U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Co-Optimization of Fuels and Engines

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FOA Webinar

DE-FOA-0001461

8/17/16

Anticipated Schedule:

FOA Issue Date:	**August 1, 2016**
Informational Webinar:	August 17, 2016 1:00pm ET
Submission Deadline for Concept Papers:	August 29, 2016 5:00pm ET
Submission Deadline for Full Applications:	October 16, 2016 5:00pm ET
Expected Submission Deadline for Replies to Reviewer Comments:	November 11, 2016 5:00pm ET
Expected Date for EERE Selection Notifications:	January 15, 2017
Expected Timeframe for Award Negotiations	March 2017

Notice

- All applicants are strongly encouraged to carefully read the Funding Opportunity Announcement DE-FOA-0001461 **"Co-Optimization of Fuels and Engines"** and adhere to the stated submission requirements.
- This presentation summarizes the contents of FOA. If there are any inconsistencies between the FOA and this presentation or statements from DOE personnel, the FOA is the controlling document and applicants should rely on the FOA language and seek clarification from EERE.
- If you believe there is an inconsistency, please contact OptimaFOA@ee.doe.gov

Agenda

1) FOA Description
2) National Laboratory Project Description
3) Topic Areas/Technical Areas of Interest
4) Award Information
5) Cost Sharing
6) Concept Papers
7) Full Applications
8) Merit Review and Selection Process
9) Registration Requirements

FOA Description

- This FOA supports DOE's Co-Optimization of Fuels and Engines (Co-Optima) initiative, which seeks to accelerate the introduction of affordable, scalable, and sustainable high performance fuels for use in high-efficiency, low-emission engines.
- In fiscal year 2016, the Bioenergy Technologies Office (BETO) and the Vehicle Technologies Office (VTO) jointly funded a consortium of nine DOE National Laboratories to begin an initial three-year project in support of the Co-Optima initiative.
- Projects selected under this FOA will complement the ongoing DOE National Laboratory Project and support the broader Co-Optima initiative.
- **Eligibility for this FOA is restricted to U.S. Institutions of Higher Education (as defined in 20 U.S.C. § 1001, in accordance with 2 C.F.R § 200.55), and non-profit research institutions that operate as a division under the U.S. Institutions of Higher Education. This restricted eligibility applies to both Prime Recipients and Subrecipients.**

FOA Description

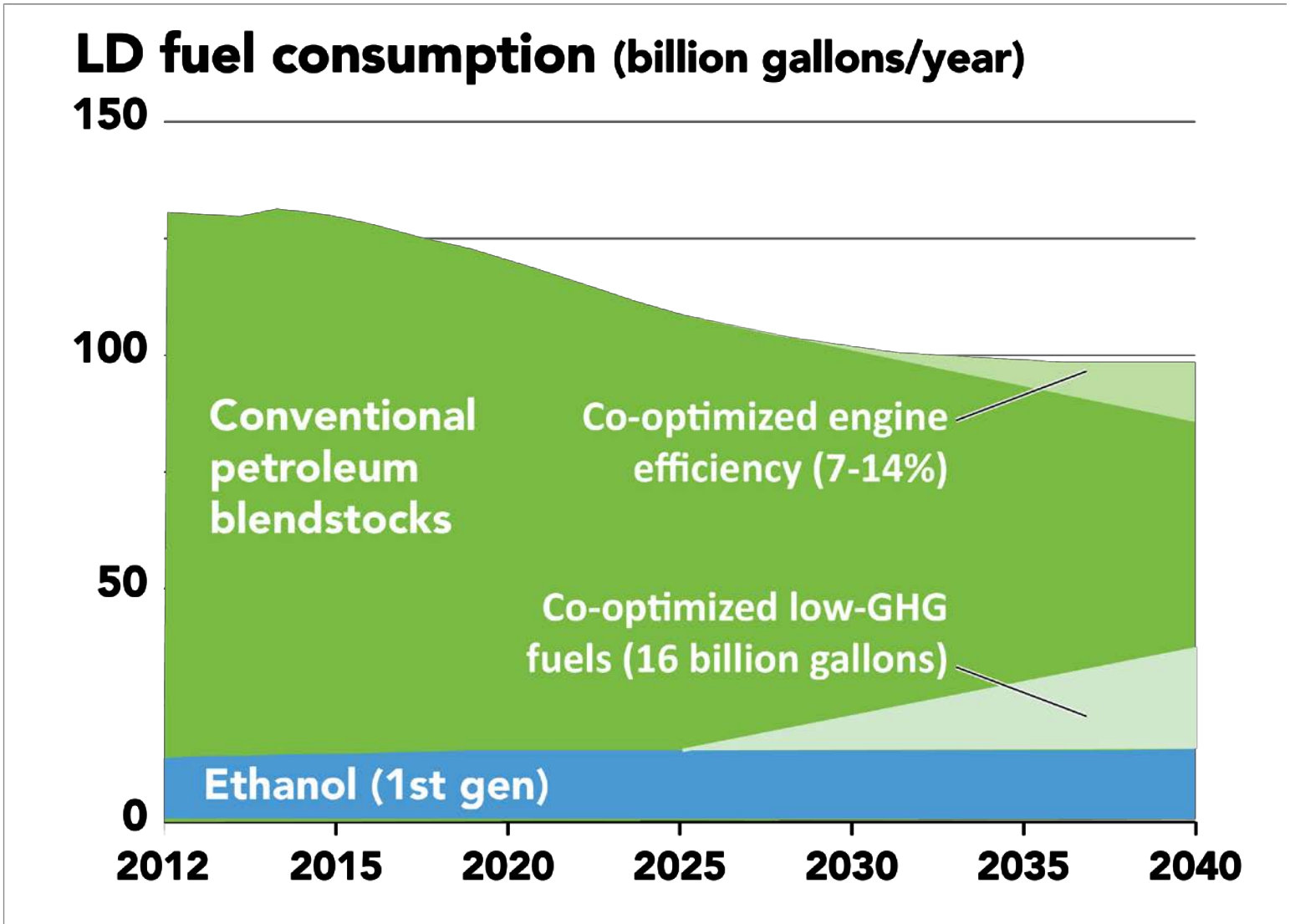
- The outputs from this FOA are expected to contribute information, data, and methods that will inform the planning of additional R&D efforts associated with the overall Co-Optima initiative.
- Recipients funded under this FOA are expected to interface with the National Laboratory consortium throughout the performance of their projects and attend annual or more frequent all-hands Co-Optima initiative meetings.
- A National Laboratory expert researcher with relevant expertise will be assigned after selections are made to assist coordination and provide technical assistance to each award.

