Frequently Asked Questions (FAQ) for the DARPA Fleetwood Program

Yellow highlighting indicates new FAQs/Responses since the previous version of the FAQ as of 3/31/2026 posting

Contents

General Questions

FAQ: Is the Program Manager available for a meeting to discuss our idea(s)?

Due to scheduling limitations, and in the interest of fairness to all proposers, the Program Manager will not be taking program-related calls and meetings. The best way to receive feedback on an approach is through the submission of a proposal abstract prior to the deadline specified in the Program Solicitation (PS). The PS describes the program, including metrics, in detail. Similarly, the best way to receive feedback on a strategy to organize and manage the working groups supporting Fleetwood is through submission of a proposal abstract prior to the deadline specified in the Special Notice (DARPA-PS-26-23). Specific questions may be submitted by email to fleetwood@darpa.mil. Proposers should be aware that submitted questions and answers may be published on an FAQ page, with revisions to remove proprietary information.

FAQ: Our research is not geared specifically to meet the Fleetwood program goals. Is there an alternate solicitation that I can respond to?

Yes. DARPA/BTO has an office-wide solicitation (HR001126S0003) for this purpose. Responses are being collected through September 30, 2026.

FAQ: Do you anticipate that topics aligned with biomass valorization and catalytic innovation (such as those in Fleetwood) may appear in future DARPA Young Faculty Award (YFA) solicitations?

DARPA regularly releases announcements for new funding opportunities. Please continue to check the DARPA website and SAM.gov for any future related announcements.

FAQ: What are the citizenship or clearance requirements for participation in the Fleetwood program, and can green card holders with pending naturalization applications be eligible? Can a non-US citizen/ green card holders participate as team members?

The Fleetwood program does not explicitly require U.S. citizenship for participation; however, all participants must comply with applicable nondisclosure agreements, security regulations, export control laws, and other governing statutes. Green card holders may be eligible to participate, provided they meet these requirements. Please read over https://www.darpa.mil/work-with-us/communities/academia/fundamental-research and all of the links under Resources. The links will help identify what could be considered a likely risk or not. If there are no or only minor issues identified those can be mitigated for Phase 1 of the program. If there are larger concerns, then it may not be possible for an individual to perform or major mitigations could be needed. This process is the same for all individuals regardless of nationality. For Phase 2 of the program DARPA will do an additional security review and weigh that against the unique abilities of personnel supporting the teams we fund. Depending on our review, an individual may have no restriction for working on CUI, or they may need to be restricted from working on CUI. With other possible mitigation put in place, it is also possible that an individual may be limited to only the portions of CUI that their team is generating. CUI controlled by DARPA, to include CUI marked NOFORN or EXPORT CONTROLLED, may be disclosed to US Persons if they are a performer on a DARPA S&T proposal team or, if they are a performer who has been awarded a DARPA S&T project. The key is that there is a valid solicitation or contract in place with binding CUI direction and guidance.

CUI, even CUI marked NOFORN (No Foreign Nationals), may be disclosed to US Persons when:
(1) They are employed by the DoD.
(2) There are no contract restrictions prohibiting access to such information.
(3) Access to such information is within the scope of their assigned duties.
(4) Access to such information would help accomplish a lawful and authorized DoD mission or purpose and would not be detrimental to the interests of the DoD or the U.S. Government.

A U.S. Person, also known as a "Green Card holder" is a person who is a lawful permanent resident of the United States or who is a protected individual as defined by 8 U.S.C. 1101(a)(20) or 8 U.S.C.1324b(a)(3).

FAQ: Are non-U.S. companies, international collaborator/partner, or foreign research institutions eligible to participate as subcontractors or unfunded partners? What additional disclosures or reviews would be required under DARPA's Countering Foreign Influence Program (CFIP) and DoD research security policies? Are U.S. corporations that are majority-owned by a foreign national allowed?

It is possible for a team to include an international sub-awardee; however, division of labor across the team should be structured to mitigate any identified security risks. In particular, all team members, regardless of their location, institutional affiliation, or nationality must comply with applicable non-disclosure agreements, security regulations, export control laws, and other governing statutes. If selected for an OPP, all proposers must complete the Fundamental Research Risk-Based Security Review Program

(FRRBS) process as outlined in DARPA-PS-26-23, Section 5.7. The prime must provide a detailed description of why a US person or institution cannot be used instead. The description must include 1) a summary of the individual's resume, 2) what tasks they will perform, 3) what steps were taken, albeit unsuccessfully, to identify a US organization or person with similar skills, and 4) a security plan on how Non-US citizens and/or organizations will be limited to only the CUI information that is required for them to perform their duties. The organization or individual will not be authorized to access CUI unless approved by DARPA following the security evaluation. For international collaborators, the sub-awardee institution/organization in addition to individual team members from that institution/organization will be considered as part of the security risk assessment. Security plans and division of labor on a team that restricts access to CUI to US institutions will significantly limit the security risks for teams with international sub-awardees.

