



Co-Optimization of Fuels & Engines

Co-Optima Directed Funding Opportunity (DFO) Q&A

- Question:** The call lists “the anticipated impact towards increasing adoption of biomass-derived fuels” as an evaluation criteria. Does this include waste gases and CO₂-derived fuels?
Answer: Waste gases and CO₂-derived fuels are in scope if the blendstock or fuel meets Co-Optima fuel property and life cycle targets.
- Question:** Does this white paper call include Renewable Natural Gas?
Answer: Renewable natural gas is out of scope. Co-Optima is limited to liquid fuels for on-road vehicles.
- Question:** Can a company subcontract part of the work to a university as part of this proposal provided the university is also part of the CRADA?
Answer: The DFO is intended for stakeholders to leverage National Laboratory resources. A company may subcontract part of the work to a university, but DOE funds are only allocated to the National Labs.
- Question:** It says that non-profit businesses are eligible to apply. What is an example of a non-profit business? Is a non-profit University considered a non-profit business? Is there a mechanism for Universities to be involved in this DFO?
Answer: A nonprofit organization, for purpose of identification, is defined as a business entity organized and operated exclusively for charitable, scientific, or educational purposes, of which no part of the net earnings inure to the benefit of any private share holder or individual, of which no substantial part of the activities is carrying on propaganda or otherwise attempting to influence legislation or participating in any political campaign on behalf of any candidate for public office, and which are exempt from federal income taxation under section 501 of the Internal Revenue Code ([reference FAR subpart 31.7-Contracts with nonprofit organizations](#)). Universities may be part of a team, either as a partner with a National Lab or as a subcontractor with an industry proposer, but DOE funds are allocated only to the National Labs.
- Question:** Can a stakeholder submit multiple proposals?
Answer: Yes.
- Question:** Can the DOE laboratory subcontract to a university?
Answer: Yes.
- Question:** Can you provide more detail on what entities are acceptable?
Answer: The DFO is intended for stakeholders to leverage National Laboratory resources. While a subcontract to a university is not prohibited, the appropriateness of that will be deemed on a case-by-case basis. The final decision will be made by DOE. Significant subcontracting to a university is counter to the purpose of a DFO.

8. **Question:** Can a lab partner with more than one organization on a common response (i.e., can more than one industry member team together with a lab(s) in a common proposal)
Answer: Yes.
9. **Question:** Can a proposer propose more than one project with two different Labs (or universities, if possible)?
Answer: Yes. You may propose with multiple National Laboratories on a single proposal. Universities are not eligible for direct funding through the DFO.
10. **Question:** Can a proposer bring in a University who is not currently a Co-Optima member as recently shown in one of the slides?
Answer: Yes. For example, the industry proposer may subcontract to a university as part of its cost share contribution. DOE funds are only allocated to the National Laboratories.
11. **Question:** Can a university propose a project to collaborate with a national lab? Is an industry partner required for a successful proposal?
Answer: The DFO proposals are led by industry.
12. **Question:** Where can we find a list of Co-Optima members?
Answer: The [capabilities website](#) has specific points of contact for each capability area as well as [leadership team points of contact](#).
13. **Question:** What should go on the 'Topic' line of the template since we have only 1 topic?
Answer: Proposers may identify the high-level topic (like fuel development, combustion, etc.). However, leaving the section blank is okay since there is only one topic area for FY21.
14. **Question:** I have a question regarding the in-kind costs associated with the industry collaborators' labor. Is there any additional accounting documentation/requirement needed beyond the completion of the industry tasks/deliverables and their cost estimate in CRADA's statement of work?
Answer: There are no additional accounting requirements for the white paper beyond the completion of the industry tasks/deliverables and cost estimates in the white paper. If selected, the normal DOE requirements for accounting for in-kind cost share on a CRADA project will apply.
15. **Question:** Regarding the feedstocks, are both biomass and Gen 1.0 sources allowed for biofuel blendstock production?
Answer: Yes, so long as the proposed blendstock can meet the fuel property and the advanced biofuel life cycle greenhouse gas (GHG) emissions (>60% reduction) targets.
16. **Question:** What load range are you interested in for spark ignition?
Answer: White papers should advance foundational knowledge of promising bio-blendstocks and combustion approaches to move them closer to commercial adoption. White papers should, at a minimum, include the most relevant speed/load conditions for engine duty cycles of interest to the sector under investigation (e.g., light-, medium-, and heavy-duty).