Goal: better fuels and better vehicles **sooner**

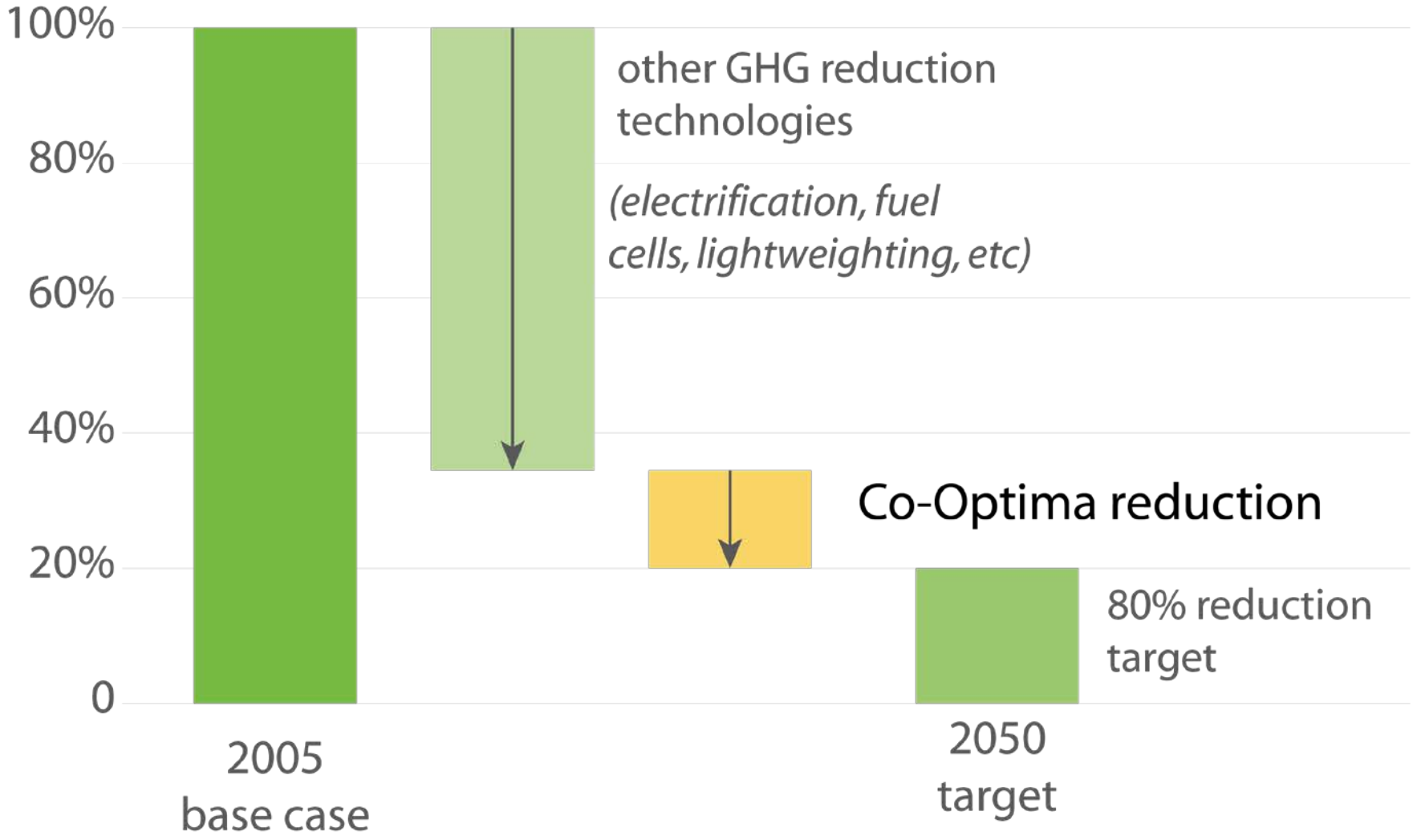
Fuel and Engine Co-Optimization

- What fuel properties maximize engine performance?
- How do engine parameters affect efficiency?
- What fuel and engine combinations are sustainable, affordable, and scalable?

30% per vehicle petroleum reduction via efficiency and displacement



National goal: 80% reduction in transportation GHG by 2050



Governing Co-Optima hypotheses:

There are engine architectures and strategies that provide higher thermodynamic efficiencies than available from modern internal combustion engines; new fuels are required to maximize efficiency and operability across a wide speed/load range