FAQ: Are non-U.S. organizations, such as non-U.S. Universities, eligible to lead an application, or allowed to participate as members of a proposing team for the Fleetwood program?

Non-U.S. organizations, such as non-U.S. Universities, are eligible to lead an application or be proposing team members for the Fleetwood program. However, please note that as a non-U.S. organization, participation is contingent upon compliance with the requirements outlined in section 3.1.2 "Other Applicants" of DARPA-PS-26-23. Please review this section carefully and ensure compliance.

FAQ: The abstract submission includes a title page, project description, and one slide. Does the slide count towards the abstract 5-page limit.

The one-slide (template found in Attachment A) does not count toward the 5-page limit of the abstract (template found in Attachment B).

FAQ: According to DARPA-PS-26-23-Attachment_B-Abstract_Template.docx, Technical papers are optional, no more than 3. Does this mean teams can include up to 3 technical papers, for example journal articles they've published, and if so, is there a page limit?

Teams can provide up to 3 technical papers (e.g., peer-reviewed, formal documents such as a journal article, research paper, review paper, etc.) along with their abstract submission. These technical papers do not have a page limit and are not included in the abstract page limit.

Contracting and Submission Related Questions

FAQ: Are Proposal Abstract submissions required?

Yes – as stated in DARPA-PS-26-23: "**Abstracts (Required):** Abstracts must be submitted as specified in Section 4.2. This will allow the Government to assess proposer's technical comprehension and understanding of the key challenges of the Fleetwood program and ability to execute the proposed

concept (see Section 4.3). Only proposers who submit an abstract will be considered for further participation in the Fleetwood program. Selected proposers will be invited to submit an OPP and deliver an in-person oral presentation (see Section 4.4)."

FAQ: How many subcontractors can be included in a team, and what is DARPA's expectation for the lead organization?

DARPA does not impose restrictions on the number of subcontractors that can be included in a team. However, the lead (prime) organization is expected to have a substantial technical role in the program and must demonstrate the capability to execute a significant portion of the work. While subcontractors can provide complementary expertise, the lead organization must house the core expertise required to address the program's objectives and cannot act solely as a program manager with minimal or ancillary technical contributions. DARPA seeks teams where the prime contractor plays a substantial technical role in addressing the program's objectives, ensuring that the core expertise required for success is housed within the prime organization.

FAQ: Are academic institutions and/or industry partners eligible to be the prime or a subcontractor of an application?

Academic institutions and industry partners are eligible to participate as either the lead (prime) or a subcontractor in the Fleetwood program. Similarly, non-academic institutions (e.g., non-profits, small businesses, or large businesses) are eligible to participate as either the lead (prime) or subcontractor to academic institutions.

FAQ: Is it required that an industrial partner be included as part of the project team? Is teaming with industry an evaluation criterion?

An industry partner is not required to be a part of a project team. Teaming with industry is not an evaluation criterion (see DARPA-PS-26-23, Section 4.3 Abstracts – Process and Basis of Evaluation). Teaming is highly encouraged to ensure that proposers possess the expertise and capabilities necessary to meet Fleetwood's objectives.

FAQ: Is there a limitation on the number of teams a PI/Co-I or an academic institution can be on? Are there restrictions on roles or overlapping efforts when participating in multiple applications? Is there a limit to the number of submissions permitted from one institution?

Individuals or organizations can participate in more than one application (including abstract and OPP), as a contributor, PI, subcontractor, or team member, but individuals may not participate as the PI on more than one awarded team on Fleetwood. In contrast, an organization may submit multiple applications as a lead (prime), provided the same individual is not the PI. For instance, a university may submit multiple applications provided they have different PIs. PIs may act as a Co-I or subcontractor on another awarded

team. *Critically, efforts involving the same personnel/organizations performing across multiple awards must be distinct and cannot overlap.* If an institution or individual is involved in multiple teams, the work performed must be unique to each team and cannot overlap. All proposers must ensure that their participation does not create organizational conflicts of interest (OCI) or compromise their ability to meet program requirements. It is the responsibility of the institution or individual to ensure compliance with all program guidelines, including submitting OCI mitigation plans if necessary.

FAQ: What is the target budget that should be considered for this project? Does this mean total funding available is $4-8M or is that the range per award? Is there a minimum funding amount?

