

GRANT APPLICATION SUMMARY SHEET

Grant Name: Technology Integration Funding Opportunity Announcement 25-27

Department: NDOT

Grantor: U.S. DEPARTMENT OF ENERGY

Pass-Through Grantor (If applicable): TN TECHNOLOGICAL UNIVERSITY

Total Applied For: \$179,540.00

Metro Cash Match: \$500,000.00

Department Contact: Casey Hopkins
880-1676

Status: NEW

Program Description:

NDOT will be responsible for the purchasing of Electric Vehicles and EV Infrastructure.

Plan for continuation of services upon grant expiration:

Operational costs for the EV Infrastructure will be reviewed in future budgets.

APPROVED AS TO AVAILABILITY OF FUNDS:

APPROVED AS TO FORM AND LEGALITY:

Kevin Crumbo/mpw 4/29/2024 | 7:47 PM CDT
Director of Finance **Date**

Courtney Mohan 4/30/2024 | 10:06 AM CD
Metropolitan Attorney **Date**

APPROVED AS TO RISK AND INSURANCE:

Balogun Cobb 4/30/2024 | 8:25 AM CDT
Director of Risk Management Services **Date**

Freddie O'Connell:mpw@nashville.gov 4/30/2024 | 4:34 PM CDT
Metropolitan Mayor **Date**

(This application is contingent upon approval of the application by the Metropolitan Council.)

Grants Tracking Form

Part One

Pre-Application <input type="radio"/>		Application <input checked="" type="radio"/>		Award Acceptance <input type="radio"/>		Contract Amendment <input type="radio"/>	
Department	Dept. No.	Contact			Phone	Fax	
NDOT	42.00	Casey Hopkins			880-1676		
Grant Name:		Technology Integration Funding Opportunity Announcement 25-27					
Grantor:		U.S. DEPARTMENT OF ENERGY			Other:		
Grant Period From:		01/01/25	<small>(applications only)</small> Anticipated Application Date:		04/30/24		
Grant Period To:		12/31/27	<small>(applications only)</small> Application Deadline:		04/30/24		
Funding Type:		FED PASS THRU	Multi-Department Grant		<input type="checkbox"/> → If yes, list below.		
Pass-Thru:		TN TECHNOLOGICAL UNIVERSITY	Outside Consultant Project:		<input type="checkbox"/>		
Award Type:		COMPETITIVE	Total Award:		\$179,540.00		
Status:		NEW	Metro Cash Match:		\$500,000.00		
Metro Category:		New Initiative	Metro In-Kind Match:		\$0.00		
CFDA #		81.086	Is Council approval required?		<input checked="" type="checkbox"/>		
Project Description:		NDOT will be responsible for the purchasing of Electric Vehicles and EV Infrastructure.					
Plan for continuation of service after expiration of grant/Budgetary Impact:		Operational costs for the EV Infrastructure will be reviewed in future budgets.					
How is Match Determined?							
Fixed Amount of \$		\$500,000.00	or	% of Grant		Other: <input checked="" type="checkbox"/>	
Explanation for "Other" means of determining match:							
For this Metro FY, how much of the required local Metro cash match:							
Is already in department budget?		Yes		Fund	40024	Business Unit 42408024	
Is not budgeted?				Proposed Source of Match:		CSP FY24	
(Indicate Match Amount & Source for Remaining Grant Years in Budget Below)							
Other:							
Number of FTEs the grant will fund:		0.00		Actual number of positions added:		0.00	
Departmental Indirect Cost Rate		18.83%		Indirect Cost of Grant to Metro:		\$127,957.38	
*Indirect Costs allowed? <input type="radio"/> Yes <input checked="" type="radio"/> No		% Allow. 0.00%		Ind. Cost Requested from Grantor:		\$0.00 in budget	
<small>*(If "No", please attach documentation from the grantor that indirect costs are not allowable. See Instructions)</small>							
Draw down allowable? <input type="checkbox"/>							
Metro or Community-based Partners:							
This is a grant project lead by Tennessee Technological University. Project partners include: TTU, East Tennessee Clean Fuels Coalition, Oak Ridge National laboratory, NDOT and City of Chattanooga							

Part Two

Grant Budget										
Budget Year	Metro Fiscal Year	Federal Grantor	State Grantor	Other Grantor	Local Match Cash	Match Source (Fund, BU)	Local Match In-Kind	Total Grant Each Year	Indirect Cost to Metro	Ind. Cost Neg. from Grantor
Yr 1	FY25	\$137,540.00	\$0.00	\$0.00	\$250,000.00	42408024, 40024	\$0.00	\$387,540.00	\$72,973.78	\$0.00
Yr 2	FY26	\$42,000.00	\$0.00	\$0.00	\$250,000.00	42408024, 40024	\$0.00	\$292,000.00	\$54,983.60	\$0.00
Yr 3	FY27	\$0.00	\$0.00	\$0.00	\$0.00	N/A	\$0.00	\$0.00	\$0.00	\$0.00
Yr 4	FY__									
Yr 5	FY__									
Total		\$179,540.00	\$0.00	\$0.00	\$500,000.00	42408024, 40024	\$0.00	\$679,540.00	\$127,957.38	\$0.00
Date Awarded:			Tot. Awarded:			Contract#:				
(or) Date Denied:			Reason:							
(or) Date Withdrawn:			Reason:							

Contact: juanita.paulsen@nashville.gov
vaughn.wilson@nashville.gov



**U.S. Department of Energy (DOE)
Office of Energy Efficiency and Renewable Energy (EERE)**

**Fiscal Year 2024 Vehicle Technologies Office (VTO) Technology
Integration (TI) Funding Opportunity Announcement**

Funding Opportunity Announcement (FOA) Number: DE-FOA-0003250

FOA Type: Initial

Assistance Listing Number: 81.086

FOA Issue Date:	2/12/2024
Submission Deadline for Concept Papers:	3/12/2024 5:00 p.m. ET
Anticipated Date for Concept Paper Notifications	4/2/2024
Submission Deadline for Full Applications:	4/30/2024 5:00 p.m. ET
Expected Date for EERE Selection Notifications:	8/5/2024
Expected Timeframe for Award Negotiations:	August-November 2024

- Applicants must submit a Letter of Intent and a Concept Paper by 5:00 p.m. ET on 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.
- **Unique Entity Identifier (UEI) and System for Award Management (SAM)** - Each applicant (unless the applicant is excepted from those requirements under 2 CFR 25.110) is required to: (1) register in the SAM at <https://www.sam.gov> before submitting an application; (2) provide a valid UEI number in the application; and (3) maintain an active SAM registration with current information when the applicant 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 UEI and SAM requirements and, if an applicant has not fully



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complied with the requirements by the time DOE is ready to make a federal award, DOE will 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.

NOTE: Due to the high number of UEI requests and SAM registrations, entity legal business name and address validations are taking longer than expected to process. Entities should start the UEI and SAM registration process as soon as possible. If entities have technical difficulties with the UEI validation or SAM registration process they should use the [HELP](#) feature on [SAM.gov](#). SAM.gov will address service tickets in the order in which they are received and asks that entities not create multiple service tickets for the same request or technical issue. Additional entity validation resources can be found here: [GSAFSD Tier 0 Knowledge Base - Validating your Entity](#).

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Questions about this FOA? Email DE-FOA-0003250@netl.doe.gov.
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I. Funding Opportunity Description

A. Background and Context

i. Background and Purpose

Building a clean and equitable energy economy and addressing the climate crisis is a top priority of the Biden Administration. This FOA will advance the Biden Administration's goals to achieve carbon pollution-free electricity by 2035 and to "deliver an equitable, clean energy future, and put the United States on a path to achieve net-zero emissions, economy-wide, by no later than 2050"¹ to the benefit of all Americans. The Department of Energy is committed to pushing the frontiers of science and engineering, catalyzing clean energy jobs through research, development, demonstration, and deployment (RDD&D), and ensuring environmental justice and inclusion of underserved communities.

This FOA supports the administration goals laid out above by awarding funding to projects across the country that advance deployment of efficient and sustainable transportation technologies. Transportation is the largest source of greenhouse gas emissions in the United States, accounting for 33% of national emissions in 2021.² Achieving the Biden Administration's goals of net-zero emissions by 2050 will require dramatic energy efficiency and emissions improvements in vehicles and the overall transportation system.

The deployment and demonstration activities to be funded under this FOA will support the government-wide approach to the climate crisis by driving the innovation that can lead to the deployment of clean energy technologies, which are critical for climate protection. Specifically, this FOA will advance decarbonization of the transportation sector by funding innovative approaches to address pressing transportation efficiency and equity needs. Where possible, applicants are encouraged to align proposed project activities with the [U.S. National Blueprint for Transportation Decarbonization | US Department of Transportation](#).

About the Vehicle Technologies Office

The Vehicle Technologies Office (VTO) will play a leading role in decarbonizing the transportation sector and address the climate crisis by driving innovation and deploying clean transportation technologies, all while maintaining transportation service quality and safety. VTO funds research, development, demonstration,

¹ Executive Order 14008, "Tackling the Climate Crisis at Home and Abroad," January 27, 2021.

² Based on 2022 EPA data, dated May 30, 2023.

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and deployment (RDD&D) of new, efficient, and clean mobility options that are affordable for all Americans. VTO leverages the unique capabilities and world-class expertise of the National Laboratory system to develop new innovations in vehicle technologies, including: advanced battery technologies; advanced materials for lighter-weight vehicle structures and better powertrains; energy-efficient mobility technologies (including automated and connected vehicles as well as innovations in efficiency-enhancing connected infrastructure); innovative powertrains to reduce greenhouse gas and criteria emissions from hard to decarbonize off-road, maritime, rail, and aviation sectors; and technology integration that helps demonstrate and deploy new technology at the community level. Across these technology areas and in partnership with industry, VTO has established aggressive technology targets to focus RDD&D efforts and ensure there are pathways for technology transfer of federally-supported innovations into commercial application.

About the Technology Integration Program

VTO's Technology Integration Program supports a broad technology portfolio that includes alternative fuels, energy efficient mobility systems and technologies, and other efficient advanced technologies that can reduce transportation energy costs for businesses and consumers. The program provides objective, unbiased data and real-world lessons learned to inform future research needs and support local decision making. It also includes projects to disseminate data, information, and insight, as well as online tools and technical assistance to cities, towns, and rural areas working to implement community-driven solutions based on local needs, opportunities, and markets.

Justice40 Goals

Activities funded under this FOA will support the federal Justice40 Initiative (Justice40). As described on DOE's Justice40 Initiative website <https://www.energy.gov/justice/justice40-initiative>, Justice40 directs that 40% of benefits from Covered Programs flow to "disadvantaged communities." OMB's Interim Implementation Guidance defines a *community* as either: (1) **Geographic**: a group of individuals living in geographic proximity (such as census tract), or (2) **Common condition**: a geographically dispersed set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions. For the "geographic" definition of community, pursuant to the Interim Implementation Guidance and OMB guidance [M-23-09](#), DOE recognizes as disadvantaged those census tracts identified by the White House Climate and Economic Justice Screening Tool (CEJST), which is located at <https://screeningtool.geoplatform.gov/>. For the "common condition" definition of community, federally recognized tribal lands

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and U.S. territories are categorized as disadvantaged in accordance with OMB's Interim Implementation Guidance.

Benefits to disadvantaged communities include (but are not limited to) measurable direct or indirect investments or positive project outcomes that achieve or contribute to the following in DACs: (1) a decrease in energy burden; (2) a decrease in environmental exposure and burdens; (3) an increase in access to low-cost capital; (4) an increase in high-quality job creation, the clean energy job pipeline, and job training for individuals; (5) increases in clean energy enterprise creation and contracting (e.g., minority-owned or disadvantaged business enterprises); (6) increases in energy democracy, including community ownership; (7) increased parity in clean energy technology access and adoption; and (8) an increase in energy resilience.

ii. Technology Space and Strategic Goals

This FOA seeks applications to address outreach, education, technical assistance, workforce training, and other innovative demonstration or deployment projects that advance the mission of an affordable, equitable, and decarbonized transportation system. Detailed technical descriptions of the specific Areas of Interest are provided in the sections that follow.

iii. Teaming Partner List

DOE is compiling a Teaming Partner List to facilitate the formation of project teams for this FOA. The Teaming Partner List allows organizations that may wish to participate on a project to express their interest to other applicants and explore potential partnerships.

The Teaming Partner List will be available on EERE eXCHANGE and will be regularly updated to reflect new teaming partners who provide their organization's information.

SUBMISSION INSTRUCTIONS: View the Teaming Partner List by visiting the EERE eXCHANGE homepage and clicking on "Teaming Partners" within the left-hand navigation pane. This page allows users to view published Teaming Partner Lists. To join the Teaming Partner List, submit a request within eXCHANGE. Select the appropriate Teaming Partner List from the drop-down menu and fill in the following information: Investigator Name, Organization Name, Organization Type, Topic Area of Interest, Background and Capabilities, Website, Contact Address, Contact Email, and Contact Phone.

DISCLAIMER: By submitting a request to be included on the Teaming Partner List, the requesting organization consents to the publication of the above-referenced information. By facilitating the Teaming Partner List, DOE is not endorsing,

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sponsoring, or otherwise evaluating the qualifications of the individuals and organizations that are identifying themselves for placement on this Teaming Partner List. DOE will not pay for the provision of any information, nor will it compensate any applicants or requesting organizations for the development of such information.

B. Topic Areas of Interest

Topic Area of Interest	Topic Area of Interest Title
1	Clean Cities Outreach, Engagement, and Technical Assistance
2	Training on Zero Emission Vehicle and Infrastructure Technologies for Critical Emergency Response Workers
3	Clean Transportation Demonstration and Deployment

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Area of Interest 1: Clean Cities Outreach, Engagement, and Technical Assistance

Introduction

In partnership with DOE, Clean Cities coalitions work locally in urban, suburban, and rural communities to advance the affordable, convenient, and energy efficient movement of people and goods. The Clean Cities mission is to advance the nation's environment, energy security and economic prosperity through collaboration with communities by building partnerships with public and private stakeholders that create equitable deployment of clean transportation solutions for all. The Clean Cities vision is a decarbonized transportation future for all communities. Clean Cities coalitions pursue this mission and vision through the following goals:

- Goal 1. Develop and maintain relationships with stakeholders to accelerate transportation decarbonization through outreach and engagement activities;
- Goal 2. Provide stakeholders targeted technical assistance and training leveraging DOE resources to advance transportation decarbonization; and
- Goal 3. Facilitate transportation decarbonization through vehicle and infrastructure planning, barrier reduction, and deployment.

Objective

The objective is to fund projects that strengthen Clean Cities coalitions' ability to achieve the Clean Cities mission, vision, and goals, by enabling coalitions to undertake high-impact activities. Project activities must emphasize bringing zero emission vehicles and infrastructure to local communities in alignment with the U.S. National Blueprint for Transportation Decarbonization. Successful applications should demonstrate significant impact on transportation emissions reduction.

Requirements

Project approach **must** include coalition outreach, engagement, and technical assistance with stakeholders in at least one of the following priority focus areas:

1. Medium- and heavy-duty vehicle fleet stakeholders;
2. Non-road transportation stakeholders in the off-road, rail, marine, aviation, and port sectors;
3. Underserved communities pertaining to local transportation and energy priorities rooted in pillars of energy and environmental justice (EEJ);
4. Tribal communities pertaining to tribal transportation and energy priorities rooted in best practices for Tribal collaboration;
5. Electric utilities and utility regulators to advance transportation electrification; or
6. Authorities having jurisdiction (AHJ) to develop plans leading to infrastructure deployment and address barriers to transportation electrification and such as codes, permitting, and other local policies;

Project approach may include:

1. Planning activities to advance transportation decarbonization on a regional or state level such as infrastructure, workforce, or resiliency planning.

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2. Implementation of a green fleet recognition or certification program;
3. Organization and facilitation of technical training and/or technical education sessions regarding alternative fuel vehicles, their appropriate use, infrastructure, and safety issues; and
4. Collaboration with DOE national laboratories.

Clean Cities technical assistance activities include but are not limited to:

- **Technical Analysis:** Using tools, resources, self-assessment toolkits, etc. to help fleets, potential end-users, and/or decision makers understand alternative fuel transportation choices; conducting fleet emissions analysis.
- **Financial Analysis:** Provide assistance with total cost of ownership analysis; understanding financial resources such as grants, loans, and incentives; and conducting economic or market analysis.
- **Program Assistance:** Share program best practices, lessons learned, and recommendations; provide project or program design input.
- **Policy & Planning Assistance:** Provide consultation for strategic planning processes such as state, municipal, and utility decisions; review draft policies; advise on best practices for codes and permitting.

Acceptable project costs for these activities include, but are not limited to: staff time, vendor costs, supplies, event space rental, training materials, hiring experienced individuals/trainers, travel costs, and other relevant, allowable, reasonable, and applicable costs.

Applications must include metrics for tracking coalition impact related to the Clean Cities mission and vision as well as Justice40 metrics. Example metrics include:

Priority Focus Areas Metrics

Quantity of Stakeholders or Communities Targeted for Coalition Outreach, Engagement, and Technical Assistance Activities		
Priority Focus Area	Total Quantity	Minimum Quantity Representing a Disadvantaged Community (DAC)
Medium Duty (MD)/Heavy Duty (HD) fleets		
Non-road transportation stakeholders in the off-road, rail, marine, aviation, and port sectors		
Underserved communities (not including tribes)		
Tribal communities		
Electric utilities and utility regulators		
AHJs		

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Special Requirements

1. Applications must allocate at least 75% of the total project budget to DOE-designated Clean Cities coalitions or their host organizations; and
2. Applicants must provide table(s) describing planned performance metrics.

Teaming Arrangements

1. Project teams **must** include at least two DOE-designated Clean Cities coalition (<https://cleancities.energy.gov/coalitions/>); and
2. Project teams involving multiple Clean Cities coalitions forming statewide partnerships, regional partnerships, or other strategic collaborations of Clean Cities coalitions are **encouraged**. However, applicants should ensure each participating Clean Cities coalition has adequate project budget plan, execute, and sustain the proposed activities and staffing levels.

Special Deliverables

Recipients **are required to** provide supplemental quarterly reporting data needed to calculate Justice40 Initiative metrics measuring the benefits that flow to disadvantaged communities. DOE will provide a reporting template to project awardees. Please see Appendix E for a list of examples Justice40 metrics related to the Areas of Interest described in this announcement.

Applications Discouraged

Projects that focus efforts on development of tools/resources that duplicate resources already available from DOE and/or DOE labs are not acceptable for this Area of Interest.

Area of Interest 2: Training on Zero Emission Vehicle and Infrastructure Technologies for Critical Emergency Response Workers**Introduction**

Zero emission vehicles and associated infrastructure deployments are expanding nationwide, with millions of vehicles now in operation in communities large and small. Considerable past work has been done to develop comprehensive training materials to educate local first, second, and third responders on proper procedures for responding to emergency situations involving zero emission vehicles and infrastructure. However, the reach of these materials is limited and often localized at a time when the need for trained responders is increasing. Opportunities exist for leveraging new opportunities for virtual and in-person training sessions to reach critical audiences with valuable interactive training material and development of collaborative plans to mitigate and respond to risk.