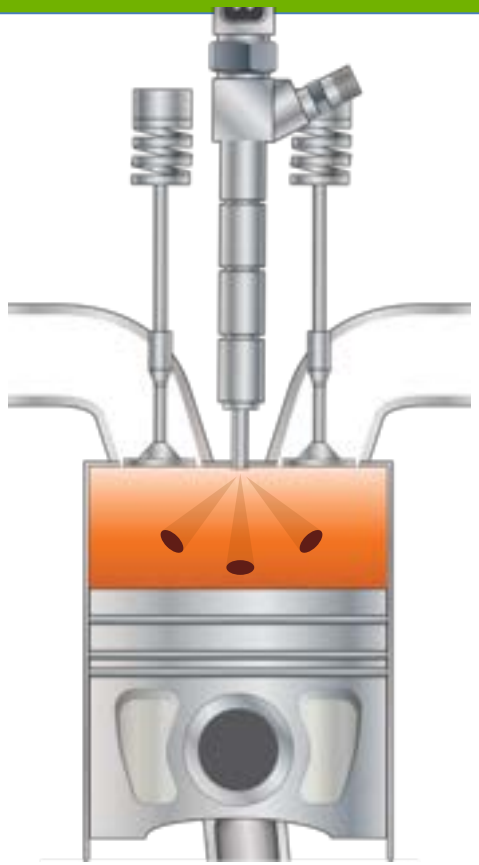
Governing Co-Optima hypotheses:

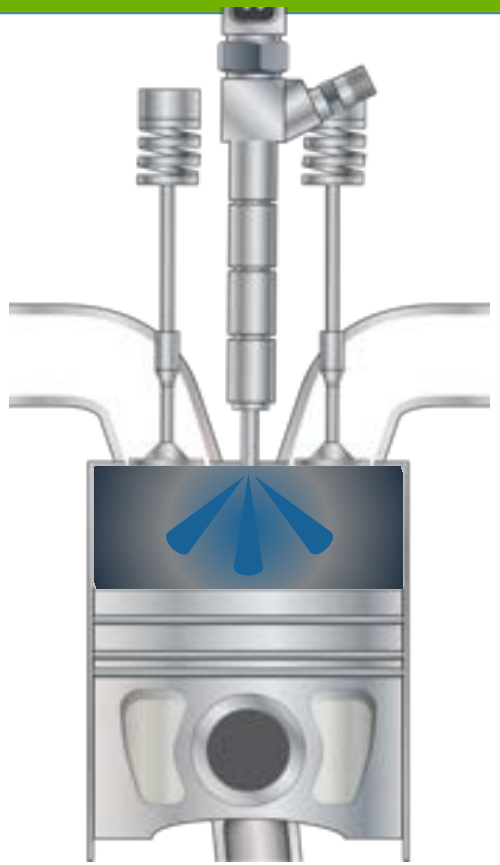
If we identify target values for the critical fuel properties that maximize efficiency and emissions performance for a given engine architecture, then fuels that have properties with those values (regardless of chemical composition) will provide comparable performance

Parallel efforts underway

Thrust I: Spark Ignition (SI)

Thrust II: Advanced Compression Ignition
kinetically-controlled and compression-ignition combustion

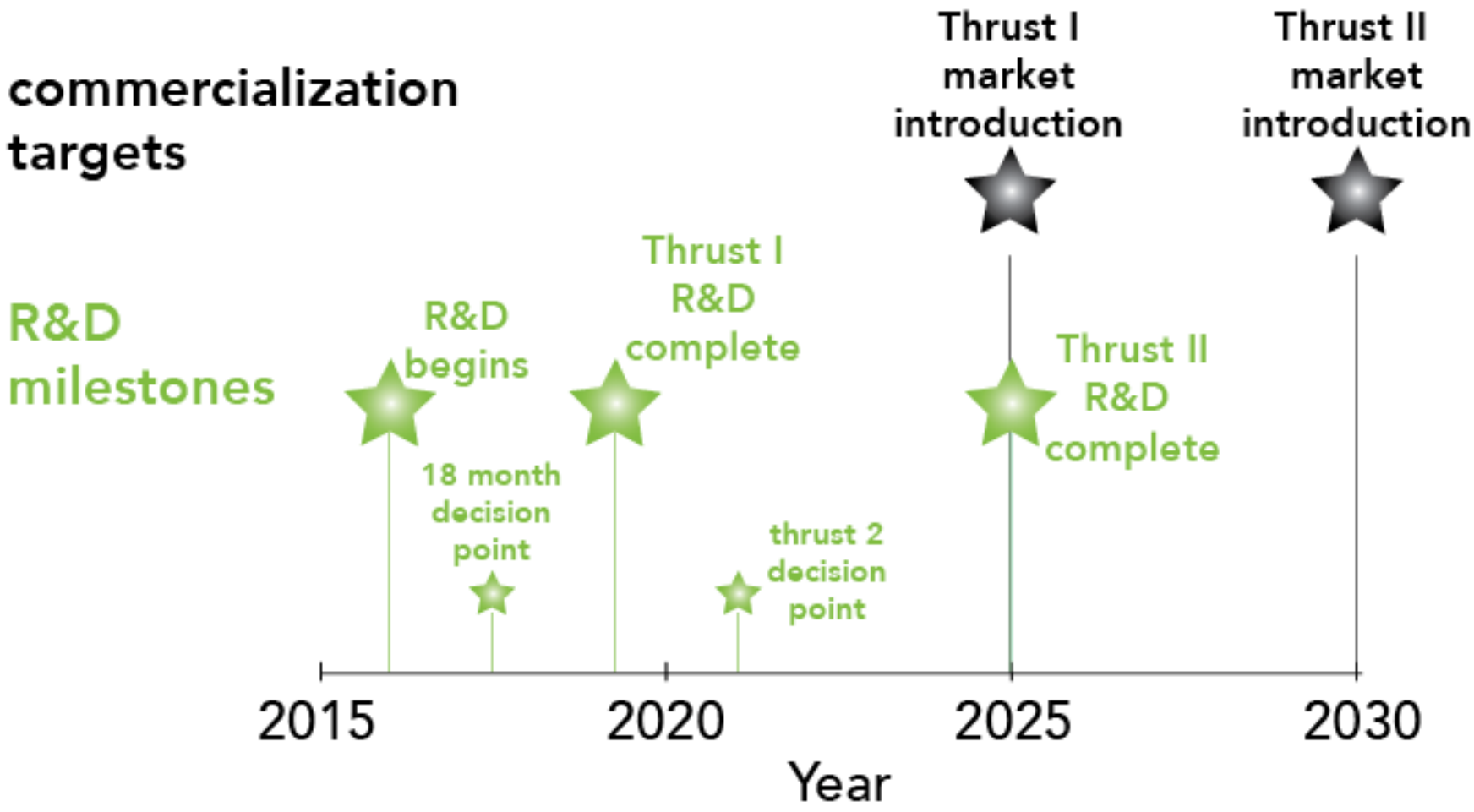




Low reactivity fuel

Range of fuel properties TBD

High reactivity fuel


commercialization targets
R&D milestones
Thrust I market introduction
Thrust II market introduction
Thrust I R&D complete
R&D begins
Thrust II R&D complete
18 month decision point
thrust 2 decision point
2015
2020
2025
2030
Year