As stated in DARPA-PS-26-23: "Multiple awards estimated between $4,000,000 and $8,000,000 anticipated, inclusive of Phase 1 and Phase 2." This range is per award. There is not a minimum or maximum amount; proposers should use the award range to inform how they build their teams to accomplish the metrics.

FAQ: Is there a budget spreadsheet that we need to include or is the budget estimate in the abstract sufficient?

The budget estimate in the abstract is sufficient.

FAQ: For the two FAs, should proposers propose solutions for both, or can proposers just focus on one?

A proposing team must address both FAs in each Phase to be considered for evaluation, whereas members of the team can focus on one FA. Therefore, teaming is highly encouraged to ensure that proposer teams possess the expertise and capabilities necessary to meet Fleetwood's objectives.

DARPA-PS-26-23 states: "Abstracts and OPPs must address both FAs in each Phase to be considered for evaluation…Teaming is highly encouraged to ensure that proposers possess the expertise and capabilities necessary to meet Fleetwood's objectives."

FAQ: Are Federal Agencies and Government Labs eligible to be included as part of a proposing team for this solicitation? Can National Labs serve as subcontractors? What is the eligibility of researchers from service laboratories, including the US Army DEVCOM Army Research Laboratory (ARL) to participate in the Fleetwood Program?

A service laboratory, such as the US Army DEVCOM Army Research Laboratory (ARL) is a Government Entity and not eligible to propose, nor are they eligible as subcontractors or consultants as part of a proposal.

DARPA-PS-26-23 states: "Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARCs), and Government Entities to include National Laboratories are not

eligible to propose to this solicitation, nor are they eligible as subcontractors or consultants as part of a proposal."

FAQ: Will DARPA help to form teams?

Teaming activities for any proposals are at the discretion of the lead (prime) of each team. Upon request, the DARPA Fleetwood team can share teaming profiles received from interested parties submitted for the Industry Day event for informational purposes.

FAQ: If the proposal has multiple subcontractors, should each fill out a separate abstract and refer to the other collaborators, or do all collaborators submit one joint abstract?

At the proposal abstract stage, DARPA needs **one** .zip archive per team (completed by the prime), containing the summary slide and abstract (using the provided templates) uploaded to BAAT.

FAQ: Is the date(s) of the oral presentation day known?

DARPA is targeting to host invited oral presentations mid-June 2026. Teams who are invited to submit an OPP will receive a communication that will detail the exact presentation dates.

DARPA-PS-26-23 states: "If the Government is interested in a specific approach during the Abstract review, the proposer will be asked to submit an OPP and provide a presentation to offer further details on its proposed solution…Additional details and guidance for preparing the OPP will accompany the invitation to participate…The Government intends for Oral Presentations to be done in-person over the course of 1-2 days in the Washington, DC metro area."

FAQ: In the teaming perspective, do we need to include component suppliers for all critical components, or can we prioritize research/applied engineering capabilities only?

DARPA-PS-26-23 states: "Biomass feedstocks will be sourced and supplied by the Government Test and Evaluation (T&E) Team to ensure consistency across the program."

Suppliers of other materials and equipment do not need to be included in teaming aspects if they are not contributing to the technical merit of the proposed approach.

FAQ: Can proposals include plans to purchase equipment and hire necessary support staff, or is it expected that all required infrastructure and personnel are already in place at the time of submission?

It is not expected that all the required infrastructure and personnel will be already in place at the time of the abstract and OPP submission. DARPA-PS-26-23 states in Section 4.2 that Abstracts must include an estimated cost to include estimated total labor cost, and estimated materials and ODCs (equipment, materials, travel, tuition) for Phase 1 and 2.

FAQ: Are teams expected to be fully defined at the abstract stage, or is there flexibility to incorporate additional collaborators between the abstract and full proposal phases?

There will be opportunity after the abstract submission to incorporate additional collaborators.

FAQ: Are there any specific considerations we should be aware of regarding IP ownership and control in such scenarios? Can DARPA clarify the minimum level of technical detail expected and how performers should balance this requirement with protection of proprietary background IP? Are such agreements required to be executed prior to abstract submission, or is it sufficient to identify anticipated agreement needs at the abstract/OPP stage and execute them post-selection but prior to or during program performance?

See DARPA-PS-26-23, Section 5.5 Intellectual Property (IP) / Data Rights, and Section 1.7 Test and Evaluation (T&E). Agreements do not need to be executed prior to abstract submission.