Objective

The objective of this area of interest is to provide risk mitigation, training, and education of first responders and emergency response professionals to address situations involving zero emission vehicles and infrastructure technologies.

This area of interest targets the development of local, state, regional, or national outreach, awareness, and partnership building efforts. Existing training materials, curricula, websites, online tools, and other relevant information resources previously developed in cooperation with EERE or accepted by EERE should be leveraged to the maximum extent possible. Projects can develop training in areas where gaps exist in current training curricula, including adapting curricula to fit other related stakeholder groups such as, but not limited to, fire marshals, emergency/disaster planners, homeland security offices, departments of transportation, and insurance companies. Projects must approach development and dissemination strategically by involving multiple stakeholder groups that have the expertise and authority to recommend parameter/codes for infrastructure (i.e., suggesting optimized Electric Vehicle (EV) charging in parking garages with risk mitigation); immediate emergency response techniques; make-safe and towing best practices; and development and/or deployment of local/regional stranded energy management plans.

Projects are encouraged to provide in-person training workshops or build partnerships to incorporate existing online training materials into training programs and encourage widespread reach of these training sessions. Projects addressing communities that are among the top zero emission vehicle markets in the United States are highly encouraged.

Requirements

1. A description of the specific audiences (e.g., firefighters, tow-truck drivers, fire marshals etc.), regions (e.g., regional, national, corridors etc.), and technologies (e.g., light-duty electric vehicles, DC fast charging stations, etc.) to be targeted by the project. This

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includes how related stakeholder groups will be enabled to comment and inform the project.

2. A description of the project area's status related to zero emission emergency prevention, emergency response, and stranded energy management.
3. A description of project partners, including critical partners such as Clean Cities coalitions and educational/training organizations. Partners shall have defined roles in the project that will generate expertly planned responses with widespread coordination ranging from preventative measures to stranded-energy storage and disposition.
4. Intended training outcomes, including specifics on the number and type of audiences to be reached and level of expertise to be achieved through training.
5. A description of existing information resources to be used in the project.
6. A description of any training materials to be developed to address gaps, with specific information on why new materials are being developed.
7. A plan for project activities that establishes the steps to be undertaken to complete project objectives and identifies resources to be used to achieve objectives (e.g., training facilities, subject matter expertise, etc.).
8. A plan for replicability and continuation of the training and education activities upon the completion of the project, including what information will be publicly available at the conclusion of the project.

Projects are encouraged to develop a website to host public resources, recommendations, curricula, and other products that are free for the public.

VTO highly encourages project teams that include the following partners:

- Government Offices responsible for maintaining emergency response policies and procedures (i.e., state fire marshal offices).
- Entities responsible for disaster and emergency response and/or planning.
- One or more Clean Cities coalitions
(<https://cleancities.energy.gov/coalitions/locations/>).
- Educational/training institutions with specific expertise in developing and delivering online and/or in-person training curricula.

Special Deliverables

Recipients must provide supplemental quarterly reporting data needed to calculate Justice40 Initiative metrics measuring the benefits that flow to disadvantaged communities. DOE will provide a reporting template to project awardees. Please see Appendix E for a list of examples Justice40 metrics related to the Areas of Interest described in this announcement.

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Applications Discouraged

Applications that include the following are highly discouraged:

- Training that promotes one specific brand or product.
- Only academic studies of curricula gaps and plans for future training.
- Curricula that will be solely proprietary at the conclusion of the project.

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Area of Interest 3: Clean Transportation Demonstration and Deployment

Introduction

The Technology Integration Program and its Clean Cities coalition partners have a broad portfolio of potential technology options with the opportunity to address pressing transportation efficiency and equity needs.

Objective

The objective of this area of interest is to explore novel solutions to transportation and related clean energy challenges through small-scale demonstration and deployment projects not otherwise addressed in this FOA. This could include projects to address challenges unique to their geographic areas and solutions with potential for replication in other areas across the country, or other ways to accelerate clean transportation deployment. DOE encourages projects with the largest potential impact on transportation emissions reduction. Projects of interest include but are not limited to:

1. Projects with innovative approaches to decarbonize transportation;
2. Projects that address mobility needs of local underserved regions or populations;
3. Projects that focus on the advancement of zero-emissions medium-duty and heavy-duty vehicle technologies;
4. Projects that implement transportation fuels, vehicles, systems, and technologies that have positive impact on greenhouse gas emissions, such as those that implement renewable fuels and renewable energy sources (ex: solar/wind power) into transportation systems;
5. Projects that implement advanced technologies or alternative fuels in off-road, marine, rail, and other non-road applications. For example, ships and rail projects can have very high GGE reduction per vehicle by adopting alternative fuels, renewable blends and/or advanced technologies those which develop roadmaps for decarbonization in local Clean Cities regions;
6. Projects that focus on transitioning high-impact heavy-duty fleets to new fuels and technologies that reduce petroleum consumption and greenhouse gas and criteria emissions;
7. Projects which improve transportation affordability and reduce emissions by accelerating or enabling widespread access to affordable alternative and renewable fuels; and
8. Projects that holistically drive adoption of clean energy technologies across jurisdictions.

Requirements

1. Identify the specific challenge to be addressed and the target audience for the technical solution to be implemented;
2. Identify specific technologies, approaches, or activities that align with the Area of Interest objectives described above;

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3. Define project team roles and responsibilities as well as funding for specific tasks that Clean Cities coalitions and partners will undertake; and
4. Address replicability through a project structure that produces results and insights useful to others across the country; project teams must provide for public release a final technical report that documents project information, analyses, and insights.

Special Deliverable

Recipients **must** provide supplemental quarterly reporting data needed to calculate Justice40 Initiative metrics measuring the benefits that flow to disadvantaged communities. DOE will provide a reporting template to project awardees. Please see Appendix E for a list of examples Justice40 metrics related to the Areas of Interest described in this announcement.

Teaming Arrangements

The project team **must** include at least one active and DOE designated Clean Cities coalition with a significant role (at least 10% of the Federal portion of the project budget). A list of active coalitions can be found at: <https://cleancities.energy.gov/coalitions/locations/>.

VTO highly encourages project teams and strategic partners such as the following:

1. Clean Cities Coalitions;
2. Consortia comprised of multiple Clean Cities coalitions (<https://cleancities.energy.gov/coalitions/locations/>);
3. Local/regional/state governments;
4. Metropolitan planning organizations;
5. Community-based organizations that focus on the needs and perspectives of underserved communities;
6. Transit;
7. Transportation network providers;
8. Vehicle, fuel, energy, and infrastructure providers;
9. Utility companies; and
10. Fleets and other end-user groups.

Applications Discouraged

Applications that include the following are highly discouraged:

1. Promotion of a specific brand, product, or invention;
2. Inclusion of novelty vehicles and recreational or sport vehicles;
3. Subsidies for fuel cost;
4. Rebates or tax incentives; and
5. Purchase of land.

All work under EERE funding agreements must be performed in the United States. See Section IV.I.iii. and Appendix C.

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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 Sections I.A. and I.B. of the FOA.
- Applications for proposed technologies that are not based on sound scientific principles (e.g., violates the laws of thermodynamics).
- AOI 1
 - Applications that do not allocate at least 75% of the project budget to DOE-designated Clean Cities coalitions or their host organizations.
 - Project teams that do not include at least two DOE-designated Clean Cities coalition.
 - Projects that include demonstration of any pre-commercial technology or deployment of any vehicles or fueling infrastructure.
- AOI 3
 - Project teams that do not include at least one active and DOE designated Clean Cities coalition with a significant role (at least 10% of the Federal portion of the project budget).
 - Projects in the research and development phase (not yet available for demonstration and/or deployment).

D. Diversity, Equity, and Inclusion

It is the policy of the Biden Administration that:

The Federal Government should pursue a comprehensive approach to advancing equity³ for all, including people of color and others who have been historically underserved, marginalized, and adversely affected by persistent poverty and inequality. Affirmatively advancing equity, civil rights, racial justice, and equal opportunity is the responsibility of the whole of our government. Because advancing equity requires a systematic approach to embedding fairness in decision-making processes, executive departments, and agencies (agencies) must recognize and work to redress inequities in their policies and programs that serve as barriers to equal opportunity.

³ The term “equity” means the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment, such as Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality.

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By advancing equity across the Federal Government, we can create opportunities for the improvement of communities that have been historically underserved, which benefits everyone.⁴

As part of this whole of government approach, this FOA seeks to encourage the participation of underserved communities⁵ and underrepresented groups. Applicants are highly encouraged to include individuals from groups historically underrepresented^{6,7} in STEM on their project teams. As part of the application, applicants are required to describe how diversity, equity, and inclusion objectives will be incorporated in the project. Specifically, applicants are required to submit a Diversity, Equity, and Inclusion Plan that describes the actions the applicant will take to foster a welcoming and inclusive environment, support people from underrepresented groups in STEM, advance equity, and encourage the inclusion of individuals from these groups in the project; and the extent the project activities will be located in or benefit underserved communities. [See Section IV.D.vii.]. The plan should include at least one SMART (Specific, Measurable, Assignable, Realistic and Time-Related) milestone per budget period supported by metrics to measure the

⁴ Executive Order 13985, “Advancing Racial Equity and Support for Underserved Communities Through the Federal Government” (Jan. 20, 2021).

⁵ The term “underserved communities” refers to populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life, as exemplified by the list of in the definition of “equity.” E.O. 13985. For purposes of this FOA, as applicable to geographic communities, applicants can refer to economically distressed communities identified by the Internal Revenue Service as Qualified Opportunity Zones; communities identified as disadvantaged or underserved communities by their respective States; communities identified on the Index of Deep Disadvantage referenced at <https://news.umich.edu/new-index-ranks-americas-100-most-disadvantaged-communities/>, and communities that otherwise meet the definition of “underserved communities” stated above.

⁶ According to the National Science Foundation’s 2019 report titled, “Women, Minorities and Persons with Disabilities in Science and Engineering”, women, persons with disabilities, and underrepresented minority groups—blacks or African Americans, Hispanics or Latinos, and American Indians or Alaska Natives—are vastly underrepresented in the STEM (science, technology, engineering and math) fields that drive the energy sector. That is, their representation in STEM education and STEM employment is smaller than their representation in the U.S. population. <https://nces.nsf.gov/pubs/nsf19304/digest/about-this-report> For example, in the U.S., Hispanics, African Americans and American Indians or Alaska Natives make up 24 percent of the overall workforce, yet only account for 9 percent of the country’s science and engineering workforce. DOE seeks to inspire underrepresented Americans to pursue careers in energy and support their advancement into leadership positions. <https://www.energy.gov/articles/introducing-minorities-energy-initiative>

⁷ See also. Note that Congress recognized in section 305 of the American Innovation and Competitiveness Act of 2017, Public Law 114-329:

(1) [I]t is critical to our Nation’s economic leadership and global competitiveness that the United States educate, train, and retain more scientists, engineers, and computer scientists; (2) there is currently a disconnect between the availability of and growing demand for STEM-skilled workers; (3) historically, underrepresented populations are the largest untapped STEM talent pools in the United States; and (4) given the shifting demographic landscape, the United States should encourage full participation of individuals from underrepresented populations in STEM fields.

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success of the proposed actions. This plan will be evaluated as part of the technical review process.

Further, Minority Serving Institutions⁸, Minority Business Enterprises, Minority Owned Businesses, Woman Owned Businesses, Veteran Owned Businesses, or entities located in an underserved community that meet the eligibility requirements (See Section III.) are encouraged to apply as the prime applicant or participate on an application as a proposed partner to the prime applicant. The Selection Official may consider the inclusion of these types of entities as part of the selection decision

E. Authorizing Statutes

The programmatic authorizing statute are Public Law (P.L.) 102-486, Energy Policy Act (EPAAct) of 1992, as amended by P.L. 109-58, EPAAct 2005, Section 911, as amended (codified at 42 U.S.C. § 16191) and Sections 801 and 805, as amended (codified at 42 U.S.C. § 16154), and P.L. 110-140. Additional citations for these authorities include the following:

- Title VII, Subtitles B, C, D of EPACT 2005 (42 U.S.C. §§ 16061-16093)

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

i. Estimated Funding

EERE expects to make a total of approximately \$15,000,000 of federal funding available for new awards under this FOA, subject to the availability of appropriated funds. EERE anticipates making approximately 12-18 awards under this FOA. EERE may issue one, multiple, or no awards. Individual awards may vary between \$500,000 and \$2,500,000.

EERE may issue awards in one, multiple, or none of the following Areas of Interest:

⁸ Minority Serving Institutions (MSIs), including Historically Black Colleges and Universities/Other Minority Institutions as educational entities recognized by the Office of Civil Rights (OCR), U.S. Department of Education, and identified on the OCR's Department of Education U.S. accredited postsecondary minorities' institution list. See <https://www2.ed.gov/about/offices/list/ocr/edlite-minorityinst.html>.

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Area of Interest Number	Area of Interest Title	Anticipated Number of Awards	Anticipated Minimum Award Size for Any One Individual Award (Fed Share)	Anticipated Maximum Award Size for Any One Individual Award (Fed Share)	Approximate Total Federal Funding Available for All Awards	Anticipated Period of Performance (months)
1	Clean Cities Outreach, Engagement, and Technical Assistance	5	\$1,000,000	\$1,000,000	\$5,000,000	24-36
2	Training on Zero Emission Vehicle and Infrastructure Technologies for Critical Emergency Response Workers	2-3	\$1,600,000	\$2,500,000	\$5,000,000	24-36
3	Clean Transportation Demonstration and Deployment	5-10	\$500,000	\$1,000,000	\$5,000,000	24-36

ii. Period of Performance

EERE anticipates making awards that will run from 24 up to 36 months, comprised of a single budget period.

iii. 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 U.S. government.

i. 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.

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

ii. Funding Agreements with Federally Funded Research and Development Center (FFRDCs)⁹

In most cases, FFRDCs are funded independently of the remainder of the project team. The FFRDC then executes an agreement with any non-FFRDC project team members to arrange work structure, project execution, and any other matters. Regardless of these arrangements, the entity that applied as the prime recipient for the project will remain the prime recipient for the project. See Section III.E.

iii. Grants

Although EERE has the authority to provide financial support to prime recipients through grants, EERE generally does not fund projects through grants. EERE may fund a limited number of projects through grants, as appropriate.

III. Eligibility Information

To be considered for substantive evaluation, an applicant's submission must meet the criteria set forth below. If the application does not meet these eligibility requirements, it will be considered ineligible and removed from further evaluation.

The National Energy Technology Laboratory is ineligible to apply to this FOA due to its role in creating the announcement.

A. Eligible Applicants

i. Domestic Entities

The proposed prime recipient and subrecipient(s) must be domestic entities. The following types of domestic entities are eligible to participate as a prime recipient or subrecipient of this FOA:

1. Institutions of higher education;
2. For-profit entities;
3. Nonprofit entities; and
4. State and local governmental entities and federally recognized Indian Tribes (Indian Tribes).

⁹ FFRDCs are public-private partnerships that conduct research for the U.S. government. A listing of FFRDCs can be found at <http://www.nsf.gov/statistics/ffrdclist/>.

To qualify as a domestic entity, the entity must be organized, chartered, or incorporated (or otherwise formed) under the laws of a particular state or territory of the United States; have majority domestic ownership and control; and have a physical place of business in the United States.

DOE/NNSA 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 participate as a subrecipient but are not eligible to apply as a prime recipient.

Federal agencies and instrumentalities (other than DOE) are eligible to participate as a subrecipient but are not eligible to apply as a prime recipient.

Entities banned from doing business with the U.S. government such as entities debarred, suspended, or otherwise excluded from or ineligible for participating in federal programs are not eligible.

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.

ii. **Foreign Entities**

In limited circumstances, EERE may approve a waiver to allow a foreign entity to participate as a prime recipient or subrecipient. A foreign entity may submit a Full Application to this FOA, but the Full Application must be accompanied by an explicit written waiver request. Likewise, if the applicant seeks to include a foreign entity as a subrecipient, the applicant must submit a separate explicit written waiver request in the Full Application for each proposed foreign subrecipient.

Appendix C lists the information that must be included in a foreign entity waiver request. The applicant does not have the right to appeal EERE's decision concerning a waiver request.

B. Cost Sharing

Applicants are bound by the cost share proposed in their Full Applications if selected for award negotiations.

Area of Interest (AOI) Number	Area of Interest (AOI) Title	Recipient Cost Share (%)
1	Clean Cities Outreach, Education and Technical Assistance	0
2	Training on Zero Emission Vehicle and Infrastructure Technologies for Critical Emergency Response Workers	0
3	Clean Transportation Demonstration and Deployment	50

To help applicants calculate proper cost share amounts, EERE has included a cost share information sheet and sample cost share calculation as Appendices A and B to this FOA.

i. Legal Responsibility

Although the cost share requirement applies to the entire project, 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. 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.

ii. 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 entire project is met.

iii. Cost Share Types and Allowability

Every cost share contribution must be allowable under the applicable federal cost principles, as described in Section III.B.iii of the FOA. In addition, cost share must be verifiable upon submission of the Full Application. Cost share may be provided in the form of cash or cash equivalents, or in-kind contributions. Cost share must come from non-federal sources (unless otherwise allowed by law), such as project participants, state or local governments, or other third-party financing. Federal financing, such as DOE Loan Guarantee, cannot be leveraged

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by applicants to provide the required cost share or otherwise support the same scope that is proposed under a project.

Cost share may be provided by the prime recipient, subrecipients, or third parties (entities that do not have a role in performing the scope of work). Vendors/contractors may not provide cost share. Any partial donation of goods or services is considered a discount and is not allowable.

Cash contributions include but are not limited to personnel costs, fringe costs, supply and equipment costs, indirect costs, and other direct costs.

In-kind contributions are those where a value of the contribution can be readily determined, verified, and justified but where no actual cash is transacted in securing the good or service comprising the contribution. Allowable in-kind contributions include but are not limited to the donation of volunteer time or the donation of space or use of equipment.

Project teams may use funding or property received from state or local governments to meet the cost share requirement, so long as the federal government did not provide the funding to the state or local government.

The recipient may not use the following sources to meet its cost share obligations:

- 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.

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Applicants are encouraged to refer to 2 CFR 200.306 as amended by 2 CFR 910.130 for additional cost sharing requirements

iv. 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.

v. 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.

vi. Cost Share Payment

DOE requires prime recipients to contribute the cost share amount incrementally over the life of the award. Specifically, the prime recipient's cost share for each billing period must always reflect the overall cost share ratio negotiated by the parties (i.e., the total amount of cost sharing on each invoice when considered cumulatively with previous invoices must reflect, at a minimum, the cost sharing percentage negotiated). As FFRDC funding will be provided directly to the FFRDC(s) by DOE, prime recipients will be required to provide project cost share at a percentage commensurate with the FFRDC costs, on a budget period basis, resulting in a higher interim invoicing cost share ratio than the total award ratio.

In limited circumstances, and where it is in the government's interest, the Contracting Officer may approve a request by the prime recipient to meet its cost share requirements on a less frequent basis, such as monthly or quarterly. Regardless of the interval requested, the prime recipient must be up to date on cost share at each interval. Such requests must be sent to the Contracting Officer during award negotiations and include the following information: (1) a detailed justification for the request; (2) a proposed schedule of payments, including amounts and dates; (3) a written commitment to meet that schedule; and (4) such evidence as necessary to demonstrate that the prime recipient has complied with its cost share obligations to date. The Contracting Officer must approve all such requests before they go into effect.