Applicable to

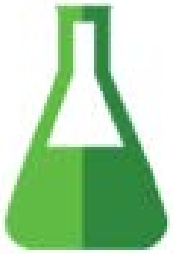
light, medium, and heavy-duty engines

hybridized and non-hybridized powertrains

Six integrated teams

Low Greenhouse Gas Fuels

Advanced Engine Development



Fuel Properties

Modeling /Simulation Toolkit

Analysis of Sustainability, Scale, Economics, Risk, and Trade

Market Transformation

Universities are key Co-Optima contributors

- Universities possess capabilities that complement those of the national labs

- Co-Optima's success depends on establishing strong ties and leveraging the strengths of academia and the national labs

Overview of current national lab tasks and research gaps

See the VTO AMR presentations on the Co-Optima website* for more details

http://energy.gov/eere/bioenergy/co-optimization-fuels-engines

Current research: fuel characterization and fuel property prediction

- Development of fuel screening criteria ("decision tree")
- Development of fuel property database
- Identification of Thrust I candidates
- Heat of vaporization (HOV) measurements of complex mixtures
- Developing fuel structure-property correlations
- Development of fuel property blending models
- Fuel blending model for simulation inputs

See http://energy.gov/sites/prod/files/2016/07/f33/ft038_mccormick_szybist_fuel_properties_2016.pdf
See http://energy.gov/sites/prod/files/2016/07/f33/ft040_mcnenly_som_toolkit%20_simulation_2016.pdf

Current research: fuel characterization and fuel property prediction

- Development of Thrust I engine merit function
- Fuel effects on low-speed pre-ignition (LSPI)
- Fuel effects on EGR and lean dilution limits
- Relationship between sensitivity and HOV on engine performance
- Efficiency benefits of high octane fuels

See http://energy.gov/sites/prod/files/2016/07/f33/ft038_mccormick_szybist_fuel_properties_2016.pdf

Gaps: fuel characterization and fuel property prediction

- More sophisticated blend models of combustion and physical properties, in particular those that blend non-linearly
  - Physical properties – boiling point distribution, HOV, viscosity, surface tension, etc
  - Combustion properties – RON/MON, flame speed, emissions, etc
  - Models must be applicable to petroleum- and biomass-derived (oxygenates) blendstocks

Current research: Kinetic measurement and mechanism development

- Development of detailed kinetic mechanism for anisole
- Investigation of the effect of molecular structure on ignition behavior at RON-like engine conditions
- Rapid compression machine (RCM) investigation of gasoline mixtures with ethanol and validation of surrogate mechanism
- Chemical kinetics and SI autoignition behavior – experiments and simulation of customized ignition quality tester (IQT)
- Ignition delay experiments to assist mechanism development and provide insight beyond RON and sensitivity
- Simulation support for kinetic mechanism development and canonical fuel experiments
- Extreme mechanism reduction for advanced DISI engines

See http://energy.gov/sites/prod/files/2016/07/f33/ft038_mccormick_szybist_fuel_properties_2016.pdf

See http://energy.gov/sites/prod/files/2016/07/f33/ft040_mcnenly_som_toolkit%20_simulation_2016.pdf

Gaps: Kinetic measurement and mechanism development

- Data from well-characterized experiments across a wide range of relevant temperatures, pressures, and equivalence ratios for prototypical bio-based candidates
- Fundamental knowledge of reaction kinetics for broad range of oxygenates
- Highly accurate, automated approaches for developing kinetics, thermochemistry, and transport properties
- Tools for accelerating high fidelity simulations with detailed turbulence and kinetics (e.g., automated mechanism reduction, multi-zoning etc.)

Current research: emissions and environmental impact analysis

- The health and environmental impacts of potential new fuels need to be understood early in RD&D cycle
  - Need understanding of effects related to production, storage, distribution, dispensing, and combustion
  - Human health and environmental impacts have either limited widespread introduction of new fuels or been reason for bans
- Current efforts focused on using literature data and sources (e.g., OSHA Hazard Classification)
  - No current laboratory projects specifically focused on health and environmental impacts

Gaps: emissions and environmental impact analysis

- Understanding of the health and environmental impacts of novel bio-based blendstocks
  - Aerobic/anaerobic degradation and migration in water table, human exposure/toxicity, etc.
- Framework for screening new fuel candidates

Current research: impact of fuel chemistry and fuel properties on particulate emissions

- Particulate Matter Index (PMI) refinement
- PM formation and oxidation fundamentals

See http://energy.gov/eere/bioenergy/downloads/vehicle-technologies-office-merit-review-2016-co-optimization-fuels-and-1

Gaps: impact of fuel chemistry and fuel properties on particulate emissions

- Understanding of how properties of bio-based blendstocks (e.g., oxygenates) impact PM formation in ACI engines
  - Example properties include HOV, viscosity, volatility, and multi-component interactions
- Identification of characteristic reaction pathways for PM formation of oxygenates
- Understanding of how PM morphology and structure differs for oxygenates vs hydrocarbons
- Understanding of how PM from oxygenates impact modern exhaust aftertreatment systems

