DEPARTMENT OF ENERGY (DOE)
OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY (EERE)

"Fiscal Year (FY) 2016 Vehicle Technologies Program Wide Funding Opportunity Announcement"

Funding Opportunity Announcement (FOA) Number: DE-FOA-0001384
FOA Type: Amendment 000006
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FOA Issue Date:	01/21/2016
Amendment 000001	01/21/2016
Amendment 000002	01/29/2016
Amendment 000003	02/02/2016
Amendment 000004	02/12/2016
Amendment 000005	03/03/2016
Amendment 000006	03/23/2016
Informational Webinar:	1/28/2016 - 2:00 p.m. ET
Submission Deadline for Concept Papers:	2/18/2016 - 8:00 p.m. ET
Submission Deadline for Full Applications:	~~3/28/2016~~ 3/31/2016 - 8:00 p.m. ET
Expected Submission Deadline for Replies to Reviewer Comments:	~~6/03/2016~~ 6/08/2016 - 8:00 p.m. ET
Expected Date for EERE Selection Notifications:	8/04/2016
Expected Timeframe for Award Negotiations	9/30/2016

- Applicants must submit a Concept Paper by 8:00pm ET the due date listed above to be eligible to submit a Full Application.

- To apply to this FOA, applicants must register with and submit application materials through EERE Exchange at https://eere-Exchange.energy.gov, EERE's online application portal.

- Applicants must designate primary and backup points-of-contact in EERE Exchange with whom EERE will communicate to conduct award negotiations. If an application is selected for award negotiations, it is not a commitment to issue an award. It is imperative that the applicant/selectee be responsive during award negotiations and meet negotiation deadlines. Failure to do so may result in cancelation of further award negotiations and rescission of the Selection.

AMENDMENTS

All changes to the Funding Opportunity Announcement as a result of this amendment are highlighted in the body of the FOA.

Amendment No.	Date	Description of Amendment
000001	01/21/2016	The purpose of this amendment is to add the link (http://LightMat.org) to the Technical Area of Interest 3 description. Please review the yellow highlighted text on Page 12 of the document for the change associated with Amendment 000001.
000002	01/29/2016	The purpose of this amendment is to: 1) revise the General Requirements located in the Technical Area of Interest 7 description to remove references to modeling; 2) revise the General Requirements located in the Technical Area of Interest 8 description to remove references to characterization techniques; 3) revise Section IV.D.2 to add the Project Overview requirement to the technical volume for Areas of Interest 1 and 10; 4) revise the content of the Concept Paper Technical Review Criteria for Area of Interest 1 in Section V.A.1; and 5) revise the list of Areas of Interest for which a Manufacturing Plan is required in Section VIII.L. Please review the green highlighted text throughout the document for the changes associated with Amendment 000002.
000003	02/02/2016	The purpose of this amendment is to revise Section V.C.1 to clarify the definition of a Climate Action Champion in the Program Policy Factors.

		Please review the blue highlighted text throughout the document for the changes associated with Amendment 000003.
000004	02/12/2016	The purpose of this amendment is to: 1) revise Section I, AOI 1 General Requirements, to clarify that showcases should be brand neutral; 2) revise Section I, AOI 10 Objective, to further define the intent of this AOI; and 3) revise Section IV.D.8 to require a separate budget justification for each subawardee with a cumulative budget of $100,000 or 25 percent of the total work effort (whichever is less). Please review the purple highlighted text throughout the document for the changes associated with Amendment 000004.
000005	3/3/2016	The purpose of this amendment is to: 1) revise submission date for Full Applications; 2) revise submission date for Replies to Reviewer Comments; and 3) revise deadline for submittal of FOA questions. Please review the red highlighted text throughout the document for the changes associated with Amendment 000005.
000006	03/23/2016	The purpose of this amendment is to revise Section IV.E to further define the content and form requirements for the Replies to Reviewer Comments. Please review the grey highlighted text in Section IV.E of the document for the changes associated with Amendment 000006.

NOTE: REGISTRATION/SUBMISSION REQUIREMENTS

Registration Requirements

There are several one-time actions you must complete in order to submit an application in response to this Announcement (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the System for Award Management (SAM), and register with EERE eXCHANGE.gov). Applicants who are not registered with SAM and Grants.gov, should allow at least 44 days to complete these requirements. It is suggested that the process be started as soon as possible.

Applicants must register through the EERE eXCHANGE.
EERE eXCHANGE website: http://eere.energy.gov/financing/exchange

Applicants must obtain a DUNS number.
DUNS website: http://fedgov.dnb.com/webform

Applicants must register with the SAM.
SAM website: http://www.sam.gov/ If you had an active registration in CCR, you should have an active registration in SAM. More information about SAM registration for applicants is found at: **https://www.sam.gov/sam/transcript/Quick_Guide_for_Grants_Registrations_v1.7.pdf.**

Applicants must register with Grants.gov.
Grants.gov website: http://grants.gov/
Applicants must register with Grants.gov in order to receive automatic updates, in the event that Amendments to this FOA are posted. However, please note that applications will not be accepted through Grants.gov.

Applicants must register with FedConnect.
FedConnect website: www.fedconnect.net.
In the event that an application is selected for negotiation of award, Applicants must be registered with FedConnect to receive the award. For more information regarding registration with FedConnect review the FedConnect Ready, Set, Go! Guide at http://www.fedconnect.net/FedConnect/Marketing/Documents/FedConnect_Ready_Set_Go.pdf

Submission Requirements

All application submissions are to be made via the EERE eXCHANGE at http://eere.energy.gov/financing/exchange. To gain access to the EERE eXCHANGE system, the applicant must first register and create an account on the main EERE eXCHANGE site. This account will then allow the user to submit an application for open EERE Funding Opportunity Announcements (FOAs) that are currently in eXCHANGE. It is recommended that each

organization or business unit, whether acting as a team or a single entity, utilize one account as the appropriate contact information for each submission.

Applicants will receive an automated response when the Application is received; this will serve as a confirmation of EERE receipt. Please do not reply to the automated response. A "User Guide" for the EERE eXCHANGE can be found on the EERE website at https://eere-Exchange.energy.gov/Manuals.aspx after logging in to the system.

To receive notices via email regarding an FOA in eXCHANGE, such as amendments to the announcement or the posting of new questions and answers from eXCHANGE you must initiate an application submission to the FOA of interest. Please note that you must finalize your application before the specified due date and time to be considered for award.

Questions

Questions related to the use of the EERE eXCHANGE website or technical issues concerning the application submittal should be submitted to: EERE-ExchangeSupport@hq.doe.gov.

Questions related to the content of the Funding Opportunity Announcement must be submitted to DE-FOA-0001384@netl.doe.gov.

The deadline for submission of FOA related questions will be March ~~21~~ 23, 2016 at 8:00 PM Eastern time. Any questions submitted after that deadline will NOT be addressed. Questions regarding problems encountered with the application submittal will be answered as time permits. Applicants are encouraged to review the posted questions and answers daily. **Please note that you must first select this FOA Number in order to view the questions and answers specific to this FOA**. Please be as specific as possible when asking questions to insure that questions will be adequately addressed. All questions submitted must clearly identify the Area of Interest (AOI) to insure a timely and accurate response. Failure to identify the AOI, or not being as specific as possible with a question, may result in additional time to address the question or require further correspondence for further clarification regarding the submitted questions.

All questions and answers related to the content of this FOA will be posted at https://eere-exchange.energy.gov/Default.aspx DOE will try to respond to questions within 5 business days, unless a similar question and answer have already been posted on the website.

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EXECUTIVE SUMMARY

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's online application portal. 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 is found at https://eere-Exchange.energy.gov/Manuals.aspx.
Total Amount to be Awarded	$55.5 million
Average Award Amount	EERE anticipates making awards that range from $500,000 to $3,750,000.
Types of Funding Agreements	Cooperative Agreements
Period of Performance	24 to 48 months
Performance of Work in the United States/Eligibility	As a condition of this announcement, all applicants must propose that 100% of the direct labor cost for the project (including contractor/sub recipient labor) will be incurred in the United States. See Section III. A.
Eligible Applicants	Individuals, Domestic Entities, Foreign Entities, Incorporated Consortia, Unincorporated Consortia, subject to the definitions in Section III.A.
Cost Share Requirements	Refer to the cost share table in Section III.B.
Submission of Multiple Applications	Applicants may submit more than one application to this FOA, provided that each application describes a unique, scientifically distinct project. All applications must be for a stand-alone project that is not dependent or contingent upon another application submitted to this or any other FOA.
Application Forms	Required forms and templates for Full Applications are available on EERE Exchange at https://eere-Exchange.energy.gov.
FOA Summary	The Office of Energy Efficiency and Renewable Energy (EERE) is issuing, on behalf of the Vehicle Technologies Office (VTO), this Funding Opportunity Announcement (FOA) entitled "FY 2016 Vehicle Technologies Program Wide Funding Opportunity Announcement". This FOA supports a broad portfolio of advanced highway transportation technologies that reduce petroleum consumption and greenhouse gas emission, while meeting or exceeding vehicle performance and cost expectations. Projects will focus on reducing the cost and improving the performance of a mix of near-and-long-term vehicle technologies. Activities will contribute to achieving the goals of the EV Everywhere Grand Challenge, with a focus on accelerating the development of advanced batteries, power electronics, and lightweight materials technologies, while also supporting technology development to reduce petroleum consumption through advancements in combustion engines, alternative fuels, and other enabling technologies. The FOA also supports Clean Cities initiatives to overcome market barriers.

I. FUNDING OPPORTUNITY DESCRIPTION

A. DESCRIPTION/BACKGROUND

The Office of Energy Efficiency and Renewable Energy (EERE) is issuing, on behalf of the Vehicle Technologies Office (VTO), this Funding Opportunity Announcement (FOA) entitled "FY 2016 Vehicle Technologies Program Wide Funding Opportunity Announcement."

The U.S. transportation sector accounts for two-thirds of U.S. petroleum use, and on-road vehicles are responsible for 80 percent of that amount. U.S. dependence on oil for transportation affects the national economy and its potential for future growth – the U.S. continues to send nearly $1 billion a day overseas for oil and the average U.S. household spends nearly one-fifth of its total expenditures on transportation, making it the second-most expensive spending category after housing. Oil price volatility also affects the national economy and household budgets. Over the past ten years, U.S. regular conventional retail gasoline prices have fluctuated from below $1.50 to over $4, resulting in increases to annual household budgets as large as $1,500 per average passenger car. In addition, the U.S. transportation sector accounts for approximately one-third of U.S. energy-related carbon pollution, and, despite recent progress in reducing other emissions, it remains a significant source of air pollution. To address these pressing challenges and help Americans reduce their transportation energy costs, there are two key solution pathways: (1) use conventional fuels more efficiently, and (2) replace them with cost-competitive, domestically-produced alternatives. Public investment in advanced transportation technologies that enable both of these pathways will improve the Nation's energy security, reduce greenhouse gas emissions, and strengthen U.S. global economic competitiveness.

The Vehicle Technologies Office supports a broad technology portfolio aimed at developing and deploying cutting-edge advanced highway transportation technologies that reduce petroleum consumption and greenhouse gas emissions, while meeting or exceeding vehicle performance and cost expectations. Research, development, and deployment efforts are focused on reducing the cost and improving the performance of a mix of near- and long-term vehicle technologies including advanced batteries, power electronics and electric motors, lightweight and propulsion materials, advanced combustion engines, advanced fuels and lubricants, and other enabling technologies.

Specifically, activities are aimed at meeting the goals and objectives of the President's EV Everywhere Grand Challenge as well as improvements in other vehicle technologies such as powertrains, fuel, tires, and auxiliary systems. The EV Everywhere Grand Challenge seeks to make the United States the first country to produce a wide array of plug-in electric vehicle (PEV) models (PEVs, including plug-in hybrids and all-electric vehicles) that are as affordable and convenient as the gasoline powered vehicles we drive today by 2022. The EV Everywhere Blueprint outlines the goals and describes the research, development, and deployment needed to meet the overall EV Everywhere goal as well as other aggressive, technology-specific goals.

The technical targets for the DOE PEV program fall into three areas: battery R&D; electric drive system R&D; and vehicle lightweighting. Key technical goals include:

- Cutting battery costs from their current $264/kWh to $125/kWh
- Eliminating almost 30% of vehicle weight through lightweighting
- Reducing the cost of electric drive systems from $12/kW to $8/kW

Investment in advanced vehicle technologies, like vehicle electrification, lightweighting, and combustion engines will yield benefits to conventional vehicles, as well as yielding the technologies necessary for alternative fuel vehicles with sufficiently long ranges, sufficiently low costs, and broad consumer appeal to result in significant market penetration potential. Analysis shows that VTO's combined portfolio of technologies could reduce petroleum consumption by nearly 20% from projected 2030 levels in the Energy Information Agency (EIA) Annual Energy Outlook.

This FOA contains a total of 11 Areas of Interest (AOIs) and focuses on advanced light-weighting; advanced battery development; low cost electric motor development; enabling technologies for high efficiency engines; and support for EV deployment and AFV workplace safety programs. These areas of interest apply to light, medium, and heavy-duty on-road vehicles.

The Statutory Authorities for this FOA are Public Law 102-486, Energy Policy Act (EPAct) of 1992, as amended by Public Law 109-58, of EPAct 2005; and the Energy Independence and Security Act (EISA, Public Law 110-140).

B. TOPIC AREAS/TECHNICAL AREAS OF INTEREST

The FOA includes eleven (11) Areas of Interest, which are reflected in the table below. One or more projects awarded may be managed collaboratively with the U.S. Army Tank Automotive Research Development and Engineering Center (TARDEC). A separate agreement with TARDEC will not be required.

AOI Number	Title
Critical Technologies to Meet the EV Everywhere Grand Challenge	
1	EV Everywhere Plug-In Electric Vehicle Local Showcases
2	Grid Modernization for Electric Vehicles
3	Accelerated Development and Deployment of Low-Cost Automotive Mg Sheet Components
4	Corrosion Protection and Dissimilar Material Joining for Next-Generation Lightweight Vehicles
5	Advances for the Production of Low Cost Electric Drive Vehicle Motors
6	Development of Advanced High-Voltage Electrolytes and Additives, Conformable and Self-healing Solid State Electrolytes, and Lithium Metal Protection
7	Development of Advanced Battery Material Characterization Techniques
8	Advanced Battery Materials Modeling
Technology Development to Reduce Petroleum Consumption Through Fuel Efficiency Improvements and Alternative Fuel Utilization in Passenger and Commercial Vehicles	
9	Enabling Technologies for Engine and Powertrain Systems
10	Alternative Fuel Vehicle Workplace Safety Programs
Exploratory Topics	
11	Open Topic/Exploratory Research

CRITICAL TECHNOLOGIES TO MEET THE EV EVERYWHERE GRAND CHALLENGE

Area of Interest (AOI) 1: EV Everywhere Plug-In Electric Vehicle Local Showcases

AOI 1 Objective

Due to the variety of vehicle technology options available and the prospect of installing home-based infrastructure, consumers who are interested in a plug-in electric vehicle (PEV) often require extra coaching and education to understand the extent of the benefits that can be realized from their purchase. The objective of AOI 1 is to promote and demonstrate PEV use by establishing local showcases that provide a hands-on consumer experience and in-depth education in a conveniently located, brand-neutral setting. This AOI will help promote the use of PEVs to reduce dependence on petroleum and reduce greenhouse gas emissions.

AOI 1 General Requirements

Projects must establish either a site-specific and/or or mobile showcase in a suitable high-traffic areas that is open convenient hours, easily accessible, and at no cost to consumers and fleets. The showcase will be staffed by professionally trained personnel able to provide consumers answers to commonly asked questions about PEVs and electric vehicle supply equipment. The showcase will provide a hands-on experience by allowing consumers to test drive a variety of PEVs that are locally available and experience on-site vehicle charging. Efforts should focus only on demonstrating commercially available PEVs that can be purchased through dealerships and are warranted by an original equipment manufacturer as well as electric vehicle supply equipment that is certified by a nationally recognized testing laboratory such as Underwriters Laboratory or Electrical Testing Laboratory. EERE intends the showcases to be brand-neutral. Vehicles and equipment utilized in projects can be brand affiliated as part of a portfolio, but projects should not be exclusive to a single brand or product line.

The showcase/demonstration will educate consumers on the benefits of PEV, the variation within PEV technologies, and the unique differences from other vehicles, as well as total cost of ownership calculations and available incentives. Consumers will have the opportunity to experience driving a variety of PEVs to understand and compare range and recharging options.

The showcase should be capable of educating and/or training consumers, fleets, local governments, property developers, multi-unit dwelling owners, property managers, automotive dealership staff, and other businesses on PEVs and Electric Vehicle Supply Equipment, including cost, technical, and safety considerations.

The projects will use targeted media campaigns to promote the showcases to a broad spectrum of consumers and businesses to maximize the amount of exposure to interested consumers. DOE anticipates that projects will include a strong internet presence incorporating social media

that supports the showcase along with identification of metrics planned for measuring the impact of the project as a result of online social media and showcase visitors.

Applicant teams are highly encouraged to include participants with relevant experience and expertise as well as one or more utility or other electricity provider, networked charging providers, automotive dealers, original equipment manufacturers, and active DOE designated Clean Cities Coalitions, http://www.eere.energy.gov/cleancities/progs/coalition_locations.php.

Applications must include a detailed approach for how the project will be carried out including the partners involved, timeline/milestones, and key staff personnel with assigned roles/duties. Applications must provide a business case explaining how the project will be sustainable beyond the performance period and expiration of federal funding

Materials developed under this award will be publicly releasable.

AOI 1 Additional Requirements

In addition to the information provided in the narrative above specific to this area of interest, applications must also specifically address the following aspects:

- Applications should include an impact analysis with area-wide metrics of the types and numbers of consumers, fleets, property developers, apartment building owners, local agencies and others that the showcase would support; metrics for identifying high traffic routes; and a rationale identifying showcase locations. The analysis may include demographic and fleet data reflecting specific market research and may also list policies, laws and incentives that are in effect or in process that make the business case or require the sale and/or purchases of PEVs in the area.
- Applications should contain a detailed description of the metrics used to find high-traffic routes and areas to locate a showcase in their region relative to the proximity of targeted consumers, fleets and local agencies.
- Applications should detail how employees staffing the showcase will be trained and the type of curriculum and coursework that will be developed for them.
- Applications should include a description of a targeted multimedia promotional campaign to advertise the showcases. This must clearly discuss the approach to promotions to maximize consumer visits and to provide training and events to engage fleets, local agencies, property managers and developers, dealership staff and others.
- Applications should include letters of commitment from each of the project partners, indicating the amount, timeline, and type of technical, financial, or other resources being provided to the project, along with affirming their role/commitment to the project. Letters of commitment from local dealerships, utilities and Clean Cities Coalitions are highly encouraged. Letters which identify support for the project with no discernable commitment of resources will not be considered in reviewing the merits of an application.

- If applicants or their partners have received federal funds for efforts similar to those proposed, the application must clearly describe how the new activities will be distinctly different from those already being funded under the other awards.
- The PEV used for demonstrations are limited to model year (MY) 2014 or newer vehicles.
- The PEV used for demonstrations shall be commercially available, Environmental Protection Agency (EPA) certified, Federal Motor Vehicle Safety Standard (FMVSS) compliant, and California Air Resources Board (CARB) compliant where applicable.

Applications proposing the following are **strongly discouraged**:

- Applications that propose to utilize pre-commercial vehicles or fueling infrastructure. Vehicles and infrastructure that is still in testing and/or development should not be included in the application.
- Applications that include the purchase of vehicles, the purchase and installation of Electric Vehicle Supply Equipment, or the purchase and/or installation of facility upgrades or building modifications. Any costs associated with these activities will be unallowable as a project cost, including cost share.
- Vehicle and electric vehicle supply equipment depreciation or lease values are allowable in accordance with 2 CFR §200.436 and 2 CFR §200.465 respectively.

AOI 1 Special Deliverables:

Other than the deliverables required in the Federal Assistance Reporting Requirements Checklist, there are no special deliverables for AOI 1.

Area of Interest (AOI) 2: Grid Modernization for Electric Vehicles

AOI 2 Objective

The objective of AOI 2 is to research, develop, and demonstrate plug-in electric vehicle (PEV) technologies that enable efficient grid integration. Applications under this AOI must address one or more of the specific technology areas (a, b and/or c) outlined below.

AOI 2 General Requirements for all Technical Areas (a, b, and c (see below)).

- The charging system can be a conductive or inductive system.
- Cybersecurity constraints must be addressed in the development of the proposed technology.
- The demonstration vehicle must be a light, medium, or heavy duty Plug-in Hybrid Electric Vehicle (PHEV) or Electric Vehicle (EV).
- The demonstration phase should have an adequate number of vehicles and components for a statistically valid data set.
- The demonstration battery and/or vehicle may be commercially available or a prototype.
- Technology development is limited to the technology area identified and should not include battery or vehicle development beyond integration of the technology.
- Data from the demonstration may be provided to a DOE national laboratory for analysis.

Teaming arrangements which involve a vehicle manufacturer, electric utility, EVSE manufacturer, and a fleet operator, as appropriate, are highly encouraged.

Applications under this AOI must address one of the specific technology areas (a, b and/or c) identified below. Applications may address more than one of the technical areas if appropriate:

a) Bi-Directional Power Flow: Cost and reduced battery life present significant barriers to customer acceptance of technologies that are capable of charging and discharging the PEV battery pack when connected to the grid.

The objective of this technology area is to research, develop, and demonstrate an integrated PEV bi-direction power-management system capable of operation under on-road and grid-based loads.

Additional requirements for “technical area (a)” are as follows:

- The bi-directional converter must be capable of supplying at least 6.6 kW out of the battery pack.

- The bi-directional converter must include all appropriate safety features.
- The plan for developing the grid load duty cycle must be provided.
- Battery life should be evaluated under reverse power flow conditions through lab and/or vehicle testing.
- The proposed battery durability testing should consider both vehicle and grid requirements
- Projects will consist of three phases.
    - Phase 1 and Phase 2 combined must not exceed two years
        - Phase 1: Technology Development
        - Phase 2: Technology Integration
    - Phase 3: Vehicle and infrastructure demonstration shall be initiated within 3 months of Phase 3 initiation and demonstrated for at least six months.
- Data must be collected and analyzed to evaluate the performance, durability, and usage characteristics of the vehicle and grid technology. Data from the demonstration may be provided to a DOE national laboratory for analysis.

b) **Load Control Using Vehicle to Grid (V2G) Communication:** Smart devices capable of managing the transformer load for residential, multi-dwelling units (MDU), and workplace charging sites have the potential to increase transformer life without requiring significant hardware upgrades.

The objective of this technology area is to research, develop, and demonstrate technologies which utilize PEV and/or electric vehicle charging equipment communication to effectively manage the load on a transformer that is charging multiple grid-connected electric drive vehicles. The proposed technology should not adversely impact the PEV charging equipment efficiency in terms of quality and charge time.

Additional requirements for "technical area (b)" are as follows:

- Projects will consist of three phases.
- Phase 1 and Phase 2 combined must not exceed two years
    - Phase 1: Technology Development
    - Phase 2: Technology Integration
- Phase 3: Vehicle and infrastructure demonstration shall be initiated within 3 months of Phase 3 initiation and demonstrated for at least six months.