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C. Compliance Criteria

All applicant submissions must:

- Comply with the applicable content and form requirements listed in Section IV. of the FOA;
- Include all required documents;
- Be uploaded and submitted to EERE eXCHANGE <https://eere-eXCHANGE.energy.gov>; and
- Be submitted by the deadline stated in the FOA.

EERE will not review or consider submissions submitted through means other than EERE eXCHANGE, submissions submitted after the applicable deadline, or incomplete submissions.

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 before the submission deadline), applicants should allow at least one hour to submit a Concept Paper or a Full Application. Once the Concept Paper or Full Application is submitted in EERE eXCHANGE, applicants may revise or update that submission until the expiration of the applicable deadline. If changes are made to any of these documents, the applicant must resubmit the Concept Paper or Full Application before the applicable deadline. EERE will not extend the submission deadline for applicants that fail to submit required information by the applicable deadline due to server/connection congestion.

D. Responsiveness Criteria

All “Applications Specifically Not of Interest,” as described in Section I.C. of the FOA, are deemed nonresponsive and are not reviewed or considered.

E. Other Eligibility Requirements

i. Requirements for DOE/NNSA and Non-DOE/NNSA FFRDCs 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.

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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. Funding, Cost Share, and Subaward with FFRDCs

The value of and funding for the FFRDC portion of the work will not normally be included in the award. DOE/NNSA FFRDCs participating as a subrecipient on a project will be funded directly through the DOE field work proposal (WP) process. Non-DOE/NNSA FFRDCs participating as a subrecipient will be funded through an interagency agreement with the sponsoring agency. Although the FFRDC portion of the work is excluded from the award, the applicant's cost share requirement will be based on the total cost of the project, including the applicant's, the subrecipient's, and the FFRDC's portions of the project.

Unless instructed otherwise by the DOE Contracting Officer for the DOE award, all FFRDCs are required to enter into a Cooperative Research and Development Agreement¹⁰ (CRADA) or, if the role of the DOE/NNSA FFRDC is limited to technical assistance and intellectual property is not anticipated to be generated from the DOE/NNSA FFRDC's work, a Technical Assistance Agreement (TAA), with at least the prime recipient before any project work begins. Any questions regarding the use of a CRADA or TAA should be directed to the cognizant DOE field intellectual property (IP) counsel.

The CRADA or TAA is used to ensure accountability for project work and provide the appropriate management of IP, e.g., data protection and background IP. The CRADA or TAA must be agreed upon by all parties and submitted to DOE or other sponsoring agency, when applicable, for approval, or submitted to DOE for notice under the Master Scope of Work process,

¹⁰ A cooperative research and development agreement is a contractual agreement between a national laboratory contractor and a private company or university to work together on research and development. For more information, see <https://www.energy.gov/gc/downloads/doe-cooperative-research-and-development-agreements>.

when applicable, using any DOE or other sponsoring agency approved CRADA or TAA template without substantive changes by the time the award is made to the prime recipient.

d. 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.

e. Limit on FFRDC Effort

Area of Interest (AOI) Number	Area of Interest (AOI) Title	Limit on FFRDC Participation
1	Clean Cities Outreach, Education and Technical Assistance	Not to exceed 20% of the total project cost
2	Training on Zero Emission Vehicle and Infrastructure Technologies for Critical Emergency Response Workers	Not to exceed 20% of the total project cost
3	Clean Transportation Demonstration and Deployment	Not to exceed 25% of the total project cost

The FFRDC effort, in aggregate, shall not exceed the percentage of the total estimated cost of the project listed in the table above, including the applicant's and the FFRDC's portions of the effort.

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

An entity may submit more than one Concept Paper and Full Application to this FOA, provided that each application describes a unique, scientifically distinct project and an eligible Concept Paper was submitted for each Full Application.

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 apply in response to this FOA lies solely with the applicant.

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IV. Application and Submission Information

A. Application Process

The application process includes multiple submission phases: Concept Paper and Full Application. **Only applicants who have submitted an eligible Concept Paper will be eligible to submit a Full Application.**

All submissions must conform to the form and content requirements described below, including maximum page lengths.

- 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" paper with margins not less than one inch on every side. Use Calibri 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;
- A **control number** will be issued when an applicant begins the EERE eXCHANGE application process. The control number must be included with all application documents. Specifically, the control number must be prominently displayed on the upper right corner of the header of every page and included in the file name (i.e., *Control Number_Applicant Name_Full Application*);
- Page numbers must be included in the footer of every page; and
- 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.

i. 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.

Applicants who experience technical difficulties with submission PRIOR to the FOA deadline should contact the EERE eXCHANGE helpdesk for assistance (EERE-eXCHANGESupport@hq.doe.gov).

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B. Application Forms

The application forms and instructions are available at [EERE Funding Application and Management Forms](#) and on EERE eXCHANGE. To access these materials on EERE eXCHANGE, 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 50MB. Files larger than 50MB cannot be uploaded and hence cannot be submitted for review. If a file is larger than 50MB 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:

TechnicalVolume_Part_1

TechnicalVolume_Part_2

DOE will not accept late submissions that resulted from technical difficulties due to uploading files that exceed 50MB.

C. Content and Form of the Concept Paper

Each Concept Paper must be limited to a single concept or technology. The Concept Paper must conform to the requirements listed below, including the stated page limits.

Section	Page Limit	Description
Cover Page	1 page maximum	The cover page should include the project title, the specific announcement Area of Interest being addressed (if applicable), both the technical and business points of contact, names of all team member organizations, the project location(s), and any statements regarding confidentiality.
Project Description and Impacts	3 pages maximum	Applicants are required to describe succinctly: <ul style="list-style-type: none"> • The problem being addressed by the project and the relevance of this problem to the AOI; • The project goal (i.e., what the project will accomplish) and what technologies will be used within the scope of that project; • The project's approach to accomplishing the goal and its innovation; • The stakeholders/communities that will benefit from the project; • The potential impact that the proposed project would have on the problem being addressed; • How EERE funding is necessary to achieve the project objectives;

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Section	Page Limit	Description
		<ul style="list-style-type: none"> The project team's qualifications, experience, and capabilities to successfully execute the proposed project; and Applicants may provide graphs, charts, or other data within the 3-page limit.

EERE makes an independent assessment of each Concept Paper based on the criteria in Section V.A.i. of the FOA. EERE will encourage a subset of applicants to submit Full Applications. Other applicants will be discouraged from submitting a Full Application.

D. Content and Form of the Full Application

Applicants must complete the following application forms found at [EERE Funding Application and Management Forms](#) and on the EERE eXCHANGE website at <https://eere-eXCHANGE.energy.gov/>.

Applicants will have approximately 30 days from receipt of the Concept Paper Encourage/Discourage notification on EERE eXCHANGE 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.

i. Full Application Content Requirements

Each Full Application must be limited to a single concept. Full Applications must conform to the following requirements and must not exceed the stated page limits.

Component	File Format	Page Limit	File Name
SF-424: Application for Federal Assistance	PDF	n/a	ControlNumber_LeadOrganization_App424
Technical Volume	PDF	30	ControlNumber_LeadOrganization_TechnicalVolume
Resumes	PDF	3 pages each	ControlNumber_LeadOrganization_Resumes
Letters of Commitment	PDF	1 page each	ControlNumber_LeadOrganization_LOCs
Statement of Project Objectives	MS Word	7	ControlNumber_LeadOrganization_SOPO

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Diversity Equity and Inclusion Plan	PDF	5	ControlNumber_LeadOrganization_DEIP
Budget Justification Workbook	MS Excel	n/a	ControlNumber_LeadOrganization_Budget_Justification
Summary/Abstract for Public Release	PDF	1	ControlNumber_LeadOrganization_Summary
Summary Slide	MS PowerPoint	1	ControlNumber_LeadOrganization_Slide
Subrecipient Budget Justification	MS Excel	n/a	ControlNumber_LeadOrganization_Subrecipient_Budget_Justification
DOE Work Proposal for FFRDC, (see DOE O 412.1A, Attachment 2)	PDF	n/a	ControlNumber_LeadOrganization_WP
Authorization from cognizant Contracting Officer for FFRDC	PDF	n/a	ControlNumber_LeadOrganization_FFRDCAuth
SF-LLL Disclosure of Lobbying Activities	PDF	n/a	ControlNumber_LeadOrganization_SF-LLL
Waiver Requests	PDF	n/a	ControlNumber_LeadOrganization_Waiver
Current and Pending Support	PDF	n/a	ControlNumber_LeadOrganization_CPS
Location(s) of Work	Excel	n/a	ControlNumber_LeadOrganization_LOW
Transparency of Foreign Connections	PDF	n/a	ControlNumber_LeadOrganization_TFC
Potentially Duplicative Funding Notice	PDF	n/a	ControlNumber_LeadOrganization_PDFN

Note: The maximum file size that can be uploaded to the EERE eXCHANGE website is 50MB. See Section IV.B.

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

ii. SF-424: Application for Federal Assistance

Applicants must complete the SF-424 Application for Federal Assistance, which is available on [EERE Funding Application and Management Forms](#).

Effective January 1, 2020, the System for Award Management (SAM) is the central repository for common government-wide certifications and representations required of Federal grants recipients. As registration in SAM is required for eligibility for a federal award and registration must be updated annually, Federal agencies use SAM information to comply with award requirements and avoid increased burden and costs of separate requests for

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such information, unless the recipient fails to meet a federal award requirement, or there is a need to make updates to their SAM registration for other purposes.

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_424”.

iii. Technical Volume

The Technical Volume must conform to the following content and form requirements. This volume must address the technical review criteria as discussed in Section V. 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. However, EERE and reviewers are under no obligation to review cited sources.

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 information in the table below. The applicant should consider the weighting of each of the technical review criteria (see Section V.A.ii. of the FOA) when preparing the Technical Volume.

The Technical Volume should clearly describe and expand upon information provided in the Concept Paper.

Technical Volume 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, names of the PI, Senior/Key Personnel and their organizations, the project location(s), and any statements regarding confidentiality.
Project Overview (Approximately 10% of the Technical Volume)	<p>The Project Overview section should contain a brief summary of the proposed project including the following information:</p> <p>Project Summary:</p> <ul style="list-style-type: none"> • Explanation of the project’s relevance to the AOI objectives; • The project’s end goal(s): Describe what the project will accomplish; • The project approach: Summarize the proposed project tasks to achieve the project’s end goal(s); • Project outcomes: Describe specific short-term results from the project activities; • Project outputs: Describe specific deliverables or tools to be produced; and • Project impacts: Describe expected long-term impacts resulting from the project activities. <p>Project Team and Qualifications</p> <p>Describe the team member organizations’ experience with this type of work and any special qualifications of key individuals in relation to the proposed work.</p>
Project Approach (Approximately 30% of the Technical Volume)	<p>The Project Approach and Impact section should contain the following information:</p> <p>Project Approach and Impact Description</p> <ul style="list-style-type: none"> • Describe the problem being addressed, or the opportunity pursued by the project, using quantifiable metrics; • Describe the current state of the market sector applicable to the AOI (e.g., mobility accessibility, local knowledge and use of electric vehicles, availability of electric vehicle charging stations, market penetration, etc.). This should be specific to the geographic project area being proposed; • Using measurable/quantifiable elements, describe the expected change in the market sector as a result of the project activities. This should be specific to the geographic project area being proposed; • The project approach: Describe the proposed project approach including what tasks and activities will be undertaken to achieve the project’s end goal(s);

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	<ul style="list-style-type: none"> • Provide a detailed description of: <ul style="list-style-type: none"> - the technology or system to be demonstrated or deployed including quantity, type, location, specifications, etc. and/or - the outreach and education programs and activities to be developed/conducted and/or - the training to be developed/conducted. • Describe how community stakeholders affected by the project are involved in the design and implementation of the project activities; • The project’s end goal(s): Describe what the project will accomplish by the end of the project period; • Describe the project outcomes: the associated metrics and the approach to measuring their impact; • Project outputs: Describe specific deliverables or tools to be produced; and • Describe how the proposed project is innovative and replicable in other communities. <p>Justice 40 Considerations</p> <ul style="list-style-type: none"> • Identify applicable disadvantaged communities (DACs) to which the anticipated project benefits will flow. • Identify applicable benefits that are quantifiable, measurable, and trackable, including, at a minimum, a discussion of the relevance of each of the eight DOE Justice40 Initiative benefits outlined in Section I Background and Context. • A description of how and when anticipated benefits are expected to flow to DACs.
<p>Market Transformation Plan (Approximately 5% of the Technical Volume)</p>	<p>The Market Transformation Plan section should include the following information:</p> <ul style="list-style-type: none"> • Describe the project’s approach to ensuring long-term, market transforming impacts resulting from the project activities. • Describe the long-term impacts from the project activities on the problem being addressed, including the alleviation of any market barriers; • Describe the approach for broadly disseminating project learnings, valuable insights, best practices and outcomes throughout the project period, in order to enable other communities to replicate project successes; and <p>Describe how project deployments, training programs, outreach and education programs would sustain themselves or expand after the completion the project period.</p>
<p>Workplan (Approximately 35% of the Technical Volume)</p>	<p>The Workplan should contain the following information:</p> <p>Project Summary by Budget Period: Provide a summary description of the work scope by budget periods.</p> <ul style="list-style-type: none"> • Describe the specific expected outcome(s) of each budget period.

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Project Schedule (Gantt Chart or similar): Provide a schedule for the entire project, including

- Task and subtask durations;
- Milestones; and
- Go/No-Go decision points.

Work Breakdown Structure (WBS): Provide a WBS which:

- Is structured with a hierarchy of budget periods (approximately annual), task and subtasks;
- Contains a concise description of the specific activities to be conducted;
- Describes how the team members will accomplish the work, achieve the milestones, and produce the deliverables in order to meet the final project goal(s); and
- For each work package in the WBS, clearly indicates the responsible party and the location of the work.

Milestone Summary: Provide a summary of appropriate milestones throughout the project to demonstrate success.

A milestone may be either a progress measure (which can be activity based) or a SMART technical milestone. SMART milestones should be Specific, Measurable, Achievable, Relevant, and Timely, and must demonstrate a technical achievement rather than simply completing a task. Completion of a deliverable (a project output such as a technical report or tool) should be associated with an individual milestone.

The minimum requirement is that each project must have at least one milestone per quarter for the duration of the project with at least one SMART technical milestone per year (depending on the project, more milestones may be necessary to comprehensively demonstrate progress).

Include the following information:

- Milestone Title;
- Milestone description;
- Associated task number;
- Timeframe for completion (e.g., project month or quarter); and
- How the milestone will be verified.

Go/No-Go Decision Points: 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, project 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.

- Provide the specific criteria to be used to evaluate the project at the Go/No-Go decision point; and

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- Go/No-Go decision points are considered “SMART” and can fulfill the requirement for an annual SMART milestone.

End of Project Goal: Provide a summary of the end of project goal(s). Each project must have at least one SMART end of project goal.

Project data: Provide a description of:

- The data to be collected from project related infrastructure, vehicles, or processes; market impact metrics;
- The Justice 40 Initiative metrics the project will collect; and
- The types and quantities of analyses to be performed to determine the project impact on market transformation and on underserved communities.

Buy America Requirements for Infrastructure Projects: Within the first 2 pages of the Workplan, include a short statement on whether the project will involve the construction, alteration, and/or repair of infrastructure in the United States. See Appendix D for applicable definitions and other information to inform this statement.

Project Management and Controls: Provide an overview of the team’s approach to project management and controls, including the following:

- The overall approach to managing the work;
- Financial management practices and systems used to track project costs, invoicing, and payments;
- Project management practices and systems used to provide oversight of task progress, scope, schedule, and budget management;
- Process for managing project changes;
- The involvement (responsible, accountable, consulted, or informed) of each project team organization in relation to the tasks, milestones and deliverables;
- Describe the internal communication process among project team members;
- Identification of project risks, mitigation strategies and risk management responsibilities; and
- Quality Assurance/Control process to ensure the quality of services and products (including deliverables) generated by the team.

Note that a SOPO is required as a separate submission in the application (SOPO template is available in EERE Exchange). The tasks, milestones, and go/no-go decision points in the SOPO must be consistent with those proposed in the Workplan.

<p>Project Team and Qualifications (Approximately 20% of the Technical Volume)</p>	<p>The Project Team and Qualifications section should contain the following information:</p> <ul style="list-style-type: none"> • Describe the unique qualifications, expertise, and experience of the key individuals in the project team in relation to project and AOI objectives; • Describe succinctly the roles and the work to be performed by each Principal Investigator (PI) and key participant in relation to their qualifications, expertise, and experience; • Describe the time commitment of the PI and key participants to support the project; • Describe the alignment between the team organizations' missions/strategic goals with the objectives of the AOI and with the teaming arrangement encouraged or required by the AOI; • Describe the technical services to be provided by DOE/NNSA FFRDCs, if applicable; and Describe how the project team's financial and resource commitments to the project will facilitate the successful achievement of the project's end goals.
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iv. Resumes

A resume provides information reviewers can use to evaluate an individual's relevant skills and the experience of the key project personnel. Applicants must submit a resume (limited to three pages) for each project manager and Senior/Key Personnel that includes the following:

1. Contact information;
2. Education: All academic institutions attended, major/area, degree;
3. Training: (e.g.,) certification or credential from a Registered Apprenticeship or Labor Management Partnership;
4. Professional experience: Beginning with the current position, list professional/academic positions in chronological order with a brief description;
5. List all current academic, professional, or institutional appointments, foreign or domestic, at the applicant institution or elsewhere, whether or not remuneration is received, and, whether full-time, part-time, or voluntary; and
6. There should be no lapses in time over the past 10 years or since age 18, whichever period is shorter.

As an alternative to a resume, it is acceptable to use the biographical sketch format approved by the National Science Foundation (NSF). The biographical sketch format may be generated by the Science Experts Network Curriculum Vita (SciENCv), a cooperative venture maintained at <https://www.ncbi.nlm.nih.gov/sciencv/>, also available at

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https://www.nsf.gov/bfa/dias/policy/researchprotection/commonform_biographicalsketch.pdf. The use of a format required by another agency is intended to reduce the administrative burden to researchers by promoting the use of common formats.

Save the resumes in a single PDF file using the following convention for the title “ControlNumber_LeadOrganization_Resumes”.

v. Letters of Commitment

Submit letters of commitment from all subrecipient and third-party cost share providers. If applicable, the letter must state that the third party is committed to providing a specific minimum dollar amount or value of in-kind contributions allocated to cost sharing. The following information for each third party contributing to cost sharing should be identified: (1) the name of the organization; (2) the proposed dollar amount to be provided; and (3) the proposed cost sharing type (cash-or in-kind contributions). Each letter must not exceed one page.

Save the letters of commitment in a single PDF file using the following convention for the title “ControlNumber_LeadOrganization_LOCs”.

Letters of support or endorsement for the project from entities that do not have a substantive role in the project will not be accepted.

vi. Statement of Project Objectives (SOPO)

Applicants must complete a SOPO. A SOPO template is available on [EERE Funding Application and Management Forms](#) and on EERE eXCHANGE at <https://eere-eXCHANGE.energy.gov/>. The SOPO, including the Milestone Table, must not exceed 7 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 (except in figures or tables, which may be 10-point font).