17. **Question:** Is there an RPM limit on how fast the engine runs to be considered for the grant? (More specifically, the upper RPM limit)
Answer: No.
18. **Question:** Would you be interested in only primary emissions (NO_x, PM, etc.) or also in investigating the secondary aerosol forming potential from these advanced fuels/engines at different conditions?
Answer: White papers should advance foundational knowledge of promising bio-blendstocks and combustion approaches to move them closer to commercial adoption. The white paper should clearly indicate how addressing secondary aerosol emissions achieves that goal.
19. **Question:** Is the DFO limited only to ground transportation fuels application? Can proposals include marine and/or aviation fuels application?
Answer: Co-Optima is a ground transportation initiative. The fuel must be appropriate first for ground transportation.
20. **Question:** Does the proposed project have to be focused on a new technology which isn't commercial, or can it be for production of a fuel already in use but being produced from a new biomass feedstock?
Answer: If there are advantages conferred by the new approach that advance Co-Optima aims for higher efficiency and reduced emissions, the proposed project would be considered in scope. The proposer should demonstrate in the white paper how the approach advances Co-Optima aims.
21. **Question:** Does it makes sense for the DFO to think about fuel properties for combustion process in hybrid vehicles?
Answer: Co-Optima has not been conducting research and development (R&D) specific to hybrid systems. Some analysis has been done to understand how hybridization and electrification impact the adoption of fuel and engine technologies that Co-Optima has evaluated, but Co-Optima has not specifically designed fuels or combustion approaches to enable or impact electrification directly. The proposer should demonstrate how the proposed approach fits within the Co-Optima framework to improve combustion efficiency and reduce emissions.
22. **Question:** If the process produces a co-product which can be a liquid biofuel blendstock, is that allowed?
Answer: Yes. The proposal needs to demonstrate how the blendstock produced meets Co-Optima aims to generate better fuels that enable more efficient combustion, with lower life cycle GHG emissions.
23. **Question:** Is the design of control systems to make engines operate appropriately with fuels with different properties suitable for this DFO?
Answer: Control systems have not been the primary focus of R&D. While controls are an important barrier for some combustion approaches, the proposal must demonstrate how the approach enables more efficient combustion and lower emissions at the fuel-engine interface.
24. **Question:** Does the bio-blendstock being considered have to be one of the molecules as identified by Co-Optima? Or can a new molecule be looked into as well? For example, I did not see N-butanol as one of the candidates.
Answer: A new molecule can be proposed. The Co-Optima net was cast very broadly, but if there is a new fuel that was not considered previously by Co-Optima and fits the selection criteria, it can certainly be considered. The rationale and fuel property basis would have to be stated in the white paper. N-butanol was

evaluated in the report [Top Ten Blendstocks Derived From Biomass For Turbocharged Spark Ignition Engines](#). The report describes the fuel properties and selection rationale.

25. **Question:** Are advanced fuel injection technologies within scope? For example, on-demand direct injection and optimization of fuel properties through direct injection of two fuel streams through a single injector, one is bio-blends?
Answer: Dual-fuel approaches have historically been out of scope of the Co-Optima initiative. If you propose a dual-fuel approach, the use of a bio-blendstock must be significant (i.e., at the levels evaluated by Co-Optima of at least 10% beyond the additive level).
26. **Question:** If CO, CO₂, O₂, NO_x, and HC can be measured but not PM, is that ok?
Answer: Answering specific questions about the technical approach is not appropriate for this Q&A. The proposer must justify the potential and impact of the research. Note that the DFO is aimed at making National Laboratory resources available to industry. Therefore, National Laboratory partners may be identified who measure PM as well as gaseous emissions.
27. **Question:** Does "engine" in the initiative include aftertreatment systems?
Answer: Yes. The proposal would have to meet Co-Optima objectives.
28. **Question:** What scales should the proposal aim at? lab/bench or pilot? Provided the budget is justified for that scale?
Answer: All of the above. Since the DOE labs will be the federally funded research, the proposal must identify a scale that is available at a DOE lab within the \$250K budget.
29. **Question:** Engine innovations will likely come from new manufacturing technologies, does the DFO acknowledge this? (3-d printing, hi-temp materials, novel alloys, etc.)
Answer: This is not a manufacturing or materials-development DFO. Co-Optima is focused on research and development at the fuel-engine interface, which could include design changes to the engine. Manufacturing and/or materials development are out of scope, however.
30. **Question:** I have a couple of concepts to improve the performance of Diesel engines which might also work with Otto cycle engines, if they are GDI. I am wondering if the Co-Optima program might have any interest in this?
Answer: The Co-Optima initiative is open to new concepts and engine architectures as long as the approach meets Co-Optima objectives, including advancing technologies that move promising bio-blendstocks and combustion approaches closer to commercial adoption to increase efficiency and reduce emissions.
31. **Question:** So, the role of the proposer is to suggest ideas that will be carried out by one of the DOE labs, since folks outside of DOE can't be funded from the DFO. Is that a correct interpretation of the program?
Answer: Yes.
32. **Question:** The provided template states that each section of the template is aligned with the specific review criteria for Co-Optima DFO projects. Where can I locate those specific technical review criteria for reference?
Answer: See the review template [here](#).