Data will be collected and analyzed to evaluate the performance, durability, and usage characteristics of the vehicle and grid technology and the impact on transformer and electric vehicle charging equipment life.

c) Impact of Grid Services on PEVs: Grid management services optimize grid efficiency and have the potential to significantly alter the required charging frequency, profile, and power level provided to the PEV.

The objective of this technology area is to research and assess different grid-management-service-use-case-scenarios that affect integration with a PEV through modeling and hardware evaluation. The research should include existing grid management services as well as future changes that affect integration with a PEV.

Additional requirements for "technical area (c)" are as follows:

- Projects will consist of two phases.
  - Phase 1: Use Case Development (not to exceed one year)
  - Phase 2: Vehicle and Infrastructure Modeling and Demonstration (not to exceed two years)
- Data will be collected and analyzed to evaluate the impact of grid management services on the vehicle components' and EVSE durability as well as the overall efficiency of the vehicle charging.

AOI 2 Special Deliverables:

Other than the deliverables required in the Federal Assistance Reporting Requirements Checklist, there are no special deliverables for AOI 2.

Area of Interest (AOI) 3: Accelerated Development and Deployment of Low-Cost Automotive Mg Sheet Components

AOI 3 Objective

The objective of AOI 3 is to apply an integrated suite of experimental, computational, and data tools to accelerate research, development, and demonstration of a magnesium (Mg) sheet component (or components) on a model year 2013 (MY13) or newer vehicle at a manufacturing cost of less than $2.50 per pound of weight saved. While Mg die-castings have been applied in some vehicles, Mg sheet components are only found in very low-volume, specialty vehicles. The vast majority of a vehicle structure is composed of stamped sheet product, and thus introducing technologies for high-volume manufacturing of Mg sheet products could enable much greater weight savings.

AOI 3 General Requirements

While Mg sheet components offer substantial weight reduction potential, they suffer from technical and commercial challenges throughout the supply chain. A breakthrough in a single step in the supply chain, for example forming or corrosion protection technology, is insufficient for enabling widespread Mg sheet alloy application. To address this challenge holistically, applications to AOI 3 must:

- Identify a baseline component or components in a model year 2013 (MY2013) or newer vehicle suitable for replacement with Mg sheet. The baseline vehicle must be an on-highway passenger vehicle.
    - Weight reduction potential of the selected baseline component will be evaluated. Small components with minimal weight reduction potential are discouraged.
- Specify activities to address technology development needs specific to the identified component in the areas of sheet manufacturing (e.g. to coil), component manufacturing (e.g. forming), joining and integration, and corrosion protection. Applications may also include activities in other aspects of the supply chain, such as primary manufacturing, alloy development, or end-of-life processing.
- Formulate a technical approach through which an integrated set of experimental, computational, and data tools is applied to accelerate the research, development, and demonstration process.
- Provide a test and demonstration plan through which the performance and manufacturing cost of the component(s) are validated.
- Clearly describe data and code planned for public release as well as the items that will be proposed as proprietary or business sensitive.

To support this effort and leverage the excellent light metals resources within the DOE National Laboratory system, project teams are encouraged to interface with the LightMat Consortium (http://LightMat.org) led by Pacific Northwest National Lab (PNNL), LightMat offers a single point of contact for industry led teams to access and network DOE National Laboratory resources from across the U.S., technical expertise in advanced light metals R&D techniques for accelerated development, data/code curation and hosting, and collaboration support.

- Upon award, Recipients shall provide all public data and code (such as technical data used to support published journal articles or research code used for simulations) to LightMat for curation and hosting. Proprietary and business-sensitive data are exempt from this requirement.
- Upon award, Recipients may, at their discretion, choose to access National Laboratory tools and expert researchers within the LightMat Consortium. Access to these tools will be provided by DOE at no cost to the project up to $1M. Costs above $1M must be paid for by the applicant outside of project costs. The specific National Laboratory resources planned for use under the project should be clearly identified in the application.

AOI 3 Additional Requirements

Applicants are highly encouraged to include participation from an automotive OEM or Tier 1 supplier to provide performance and manufacturing requirements for the proposed technology. Applicants are also encouraged to include university partners to leverage research capabilities.

In addition to the information provided in the narrative above specific to this area of interest, applications must also specifically address the following aspects:

- The weight reduction potential of the selected baseline component. Small components with minimal weight reduction potential are discouraged.
- The extent to which integration of experimental, computational, and data tools is innovatively and effectively applied towards accelerated development of low-cost Mg sheet components.
- The extent of data and code planned for public release.

AOI 3 Special Deliverables:

In addition to the deliverables required in the Federal Assistance Reporting Requirements Checklist, the following data must be provided to the DOE:

- Applicants shall provide all public data and code (such as technical data used to support published journal articles or research code used for simulations) to the PNNL LightMat Consortium for curation and hosting. Proprietary and business-sensitive data are exempt from this requirement.

Area of Interest (AOI) 4: Corrosion Protection and Dissimilar Material Joining for Next-Generation Lightweight Vehicles

AOI 4 Objective

The objective of AOI 4 is to identify specific dissimilar material joining and/or corrosion protection challenges that prevent near term introduction of lightweight materials, and to bring novel technologies that address these challenges to near-commercial readiness. Only structures utilizing dissimilar combinations of the following materials are desired:

- Aluminum (5000, 6000, or 7000 series alloys)
- Steel (Mild, HSLA, AHSS, or Boron automotive alloy)
- Magnesium (cast, sheet, or extrusion, any alloy)
- Carbon Fiber Polymer Composite

AOI 4 General Requirements

Applications must include activities to advance technology development to a state such that private investment or automotive industry internal R&D are likely to carry the technology through to final commercial readiness. The project must include prototype-scale demonstration and testing in order to validate performance.

Applications must include:

- A specific application (e.g. joint or couple between multiple specified components manufactured from specified materials) where new corrosion protection and/or dissimilar material joining technology would enable introduction of a lightweight material and reduction of total vehicle weight.
- Test results demonstrating the nature of the problem, such as corrosion performance or joint strength using today's best-in-class technology.
- A description of how the new technology is needed to enable introduction of a new material and reduction in total vehicle weight.
- Quantitative targets indicating the improvement over baseline test results that the new technology is expected to demonstrate.
- An assessment of the weight reduction potential of the technology if applied reasonably across an entire vehicle platform.
- A technology development plan that clearly articulates the state of the proposed technology, the critical performance targets necessary to meet automotive requirements, and the project activities to achieve these targets.

- A commercialization plan that includes advancement during the awarded project towards near-commercial readiness. Commercialization plans that require greater than 3 years of effort following project completion are strongly discouraged. Commercialization plans should include an analysis of implementation cost compared to baseline technology.

Applications must provide detailed analysis and prior test data demonstrating that the proposed technology could plausibly achieve compatibility with automotive manufacturing processes as necessary for the specified vehicle application. For example, analysis should demonstrate that the proposed joining technology can achieve cycle time comparable to today's commercial processes for a given application, and/or that the proposed corrosion protection technology is compatible with today's coating and paint bake processes.

AOI 4 Additional Requirements

Applicant teams are highly encouraged to include an automotive OEM, tier 1 supplier, or automotive joining equipment manufacturer to provide performance and manufacturing requirements for the proposed technology in the specified application. The DOE anticipates that the industry partner will participate in performance validation assessments. Teams are also encouraged to include research partners from universities or National Laboratories to encourage different perspectives from the joining and corrosion research community.

Applications proposing the following are **strongly discouraged**:

- Structures utilizing materials other than the following:
  - Aluminum (5000, 6000, or 7000 series alloys)
  - Steel (Mild, HSLA, AHSS, or Boron automotive alloy)
  - Magnesium (cast, sheet, or extrusion, any alloy)
  - Carbon Fiber Polymer Composite
- Structures involving only different grades from within a material system (for example 6000-7000 series aluminum or HSLA-AHSS steel)
- Applications that do not include prototype-scale demonstration and testing in order to validate performance.

AOI 4 Special Deliverables:

Aside from the deliverables required in the Federal Assistance Reporting Requirements Checklist, there are no special deliverables for AOI 4.

Area of Interest (AOI) 5: Advances for the Production of Low Cost Electric Drive Vehicle Motors

AOI 5 Objective

The objective of AOI 5 is to develop and demonstrate advanced electric machine technologies with a focus on motor design, material, and production pathways to significantly lower cost. Projects should emphasize materials-based developments that link to manufacturing and scale-up of materials and machine designs that can meet cost, specific power, and power density technical targets for electric drive vehicle motors.

VTO's long-term research and development strategy recognizes that reducing the cost of electric drive vehicles is essential for increasing consumer adoption, and notes that achieving EV Everywhere targets for Electric Drive Technologies will require R&D in several areas including electric motors and/or electric machines. In particular, this topic aims to develop and show technology readiness for advanced electric machine technologies that can achieve the following technical targets by integrating new materials or technology-based approaches to current electric machine production.

Specific improvements of interest include, but are not limited to, hard or soft magnetic materials, non-rare earth machine designs, insulation materials, and production or process improvements. Proposed improvements should already be demonstrated or proven at a bulk material, prototype, or proof-of-concept level, and projects should generally focus on a transition from Technology Readiness Level (TRL) 4 to 7 (http://www.esto.nasa.gov/files/TRL_definitions.pdf). Applicants are encouraged to include automotive original equipment manufacturers (OEMs) and/or automotive suppliers through partnerships to create a strong path to product commercialization for vehicles.

Technical Targets		
Cost	**Specific Power**	**Power Density**
$4.7/kilowatt (kW)	1.6 kW/kilogram	5.7 kW/Liter

For the technical targets listed in the table, the following methods should be used for the purposes of this area of interest:

- Calculate cost based on 2015 equivalent dollars
- Calculate power based on peak power capability for a duration of at least 2 seconds
- Calculate weight based on active machine materials including rotor shaft and bearings. Weight does not need to include the machine case, connections, or connectors.
- Calculate volume based on overall stator outside diameter (or maximum diameter) and overall length. Volume does not need to include case, connections, or connectors.

AOI 5 General Requirements

Applications must:

- Identify a current baseline machine design, and describe how the proposed R&D will lead to specific improvements and address the technical targets, with particular emphasis and details on cost reduction.
- Specifically describe how improvements and targets will be demonstrated through final machine design testing or characterization.
- Be suitable for scale-up to manufacture for vehicle applications at low cost and high volumes. This requirement should be met through the description of applicable process steps, supporting suppliers and/or materials, and equipment appropriate for high volume manufacturing. Additionally, machine designs should take into account typical or representative vehicle conditions and limitations such as cooling, voltage, temperatures, and speeds.
- Identify applicant or application partnership member electric machine manufacturing capabilities in the U.S. and describe how the proposed advancement could be integrated into existing manufacturing processes.

AOI 5 Special Deliverables:

In addition to the deliverables required in the Federal Assistance Reporting Requirements Checklist, the following deliverables are required:

1. Test plan to demonstrate final machine performance to technical targets
2. Listing of estimated manufacturing equipment and equipment cost required to produce the final machine design
3. Modular or indentured bill of materials for the final machine design

Area of Interest (AOI) 6: Development of Advanced High-Voltage Electrolytes and Additives, Conformable and Self-healing Solid State Electrolytes, and Lithium Metal Protection

AOI 6 Objective

The objective of AOI 6 is to develop:

1. Advanced electrolytes and additives that are stable above 4.3V, safe and low cost without sacrificing performance;
2. Conformable and self-healing solid state electrolytes that will enable lithium metal or beyond-lithium batteries to achieve energy densities at least 2x higher than the state-of-the art lithium-ion cells; and
3. Novel approaches to protect the metallic lithium electrode from dendrite formation.

Applications should include strategies to overcome key technical barriers while advancing the state-of-the-art for these topic areas.

AOI 6 General Requirements

Applications must:

- Identify the appropriate full-cell or half-cell chemistry that will be used to demonstrate success. This should include, where appropriate, the anode, cathode, electrolyte and separator compositions, as well as the cell composition/construction.
- Demonstrate an understanding of all major issues impeding the proposed chemistry, and clearly identify the particular barriers that are to be the target of the research effort.
- Identify the synthesis, testing, modeling and diagnostics activities to be performed to understand the causes of the issues being addressed, and describe the methods and technologies that will be used to mitigate those issues.
- Identify plans to implement those mitigation methods and technologies, and test their effectiveness.
- Provide a Gantt chart with critical path and deliverables clearly defined.

AOI 6 Special Deliverables:

In addition to the deliverables required in the Federal Assistance Reporting Requirements Checklist, the following items are required for performance evaluation at a designated DOE testing laboratory:

- 12 Baseline cells or half cells with a minimum capacity of 10 mAh
- 12 Improved cells or half cells with a minimum capacity of 10 mAh

- Suggested test procedures for the cells/half-cells evaluation. This should include discharge/charge voltage and current limits, number of test sequences, recommended cycling temperature, or other relevant test conditions as appropriate

The DOE will conduct non-destructive performance testing on the deliverables to validate performance. This testing will be conducted outside the Statement of Project Objectives (SOPO) for the proposed project, and therefore will not be addressed in the SOPO nor included in the total estimated project costs. Participation by DOE test agencies in test planning and execution will be addressed by a Non-Disclosure Agreement (NDA) between the test agency and the end item manufacturer. The results of the DOE laboratory testing will be documented in a publically releasable Summary Test Report (to be approved by both DOE and the Recipient prior to release) that validates performance of the deliverables relative to the end item performance targets as well as the technology deployment impact relative to DOE strategic goals. The Summary Test Report will be delivered to the DOE Vehicle Technologies Office and end item manufacturer. Test materials, cells, modules, full battery systems (manufacturing end item), or special test equipment supplied by the end item manufacturer for the purposes of the test will be returned at the conclusion of testing at no cost to the recipient or the project.

Area of Interest (AOI) 7: Development of Advanced Material Characterization Techniques

AOI 7 Objective

The objective of AOI 7 is to develop *in situ* microscopy and spectroscopy tools capable of identifying physical and chemical changes of Li battery components during charging and discharging with time, depth, and space resolution, and that will allow detailed monitoring of processes at relevant length scales. When combined with advanced electrochemical techniques, especially at the single particle level, these suites of techniques will provide a rich understanding of battery behavior in operando.

Applications are sought for, but not limited to, the following areas:

- Formation and function of solid electrolyte interface layers, especially in Si and Li metal anodes.
- Examination of nucleation and growth of layers in metal anodes and sulfur cathodes.
- Identification of speciation in sulfur cathodes.
- Identification of reaction products during high-voltage operation of cathodes and during electrolyte reduction on anodes.
- Measurement of kinetic, transport, and mechanical properties at the scale of a single particle with specific emphasis on rates of reactions at high voltages, transports in bulk vs. grain boundaries, and role of exposed facets.
- Structural changes in electrode materials during lithiation and cycling and their relationships to performance, especially in the Li-Mn rich Ni-Mn-Co cathode.

AOI 7 General Requirements

Applications must:

- Identify the specific technical issue which will be addressed by the ~~modeling or~~ single particle techniques and their importance to advancing the state of art.
- Describe in detail the methods of ~~modeling or~~ diagnostics techniques to be performed.
- Describe in detail the methods of validation for ~~both~~ the ~~modeling and~~ single particle diagnostic techniques.
- Identify the final output of the project upon completion and metrics for success.
- Provide a Gantt chart with critical path and deliverables clearly defined.

AOI 7 Special Deliverables:

Aside from the deliverables required in the Federal Assistance Reporting Requirements Checklist, there are no special deliverables for AOI 7.

Area of Interest (AOI) 8: Advanced Battery Materials Modeling

AOI 8 Objective

The objective of AOI 8 is to develop advanced models to assess emerging Li-Ion and beyond Li-Ion systems in order to understand the challenges impeding their full potential. Models will include electrochemical/chemical and transport processes (kinetics, thermodynamics, phase transitions, ion transport, etc.) that occur in a wide range of length and time scales. The focus of this effort will be to push the boundary of modeling techniques and to use the knowledge gained to suggest solutions to relevant problems.

Better models are needed to assess emerging Li-Ion and beyond Li-Ion systems in order to understand the challenges impeding their full potential. Models of interest include but are not limited to:

- Models that use first-principles approaches to address specific problems such as: (i) high-voltage cathode stability (electrolyte oxidation, oxygen loss), (ii) electrolyte reduction and solid electrolyte interface (SEI) formation, especially on Si and Li metal anodes (iii) speciation in sulfur cathodes.
- Models that address nucleation and growth during deposition in Li anodes with the aim of predicting dendrite formation and morphology evolution.
- Models that address the role of protective layers on Li metal and provide guidance on ideal layers with good mechanical and chemical properties.
- Multi-scale predictive models that quantify the loss of Li due to instability of the SEI in Si and Li metal anodes.

AOI 8 General Requirements

Applications must:

- Identify the specific technical issue which will be addressed by the modeling ~~or single particle~~ techniques and their importance to advancing the state of art.
- Describe in detail the methods of modeling ~~or diagnostics~~ techniques to be performed.
- Describe in detail the methods of validation for ~~both~~ the modeling ~~and single particle diagnostic~~ techniques.
- Identify the final output of the project upon completion and metrics for success.
- Provide a Gantt chart with critical path and deliverables clearly defined.

AOI 8 Special Deliverables:

Aside from the deliverables required in the Federal Assistance Reporting Requirements Checklist, there are no special deliverables for AOI 8.

TECHNOLOGY DEVELOPMENT TO REDUCE PETROLEUM CONSUMPTION THROUGH FUEL EFFICIENCY IMPROVEMENTS AND ALTERNATIVE FUEL UTILIZATION IN PASSENGER AND COMMERCIAL VEHICLES

Area of Interest (AOI) 9: Enabling Technologies for Engine and Powertrain Systems

AOI 9 Objective

The objective of AOI 9 is to develop advanced enabling technologies for engine and powertrain systems for heavy-duty and light-duty vehicles that will be capable of supporting the achievement of breakthrough thermal efficiencies, while meeting future emissions standards. These novel approaches and ideas should address existing barriers and limitations that inhibit using advanced technologies on a mass market basis to address national energy concerns.

Examples of enabling technologies to be considered include, but are not limited to: low-cost, robust sensors for engine exhaust constituents and in-cylinder phenomena; waste heat recovery; variable valve actuation and timing; lightweight components; reduced friction; low heat rejection and thermal management; low energy penalty emission controls; advanced fuel injection; intake air management; and turbomachinery.

Teaming arrangements with OEM's or suppliers are highly encouraged.

AOI 9 General Requirements

Applications must clearly describe the expected fuel saving improvements of the technologies developed and how the improvements are to be validated.
At a minimum, validation will include testing the component or enabling technologies in a bench type apparatus that closely simulates how the component will be used. Testing the component as part of an engine system on a dynamometer is preferred.

Applications should demonstrate a clear path to commercialization as supported by a detailed commercialization plan and evidence which supports a market need and expected uptake of the technology once developed.

Applications which propose development of complete engines are not desired and **strongly discouraged**.

AOI 9 Special Deliverables:

Aside from the deliverables required in the Federal Assistance Reporting Requirements Checklist, there are no special deliverables for AOI 9.

Area of Interest (AOI) 10: Alternative Fuel Vehicle Workplace Safety Programs

AOI 10 Objective

The objective of AOI 10 is to provide safety training and guidance related to maintenance and garage facility upgrades and building modifications that will support the use of alternative fuel vehicles (AFVs). This AOI is focused only on facilities with EPACT defined natural gas, propane, and hydrogen vehicle refueling infrastructure (http://www1.eere.energy.gov/vehiclesandfuels/epact/key_terms.html).

Gaseous alternative fuels have unique/unusual safety aspects that must be considered when designing or upgrading facilities such as garage maintenance facilities, fueling operations, and parking structures. Building designers, safety officials, and decision makers that are misinformed or unfamiliar with these fuels are often confronted with unnecessary or impractical construction proposals and budget estimates that prevent AFVs from being seriously considered.

It is not the intent of this AOI to fund R&D projects and initiatives to change or modify code requirements. The intent is to provide education and share best practices related to the proper application of current codes and safety requirements for gaseous fuels. If appropriate, projects may include analytical tools used to help evaluate facility needs. Applicants are encouraged to leverage or utilize training curriculum, materials, and information previously developed or funded by the DOE.

AOI 10 General Requirements

Applications must identify plans to hold workshops which include site tours showcasing facilities that have been properly designed/upgraded for code-compliance and for the safe use of gaseous fuels. Each project will include approximately 5-7 regional workshops, development of written handbooks and online technical guidance, videos, and reports on best practices for ensuring safety compliance along with approaches to keep construction costs reasonable and appropriate. Projects should address safety compliance aspects for vehicles/facilities that will be using a single alternative fuel or multiple alternative fuels at the same facility. This AOI is focused only on facilities with EPACT defined natural gas, propane, and hydrogen vehicle refueling infrastructure (http://www1.eere.energy.gov/vehiclesandfuels/epact/key_terms.html).

Applicants teams are highly encouraged to include utilities, fuel providers, fleets currently using gaseous fuels, standards development organizations, alternative fuel safety training organizations, fire and safety officials, related industry trade groups, automotive dealers, original equipment manufacturers, and active DOE designated Clean Cities Coalitions, http://www.eere.energy.gov/cleancities/progs/coalition_locations.php.

AOI 10 Additional Requirements

In addition to the information provided in the narrative above specific to this area of interest, applications must also specifically address the following aspects:

- Projects must include hands-on education to building code officials, facility designers, fleet managers, public safety officials, and other key stakeholders about the proper and safe way to design, build, and operate garage and maintenance facilities for AFVs.
- Projects must provide workshop participants the ability to tour facilities and interact with fleet and facility operators that have practical experience, instead of having to rely solely on complex handbooks and technical manuals.
- Applications must include practical real world examples, best practices and approaches that can be emphasized in order to avoid unnecessary or unreasonably expensive designs that often prevent AFVs from being seriously considered.
- The alternative fuel vehicles used for demonstrations shall be compliant with Federal and State safety and emissions regulations (i.e. Environmental Protection Agency (EPA) certified, Federal Motor Vehicle Safety Standard (FMVSS) compliant, California Air Resources Board (CARB) compliant where applicable), and commercially available.
- Applications must not include the purchase and/or installation of facility upgrades or building modifications. Any costs associated with these activities will be unallowable as a project cost including cost share.

AOI 10 Special Deliverables:

Other than the deliverables required in the Federal Assistance Reporting Requirements Checklist, there are no special deliverables for AOI 10.

EXPLORATORY TOPICS

Area of Interest (AOI) 11: Open Topic/Exploratory Research

AOI 11 Objective

The objective of AOI 11 is to develop novel, non-incremental technologies that facilitate one or more of the overall Vehicle Technologies Office's (VTO) goals but are not represented in a significant way in the VTO's existing Technology Roadmaps or current project portfolios. Projects should support high-risk, proof-of-concept research to develop a unique technology concept, either in an area not currently supported by the VTO or as a potential enhancement to an ongoing focused technology area. The full spectrum of technologies and/or non-hardware solutions relevant to efficient and environmentally friendly transportation technologies will be considered.