Save the SOPO in a single Microsoft Word file using the following convention for the title “ControlNumber_LeadOrganization_SOPO”.

vii. Diversity, Equity, and Inclusion Plan

As part of the application, applicants are required to describe how diversity, equity, and inclusion objectives will be incorporated in the project. Specifically, applicants are required to submit a Diversity, Equity, and Inclusion Plan that describes the actions the applicant will take to foster a welcoming and inclusive environment, support people from groups underrepresented in STEM, advance equity, and encourage the inclusion of individuals from these groups in the

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project; and the extent the project activities will be located in or benefit underserved communities (also see Section I.D.). The plan should include at least one SMART milestone per Budget Period supported by metrics to measure the success of the proposed actions and will be incorporated into the award if selected. The Diversity, Equity, and Inclusion Plan should contain the following information:

- Equity Impacts: the impacts of the proposed project on underserved communities, including social and environmental impacts.
- Benefits: The overall benefits of the proposed project, if funded, to underserved communities; and
- How diversity, equity, and inclusion objectives will be incorporated in the project.

The following is a non-exhaustive list of actions that can serve as examples of ways the proposed project could incorporate diversity, equity, and inclusion elements. These examples should not be considered either comprehensive or prescriptive. Applicants may include appropriate actions not covered by these examples.

- a. Include persons from groups underrepresented in STEM as PI, co-PI, and/or other senior personnel;
- b. Include persons from groups underrepresented in STEM as student researchers or post-doctoral researchers;
- c. Include faculty or students from Minority Serving Institutions as PI/co-PI, senior personnel, and/or student researchers, as applicable;
- d. Enhance or collaborate with existing diversity programs at your home organization and/or nearby organizations;
- e. Collaborate with students, researchers, and staff in Minority Serving Institutions;
- f. Disseminate results of research and development in Minority Serving Institutions or other appropriate institutions serving underserved communities;
- g. Implement evidence-based, diversity-focused education programs (such as implicit bias training for staff) in your organization;
- h. Identify Minority Business Enterprises, Minority Owned Businesses, Woman Owned Businesses and Veteran Owned Businesses to solicit as vendors and sub-contractors for bids on supplies, services and equipment.

The Diversity, Equity, and Inclusion Plan must not exceed 5 pages. Save the Diversity, Equity and Inclusion Plan in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_DEIP".

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viii. Budget Justification Workbook

Applicants must complete the Budget Justification Workbook, which is available on [EERE Funding Application and Management Forms and](#) on EERE eXCHANGE at <https://eere-eXCHANGE.energy.gov/>. Applicants must complete each tab of the Budget Justification Workbook for the project, including all work to be performed by the prime recipient and its subrecipients and contractors. 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”.

ix. Summary for Public Release

Applicants must submit a one-page summary of their project that is 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 business-sensitive information as DOE may make it available to the public after selections are made. The summary must not exceed one 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”.

x. Summary Slide

Applicants must provide a single slide summarizing the proposed project. The Summary Slide template is available on EERE eXCHANGE at <https://eere-eXCHANGE.energy.gov/> and must include the following information:

- A technology summary;
- A description of what the project will do;
- Proposed project goals;
- Any key graphics (illustrations, charts and/or tables);

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- The project’s key idea/takeaway;
 - Project title, prime recipient, PI, and Senior/Key Personnel information; and
 - Requested EERE funds and proposed applicant cost share.

Save the Summary Slide in a single Microsoft PowerPoint file using the following convention for the title “ControlNumber_LeadOrganization_Slide”.

xi. Subrecipient Budget Justification (if applicable)

Applicants must provide a separate budget justification for each subrecipient that is expected to perform work estimated to be more than \$250,000 or 25% 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 subrecipient budget justification in a Microsoft Excel file using the following convention for the title:

“ControlNumber_LeadOrganization_Subrecipient_Budget_Justification”.

xii. Budget for DOE/NNSA FFRDC (if applicable)

If a DOE/NNSA FFRDC is to perform a portion of the work, the applicant must provide a DOE work proposal (WP) in accordance with the requirements in DOE Order 412.1A, Work Authorization System, Attachment 2, available at: <https://www.directives.doe.gov/directives-documents/400-series/0412.1-BOrder-a-chg1-AdmChg>.

Save the WP in a single PDF file using the following convention for the title “ControlNumber_LeadOrganization_WP”.

xiii. 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”.

xiv. SF-LLL: Disclosure of Lobbying Activities

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.

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Prime recipients and subrecipients are required to complete and submit SF-LLL, “Disclosure of Lobbying Activities”

(<https://www.grants.gov/web/grants/forms/sf-424-individual-family.html>) to ensure that non-federal funds have not been paid and will not be paid to any person for influencing or attempting to influence any of the following in connection with the 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”.

xv. Waiver Requests (if applicable)

Foreign Entity Participation

For projects selected under this FOA, all recipients and subrecipients must qualify as domestic entities. See Section III.A.i. To request a waiver of this requirement, the applicant must submit an explicit waiver request in the Full Application. Appendix C lists the information that must be included in a waiver request.

Performance of Work in the United States (Foreign Work Waiver Request)

As set forth in Section IV.I.iii., all work for projects selected under this FOA must be performed in the United States. To request a waiver of this requirement, the applicant must submit an explicit waiver request in the Full Application. Appendix C lists the information that must be included in a foreign work waiver request.

Save the Waivers in a single PDF file using the following convention for the title “ControlNumber_LeadOrganization_Waiver”.

xvi. Current and Pending Support

Current and pending support is intended to allow the identification of potential duplication, overcommitment, potential conflicts of interest or commitment, and all other sources of support. As part of the application, the principal investigator and Senior/Key Personnel at the applicant and subrecipient level must provide a list of all sponsored activities, awards, and appointments, whether paid or unpaid; provided as a gift with terms or conditions or provided as a gift without

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terms or conditions; full-time, part-time, or voluntary; faculty, visiting, adjunct, or honorary; cash or in-kind; foreign or domestic; governmental or private-sector; directly supporting the individual's research or indirectly supporting the individual by supporting students, research staff, space, equipment, or other research expenses. All connections with foreign government-sponsored talent recruitment programs must be identified in current and pending support.

For every activity, list the following items:

- The sponsor of the activity or the source of funding;
- The award or other identifying number;
- The title of the award or activity. If the title of the award or activity is not descriptive, add a brief description of the research being performed that would identify any overlaps or synergies with the proposed research;
- The total cost or value of the award or activity, including direct and indirect costs and cost share. For pending proposals, provide the total amount of requested funding;
- The award period (start date through end date); and
- The person-months of effort per year dedicated to the award or activity.

To identify overlap, duplication of effort, or synergistic efforts, append a description of the other award or activity to the current and pending support.

Details of any obligations, contractual or otherwise, to any program, entity, or organization sponsored by a foreign government must be provided on request to either the applicant institution or DOE. Supporting documents of any identified source of support must be provided to DOE on request, including certified translations of any document.

PIs and Senior/Key Personnel must provide a separate disclosure statement listing the required information above regarding current and pending support. Each individual must sign and date their respective disclosure statement and include the following certification statement:

I, [Full Name and Title], certify to the best of my knowledge and belief that the information contained in this Current and Pending Support Disclosure Statement is true, complete, and accurate. I understand that any false, fictitious, or fraudulent information, misrepresentations, half-truths, or omissions of any material fact, may subject me to criminal, civil, or administrative penalties for fraud, false statements, false claims or otherwise. (18 U.S.C. §§ 1001 and 287, and 31 U.S.C. 3729-3733 and 3801-3812). I further understand and agree that (1) the statements and representations made herein are material to DOE's funding

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decision, and (2) I have a responsibility to update the disclosures during the period of performance of the award should circumstances change which impact the responses provided above.

The information may be provided in the approved common disclosure format available at Common Form for Current and Pending (Other) Support (nsf.gov).

Save the Current and Pending Support in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_CPS".

Definitions:

Current and pending support – (a) All resources made available, or expected to be made available, to an individual in support of the individual's RD&D efforts, regardless of (i) whether the source is foreign or domestic; (ii) whether the resource is made available through the entity applying for an award or directly to the individual; or (iii) whether the resource has monetary value; and (b) includes in-kind contributions requiring a commitment of time and directly supporting the individual's RD&D efforts, such as the provision of office or laboratory space, equipment, supplies, employees, or students. This term has the same meaning as the term Other Support as applied to researchers in NSPM-33: For researchers, Other Support includes all resources made available to a researcher in support of and/or related to all of their professional RD&D efforts, including resources provided directly to the individual or through the organization, and regardless of whether or not they have monetary value (e.g., even if the support received is only in-kind, such as office/laboratory space, equipment, supplies, or employees). This includes resource and/or financial support from all foreign and domestic entities, including but not limited to gifts provided with terms or conditions, financial support for laboratory personnel, and participation of student and visiting researchers supported by other sources of funding.

Foreign Government-Sponsored Talent Recruitment Program – An effort directly or indirectly organized, managed, or funded by a foreign government, or a foreign government instrumentality or entity, to recruit science and technology professionals or students (regardless of citizenship or national origin, or whether having a full-time or part-time position). Some foreign government-sponsored talent recruitment programs operate with the intent to import or otherwise acquire from abroad, sometimes through illicit means, proprietary technology or software, unpublished data and methods, and intellectual property to further the military modernization goals and/or economic goals of a foreign government. Many, but not all, programs aim to incentivize the targeted individual to physically relocate to the foreign state for the above purpose. Some

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programs allow for or encourage continued employment at United States research facilities or receipt of federal research funds while concurrently working at and/or receiving compensation from a foreign institution, and some direct participants not to disclose their participation to United States entities. Compensation could take many forms including cash, research funding, complimentary foreign travel, honorific titles, career advancement opportunities, promised future compensation, or other types of remuneration or consideration, including in-kind compensation.

Senior/Key Personnel – An individual who contributes in a substantive, meaningful way to the scientific development or execution of a research, development, and demonstration (RD&D) project proposed to be carried out with a DOE award.¹¹

xvii. **Locations of Work**

The applicant must provide a list of locations where project work will be performed by the prime recipient or subrecipient(s) including the following information for each location:

- Location Type
- Location Type Category
- Is this a Principal Place of Performance?
- Prime or Subrecipient Location?
- If Subrecipient, Subrecipient/Community Name
- Facility Name (if applicable)
- Is location in a foreign country?
- Street Address, City, State, 5-Digit Zip Code - +4
- Briefly describe the primary activity at this location or with this population. For example, management headquarters; construction, operations, production; raw materials extraction, etc.
- Latitude/Longitude
- Does the location or community qualify as a disadvantaged community (DAC) according to the Climate and Economic Justice Screening Tool (CEJST)?
- If DAC, add the census tract number or describe the distributed disadvantaged community served (e.g., migrant workers)
- % of work performed at this location

For your convenience, a Locations of Work template is available on EERE eXCHANGE at <https://eere-eXCHANGE.energy.gov/>. Applicants are strongly

¹¹ Typically, these individuals have doctoral or other professional degrees, although individuals at the masters or baccalaureate level may be considered Senior/Key Personnel if their involvement meets this definition. Consultants, graduate students, and those with a postdoctoral role also may be considered Senior/Key Personnel if they meet this definition.

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encouraged to use the template. If the template is not used, the submission must include all of the elements described above, and as outlined in the template.

Applicants must provide the Locations of Work Documentation as a Microsoft Excel file using the following convention for the title: "Control Number_LeadOrganization_LOW."

xviii. Transparency of Foreign Connections

Applicants must provide the following as it relates to the proposed recipient and subrecipients. Include a separate disclosure for the applicant and each proposed subrecipient. U.S. National Laboratories, domestic government entities, and institutions of higher education are only required to respond to items 1, 2 and 9, and if applying as to serve as the prime recipient, must provide complete responses for project team members that are not U.S. National Laboratories, domestic government entities, or institutions of higher education.

1. Entity name, website address, and mailing address;
2. The identity of all owners, principal investigators, project managers, and Senior/Key Personnel who are a party to any *Foreign Government-Sponsored Talent Recruitment Program* of a foreign country of risk (i.e., China, Iran, North Korea, and Russia);
3. The existence of any joint venture or subsidiary that is based in, funded by, or has a foreign affiliation with any foreign country of risk;
4. Any current or pending contractual or financial obligation or other agreement specific to a business arrangement, or joint venture-like arrangement with an enterprise owned by a foreign state or any foreign entity;
5. Percentage, if any, that the proposed recipient or subrecipient has foreign ownership or control;
6. Percentage, if any, that the proposed recipient or subrecipient is wholly or partially owned by an entity in a foreign country of risk;
7. Percentage, if any, of venture capital or institutional investment by an entity that has a general partner or individual holding a leadership role in such entity who has a foreign affiliation with any foreign country of risk;
8. Any technology licensing or intellectual property sales to a foreign country of risk, during the 5-year period preceding submission of the proposal;
9. Any foreign business entity, offshore entity, or entity outside the United States related to the proposed recipient or subrecipient;
10. Complete list of all directors (and board observers), including their full name, citizenship and shareholder affiliation, date of appointment, duration of term, as well as a description of observer rights as applicable;

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11. Complete capitalization table for your entity, including all equity interests (including LLC and partnership interests, as well as derivative securities). Include both the number of shares issued to each equity holder, as well as the percentage of that series and all equity on a fully diluted basis. Identify the principal place of incorporation (or organization) for each equity holder. If the equity holder is a natural person, identify the citizenship(s). If the recipient or subrecipient is a publicly traded company, provide the above information for shareholders with an interest greater than 5%;
 12. A summary table identifying all rounds of financing, the purchase dates, the investors for each round, and all the associated governance and information rights obtained by investors during each round of financing; and
 13. An organization chart to illustrate the relationship between your entity and the immediate parent, ultimate parent, and any intermediate parent, as well as any subsidiary or affiliates. Identify where each entity is incorporated.

DOE reserves the right to request additional or clarifying information based on the information submitted.

Save the Transparency of Foreign Connections information in a single PDF file using the following convention for the title
"ControlNumber_LeadOrganization_TFC."

xix. Potentially Duplicative Funding Notice

If the applicant or project team member has other active awards of federal funds, the applicant must determine whether the activities of those awards potentially overlap with the activities set forth in its application to this FOA. If there is a potential overlap, the applicant must notify DOE in writing of the potential overlap and state how it will ensure any project funds (i.e., recipient cost share and federal funds) will not be used for identical cost items under multiple awards. Likewise, for projects that receive funding under this FOA, if a recipient or project team member receives any other award of federal funds for activities that potentially overlap with the activities funded under the DOE award, the recipient must promptly notify DOE in writing of the potential overlap and state whether project funds from any of those other federal awards have been, are being, or are to be used (in whole or in part) for one or more of the identical cost items under the DOE award. If there are identical cost items, the recipient must promptly notify the Contracting Officer in writing of the potential duplication and eliminate any inappropriate duplication of funding.

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Save the Potentially Duplicative Funding Notice in a single PDF file using the following convention for the title "ControlNumber_LeadOrganization_PDFN."

E. Post Selection Information Requests

If selected for award negotiations, EERE reserves the right to require that selected applicants provide additional or clarifying information regarding the application submissions, the project, the project team, the award requirements, and any other matters related to anticipated award. The following is a list of examples of information that may be required:

- Personnel proposed to work on the project and collaborating organizations (See Section VI.B.xx. Participants and Collaborating Organizations);
- Current and Pending Support (See Sections IV.E.xvii. and VI.B.xxi. Current and Pending Support);
- Indirect cost information;
- Other budget information;
- Letters of Commitment 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);
- Information for the DOE Office of Civil Rights to process assurance reviews under 10 CFR 1040;
- Representation of Limited Rights Data and Restricted Software, if applicable; and
- Environmental Questionnaire.

F. Unique Entity Identifier (UEI) and System for Award Management (SAM)

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: (1) register in the SAM at <https://www.sam.gov> before submitting an application; (2) provide a valid UEI in the application; and (3) 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 UEI and SAM requirements. If an applicant has not fully complied with the requirements by the time DOE is ready to make a federal award, DOE will 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.

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NOTE: Due to the high demand of UEI requests and SAM registrations, entity legal business name and address validations are taking longer than expected to process. Entities should start the UEI and SAM registration process as soon as possible. If entities have technical difficulties with the UEI validation or SAM registration process they should use the [HELP](#) feature on [SAM.gov](#). SAM.gov will work entity service tickets in the order in which they are received and asks that entities not create multiple service tickets for the same request or technical issue. Additional entity validation resources can be found here: [GSAFSD Tier 0 Knowledge Base - Validating your Entity](#).

G. Submission Dates and Times

All required submissions must be submitted in EERE eXCHANGE no later than 5 p.m. ET on the dates provided on the cover page of this FOA.

H. Intergovernmental Review

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

I. Funding Restrictions

i. Allowable Costs

All expenditures must be allowable, allocable, and reasonable in accordance with the applicable federal cost principles. Pursuant to 2 CFR 910.352, the cost principles in the Federal Acquisition Regulations (48 CFR 31.2) apply to for-profit entities. The cost principles contained in 2 CFR Part 200, Subpart E apply to all entities other than for-profits.

ii. Pre-Award Costs

Applicants selected for award negotiations (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.

Pre-award costs cannot be incurred prior to the Selection Official signing the Selection Statement and Analysis.

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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.

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

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 pre-award costs incurred prior to receiving written authorization from the Contracting Officer. If the applicant elects to undertake activities that DOE determines 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 for their project 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 overrides the requirement 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. Likewise, if an application 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.

iii. Performance of Work in the United States (Foreign Work Waiver)

1. Requirement

All work performed under EERE awards must be performed in the United States. The prime recipient must flow down this requirement to its subrecipients.

2. 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

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any work under this award be performed outside the United States, absent a waiver, regardless of whether the work is performed by the prime recipient, subrecipients, contractors or other project partners.

3. Waiver

To seek a foreign work waiver, the applicant must submit a written waiver request to EERE. [Appendix C lists the information that must be included in a request for a foreign work waiver.](#)

Save the waiver request(s) in a single PDF file. The applicant does not have the right to appeal EERE's decision concerning a waiver request.

iv. Construction

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

v. Foreign Travel

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 United States flag carrier, if service is available. Foreign travel costs are allowable only with the written prior approval of the Contracting Officer assigned to the award.

vi. 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.

vii. Build America Buy America Requirements for Infrastructure Projects

Pursuant to the Build America Buy America Act, subtitle IX of BIL (Buy America, or BABA), federally assisted projects that involve infrastructure work, undertaken by applicable recipient types, require that:

- All iron, steel, and manufactured products used in the infrastructure work are produced in the United States; and

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- All construction materials used in the infrastructure work are manufactured in the United States.

Whether a given project must apply this requirement is project-specific and dependent on several factors, such as the recipient's entity type, whether the work involves "infrastructure," as defined in Section 70914 of the BIL, and whether the infrastructure in question is publicly owned or serves a public function.

Applicants are strongly encouraged to consult Appendix D of this FOA to determine whether their project may have to apply this requirement, both to make an early determination as to the need of a waiver, as well as to determine what impact, if any, this requirement may have on the proposed project's budget.