Current research: small volume, high throughput fuel testing

- Goal – provide early-stage feedback to rapidly screen candidates and identify promising fuel blendstocks
- Three experimental approaches focused on correlating reactivity data with combustion properties (principally autoignition – RON/MON)
  - Flames with repetitive extinction and ignition
  - Flow reactor for small volume autoignition experiments
  - RCM as a small volume autoignition experiment

See http://energy.gov/sites/prod/files/2016/07/f33/ft038_mccormick_szybist_fuel_properties_2016.pdf

Gaps: small volume, high throughput fuel testing

- Experimental platform that links rapid screening and small volumes (<< 1 ml) with properties at engine-relevant conditions
- Experimental approach that provides correlation to multiple key properties (e.g., RON/MON, flame speed, HOV, PMI, etc.) – constitutes “Holy Grail”

Current research: addressing additional barriers

- Develop downselect metrics, definitions, guidance related to sustainability, economics, scale, and feedstocks
- Mitigate market acceptance barriers with SAE, focus on misfueling
- Develop MT evaluation metrics related to infrastructure compatibility, market acceptance, etc.
- Guidance documents - previous fuel/vehicle introductions, laws and incentives, fuel infrastructure barriers, feedstock market evolution, etc.

http://energy.gov/sites/prod/files/2016/07/f33/ft037_farrell_co-optima_overview_2016.pdf

Gaps: addressing additional barriers

- Insights into consumer behavior and preferences, and how these might impact simultaneous deployment of new fuels and vehicles
- Understanding of how backward compatibility – both existing vehicles and fuel distribution infrastructure – impacts decisions related to co-optimized fuels/vehicles
- Cost-benefit analysis of new fuel/vehicle introduction to guide R&D decisions

Topic Areas/Technical Areas of Interest

- This FOA has one Topic Area
- DOE seeks proposals that address one or more of the following sub-topics:
  1. Fuel characterization and fuel property prediction
  2. Kinetic measurement and mechanism development
  3. Emissions and environmental impact analysis
  4. Impact of fuel chemistry and fuel properties on particulate emissions
  5. Small volume, high throughput fuel testing
  6. Addressing Additional Barriers

Topic Areas/Technical Areas of Interest

- Applicants are strongly encouraged to partner with other eligible entities in order to address multiple sub-topics.
- This FOA specifically targets the longer term Thrust II efforts related to ACI engines and fuels co-optimization and stronger consideration will be given to proposals that will contribute to the longer term, Thrust II goals of Co-Optima.
- Recipients are expected to work in close collaboration with the DOE National Laboratory Project consortium for insight on target fuel candidates.

Topic Areas/Technical Areas of Interest

Sub-Topic 1: Fuel characterization and fuel property prediction.

- Successful projects will establish a new or improved approach for simulating and/or predicting fuel properties.
- Characterization and modeling that predicts important biofuel combustion, autoignition and physical properties of mixtures at engine-relevant conditions
  - Particular interest in properties that blend non-linearly
  - Preference for approaches relevant to both petroleum- and bio-derived molecules and mixtures
- Properties of interest include, but are not limited to:
  - Prediction of autoignition metrics such as octane number and sensitivity
  - Combustion properties such as flame speed and soot formation tendency
  - Fuel physical properties such as volatility, viscosity, and properties related to spray vaporization and droplet formation

Topic Areas/Technical Areas of Interest

Sub-Topic 2: Kinetic Measurement and Mechanism Development.

- Successful projects will provide modeling and validation data to advance the state of technology of kinetic measurement and mechanism development for identified fuel compounds and mixtures.
- Experimental measurements
  - Experimental data from well-characterized apparatuses that can be used to validate kinetic mechanisms
  - Examples include (but are not limited to) shock tubes, flames, jet stirred reactors, flow reactors, constant volume combustion vessels, and rapid compression machines
- Development of accurate kinetic mechanisms
  - Reaction rate and thermodynamic calculations and reaction pathways for multi-component blend
  - Research that accelerates the development and simulation times, including automation of kinetic mechanism creation for new fuel compounds and mixtures, and automatic mechanism reduction.

Topic Areas/Technical Areas of Interest

Sub-Topic 3: Emissions and Environmental Impact Analysis.

- Successful projects will help establish additional criteria to inform the planned down-select of fuel candidates.
- Accelerate understanding of the multimedia environmental impact from fuel production, storage and combustion for advanced technology engines
- Environmental impacts should include
  - Emissions of pollutants to air and water and the linking of these emissions to human health effects, specifically, in the area of biodegradation and anaerobic degradation
  - Health and environmental effects associated with exposure to candidate blendstocks in neat or blended format
  - Analyses examining environmental impacts that are generally included in a fuels' EPA registrations

Topic Areas/Technical Areas of Interest

Sub-Topic 4: Impact of Fuel Chemistry and Fuel Properties on Particulate Emissions.

- Successful projects will provide new or improved methodologies to quantify the impacts of fuel properties on engine particle emissions.
  - Examples include heat of vaporization (HoV), droplet surface tension, and fuel chemical structure
  - Careful studies aimed at nonlinear interactions needed
- Linking metrics used in the engine community to metrics used in the broader combustion community
- Other examples include
  - in situ sampling/characterization; comparative data on type, mass and number of particles created by combustion of similar biofuels; novel methods of interrogating particulate filters during regeneration

Topic Areas/Technical Areas of Interest

Sub-Topic 5: Small volume, high throughput fuel testing.

- Successful projects will yield a prototype device to improve small-volume, bench-top collection of thermo-physical fuels data that can streamline fuel candidate screening by reducing the need for more extensive and costlier engine testing.
- Goal is to enable small volume (<20 µl), high through-put (>100 tests/device/month) measurements
- Primary properties of interest are the auto-ignition properties of the fuel (RON and MON); others include
  - Flame speed, heat of vaporization and sooting propensity at engine relevant conditions
  - Development of new metrics that can capture the fuel performance needs of ACI engines
  - Interest in both Thrust I and II fuels

Topic Areas/Technical Areas of Interest

Sub-Topic 6: Addressing Additional Barriers.