For reference, below is an example list of current technology roadmaps, reports, and information on current VTO projects:

- Vehicle Technologies Office USDrive Technology Roadmaps
- Vehicle Technologies Office 21st Century Truck Partnership Roadmaps
- Advanced Combustion and Emission Control Technical Team Roadmap
- Electrical and Electronics Technical Team Roadmap
- Electrochemical Energy Storage Technical Team Roadmap
- Materials Technical Team Roadmap
- Vehicle Systems and Analysis Technical Team Roadmap
- Vehicle Technologies Office Annual Progress Reports
- Vehicle Technologies Office Annual Merit Review Presentations

Applications proposing the following are **strongly discouraged**:

- Commercial hardware technologies, products, and solutions;
- Incremental improvements to existing technologies, products, or solutions;
- Solutions, approaches, or technologies similar to those already being investigated through current or recent DOE projects;
- Solutions, approaches, or technologies similar to current or recent solicitations, solicitation topics or areas of interest, awards, prizes, or announcements from DOE; and

- Technologies that are not based on sound scientific principles (e.g., violates the law of thermodynamics).

AOI 11 Special Deliverables:

Aside from the deliverables required in the Federal Assistance Reporting Requirements Checklist, there are no special deliverables for AOI 11.

C. APPLICATIONS SPECIFICALLY NOT OF INTEREST

The following types of applications will be deemed nonresponsive and will not be reviewed or considered (See Section III.D of the FOA):

- Applications that fall outside the technical parameters specified in Section I.B of the FOA.
- Applications for proposed technologies that are not based on sound scientific principles (e.g., violates the laws of thermodynamics).

D. AUTHORIZING STATUTES

The programmatic authorizing statute is Public Law 102-486, Energy Policy Act (EPAct) of 1992, as amended by Public Law 109-58, of EPAct 2005; the Energy Independence and Security Act (EISA, Public Law 110-140).

Awards made under this announcement will fall under the purview of 2 CFR Part 200 as amended by 2 CFR Part 910.

II. AWARD INFORMATION

A. AWARD OVERVIEW

1. ESTIMATED FUNDING

EERE expects to make approximately $55.5 million of Federal funding available for new awards under this FOA, subject to the availability of appropriated funds. EERE anticipates making approximately 27-44 awards under this FOA. EERE may issue one, multiple, or no awards.

Individual awards may vary between $500,000 and $3,750,000 million.

The anticipated total Federal funding and the approximate maximum and minimum Federal Share for any one individual award made under this announcement are set forth in the table below.

One or more projects awarded may be managed collaboratively with U.S. Army Tank Automotive Research Development and Engineering Center (TARDEC). A separate agreement with TARDEC will not be required.

AOI Number	Area of Interest	Anticipated Maximum Award Size for Any One Individual Award (Fed Share)	Anticipated Minimum Award Size for Any One Individual Award (Fed Share)	Approximate Total Federal Funding Available for All Awards
Critical Technologies to Meet the EV Everywhere Grand Challenge				
1	EV Everywhere Plug-In Electric Vehicle Local Showcases	$1M	$0.75M	$2.5M
2	Grid Modernization for Electric Vehicles	$2M	$0.5M	$3M
3	Accelerated Development and Deployment of Low-Cost Automotive Mg Sheet Components	$4M	$3M	$8M
4	Corrosion Protection and Dissimilar Material Joining for Next-Generation Lightweight Vehicles	$2.75M	$1.5M	$5M
5	Advances for the Production of Low Cost Electric Drive Vehicle Motors	$5.0M	$4.0M	$15M
6	Development of Advanced High-Voltage Electrolytes and Additives, Conformable and Self-healing Solid State Electrolytes, and Lithium Metal Protection	$1.25M	$1M	$8M
7	Development of Advanced Battery Material Characterization Techniques	$1.5M	$1.5M	$5M
8	Advanced Battery Materials Modeling	$1M	$1M	$2M

Technology Development to Reduce Petroleum Consumption Through Fuel Efficiency Improvements and Alternative Fuel Utilization in Passenger and Commercial Vehicles				
9	Enabling Technologies for Engine and Powertrain Systems	$2M	$1.5M	$3.5M
10	Alternative Fuel Vehicle Workplace Safety Programs	$1.5M	$0.75M	$1.5M
Exploratory Topics				
11	Open Topic / Exploratory Research	$1M	$0.5M	$2M

EERE may establish more than one budget period for each award and fund only the initial budget period(s). Funding for all budget periods, including the initial budget period, is not guaranteed. Funding for all awards is contingent upon the availability of funds appropriated by Congress for the purpose of this program and the availability of future year budget authority (if applicable) for funds provided by DOE.

2. PERIOD OF PERFORMANCE

EERE anticipates making awards that will run 24-48 months in length. Project continuation will be contingent upon satisfactory performance and go/no-go decision review. At the go/no-go decision points, EERE will evaluate project performance, project schedule adherence, meeting milestone objectives, compliance with reporting requirements, and overall contribution to the program goals and objectives. As a result of this evaluation, EERE will make a determination to continue the project, re-direct the project, or discontinue funding the project.

One or more projects awarded may be managed collaboratively with U.S. Army Tank Automotive Research Development and Engineering Center (TARDEC). A separate agreement with TARDEC will not be required.

AOI Number	Area of Interest	Anticipated Number of Awards	Period of Performance
Critical Technologies to Meet the EV Everywhere Grand Challenge			
1	EV Everywhere Plug-in Vehicle and Infrastructure Showcases	2-3	3 Years
2	Grid Modernization for Electric Vehicles	2-6	3 Years
3	Accelerated Development and Deployment of Low-Cost Automotive Mg Sheet Components	2-3	3-4 Years
4	Corrosion Protection and Dissimilar Material Joining for Next-Generation Lightweight Vehicles	2-3	4 Years
5	Advances for the Production of Low Cost Electric Drive Vehicle Motors	4-6	2-3 Years
6	Development of Advanced High-Voltage Electrolytes and Additives, Solid State Electrolytes, and Lithium Metal Protection	6-8	2-3 Years
7	Development of Advanced Battery Material Characterization Techniques	2-3	2-3 Years
8	Advanced Battery Materials Modeling	2	2-3 Years
Technology Development to Reduce Petroleum Consumption Through Fuel Efficiency Improvements and Alternative Fuel Utilization in Passenger and Commercial Vehicles			
9	Enabling Technologies for Engine and Powertrain Systems	1-2	2-4 Years
10	Alternative Fuel Vehicle Workplace Safety Programs	1-2	3 Years
Exploratory Topics			
11	Open Topic/Exploratory Research	2-4	3 Years

3. *NEW APPLICATIONS ONLY*

EERE will accept only new applications under this FOA. EERE will not consider applications for renewals of existing EERE-funded awards through this FOA.

B. EERE FUNDING AGREEMENTS

Through Cooperative Agreements and other similar agreements, EERE provides financial and other support to projects that have the potential to realize the FOA objectives. EERE does not use such agreements to acquire property or services for the direct benefit or use of the United States Government. As outlined below EERE intends to issue cooperative agreements under this FOA.

1. *COOPERATIVE AGREEMENTS*

EERE generally uses Cooperative Agreements to provide financial and other support to Prime Recipients.

Through Cooperative Agreements, EERE provides financial or other support to accomplish a public purpose of support or stimulation authorized by Federal statute. Under Cooperative Agreements, the Government and Prime Recipients share responsibility for the direction of projects.

EERE has substantial involvement in all projects funded via Cooperative Agreement. See Section VI.B.9 of the FOA for more information on what substantial involvement may involve.

III. ELIGIBILITY INFORMATION

To be considered for further substantive evaluation, an applicant's submission must meet the criteria set forth below. If the applicant or application does not meet these initial requirements it will be considered non-compliant and/or non-responsive, removed from further evaluation, and ineligible for any award.

A. ELIGIBLE APPLICANTS

1. RESTRICTED ELIGIBILITY:

The National Energy and Technology Laboratory and U.S. Army Tank Automotive Research Development and Engineering Center (TARDEC) are ineligible to participate as a prime applicant or as a team member/sub-recipient on another entities application because of each entities role in developing the requirements for this announcement.

2. PERFORMANCE OF WORK IN THE UNITED STATES

a. Requirement
All work (100% of all direct labor, including contract/subrecipient labor) performed under EERE Awards must be performed in the United States. This requirement does not apply to the purchase of supplies and equipment; however, the Prime Recipient should make every effort to purchase supplies and equipment within the United States. The Prime Recipient must flow down this requirement to its Subrecipients.

b. Failure to Comply
If the Prime Recipient fails to comply with the Performance of Work in the United States requirement, EERE may deny reimbursement for the work conducted outside the United States and such costs may not be recognized as allowable recipient cost share. The Prime Recipient is responsible should any work under this Award be performed outside the United States, absent a waiver, regardless of if the work is performed by the Prime Recipient, Subrecipients, contractors or other project partners.

c. Waiver
There may be limited circumstances where it is in the interest of the project to perform a portion of the work outside the United States. To seek a waiver of the Performance of Work in the United States requirement, the applicant must submit a written waiver request to EERE. Appendix C lists the necessary

information that must be included in a request to waive the Performance of Work in the United States requirement.

The applicant must demonstrate to the satisfaction of EERE that a waiver would further the purposes of the FOA and is in the economic interests of the United States. EERE may require additional information before considering a waiver request. Save the waiver request(s) in a single PDF file titled "ControlNumber_PerformanceofWork_Waiver". The applicant does not have the right to appeal EERE's decision concerning a waiver request.

3. INDIVIDUALS

U.S. citizens and lawful permanent residents are eligible to apply for funding as a Prime Recipient or Subrecipient.

4. DOMESTIC ENTITIES

For-profit entities, educational institutions, and nonprofits that are incorporated (or otherwise formed) under the laws of a particular State or territory of the United States are eligible to apply for funding as a Prime Recipient or Subrecipient. Nonprofit organizations described in section 501(c)(4) of the Internal Revenue Code of 1986 that engaged in lobbying activities after December 31, 1995, are not eligible to apply for funding.

State, local, and tribal government entities are eligible to apply for funding as a Prime Recipient or Subrecipient.

DOE/NNSA Federally Funded Research and Development Centers (FFRDCs) are eligible to apply for funding as a Subrecipient, but are not eligible to apply as a Prime Recipient.

Non-DOE/NNSA FFRDCs are eligible to apply for funding as a Subrecipient, but are not eligible to apply as a Prime Recipient.

Federal agencies and instrumentalities (other than DOE) are eligible to apply for funding as a Subrecipient, but are not eligible to apply as a Prime Recipient.

5. FOREIGN ENTITIES

Foreign entities, whether for-profit or otherwise, are eligible to apply for funding under this FOA. Other than as provided in the "Individuals" or "Domestic Entities" sections above, all Prime Recipients receiving funding under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States and must perform all work in the United States (100% of all direct labor, including contract/subrecipient labor). If a foreign entity applies for funding as a Prime Recipient, it must designate in the Full Application a subsidiary or affiliate incorporated (or otherwise formed) under the laws of a State or territory of the United

States to be the Prime Recipient. The Full Application must state the nature of the corporate relationship between the foreign entity and domestic subsidiary or affiliate.

A foreign entity may receive funding as a Subrecipient.

6. INCORPORATED CONSORTIA

Incorporated consortia, which may include domestic and/or foreign entities, are eligible to apply for funding as a Prime Recipient or Subrecipient. For consortia incorporated (or otherwise formed) under the laws of a State or territory of the United States, please refer to "Domestic Entities" above. For consortia incorporated in foreign countries, please refer to the requirements in "Foreign Entities" above. All applicants must perform all work in the United States (100% of all direct labor, including contract/subrecipient labor).

Each incorporated consortium must have an internal governance structure and a written set of internal rules. Upon request, the consortium must provide a written description of its internal governance structure and its internal rules to the EERE Contracting Officer.

7. UNINCORPORATED CONSORTIA

Unincorporated Consortia, which may include domestic and foreign entities, must designate one member of the consortium to serve as the Prime Recipient/consortium representative. The Prime Recipient/consortium representative must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. The eligibility of the consortium will be determined by the eligibility of the Prime Recipient/consortium representative under Section III.A of the FOA. All applicants must perform all work in the United States (100% of all direct labor, including contract/subrecipient labor).

Upon request, unincorporated consortia must provide the EERE Contracting Officer with a collaboration agreement, commonly referred to as the articles of collaboration, which sets out the rights and responsibilities of each consortium member. This agreement binds the individual consortium members together and should discuss, among other things, the consortiums:

- Management structure;
- Method of making payments to consortium members;
- Means of ensuring and overseeing members' efforts on the project;
- Provisions for members' cost sharing contributions; and
- Provisions for ownership and rights in intellectual property developed previously or under the agreement.

B. COST SHARING

Cost share is based on the total allowable costs of the project (i.e. sum of the Government share, including FFRDC costs if applicable, and the recipient share of allowable costs equals the total allowable cost of the project) and must come from non-Federal sources unless otherwise allowed by law.

EERE has issued a Cost Share Reduction determination pursuant to Section 988(b)(3) of the Energy Policy Act of 2005 that is applicable to certain entities applying under this FOA. This determination applies to the following Areas of Interest:

- AOI 2, entitled "Grid Modernization for Electric Vehicles"
- AOI 3, entitled "Accelerated Development and Deployment of Low-Cost Automotive Mg Sheet Components"
- AOI 4, entitled "Corrosion Protection and Dissimilar Material Joining for Next-Generation Lightweight Vehicles"
- AOI 5, entitled "Advances for the Production of Low Cost Electric Drive Vehicle Motors"
- AOI 6, entitled "Development of Advanced High-Voltage Electrolytes and Additives, Conformable and Self-healing Solid State Electrolytes, and Lithium Metal Protection"
- AOI 7, entitled "Development of Advanced Battery Material Characterization Techniques"
- AOI 8, entitled "Advanced Battery Materials Modeling"
- AOI 10, entitled "Alternative Fuel Vehicle Workplace Safety Programs"
- AOI 11, entitled "Open Topic/Exploratory Research"

The recipient cost share requirement for applied research and development activities projects is reduced to 10% and applied when the Prime Applicant selected for an award is a domestic institution of higher education; domestic nonprofit; or U.S. State, local or tribal government, and performs more than 50% of the project work, as measured by the total project cost.

Prime Applicants for the above noted Areas of Interest who do not qualify for the cost share reduction must meet the minimum cost share requirements for the total cost of the project (including that portion of the work performed by subawardees who are a domestic institution of higher education; a domestic nonprofit; or U.S. State, local or tribal government; a Federal Laboratory; or an FFRDC) as established in the table below according to the AOI.

The minimum cost share required for each AOI for different types of Applicants is as follows:

One or more projects awarded may be managed collaboratively with U.S. Army Tank

Automotive Research Development and Engineering Center (TARDEC). A separate agreement with TARDEC will not be required.

AOI Number	Area of Interest	Required Minimum Non-Federal Cost Share for Prime Applicants who are 1) For-Profit; or 2) domestic institution of higher education; domestic nonprofit; or a U.S. State, local or tribal government and are not performing more than 50% of the project work as measured by the total project costs	Required Minimum Non-Federal Cost Share for Prime Applicants who are a domestic institution of higher education; a domestic nonprofit; or a U.S. State, local or tribal government and are performing more than 50% of the project work as measured by the total project costs
Critical Technologies to Meet the EV Everywhere Grand Challenge			
1	EV Everywhere Plug-In Electric Vehicle Local Showcases	50%	50%
2*	Grid Modernization for Electric Vehicles	20%*	10%*
3	Accelerated Development and Deployment of Low-Cost Automotive Mg Sheet Components	30%	10%
4	Corrosion Protection and Dissimilar Material Joining for Next-Generation Lightweight Vehicles	20%	10%
5	Advances for the Production of Low Cost Electric Drive Vehicle Motors	20%	10%
6	Development of Advanced High-Voltage Electrolytes and Additives, Conformable and Self-healing Solid State Electrolytes, and Lithium Metal Protection	20%	10%
7	Development of Advanced Battery Material Characterization Techniques	20%	10%
8	Advanced Battery Materials Modeling	20%	10%
Technology Development to Reduce Petroleum Consumption Through Fuel Efficiency Improvements and Alternative Fuel Utilization in Passenger and Commercial Vehicles			
9	Enabling Technologies for Engine and Powertrain Systems	50%	50%
10	Alternative Fuel Vehicle Workplace Safety Programs	20%	10%
Exploratory Topics			
11	Open Topic/Exploratory Research	20%	10%

**AOI2 will consist of R&D and demonstration phases. R&D phases under this AOI will require 20% cost share, unless the prime meets the requirements for a cost share reduction, in which case the cost share will be 10%. Demonstration phases will require 50% cost share for all recipients.*

To assist Applicants in calculating proper cost share amounts, EERE has included a cost share information sheet and sample cost share calculation as Appendices B and C to this Funding Opportunity Announcement.

1. LEGAL RESPONSIBILITY

Although the cost share requirement applies to the project as a whole, including work performed by members of the project team other than the Prime Recipient, the Prime Recipient is legally responsible for paying the entire cost share. The Prime Recipient's cost share obligation is expressed in the Assistance Agreement as a static amount in U.S. dollars (cost share amount) and as a percentage of the Total Project Cost (cost share percentage). If the funding agreement is terminated prior to the end of the project period, the Prime Recipient is required to contribute at least the cost share percentage of total expenditures incurred through the date of termination.

The Prime Recipient is solely responsible for managing cost share contributions by the Project Team and enforcing cost share obligation assumed by Project Team members in subawards or related agreements.

2. COST SHARE ALLOCATION

Each Project Team is free to determine how best to allocate the cost share requirement among the team members. The amount contributed by individual Project Team members may vary, as long as the cost share requirement for the project as a whole is met.

3. COST SHARE TYPES AND ALLOWABILITY

Every cost share contribution must be allowable under the applicable Federal cost principles, as described in Section IV.J.1 of the FOA. In addition, cost share must be verifiable upon submission of the Full Application.

Project Teams may provide cost share in the form of cash or in-kind contributions. Cash contributions may be provided by the Prime Recipient or Subrecipients. Allowable in-kind contributions 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.

Project teams may use funding or property received from state or local governments to meet the cost share requirement, so long as the funding was not provided to the state or local government by the Federal Government.

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 (e.g., Federal grants, equipment owned by the Federal Government); or
- Expenditures that were reimbursed under a separate Federal Program.

Project Teams may not use the same cash or in-kind contributions to meet cost share requirements for more than one project or program.

Cost share contributions must be specified in the project budget, verifiable from the Prime Recipient's records, and necessary and reasonable for proper and efficient accomplishment of the project. As all sources of cost share are considered part of total project cost, the cost share dollars will be scrutinized under the same Federal regulations as Federal dollars to 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.

Applicants are encouraged to refer to 2 CFR 200.306 as amended by 2 CFR 910.130 & 10 CFR 603.525-555 for additional guidance on cost sharing.

4. COST SHARE CONTRIBUTIONS BY FFRDCS

Because FFRDCs are funded by the Federal Government, costs incurred by FFRDCs generally may not be used to meet the cost share requirement. FFRDCs may contribute cost share only if the contributions are paid directly from the contractor's Management Fee or another non-Federal source.

5. COST SHARE VERIFICATION

Applicants are required to provide written assurance of their proposed cost share contributions in their Full Applications.

Upon selection for award negotiations, applicants are required to provide additional information and documentation regarding their cost share contributions. Please refer to Appendix A of the FOA.

6. COST SHARE PAYMENT

All proposed cost share contributions must be reviewed in advance by the Contracting Officer and incorporated into the project budget before the expenditures are incurred.

EERE requires Prime Recipients to contribute the cost share amount incrementally over the life of the award. Cumulative invoices received must reflect, at a minimum, the cost sharing percentage specified in the award at the conclusion of each budget period or at some negotiated timeframe within each budget period, i.e. every three or six months. If the Award is terminated or discontinued, the Recipient shall refund sufficient funds to the Government in order to achieve the Recipient's cost-share percentage based on total allowable project cost.

C. COMPLIANCE CRITERIA

Concept Papers and Full Applications must meet all Compliance criteria listed below or they will be considered noncompliant. EERE will not review or consider noncompliant submissions, including Concept Papers, Full Applications, and Replies to Reviewer Comments that were: submitted through means other than EERE Exchange; submitted after the applicable deadline; and/or submitted incomplete. EERE will not extend the submission deadline for applicants that fail to submit required information due to server/connection congestion.

1. COMPLIANCE CRITERIA

a. Concept Papers

Concept Papers are deemed compliant if:

- The Concept Paper complies with the content and form requirements in Section IV.C of the FOA; and
- The applicant successfully uploaded all required documents and clicked the "Submit" button in EERE Exchange by the deadline stated in this FOA.

b. Full Applications

Full Applications are deemed compliant if:

- The applicant submitted a compliant Concept Paper;
- The Full Application complies with the content and form requirements in Section IV.D of the FOA; and
- The applicant successfully uploaded all required documents and clicked the "Submit" button in EERE Exchange by the deadline stated in the FOA.

c. Replies to Reviewer Comments

Replies to Reviewer Comments are deemed compliant if:

- The Reply to Reviewer Comments complies with the content and form requirements in Section IV.E of the FOA; and
- The applicant successfully uploaded all required documents to EERE Exchange by the deadline stated in the FOA.

D. RESPONSIVENESS CRITERIA

All "Applications Specifically Not of Interest," as described in Section I.C and Section I.B of the FOA, are deemed nonresponsive and are not reviewed or considered for a technical merit review of the full application.

E. OTHER ELIGIBILITY REQUIREMENTS

1. REQUIREMENTS FOR DOE/NNSA AND NON-DOE/NNSA FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTERS INCLUDED AS A SUBRECIPIENT

DOE/NNSA and non-DOE/NNSA FFRDCs may be proposed as a Subrecipient on another entity's application subject to the following guidelines:

a. Authorization for non-DOE/NNSA FFRDCs

The Federal agency sponsoring the FFRDC must authorize in writing the use of the FFRDC on the proposed project and this authorization must be submitted with the application. The use of a FFRDC must be consistent with its authority under its award.

b. Authorization for DOE/NNSA FFRDCs

The cognizant Contracting Officer for the FFRDC must authorize in writing the use of the FFRDC on the proposed project and this authorization must be submitted with the application. The following wording is acceptable for this authorization:

> Authorization is granted for the _____ Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complementary to the missions of the laboratory, and will not adversely impact execution of the DOE assigned programs at the laboratory.

c. Value/Funding

The value of and funding for the FFRDC portion of the work will not normally be included in the award to a successful applicant. Usually, DOE will fund a DOE/NNSA FFRDC contractor through the DOE field work proposal system and non-DOE/NNSA FFRDC through an interagency agreement with the sponsoring agency.

d. Cost Share

Although the FFRDC portion of the work is usually excluded from the award to a successful applicant, the applicant's cost share requirement will be based on the total cost of the project, including the applicant's and the FFRDC's portions of the project.

e. Responsibility

The Prime Recipient will be the responsible authority regarding the settlement and satisfaction of all contractual and administrative issues including, but not limited to disputes and claims arising out of any agreement between the Prime Recipient and the FFRDC contractor.

F. Limitation on Number of Concept Papers and Full Applications Eligible for Review

Applicants may submit more than one Full Application to this FOA, provided that each application describes a unique, scientifically distinct project. All concept papers and applications must be for a stand-alone project that is not dependent or contingent upon another application submitted to this or any other FOA.

G. Questions Regarding Eligibility

EERE will not make eligibility determinations for potential applicants prior to the date on which applications to this FOA must be submitted. The decision whether to submit an application in response to this FOA lies solely with the applicant.