Please note that, based on implementation guidance from the Office of Management and Budget issued on April 18, 2022, the Buy America requirements of the BIL do not apply to DOE projects in which the prime recipient is a for-profit entity; the requirements only apply to projects whose prime recipient is a "non-Federal entity," e.g., a State, local government, Indian Tribe, Institution of Higher Education, or nonprofit organization. Subawards should conform to the terms of the prime award from which they flow; in other words, for-profit prime recipients are not required to flow down these Buy America requirements to subrecipients, even if those subrecipients are non-Federal entities as defined above. Conversely, prime recipients which are non-Federal entities must flow the Buy America requirements down to all subrecipients, even if those subrecipients are for-profit entities. Finally, for all applicants—both non-Federal entities and for-profit entities—DOE is including a Program Policy Factor that the Selection Official may consider in determining which Full Applications to select for award negotiations that considers whether the applicant has made a commitment to procure U.S. iron, steel, manufactured products, and construction materials in its project.

The DOE financial assistance agreement will require each recipient to: (1) fulfill the commitments made in its application regarding the procurement of U.S.-produced products and (2) fulfill the commitments made in its application regarding the procurement of other key component metals and domestically manufactured products that are deemed available in sufficient and reasonably available quantities or of a satisfactory quality at the time of award negotiation. Applicants may seek waivers of these requirements in very limited circumstances and for good cause shown. Further details on requesting a waiver can be found in Appendix D and the terms and conditions of an award.

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Applicants are strongly encouraged to consult Appendix D for more information.

viii. 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” (<https://www.grants.gov/web/grants/forms/sf-424-individual-family.html>) to ensure that non-federal funds have not been paid and will not be paid to any person for influencing or attempting to influence any of the following in connection with the 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.

ix. Risk Assessment

Pursuant to 2 CFR 200.206, DOE will conduct an additional review of the risk posed by applications submitted under this FOA. Such risk assessment will consider:

1. Financial stability;
2. Quality of management systems and ability to meet the management standards prescribed in 2 CFR 200 as amended and adopted by 2 CFR 910;
3. History of performance;
4. Audit reports and findings; and
5. The applicant's ability to effectively implement statutory, regulatory, or other requirements imposed on non-federal entities.

DOE may make use of other publicly available information and the history of an applicant’s performance under DOE or other federal agency awards.

Depending on the severity of the findings and whether the findings were resolved, DOE may elect not to fund the applicant.

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,

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suspended, or otherwise excluded from or ineligible for participation in federal programs or activities.

Further, as DOE invests in critical infrastructure and funds critical and emerging technology areas, DOE also considers possible threats to United States research, technology, and economic security from undue foreign government influence when evaluating risk. If high risks are identified and cannot be sufficiently mitigated, DOE may elect to not fund the applicant. As part of the research, technology, and economic security risk review, DOE may contact the applicant and/or proposed project team members for additional information to inform the review.

x. Invoice Review and Approval

DOE employs a risk-based approach to determine the level of supporting documentation required for approving invoice payments. Recipients may be required to provide some or all of the following items with their requests for reimbursement:

- Summary of costs by cost categories;
- Timesheets or personnel hours report;
- Invoices/receipts for all travel, equipment, supplies, contractual, and other costs;
- UCC filing proof for equipment acquired with project funds by for-profit recipients and subrecipients;
- Explanation of cost share for invoicing period;
- Analogous information for some subrecipients; and
- Other items as required by DOE.

xi. Prohibition Related to Foreign Government-Sponsored Talent Recruitment Programs

a. Prohibition

Persons participating in a *Foreign Government-Sponsored Talent Recruitment Program of a Foreign Country of Risk* are prohibited from participating in projects selected for federal funding under this FOA. Should an award result from this FOA, the recipient must exercise ongoing due diligence to reasonably ensure that no individuals participating on the DOE-funded project are participating in a *Foreign Government-Sponsored Talent Recruitment Program of a Foreign Country of Risk*. Consequences for violations of this prohibition will be determined according to applicable law, regulations, and policy. Further, the recipient must notify DOE within five (5) business days upon learning that an individual on the project team is or is believed to be participating in a foreign government talent recruitment

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program of a foreign country of risk. DOE may modify and add requirements related to this prohibition to the extent required by law.

b. Definitions

- 1. Foreign Government-Sponsored Talent Recruitment Program.** An effort directly or indirectly organized, managed, or funded by a foreign government, or a foreign government instrumentality or entity, to recruit science and technology professionals or students (regardless of citizenship or national origin, or whether having a full-time or part-time position). Some foreign government-sponsored talent recruitment programs operate with the intent to import or otherwise acquire from abroad, sometimes through illicit means, proprietary technology or software, unpublished data and methods, and intellectual property to further the military modernization goals and/or economic goals of a foreign government. Many, but not all, programs aim to incentivize the targeted individual to relocate physically to the foreign state for the above purpose. Some programs allow for or encourage continued employment at United States research facilities or receipt of federal research funds while concurrently working at and/or receiving compensation from a foreign institution, and some direct participants not to disclose their participation to U.S. entities. Compensation could take many forms including cash, research funding, complimentary foreign travel, honorific titles, career advancement opportunities, promised future compensation, or other types of remuneration or consideration, including in-kind compensation.
- 2. Foreign Country of Risk.** DOE has designated the following countries as foreign countries of risk: Iran, North Korea, Russia, and China. This list is subject to change.

xii. Affirmative Action and Pay Transparency Requirements

All applicants must comply with all applicable federal labor and employment laws, including but not limited to Title VII of the Civil Rights Act of 1964, the Fair Labor Standards Act, the Occupational Safety and Health Act, and the National Labor Relations Act, which protects employees' right to bargain collectively and engage in concerted activities for the purpose of workers' mutual aid or protection.

All federally assisted construction contracts exceeding \$10,000 annually will be subject to the requirements of Executive Order 11246:

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(1) Recipients, subrecipients, contractors, and subcontractors are prohibited from discriminating in employment decisions on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin.

(2) Recipients and contractors are required to take affirmative action to ensure that equal opportunity is provided in all aspects of their employment. This includes flowing down the appropriate language to all subrecipients, contractors, and subcontractors.

(3) Recipients, subrecipients, contractors, and subcontractors are prohibited from taking adverse employment actions against applicants and employees for asking about, discussing, or sharing information about their pay or, under certain circumstances, the pay of their co-workers.

DOL's Office of Federal Contractor Compliance Programs (OFCCP) uses a neutral process to schedule compliance evaluations. Consult OFCCP's Technical Assistance Guide¹² to gain an understanding of the requirements and possible actions the recipients, subrecipients, contractors, and subcontractors must take. Additional guidance may also be found in the National Policy Assurances, produced by DOE.

xiii. Foreign Collaboration Considerations

- a. Consideration of new collaborations with foreign entities, organizations, and governments. The recipient will be required to provide DOE with advanced written notification of any potential collaboration with foreign entities, organizations, or governments in connection with its DOE-funded award scope. The recipient will then be required to await further guidance from DOE prior to contacting the proposed foreign entity, organization, or government regarding the potential collaboration or negotiating the terms of any potential agreement.
- b. Existing collaborations with foreign entities, organizations, and governments. The recipient will be required to provide DOE with a written list of all existing foreign collaborations in which has entered in connection with its DOE-funded award scope.
- c. Description of collaborations that should be reported. In general, a collaboration will involve some provision of a thing of value to, or from, the recipient. A thing of value includes but may not be limited to all resources

¹² See OFCCP's Technical Assistance Guide at:

<https://www.dol.gov/sites/dolgov/files/ofccp/Construction/files/ConstructionTAG.pdf?msclkid=9e397d68c4b111e9c9d8e6fecb6c710ec> Also see the National Policy Assurances <http://www.nsf.gov/awards/managing/rtc.jsp>

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made available to, or from, the recipient in support of and/or related to the DOE award, regardless of whether or not they have monetary value. Things of value also may include in-kind contributions (such as office/laboratory space, data, equipment, supplies, employees, students). In-kind contributions not intended for direct use on the DOE award but resulting in provision of a thing of value from or to the DOE award must also be reported. Collaborations do not include routine workshops, conferences, use of the recipient's services and facilities by foreign investigators resulting from its standard published process for evaluating requests for access, or the routine use of foreign facilities by awardee staff in accordance with the recipient's standard policies and procedures.

V. Application Review Information

A. Technical Review Criteria

i. Concept Papers

Concept Papers are evaluated based on consideration the following factors. All sub-criteria are of equal weight.

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

This criterion involves consideration of the following factors:

- The applicant clearly describes the problem being addressed by the project, the project goal, and what technologies will be used within the scope of the project;
- The applicant clearly describes how the project is unique and innovative;
- The applicant demonstrates adequate involvement from intended partnerships;
- The applicant has the qualifications, experience, capabilities and other resources necessary to complete the proposed project;
- The proposed project clearly meets the requirements of the FOA Area of Interest; and
- The proposed work, if successfully accomplished, would have a meaningful impact on the problem targeted by the FOA Area of Interest.

ii. Full Applications

Applications will be evaluated against the technical review criteria shown below. All sub-criteria are of equal weight.

Criterion 1: Project Approach and Impact (30%)

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This criterion involves consideration of the following factors:

- Extent to which the proposed approach is relevant to the Topic AOI objectives, demonstrates how DOE funding will impact the problem that is being addressed, and is innovative;
- Extent to which the application objectively describes the current state of the market sector using quantifiable metrics and how the project outcomes will measurably advance the state of the market sector;
- Extent to which the community which will be affected by the project is involved in the design and implementation of the project activities; and
- Extent to which the project includes activities to produce and share valuable insights and best practices that will effectively enable others to replicate the project successes.

Criterion 2: Project Plan (30%)

This criterion involves consideration of the following factors:

- Extent to which the workplan clearly defines the scope, tasks, milestones, and schedule of the project such that the parameters of the project are appropriately defined, the tasks are logically ordered, the task durations are reasonable, and that the overall plan will result in successful achievement of project outcomes and goals;
- Reasonableness of the approach to managing the work, including the extent to which the involvement of project team organizations/individuals are defined in relation to specific work tasks, milestones and deliverables, and of the structure of the plan for communication among team members;
- Reasonableness of the proposed plan for collecting, utilizing, analyzing, and publicly sharing project data; and
- Reasonableness of the allocation of project resources, including project budget and key personnel time commitment, to ensure the successful completion of the proposed work.

Criterion 3: Project Team and Qualifications (25%)

This criterion involves consideration of the following factors:

- Extent of key personnel qualifications, expertise, and experience, in relation to project and AOI objectives;
- Extent of the alignment between the team organizations' missions/strategic goals with the objectives of the AOI and with the teaming arrangement proposed by the AOI; and
- Appropriateness of the resource commitments proposed by project partners or other key participants as validated by letters of commitment.

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Criterion 4: Diversity, Equity, and Inclusion (15%)

This criterion involves consideration of the following factors:

- The quality and manner in which the measures incorporate diversity, equity and inclusion goals in the project; and
- Extent to which the project benefits underserved communities.

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 "DOE Merit Review Guide for Financial Assistance," effective September 2020, which is available at: <https://energy.gov/management/downloads/merit-review-guide-financial-assistance-and-unsolicited-proposals-current>.

c. Other Selection Factors**i. 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 exhibits technological diversity when compared to the existing DOE project portfolio and other projects selected from the subject FOA;
- The degree to which the proposed project, including proposed cost share, optimizes the use of available EERE funding to achieve programmatic objectives;
- The level of industry involvement and demonstrated ability to accelerate commercialization and overcome key market barriers;
- The degree to which the proposed project will accelerate transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty;
- The degree to which the proposed project, or group of projects, represent a desired geographic distribution (considering past awards and current applications);
- The degree to which the proposed project incorporates applicant or team members from Minority Serving Institutions (e.g., Historically Black Colleges and Universities (HBCUs)/Other Minority Institutions (OMIs)); and

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- partnerships with Minority Business Enterprises, minority-owned businesses, woman-owned businesses, veteran-owned businesses, or Indian Tribes; and
- The degree to which the proposed project will employ procurement of U.S. iron, steel, manufactured products, and construction materials.
 - The degree to which the proposed project contributes to the diversity of organizations and organization types and sizes selected from the subject FOA when compared to the existing DOE project portfolio.
 - The degree to which the proposed project has broad public support from the communities most directly impacted by the project.
 - The degree to which the proposed project avoids duplication/overlap with other publicly or privately funded work.
 - The degree to which the proposed project supports complementary efforts or projects, which, when taken together, will best achieve the research goals and objectives.
 - The degree to which the proposed project enables new and expanding market segments.
 - The degree to which the project's solution or strategy will maximize deployment or replication.
 - The degree to which the project promotes increased coordination with nongovernmental entities for demonstration of technologies and research applications to facilitate technology transfer.

D. Evaluation and Selection Process

i. 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, and risk reviews in determining which applications to select.

ii. Pre-Selection Clarification

EERE may determine that pre-selection clarifications are necessary from one or more applicants. Pre-selection clarifications are distinct from and less formal than pre-selection interviews. These pre-selection clarifications will solely be for the purposes of clarifying the application. The pre-selection clarifications may occur before, during or after 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. Typically, a pre-selection clarification will be carried out through either written responses to

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EERE's written clarification questions or video or conference calls with EERE representatives.

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.

iii. Recipient Responsibility and Qualifications

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 responsibility and qualification information about the applicant that is in the entity information domain in [SAM.gov](https://sam.gov) (see 41 U.S.C. 2313).

The applicant, at its option, may review information in the entity information domain in [SAM.gov](https://sam.gov) and comment on any information about itself that a federal awarding agency previously entered and is currently in the entity information domain in [SAM.gov](https://sam.gov).

DOE will consider any written comments by the applicant, in addition to the other information in the entity information domain in [SAM.gov](https://sam.gov), 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 2 CFR 200.206.

iv. Selection

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

E. Anticipated Notice of Selection and Award Negotiation Dates

EERE anticipates notifying applicants selected for negotiation of award and negotiating awards by the dates provided on the cover page of this FOA.

VI. Award Administration Information

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A. Award Notices

i. Ineligible Submissions

Ineligible Concept Papers and Full Applications will not be further reviewed or considered for award. The Contracting Officer will send a notification letter by email to the technical and administrative points of contact designated by the applicant in EERE eXCHANGE. The notification letter will state the basis upon which the Concept Paper or the Full Application is ineligible and not considered for further review.

ii. Concept Paper Notifications

EERE will notify applicants of its determination to encourage or discourage the submission of a Full Application. EERE will post these notifications to EERE eXCHANGE. EERE may include general comments provided from reviewers on an applicant's Concept Paper in the encourage/discourage notifications.

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 encouraging the submission of a Full Application does not authorize the applicant to commence performance of the project.

iii. 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.

iv. Applicants Selected for Award Negotiations

Successful applicants will receive written notification that they have been selected for award negotiations. 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 nor is it a

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guarantee of federal government funding. Applicants do not receive an award unless and until award negotiations are complete and the Contracting Officer executes the funding agreement, accessible by the prime recipient in FedConnect.

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.I.ii. of the FOA for guidance on pre-award costs.

v. 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.

vi. 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.

B. Administrative and National Policy Requirements

i. Registration Requirements

There are several one-time actions applicants must take before applying to this FOA. Some of these may take several weeks, so it is vital applicants build in enough time to complete them. Failure to complete these actions could interfere with application or negotiation deadlines or the ability to receive an award if selected. These requirements are as follows:

1. EERE Funding Opportunity Exchange (eXCHANGE)

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Register and create an account on EERE eXCHANGE at <https://eere-eXCHANGE.energy.gov>. This account will allow the user to apply to any open EERE FOAs that are currently in EERE eXCHANGE.

To access [EERE eXCHANGE](#), potential applicants must have a [Login.gov](#) account. As part of the eXCHANGE registration process, new users will be directed to create an account in Login.gov. Please note that the email address associated with Login.gov must match the email address associated with the eXCHANGE account. For more information, refer to the eXCHANGE Multi-Factor Authentication (MFA) Quick Guide in the [Manuals section](#) of eXCHANGE.

Each organization or business unit, whether acting as a team or a single entity, should use only one account as the contact point for each submission. Applicants should also designate backup points of contact. **This step is required to apply to this FOA.** The 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.**

2. System for Award Management

Register with the SAM at <https://www.sam.gov>. Designating an Electronic Business Point of Contact (EBiz POC) and obtaining a special password called a Marketing Partner ID Number (MPIN) are important steps in SAM registration. Please update your SAM registration annually.

3. 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 https://www.fedconnect.net/FedConnect/Marketing/Documents/FedConnect_Ready_Set_Go.pdf.

4. Grants.gov

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

Electronic Authorization of Applications and Award Documents

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

ii. 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.

iii. Foreign National Participation

All applicants selected for an award under this FOA and project participants (including subrecipients and contractors) who anticipate involving foreign nationals in the performance of an award, may be required to provide DOE with specific information about each foreign national to satisfy requirements for foreign national participation. A "foreign national" is defined as any person who is not a United States citizen by birth or naturalization. The volume and type of information collected may depend on various factors associated with the award. DOE concurrence may be required before a foreign national can participate in the performance of any work under an award.

DOE may elect to deny a foreign national's participation in the award. Likewise, DOE may elect to deny a foreign national's access to a DOE site, information, technologies, equipment, programs, or personnel.

iv. 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.

v. 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>.

vi. 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 NEPA (42 U.S.C. 4321, *et seq.*). NEPA requires federal agencies to integrate environmental values into their decision-making processes by

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considering the potential environmental impacts of their proposed actions. For additional background on NEPA, please see DOE's NEPA website, at <https://www.energy.gov/nepa>.

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 recipient may be required to prepare the records and the costs to prepare the necessary records may be included as part of the project costs.

vii. Flood Resilience

Applications should indicate whether the proposed project location(s) is within a floodplain, how the floodplain was defined, and how flooding will factor into the project's design. The base floodplain long used for planning has been the 100-year floodplain, which has a 1% chance of flooding in any given year. As directed by Executive Order 13690, Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input (2015), federal agencies, including DOE, must continue to avoid development in a floodplain to the extent possible. When doing so is not possible, federal agencies are directed to "expand management from the current base flood level to a higher vertical elevation and corresponding horizontal floodplain to address current and future flood risk and ensure that projects funded with taxpayer dollars last as long as intended." The higher flood elevation is based on one of three approaches: climate-informed science (preferred), freeboard value, or 0.2% annual flood change (500-year floodplain). EO 13690 and related information is available at: <https://www.energy.gov/nepa/articles/eo-13690-establishing-federal-flood-risk-management-standard-and-process-further>.

viii. Applicant Representations and Certifications

1. 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.

2. Corporate Felony Conviction and Federal Tax Liability Representations

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

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- a. It is **not** a corporation that has been convicted of a felony criminal violation under any federal law within the preceding 24 months; and
- b. 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, a corporation is any for-profit or nonprofit 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].

3. Nondisclosure and Confidentiality Agreements Representations

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

- a. 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 contractors 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.
- b. 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:

(1) *“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.”*

(2) The limitation above shall not contravene requirements applicable to Standard Form 312 Classified Information

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Nondisclosure Agreement

(<https://fas.org/sgp/othergov/sf312.pdf>), Form 4414

Sensitive Compartmented Information Disclosure

Agreement (<https://fas.org/sgp/othergov/intel/sf4414.pdf>),

or any other form issued by a federal department or agency governing the nondisclosure of classified information.