DARPA-PS-26-23 states: "Performers should plan to interact with the Government T&E team frequently over the course of the program. This team will be composed of researchers with relevant expertise from US Government laboratories. Performers will engage with T&E team to consult on experimental design and relevant controls, in addition to TEA assumptions, calculations, and reporting. The interaction with T&E team, including early consideration of TEA and experimental results, is envisioned to de-risk and inform eventual transition pathways. Additionally, the Government T&E team will replicate and evaluate key aspects of successful technologies, as possible, at laboratory scale. Consequently, proposals must plan for any required agreements needed to share background intellectual property (IP) with government partners that could be required for evaluation studies. These agreements should be appropriate for the proposed technology and experimental studies, and they may necessitate material transfer agreements, data sharing agreements, cooperative research and development agreements (CRADAs), or other such agreements. DARPA is not responsible for negotiating these agreements because these terms must be agreed upon between the two parties exchanging information and/or materials (i.e., the government partner and the contracted performer on the program). Any foreground IP generated during performance on Fleetwood will be governed by the policy set forth in Section 5.5 and the terms and conditions in the model Other Transaction for Prototype Agreement), and as such, this information will be shared with members of the government team, as necessary, for them to support the program."

FAQ: What is the expected start date for the effort, if selected for award?

The start date is expected to be in the fall of 2026. More information will be provided if selected for OPP.

Security-Related Questions

FAQ: How do we address discussions and confirm the production of export-controlled compounds on the program and security questions for program?

DARPA-PS-26-23 states: "A program specific CUI Guide has not been established to help proposers determine CUI thresholds for information relevant to, and technologies developed under the program at this time. CTI is not anticipated for this program but, foreign proposers are encouraged to understand U.S. export law and have a plan in place to obtain export licenses if proposing to generate export-controlled information. Possible methods include teaming with a U.S. prime and/or having a U.S. subsidiary/parent company. Dependent upon selection for award, a program specific CUI guide will be provided to the performer to observe and follow if export-controlled information will be generated. If abstracts or OPPs include novel processes or steps to manufacture chemical compounds list on the commerce control list, explosives listed in the ANNEX to Category 1 List of Explosives, or the US Munitions List proposers are encouraged to first contact the agency point of contact listed in the Overview section prior to the abstract due date to discuss security requirements."

CTI stands for "Controlled Technical Information."

Technical Questions

FAQ: Could you confirm whether metric definitions follow standard lignin depolymerization conventions (e.g., as referenced in Abu-Omar et al.), and whether alternative but well-justified definitions of yield or selectivity would be acceptable?

Alternative definitions of yield and selectivity must be addressed and justified in the Abstracts and OPPs to be considered for evaluation.

DARPA-PS-26-23 states: "Calculation of lignin depolymerization, or lignin yield, and aromatic monomer yield must follow standard, accepted research practices such as those set forth in Abu-Omar et al. Characterization of biomass samples should be performed in accordance with US Department of Energy National Laboratory of the Rockies – Laboratory Analytical Procedures (LAPs) for relevant characterization techniques. Catalyst characterization and reactor studies should be performed following accepted research practices such as those set forth in the above citation."

FAQ: Should proposed efforts be primarily application-driven, or is there room for more discovery-oriented and fundamental innovation as part of the program?

Novel and innovative approaches are expected. See DARPA-PS-26-23 Section 4.3 Abstracts – Process and Basis of Evaluation.

DARPA-PS-26-23 states: "Abstracts and OPPs must focus on novel catalytic strategies that align with the program's emphasis on advancing state-of-the-art technologies for atomic-level precision and control in lignin valorization and conversion, while ensuring the economic feasibility of the proposed approaches through efficient resource utilization and cost-effective implementation."

FAQ: What are the target metrics for catalyst performance, e.g., metrics for turnover number, turnover frequency?

Specific numerical values for catalyst performance are not defined in the solicitation. See DARPA-PS-26-23 Section 1.5 Program Goals/Metrics for all Fleetwood program metrics and requirements.

DARPA-PS-26-23 states: "The design of catalytic systems must prioritize selectivity and activity, ensuring the formation of target chemicals at high yield while minimizing side products. Fleetwood seeks approaches that maximize carbon utilization and enhance the overall economic viability of the biomass conversion process…Proposers should evaluate atom economy and energy usage in addition to cost when selecting a chemical(s). Additionally, abstracts and OPPs must specify and justify the production of the target chemical across three scales of production for evaluation in performer developed Technoeconomic Analyses (TEAs), providing rationale for scalability and feasibility at each level." And "Individual abstracts will be evaluated against the evaluation criteria described below: **Technical Approach:** The proposed technical approach is reasonable, feasible, and innovative. The approach demonstrates an innovative yet feasible approach to address the identified technical risks and challenges and meet program metrics."

FAQ: High temperature processes (hydrothermal liquefaction, pyrolysis, gasification) are out of scope. Are there temperature limit metrics? How should performers include the impact of process parameters (temperature, solvent, etc.) on catalyst performance?