IV. APPLICATION AND SUBMISSION INFORMATION

A. APPLICATION PROCESS

The application process will include two phases: a Concept Paper phase and a Full Application phase. **Only applicants who have submitted an eligible Concept Paper will be eligible to submit a Full Application**. At each phase, EERE performs an initial eligibility review of the applicant submissions to determine whether they meet the eligibility requirements of Section III of the FOA. EERE will not review or consider submissions that do not meet the eligibility requirements of Section III. All submissions must conform to the following form and content requirements, including maximum page lengths (described below) and must be submitted via EERE Exchange at https://eere-exchange.energy.gov/, unless specifically stated otherwise. **EERE will not review or consider submissions submitted through means other than EERE Exchange, submissions submitted after the applicable deadline, and incomplete submissions**. EERE will not extend deadlines for applicants who fail to submit required information and documents due to server/connection congestion. A control number will be issued when an applicant begins the Exchange application process. This control number must be included with all Application documents, as described below.

The Concept Paper, Full Application, and Reply to Reviewer Comments must conform to the following requirements:

- Each must be submitted in Adobe PDF format unless stated otherwise.
- Each must be written in English.
- All pages must be formatted to fit on 8.5 x 11 inch paper with margins not less than one inch on every side. Use Times New Roman typeface, a black font color, and a font size of 12 point or larger (except in figures or tables, which may be 10 point font). A symbol font may be used to insert Greek letters or special characters, but the font size requirement still applies. References must be included as footnotes or endnotes in a font size of 10 or larger. Footnotes and endnotes are counted toward the maximum page requirement.
- The Control Number must be prominently displayed on the upper right corner of the header of every page. Page numbers must be included in the footer of every page.
- Each submission must not exceed the specified maximum page limit, including cover page, charts, graphs, maps, and photographs when printed using the formatting requirements set forth above and single spaced. If applicants exceed the maximum page lengths indicated below, EERE will review only the authorized number of pages and disregard any additional pages.

Applicants are responsible for meeting each submission deadline. **Applicants are strongly encouraged to submit their Concept Papers and Full Applications at least 48 hours in advance of the submission deadline**. Under normal conditions (i.e., at least 48 hours in advance of the submission deadline), applicants should allow at least 1 hour to submit a Concept Paper, Full Application, or Reply to Reviewer Comments. Once the Concept Paper, Full Application, or Reply to Reviewer Comments is submitted in EERE Exchange, applicants may revise or update that submission until the expiration of the applicable deadline. If changes are made, the applicant must resubmit the Concept Paper, Full Application, or Reply to Reviewer Comments before the applicable deadline.

EERE urges applicants to carefully review their Concept Papers, and Full Applications and to allow sufficient time for the submission of required information and documents. All Full Applications that pass the initial compliance review will undergo comprehensive technical merit review according to the criteria identified in Section V.A.2 of the FOA.

1. ADDITIONAL INFORMATION ON EERE EXCHANGE

EERE Exchange is designed to enforce the deadlines specified in this FOA. The "Apply" and "Submit" buttons will automatically disable at the defined submission deadlines. Should applicants experience problems with Exchange, the following information may be helpful.

Applicants that experience issues with submission PRIOR to the FOA deadline: In the event that an applicant experiences technical difficulties with a submission, the Application should contact the Exchange helpdesk for assistance (EERE-ExchangeSupport@hq.doe.gov). The Exchange helpdesk and/or the EERE Exchange system administrators will assist Applicants in resolving issues.

Applicants that experience issue with submissions that result in late submissions: In the event that an applicant experiences technical difficulties so severe that they are unable to submit their application by the deadline, the applicant should contact the Exchange helpdesk for assistance (EERE-ExchangeSupport@hq.doe.gov). The Exchange helpdesk and/or the EERE Exchange system administrators will assist the applicant in resolving all issues (including finalizing submission on behalf of and with the applicant's concurrence). PLEASE NOTE, however, those applicants who are unable to submit their application on time due to their waiting until the last minute when network traffic is at its heaviest to submit their materials will not be able to use this process which may result in their full application not being considered.

B. APPLICATION FORMS

The application forms and instructions are available on EERE Exchange. To access these materials, go to https://eere-Exchange.energy.gov and select the appropriate funding opportunity number.

Note: The maximum file size that can be uploaded to the EERE Exchange website is 10MB. Files in excess of 10MB cannot be uploaded, and hence cannot be submitted for review. If a file exceeds 10MB but is still within the maximum page limit specified in the FOA, it must be broken into parts and denoted to that effect. For example:

ControlNumber_LeadOrganization_Project_Part_1
ControlNumber_LeadOrganization_Project_Part_2, etc.

C. CONTENT AND FORM OF THE CONCEPT PAPER

To be eligible to submit a Full Application, applicants must submit a Concept Paper by the specified due date and time.

1. CONCEPT PAPER CONTENT REQUIREMENTS

EERE will not review or consider ineligible Concept Papers (see Section III of the FOA).

Each Concept Paper must be limited to a single concept or technology. Unrelated concepts and technologies should not be consolidated into a single Concept Paper.

The format for Concept Paper is specific to the Area of Interest for which the concept paper is being submitted. Concept Paper format requirements are listed below, respective to each AOI.

Concept Papers submitted under **Area of Interest 1 (EV Everywhere Plug-in Electric Vehicle Local Showcases)** must conform to the following content requirements:

Section	Page Limit	Description
Title Page	1 page maximum	The title page must contain the following: • Applicant Name • Project Title • Area of Interest to which the organization is submitting the concept paper • Control Number • Principal Investigator • Key Team Member(s)
Project Description	2 pages maximum	Applicants are required to describe succinctly: • The proposed showcase, including how it would be established and its physical location • The specific targeted audiences to be reached and the projected number of visitors • How the proposed showcase would educate the targeted audiences and provide driving and recharging experiences • How the project will attract visitors and promote the showcase

		• Anticipated partners, stakeholders, or manufacturers and how their products/materials would be incorporated into the showcase
Addendum	2 pages maximum	Applicants may provide graphs, charts, or other data to supplement their Technology Description. Applicants are required to describe succinctly the qualifications, experience, and capabilities of the proposed Project Team, including: • Whether the Principal Investigator (PI) and Project Team have the skill and expertise needed to successfully execute the project plan; • Whether the Applicant has prior experience that demonstrates an ability to perform tasks of similar risk and complexity; • Whether the Applicant has worked together with its teaming partners on prior projects or programs; and • Whether the Applicant has adequate access to equipment and facilities necessary to accomplish the effort and/or clearly explain how it intends to obtain access to the necessary equipment and facilities will be obtained.

Concept Papers submitted under **Areas of Interest 2, 3, 4, 5, 6, 7, 8, 9, and 11** must conform to the following content requirements:

Section	Page Limit	Description
Cover Page	1 page maximum	The cover page should include the project title, the specific FOA Topic Area being addressed (if applicable), both the technical and business points of contact, names of all team member organizations, and any statements regarding confidentiality.
Technology Description	[2] pages maximum	Applicants are required to describe succinctly: • The proposed technology, including its basic operating principles and how it is unique and innovative; • The proposed technology's target level of performance (applicants should provide technical data or other support to show how the proposed target could be met); • The current state-of-the-art in the relevant field and application, including key shortcomings, limitations, and challenges; • How the proposed technology will overcome the shortcomings, limitations, and challenges in the relevant field and application; • The potential impact that the proposed project would have on the relevant field and application; • The key technical risks/issues associated with the proposed technology development plan; and • The impact that EERE funding would have on the proposed project.

Addendum	[2] pages maximum	Applicants are required to describe succinctly the qualifications, experience, and capabilities of the proposed Project Team, including: • Whether the Principal Investigator (PI) and Project Team have the skill and expertise needed to successfully execute the project plan; • Whether the applicant has prior experience which demonstrates an ability to perform tasks of similar risk and complexity; • Whether the applicant has worked together with its teaming partners on prior projects or programs; and • Whether the applicant has adequate access to equipment and facilities necessary to accomplish the effort and/or clearly explain how it intends to obtain access to the necessary equipment and facilities. Applicants may provide graphs, charts, or other data to supplement their Technology Description.

Concept Papers submitted under **Area of Interest 10 (Alternative Fuel Vehicle Workplace Safety Programs)** must conform to the following content requirements:

Section	Page Limit	Description
Title Page	1 page maximum	The title page must contain the following: • Applicant Name • Project Title • Area of Interest to which the organization is submitting the concept paper • Control Number • Principal Investigator • Key Team Member(s)
Project Description	2 pages maximum	Applicants are required to describe succinctly: • The proposed workplace safety program, including which fuels would be addressed and location of project; • How the program is unique and innovative; • What products would be developed, such as handbooks, technical guidance, videos, etc.; • How the proposed program would educate the targeted audiences; • Project partners and/or stakeholders and how they will be utilized by the project; • The attributes of the facilities that would make ideal sites for tours and showcasing of safe use of target fuels
Addendum	2 pages maximum	Applicants may provide graphs, charts, or other data to supplement their Technology Description. Applicants are required to describe succinctly the qualifications,

		experience, and capabilities of the proposed Project Team, including: • Whether the Principal Investigator (PI) and Project Team have the skill and expertise needed to successfully execute the project plan; • Whether the Applicant has prior experience that demonstrates an ability to perform tasks of similar risk and complexity; • Whether the Applicant has worked together with its teaming partners on prior projects or programs; and • Whether the Applicant has adequate access to equipment and facilities necessary to accomplish the effort and/or clearly explain how access to the necessary equipment and facilities will be obtained.

EERE will not review or consider non-compliant Concept Papers (see Section III of the FOA).

EERE makes an independent assessment of each Concept Paper based on the criteria in Section V.A.1 of the FOA. EERE will encourage a subset of applicants to submit Full Applications. Other applicants will be discouraged from submitting a Full Application, based upon this assessment. An applicant who receives a "discouraged" notification may still submit a Full Application. EERE will review all eligible Full Applications. However, by discouraging the submission of a Full Application, EERE intends to convey its lack of programmatic interest in the proposed project in an effort to save the Applicant the time and expense of preparing an application that is unlikely to be selected for award negotiations.

In order to provide Applicants with feedback on their Concept Papers, EERE will include general comments provided from reviewers on an Applicant's Concept Paper in the discourage notification sent to Applicants at the close of that phase.

Applicants who receive an "encourage" notification will not be provided with comments from reviewers.

While the content and form of the Concept Paper does not require proposing a cost share amount during this concept paper submission phase, the Exchange system will require entering a proposed cost share as a step in the submission process. Any proposed cost share at the Concept Paper stage of the application process can be updated or amended at the time of full application submission.

D. CONTENT AND FORM OF THE FULL APPLICATION

Applicants must submit a Full Application by the specified due date and time to be considered for funding under this FOA. Applicants must complete the following application forms found on the EERE Exchange website at https://eere-Exchange.energy.gov/, in accordance with the instructions.

Applicants will have approximately 30 days from receipt of the Concept Paper Encourage/Discourage notification to prepare and submit a Full Application. Regardless of the date the applicant receives the Encourage/Discourage notification, the submission deadline for the Full Application remains the date and time stated on the FOA cover page.

All Full Application documents must be marked with the Control Number issued to the applicant. Applicants will receive a control number upon submission of their Concept Paper, and should include that control number in the file name of their Full Application submission (i.e., *Control number_Applicant Name_Full Application*).

1. FULL APPLICATION CONTENT REQUIREMENTS

EERE will not review or consider ineligible Full Applications (see Section III of the FOA).

Each Full Application shall be limited to a single concept or technology. Unrelated concepts and technologies shall not be consolidated in a single Full Application.

The Full Application must conform to the content and form requirements, including maximum page lengths, as outlined in the table below. If Applicants exceed the maximum page lengths indicated below, EERE will review only the authorized number of pages and disregard any additional pages.

Full Applications must conform to the following requirements:

Submission	Components	File Name
Full Application (PDF, unless stated otherwise)	Technical Volume (See Chart in Section IV.D.2) (Adobe PDF format). Page limitations specific to Area of Interest.	ControlNumber_LeadOrganization_TechnicalVolume
	Statement of Project Objectives (Microsoft Word format. Applicants must use the template available in EERE Exchange) (10 page limit)	ControlNumber_LeadOrganization_SOPO
	SF-424 (Applicants must use the template available in EERE Exchange)	ControlNumber_LeadOrganization_App424
	Budget Justification (EERE 335) (Microsoft Excel format. Applicants must use the template available in EERE Exchange)	ControlNumber_LeadOrganization_Budget_Justification

	Summary for Public Release (1 page limit, Microsoft PowerPoint format)	ControlNumber_LeadOrganization_Summary
	Summary Slide (1 page limit, Microsoft PowerPoint format)	ControlNumber_LeadOrganization_Slide
	Subaward Budget Justification (if applicable) (EERE 335) (Microsoft Excel format. Applicants must use the template available in EERE Exchange)	ControlNumber_LeadOrganization_Subawardee_Budget_Justification
	Budget for FFRDC (if applicable)	ControlNumber_LeadOrganization_FWP
	Authorization from cognizant Contracting Officer for FFRDC (if applicable) (Microsoft Word or Adobe PDF format)	ControlNumber_LeadOrganization_FFRDCAuth
	SF-LLL Disclosure of Lobbying Activities	ControlNumber_LeadOrganization_SF-LLL
	Performance of Work in the United States waiver requests (if applicable) (Microsoft Word or Adobe PDF format)	ControlNumber_LeadOrganization_Waiver
	U.S. Manufacturing Plans (Microsoft Word or Adobe PDF format) **Only required if applying to AOIs 2, 3, 4, 5, 6, 9, and 11.**	ControlNumber_LeadOrganization_USMP
	Data Management Plan (Microsoft Word or Adobe PDF format)	ControlNumber_LeadOrganization_DMP
	Open Source Software Distribution Plan (if applicable) (Microsoft Word or Adobe PDF format)	ControlNumber_LeadOrganization_OSSDP
	Environmental Questionnaire (Applicants must use the template available in EERE Exchange)	ControlNumber_LeadOrganization_EQ
	Letters of Commitment, (if applicable) (Adobe PDF format)	ControlNumber_LeadOrganization_LOC

Note: The maximum file size that can be uploaded to the EERE Exchange website is 10MB. Files in excess of 10MB cannot be uploaded, and hence cannot be submitted for review. If a file exceeds 10MB but is still within the maximum page limit specified in the FOA it must be broken into parts and denoted to that effect. For example:

ControlNumber_LeadOrganization_TechnicalVolume_Part_1
ControlNumber_LeadOrganization_TechnicalVolume_Part_2, etc.

EERE will not accept late submissions that resulted from technical difficulties due to uploading files that exceed 10MB.

EERE provides detailed guidance on the content and form of each component below.

2. TECHNICAL VOLUME

The Technical Volume must be submitted in Adobe PDF format. The Technical Volume must conform to the following content and form requirements, including maximum page lengths. If applicants exceed the maximum page lengths indicated below, EERE will review only the

authorized number of pages and disregard any additional pages. This volume must address the Merit Review Criteria as discussed in Section V.A.2 of the FOA. Save the Technical Volume in a single PDF file using the following convention for the title: "ControlNumber_LeadOrganization_TechnicalVolume".

Applicants must provide sufficient citations and references to the primary research literature to justify the claims and approaches made in the Technical Volume. EERE and reviewers may review primary research literature in order to evaluate applications. However, EERE and reviewers are under no obligation to review cited sources (e.g., internet websites).

Example Milestone Summary Table and Work Breakdown Structure are provided at the end of this section.

The Technical Volume to the Full Application may not be more than 30 pages, including the cover page, table of contents, and all citations, charts, graphs, maps, photos, or other graphics, and must include all of the information in the table below. The page limitation does not include the Statement of Project Objectives, which is a separate document and not included as part of the technical volume. The applicant should consider the weighting of each of the evaluation criteria (see Section V.A.2 of the FOA) when preparing the Technical Volume.

Note: Technical Volume content requirements are specific to each Area of Interest. Technical Volume content requirements are listed below, respective to each AOI.

a. Technical Volumes submitted under **Area of Interest 1 and Area of Interest 10** must conform to the following content requirements:

Section/Page Limit	Description
Cover Page	The cover page should include the project title, the specific FOA Area of Interest being addressed (if applicable), both the technical and business points of contact, names of all team member organizations, and any statements regarding confidentiality.
Project Overview (Approximately 10% of the Technical Volume)	The Project Overview should contain the following information: • Background: The Applicant should discuss the background of their organization, including the history, successes, and current research and development status (i.e., the technical baseline) relevant to the technical topic being addressed in the Full Application. • Project Goal: The Applicant should explicitly identify the targeted impacts and critical success factors in achieving the project goal. DOE Impact: The Applicant should discuss the impact that DOE funding would have on the proposed project. Applicants should specifically explain how DOE funding, relative to prior, current, or anticipated funding from other public and private sources, is necessary to achieve the project objectives.

Technical Description, Innovation, and Impact (Approximately 25% of the Technical Volume)	The Technical Description should contain the following information: • Relevance and Outcomes: The Applicant should provide a detailed description of the project approach, including its basic operating principles and strategy. This section should describe the relevance of the proposed project to the goals and objectives of the FOA, including the potential to meet specific DOE technical targets or other relevant performance targets. The Applicant should clearly specify the expected outcomes of the project. • Feasibility: The Applicant should demonstrate the technical feasibility of the proposed approach and capability of achieving the anticipated performance targets, including a description of previous work done and prior results. • Innovation and Impacts: The Applicant should describe the current state of existing programs, the specific innovation of the proposed approach and the overall impact that the proposed project would have.
Workplan (Approximately 40% of the Technical Volume)	The Workplan section in the application should include a summary of the Project Objectives, Technical Scope, Work Breakdown Structure, Milestones, Go/No-Go Decision Points, and Project Schedule. A detailed Statement of Project Objectives (SOPO) is requested separately. The Workplan should contain the following information: • Project Objectives: The Applicant should provide a clear and concise (high-level) statement of the goals and objectives of the project as well as the expected outcomes. • Technical Scope Summary: The Applicant should provide a summary description of the overall work scope and approach to achieve the objective(s). The overall work scope is to be divided by performance periods that are separated by discrete, approximately annual decision points (see below for more information on go/no-go decision points). The applicant should describe the specific expected end result of each performance period. • Work Breakdown Structure (WBS) and Task Description Summary: The Workplan should describe the work to be accomplished and how the applicant will achieve the milestones, will accomplish the final project goal(s), and will produce all deliverables. The Workplan is to be structured with a hierarchy of performance period (approximately annual), task and subtasks, which is typical of a standard work breakdown structure (WBS) for any project. The Workplan shall contain a concise detailed description of the specific activities to be conducted over the life of the project. "Detailed" is defined as a full explanation and disclosure of the project being proposed (i.e., a statement such as "we will then complete a proprietary process" is unacceptable). It is the Applicant's responsibility to prepare an adequately detailed task plan to describe the proposed project and the plan for addressing the objectives of this FOA. The summary provided should be consistent with the SOPO. The SOPO will contain a more detailed description of the WBS and tasks. • Milestone Summary: The Applicant should provide a summary of appropriate milestones throughout the project to demonstrate success, where success is defined as technical achievement rather than simply completing a task. To ensure that milestones are relevant, Applicants should follow the SMART rule of thumb, which is that all milestones should be **S**pecific, **M**easurable, **A**chievable, **R**elevant, and **T**imely. Unless otherwise specified in the FOA, the minimum requirement is that each project must have at least one milestone per quarter for the duration of the project (depending on the project, more milestones may be necessary to comprehensively demonstrate progress). The Applicant should also provide the means by which the milestone will be verified.

	• Go/No-Go Decision Point Summary: The Applicant should provide a summary of project-wide go/no-go decision points at appropriate points in the Workplan. A go/no-go decision point is a risk management tool and a project management best practice to ensure that, for the current phase or period of performance, technical success is definitively achieved and potential for success in future phases or periods of performance is evaluated, prior to actually beginning the execution of future phases. Unless otherwise specified in the FOA, the minimum requirement is that each project must have at least one project-wide go/no-go decision point for each year or for each budget period, with the budget period typically every 12-18 months. The Applicant should also provide the specific technical criteria to be used to make the go/no-go decision. • Project Schedule (Gantt chart or similar): The Applicant should provide a detailed schedule for the entire project, including task and subtask durations, milestones, and go/no-go decision points. • Project Management: The Applicant should discuss the team's proposed management plan, including the following: o The overall approach to and organization for managing the work o The roles of each Project Team member o Any critical handoffs/interdependencies among Project Team members o The technical and management aspects of the management plan, including systems and practices, such as financial and project management practices o The approach to project risk management o A description of how project changes will be handled o If applicable, the approach to Quality Assurance/Control o How communications will be maintained among Project Team members
Technical Qualifications and Resources (Approximately 25% of the Technical Volume)	The Technical Qualifications and Resources should contain the following information: • Describe the Project Team's unique qualifications and expertise, including those of key subrecipients • Describe the Project Team's existing equipment and facilities that will facilitate the successful completion of the proposed project; include a justification of any new equipment or facilities requested as part of the project • This section should also include relevant, previous work efforts, demonstrated innovations, and how these enable the Applicant to achieve the project objectives. • Describe the time commitment of the key team members to support the project. • Attach one-page resumes for key participating team members as an appendix. Resumes do not count towards the page limit. Multi-page resumes are not allowed. • Describe the technical services to be provided by DOE/NNSA FFRDCs and GOGOs, if applicable. • Attach any letters of support from partners/end users as an appendix (1 page maximum per letter). Letters of support do not count towards the page limit. Only letters of support from

	project partners that are substantively engaged in the project will be considered. Letters of endorsement or letters expressing general interest and support for the project are not appropriate.
	• For multi-organizational or multi-investigator projects, describe succinctly:
	  • The roles and the work to be performed by each PI and Key Participant;
	  • Business agreements between the Applicant and each PI and Key Participant;
	  • How the various efforts will be integrated and managed;
	  • Process for making decisions on scientific/technical direction;
	  • Publication arrangements;
	  • Intellectual Property issues; and
	  • Communication plans

b. Technical Volumes submitted under **Areas of Interest 2, 3, 4, 5, 6, 7, 8, 9, and 11** must conform to the following content requirements:

Section/Page Limit	Description
Cover Page	The cover page should include the project title, the specific FOA Area of Interest being addressed (if applicable), both the technical and business points of contact, names of all team member organizations, and any statements regarding confidentiality.
Project Overview (This section should constitute approximately 10% of the Technical Volume)	The Project Overview should contain the following information: • Background: The applicant should discuss the background of their organization, including the history, successes, and current research and development status (i.e., the technical baseline) relevant to the technical topic being addressed in the Full Application. • Project Goal: The applicant should explicitly identify the targeted improvements to the baseline technology and the critical success factors in achieving that goal. • DOE Impact: The applicant should discuss the impact that DOE funding would have on the proposed project. Applicants should specifically explain how DOE funding, relative to prior, current, or anticipated funding from other public and private sources, is necessary to achieve the project objectives.
Technical Description, Innovation, and Impact (This section should constitute approximately 30% of the Technical Volume)	The Technical Description should contain the following information: • Relevance and Outcomes: The applicant should provide a detailed description of the technology, including the scientific and other principles and objectives that will be pursued during the project. This section should describe the relevance of the proposed project to the goals and objectives of the FOA, including the potential to meet specific DOE technical targets or other relevant performance targets. The applicant should clearly specify the expected outcomes of the project.