- (3) 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.

ix. 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 unusual 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.

x. 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. 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.

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3. EERE may redirect or discontinue funding the project based on the outcome of EERE's evaluation of the project at the Go/No-Go decision point(s).
4. EERE participates in major project decision-making processes.

xi. 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>.

xii. Reporting

Reporting requirements are identified on the Federal Assistance Reporting Checklist, attached to the award agreement.

xiii. Go/No-Go Review

This FOA does not have a Go/No-Go decision review. 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.

xiv. 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 U.S. 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.

xv. Uniform Commercial Code (UCC) Financing Statements

Per 2 CFR 910.360 (Real Property and Equipment) when a piece of equipment is purchased by a for-profit recipient or subrecipient with federal funds, and when the federal share of the financial assistance agreement is more than \$1 million the recipient or subrecipient must:

Properly record, and consent to the Department's ability to properly record if the recipient fails to do so, UCC financing statement(s) for all equipment in excess of \$5,000 purchased with project funds. These financing statement(s)

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must be approved in writing by the Contracting Officer prior to the recording, and they shall provide notice that the recipient's title to all equipment (not real property) purchased with federal funds under the financial assistance agreement is conditional pursuant to the terms of this section, and that the government retains an undivided reversionary interest in the equipment. The UCC financing statement(s) must be filed before the Contracting Officer may reimburse the recipient for the federal share of the equipment unless otherwise provided for in the relevant financial assistance agreement. The recipient shall further make any amendments to the financing statements or additional recordings, including appropriate continuation statements, as necessary or as the Contracting Officer may direct.

xvi. Real Property and Equipment

Subject to the vesting of any property pursuant to Section 309 of the FY 23 Consolidated Appropriations Act (Pub.L.No. 117-328), Division D, Title III, property disposition may be required at the end of a project if the current fair market value of property exceeds \$5,000. For-profit entity disposition requirements are set forth at 2 CFR 910.360. Property disposition requirements for other non-federal entities are set forth in 2 CFR.310 – 200.316.

Real property and equipment purchased with project funds (federal share and recipient cost share) are subject to the requirements at 2 CFR 200.310, 200.311, 200.313, and 200.316 (non-federal entities, except for-profit entities) and 2 CFR 910.360 (for-profit entities).

For projects selected for awards under this FOA, the recipients may (1) take disposition action on the real property and equipment; or (2) continue to use the real property and equipment after the conclusion of the award period of performance with Contracting Officer approval. The recipient's written request for Continued Use must identify the property and include: a summary of how the property will be used (must align with the authorized project purposes); a proposed use period, (e.g., perpetuity, until fully depreciated, or a calendar date when the recipient expects to submit disposition instructions); acknowledgement that the recipient shall not sell or encumber the property or permit any encumbrance without prior written DOE approval; current fair market value of the property; and an estimated useful life or depreciation schedule for equipment.

When the property is no longer needed for authorized project purposes, the recipient must request disposition instructions from DOE. For-profit entity disposition requirements are set forth in 2 CFR 910.360. Property disposition

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requirements for other non-federal entities are set forth in 2 CFR 200.310 – 200.316.

xvii. Implementation of Executive Order 13798, Promoting Free Speech and Religious Liberty

States, local governments, and other public entities may not condition subawards in a manner that would discriminate against or otherwise disadvantage subrecipients based on their religious character.

xviii. Participants and Collaborating Organizations

If selected for award negotiations, the selected applicant must submit a list of personnel who are proposed to work on the project, both at the recipient and subrecipient level and a list of collaborating organizations prior to award. Recipients will have an ongoing responsibility to notify DOE of changes to the personnel and collaborating organizations and submit updated information during the life of the award.

xix. Current and Pending Support

If selected for award negotiations, within 30 days of the selection notice, the selectee must submit 1) current and pending support disclosures and resumes for any new PIs or Senior/Key Personnel and 2) updated disclosures if there have been any changes to the current and pending support submitted with the application. Throughout the life of the award, the Recipient has an ongoing responsibility to submit 1) current and pending support disclosure statements and resumes for any new PI and Senior/Key Personnel and 2) updated disclosures if there are changes to the current and pending support previously submitted to DOE. Also see Section IV.E.xvii.

xx. Interim Conflict of Interest Policy for Financial Assistance

The DOE interim Conflict of Interest Policy for Financial Assistance (COI Policy)¹³ is applicable to all non-Federal entities applying for, or that receive, DOE funding by means of a financial assistance award (e.g., a grant, cooperative agreement, or technology investment agreement) and, through the implementation of this policy by the entity, to each Investigator who is planning to participate in, or is participating in, the project funded wholly or in part under the DOE financial assistance award. The term “Investigator” means the PI and any other person, regardless of title or position, who is responsible for the purpose, design, conduct, or reporting of a project funded by DOE or proposed for funding by DOE. Recipients must flow down the requirements of the interim COI Policy to

¹³ DOE’s interim COI Policy can be found at [PF 2022-17 FAL 2022-02 Department of Energy Interim Conflict of Interest Policy Requirements for Financial Assistance](#).

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any subrecipient non-federal entities. Further, for DOE funded projects, the recipient must include all financial conflicts of interest (FCOI) (i.e., managed and unmanaged/ unmanageable) in its initial and ongoing FCOI reports.

It is understood that non-federal entities and individuals receiving DOE financial assistance awards will need sufficient time to come into full compliance with DOE's interim COI Policy. To provide some flexibility, DOE allows for a staggered implementation. Specifically, prior to award, applicants selected for award negotiations must: ensure all Investigators complete their significant financial disclosures; review the disclosures; determine whether a FCOI exists; develop and implement a management plan for FCOIs; and provide DOE with an initial FCOI report that includes all FCOIs (i.e., managed and unmanaged/ unmanageable). Recipients will have 180 days from the date of the award to come into full compliance with the other requirements set forth in DOE's interim COI Policy. Prior to award, the applicant must certify that it is, or will be within 180 days of the award, compliant with all requirements in the COI Policy.

xxi. Fraud, Waste, and Abuse

The mission of the DOE Office of Inspector General (OIG) is to strengthen the integrity, economy, and efficiency of the Department's programs and operations including deterring and detecting fraud, waste, abuse, and mismanagement. The OIG accomplishes this mission primarily through investigations, audits, and inspections of DOE activities to include grants, cooperative agreements, loans, and contracts.

The OIG maintains a hotline for reporting allegations of fraud, waste, abuse, or mismanagement. To report such allegations, please visit <https://www.energy.gov/ig/ig-hotline>.

Additionally, recipients of DOE awards must be cognizant of the requirements of [2 CFR 200.113 Mandatory disclosures](#), which states:

The non-Federal entity or applicant for a federal award must disclose, in a timely manner, in writing to the Federal awarding agency or pass-through entity all violations of Federal criminal law involving fraud, bribery, or gratuity violations potentially affecting the Federal award. Non-Federal entities that have received a federal award including the term and condition outlined in appendix XII of 2 CFR Part 200 are required to report certain civil, criminal, or administrative proceedings to SAM.gov. Failure to make required disclosures can result in any of the remedies described in [2 CFR 200.339](#). (See also [2 CFR part 180](#), [31 U.S.C. § 3321](#), and [41 U.S.C. § 2313](#).) [[85 FR 49539](#), Aug. 13, 2020]

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Applicants and subrecipients (if applicable) are encouraged to allocate sufficient costs in the project budget to cover the costs associated for personnel and data infrastructure needs to support performance management and program evaluation needs, including but not limited to independent program and project audits to mitigate risks for fraud, waste, and abuse.

xxii. Human Subjects Research

Research involving human subjects, biospecimens, or identifiable private information conducted with DOE funding is subject to the requirements of DOE Order 443.1C, Protection of Human Research Subjects, 45 CFR Part 46, Protection of Human Subjects (subpart A which is referred to as the “Common Rule”), and 10 CFR Part 745, Protection of Human Subjects. Additional information on the DOE Human Subjects Research Program can be found at: [HUMAN SUBJECTS Human Subjects Pr... | U.S. DOE Office of Science \(SC\) \(osti.gov\)](#).

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 described below. Questions regarding this FOA must be submitted to [\[insert FOA email address\]](#) no later than three (3) business days prior to the application due date and time. Please note, feedback on individual concepts will not be provided through Q&A.

All questions and answers related to this FOA will be posted on EERE eXCHANGE at: <https://eere-exchange.energy.gov>. **You must first select the FOA Number to view the questions and answers specific to this FOA.** EERE will attempt to respond to a question within three (3) 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 Modifications

Amendments to this FOA will be posted on EERE eXCHANGE 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

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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. 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.

C. 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.

D. Treatment of Application Information

Applicants should not include trade secrets or business-sensitive, proprietary, or otherwise confidential information 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. Applicants are advised to not include any critically sensitive proprietary detail.

If an application includes trade secrets or business-sensitive, proprietary, or otherwise confidential information, it is furnished to the federal government in confidence with the understanding that the information shall be used or disclosed only for evaluation of the application. Such information will be withheld from public disclosure to the extent permitted by law, including the Freedom of Information Act. Without assuming any liability for inadvertent disclosure, EERE will seek to limit disclosure of such information to its employees and to outside reviewers when necessary for merit review of the application or as otherwise authorized by law. This restriction does not limit the federal government's right to use the information if it is obtained from another source.

If an applicant chooses to submit trade secrets or business-sensitive, proprietary, or otherwise confidential information, the applicant must provide **two copies** of the submission (e.g., Concept Paper, Full Application). The first copy should be marked "non-confidential," with the information believed to be confidential deleted. The second copy should be marked "confidential" and must clearly and conspicuously identify the trade secrets or business-sensitive, proprietary, or otherwise confidential information and must be marked as described below. Failure to comply with these marking requirements may result in the disclosure of the unmarked information under the Freedom of Information Act or otherwise. The federal government is not liable for the disclosure or use of unmarked information and may use or disclose such information for any purpose as authorized by law.

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The cover sheet of the Full Application, and other applicant submission must be marked as follows and identify the specific pages containing trade secrets or business-sensitive, proprietary, or otherwise confidential information:

Notice of Restriction on Disclosure and Use of Data:

Pages [list applicable pages] of this document may contain trade secrets or business-sensitive, proprietary, or otherwise confidential information that is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes or in accordance with a financial assistance 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]

In addition, (1) the header and footer of every page that contains trade secrets or business-sensitive, proprietary, or otherwise confidential information must be marked as follows: “Contains Trade Secrets or Business-Sensitive, Proprietary, or Otherwise Confidential Information Exempt from Public Disclosure,” and (2) every line or paragraph containing such information must be clearly marked with double brackets or highlighting. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

E. Evaluation and Administration by Non-Federal Personnel

In conducting the merit review evaluation, the Go/No-Go Reviews, and Peer Reviews, 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, including EERE contractors. The applicant, by submitting its application, consents to the use of non-federal reviewers/administrators. Non-federal reviewers must sign conflict of interest (COI) and non-disclosure acknowledgements (NDA) prior to reviewing an application. Non-federal personnel conducting administrative activities must sign an NDA.

F. 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.

G. 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

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personal credit information of principal(s) of a small business if there is insufficient information to determine financial capability of the organization).

H. 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.

I. Retention of Submissions

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

J. 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.

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.

K. 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.

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L. Export Control

The United States government regulates the transfer of information, commodities, technology, and software considered to be strategically important to the United States to protect national security, foreign policy, and economic interests without imposing undue regulatory burdens on legitimate international trade. There is a network of federal agencies and regulations that govern exports that are collectively referred to as “Export Controls.” All recipients and subrecipients are responsible for ensuring compliance with all applicable United States Export Control laws and regulations relating to any work performed under a resulting award.

The recipient must immediately report to DOE any export control violations related to the project funded under the DOE award, at the recipient or subrecipient level, and provide the corrective action(s) to prevent future violations.

M. Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment

As set forth in 2 CFR 200.216, recipients and subrecipients are prohibited from obligating or expending project funds (federal funds and recipient cost share) to procure or obtain; extend or renew a contract to procure or obtain; or enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that use *covered telecommunications equipment or services* as a substantial or essential component of any system, or as critical technology as part of any system. As described in Section 889 of Public Law 115-232, *covered telecommunications equipment* is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).

See Public Law 115-232, Section 889, 2 CFR 200.216, and 2 CFR 200.471 for additional information.

N. Personally Identifiable Information (PII)

All information provided by the applicant must to the greatest extent possible exclude PII. The term “PII” refers to information which can be used to distinguish or trace an individual's identity, such as their name, social security number, biometric records, alone, or when combined with other personal or identifying information which is linked or linkable to a specific individual, such as date and place of birth, mother's maiden name. (See OMB Memorandum M-17-12 dated January 3, 2017)

By way of example, applicants must screen resumes to ensure that they do not contain PII such as personal addresses, personal landline/cell phone numbers, and personal emails. **Under no circumstances should Social Security Numbers (SSNs) be**

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included in the application. Federal agencies are prohibited from the collecting, using, and displaying unnecessary SSNs. (See, the Federal Information Security Modernization Act of 2014 (Pub. L. No. 113-283, Dec 18, 2014; 44 U.S.C. § 3551).

O. Annual Independent Audits

If a for-profit entity is a prime recipient and has expended \$750,000 or more of DOE awards during the entity's fiscal year, an annual compliance audit performed by an independent auditor is required. For additional information, please refer to 2 CFR 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 awards during the non-federal entity's fiscal year, a Single or Program-Specific Audit is required. For additional information, please refer to 2 CFR 200.501 and Subpart F.

Applicants and subrecipients (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 terms in the titles specific to regulations applicable to cost sharing. EERE almost always uses “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. The 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 two 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, it is allowable as cost share. Conversely, if the cost is not allowable under the cost principles and not eligible for reimbursement, 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:

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- 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 above regulations, other factors may also come into play such as timing of donations and length of the project period. For example, the value of 10 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.

General Cost Sharing Rules on a DOE Award

- 1. Cash Cost Share** encompasses all contributions to the project made by the recipient or subrecipient(s), for costs incurred and paid for during the project. This includes when an organization pays for personnel, supplies, equipment for their own company with organizational resources. If the cost of the item or service is reimbursed, it is cash cost share. All cost share items must be necessary to the performance of the project.
- 2. In-Kind Cost Share** encompasses all contributions to the project made by the recipient or subrecipient(s) that do not involve a payment or reimbursement and represent donated items or services. In-Kind cost share items include volunteer personnel hours, donated existing equipment, and donated existing supplies. The cash value and calculations thereof for all In-Kind cost share items must be justified and explained in the Cost Share section of the project Budget Justification. All cost share items must be necessary to the performance of the project. Consult your DOE contact if you have questions before filling out the In-Kind cost share section of the Budget Justification.
- 3. Funds from other federal sources** may **not** be counted as cost share. This prohibition includes FFRDC subrecipients. Non-federal sources include any source not originally derived from federal funds. Cost sharing commitment letters from subrecipients must be provided with the original application.
- 4. Fee or profit**, including foregone fee or profit, are not allowable as project costs (including cost share) under any resulting award. The project may only incur those costs that are allowable and allocable to the project (including cost share) as determined in accordance with the applicable cost principles prescribed in FAR Part 31 for For-Profit entities and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.

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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:

(A) 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:

- (1)** They are verifiable from the recipient's records.
- (2)** They are not included as contributions for any other federally assisted project or program.
- (3)** They are necessary and reasonable for the proper and efficient accomplishment of project or program objectives.
- (4)** They are allowable under the cost principles applicable to the type of entity incurring the cost as follows:
 - a.** 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 FAR, 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; and
 - b.** Other types of organizations. For all other non-federal entities, allowability of costs is determined in accordance with 2 CFR Part 200 Subpart E.
- (5)** They are not paid by the federal government under another award unless authorized by federal statute to be used for cost sharing or matching.
- (6)** They are provided for in the approved budget.

(B) Valuing and documenting contributions

- (1)** 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

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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:

- a. The certified value of the remaining life of the property recorded in the recipient's accounting records at the time of donation; or
 - b. 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.
- (2)** 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.
- (3)** 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.
- (4)** Valuing property donated by third parties.
 - a. 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.
 - b. 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:

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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 million 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)

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APPENDIX C – WAIVER REQUESTS FOR: 1. FOREIGN ENTITY PARTICIPATION; AND 2. FOREIGN WORK

1. Waiver for Foreign Entity Participation

Many of the technology areas DOE funds fall in the category of critical and emerging technologies (CETs). CETs are a subset of advanced technologies that are potentially significant to United States national and economic security.¹⁴ For projects selected under this FOA, all recipients and subrecipients must be organized, chartered, or incorporated (or otherwise formed) under the laws of a state or territory of the United States; have majority domestic ownership and control; and have a physical location for business operations in the United States. To request a waiver of this requirement, an applicant must submit an explicit waiver request in the Full Application.

Waiver Criteria

Foreign entities seeking to participate in a project funded under this FOA must demonstrate to the satisfaction of DOE that:

- a. Its participation is in the best interest of the United States industry and United States economic development;
- b. The project team has appropriate measures in place to control sensitive information and protect against unauthorized transfer of scientific and technical information;
- c. Adequate protocols exist between the United States subsidiary and its foreign parent organization to comply with export control laws and any obligations to protect proprietary information from the foreign parent organization;
- d. The work is conducted within the United States and the entity acknowledges and demonstrates that it has the intent and ability to comply with the United States Competitiveness Provision (see Section VI.B.xxii.); and
- e. The foreign entity will satisfy other conditions that may be deemed necessary by DOE to protect United States government interests.

Content for Waiver Request

A Foreign Entity waiver request must include the following:

- a. Information about the entity: name, point of contact, and proposed type of involvement in the project;
- b. Country of incorporation, the extent of the ownership/level control by foreign entities, whether the entity is state owned or controlled, a summary of the ownership breakdown of the foreign entity, and the percentage of

¹⁴ See [Critical and Emerging Technologies List Update \(whitehouse.gov\)](https://www.whitehouse.gov).

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- ownership/control by foreign entities, foreign shareholders, foreign state or foreign individuals;
- c. The rationale for proposing a foreign entity participate (must address criteria above);
 - d. A description of the project's anticipated contributions to the United States economy;
 - How the project will benefit the United States, including manufacturing, contributions to employment in the United States and growth in new markets and jobs in the United States;
 - How the project will promote manufacturing of products and/or services in the United States;
 - e. A description of how the foreign entity's participation is essential to the project;
 - f. A description of the likelihood of Intellectual Property (IP) being created from the work and the treatment of any such IP; and
 - g. Countries where the work will be performed (Note: if any work is proposed to be conducted outside the United States, the applicant must also complete a separate request foreign work waiver.)

DOE may also require:

- A risk assessment with respect to IP and data protection protocols that includes the export control risk based on the data protection protocols, the technology being developed, and the foreign entity and country. These submissions could be prepared by the project lead (if not the prime recipient), but the prime recipient must make a representation to DOE as to whether it believes the data protection protocols are adequate and make a representation of the risk assessment – high, medium, or low risk of data leakage to a foreign entity.
- Additional language be added to any agreement or subagreement to protect IP, mitigate risk, or other related purposes.

DOE may require additional information before considering the waiver request.

DOE's decision concerning a waiver request is not appealable.