- Successful projects will address one or more of the following barriers associated with concurrent deployment of biofuels and advanced technology engines:
  - Public Perception and Consumer Acceptance: public perception barriers to co-optimized fuels and engines
  - Low Cost: co-optimized fuels and vehicles with lower total operating cost than conventional fuels and vehicles
  - Low GHG Impacts: drivers to prompt refiners and distributers to adopt co-optimized fuels
  - High Volume: production level of new fuels/blends needed to motivate vehicle manufacturers to switch technologies and consumers to adopt co-optimized fuels and vehicles
  - Infrastructure Compatibility

NOTE: In order to receive consideration, applications addressing Sub-Topic 6 must also address one or more of Sub-Topics 1-5. Collaborations with other eligible entities addressing multiple sub-topics are encouraged.

Non-Responsive Applications

The following types of applications will be deemed nonresponsive and will not be reviewed or considered for an award:

- Applications that fall outside the technical parameters specified in Section I.B of the FOA, including but not limited to :
  - Applications for proposed technologies that are not based on sound scientific principles (e.g., violates the law of thermodynamics).
  - Applications solely focused on the production of ethanol.
  - Applications that do not explicitly support DOE's Co-Optima initiative.
  - Applications that do not include any link to biofuels.

Award Information

Total Amount to be Awarded	**$7,000,000***
Average Award Amount	EERE anticipates making awards that range from $300,000 to $3,000,000.
Types of Funding Agreements	Cooperative Agreements, Grants
Period of Performance	12 to 36 months
Cost Share Requirement	10% of Total Project Costs

*Subject to the availability of appropriated funds

Statement of Substantial Involvement

EERE may have substantial involvement in work performed under Awards made following this FOA. EERE does not limit its involvement to the administrative requirements of the Award. Instead, EERE has substantial involvement in the direction and redirection of the technical aspects of the project as a whole. Substantial involvement includes, but is not limited to, the following:

- EERE shares responsibility with the Recipient for the management, control, direction, and performance of the Project.
- EERE may intervene in the conduct or performance of work under this Award for programmatic reasons. Intervention includes the interruption or modification of the conduct or performance of project activities.
- EERE may redirect or discontinue funding the Project based on the outcome of EERE's evaluation of the Project at that the Go/No Go decision point.
- EERE participates in major project decision-making processes.
- See also Section VI.B.ix of FOA

Cost Sharing Requirements

- Applicants must contribute a minimum of 20% of the total project costs for R&D projects. *Unless the project qualifies for the Cost Share Reduction.*
- ***Cost Share Reduction***: EERE has reduced the Recipient Cost Share Requirement to **10%** for R&D activities where:
  - The Prime Recipient is a domestic institution of higher education
  - The Prime Recipient performs more than 50% of the project work, as measured by the Total Project Cost

Cost Share Contributions

- Contributions must be:
  - Specified in the project budget
  - Verifiable from the Prime Recipient's records
  - Necessary and reasonable for proper and efficient accomplishment of the project
- Every cost share contribution must be reviewed and approved in advance by the Contracting Officer and incorporated into the project budget before the expenditures are incurred

Allowable Cost Share

- Cost Share must be allowable and must be verifiable upon submission of the Full Application
- Refer to the following applicable Federal cost principles:

Entity	Cost Principles
For-profit entities	FAR Part 31
All other non-federal entities	2 CFR Part 200 Subpart E - Cost Principles

Allowable Cost Share

- Cash Contributions
  - May be provided by the Prime Recipient, Subrecipients, or a Third Party
- In-Kind Contributions
  - Can include, but are not limited to: personnel costs, indirect costs, facilities and administrative costs, rental value of buildings or equipment, and the value of a service, other resource, or third party in-kind contribution