	• Feasibility: The applicant should demonstrate the technical feasibility of the proposed technology and capability of achieving the anticipated performance targets, including a description of previous work done and prior results. • Innovation and Impacts: The applicant should describe the current state of the art in the applicable field, the specific innovation of the proposed technology, the advantages of proposed technology over current and emerging technologies, and the overall impact on advancing the state of the art/technical baseline if the project is successful.
Workplan and Market Transformation Plan (This section should constitute approximately 40% of the Technical Volume)	The Workplan should include a summary of the Project Objectives, Technical Scope, Work Breakdown Structure, Milestones, Go/No-Go Decision Points, and Project Schedule. A detailed Statement of Project Objectives (SOPO) is separately requested. The Workplan should contain the following information: • Project Objectives: The applicant should provide a clear and concise (high-level) statement of the goals and objectives of the project as well as the expected outcomes. • Technical Scope Summary: The applicant should provide a summary description of the overall work scope and approach to achieve the objective(s). The overall work scope is to be divided by performance periods that are separated by discrete, approximately annual decision points (see below for more information on go/no-go decision points). The applicant should describe the specific expected end result of each performance period. • Work Breakdown Structure (WBS) and Task Description Summary: The Workplan should describe the work to be accomplished and how the applicant will achieve the milestones, will accomplish the final project goal(s), and will produce all deliverables. The Workplan is to be structured with a hierarchy of performance period (approximately annual), task and subtasks, which is typical of a standard work breakdown structure (WBS) for any project. The Workplan shall contain a concise description of the specific activities to be conducted over the life of the project. The description shall be a full explanation and disclosure of the project being proposed (i.e., a statement such as "we will then complete a proprietary process" is unacceptable). It is the applicant's responsibility to prepare an adequately detailed task plan to describe the proposed project and the plan for addressing the objectives of this FOA. The summary provided should be consistent with the SOPO. The SOPO will contain a more detailed description of the WBS and tasks. • Milestone Summary: The applicant should provide a summary of appropriate milestones throughout the project to demonstrate success, where success is defined as technical achievement rather than simply completing a task. To ensure that milestones are relevant, applicants should follow the SMART rule of thumb, which is that all milestones should be Specific, Measurable, Achievable, Relevant, and Timely. Unless otherwise specified in the FOA, the minimum requirement is that each project must have at least one milestone per quarter for the duration of the project (depending on the project, more milestones may be necessary to comprehensively demonstrate progress). The applicant should also provide the means by which the milestone will be verified. The summary provided should be consistent with the Milestone Summary Table in the SOPO. • Go/No-Go Decision Points: The applicant should provide a summary of project-wide go/no-go decision points at appropriate points in the Workplan. A go/no-go decision point is a risk management tool and a project management best practice to ensure that, for the current phase or period of performance, technical success is definitively achieved and potential for success in future phases or periods of performance is evaluated, prior to actually beginning the execution of future phases. Unless otherwise specified in the FOA, the minimum

	requirement is that each project must have at least one project-wide go/no-go decision point for each budget period (12 to 18-month period) of the project. The Applicant should also provide the specific technical criteria to be used to make the go/no-go decision. The summary provided should be consistent with the SOPO.
	• Project Schedule (Gantt chart or similar): The applicant should provide a schedule for the entire project, including task and subtask durations, milestones, and go/no-go decision points.
	• Project Management: The applicant should discuss the team's proposed management plan, including the following:
	  • The overall approach to and organization for managing the work
	  • The roles of each Project Team member
	  • Any critical handoffs/interdependencies among Project Team members
	  • The technical and management aspects of the management plan, including systems and practices, such as financial and project management practices
	  • The approach to project risk management
	  • A description of how project changes will be handled
	  • If applicable, the approach to Quality Assurance/Control
	  • How communications will be maintained among Project Team members
	• Market Transformation Plan*: The applicant should provide a market transformation plan, including the following:
	  • Identification of target market, competitors, and distribution channels for proposed technology along with known or perceived barriers to market penetration, including a mitigation plan
	  • Identification of a product development and/or service plan, commercialization timeline, financing, product marketing, legal/regulatory considerations including intellectual property, infrastructure requirements, data dissemination, U.S. manufacturing plan* etc., and product distribution.

Technical Qualifications and Resources (Approximately 20% of the Technical Volume)	The Technical Qualifications and Resources should contain the following information: • Describe the Project Team's unique qualifications and expertise, including those of key Subrecipients. • Describe the Project Team's existing equipment and facilities that will facilitate the successful completion of the proposed project; include a justification of any new equipment or facilities requested as part of the project. • This section should also include relevant, previous work efforts, demonstrated innovations, and how these enable the applicant to achieve the project objectives. • Describe the time commitment of the key team members to support the project. • Attach one-page resumes for key participating team members as an appendix. Resumes do not count towards the page limit. Multi-page resumes are not allowed. • Describe the technical services to be provided by DOE/NNSA FFRDCs, if applicable.

	• Attach letters of commitment from all Subrecipient/third party cost share providers as an appendix. Letters of commitment do not count towards the page limit.
	• Attach any letters of support from partners/end users as an appendix (1 page maximum per letter). Letters of support do not count towards the page limit.
	• For multi-organizational or multi-investigator projects, describe succinctly:
	  • The roles and the work to be performed by each PI and Key Participant;
	  • Business agreements between the applicant and each PI and Key Participant;
	  • How the various efforts will be integrated and managed;
	  • Process for making decisions on scientific/technical direction;
	  • Publication arrangements;
	  • Intellectual Property issues; and
	  • Communication plans

**Market Transformation Plan and US Manufacturing Plan will not be required for Areas of Interest 7 and 8.*

Example Milestone Summary Table

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

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

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

Note 2: It is required that each project has at least one project-wide go/no-go decision point each year. If a decision point is not specific to a particular task, then you may leave the task information blank for those decision points.

Note 3: All milestones should follow the SMART rule of thumb: Specific, Measureable, Achievable, Relevant, and Timely

Example Work Breakdown Structure

Technical Summary: Provide a high-level overview of the final result of this project. Explain the final objective, outcome, milestone and/or deliverable that are to be produced and the rationale for why the applicant has organized the tasks in the way they have.

Technical Details (Optional): Describe the relevant management, engineering, design, process, scientific or other principles and aspects of the project that warrant discussion.

Task 1: Distinctive Title, Date range of the task in months (M1-M4)

Task Summary: Task summaries shall explicitly describe what work is to be accomplished, identify the project objectives/outcomes being addressed and provide a concise statement of the objectives of that task. In addition, the description should indicate the project deliverables that this task will help achieve (D1, D2, D5 etc. note that deliverables may be applicable to multiple or all tasks.]

Task Details: Within this section, the barriers and risks should be identified, as well as the approaches for overcoming those barriers and risks. Where appropriate, multiple pathways early in the effort can be outlined for risk reduction.

Milestone 1.1 (if applicable)
Milestone 1.2 (if applicable)
Etc.

Subtask 1.1: Date range (M1-M2)

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

Subtask Details: Describe the evaluation techniques that will be used and the expected result that will be generated from the effort.

Milestone 1.1.1 (if applicable)
Milestone 1.1.2 (if applicable)
Etc.

Subtask 1.2:
(Continue until all Task 1 subtasks are listed)

Task 2: (continue in the format above until all tasks and subtasks are listed)
Subtask 2.1: Description and Discussion
Subtask 2.2: Description and Discussion

3. *Statement of Project Objectives*

Applicants are required to complete a Statement of Project Objectives (SOPO). Applicants must use the SOPO template available in EERE Exchange. The SOPO, including the Milestone Table, must not exceed 10 pages when printed using standard 8.5 x 11 paper with 1" margins (top, bottom, left, and right) with font not smaller than 12 point. Save the SOPO in a single Microsoft Word file using the following convention for the title "ControlNumber_LeadOrganization_SOPO".

4. *SF-424: Application for Federal Assistance*

Complete all required fields in accordance with the instructions on the form. The list of certifications and assurances in Field 21 can be found at http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms, under Certifications and Assurances. Note: The dates and dollar amounts on the SF-424 are for the complete project period and not just the first project year, first phase or other subset of the project period. Save the SF-424 in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_App424".

5. *Budget Justification Workbook (EERE 335)*

Applicants are required to complete the Budget Justification Workbook. This form is available on EERE Exchange at https://eere-Exchange.energy.gov/. Prime Recipients must complete each tab of the Budget Justification Workbook for the project as a whole, including all work to be performed by the Prime Recipient and its Subrecipients and Contractors, and provide all requested documentation (e.g., a Federally-approved rate agreement, vendor quotes). Applicants should include costs associated with required annual audits and incurred cost proposals in their proposed budget documents. The "Instructions and Summary" included with the Budget Justification Workbook will auto-populate as the applicant enters information into the Workbook. Applicants must carefully read the "Instructions and Summary" tab provided within the Budget Justification Workbook. Save the Budget Justification Workbook in a single Microsoft Excel file using the following convention for the title "ControlNumber_LeadOrganization_Budget_Justification".

6. *Summary/Abstract for Public Release*

Applicants are required to submit a one-page summary/abstract of their project. The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (e.g., benefits, outcomes), and major participants (for collaborative projects). This document must not include any proprietary or sensitive business information as DOE may make it available to the public after selections are made. The project summary must not exceed 1

page when printed using standard 8.5 x 11 paper with 1" margins (top, bottom, left, and right) with font not smaller than 12 point. Save the Summary for Public Release in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_Summary".

7. SUMMARY SLIDE

Applicants are required to provide a single PowerPoint slide summarizing the proposed project. The slide must be submitted in Microsoft PowerPoint format. This slide is used during the evaluation process. Save the Summary Slide in a single file using the following convention for the title "ControlNumber_LeadOrganization_Slide".

The Summary Slide template requires the following information:

- A technology Summary;
- A description of the technology's impact;
- Proposed project goals;
- Any key graphics (illustrations, charts and/or tables);
- The project's key idea/takeaway;
- Project title, Prime Recipient, Principal Investigator, and Key Participant information; and
- Requested EERE funds and proposed applicant cost share.

8. SUBAWARD BUDGET JUSTIFICATION (EERE 335)

Applicants must provide a separate budget justification, EERE 335 (i.e., budget justification for each budget year and a cumulative budget) for each subawardee that is expected to perform work estimated to be more than $100,000 or 25 percent of the total work effort (whichever is less). The budget justification must include the same justification information described in the "Budget Justification" section above. Save each subaward budget justification in a Microsoft Excel file using the following convention for the title "ControlNumber_LeadOrganization_Subawardee_Budget_Justification".

9. BUDGET FOR DOE/NNSA FFRDC (IF APPLICABLE)

If a DOE/NNSA FFRDC contractor is to perform a portion of the work, the applicant must provide a DOE Field Work Proposal (FWP) in accordance with the requirements in DOE Order 412.1, Work Authorization System. DOE Order 412.1 and DOE O 412.1 (Field Work Proposal form) area available at the following link, under "DOE Budget Forms": https://www.directives.doe.gov/directives/0412.1-BOrder-a/view. Save the FWP in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_FWP".

10. Authorization for non-DOE/NNSA or DOE/NNSA FFRDCs (if applicable)

The Federal agency sponsoring the FFRDC must authorize in writing the use of the FFRDC on the proposed project and this authorization must be submitted with the application. The use of a FFRDC must be consistent with the contractor's authority under its award. Save the Authorization in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_FFRDCAuth".

11. SF-LLL: Disclosure of Lobbying Activities

Prime Recipients and Subrecipients may not use any Federal funds to influence or attempt to influence, directly or indirectly, congressional action on any legislative or appropriation matters.

Prime Recipients and Subrecipients are required to complete and submit SF-LLL, "Disclosure of Lobbying Activities" (http://www.whitehouse.gov/sites/default/files/omb/grants/sflllin.pdf) if any non-Federal funds have been paid or will be paid to any person for influencing or attempting to influence any of the following in connection with your application:

- An officer or employee of any Federal agency;
- A Member of Congress;
- An officer or employee of Congress; or
- An employee of a Member of Congress.

Save the SF-LLL in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_SF-LLL".

12. Waiver Request: Performance of Work in the United States

As set forth in Section IV.J.3, all work under EERE funding agreements must be performed in the United States. This requirement does not apply to the purchase of supplies and equipment, so a waiver is not required for foreign purchases of these items. However, the Prime Recipient should make every effort to purchase supplies and equipment within the United States. Appendix C lists the necessary information that must be included in a request to waive the Performance of Work in the United States requirement.

13. U.S. Manufacturing Commitments

As part of the application, applicants **are required to submit a U.S. Manufacturing Plan when applying to Areas of Interest 2, 3, 4, 5, 6, 9, and 11.** Applicants to all other AOIs are not required to submit a U.S. Manufacturing Plan.

The U.S. Manufacturing Plan represents the applicant's measurable commitment to support U.S. manufacturing as a result of its award.

The weight given to the U.S. Manufacturing Plans during the review and selection process varies based on the particular FOA. Applicants should review Section V.A.2 of this FOA to determine the weight given to the U.S. Manufacturing Plans under this FOA.

A U.S. Manufacturing Plan should contain the following or similar preamble: "If selected for funding, the applicant agrees to the following commitments as a condition of that funding:" and, after the preamble, the plan should include one or more specific and measureable commitments. For example, an applicant may commit particular types of products to be manufactured in the U.S. In addition to or instead of making a commitment tied to a particular product, the applicant may make other types of commitments still beneficial to U.S. manufacturing. An applicant may commit to a particular investment in a new or existing U.S. manufacturing facility, keep certain activities based in the U.S. (i.e., final assembly) or support a certain number of jobs in the U.S. related to the technology and manufacturing. For an applicant which is likely to license the technology to others, especially universities for which licensing may be the exclusive means of commercialization the technology, the U.S. manufacturing plan may indicate the applicant's plan and commitment to use a licensing strategy that would likely support U.S. manufacturing.

When an applicant that is a domestic small business, domestic educational institution, or nonprofit organization is selected for an award, the U.S. Manufacturing Plan submitted by the applicant becomes part of the terms and conditions of the award. The applicant/awardee may request a waiver or modification of the U.S. Manufacturing Plan from DOE upon a showing that the original U.S. Manufacturing Plan is no longer economically feasible.

When an applicant that is a domestic large business is selected for an award, a class patent waiver applies as set forth in Section VIII. L. Under this class patent waiver, domestic large businesses may elect title to their subject inventions similar to the right provided to the domestic small businesses, educational institutions, and nonprofits by law. In order to avail itself of the class patent waiver, a domestic large business must agree that any products embodying or produced through the use of an invention conceived or first actually reduced to practice under the award will be substantially manufactured in the United States, unless DOE agrees that the commitments proposed in the U.S. Manufacturing Plan are sufficient.

For other entity types that are selected for award, please see Section VIII.L regarding U.S. manufacturing commitments.

14. DATA MANAGEMENT PLAN

Applicants whose Full Applications are selected for award negotiations will be required to submit a Data Management Plan within 45 days of award. The Data Management Plan is a document that outlines the proposed plan for data sharing or preservation. Submission of this

plan is required, and failure to submit the plan may result in the termination of award negotiations. As a courtesy, guidance for preparing a Data Management Plan is provided in Appendix D of the FOA.

15. Open Source Software Distribution Plan

Applicants are required to submit an Open Source Software Distribution Plan as part of their Full Application. This plan describes how software produced under this FOA will be distributed. Submission of an Open Source Software Distribution Plan is required; failure to submit a complete Plan may result in a determination of non-compliance for your Full Application. Guidance for preparing an Open Source Software Distribution Plan is included in Appendix E of the FOA.

16. Environmental questionnaire

You must complete the Environmental Questionnaire. This form is available on EERE Exchange at https://eere-Exchange.energy.gov/ and can also be found at https://www.eere-pmc.energy.gov/RecipientLogin/EQ_Sample.pdf

Save the Environmental Questionnaire in a single PDF file using the following convention for the title "Control Number_LeadOrganization_EQ."

17. Cost Share Commitment Letters

If cost share is required, you must have a letter from each third party contributing cost share (i.e., a party other than the organization submitting the application) stating that the third party is committed to providing a specific minimum dollar amount of cost share. Identify the following information for each third party contributing cost share: (1) the name of the organization; (2) the proposed dollar amount to be provided; (3) the amount as a percentage of the total project cost; and (4) the proposed type of cost share – cash, services, or property.

Letters of Commitment from parties participating in the project, exclusive of vendors, who will not be contributing cost share, but will be integral to the success of the project. Examples include participation support letters from OEMs and Tier 1 suppliers.

Please combine each individual Letter of Commitment into a single file.

Save the Letters of Commitment in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_LOC".

E. CONTENT AND FORM OF REPLIES TO REVIEWER COMMENTS

EERE will provide Applicants with reviewer comments following evaluation of all eligible Full Applications. Applicants will have approximately three (3) business days to prepare a short Reply to Reviewer Comments responding to comments. ~~however they desire or supplementing their Full Application.~~ Applicant Replies to Reviewer Comments are limited to clarifying aspects of the application and correcting misunderstandings related to the initial comments provided by EERE. The reply may not be used to modify or materially change the submitted application.

EERE will notify applicants via email when the Reviewer Comments are available for reply. The expected submission deadline is on the cover page of the FOA; however, it is the applicant's responsibility to monitor email in the event that the expected date changes. The deadline will not be extended for applicants who are unable to timely submit their reply due to failure to check email or relying on the expected date alone.

EERE will not review or consider ineligible Replies to Reviewer Comments (see Section III of the FOA). EERE will review and consider each eligible Full Application, even if no Reply is submitted or if the Reply is found to be ineligible.

Replies to Reviewer Comments must conform to the following content and form requirements, including maximum page lengths, described below. If a Reply to Reviewer Comments is more than three pages in length, EERE will review only the first three (3) pages and disregard any additional pages.

Section	Page Limit	Description
Text	2 pages max	Applicants may respond to one or more reviewer comments ~~or supplement their Full Application~~. Applicant Replies to Reviewer Comments are limited to clarifying aspects of the application and correcting misunderstandings related to the initial comments provided by EERE. The reply may not be used to modify or materially change the submitted 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~~. Applicant Replies to Reviewer Comments are limited to clarifying aspects of the application and correcting misunderstandings related to the initial comments provided by EERE. The reply may not be used to modify or materially change the submitted application.

F. POST-AWARD INFORMATION REQUESTS

If selected for award, EERE reserves the right to request additional or clarifying information for any reason deemed necessary, including but not limited to:

- Indirect cost information
- Other budget information
- Updated Commitment Letters from Third Parties Contributing to Cost Share, if applicable
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)
- Representation of Limited Rights Data and Restricted Software, if applicable
- Updated Environmental Questionnaire
- Foreign National Involvement

G. DUN AND BRADSTREET UNIVERSAL NUMBERING SYSTEM NUMBER AND SYSTEM FOR AWARD MANAGEMENT

Each applicant (unless the applicant is an individual or Federal awarding agency that is excepted from those requirements under 2 CFR §25.110(b) or (c), or has an exception approved by the Federal awarding agency under 2 CFR §25.110(d)) is required to: (i) Be registered in the System for Award Management (SAM) at https://www.sam.gov before submitting its application; (ii) provide a valid Dun and Bradstreet Universal Numbering System (DUNS) number in its application; and (iii) continue to maintain an active SAM registration with current information at all times during which it has an active Federal award or an application or plan under consideration by a Federal awarding agency. DOE may not make a Federal award to an applicant until the applicant has complied with all applicable DUNS and SAM requirements and, if an applicant has not fully complied with the requirements by the time DOE is ready to make a Federal award, the DOE may determine that the applicant is not qualified to receive a Federal award and use that determination as a basis for making a Federal award to another applicant.

H. SUBMISSION DATES AND TIMES

Concept Papers, Full Applications, and Replies to Reviewer Comments must be submitted in EERE Exchange no later than 8:00 p.m. Eastern Time on the dates provided on the cover page of this FOA.

I. INTERGOVERNMENTAL REVIEW

This FOA is not subject to Executive Order 12372 – Intergovernmental Review of Federal Programs.

J. FUNDING RESTRICTIONS

1. ALLOWABLE COSTS

All expenditures must be allowable, allocable, and reasonable in accordance with the applicable Federal cost principles.

Refer to the following applicable Federal cost principles for more information:

- FAR Part 31 for For-Profit entities; and
- 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.

2. PRE-AWARD COSTS

Selectees must request prior written approval to charge pre-award costs. Pre-award costs are those incurred prior to the effective date of the Federal award directly pursuant to the negotiation and in anticipation of the Federal award where such costs are necessary for efficient and timely performance of the scope of work. Such costs are allowable only to the extent that they would have been allowable if incurred after the date of the Federal award and **only** with the written approval of the Federal awarding agency, through the Contracting Officer assigned to the award.

Pre-award costs cannot be incurred prior to the Selection Official signing the Selection Statement and Analysis. Pre-award costs can only be incurred if such costs would be reimbursable under the agreement if incurred after award.

Pre-Award expenditures are made at the Selectee's risk; EERE is not obligated to reimburse costs: (1) in the absence of appropriations; (2) if an award is not made; or (3) if an award is made for a lesser amount than the Selectee anticipated.

a. Pre-Award Costs Related to National Environmental Policy Act (NEPA) Requirements

EERE's decision whether and how to distribute Federal funds under this FOA is subject to NEPA. Applicants should carefully consider and should seek legal counsel or other expert advice before taking any action related to the proposed project that would have an adverse effect on the environment or limit the choice of reasonable alternatives prior to EERE completing the NEPA review process.

EERE does not guarantee or assume any obligation to reimburse costs where the Prime Recipient incurred the costs prior to receiving written authorization from the Contracting Officer. If the applicant elects to undertake activities that may have an adverse effect on the environment or limit the choice of reasonable alternatives prior to receiving such written authorization from the Contracting Officer, the applicant is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share. Likewise, if a project is selected for negotiation of award, and the Prime Recipient elects to undertake activities that are not authorized for Federal funding by the Contracting Officer in advance of EERE completing a NEPA review, the Prime Recipient is doing so at risk of not receiving Federal Funding and such costs may not be recognized as allowable cost share. Nothing contained in the pre-award cost reimbursement regulations or any pre-award costs approval letter from the Contracting Officer override these NEPA requirements to obtain the written authorization from the Contracting Officer prior to taking any action that may have an adverse effect on the environment or limit the choice of reasonable alternatives.

3. PERFORMANCE OF WORK IN THE UNITED STATES

a. Requirement
All work performed under EERE Awards must be performed in the United States (100% of all direct labor, including contract/subrecipient labor). This requirement does not apply to the purchase of supplies and equipment; however, the Prime Recipient should make every effort to purchase supplies and equipment within the United States. The Prime Recipient must flow down this requirement to its Subrecipients.

b. Failure to Comply
If the Prime Recipient fails to comply with the Performance of Work in the United States requirement, EERE may deny reimbursement for the work conducted outside the United States and such costs may not be recognized as allowable recipient cost share. The Prime Recipient is responsible should any work under this Award be performed outside the United States, absent a waiver, regardless of if the work is performed by the Prime Recipient, Subrecipients, contractors or other project partners.

c. Waiver
There may be limited circumstances where it is in the interest of the project to perform a portion of the work outside the United States. To seek a waiver of the Performance of Work in the United States requirement, the applicant must submit a written waiver request to EERE. Appendix C lists the necessary information that must be included in a request to waive the Performance of Work in the United States requirement.