2. **Performance of Work in the United States (Foreign Work Waiver Request)**

As set forth in Section IV.I.iii., all work funded under this FOA must be performed in 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 DOE that it would further the purposes of this FOA and is otherwise in the economic interests of the

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United States to perform work outside of the United States. A request for a foreign work waiver must include the following:

1. The rationale for performing the work outside the United States (“foreign work”);
2. A description of the work proposed to be performed outside the United States;
3. An explanation as to how the foreign work is essential to the project;
4. A description of the anticipated benefits to be realized by the proposed foreign work and the anticipated contributions to the U.S. economy;
5. The associated benefits to be realized and the contribution to the project from the foreign work;
6. How the foreign work will benefit the United States, including manufacturing, contributions to employment in the United States and growth in new markets and jobs in the United States;
7. How the foreign work will promote manufacturing of products and/or services in the United States;
8. A description of the likelihood of IP being created from the foreign work and the treatment of any such IP;
9. The total estimated cost (DOE and recipient cost share) of the proposed foreign work;
10. The countries in which the foreign work is proposed to be performed; and
11. The name of the entity that would perform the foreign work.

DOE may require additional information before considering the waiver request.

DOE’s decision concerning a waiver request is not appealable.

APPENDIX D – REQUIRED USE OF AMERICAN IRON, STEEL, MANUFACTURED PRODUCTS, AND CONSTRUCTION MATERIALS BUY AMERICA REQUIREMENTS FOR INFRASTRUCTURE PROJECTS

A. Definitions

For purposes of the Buy America requirements, based both on the statute and OMB Guidance Document dated April 18, 2022, the following definitions apply:

Construction materials includes an article, material, or supply—other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives¹⁵—that is or consists primarily of:

- Non-ferrous metals;
- Plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
- Glass (including optic glass);
- Lumber; or
- Drywall.

Infrastructure includes, at a minimum, the structures, facilities, and equipment for, in the United States, roads, highways, and bridges; public transportation; dams, ports, harbors, and other maritime facilities; intercity passenger and freight railroads; freight and intermodal facilities; airports; water systems, including drinking water and wastewater systems; electrical transmission facilities and systems; utilities; broadband infrastructure; and buildings and real property. Infrastructure includes facilities that generate, transport, and distribute energy.

Moreover, according to the OMB guidance document:

When determining if a program has infrastructure expenditures, Federal agencies should interpret the term “infrastructure” broadly and consider the definition provided above as illustrative and not exhaustive. When determining if a particular construction project of a type not listed in the definition above constitutes “infrastructure,” agencies should consider whether the project will serve a public function, including whether the project is publicly owned and operated, privately operated on behalf of the public, or is a place of public accommodation, as opposed to a project that is privately owned and not open to the public. Projects with the former qualities have greater indicia of infrastructure, while projects with the latter quality have fewer. Projects consisting solely of the

¹⁵ BIL, § 70917(c)(1).

purchase, construction, or improvement of a private home for personal use, for example, would not constitute an infrastructure project.

The Agency, not the applicant, will have the final say as to whether a given project includes infrastructure, as defined herein. Accordingly, in cases where the “public” nature of the infrastructure is unclear but the other relevant criteria are met, DOE strongly recommends that applicants complete their full application with the assumption that Buy America requirements will apply to the proposed project.

Project means the construction, alteration, maintenance, or repair of infrastructure in the United States.

B. Buy America Requirements for Infrastructure Projects (“Buy America” requirements)

In accordance with Section 70914 of the BIL, none of the project funds (includes federal share and recipient cost share) may be used for a project for infrastructure unless:

- (1) all iron and steel used in the project are produced in the United States--this means all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States;
- (2) all manufactured products used in the project are produced in the United States—this means the manufactured product was manufactured in the United States; and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been established under applicable law or regulation; and
- (3) all construction materials¹⁶ are produced in the United States—this means that all manufacturing processes for the construction material occurred in the United States.

The Buy America requirements only apply to articles, materials, and supplies that are consumed in, incorporated into, or affixed to an infrastructure project. As such, it does not apply to tools, equipment, and supplies, such as temporary scaffolding, brought to the construction site and removed at or before the completion of the infrastructure project. Nor does the Buy America requirements apply to equipment and furnishings, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished infrastructure project, but are not an integral part of the structure or permanently affixed to the infrastructure project.

¹⁶ Excludes cement and cementitious materials, aggregates such as stone, sand, or gravel, or aggregate binding agents or additives.

These requirements must flow down to all sub-awards, all contracts, subcontracts, and purchase orders for work performed under the proposed project, except where the prime recipient is a for-profit entity. Based on guidance from the Office of Management and Budget (OMB), the Buy America requirements of the BIL do not apply to DOE projects in which the prime recipient is a for-profit entity; the requirements only apply to projects whose prime recipient is a State, local government, Indian Tribe, Institution of Higher Education, or non-profit organization.

For additional information related to the application and implementation of these Buy America requirements, please see OMB Memorandum M-22-11, issued April 18, 2022:

Note that for all applicants—both non-Federal entities and for-profit entities—DOE is including a Program Policy Factor that the Selection Official may consider in determining which Full Applications to select for award negotiations that considers whether the applicant has made a commitment to procure U.S. iron, steel, manufactured products, and construction materials in its project.

C. Waivers

The DOE financial assistance agreement will require each recipient: (1) to fulfill the commitments made in its application regarding the procurement of U.S.-produced products and (2) to fulfill the commitments made in its application regarding the procurement of other key component metals and domestically manufactured products that are deemed available in sufficient and reasonably available quantities or of a satisfactory quality at the time of award negotiation.

In limited circumstances, DOE may waive the application of the Buy America requirements where DOE determines that:

- (1) Applying the Buy America requirements would be inconsistent with the public interest;
- (2) The types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality; or
- (3) The inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25%.

If an applicant or recipient is seeking a waiver of the Buy America requirements, it may submit a waiver request after it has been notified of its selection for award negotiations. A waiver request must include:

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Include FOA name and number in subject line.*

- A detailed justification for the use of “non-domestic” iron, steel, manufactured products, or construction materials to include an explanation as to how the non-domestic item(s) is essential to the project;
- A certification that the applicant or recipient made a good faith effort to solicit bids for domestic products supported by terms included in requests for proposals, contracts, and nonproprietary communications with potential suppliers;
- Applicant/Recipient name and Unique Entity Identifier (UEI)
- Total estimated project cost, DOE and cost-share amounts;
- Project description and location (to the extent known);
- List and description of iron or steel item(s), manufactured goods, and construction material(s) the applicant or recipient seeks to waive from Domestic Content Procurement Preference requirement, including name, cost, country(ies) of origin (if known), and relevant PSC and NAICS code for each;
- Waiver justification including due diligence performed (e.g., market research, industry outreach) by the applicant or recipient; and
- Anticipated impact if no waiver is issued.

DOE may require additional information before considering the waiver request.

Waiver requests are subject to public comment periods of no less than 15 days and must be reviewed by the Made in America Office. There may be instances where an award qualifies, in whole or in part, for an existing waiver described at [DOE Buy America Requirement Waiver Requests](#).

DOE’s decision concerning a waiver request is not appealable.

APPENDIX E – LIST OF EXAMPLE JUSTICE40 METRICS

The following represents a list of example metrics that VTO may use to measure projects' Justice40 benefits to underserved communities. Some metrics may be more specific to certain Areas of Interest or projects than others, and VTO will work with successful applicants to determine which Justice40 metrics are most relevant to their project.

Metric Category	Metric Description
Energy Democracy	Number of organizations with a funded role in the project who represent a DAC
	Project dollars budgeted [\$] for organizations who represent a DAC
	Total number of outreach/education events
	Number of outreach/education events designed to benefit members of DACs
	Total number of people reached through outreach/education events
	Number of stakeholder engagement events designed to benefit members of DACs
	Total number of people reached through stakeholder engagement events
Technical Assistance	Number of fleets who were provided technical assistance
	Number of fleets who were provided technical assistance which represent a DAC
	Number of non-fleet organizations who were provided technical assistance
	Number of non-fleet organizations receiving technical assistance which represent a DAC
Workforce Training	Number of workforce development events provided
	Number of workforce development events primarily serving DACs
	Number of attendees receiving workforce development training
	Project \$ allocated for training events for people who work or live in DACs
Energy Burden	Net gasoline gallon equivalent (GGE) reduced annually for an underserved community
	Reduced transportation energy burden for an underserved community

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Metric Category	Metric Description
Environmental: Vehicle Emissions Reductions	Reduction in PM 2.5 in an underserved community
	Reduction in NOx annually in an underserved community
	Reduction in GHG annually in an underserved community

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APPENDIX F – LIST OF ACRONYMS

COI	Conflict of Interest
CRADA	Cooperative Research and Development Agreement
DEC	Determination of Exceptional Circumstances
DEI	Diversity, Equity, and Inclusion
DMP	Data Management Plan
DOE	Department of Energy
DOI	Digital Object Identifier
EERE	Energy Efficiency and Renewable Energy
FAR	Federal Acquisition Regulation
FCOI	Financial Conflicts of Interest
FFATA	Federal Funding and Transparency Act of 2006
FOA	Funding Opportunity Announcement
FOIA	Freedom of Information Act
FFRDC	Federally Funded Research and Development Center
GAAP	Generally Accepted Accounting Principles
IPMP	Intellectual Property Management Plan
IRB	Institutional Review Board
M&O	Management and Operating
MFA	Multi-Factor Authentication
MPIN	Marketing Partner ID Number
MSI	Minority-Serving institution
MYPP	Multi-Year Program Plan
NDA	Non-Disclosure Acknowledgement
NEPA	National Environmental Policy Act
NNSA	National Nuclear Security Agency
NSF	National Science Foundation
OIG	Office of Inspector General
OMB	Office of Management and Budget
OSTI	Office of Scientific and Technical Information
OTA	Other Transactions Authority
PII	Personal Identifiable Information
R&D	Research and Development
RFI	Request for Information
RFP	Request for Proposal
SAM	System for Award Management
SciENCv	Science Experts Network Curriculum Vita
SMART	Specific, Measurable, Attainable, Realistic, and Timely
SOPO	Statement of Project Objectives
SPOC	Single Point of Contact
STEM	Science, Technology, Engineering, and Mathematics
TAA	Technical Assistance Agreement

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TIA	Technology Investment Agreement
TRL	Technology Readiness Level
UCC	Uniform Commercial Code
UEI	Unique Entity Identifier
WBS	Work Breakdown Structure
WP	Work Proposal

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Project Title: Charging Tennessee: Advancing Public Vehicle Fleet Electrification

DE-FOA-0003250: Topic Area of Interest 3: Clean Transportation Demonstration and Deployment

Control Number: 3250-1575

Principal Investigator: Prof. Ping Chen
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Tennessee Technological University, 1 William L Jones Dr, Cookeville, TN 38505
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Team Member Organizations and Project Locations

Tennessee Technological University (TTU, lead, Location: Cookeville, TN)
Nashville Department of Transportation (NDOT, Nashville, TN)
Nashville Electric Service (NES, Nashville, TN)
City of Chattanooga (Chattanooga, TN)
Electric Power Board of Chattanooga (EPB, Chattanooga, TN)
Volkswagen Group of America, Inc. (VW, Chattanooga, TN)
Oak Ridge National Laboratory (ORNL, Oak Ridge, TN)
East Tennessee Clean Fuels Coalition (ETCFC, Knoxville, TN)
Middle-West Tennessee Clean Fuels Coalition (MWTFCF, Nashville, TN)

1. Project Overview (Approximately 10% of the Technical Volume)

Background & Relevance to AOI Objectives: Public vehicle fleets ranging from light-duty (LD) vehicles that serve public works to medium-duty (MD) and heavy-duty (HD) transit vehicles, contribute significantly to the greenhouse gas emissions, as there is a total of 4,278, 956 vehicles (federal, state, county, and municipal)¹ in 2023. For rapidly growing large cities like Nashville, a park-and-ride system (P+R), has become an integral part of transportation infrastructure. A P+R system (including 15 MD traditional shuttles), has been deployed by Nashville Department of Transportation (NDOT) to serve diverse commuters. In the P+R system, commuters drive to a central parking location and leave their cars in designated park-and-ride lots, and then board a bus from that location to reach their final destination within the city. While electrifying P+R systems can help create a more sustainable, efficient, and healthy future for urban transportation, there are limited number of electrified P+R systems deployed in U.S. to help make informed decision in P+R system electrification. For many medium-sized cities like City of Chattanooga, hundreds to thousands of public vehicles have been deployed to serve various public works. Currently, as is the case with many municipalities across the country, Chattanooga faces many real challenges to meeting operational and capital budget needs. As such, the City is focusing its electrification efforts on the over 300 eligible light-duty vehicles whose functions can be met with EV technology.

Project Goal and Proposed Technologies: To address the abovementioned challenges, the goal of this project is to create a proof-of-concept EV testbed including two of the most rapidly growing cities in TN including Nashville and Chattanooga for pilot deployment and demonstration of various EVs in public vehicle fleets in diverse applications to achieve over 50% reduction of greenhouse gas (GHG) emissions with lower total cost of ownerships (TCOs). On one side, an electric P+R system will be established to downtown Nashville that will deploy electric shuttle buses while providing charging capabilities to the commuters for EV charging, as shown in Figure 1. Four electric shuttle buses will be deployed and demonstrated in four P+R routes in downtown Nashville. Six charging stations (4 high-power level-2 charging stations and 2 DCFC stations) will be developed for overnight charging of the electric shuttle buses at the parking lot of P+R. Additional 4 charging stations will be deployed at the centralized parking facility to support EV charging for the commuters. Such electric P+R system can serve as a centralized charging hub for low-income commuters who may own EVs but do not have dedicated charging stations. On the other side, a fleet of 12 light-duty EVs (including electric sedan/hatch back, SUV, pickup truck) will be deployed by City of Chattanooga as a pilot group of public vehicles to serve five different departments and divisions, as shown in Figure 1, including Department of Community Development, Department of Waste Resources, Department of Public Works, Department of Parks and Outdoors, and City Internal Mail Services. Charging infrastructure will be developed in City of Chattanooga via partnership with EPB of Chattanooga to support charging of EV fleets.

¹ <https://www.fhwa.dot.gov/policyinformation/statistics/2021/mv7.cfm>

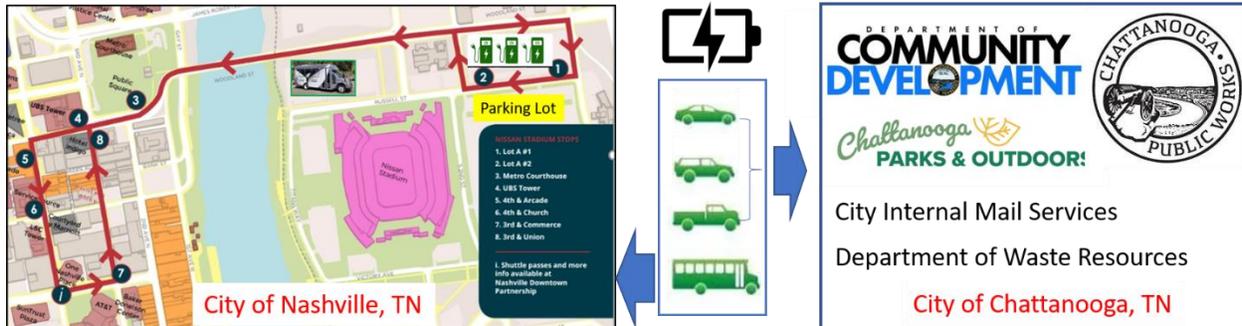


Figure 1 Electrification of Public Vehicle Fleets in Nashville and Chattanooga, TN

Project Team: A strong project team has been assembled to conduct this project, including

- Tennessee Technological University (leading organization of this proposal), to oversee project implementation, lead pilot demonstration of EV fleet and fleet study, outreach and education.
- East TN Clean Fuels Coalition (one of the leading Clean-city coalitions in U.S.) and Middle-West TN Clean Fuels Coalition, to support EV fleet studies, outreach and education.
- Nashville Department of Transportation, to implement electric P+R service in Nashville
- Nashville Electric Service and Electric Power Board of Chattanooga as the power distribution companies to support EV charging infrastructure development and energy and grid studies.
- Volkswagen Group of America, Inc. and Phoenix Motorcars, as vehicle OEM to support data collection and electric shuttle bus operation.
- Oak Ridge National Lab, to support data analyses and operational optimization.

Project tasks: the project goal will be achieved via the following tasks:

1) EV acquisition and demonstration: This task will include **a)** acquisition of four electric shuttle buses (a 141-kWh battery, up to 150 miles per full charge) for NDOT P+R service; **b)** acquisition of 12 light-duty EVs for City of Chattanooga public fleet service; **c)** instrument all EVs with data acquisition system for data collection and analysis; **d)** demonstrate the four electric shuttle buses in the four P+R routes in downtown Nashville, TN; **e)** demonstrate light-duty EVs in seven various public applications (within 5 different departments) by Chattanooga's municipal fleet.

2) Charging infrastructure development and demonstration: This task will include: **a)** development and deployment of EV charging infrastructure that including 4 19.2-kW level-2 charging stations and 2 DCFC stations along NDOT P+R route in Nashville to support electric shuttle bus operation; **b)** development and deployment of 10 level-2 charging stations (non-networked) in City of Chattanooga's fleet facility to support light-duty EV operation.

3) Data collection and analysis, and operational optimization: this task will include: **a)** collecting diverse operational data from electric shuttle bus in four diverse routes and light-duty EVs with comprehensive seasonal and traffic factors. **b)** provide comprehensive data analysis to quantify the benefits of electric shuttle bus and light-duty EVs (fuel saving, total cost of ownership, eco-driving/routing, driving behavior study); **c)** Based on the data analysis results, the project team will optimize EV operation (driving, routing, charging schedules). **d)** Based on the pilot demonstration, the project team will develop plan for 100% fleet electrification for NDOT's P+R system (15 shuttle buses in total) and City of Chattanooga (over 300 eligible light-duty vehicles whose functions can be met with EV technology).

4) Information exchange, outreach and education: **a)** Share successful stories, project findings, observations, best practices and lessons learned with broad stakeholders including urban communities using P+R service, municipal fleet managers, and policy makers across TN and other states; **b)** Conduct various outreach activities (EV Ride-n-Drive/Show-n-Tell, webinar series, local/regional EV chapter development) to educate stakeholders.

[Need to add a short paragraph about project output deliverables]

The **impacts of EERE funding** include: 1) helping urban/suburban residents, fleet owners, and government agencies to significantly accelerate EV adoption; 2) supporting smooth transition from fossil fuel-based economy to clean energy economy and create new job opportunities in EV sector; 3) reducing fossil fuel consumption and greenhouse gas emissions, and improving fuel diversity, environmental quality and public health in urban areas; 4) improving mobility equity for the underserved and economically disadvantaged communities in urban community; 5) facilitating collaborative opportunities between university, automotive EV OEMs, national lab, and other stakeholders to serve rapidly growing EV industry and clean energy economy.