There are no explicit limitations on operational temperatures, pressures, solvents, etc. However, process operational temperature (and related energy requirements), must be represented and assessed through a comprehensive technoeconomic analysis (TEA) and process model.

DARPA-PS-26-23 states: "Abstracts and OPPs must focus on novel catalytic strategies that align with the program's emphasis on advancing state-of-the-art technologies for atomic-level precision and control in lignin valorization and conversion, while ensuring the economic feasibility of the proposed approaches through efficient resource utilization and cost-effective implementation. Performers will develop catalytic strategies to produce value-added chemicals and should focus on maximizing across three production scales as assessed through a comprehensive technoeconomic analysis (TEA) and process model. Overall value will be determined through an analysis of the Minimum Selling Price of the chosen product chemicals…Proposers should evaluate atom economy and energy usage in addition to cost when selecting a chemical(s). Additionally, abstracts and OPPs must specify and justify the production of the target chemical across three scales of production for evaluation in performer developed Technoeconomic Analyses (TEAs), providing rationale for scalability and feasibility at each level."

FAQ: Is the intent to experimentally demonstrate the full production pathway for a value-added chemical, or is the demonstration of production of a precursor molecule sufficient? Can precursors to target compounds be produced if we do not demonstrate a synthesis pathway to the final compound on the program, but include information and steps to the final desired molecule in the TEA/LCA?

A chosen target chemical(s) that is a precursor to a subsequent value-added chemical(s) is within scope, but the chosen target chemical(s) or precursor(s), not the subsequent value-added chemical(s), will be assessed by the Government Team through a comprehensive technoeconomic analysis (TEA) and process model.

DARPA-PS-26-23 states: "The goal of the Fleetwood program is to develop stable, active, and selective catalysts that are capable of valorizing lignin-containing waste biomass feedstocks, both domestically and in deployed environments, thereby accessing a robust source for value-added chemicals and precursors."

FAQ: Is it okay to use other chemical feedstocks to make the final product? For example, taking a phenol product derived from lignin and adding other organic, non-lignin derived chemicals to make a new product?

The chosen target chemical(s) will be assessed through a comprehensive technoeconomic analysis (TEA) and process model. All non-lignin derived chemicals and reagents must be accounted for and assessed at market rates, including all assumptions regarding chemical(s) accessibility in the comprehensive TEA.

DARPA-PS-26-23 states: "Proposers should evaluate atom economy and energy usage in addition to cost when selecting a chemical(s). Additionally, abstracts and OPPs must specify and justify the production of the target chemical across three scales of production for evaluation in performer developed Technoeconomic Analyses (TEAs), providing rationale for scalability and feasibility at each level…Performers will develop catalytic strategies to produce value-added chemicals and should focus on maximizing overall value across three production scales as assessed through a comprehensive technoeconomic analysis (TEA) and process model. Overall value will be determined through an analysis of the Minimum Selling Price of the chosen product chemicals."

FAQ: If a functional substitute for a value-added chemical is proposed, does the proposer need to provide proof of comparable performance?

If a functional substitute is the chosen target chemical(s), proposers must substantiate that the functional substitute is equivalent or superior to a value-added chemical(s) for all relevant parameters as related to the functional substitute's stated application.

DARPA-PS-26-23 states: "Abstracts and OPPs should include routes to functional substitutes or performance advantage chemicals versus direct product replacements. Proposers should evaluate atom economy and energy usage in addition to cost when selecting a chemical(s)."

FAQ: Would delivery of a domestic production process for an established chemical whose current production is predominantly abroad qualify?

Delivery of a domestic production process for an established chemical(s) whose current production is predominantly abroad is within scope. The chosen target chemical(s) will be assessed through a comprehensive technoeconomic analysis (TEA) and process model, and the overall value will be determined through an analysis of the Minimum Selling Price of the chosen target chemical(s).

FAQ: For the purpose of this program, how far should a process push into the product chain…core chemical feedstock, chemical intermediates, or end-use products? What are the target deliverables? Does the program consider the production of a monomer or monomer precursor to be an acceptable deliverable, or is a fully finished product specifically expected? What types of products are considered compliant. Our process will generate mixtures of aromatic monomers, including alkyl aromatics and aromatic carboxylic acids. Are these chemicals suitable as final products, or should we be including "separations" and/or "conversions" of these products into specific market targets?

Chosen target chemical(s) that are part of core chemical feedstocks, precursors, intermediates, and end-use products are within scope. If a monomer or monomer precursor is selected as the chosen target chemical it will be assessed through a comprehensive technoeconomic analysis (TEA) and process model, and the overall value will be determined through an analysis of the Minimum Selling Price.