The applicant must demonstrate to the satisfaction of EERE that a waiver would further the purposes of the FOA and is in the economic interests of the United States. EERE may require additional information before considering a waiver request. Save the waiver request(s) in a single PDF file titled "ControlNumber_PerformanceofWork_Waiver". The applicant does not have the right to appeal EERE's decision concerning a waiver request.

4. CONSTRUCTION

Recipients are required to obtain written authorization from the Contracting Officer before incurring any major construction costs.

5. FOREIGN TRAVEL

Foreign travel may be necessary and appropriate for projects. Foreign travel will be approved on a case by case basis with prior written approval by the Contracting Officer.

If international travel is proposed for your project, please note that your organization must comply with the International Air Transportation Fair Competitive Practices Act of 1974 (49 USC 40118), commonly referred to as the "Fly America Act," and implementing regulations at 41 CFR 301-10.131 through 301-10.143. The law and regulations require air transport of people or property to, from, between, or within a country other than the United States, the cost of which is supported under this award, to be performed by or under a cost-sharing arrangement with a U.S. flag carrier, if service is available.

6. EQUIPMENT AND SUPPLIES

To the greatest extent practicable, all equipment and products purchased with funds made available under this FOA should be American-made. This requirement does not apply to used or leased equipment.

Property disposition will be required at the end of a project if the current fair market value of property exceeds $5,000. The rules for property disposition are set forth in 2 CFR 200.310 – 200.316 as amended by 2 CFR 910.360.

7. LOBBYING

Recipients and Subrecipients may not use any Federal funds to influence or attempt to influence, directly or indirectly, congressional action on any legislative or appropriation matters.

Recipients and Subrecipients are required to complete and submit SF-LLL, "Disclosure of Lobbying Activities" (http://www.whitehouse.gov/sites/default/files/omb/grants/sflllin.pdf) if

any non-Federal funds have been paid or will be paid to any person for influencing or attempting to influence any of the following in connection with your application:

- An officer or employee of any Federal agency;
- A Member of Congress;
- An officer or employee of Congress; or
- An employee of a Member of Congress.

8. RISK ASSESSMENT

Prior to making a Federal award, the DOE is required by 31 U.S.C. 3321 and 41 U.S.C. 2313 to review information available through any OMB-designated repositories of government-wide eligibility qualification or financial integrity information, such as SAM Exclusions and "Do Not Pay."

In addition, DOE evaluates the risk(s) posed by applicants before they receive Federal awards. This evaluation may consider: results of the evaluation of the applicant's eligibility; the quality of the application; financial stability; quality of management systems and ability to meet the management standards prescribed in this part; history of performance; reports and findings from audits; and the applicant's ability to effectively implement statutory, regulatory, or other requirements imposed on non-Federal entities.

In addition to this review, DOE must comply with the guidelines on government-wide suspension and debarment in 2 CFR 180, and must require non-Federal entities to comply with these provisions. These provisions restrict Federal awards, subawards and contracts with certain parties that are debarred, suspended or otherwise excluded from or ineligible for participation in Federal programs or activities.

V. APPLICATION REVIEW INFORMATION

A. TECHNICAL REVIEW CRITERIA

1. CONCEPT PAPERS

Area of Interest 1
Concept Papers submitted to Area of Interest 1 are evaluated based on the following criteria:
Concept Paper Criterion: Overall FOA Responsiveness and Viability of the Project (Weight: 100%)

- The proposed showcase is clearly described;
- The impact of the project including the degree to which the project will encourage PEV adoption in the areas proposed in the application;
- The applicant and partner have 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.

Areas of Interest 2, 3, 4, 5, 6, 7, 8, 9, and 11
Concept Papers submitted to Areas of Interest 2, 3, 4, 5, 6, 7, 8, 9, and 11 are evaluated based on the following criteria:
Concept Paper Criterion: Overall FOA Responsiveness and Viability of the Project (Weight: 100%)

- The applicant clearly describes the proposed technology, describes how the technology is unique and innovative, and how the technology 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;
- 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.

Areas of Interest 10
Concept Papers submitted to Area of Interest 10 are evaluated based on the following criteria:

Concept Paper Criterion: Overall FOA Responsiveness and Viability of the Project (Weight: 100%)

- The approach of the proposed workplace safety program;
- The potential impact of the proposed workplace safety program;
- The applicant team has the qualifications, experience, capabilities and other resources necessary to complete the proposed project; and
- The degree to which proposed approach/project is responsive to the AOI.

2. FULL APPLICATIONS

Area of Interest 1

Full Applications submitted to Area of Interest 1 will be evaluated based on the following criteria:

Criterion 1: Probability of Project Success Based on Technical Approach (35%)

- Degree to which the proposed approach will educate potential PEV users and other stakeholders;
- Degree to which the task descriptions are detailed, timely, and reasonable, resulting in a high likelihood that the proposed Workplan will succeed in meeting the project goals;
- Degree to which the approach provides consumers opportunities to experience driving a variety of plug in electric vehicles (PEVs) and interacting with Electric Vehicle Supply Equipment (EVSE);
- Degree to which the showcase will be promoted to a broad spectrum of consumers and businesses as demonstrated by thoroughness of the proposed approach;
- The extent to which the project leverages existing local and state policies and incentives that are pushing the market for plug-in electric vehicles;
- The extent to which the project includes an adequate schedule and appropriate milestones for measuring progress;
- Probability of project sustainability beyond the project performance period and expiration of federal funding;
- The extent of the projected impact on PEV deployment in the geographic area of the project;
- The extent to which the project will reach consumers as supported by a sound analysis that includes comprehensive metrics measuring the types of entities the showcase will support; and

- The extent to which the application uses multimedia promotions to advertise the showcases to promote customer visits as to provide training.

Criterion 2: Potential Impact (30%):

- Degree to which the proposed activities will promote plug-in electric vehicles to a larger audience of potential buyers to bring about significant and sustainable use of PEVs;
- Degree to which the proposed activities have identified high-traffic easily accessible locations(s) for local PEV showcases and show a clear assessment of the market potential and types of consumers that will visit;
- Degree to which the proposed activities provide educational and training opportunities to consumers, fleet managers, dealers, property developers and owners, and other target audiences.
- Extent of commitment to continue the showcases beyond the time that federal funding is available; and
- Likelihood that the project will lead to market transformation and bring about significant and sustainable use of plug-in electric vehicles.

Criterion 3: Probability of Project Success Based on Team Expertise (35%)

- Qualifications, expertise, and experience of the identified key personnel, applicant organization and partners in areas relevant to the proposed work. Include resumes of individuals proposed for this project;
- Appropriateness of personnel assigned to major project tasks, their roles in relation to the work required, and percent of their time on the project;
- Degree to which the applicant and/or team resources are appropriately allocated to successfully complete the proposed work;
- Strength of partnerships and active participation in leveraging the project activities; and
- Quality and strength of commitment letters documenting technical and/or financial support from all team partners.

Area of Interest 2

Full Applications submitted to Area of Interest 2 are evaluated based on the following criteria:

Criterion 1: Technical Merit and Innovation (45%):

- Extent to which the proposed technology or process is innovative and has the potential to advance the state of the art;
- Extent to which the proposed technology or process is consistent with the objectives and achievement of prescribed goals, targets, or metrics as described in the area of interest; and
- Extent to which the proposed technology or process is technically sound, technically viable, and includes relevant data, calculations, technical assumptions, design rationale, alternatives, discussion of prior work, and literature.

Criterion 2: Project Approach and Market Transformation/Commercialization Plan (40%):

- Extent to which the tasks and task descriptions are comprehensive, appropriate, detailed, and unambiguous in explaining how project goals will be met;
- Extent to which the project would provide accurate, quantifiable results which support efficient grid integration with plug-in electric vehicles;
- Extent to which the approach comprehensively and logically addresses research, development, validation, demonstration activities, risks, and risk mitigation strategies;
- Extent to which the project schedule represents a realistic and comprehensive plan for the project and provides the critical path for project completion;
- Degree to which the test plan addresses key and relevant operational and performance evaluations for the proposed project, including details such as proposed test matrices, modeling and simulation, data acquisition, and sampling and analysis protocols;
- Comprehensiveness, appropriateness, and clarity of quantifiable project metrics, milestones, and Go/No Go Decision Points;
- Extent to which the Market Transformation/Commercialization Plan demonstrates capability to increase market penetration of grid connected electric drive vehicles while minimizing potentially negative impacts to the electric grid, which is demonstrated by the following:
  - Knowledge of the target market(s), distribution channels, and competitors as well as the risks and risk mitigation strategies associated with each;
  - Extent to which the Applicant addresses infrastructure requirements, and presents a viable plan for infrastructure development to manufacture the technology; and

- Comprehensiveness and reasonableness of the Market Transformation/Commercialization Plan and extent to which items such as the following items are addressed:
  - economic viability of the proposed technology;
  - the commercialization timeline;
  - alternatives;
  - distribution;
  - infrastructure requirements;
  - U.S. Manufacturing Plan;
  - licensing; and
  - legal/regulatory considerations such as intellectual property.

Criterion 3: Team and Resources (15%):

- Extent to which the application demonstrates that the proposed team and individuals have the capabilities, qualifications and proven experience to comprehensively address all aspects of the proposed project as well as further development and commercial deployment of the proposed technologies;
- Degree to which the proposed consortia/team demonstrates the ability to facilitate and expedite further development and commercial deployment of the proposed technologies;
- Sufficiency of the proposed equipment and facilities to support all aspects of the proposed project; and
- Level of participation by project participants as evidenced by letter(s) of commitment and how well they are integrated into the workplan.

Areas of Interest 3, 4, 5, 9, and 11

Full Applications submitted to Areas of Interest 3, 4, 5, 9, and 11 are evaluated based on the following criteria:

Criterion 1: Technical Merit and Innovation (45%):

- Extent to which the application demonstrates knowledge of the current state-of-the-art (SOA) or baseline technology;
- Extent to which the proposed innovative technology is consistent with the objectives and achievement of prescribed goals, targets, or metrics as described in the area of interest; and
- Extent to which the proposed project is technically sound, technically viable, and includes relevant data, calculations, technical assumptions, design rationale, alternatives, discussion of prior work, and literature.

Criterion 2: Project Approach and Market Transformation/Commercialization Plan (40%):

- Extent to which the tasks and task descriptions are comprehensive, appropriate, detailed, and unambiguous in explaining how project goals will be met;
- Extent to which the approach comprehensively and logically addresses research, development, validation, demonstration activities, risks, and risk mitigation strategies;
- Extent to which the project schedule represents a realistic and comprehensive plan for the project and provides the critical path for project completion;
- Degree to which the test plan addresses key and relevant operational and performance evaluations for the proposed project, including details such as proposed test matrices, modeling and simulation, data acquisition, and sampling and analysis protocols;
- Extent of the comprehensiveness, appropriateness, and clarity of the quantifiable project metrics, milestones, interim deliverables, and Go/No Go Decision Points;
- Extent to which the Market Transformation/Commercialization Plan demonstrates capability to impact domestic fleet efficiency, which is demonstrated by the following:
  - Knowledge of the target market(s), distribution channels, and competitors as well as the risks and risk mitigation strategies associated with each;
  - Extent to which the Applicant addresses infrastructure requirements, and presents a viable plan for infrastructure development to manufacture the technology; and
- Comprehensiveness and reasonableness of the Market Transformation/Commercialization Plan and extent to which items such as the following items are addressed:
  - economic viability of the proposed technology;

- the commercialization timeline;
- alternatives;
- distribution;
- infrastructure requirements;
- U.S. Manufacturing Plan;
- licensing; and
- legal/regulatory considerations such as intellectual property.

Criterion 3: Team and Resources (15%):

- Extent to which the application demonstrates that the proposed team and individuals have the capabilities, qualifications and proven experience to comprehensively address all aspects of the proposed project as well as further development and commercial deployment of the proposed technologies;
- Degree to which the proposed consortia/team demonstrates the ability to facilitate and expedite further development and commercial deployment of the proposed technologies;
- Sufficiency of the proposed equipment and facilities to support all aspects of the proposed project; and
- Level of participation by project participants as evidenced by letter(s) of commitment and how well they are integrated into the workplan.

Areas of Interest 6, 7, and 8

Full Applications submitted to Areas of Interest 6, 7, and 8 are evaluated based on the following criteria:

Criterion 1: Technical Merit and Innovation (45%):

- Extent to which the application demonstrates knowledge of the current state-of-the-art (SOA);
- Extent to which the proposed innovative technology is consistent with the objectives and achievement of prescribed goals, targets, or metrics as described in the area of interest; and
- Extent to which the proposed project is technically sound, technically viable, and includes where applicable relevant data, calculations, technical assumptions, design rationale, alternatives, discussion of prior work, and literature.

Criterion 2: Project Approach (40%):

- Extent to which the tasks and task descriptions are comprehensive, appropriate, detailed, and unambiguous in explaining how project goals will be met;
- Extent to which the approach comprehensively and logically addresses research activities, risks, and risk mitigation strategies;
- Extent to which the project schedule represents a realistic and comprehensive plan for the project and provides the critical path for project completion;
- Degree to which the project appropriately addresses key and relevant operational and performance evaluations, including where applicable details such as proposed test matrices, modeling and simulation, validation, data acquisition, and sampling and analysis protocols; and
- Extent of the comprehensiveness, appropriateness, and clarity of the quantifiable project metrics, milestones, and Go/No Go Decision Points.

Criterion 3: Team and Resources (15%):

- Extent to which the application demonstrates that the proposed team and individuals have the capabilities, qualifications and proven experience to comprehensively address all aspects of the proposed project;
- Sufficiency of the proposed equipment and facilities to support all aspects of the proposed project; and
- Level of participation by project participants as evidenced by letter(s) of commitment and how well they are integrated into the workplan.

Area of Interest 10 (Alternative Fuel Vehicle Workplace Safety Programs)

Full Applications submitted to Area of Interest 10 are evaluated based on the following criteria:

Criterion 1: Probability of Project Success Based on Technical Approach (35%)

- Degree to which the task descriptions are detailed, timely, and reasonable, resulting in a high likelihood that the proposed workplan will succeed in meeting the project goals;
- Degree to which the project addresses applicable code requirements associated with designing and upgrading facilities;
- Degree to which best practices for ensuring safety compliance are well documented; and
- Degree to which the technical approach is practical and reflects a good understanding of project needs, challenges, and desired outcomes.

Criterion 2: Potential Impact (30%)

- Potential of the project to reach the maximum number of participants from the target audience;
- Degree to which the proposed workshop participants represent key niche markets that have potential for high market transformation;
- Degree to which the proposed showcase facilities represent high-visibility that will maximize educational exposure; and
- Extent to which the messaging, workshops and educational materials can be replicated and continue to be effective after federal funding is exhausted.

Criterion 3: Probability of Project Success Based on Team Expertise (35%)

- Qualifications, expertise, and experience in areas relevant to the proposed work of both the identified key personnel and the applicant organization and/or partners in areas relevant to the proposed work;
- Extent to which team members demonstrate a proven track record or history of success with requirements for designing and upgrading facilities for the safe use of target fuels;
- Extent to which Authorities Having Jurisdiction are consulted as a part of the project team;
- Extent to which the letters of commitment and support indicate substantial and relevant investment/contributions from critical partners;

- Extent to which technical and engineering disciplines are adequate for the work proposed; and
- Extent to which Clean Cities coalitions are involved in order to leverage the network for engaging key stakeholders and disseminating information.

3. CRITERIA FOR REPLIES TO REVIEWER COMMENTS

EERE has not established separate criteria to evaluate Replies to Reviewer Comments. Instead, Replies to Reviewer Comments are attached to the original applications and evaluated as an extension of the Full Application.

B. STANDARDS FOR APPLICATION EVALUATION

Applications that are determined to be eligible will be evaluated in accordance with this FOA, by the standards set forth in EERE's Notice of Objective Merit Review Procedure (76 Fed. Reg. 17846, March 31, 2011) and the guidance provided in the "Department of Energy Merit Review Guide for Financial Assistance," which is available at: http://energy.gov/sites/prod/files/meritrev.pdf.

C. OTHER SELECTION FACTORS

1. PROGRAM POLICY FACTORS

In addition to the above criteria, the Selection Official may consider the following program policy factors in determining which Full Applications to select for award negotiations:

- The degree to which the proposed project, including proposed cost shares, optimizes the use of available EERE funding to achieve programmatic objectives;
- The level of industry involvement and demonstrated ability to commercialize energy or related technologies;
- Technical, market, organizational, and environmental risks associated with the project;
- Whether the proposed project is likely to lead to increased employment and manufacturing in the United States;
- Whether 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

- The degree to which the proposed project collectively represents diverse types and sizes of applicant organizations while not being detrimental to the overall objectives of the program;
- The degree to which the proposed project represents diverse technology concepts and applications, as well as technical approaches, while not being detrimental to the overall objectives of the program;
- Whether the proposed project has significant potential to impact the market while not being detrimental to the overall objectives of the program; and
- ~~Whether the proposed project will advance the goals of the Climate Action Champion initiative, as committed to by the designated Champion pursuant to its designation agreement. The Climate Action Champion initiative goals include improving climate resilience and reducing greenhouse gas emissions.~~
- 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 previously referenced RFA.

~~*Note: The Climate Action Champion initiative program policy factor is only applicable to (1) projects proposed by Climate Action Champions[1] [2] as designated under DOE's Request for Applications DE-FOA-0001189; (2) projects proposed by a member of a regional collaboration or consortium designated as a Champion; and (3) projects proposed in a Climate Action Champion community where the applicant submits a letter from the Champion confirming the proposed project would further the Champion's goals under the Climate Action Champion initiative. If an applicant is seeking to receive consideration under (3), the applicant must contact the applicable Champion to obtain a letter of support.*~~

~~[1] In recognition of the importance of the dual policy goals of reducing greenhouse gas emissions and enhancing climate resilience, the U.S. Department of Energy (DOE) – in close collaboration with other Federal agencies – launched the Climate Action Champion initiative to identify and showcase U.S. local and tribal governments that have proven to be climate leaders through pursuing opportunities to advance both of these goals in their communities. Recently, DOE selected sixteen (16) U.S. local governments and tribal governments – or regional collaborations or consortia thereof – that demonstrated a strong and ongoing commitment to implementing strategies that both reduce greenhouse gas emissions and enhance climate resilience, with a particular emphasis on strategies that further both goals. http://www.whitehouse.gov/blog/2014/12/03/announcing-first-class-climate-action-champions~~

In recognition of the importance of the dual policy goals of reducing greenhouse gas emissions and enhancing climate resilience, the U.S. Department of Energy (DOE) – in close collaboration with other Federal agencies – launched the Climate Action Champion initiative to identify and showcase U.S. local and tribal governments that have proven to be climate leaders through pursuing opportunities to advance both of these goals in their communities. In 2014, DOE selected sixteen (16) U.S. local governments and tribal governments – or regional collaborations or consortia thereof – that demonstrated a strong and ongoing commitment to implementing strategies that both reduce greenhouse gas emissions and enhance climate resilience, with a particular emphasis on strategies that further both goals. http://www.whitehouse.gov/blog/2014/12/03/announcing-first-class-climate-action-champions

D. Evaluation and Selection Process

1. Overview

The evaluation process consists of multiple phases; each includes an initial eligibility review and a thorough technical review. Rigorous technical reviews of eligible submissions 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, in determining which applications to select.

2. Pre-Selection Clarification

EERE may determine that pre-selection clarifications are necessary from one or more applicants. These pre-selection clarifications will solely be for the purposes of clarifying the application, and will be limited to information already provided in the application documentation. The pre-selection clarifications may occur before or during the merit review evaluation process. Information provided by an applicant that is not necessary to address the pre-selection clarification question will not be reviewed or considered.

The information provided by Applicants to EERE through pre-selection clarifications is incorporated in their applications and contributes to the merit review evaluation and EERE's selection decisions. If EERE contacts an applicant for pre-selection clarification purposes, it does not signify that the applicant has been selected for negotiation of award or that the applicant is among the top ranked applications.

EERE will not reimburse applicants for expenses relating to the pre-selection clarifications, nor will these costs be eligible for reimbursement as pre-award costs.

3. Selection

The Selection Official may consider the technical merit, the Federal Consensus Board's recommendations, program policy factors, and the amount of funds available in arriving at selections for this FOA.

4. Recipient Integrity and Performance Matters (DECEMBER 2015)

DOE, prior to making a Federal award with a total amount of Federal share greater than the simplified acquisition threshold, is required to review and consider any information about the applicant that is in the designated integrity and performance system accessible through SAM (currently FAPIIS) (see 41 U.S.C. 2313);

The applicant, at its option, may review information in the designated integrity and performance systems accessible through SAM and comment on any information about itself that a Federal awarding agency previously entered and is currently in the designated integrity

and performance system accessible through SAM;

DOE will consider any written comments by the applicant, in addition to the other information in the designated integrity and performance system, in making a judgment about the applicant's integrity, business ethics, and record of performance under Federal awards when completing the review of risk posed by applicants as described in §200.205 Federal awarding agency review of risk posed by applicants.

E. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES

EERE anticipates notifying applicants selected for negotiation of award in August 2016 timeframe and making awards by September 30, 2016.

VI. AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

1. *REJECTED SUBMISSIONS*

Noncompliant and nonresponsive Concept Papers and Full Applications are rejected by the Contracting Officer and are not reviewed or considered. The Contracting Officer sends a notification letter by email to the technical and administrative points of contact designated by the Applicant in EERE Exchange. The notification letter states the basis upon which the Concept Paper or the Full Application was rejected.

2. *CONCEPT PAPER NOTIFICATIONS*

EERE will notify applicants of its determination to encourage or discourage the submission of a Full Application. EERE will send a notification letter by email to the technical and administrative points of contact designated by the applicant in EERE Exchange.

Applicants may submit a Full Application even if they receive a notification discouraging them from doing so. By discouraging the submission of a Full Application, EERE intends to convey its lack of programmatic interest in the proposed project. Such assessments do not necessarily reflect judgments on the merits of the proposed project. The purpose of the Concept Paper phase is to save applicants the considerable time and expense of preparing a Full Application that is unlikely to be selected for award negotiations.

A notification letter encouraging the submission of a Full Application does not authorize the applicant to commence performance of the project. Please refer to Section IV.J.2 of the FOA for guidance on pre-award costs.

3. *FULL APPLICATION NOTIFICATIONS*

EERE will notify applicants of its determination via a notification letter by email to the technical and administrative points of contact designated by the applicant in EERE Exchange. The notification letter will inform the applicant whether or not its Full Application was selected for award negotiations. Alternatively, EERE may notify one or more applicants that a final selection determination on particular Full Applications will be made at a later date, subject to the availability of funds or other factors.

4. *SUCCESSFUL APPLICANTS*

Receipt of a notification letter selecting a Full Application for award negotiations does not authorize the applicant to commence performance of the project. If an application is selected for award negotiations, it is not a commitment by EERE to issue an award. Applicants do not

receive an award until award negotiations are complete and the Contracting Officer executes the funding agreement.

The award negotiation process will take approximately 60 days. Applicants must designate a primary and a backup point-of-contact in EERE Exchange with whom EERE will communicate to conduct award negotiations. The applicant must be responsive during award negotiations (i.e., provide requested documentation) and meet the negotiation deadlines. If the applicant fails to do so or if award negotiations are otherwise unsuccessful, EERE will cancel the award negotiations and rescind the Selection. EERE reserves the right to terminate award negotiations at any time for any reason.