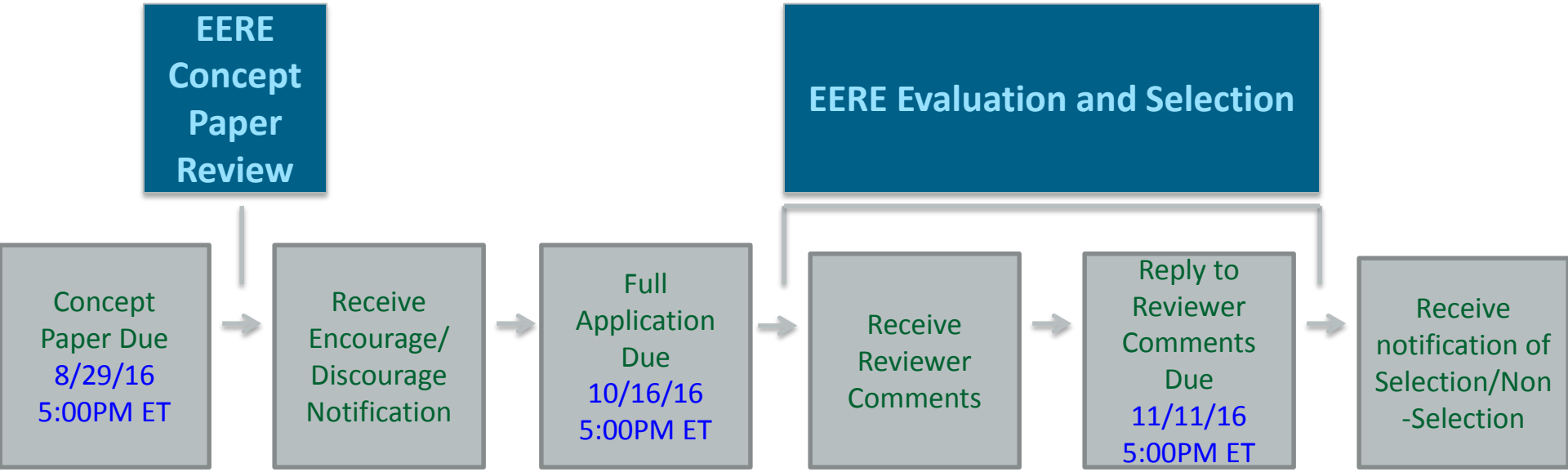
Unallowable Cost Share

- The Prime Recipient may not use the following sources to meet its cost share obligations including, but not limited to:
  - Revenues or royalties from the prospective operation of an activity beyond the project period
  - Proceeds from the prospective sale of an asset of an activity
  - Federal funding or property
  - Expenditures reimbursed under a separate Federal Technology Office
  - Independent research and development (IR&D) funds
  - The same cash or in-kind contributions for more than one project or program

Cost Share Payment

- Recipients must provide documentation of the cost share contribution, incrementally over the life of the award
- The cumulative cost share percentage provided on each invoice must reflect, at a minimum, the cost sharing percentage negotiated
- In limited circumstances, and where it is in the government's interest, the EERE Contracting Officer may approve a request by the Prime Recipient to meet its cost share requirements on a less frequent basis, such as monthly or quarterly. See Section III.B.v of the FOA.

FOA Timeline



EERE anticipates making awards in March 2017

Concept Papers

- Applicants must submit a Concept Paper
  - Concept Papers should clearly delineate the sub topic(s) being addressed, both on the cover page and the technology descriptions.
- The Concept Paper must include a technology description (See Section IV.C of the FOA)
  - The technology description is limited to 3 pages
  - The Concept Paper can also include graphs, charts, or other data (limited to 1 pages)
- Concept Papers must be submitted by August 29, 2016, 5:00PM ET through EERE Exchange, and must comply with the content and form requirements in Section IV.C of the FOA
- EERE provides applicants with: (1) an "encouraged" or "discouraged" notification, and (2) the reviewer comments

Concept Paper Review

- EERE evaluates the Concept Papers based on consideration of the following factors. All sub-criteria are of equal weight.
- **Concept Paper Criterion: Overall FOA Responsiveness and Viability of the Project (Weight: 100%)**
  - The applicant clearly describes the proposed technology or approach, and the sub-topic(s) being addressed, describes how the technology or approach is unique and innovative, and how the technology or approach will advance the current state-of-the-art;
  - The applicant has identified risks and challenges, including possible mitigation strategies, and has shown the impact that EERE funding and the proposed project would have on the relevant field and application, including how the proposed project will contribute to the overall Co-Optima goals and objectives;
  - The applicant has the qualifications, experience, capabilities and other resources necessary to complete the proposed project; and
  - The proposed work, if successfully accomplished, would clearly meet the objectives as stated in the FOA.

Full Applications

- The Full Application includes:
  - **Technical Volume**: The key technical submission - info relating to the technical content, project team members, etc.
  - **Statement of Project Objectives (EERE 303)**
  - **SF-424 Application for Federal Assistance:** The formal application signed by the authorized representative of the applicant.
  - **Budget Justification Workbook (EERE 335):** a detailed budget and spend plan for the project.
  - **Summary/Abstract for Public Release**
  - **Summary Slide**
  - **Administrative Documents:** U.S. Manufacturing Plan, Data Management Plan, Disclosure of Lobbying Activities, Subaward Budget Justification, 'Performance of Work in the US' waiver (if applicable)

http://www1.eere.energy.gov/financing/resources.html

Full Applications: Technical Volume Content

- **Technical Volume: the key technical component of the Full Application**

Content of Technical Volume	Suggested % of Technical Volume
Cover Page	1 page max
Project Overview	10%
Technical Description, Innovation and Impact	30%
Workplan	40%
Technical Qualifications and Resources	20%

Full Application Eligibility Requirements

- Applicants must submit a Full Application by October 16, 2016, 5:00PM ET
- Full Applications are eligible for review if:
  - The Applicant is an eligible entity Section III.A of FOA;
  - The Applicant submitted an eligible Concept Paper;
  - The Cost Share requirement is satisfied Section III.B of FOA;
  - The Full Application is compliant Section III.C of FOA; and
  - The proposed project is responsive to the FOA Section III.D of FOA
  - The Full Application meets any other eligibility requirements listed in Section III of the FOA.

Who's Eligible to Apply?

Eligibility for this FOA is restricted to U.S. Institutions of Higher Education (as defined in 20 U.S.C. § 1001, in accordance with 2 C.F.R § 200.55), and non-profit research institutions that operate as a division under the U.S. Institutions of Higher Education. This restricted eligibility applies to both Prime Recipients and Subrecipients.

Multiple Applications

- Applicants may submit more than one application to this FOA, provided that each application describes a unique, scientifically distinct project
- Applicants are strongly encouraged to partner with other eligible entities in order to address multiple sub-topics.

Merit Review and Selection Process (Full Applications)

- The Merit Review process consists of multiple phases that each include an initial eligibility review and a thorough technical review
- Rigorous technical reviews are conducted by reviewers that are experts in the subject matter of the FOA
- Ultimately, the Selection Official considers the recommendations of the reviewers, along with other considerations such as program policy factors, to make the selection decisions

Technical Merit Review Criteria

Criterion 1: Technical Merit, Innovation, and Impact (40%)

Technical Merit and Innovation

- Extent to which the proposed technology or process is innovative
- Degree to which the current state of the technology and the proposed advancement are clearly described;
- Extent to which the application specifically and convincingly demonstrates how the applicant will move the state of the art to the proposed advancement; and
- Sufficiency of technical detail in the application to assess whether the proposed work is scientifically meritorious and revolutionary, including relevant data, calculations and discussion of prior work in the literature with analyses that support the viability of the proposed work.