DARPA-PS-26-23 states: "Molecules of interest include, but are not limited to pharmaceuticals, defense-relevant materials, lubricants, and other specialty and value-added chemicals. The design of catalytic systems must prioritize selectivity and activity, ensuring the formation of target chemicals at high yield while minimizing side products. Fleetwood seeks approaches that maximize carbon utilization and enhance the overall economic viability of the biomass conversion process…Performers will develop catalytic strategies to produce value-added chemicals and should focus on maximizing overall value across three production scales as assessed through a comprehensive technoeconomic analysis (TEA) and process model. Overall value will be determined through an analysis of the Minimum Selling Price of the chosen product chemicals."

FAQ: Is Fleetwood interested in lignin-based polymer applications? Does the FA1 process need to completely depolymerize the lignin prior to the FA2 upgrading? Is achieving monomer yield targets the most critical metric for project success or can we target 100% lignin utilization in chemical and materials applications?

A metric of the Fleetwood program, as outlined in Section 1.5 of DARPA-PS-26-23, is 100% separation and conversion of lignin to monomers – aromatic monomer yield on a mass basis – irrelevant of the chosen target chemical(s) or material(s). Success in the Fleetwood program will be defined by meeting or exceeding the metrics outlined in Table 2 of DARPA-PS-26-23, which represent the minimum set of

requirements established by the Government. There is no one most critical metric; all metrics must be met.

FAQ: Do market size and volatility need to be considered for the product value, or only the Minimum Selling Price?

DARPA-PS-26-23 states: "In Phase 1, performers will develop and provide a comprehensive TEA for their solution. In Phase 2, this analysis is updated based on Phase 1 progress and results. This assessment must 1) evaluate technical feasibility, including technology readiness level (TRL), integration risks, and projected development milestones and 2) analyze economic viability, including cost structure, anticipated return on investment (ROI), pricing strategy, long-term stability, and potential for scalability. Moreover, the TEA should include market determination and sizing, as well as clearly outlining assumptions, methodologies, and data sources. The analysis should also include relevant regulatory and reimbursement pathways, timelines, cost implications, and demonstrate: Alignment with market needs, Economic justification for adoption and deployment, Strategic insight into commercialization pathways."

FAQ: When the government validates performer TEAs for the performance incentive, will MSP calculations that include carbohydrate co-product revenue credits be evaluated on a whole-biomass basis, or will the performance incentive be calculated on lignin-derived product value only? Will DARPA apply a standardized methodology or assumptions for MSP verification across performers, and how will differences between performer-developed TEAs and government verified TEAs be resolved?

DARPA-PS-26-23 states: "Subject to availability of funds, one performer may be awarded a performance incentive of $50,000 at the conclusion of each 12-month phase based on Minimum Selling Price (MSP) of the chosen output chemical(s) and demonstrating maximum overall value of the process. This evaluation will account for capital expenditure (CAPEX), operating expense (OPEX), maintenance costs, and other economic considerations, through verification and validation of the performers' TEA and MSP by the Program Manager and the Government T&E Team."

FAQ: Are there any requirements for the TEA modeling portion, or can it be a single engineer using Excel? At the abstract stage, does DARPA expect proposers to provide quantitative TEA outputs, or are qualitative economic assumptions and high-level rationale sufficient for evaluation?

The Preliminary System Design report is due Month 1 as stated in Table 3, Section 1.6 of DARPA-PS-26-23. DARPA-PS-26-23 states: "Preliminary System Design Report shall include an initial process model of the chosen process unit operations and catalyst system in ASPEN Plus or similar chemical engineering process modeling software. This model will be the basis and should be incorporated into a full process TEA at multiple scales. Performers should explore a range of scales, at least 3, spanning small, modular production in a deployed scenario to large chemical manufacturing."

FAQ: Are there guidelines for the three scales that should be proposed for the technoeconomic analysis (TEA)? Does the proposer decide what these scales are or does the program have more prescriptive targets for the largest scale (e.g., 1 dry tonne per day of biomass feedstock)? Could these production scales comprise similar scales, but different reactor configurations (e.g. batch vs. continuous process)?

The program does not have prescriptive mass targets for the three scales. The three scales and the related approaches (e.g., reactor configurations) are decided and justified by the proposing team. The team must substantiate the chosen scales and reactor configurations for each scale, as dictated by the chosen target chemical(s) and the chosen target chemical(s) stated application(s). The scales will help identify potential market applications and viability and validate configuration models for the given target chemical(s) and technological approaches.