Please refer to Section IV.J.2 of the FOA for guidance on pre-award costs.

5. ALTERNATE SELECTION DETERMINATIONS

In some instances, an applicant may receive a notification that its application was not selected for award and EERE designated the application to be an alternate. As an alternate, EERE may consider the Full Application for Federal funding in the future. A notification letter stating the Full Application is designated as an alternate does not authorize the applicant to commence performance of the project. EERE may ultimately determine to select or not select the Full Application for award negotiations.

6. UNSUCCESSFUL APPLICANTS

EERE shall promptly notify in writing each applicant whose application has not been selected for award or whose application cannot be funded because of the unavailability of appropriated funds. Written feedback on Full Applications that are not selected will be made available to Applicants. By providing feedback, EERE intends to guide the further development of the proposed technology.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

1. REGISTRATION REQUIREMENTS

There are several one-time actions before submitting an application in response to this FOA, and it is vital that applicants address these items as soon as possible. Some may take several weeks, and failure to complete them could interfere with an applicant's ability to apply to this FOA, or to meet the negotiation deadlines and receive an award if the application is selected. These requirements are as follows:

a. EERE Exchange

Register and create an account on EERE Exchange at https://eere-Exchange.energy.gov.

This account will then allow the user to register for any open EERE FOAs that are currently in EERE Exchange. It is recommended that each organization or business unit, whether acting as a team or a single entity, use only one account as the contact point for each submission. Applicants should also designate backup points of contact so they may be easily contacted if deemed necessary. **This step is required to apply to this FOA.**

The EERE Exchange registration does not have a delay; however, **the remaining registration requirements below could take several weeks to process and are necessary for a potential applicant to receive an award under this FOA**.

b. DUNS Number

Obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number (including the plus 4 extension, if applicable) at http://fedgov.dnb.com/webform.

c. System for Award Management

Register with the System for Award Management (SAM) at https://www.sam.gov. Designating an Electronic Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in SAM registration. Please update your SAM registration annually.

d. FedConnect

Register in FedConnect at https://www.fedconnect.net. To create an organization account, your organization's SAM MPIN is required. For more information about the SAM MPIN or other registration requirements, review the FedConnect Ready, Set, Go! Guide at http://www.fedconnect.net/FedConnect/Marketing/Documents/FedConnect_Ready_Set_Go.pdf

e. Grants.gov

Register in Grants.gov (http://www.grants.gov) to receive automatic updates when Amendments to this FOA are posted. However, please note that Concept Papers, and Full Applications will not be accepted through Grants.gov.

f. Electronic Authorization of Applications and Award Documents

Submission of an application and supplemental information under this FOA through electronic systems used by the Department of Energy, including EERE Exchange and FedConnect.net, constitutes the authorized representative's approval and electronic signature.

2. AWARD ADMINISTRATIVE REQUIREMENTS

The administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR Part 200 as amended by 2 CFR Part 910. The EERE standard award special terms and conditions can be accessed at http://www1.eere.energy.gov/financing/pdfs/special_terms_conditions.pdf.

3. *Foreign National Involvement*

All applicants selected for an award resulting from this FOA may be required to provide information to the Department of Energy (DOE) in order to facilitate our responsibilities associated with foreign national access to DOE sites, information, technologies, and equipment. Foreign national is defined as any person who was born outside the jurisdiction of the United States, is a citizen of a foreign government, and has not been naturalized under U.S. law. If the selected applicant, including subrecipients/contractors, anticipates utilizing a foreign national person in the performance of an award, the selected applicant may be responsible for providing to the DOE representative specific information of the foreign national(s) to satisfy compliance with all of the requirements for access approval.

4. *Subaward and Executive Reporting*

Additional administrative requirements necessary for DOE grants and cooperative agreements to comply with the Federal Funding and Transparency Act of 2006 (FFATA) are contained in 2 CFR Part 170. Prime Recipients must register with the new FFATA Subaward Reporting System database and report the required data on their first tier Subrecipients. Prime Recipients must report the executive compensation for their own executives as part of their registration profile in SAM.

5. *National Policy Requirements*

The National Policy Assurances that are incorporated as a term and condition of award are located at: http://www.nsf.gov/awards/managing/rtc.jsp.

6. *Environmental Review in Accordance with National Environmental Policy Act (NEPA)*

EERE's decision whether and how to distribute federal funds under this FOA is subject to the National Environmental Policy Act (42 USC 4321, *et seq.*). NEPA requires Federal agencies to integrate environmental values into their decision-making processes by considering the potential environmental impacts of their proposed actions. For additional background on NEPA, please see DOE's NEPA website, at http://nepa.energy.gov/.

While NEPA compliance is a Federal agency responsibility and the ultimate decisions remain with the Federal agency, all recipients selected for an award will be required to assist in the timely and effective completion of the NEPA process in the manner most pertinent to their proposed project. If DOE determines certain records must be prepared to complete the NEPA

review process (e.g., biological evaluations or environmental assessments), the costs to prepare the necessary records may be included as part of the project costs.

The environmental questionnaire can be found at https://www.eerepmc.energy.gov/RecipientLogin/EQ_Sample.pdf. Applicants selected for negotiations leading to award will be required to complete and submit their EQ electronically.

7. APPLICANT REPRESENTATIONS AND CERTIFICATIONS

a. Lobbying Restrictions

By accepting funds under this award, the Prime Recipient agrees that none of the funds obligated on the award shall be expended, directly or indirectly, to influence Congressional action on any legislation or appropriation matters pending before Congress, other than to communicate to Members of Congress as described in 18 U.S.C. §1913. This restriction is in addition to those prescribed elsewhere in statute and regulation.

b. Corporate Felony Conviction and Federal Tax Liability Representations

In submitting an application in response to this FOA, the applicant represents that:

1. It is **not** a corporation that has been convicted of a felony criminal violation under any Federal law within the preceding 24 months, and

2. It is **not** a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

For purposes of these representations the following definitions apply:

A Corporation includes any entity that has filed articles of incorporation in any of the 50 states, the District of Columbia, or the various territories of the United States [but not foreign corporations]. It includes both for-profit and non-profit organizations.

c. Nondisclosure and Confidentiality Agreements Representations

In submitting an application in response to this FOA the applicant represents that:

1. It **does not and will not** require its employees or contractors to sign internal nondisclosure or confidentiality agreements or statements prohibiting or otherwise restricting its employees or contactors from lawfully reporting waste, fraud, or abuse to a designated investigative or law enforcement

representative of a Federal department or agency authorized to receive such information.

2. It **does not and will not** use any Federal funds to implement or enforce any nondisclosure and/or confidentiality policy, form, or agreement it uses unless it contains the following provisions:

   i. *''These provisions are consistent with and do not supersede, conflict with, or otherwise alter the employee obligations, rights, or liabilities created by existing statute or Executive order relating to (1) classified information, (2) communications to Congress, (3) the reporting to an Inspector General of a violation of any law, rule, or regulation, or mismanagement, a gross waste of funds, an abuse of authority, or a substantial and specific danger to public health or safety, or (4) any other whistleblower protection. The definitions, requirements, obligations, rights, sanctions, and liabilities created by controlling Executive orders and statutory provisions are incorporated into this agreement and are controlling.''*

   ii. The limitation above shall not contravene requirements applicable to Standard Form 312, Form 4414, or any other form issued by a Federal department or agency governing the nondisclosure of classified information.

   iii. Notwithstanding the provision listed in paragraph (a), a nondisclosure or confidentiality policy form or agreement that is to be executed by a person connected with the conduct of an intelligence or intelligence-related activity, other than an employee or officer of the United States Government, may contain provisions appropriate to the particular activity for which such document is to be used. Such form or agreement shall, at a minimum, require that the person will not disclose any classified information received in the course of such activity unless specifically authorized to do so by the United States Government. Such nondisclosure or confidentiality forms shall also make it clear that they do not bar disclosures to Congress, or to an authorized official of an executive agency or the Department of Justice, that are essential to reporting a substantial violation of law.

8. STATEMENT OF FEDERAL STEWARDSHIP

EERE will exercise normal Federal stewardship in overseeing the project activities performed under EERE Awards. Stewardship Activities include, but are not limited to, conducting site visits; reviewing performance and financial reports, providing assistance and/or temporary intervention in usual circumstances to correct deficiencies that develop during the project;

assuring compliance with terms and conditions; and reviewing technical performance after project completion to ensure that the project objectives have been accomplished.

9. STATEMENT OF SUBSTANTIAL INVOLVEMENT

EERE has substantial involvement in work performed under Awards made as a result of 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:

1. EERE shares responsibility with the recipient for the management, control, direction, and performance of the Project.

2. 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.

3. 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(s).

4. EERE participates in major project decision-making processes.

The aforementioned substantial involvement language is anticipated by EERE for applications leading to award under this FOA. However, it may be revised during negotiations leading to award if EERE deems necessary

10. SUBJECT INVENTION UTILIZATION REPORTING

In order to ensure that Prime Recipients and Subrecipients holding title to subject inventions are taking the appropriate steps to commercialize subject inventions, EERE may require that each Prime Recipient holding title to a subject invention submit annual reports for 10 years from the date the subject invention was disclosed to EERE on the utilization of the subject invention and efforts made by Prime Recipient or their licensees or assignees to stimulate such utilization. The reports must include information regarding the status of development, date of first commercial sale or use, gross royalties received by the Prime Recipient, and such other data and information as EERE may specify.

11. INTELLECTUAL PROPERTY PROVISIONS

The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at http://energy.gov/gc/standard-intellectual-property-ip-provisions-financial-assistance-awards.

12. REPORTING

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement. The checklist can be accessed at http://energy.gov/sites/prod/files/2013/05/f0/Attch_FA_RepReqChecklist_COMBINED_FINAL_4-23-13%20%283%29_0.pdf.

In addition to the deliverables contained in the Federal Assistance Reporting Checklist, the following additional deliverable requirements are listed below by AOI, where applicable:

AOI 3 Special Deliverables:
In addition to the deliverables required in the Federal Assistance Reporting Requirements Checklist, the following data must be provided to the DOE:

- Applicants shall provide all public data and code (such as technical data used to support published journal articles or research code used for simulations) to the PNNL LightMat Consortium for curation and hosting. Proprietary and business-sensitive data are exempt from this requirement.

AOI 5 Special Deliverables

In addition to the deliverables required in the Federal Assistance Reporting Requirements Checklist, the following deliverables are required:

- Test plan to demonstrate final machine performance to technical targets;
- Listing of estimated manufacturing equipment and equipment cost required to produce the final machine design; and
- Modular or indentured bill of materials for the final machine design.

AOI 6 Special Deliverables
In addition to the deliverables required in the Federal Assistance Reporting Requirements Checklist, the following items are required for performance evaluation at a designated DOE testing laboratory:

- 12 Baseline cells or half cells with a minimum capacity of 10 mAh;
- 12 Improved cells or half cells with a minimum capacity of 10 mAh; and
- Suggested test procedures for the cells/half-cells evaluation. This should include discharge/charge voltage and current limits, number of test sequences, recommended cycling temperature, or other relevant test conditions as appropriate

The DOE will conduct non-destructive performance testing on the deliverables to validate performance. This testing will be conducted outside the Statement of Project Objectives (SOPO) for the proposed project, and therefore will not be addressed in the SOPO nor included in the total estimated project costs. Participation by DOE test agencies in test planning and execution will be addressed by a Non-Disclosure Agreement (NDA) between the test agency and the end item manufacturer. The results of the DOE laboratory testing will be documented in a publically releasable Summary Test Report (to be approved by both DOE and the Recipient prior to release) that validates performance of the deliverables relative to the end item performance targets as well as the technology deployment impact relative to DOE strategic goals. The Summary Test Report will be delivered to the DOE Vehicle Technologies Office and end item manufacturer. Test materials, cells, modules, full battery systems (manufacturing end item), or special test equipment supplied by the end item manufacturer for the purposes of the test will be returned at the conclusion of testing at no cost to the recipient or the project.

13. Go/No-Go Review

Each project selected under this FOA will be subject to a periodic project evaluation referred to as a Go/No-Go Review. Federal funding beyond the Go/No Go decision point (continuation funding), is contingent on (1) the availability of funds appropriated by Congress for the purpose of this program and the availability of future-year budget authority; (2) meeting the objectives, milestones, deliverables, and decision point criteria of recipient's approved project and obtaining approval from EERE to continue work on the project; and (3) the submittal of required reports in accordance with the Statement of Project Objectives.

As a result of the Go/No Go Review, DOE may, at its discretion, authorize the following actions: (1) continue to fund the project, contingent upon the availability of funds appropriated by Congress for the purpose of this program and the availability of future-year budget authority; (2) recommend redirection of work under the project; (3) place a hold on federal funding for the project, pending further supporting data or funding; or (4) discontinue funding the project because of insufficient progress, change in strategic direction, or lack of funding.

The Go/No-Go decision is distinct from a non-compliance determination. In the event a recipient fails to comply with the requirements of an award, EERE may take appropriate action, including but not limited to, redirecting, suspending or terminating the award.

14. Conference Spending

The recipient shall not expend **any** funds on a conference not directly and programmatically related to the purpose for which the grant or cooperative agreement was awarded that would defray the cost to the United States Government of a conference held by any Executive branch department, agency, board, commission, or office for which the cost to the United States Government would otherwise exceed $20,000, thereby circumventing the required notification by the head of any such Executive Branch department, agency, board, commission, or office to

the Inspector General (or senior ethics official for any entity without an Inspector General), of the date, location, and number of employees attending such conference.

VII. QUESTIONS/AGENCY CONTACTS

Upon the issuance of a FOA, EERE personnel are prohibited from communicating (in writing or otherwise) with applicants regarding the FOA except through the established question and answer process as described below. Specifically, questions regarding the content of this FOA must be submitted to DE-FOA-0001384@netl.doe.gov. Questions must be submitted not later than five (5) business days prior to the application due date and time.

Therefore, the deadline for submission of FOA related questions will be March ~~21~~ 23, 2016 at 8:00 PM Eastern time. Any questions submitted after that deadline will NOT be addressed. Questions regarding problems encountered with the application submittal will be answered as time permits. Applicants are encouraged to review the posted questions and answers daily. Please be as specific as possible when asking questions to insure that questions will be adequately addressed. All questions submitted must clearly identify the Area of Interest (AOI) to ensure a timely and accurate response. Failure to identify the AOI, or not being as specific as possible with a question, may result in additional time to address the question or require further correspondence for further clarification regarding the submitted questions.

All questions and answers related to this FOA will be posted on EERE Exchange at: https://eere-exchange.energy.gov. **Please note that you must first select this specific FOA Number in order to view the questions and answers specific to this FOA**. EERE will attempt to respond to a question within five (5) business days, unless a similar question and answer has already been posted on the website.

Questions related to the registration process and use of the EERE Exchange website should be submitted to: EERE-ExchangeSupport@hq.doe.gov.

VIII. OTHER INFORMATION

A. FOA AMENDMENTS

Amendments to this FOA will be posted on the EERE Exchange website and the Grants.gov system. However, you will only receive an email when an amendment or a FOA is posted on these sites if you register for email notifications for this FOA in Grants.gov. EERE recommends that you register as soon after the release of the FOA as possible to ensure you receive timely notice of any amendments or other FOAs.

B. INFORMATIONAL WEBINAR

EERE will conduct one informational webinar during the FOA process. It will be held after the initial FOA release but before the due date for Concept Papers.

Attendance is not mandatory and will not positively or negatively impact the overall review of any applicant submissions. As the webinar will be open to all applicants who wish to participate, applicants should refrain from asking questions or communicating information that would reveal confidential and/or proprietary information specific to their project. Specific dates for the webinar can be found on the cover page of the FOA.

C. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE

EERE reserves the right, without qualification, to reject any or all applications received in response to this FOA and to select any application, in whole or in part, as a basis for negotiation and/or award.

D. COMMITMENT OF PUBLIC FUNDS

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by anyone other than the Contracting Officer, either express or implied, is invalid.

E. TREATMENT OF APPLICATION INFORMATION

In general, EERE will only use data and other information contained in applications for evaluation purposes, unless such information is generally available to the public or is already the property of the Government.

Applicants should not include trade secrets or commercial or financial information that is privileged or confidential in their application unless such information is necessary to convey an understanding of the proposed project or to comply with a requirement in the FOA. Applications containing trade secrets or commercial or financial information that is privileged or

confidential, which the applicant does not want disclosed to the public or used by the Government for any purpose other than application evaluation, must be marked as described in this section.

The cover sheet of the application must be marked as follows and identify the specific pages containing trade secrets or commercial or financial information that is privileged or confidential:

> Notice of Restriction on Disclosure and Use of Data:
> Pages [list applicable pages] of this document may contain trade secrets or commercial or financial information that is privileged or confidential, and is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes or in accordance with a financial assistance or loan agreement between the submitter and the Government. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source.
> [End of Notice]

The header and footer of every page that contains trade secrets or commercial or financial information that is privileged must be marked as follows: "May contain trade secrets or commercial or financial information that is privileged or confidential and exempt from public disclosure."

In addition, each line or paragraph containing trade secrets or commercial or financial information that is privileged or confidential must be enclosed in brackets.

The above markings enable EERE to follow the provisions of 10 CFR 1004.11(d) in the event a Freedom of Information Act (FOIA) request is received for information submitted with an application. Failure to comply with these marking requirements may result in the disclosure of the unmarked information under a FOIA request or otherwise. The U.S. Government is not liable for the disclosure or use of unmarked information, and may use or disclose such information for any purpose.

Subject to the specific FOIA exemptions identified in 5 U.S.C. 552(b), all information submitted to EERE by a FOA applicant is subject to public release under the Freedom of Information Act, 5 U.S.C. §552, as amended by the OPEN Government Act of 2007, Pub. L. No. 110-175. It is the applicant's responsibility to review FOIA and its exemptions to understand (1) what information may be subject to public disclosure and (2) what information applicants submit to the Government that are protected by law. In some cases, DOE may be unable to make an independent determination regarding which information submitted by an applicant is releasable and which is protected by an exemption. In such cases, DOE will consult with the applicant, in accordance with 10 C.F.R. §1004.11, to solicit the applicant's views on how the information should be treated.

F. Evaluation and Administration by Non-Federal Personnel

In conducting the merit review evaluation, the Go/No-Go Review and Peer Review, the Government may seek the advice of qualified non Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing an application. Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

G. Notice Regarding Eligible/Ineligible Activities

Eligible activities under this FOA include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.

H. Notice of Right to Conduct a Review of Financial Capability

EERE reserves the right to conduct an independent third party review of financial capability for applicants that are selected for negotiation of award (including personal credit information of principal(s) of a small business if there is insufficient information to determine financial capability of the organization).

I. Notice of Potential Disclosure Under Freedom of Information Act

Applicants should be advised that identifying information regarding all applicants, including applicant names and/or points of contact, may be subject to public disclosure under the Freedom of Information Act, whether or not such applicants are selected for negotiation of award.

J. Requirement for Full and Complete Disclosure

Applicants are required to make a full and complete disclosure of all information requested. Any failure to make a full and complete disclosure of the requested information may result in:

- The termination of award negotiations;
- The modification, suspension, and/or termination of a funding agreement;
- The initiation of debarment proceedings, debarment, and/or a declaration of ineligibility for receipt of Federal contracts, subcontracts, and financial assistance and benefits; and

- Civil and/or criminal penalties.

K. RETENTION OF SUBMISSIONS

EERE expects to retain copies of all Letters of Intent, Concept Papers, Full Applications, Replies to Reviewer Comments, and other submissions. No submissions will be returned. By applying to EERE for funding, applicants consent to EERE's retention of their submissions.

L. TITLE TO SUBJECT INVENTIONS

Ownership of subject inventions is governed pursuant to the authorities listed below.

- Domestic Small Businesses, Educational Institutions, and Nonprofits: Under the Bayh-Dole Act (35 U.S.C. § 200 et seq.), domestic small businesses, educational institutions, and nonprofits may elect to retain title to their subject inventions.
- All other parties: The Federal Non-Nuclear Energy Act of 1974, 42. U.S.C. 5908, provides that the Government obtains title to new inventions unless a waiver is granted (see below).
- Class Patent Waiver: DOE has issued a class waiver that applies to this FOA. Under this class waiver, domestic large businesses may elect title to their subject inventions similar to the right provided to the domestic small businesses, educational institutions, and nonprofits by law. In order to avail itself of the class waiver, a domestic large business must agree that any products embodying or produced through the use of a subject invention first created or reduced to practice under this program will be substantially manufactured in the United States, unless DOE agrees that the commitments proposed in the U.S. Manufacturing Plan are sufficient.
- Advance and Identified Waivers: Applicants may request a patent waiver that will cover subject inventions that may be invented under the award, in advance of or within 30 days after the effective date of the award. Even if an advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver for identified inventions, i.e., individual subject inventions that are disclosed to EERE within the timeframes set forth in the award's intellectual property terms and conditions. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784.
- Determination of Exceptional Circumstances (DEC): Applications submitted to Areas of Interest 2, 3, 4, 5, 6, 9, and 11 require the submission of a U.S. Manufacturing Plan. If selected, the U.S. Manufacturing Plan shall be incorporated into the award terms and conditions for domestic small businesses and nonprofit organizations. DOE has determined that exceptional circumstances exist that warrants the modification of the standard patent rights clause for small businesses and non-profit awardees under Bayh-Dole to the extent necessary to implement and enforce the U.S. Manufacturing

Plan. For example, the commitments and enforcement of a U.S. Manufacturing Plan may be tied to subject inventions. Any Bayh-Dole entity (domestic small business or nonprofit organization) affected by this DEC has the right to appeal it.

M. GOVERNMENT RIGHTS IN SUBJECT INVENTIONS

Where Prime Recipients and Subrecipients retain title to subject inventions, the U.S. Government retains certain rights.

1. GOVERNMENT USE LICENSE

The U.S. Government retains a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any subject invention throughout the world. This license extends to contractors doing work on behalf of the Government.

2. MARCH-IN RIGHTS

The U.S. Government retains march-in rights with respect to all subject inventions. Through "march-in rights," the Government may require a Prime Recipient or Subrecipient who has elected to retain title to a subject invention (or their assignees or exclusive licensees), to grant a license for use of the invention to a third party. In addition, the Government may grant licenses for use of the subject invention when a Prime Recipient, Subrecipient, or their assignees and exclusive licensees refuse to do so.

DOE may exercise its march-in rights only if it determines that such action is necessary under any of the four following conditions:

- The owner or licensee has not taken or is not expected to take effective steps to achieve practical application of the invention within a reasonable time;
- The owner or licensee has not taken action to alleviate health or safety needs in a reasonably satisfied manner;
- The owner has not met public use requirements specified by Federal statutes in a reasonably satisfied manner; or
- The U.S. Manufacturing requirement has not been met.

Any determination that march-in rights are warranted must follow a fact-finding process in which the recipient has certain rights to present evidence and witnesses, confront witnesses and appear with counsel and appeal any adverse decision. To date, DOE has never exercised its march-in rights to any subject inventions.

N. RIGHTS IN TECHNICAL DATA

Data rights differ based on whether data is first produced under an award or instead was developed at private expense outside the award.

"Limited Rights Data": The U.S. Government will not normally require delivery of confidential or trade secret-type technical data developed solely at private expense prior to issuance of an award, except as necessary to monitor technical progress and evaluate the potential of proposed technologies to reach specific technical and cost metrics.