Impact of Technology Advancement

- How the project supports the topic area objectives and target specifications and metrics;
- How the project supports the Co-Optima initiative goals and objectives; and
- The potential impact of the project on advancing the state of the art.

Technical Merit Review Criteria - Continued

Criterion 2: Project Research and Commercialization Plan (40%)

Research Approach, Workplan and SOPO

- Degree to which the approach and critical path have been clearly described and thoughtfully considered;
- Degree to which the interaction with the on-going National Laboratory Project has been described, including sharing of data expected to be produced under an award; and
- Degree to which the task descriptions are clear, detailed, timely, and reasonable, resulting in a high likelihood that the proposed Workplan and SOPO will succeed in meeting the project goals.

Identification of Technical Risks

- Discussion and demonstrated understanding of the key technical risk areas involved in the proposed work and the quality of the mitigation strategies to address them.

Technical Merit Review Criteria - Continued

Criterion 2, Continued

Baseline, Metrics, and Deliverables

- The level of clarity in the definition of the baseline, metrics, and milestones; and
- Relative to a clearly defined experimental baseline, the strength of the quantifiable metrics, milestones, and a mid-point deliverables defined in the application, such that meaningful interim progress will be made.

Commercialization Plan

- Comprehensiveness of market transformation plan including but not limited to product development and/or service plan, commercialization timeline, licensing, financing, product marketing, legal/regulatory considerations including intellectual property, infrastructure requirements, Data Management Plan, U.S. manufacturing plan etc., and product distribution.

Technical Merit Review Criteria - Continued

Criterion 3: Team and Resources (20%)

- The capability of the Principal Investigator(s) and the proposed team to address all aspects of the proposed work with a high probability of success. The qualifications, relevant expertise, and time commitment of the individuals on the team;
- The sufficiency of the facilities to support the work;
- The degree to which the proposed consortia/team demonstrates the ability to facilitate and expedite further development and commercial deployment of the proposed technologies;
- The level of participation by project participants as evidenced by letter(s) of commitment and how well they are integrated into the Workplan; and
- The reasonableness of the budget and spend plan for the proposed project and objectives.

Replies to Reviewer Comments

- EERE provides applicants with reviewer comments
- Applicants are not required to submit a Reply - it is optional
- To be considered by EERE, a Reply must be submitted by November, 11 2016, 5:00PM ET and submitted through EERE Exchange
- Content and form requirements:

Section	Page Limit	Description
Text	2 pages max	Applicants may respond to one or more reviewer comments or supplement their Full Application.
Optional	1 page max	Applicants may use this page however they wish; text, graphs, charts, or other data to respond to reviewer comments or supplement their Full Application are acceptable.

Selection Factors

The Selection Official may consider the merit review recommendation, program policy factors, and the amount of funds available in arriving at selections for this FOA

Program Policy Factors

The Selection Official may consider the following program policy factors in making his/her selection decisions:

- The degree to which the proposed project exhibits technological diversity when compared to the existing DOE project portfolio and other projects selected from the subject FOA;
- The degree to which the proposed project, including proposed cost share, optimizes the use of available EERE funding to achieve programmatic objectives;
- The degree to which the proposed project supports the Co-Optima initiative goals and objectives and complements (vs. overlaps) the existing National Laboratory Project;
- The degree to which the proposed project is likely to lead to increased employment and manufacturing in the United States;
- The degree to which the proposed project will accelerate transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty; and
- Whether the applicant is a Climate Action Champion designated under DOE's Request for Applications DE-FOA-0001189 (RFA) or the applicant has a letter of support from a Climate Action Champion designated under the above referenced RFA.

Registration Requirements

- To apply to this FOA, Applicants must register with and submit application materials through EERE Exchange: https://eere-Exchange.energy.gov
- Obtain a "control number" at least 24 hours before the first submission deadline
- Although not required to submit an Application, the following registrations must be complete to received an award under this FOA:

Registration Requirement	Website
DUNS Number	http://fedgov.dnb.com/webform
SAM	https://www.sam.gov
FedConnect	https://www.fedconnect.net
Grants.gov	http://www.grants.gov

Means of Submission

- Concept Papers, Full Applications, and Replies to Reviewer Comments must be submitted through EERE Exchange at https://eere-Exchange.energy.gov
  - EERE will not review or consider applications submitted through other means
- The Users' Guide for Applying to the Department of Energy EERE Funding Opportunity Announcements can be found at https://eere-Exchange.energy.gov/Manuals.aspx

Key Submission Points

- Check entries in EERE Exchange
  - Submissions could be deemed ineligible due to an incorrect entry
- EERE strongly encourages Applicants to submit 1-2 days prior to the deadline to allow for full upload of application documents and to avoid any potential technical glitches with EERE Exchange
- Make sure you hit the submit button
  - Any changes made after you hit submit will un-submit your application and you will need to hit the submit button again
- For your records, print out the EERE Exchange Confirmation page at each step, which contains the application's Control Number

Applicant Points-of-Contact

- Applicants must designate primary and backup points-of-contact in EERE Exchange with whom EERE will communicate to conduct award negotiations
- It is imperative that the Applicant/Selectee be responsive during award negotiations and meet negotiation deadlines
  - Failure to do so may result in cancellation of further award negotiations and rescission of the Selection

Questions

- Questions about this FOA? Email OptimaFOA@ee.doe.gov
  - All Q&As related to this FOA will be posted on EERE Exchange
    - You must select this specific FOA Number (DE-FOA-0001461) in order to view the Q&As
  - EERE will attempt to respond to a question within 3 business days, unless a similar Q&A has already been posted on the website
- Problems logging into EERE Exchange or uploading and submitting application documents with EERE Exchange? Email EERE- ExchangeSupport@hq.doe.gov.
  - Include FOA name and number in subject line
- All questions asked during this presentation will be posted on EERE Exchange