DARPA-PS-26-23 states: "Abstracts and OPPs must propose three production scales for chosen value-added chemicals ranging from small-scale, modular unit production (e.g. forward deployed manufacturing) to large-scale chemical production. During the program, performers will evaluate their TEA at each of these production scales, which may be updated and reevaluated during the period of performance. Performers are encouraged to account for biomass resource availability when planning and evaluating production scales as biomass transportation, storage, and preprocessing costs are often overlooked and represent a significant portion of overall cost for any effort. Evaluation of multiple production scales will identify both chemicals and associated scales that are commercially viable while exploring the potential for multiple, modular production sites to reduce capital and operating expenditures."

FAQ: Are developing transition pathways an aspect of this program?

There is no explicit requirement for proposals to address specific transition pathways. However, proposals that articulate relevant applications and commercialization pathways for their proposed target chemical(s) based on a strong TEA are highly encouraged.

FAQ: Are performance-based biofuels and hydrogen included within the definition of eligible products for this solicitation?

Performance-based biofuels are within scope. Formation of H_2 as a chosen target chemical is not within scope. However, H_2 may be a reaction intermediate or secondary reaction product for chosen approaches.

DARPA-PS-26-23 states: "Strategies to…produce low-value chemicals, including C1 and C2 products, such as carbon dioxide, methanol, and ethanol are not of interest; however, these chemicals may be reaction intermediates or secondary reaction products for chosen approaches."

FAQ: Is Fleetwood exploring innovative applications of cellulose and hemicellulose fractions, such as platform chemicals or functional and structural materials? Are you entirely focused on lignin conversion, or all of the biomass (e.g., hemicellulose and cellulose) into valorized materials?

Value-added chemical(s) produced from whole biomass including cellulose and hemicellulose fractions are strongly encouraged. However, lignin must be utilized to meet the program performance and economic viability metrics. Strategies to only process carbohydrate fractions are out of scope.

DARPA-PS-26-23 states: “Abstracts and OPPs must focus on novel catalytic strategies that align with the program’s emphasis on advancing state-of-the-art technologies for atomic-level precision and control in lignin valorization and conversion, while ensuring the economic feasibility of the proposed approaches through efficient resource utilization and cost-effective implementation…Strategies to only process carbohydrate fractions…are not of interest."

FAQ: Is there interest within the Fleetwood program in the biodesign of lignocellulosic biomass? Specifically, engineered biomass with novel lignin content, tailored lignin composition, and modified chemical linkages. Are technical lignin sources, such as kraft lignin from paper pulp production and lignin produced from biorefineries as a byproduct of cellulosic fuel production considered acceptable feedstocks? Is it preferred or required to use raw biomass?

Biomass feedstock will be sourced and supplied by the Government Test and Evaluation (T&E) Team. Performers will be required to process raw biomass. Other sources for lignin are out of scope. The Program Manager will have the discretion to incorporate a replacement biomass feedstock(s) for each performer.

DARPA-PS-26-23 states: "Performers should describe an approach suitable to multiple types of biomass feedstocks (e.g. woody biomass and agricultural residue, or agricultural residue and grasses). However, the Program Manager will have the discretion to incorporate a replacement biomass feedstock(s) for each performer…Biomass feedstocks will be sourced and supplied by the Government Test and Evaluation (T&E) Team to ensure consistency across the program."

FAQ: Section 1.3.3 (FA2) lists thermo-, electro-, photo-, and cell-free biocatalysis as examples of catalytic approaches within scope. Should this list be interpreted as illustrative or exhaustive? Is there a restriction that the use of living microorganisms for bioconversion is not permitted? Are plasma approaches within scope?

This list is illustrative. Biocatalytic and biological approaches, including enzymatic or microbial delignification strategies and whole cell biocatalysis are within scope of the Fleetwood program. Multi-catalytic approaches and plasma, are also within scope. There is no restriction on the use of living microorganisms for bioconversion. Proposals are not required to include one specific type of catalysis (e.g., thermocatalysis) to be considered.

FAQ: Do you have a volume weighting in terms of chemical ultimate functionality (e.g., fuels, polymers, etc.)?

Volume weighting is a factor included in the technoeconomic analysis and economic justification of the approach. For more information, see DARPA-PS-26-23, Section 1.4, Techno-Economic Analysis (TEA).

FAQ: Does the FA1 process need to separate and recover purified monomers prior to the FA2 upgrading or just demonstrate that the FA1 process can depolymerize the lignin into monomers at the needed yields? Is the target 100% recovery of all monomers or just those relevant to downstream products?

A metric of the Fleetwood program, as outlined in Section 1.5 of DARPA-PS-26-23, is 100% separation and conversion of lignin to monomers – aromatic monomer yield on a mass basis – irrelevant of the chosen target chemical(s). Success in the Fleetwood program will be defined by meeting or exceeding the metrics outlined in Table 2 of DARPA-PS-26-23, which represent the minimum set of requirements established by the Government.