Areas of Interest 2, 3, 4, 5, 6, 7, 8, 9, and 11:
Government rights in Technical Data Produced under Awards (Special Protected Data): The U.S. Government normally retains unlimited rights in technical data produced under Government financial assistance awards, including the right to distribute to the public. However, pursuant to special statutory authority, certain categories of data generated under EERE awards may be protected from public disclosure for up to five years after the data is generated ("Protected Data"). For awards permitting Protected Data, the protected data must be marked as set forth in the awards intellectual property terms and conditions and a listing of unlimited rights data (i.e., non-protected data) must be inserted into the data clause in the award. In addition, invention disclosures may be protected from public disclosure for a reasonable time in order to allow for filing a patent application. ***EERE intends to offer five (5) years of data protection for certain categories of data generated under selected awards as outlined above under this FOA.***

Areas of Interest 1 and 10:
Government Rights in Technical Data Produced under Awards: The U.S. Government retains unlimited rights in technical data produced under Government financial assistance awards, including the right to distribute to the public. One exception to the foregoing is that invention disclosures may be protected from public disclosure for a reasonable time in order to allow for filing a patent application.

O. COPYRIGHT

The Prime Recipient and Subrecipients may assert copyright in copyrightable works, such as software, first produced under the award without EERE approval. When copyright is asserted, the Government retains a paid-up nonexclusive, irrevocable worldwide license to reproduce, prepare derivative works, distribute copies to the public, and to perform publicly and display publicly the copyrighted work. This license extends to contractors and others doing work on behalf of the Government. In addition, for those awards requiring distribution of software as Open-Source Software (OSS), the additional information in Appendix E must be addressed in the application.

P. PROTECTED PERSONALLY IDENTIFIABLE INFORMATION

In responding to this FOA, applicants must ensure that Protected Personally Identifiable Information (PII) is not included in the application documents. These documents will be used

by the Merit Review Committee in the review process to evaluate each application. PII is defined by the Office of Management and Budget (OMB) and EERE as:

Any information about an individual maintained by an agency, including but not limited to, education, financial transactions, medical history, and criminal or employment history and information that can be used to distinguish or trace an individual's identity, such as their name, social security number, date and place of birth, mother's maiden name, biometric records, etc., including any other personal information that is linked or linkable to an individual.

This definition of PII can be further defined as: (1) Public PII and (2) Protected PII.

Public PII: PII found in public sources such as telephone books, public websites, business cards, university listing, etc. Public PII includes first and last name, address, work telephone number, email address, home telephone number, and general education credentials.

Protected PII: PII that requires enhanced protection. This information includes data that if compromised could cause harm to an individual such as identity theft.

Listed below are examples of Protected PII that applicants must not include in the files listed above to be evaluated by the Merit Review Committee. This list is not all inclusive.

- Social Security Numbers in any form
- Place of Birth associated with an individual
- Date of Birth associated with an individual
- Mother's maiden name associated with an individual
- Biometric record associated with an individual
- Fingerprint
- Iris scan
- DNA
- Medical history information associated with an individual
- Medical conditions, including history of disease
- Metric information, e.g. weight, height, blood pressure
- Criminal history associated with an individual
- Employment history and other employment information associated with an individual
- Ratings
- Disciplinary actions

- Performance elements and standards (or work expectations) are PII when they are so intertwined with performance appraisals that their disclosure would reveal an individual's performance appraisal
- Financial information associated with an individual
- Credit card numbers
- Bank account numbers
- Security clearance history or related information (not including actual clearances held)

Q. ANNUAL COMPLIANCE AUDITS

If a for-profit entity is a Prime Recipient or Subrecipient and has expended $750,000 or more of DOE funds during the entity's fiscal year, an annual compliance audit performed by an independent auditor is be required. For additional information, please refer to 2 C.F.R. § 910.501 and Subpart F.

If an educational institution, non-profit organization, or state/local government is a Prime Recipient or Subrecipient and has expended $750,000 or more of Federal funds during the non-Federal entity's fiscal year, then a single or program-specific audit is required. For additional information, please refer to 2 C.F.R. § 200.501 and Subpart F.

Applicants and sub-recipients (if applicable) should propose sufficient costs in the project budget to cover the costs associated with the audit. EERE will share in the cost of the audit at its applicable cost share ratio.

APPENDIX A – COST SHARE INFORMATION

Cost Sharing or Cost Matching

The terms "cost sharing" and "cost matching" are often used synonymously. Even the DOE Financial Assistance Regulations, 2 CFR 200.306, use both of the terms in the titles specific to regulations applicable to cost sharing. EERE almost always uses the term "cost sharing," as it conveys the concept that non-federal share is calculated as a percentage of the Total Project Cost. An exception is the State Energy Program Regulation, 10 CFR 420.12, State Matching Contribution. Here "cost matching" for the non-federal share is calculated as a percentage of the Federal funds only, rather than the Total Project Cost.

How Cost Sharing Is Calculated

As stated above, cost sharing is calculated as a percentage of the Total Project Cost. FFRDC costs must be included in Total Project Costs. Following is an example of how to calculate cost sharing amounts for a project with $1,000,000 in federal funds with a minimum 20% non-federal cost sharing requirement:

- Formula: Federal share ($) divided by Federal share (%) = Total Project Cost

  Example: $1,000,000 divided by 80% = $1,250,000
- Formula: Total Project Cost ($) minus Federal share ($) = Non-federal share ($)

  Example: $1,250,000 minus $1,000,000 = $250,000
- Formula: Non-federal share ($) divided by Total Project Cost ($) = Non-federal share (%)

  Example: $250,000 divided by $1,250,000 = 20%

What Qualifies For Cost Sharing

While it is not possible to explain what specifically qualifies for cost sharing in one or even a couple of sentences, in general, if a cost is allowable under the cost principles applicable to the organization incurring the cost and is eligible for reimbursement under an EERE grant or cooperative agreement, then it is allowable as cost share. Conversely, if the cost is not allowable under the cost principles and not eligible for reimbursement, then it is not allowable as cost share. In addition, costs may not be counted as cost share if they are paid by the Federal Government under another award unless authorized by Federal statute to be used for cost sharing.

The rules associated with what is allowable as cost share are specific to the type of organization that is receiving funds under the grant or cooperative agreement, though are generally the same for all types of entities. The specific rules applicable to:

- FAR Part 31 for For-Profit entities, (48 CFR Part 31); and
- 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.

In addition to the regulations referenced above, other factors may also come into play such as timing of donations and length of the project period. For example, the value of ten years of donated maintenance on a project that has a project period of five years would not be fully allowable as cost share. Only the value for the five years of donated maintenance that corresponds to the project period is allowable and may be counted as cost share.

Additionally, EERE generally does not allow pre-award costs for either cost share or reimbursement when these costs precede the signing of the appropriation bill that funds the award. In the case of a competitive award, EERE generally does not allow pre-award costs prior to the signing of the Selection Statement by the EERE Selection Official.

DOE Financial Assistance Rules 2 CFR Part 200 as amended by 2 CFR Part 910

As stated above, the rules associated with what is allowable cost share are generally the same for all types of organizations. Following are the rules found to be common, but again, the specifics are contained in the regulations and cost principles specific to the type of entity:

1. Acceptable contributions. All contributions, including cash contributions and third party in-kind contributions, must be accepted as part of the Prime Recipient's cost sharing if such contributions meet all of the following criteria:

    A. They are verifiable from the recipient's records.

    B. They are not included as contributions for any other federally-assisted project or program.

    C. They are necessary and reasonable for the proper and efficient accomplishment of project or program objectives.

    D. They are allowable under the cost principles applicable to the type of entity incurring the cost as follows:

        i. For-profit organizations. Allowability of costs incurred by for-profit organizations and those nonprofit organizations listed in Attachment C to OMB Circular A–122 is determined in accordance with the for-profit cost principles in 48 CFR Part 31 in the Federal Acquisition Regulation, except that patent prosecution costs are not allowable unless specifically authorized in the award document. (v) Commercial Organizations. FAR Subpart 31.2—Contracts with Commercial Organizations

ii. Other types of organizations. For all other non-federal entities, allowability of costs is determined in accordance with 2 CFR Part 200 Subpart E.

E. They are not paid by the Federal Government under another award unless authorized by Federal statute to be used for cost sharing or matching.

F. They are provided for in the approved budget.

2. Valuing and documenting contributions

A. Valuing recipient's property or services of recipient's employees. Values are established in accordance with the applicable cost principles, which mean that amounts chargeable to the project are determined on the basis of costs incurred. For real property or equipment used on the project, the cost principles authorize depreciation or use charges. The full value of the item may be applied when the item will be consumed in the performance of the award or fully depreciated by the end of the award. In cases where the full value of a donated capital asset is to be applied as cost sharing or matching, that full value must be the lesser or the following:

i. The certified value of the remaining life of the property recorded in the recipient's accounting records at the time of donation; or
ii. The current fair market value. If there is sufficient justification, the Contracting Officer may approve the use of the current fair market value of the donated property, even if it exceeds the certified value at the time of donation to the project. The Contracting Officer may accept the use of any reasonable basis for determining the fair market value of the property.

B. Valuing services of others' employees. If an employer other than the recipient furnishes the services of an employee, those services are valued at the employee's regular rate of pay, provided these services are for the same skill level for which the employee is normally paid.

C. Valuing volunteer services. Volunteer services furnished by professional and technical personnel, consultants, and other skilled and unskilled labor may be counted as cost sharing or matching if the service is an integral and necessary part of an approved project or program. Rates for volunteer services must be consistent with those paid for similar work in the recipient's organization. In those markets in which the required skills are not found in the recipient organization, rates must be consistent with those paid for similar work in the labor market in which the recipient competes for the kind of services involved. In either case, paid fringe benefits that are reasonable, allowable, and allocable may be included in the valuation.

D. Valuing property donated by third parties.

i. Donated supplies may include such items as office supplies or laboratory supplies. Value assessed to donated supplies included in the cost sharing or matching share must be reasonable and must not exceed the fair market value of the property at the time of the donation.

ii. Normally only depreciation or use charges for equipment and buildings may be applied. However, the fair rental charges for land and the full value of equipment or other capital assets may be allowed, when they will be consumed in the performance of the award or fully depreciated by the end of the award, provided that the Contracting Officer has approved the charges. When use charges are applied, values must be determined in accordance with the usual accounting policies of the recipient, with the following qualifications:

a. The value of donated space must not exceed the fair rental value of comparable space as established by an independent appraisal of comparable space and facilities in a privately-owned building in the same locality.
b. The value of loaned equipment must not exceed its fair rental value.

E. Documentation. The following requirements pertain to the recipient's supporting records for in-kind contributions from third parties:

i. Volunteer services must be documented and, to the extent feasible, supported by the same methods used by the recipient for its own employees.

ii. The basis for determining the valuation for personal services and property must be documented.

APPENDIX B – SAMPLE COST SHARE CALCULATION FOR BLENDED COST SHARE PERCENTAGE

The following example shows the math for calculating required cost share for a project with $2,000,000 in Federal funds with four tasks requiring different Non-federal cost share percentages:

Task	Proposed Federal Share	Federal Share %	Recipient Share %
Task 1 (R&D)	$1,000,000	80%	20%
Task 2 (R&D)	$500,000	80%	20%
Task 3 (Demonstration)	$400,000	50%	50%
Task 4 (Outreach)	$100,000	100%	0%

Federal share ($) divided by Federal share (%) = Task Cost

Each task must be calculated individually as follows:

Task 1
$1,000,000 divided by 80% = $1,250,000 (Task 1 Cost)
Task 1 Cost minus federal share = Non-federal share
$1,250,000 - $1,000,000 = $250,000 (Non-federal share)

Task 2
$500,000 divided 80% = $625,000 (Task 2 Cost)
Task 2 Cost minus federal share = Non-federal share
$625,000 - $500,000 = $125,000 (Non-federal share)

Task 3
$400,000 / 50% = $800,000 (Task 3 Cost)
Task 3 Cost minus federal share = Non-federal share
$800,000 - $400,000 = $400,000 (Non-federal share)

Task 4
Federal share = $100,000
Non-federal cost share is not mandated for outreach = $0 (Non-federal share)

The calculation may then be completed as follows:

Tasks	$ Federal Share	% Federal Share	$ Non-Federal Share	% Non-Federal Share	Total Project Cost
Task 1	$1,000,000	80%	$250,000	20%	$1,250,000
Task 2	$500,000	80%	$125,000	20%	$625,000
Task 3	$400,000	50%	$400,000	50%	$800,000
Task 4	$100,000	100%	$0	0%	$100,000
Totals	$2,000,000		$775,000		$2,775,000

Blended Cost Share %
Non-federal share ($775,000) divided by Total Project Cost ($2,775,000) = 27.9% (Non-federal)
Federal share ($2,000,000) divided by Total Project Cost ($2,775,000) = 72.1% (Federal)

APPENDIX C – WAIVER REQUEST: PERFORMANCE OF WORK IN THE UNITED STATES

As set forth in Section IV.J.3, all work under EERE funding agreements must be performed in the United States. This requirement does not apply to the purchase of supplies and equipment, so a waiver is not required for foreign purchases of these items. However, the Prime Recipient should make every effort to purchase supplies and equipment within the United States. There may be limited circumstances where it is in the interest of the project to perform a portion of the work outside the United States. To seek a waiver of the Performance of Work in the United States requirement, the applicant must submit an explicit waiver request in the Full Application. A separate waiver request must be submitted for each entity proposing performance of work outside of the United States.

Overall, a waiver request must demonstrate to the satisfaction of EERE that it would further the purposes of this FOA and is otherwise in the economic interests of the United States to perform work outside of the United States. A request to waive the *Performance of Work in the United States* requirement must include the following:

- The rationale for performing the work outside the U.S. ("foreign work");
- A description of the work proposed to be performed outside the U.S.;
- An explanation as to how the foreign work is essential to the project;
- A description of the anticipated benefits to be realized by the proposed foreign work and the anticipated contributions to the US economy;
  - The associated benefits to be realized and the contribution to the project from the foreign work;
  - How the foreign work will benefit U.S. research, development and manufacturing, including contributions to employment in the U.S. and growth in new markets and jobs in the U.S.;
  - How the foreign work will promote domestic American manufacturing of products and/or services;
- A description of the likelihood of Intellectual Property (IP) being created from the foreign work and the treatment of any such IP;
- The total estimated cost (DOE and Recipient cost share) of the proposed foreign work;
- The countries in which the foreign work is proposed to be performed; and
- The name of the entity that would perform the foreign work.

EERE may require additional information before considering the waiver request.
The applicant does not have the right to appeal EERE's decision concerning a waiver request.

APPENDIX D - DATA MANAGEMENT PLAN

A data management plan ("DMP") explains how data generated in the course of the work performed under an EERE award will be shared and preserved or, when justified, explains why data sharing or preservation is not possible or scientifically appropriate.

DMP Requirements

In order for a DMP to be considered acceptable, the DMP must address the following:

At a minimum, the DMP must describe how data sharing and preservation will enable validation of the results from the proposed work, or how results could be validated if data are not shared or preserved.

The DMP must provide a plan for making all research data displayed in publications resulting from the proposed work digitally accessible at the time of publication. This includes data that are displayed in charts, figures, images, etc. In addition, the underlying digital research data used to generate the displayed data should be made as accessible as possible in accordance with the principles stated above. This requirement could be met by including the data as supplementary information to the published article, or through other means. The published article should indicate how these data can be accessed.

The DMP should consult and reference available information about data management resources to be used in the course of the proposed work. In particular, a DMP that explicitly or implicitly commits data management resources at a facility beyond what is conventionally made available to approved users should be accompanied by written approval from that facility. In determining the resources available for data management at DOE User Facilities, researchers should consult the published description of data management resources and practices at that facility and reference it in the DMP. Information about other DOE facilities can be found in the additional guidance from the sponsoring program.

The DMP must protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; avoid significant negative impact on innovation, and U.S. competitiveness; and otherwise be consistent with all laws (i.e., export control laws), and DOE regulations, orders, and policies.

Data Determination for a DMP

The Principal Investigator should determine which data should be the subject of the DMP and, in the DMP, propose which data should be shared and/or preserved in accordance with the DMP Requirements noted above.

For data that will be generated through the course of the proposed work, the Principal Investigator should indicate what types of data should be protected from immediate public disclosure by DOE (referred to as "protected data") and what types of data that DOE should be able to release immediately. Similarly, for data developed outside of the proposed work at private expense that will be used in the course of the proposed work, the Principal Investigator should indicate whether that type of data will be subject to public release or kept confidential (referred to as "limited rights data"). Any use of limited rights data or labeling of data as "protected data" must be consistent with the DMP Requirements noted above.

Suggested Elements for a DMP

The following list of elements for a DMP provides suggestions regarding the data management planning process and the structure of the DMP:

Data Types and Sources: A brief, high-level description of the data to be generated or used through the course of the proposed work and which of these are considered digital research data necessary to validate the research findings or results.

Content and Format: A statement of plans for data and metadata content and format including, where applicable, a description of documentation plans, annotation of relevant software, and the rationale for the selection of appropriate standards. Existing, accepted community standards should be used where possible. Where community standards are missing or inadequate, the DMP could propose alternate strategies for facilitating sharing, and should advise the sponsoring program of any need to develop or generalize standards.

Sharing and Preservation: A description of the plans for data sharing and preservation. This should include, when appropriate: the anticipated means for sharing and the rationale for any restrictions on who may access the data and under what conditions; a timeline for sharing and preservation that addresses both the minimum length of time the data will be available and any anticipated delay to data access after research findings are published; any special requirements for data sharing, for example, proprietary software needed to access or interpret data, applicable policies, provisions, and licenses for re-use and re-distribution, and for the production of derivatives, including guidance for how data and data products should be cited; any resources and capabilities (equipment, connections, systems, software, expertise, etc.) requested in the research proposal that

are needed to meet the stated goals for sharing and preservation (this could reference the relevant section of the associated research proposal and budget request); and whether/where the data will be preserved after direct project funding ends and any plans for the transfer of responsibilities for sharing and preservation.

Protection: A statement of plans, where appropriate and necessary, to protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; and avoid significant negative impact on innovation, and U.S. competitiveness.

Rationale: A discussion of the rationale or justification for the proposed data management plan including, for example, the potential impact of the data within the immediate field and in other fields, and any broader societal impact.

Additional Guidance

In determining which data should be shared and preserved, researchers must consider the data needed to validate research findings as described in the Requirements, and are encouraged to consider the potential benefits of their data to their own fields of research, fields other than their own, and society at large.

DMPs should reflect relevant standards and community best practices and make use of community accepted repositories whenever practicable.

Costs associated with the scope of work and resources articulated in a DMP may be included in the proposed research budget as permitted by the applicable cost principles.

To improve the discoverability of and attribution for datasets created and used in the course of research, EERE encourages the citation of publicly available datasets within the reference section of publications, and the identification of datasets with persistent identifiers such as Digital Object Identifiers (DOIs). In most cases, EERE can provide DOIs free of charge for data resulting from DOE-funded research through its Office of Scientific and Technical Information (OSTI) Data ID Service.

Definitions

Data Preservation: Data preservation means providing for the usability of data beyond the lifetime of the research activity that generated them.

Data Sharing: Data sharing means making data available to people other than those who have generated them. Examples of data sharing range from bilateral communications with colleagues, to providing free, unrestricted access to anyone through, for example, a web-based platform.

Digital Research Data: The term digital data encompasses a wide variety of information stored in digital form including: experimental, observational, and simulation data; codes, software and algorithms; text; numeric information; images; video; audio; and associated metadata. It also encompasses information in a variety of different forms including raw, processed, and analyzed data, published and archived data.

Research Data: The recorded factual material commonly accepted in the scientific community as necessary to validate research findings, but not any of the following: preliminary analyses, drafts of scientific papers, plans for future research, peer reviews, or communications with colleagues. This 'recorded' material excludes physical objects (e.g., laboratory samples). Research data also do not include:

1. Trade secrets, commercial information, materials necessary to be held confidential by a researcher until they are published, or similar information which is protected under law; and

2. Personnel and medical information and similar information the disclosure of which would constitute a clearly unwarranted invasion of personal privacy, such as information that could be used to identify a particular person in a research study."

Validate: In the context of DMPs, validate means to support, corroborate, verify, or otherwise determine the legitimacy of the research findings. Validation of research findings could be accomplished by reproducing the original experiment or analyses; comparing and contrasting the results against those of a new experiment or analyses; or by some other means.

APPENDIX E – OPEN SOURCE SOFTWARE

Open Source Software Distribution Plan.

Applicants that are applying to one or more Topic Areas for which open source software distribution is required must submit a plan describing how software produced under this FOA will be distributed. For a DOE National Laboratory or a FFRDC, the data rights clause, including rights and requirements pertaining to computer software, in its Management and Operating (M&O) Contract shall apply and shall take precedence over any requirement set forth in this Appendix. The plan must include the following elements:

1. A complete description of any existing software that will be modified or incorporated into software produced under this FOA, including a description of the license rights. The license rights must allow the modified or incorporated software to be distributed as open source.

2. A discussion of the open source license that the applicant plans to use for the software it plans to produce under the FOA, and how that choice furthers the goals of this FOA. The discussion must also address how the license conforms to the conditions listed below.

3. A method for depositing the software in a source code repository.

4. A method for sharing and disseminating the software and other information to team members or others when multiple parties will contribute to the development of the software or the FOA requires that the software or other information be shared or disseminated to others.

Open Source Definition: Open source licenses must conform to all of the following conditions:

Free Redistribution
The license shall not restrict any party from selling or giving away the software as a component of an aggregate software distribution containing programs from several different sources. The license shall not require a royalty or other fee for such sale. The rights attached to the software must apply to all to whom the software is redistributed without the need for execution of an additional license by those parties.

Source Code
The program must include source code, and must allow distribution in source code as well as compiled form. Where some form of a product is not distributed with source code, there must be a well-publicized means of obtaining the source code for no more than a reasonable reproduction cost preferably, i.e., downloading via the Internet without charge. The source code must be the preferred form in which a programmer would modify the program.

Deliberately obfuscated source code and intermediate forms such as the output of a preprocessor or translator are not allowed.

Derived Works
The license must allow modifications and derived works, and permit the option of distributing the modifications and derived works under the same terms as the license of the original software.

Integrity of the Author's Source Code
The license may restrict source-code from being distributed in modified form only if the license allows the distribution of "patch files" with the source code for the purpose of modifying the program at build time. The license must explicitly permit distribution of software built from modified source code. The license may require derived works to carry a different name or version number from the original software.

No Restriction against Fields of Endeavor
The license must not restrict anyone from making use of the program in a specific field of endeavor. For example, it may not restrict the program from being used in a business, or from being used for genetic research.

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License Must Not Restrict Other Software
The license must not place restrictions on other software that is distributed along with the licensed software. For example, the license must not insist that all other programs distributed on the same medium must be open-source software.

Examples of Acceptable Licenses
Apache License, 2.0
http://www.apache.org/licenses

The 2.0 version of the Apache License was approved by the Apache Software Foundation (ASF) in 2004. The goals of this license revision were to reduce the number of frequently asked questions, to allow the license to be reusable without modification by any project (including non-ASF projects), to allow the license to be included by reference instead of listed in every file, to clarify the license on submission of contributions, to require a patent license on contributions that necessarily infringe the contributor's own patents, and to move comments regarding Apache and other inherited attribution notices to a location outside the license terms

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