flow of three different candidate biomass feedstocks through Company ABC’s reactor feed system. | This project will provide valuable insights and data-driven recommendations for the bioenergy and bioproduct industries to facilitate the efficient and sustainable use of various feedstocks in biomass conversion processes. |

## Task Descriptions and Deliverables

The “Task Descriptions and Deliverables” section should clearly explain the discrete activities of the project that will result in the accomplishments of the “Technical Objectives.” Each task should be described in sufficient detail to enable reviewers to understand exactly what will be done and what will be delivered by both the participant and the laboratory partner. Below are very brief examples of effective and ineffective responses.

|  |  |
| --- | --- |
| **Examples of Effective Task Descriptions and Deliverables** | **Examples of Ineffective Task Descriptions and Deliverables** |
| Company ABC will acquire at least 10 samples of at least 1kg from at least 3 different locations, and Laboratory XNL will analyze these samples using the following methods: [cite methods]. | The team will analyze samples obtained from different sources. |
| All samples collected by Company ABC [in previous task] will be characterized by Laboratory XNL. Analyses will include ultimate, proximate, HHV, and inorganic elemental analysis using standard ASTM methods.  | Feedstocks will be converted using a batch reactor. A factorial design of experiment (DOE) approach will be used to understand how the effects of feedstock variability affect reactor conversion performance. |

## Risk Identification and Mitigation Strategies

The “Risk Identification and Mitigation Strategies” section should include specific risks associated with the project rather than general risks. Below are very brief examples of effective and ineffective responses.

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| --- | --- |
| **Example of Effective Risk Description/Mitigations** | **Example of Ineffective Risk Description/Mitigations** |
| Laboratory’s XNL pilot-scale reactor unavailable due to maintenance or unplanned downtime / XNL researchers will coordinate with XNL pilot plant manager to coordinate scheduling around regularly maintenance; for unplanned downtime, the researchers will work with XNL pilot plant manager to determine length of downtime and impacts on project schedule. | Company ABC will not be able to provide biomass feedstock samples required in a timely fashion. / Company ABC will make best efforts to acquire and supply these samples. |

# Potential for Impact (40%)

The key questions to answer in this section are:

1. How will this increase the probability of success of the participant’s biorefinery project(s)?
2. How is the proposed work consistent with the objectives in BETO goals, targets, and metrics?
3. How will the proposed public dissemination plan help the bioenergy community?

Please address these questions separately with as much detail as possible. The proposal template provides links to available resources on BETO goals, targets, and metrics. Please review this material before answering these questions.

|  |  |
| --- | --- |
| **Example of Effective Potential for Impact (Questions 1 and 3)** | **Example of Ineffective Potential for Impact (Questions 1 and 3)** |
| The proposed work will improve our company’s understanding of the impact of feedstock variability on a specific step in our overall process. It will substantially decrease the risk of this step by providing information of the impacts of variability that will allow us to take steps to mitigate these impacts. Since this process step is common to many different bioenergy stakeholders, our public dissemination plan (discussed below) will provide the bioenergy community with specific and actionable information on the impact of variability on this ubiquitous process step. | The proposed work will provide growth opportunity for companies that develop and manufacture technology to convert biomass feedstocks into fuels and chemicals. Gaining experience and learning new information can lead to further development of preprocessing and conversion technologies. |

# Appropriateness of Government Resources (10%)

Answer the two questions in this section as directly as possible, using specific information and examples.

1. Why is government investment required, and why can’t the participant independently perform this project? Avoid any generalities regarding the company’s capabilities and resources.
	1. Brief example of an effective response: “The variability and chemical complexity of the bio-intermediate produced by Company ABC presents significant challenges to its characterization and therefore potential for subsequent upgrading. We do not have the analytical tools or expertise in-house to properly characterize these bioproducts. Because we are currently focusing our resources on deploying our technology at the pilot/demonstration scale at location ABC, we do not have the resources to fund the external development of these capabilities.”
2. Why are FCIC resources the best fit for this project? Indicate specifically requested capabilities not generally available to the private sector.
	1. Brief example of an effective response: “Laboratory XNL has developed and utilized a suite of advanced analytical techniques for the chemical characterization of bio-intermediates like those produced by Company ABC and have published research which establishes relationships between feedstocks properties and bio-intermediate properties.”

# Community Benefits, Engagement, and Outreach Plan

How will the proposed project positively impact the US DOE’s Equity Action Plan (EAP)? This can include actions performed by either the participant, national laboratory, or both. Specific and effective examples of activities that can support DOE’s EAP might include (but are not limited to):

* Laboratory XNL has existing outreach programs to local community colleges to encourage interest in STEM careers. XNL researchers on this project will engage with this program to connect students at these colleges with examples of “real world” applications of STEM.
* Laboratory XNL has existing relationships with multiple Minority Serving Institutions (MSIs) and regularly host interns from MSIs at its laboratories.
* As part of our efforts to promote equity, Company ABC and Laboratory XNL will strive to publish our findings in trade and technical journals that provide open access to all readers.