DARPA-PS-26-23 states: "Approaches must demonstrate stability during extended operation, high selectivity, and near complete depolymerization of lignin into monomers, which will serve as precursors for downstream conversion into value-added chemicals…Performers will develop catalysts to convert lignin-derived monomers into value-added chemicals including but not limited to specialty chemicals, pharmaceuticals, adhesives, and lubricants. Successful strategies must demonstrate high selectivity, activity, yield, efficiency, and stability."

FAQ: Technology Readiness Level (TRL) - Is there a specific TRL that should be proposed? What level of technological maturity is expected at the start? Is it necessary for key elements of the proposed approach to already be demonstrated experimentally, or are earlier-stage concepts, innovation and discovery (e.g., modeling-driven discovery of catalysts and pathways) considered responsive if paired with a credible validation plan, or is the program primarily geared toward more advanced, demonstration-ready approaches?

There is not a specific TRL or technological maturity level requested. Teams will not be expected to demonstrate their approach at all three proposed scales. Teams will demonstrate delignification, monomer yield, process rate, and stability improvement consistent with End of Phase Metrics for 1 kg of each selected biomass type and provide TEA and process model for T&E evaluation. See DARPA-PS-26-23, Table 3.

DARPA-PS-26-23 states: "The program will include two critical demonstrations, scheduled for Month 11 and Month 23, hosted by the performer teams at their respective performance sites. These demonstrations are aligned with milestones and deliverables outlined in Table 3 (Section 1.6) and are designed to validate progress and ensure that performer teams remain on track to meet program objectives."

The End of Program Milestone – 24 Months, includes the following Deliverable: "Deliverable: End of Phase report summarizing progress against all tasks, metrics, and milestones. A section of this report must include the Prototype deliverable: the process developed for biomass separation and conversion, description of related catalyst materials, and a summary of associated technical data."

FAQ: Does the government expect, for the Month 11 and Month 23 demonstrations, a connected end-to-end physical system that takes whole biomass input and produces finished chemical output in a single uninterrupted process flow or is the demonstration expectations to validate each subsystem separately?

The Month 11 and Month 23 demonstrations must achieve the stated milestones and deliverables in Table 3, Section 1.6 of DARPA-PS-26-23. Whether the performer team should choose an appropriate demonstration to showcase and whether they should choose an end-to-end physical system or separate subsystems to demonstrate that they meet the program objectives is not prescribed by the PS. The prototype deliverable is a written report of the process developed for biomass separation and conversion, description of related catalyst materials, and a summary of associated technical data.

FAQ: Would a discovery and design approach, with subsequent experimental validation—be considered in scope under the program's emphasis on novel catalytic strategies?

DARPA-PS-26-23 states that individual abstracts will be evaluated against the following evaluation criteria: "a. **Technical Approach:** The proposed technical approach is reasonable, feasible, and innovative. The approach demonstrates an innovative yet feasible approach to address the identified technical risks and challenges and meet program metrics. b. **Technical Ability:** The proposers demonstrate an ability, if selected, to achieve the goals of the Fleetwood program. c. **Technical Comprehension**: The technical understanding is accurate, and key technical challenges and risks are identified."

FAQ: How processed will the government-provided feedstocks be? What level of impurity should we expect (e.g., insect remains, animal excrement, plastics residue)? Will the government provide preprocessed lignin streams (hydrolysate, lignin oil, or equivalent) in addition to whole biomass, and if so, at what point in the timeline?

The provided feedstocks are real biomass sources that could include various impurities. Proposers should propose mitigation strategies to address impurities. The Government T&E Team is able to furnish both preprocessed biomass and scaled process intermediates. The list in DARPA-PS-26-23 Section 1.7, "minimally processed biomass feedstocks, separated lignin oil, and cellulose/hemicellulose/lignin blendstocks" is illustrative, and not comprehensive. Performers should detail in their proposal (abstract and OPP) what process intermediates are needed and when; however, performers must demonstrate progress against both depolymerization and conversion of whole biomass. Production of processed lignin streams would be to assist with performer demonstration scale limitations and to facilitate downstream conversion development.

DARPA-PS-26-23 states: "Biomass feedstocks could include, but are not limited to: rice residue, banana residue, coconut residue, coffee residue, nut shells/hulls, palm fronds, corn stover, sugar cane bagasse, soybean residue, macadamia nut shells/hulls, sargassum seaweed, switchgrass, elephant grass, forest residues, oil palm residues, wheat residues, and barley residues…Biomass feedstocks will be sourced and supplied by the Government Test and Evaluation (T&E) Team to ensure consistency across the program."