Project Team Qualifications: The team will be led by Project PI, **Prof. Pingen Chen** at TTU. Prof. Chen is a well-recognized expert for his research on alternative fuel vehicles including EV and battery technology development, EV fleet study, and EV ecosystem development. Dr. Chen has been serving as PIs and co-PI of several DOE-funded pilot EV demonstration projects in underserved communities (rural and/or low-income) in Appalachian region. Dr. Chen will leverage his knowledge and experience in EV fleet study and EV-ecosystem from current project and is well positioned to lead the proposed public fleet electrification project. **Co-PI, Dr. Wan Li** is a Research Associate Staff Member in the Mobility and Energy Transitions Analysis (META) group at ORNL. Her research interests focus on traffic system modeling and simulation, urban transportation network operation and control, data-driven spatiotemporal forecasting, and transportation big data analytics. In particular, she is interested in integrating data driven methods, optimization algorithms, and big data analytics tools into intelligent transportation systems to explore how they could support the research and benefit the development of smart cities. **Mr. Jonathan G. Overly** has been in the advanced fuels and vehicles industry since 1997 and founded the nonprofit East Tennessee Clean Fuels Coalition in 2001. He has decades of project management experience and is heavily involved in the Drive Electric TN (DET) initiative both overseeing operations and in participating in multiple working groups and specific activities including the development of DET chapters (including in urban and rural areas), green fleet studies, infrastructure planning and siting, and organizing DET's Utilities Working Group. **Mr. Casey Hopkins** (co-PI) is currently serving as the Program Manager & Grant Coordinator at Nashville Department of Transportation. He has broad knowledge and experience in alternative fuel vehicles (such as EVs) and relevant fueling infrastructure development. He will support P+R system electrification in this project. **Mr. Erik Schmidt** (co-PI) is currently serving as the Director of Sustainability, City of Chattanooga, TN. Mr. Schmidt is leading several smart city initiatives in City of Chattanooga to adopt EVs and development charging infrastructure. He will lead the public fleet electrification efforts in Chattanooga in this project. The project will also receive strong support from vehicle OEMs like **VW** (major EV OEM) and Phoenix Motorcars and major electric power distribution companies such as NES in Nashville and EPB in Chattanooga.

Equipment, Facilities and Prior Experience: The research team has adequate access to the necessary equipment, facilities, and expertise for EV charging station development, EV

deployment and demonstration, data acquisition and storage, workforce training, outreach activities. The PI and co-PIs will effectively coordinate with the two Clean Cities Coalitions in the state. The project team has abundant prior experience on directing and conducting research projects closely related to this proposal in terms of challenge, risk, and complexity. The PIs anticipate manageable key technical risks/issues associated with the proposed project with the team members' broad and in-depth expertise in the relevant areas.

Budget: The total budget will be \$2,163,012 with DOE funding of \$999,976 and cost share of \$1,163,036 from the project team. The budget will mainly cover the costs for charging station development, acquisition and maintenance of EVs, staff support from Clean Cities Coalitions, graduate student and faculty supports, time of PI/co-PIs, travel, outreach activities, and supplies.

2. Project Approach and Impact

2.1. Problem Statement

Public fleet vehicles often have higher utilization rates compared to individual vehicles. This is because fleet vehicles are typically used for specific purposes such as public transportation, service delivery, or maintenance tasks, and are managed to maximize their usage and efficiency. Internal combustion engine (ICE) vehicles, despite their widespread use, face several challenges in public fleet applications, due to adverse emissions and environmental impact, high dependency on fossil fuels, costly maintenance and reliability, low fuel efficiency, and poor public perception. Deployment of ICE-powered vehicle can significantly impact urban air quality. In densely populated areas, ICE vehicles contribute to poor air quality. Fleet managers must balance operational needs with environmental considerations. As the world transitions toward cleaner energy sources, the long-term viability of ICE vehicles becomes uncertain. Fleet managers need to plan for future changes. In summary, while ICE vehicles have served public fleets for decades, addressing these challenges is essential to ensure efficient, sustainable, and environmentally responsible transportation.

Electric vehicles (EVs) offer several benefits when applied to public fleet applications. Here are some of the key advantages: **Lower Operating Costs:** EVs typically have higher fuel economy compared to conventional vehicles, leading to lower fuel costs. They also benefit from less volatile electricity prices, which can be more predictable over time. **Reduced Maintenance:** Electric vehicles generally require less maintenance than their gasoline or diesel counterparts, which can result in significant savings. **Performance Features:** EVs can match or surpass the performance of conventional vehicles, especially in terms of torque and smooth acceleration from a stop, which is beneficial for fleets that haul heavy loads. **Environmental Benefits:** With high efficiency and low emissions, EVs can help organizations meet environmental objectives and improve local air quality. **Safety:** Electric vehicles must meet the same federal safety standards and undergo the same rigorous testing as conventional vehicles sold in the U.S., ensuring equal safety levels. **Flexible Charging Options:** EVs can be charged at fleet facilities or public stations, with the possibility of using off-peak electric rates to further reduce costs. Plug-in hybrid electric vehicles (PHEVs) offer even more flexibility as they can also fuel with gasoline or diesel when necessary. **Positive Public Image:** Utilizing EVs in highly visible fleets, such as transit and school buses, police vehicles, and taxis, can project a positive image and demonstrate community leadership. These benefits make EVs a compelling choice for public fleet applications, contributing to cost savings, environmental sustainability, and operational efficiency.

Adopting EVs for large and mid-size municipalities comes with a set of challenges that need to be addressed to ensure a smooth transition. Here are some of the key challenges:

Charging Infrastructure: One of the primary challenges is the development of adequate charging infrastructure to meet the needs of EVs. This includes the installation of charging stations in strategic locations to provide necessary accessibility and the harmonization with smart grids for efficient energy management.

Cost and Budget Constraints: The higher initial cost of EVs compared to internal combustion engine vehicles can be a barrier for municipalities. Budget constraints may limit the ability to invest in EVs and the necessary infrastructure.

Energy Management: Efficient energy management is crucial as the integration of EVs into the power grid can significantly increase electricity demand. Municipalities must ensure that their energy systems can handle this increased load.

Real Estate for Charging Stations: Finding the space for charging stations can be a challenge, especially in densely populated areas where real estate is at a premium. This is particularly true for cities like Nashville, where space is limited.

Vehicle-to-Grid (V2G) Integration: The integration of V2G systems, which allow EVs to interact with the power grid, can be complex. There may be resistance from EV owners to participate in V2G programs, and economic barriers can also hinder adoption.

Maintenance and Performance: Maintenance of EVs can be more challenging due to the specialized knowledge required. Additionally, there can be a performance mismatch between lab conditions and real-world usage.

Government Regulation: Adequate government regulation is necessary to support the adoption of EVs. This includes incentives for purchasing EVs, developing infrastructure, and setting emissions targets.

Public Perception and Acceptance: Overcoming skepticism and building public confidence in EVs is essential. Municipalities need to work on changing public perception and demonstrating the benefits of EV adoption.

Equity and Accessibility: Ensuring that all socioeconomic groups have access to EVs and charging infrastructure is a challenge. Cities need to make electric mobility accessible to all citizens.

Economic Opportunities: While EVs can create jobs and economic opportunities, municipalities need to plan for the transition in terms of workforce development and supporting industries. These challenges require a coordinated approach that includes planning, community engagement, and collaboration with various stakeholders to ensure a smooth transition to electric mobility.

2.2. Current State of Market

[Describe the current state of the market sector applicable to the AOI (e.g., mobility accessibility, local knowledge and use of electric vehicles, availability of electric vehicle charging stations, market penetration, etc.). This should be specific to the geographic project area being proposed;]

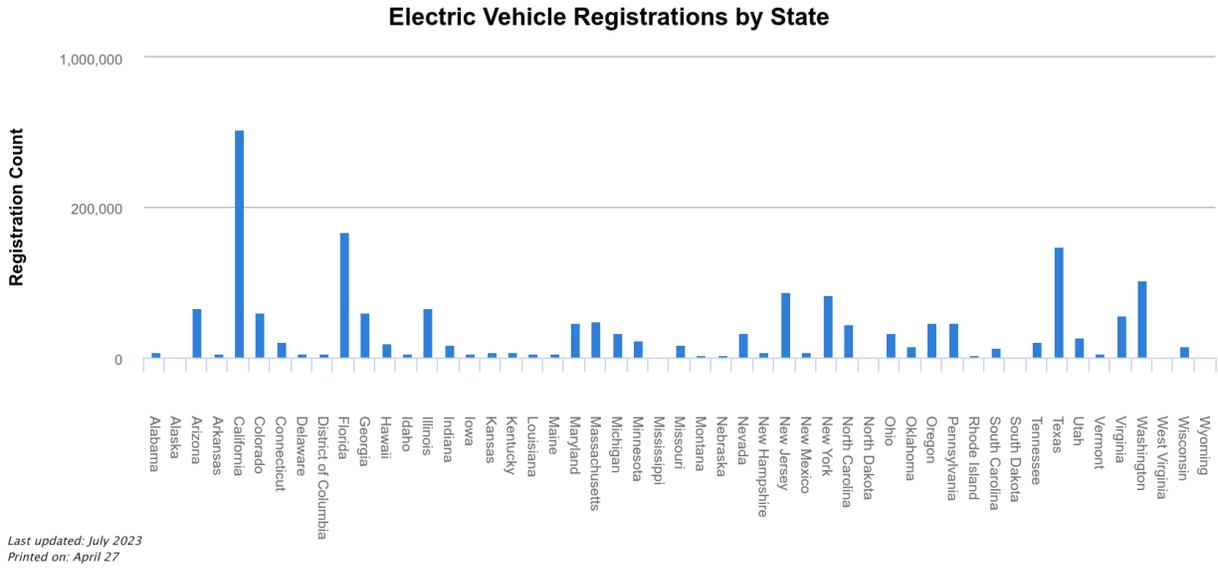


Figure 2 EV Registration by State

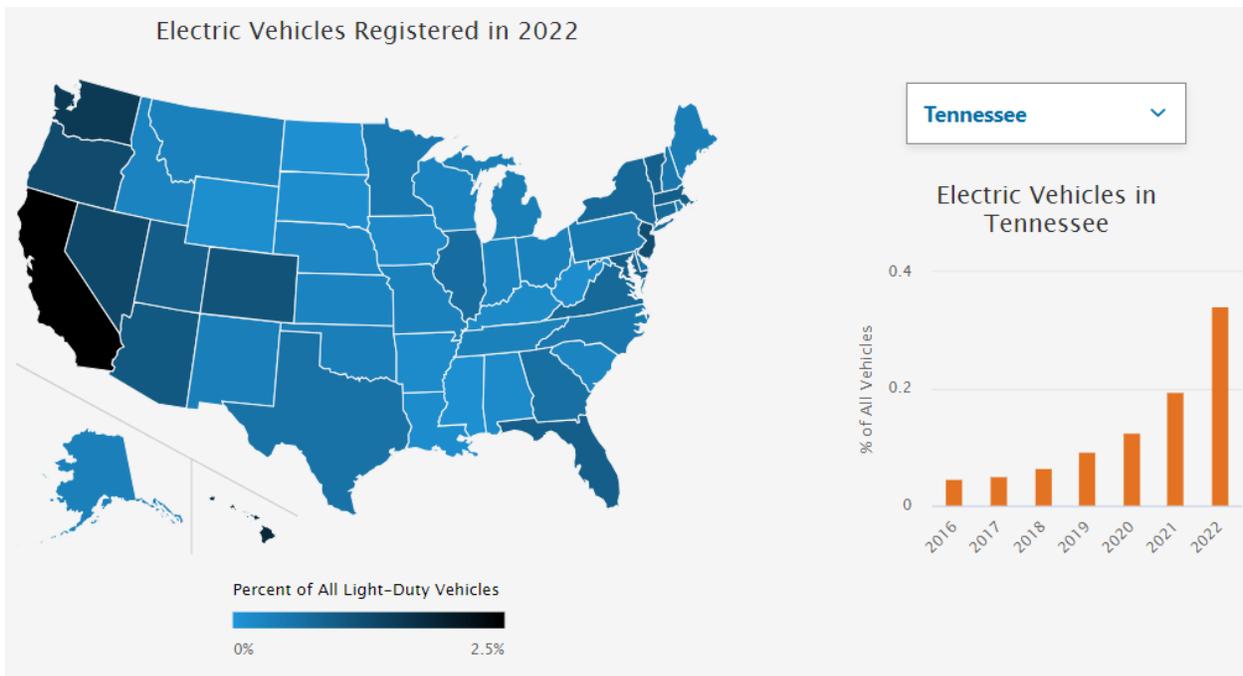


Figure 3 Market Share of EV in U.S. and TN²

² <https://afdc.energy.gov/transatlas#/?state=TN&view=percent>

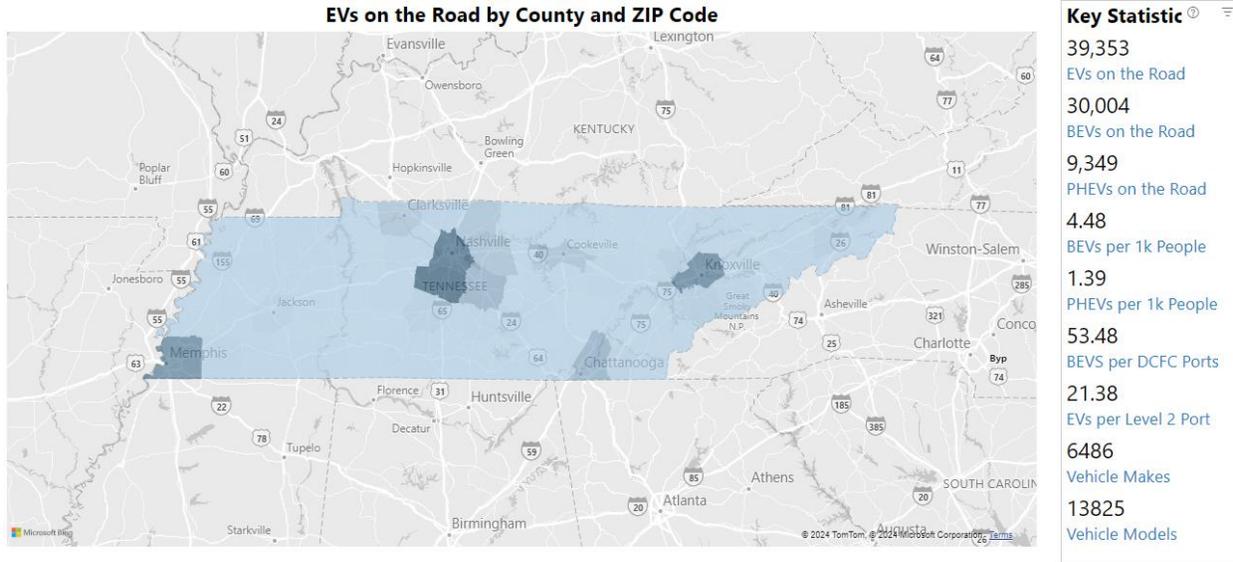


Figure 4 EV On the Road by County and Zip Code in TN³

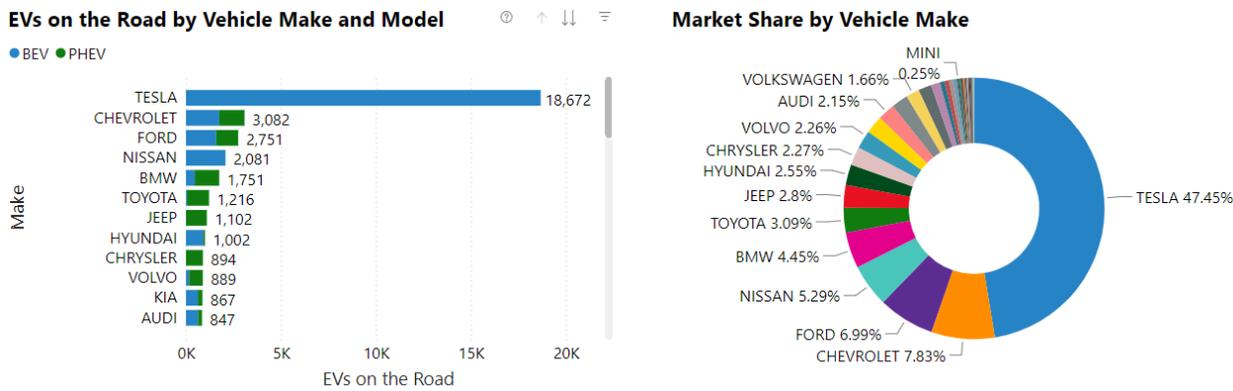


Figure 5 PEV Vehicle Composition on the Road in TN (as of Q4 2023)

The overall market share of EV in TN is very low. As of Q4 2023, there are about 36,296 EVs registered in TN, most of these vehicles are registered by private owners. The EV market penetration in Tennessee varies by city, with some areas showing higher adoption rates than others. Here’s a summary of the current state of EV market penetration in Tennessee:

Growth Trends: The number of registered EVs in Tennessee has been on the rise, with significant investments in EV production and battery manufacturing within the state. This growth is supported by automakers’ plans and the increasing number of individual EV drivers.

Top Counties for EV Registrations: The top counties in Tennessee for EV registrations include Williamson, Davidson, Shelby, Knox, Rutherford, Hamilton, Wilson, Sumner, Montgomery, Blount, and Washington. Notably, six of these counties are in Middle Tennessee, around the Nissan plant in Smyrna and Nashville, the most populous city in the state.

Infrastructure Development: Efforts are underway to develop a statewide EV fast-charging network, which is expected to alleviate range anxiety and further encourage EV adoption.

³ <https://www.atlasevhub.com/materials/state-ev-registration-data/>

Urban Centers: Major urban centers such as Memphis, Knoxville, Chattanooga, and Nashville are seeing clusters of both fast charging and Level 2 charging sites, indicating a focus on EV infrastructure development in these areas.

This information suggests that Tennessee is actively working towards becoming a hub for EV activity, with certain cities leading the way in EV adoption and infrastructure development. The state's commitment to expanding the EV market is evident through its investment in charging infrastructure and the growing number of EV registrations.

TN has a large publicly owned vehicle fleet including over 125,860 vehicles (including automobile, buses, trucks and motorcycles). Public fleet vehicles often have higher utilization rates compared to individual vehicles. This is because fleet vehicles are typically used for specific purposes such as public transportation, service delivery, or maintenance tasks, and are managed to maximize their usage and efficiency. In contrast, individual vehicles are usually used for personal transportation and may spend a significant amount of time parked and not in use. Utilization rates for fleet vehicles are calculated based on how much time the vehicles are actively engaged in tasks versus being idle. Higher utilization rates indicate that a fleet is being used efficiently, contributing to the organization's productivity and cost savings. For instance, a public transit bus in a city's fleet is likely to be in operation for most of the day, serving multiple routes and passengers, whereas a privately-owned car may only be used for commuting and errands, resulting in lower daily usage. Therefore, public fleet vehicles are generally optimized for higher utilization to meet the demands of their service roles

2.3. Expected Change in Market Sector

This pilot demonstration project aims to electrify, deploy and demonstrate the most commonly used public vehicles (such as SUV, pickup truck, shuttle bus) in diverse applications in Chattanooga and Nashville. Although the numbers of EVs (16 EVs in total) will not directly impact the EV penetration rate in the TN, the best practice and lessons learned, and the rich diverse vehicle operational and charging data, will be shared with broad stakeholders who own public vehicle fleets in many cities across TN and the United States to help them make informed decision in electrifying a significant number of public fleet vehicles. This impactful pilot demonstration project will support the electrification of 124,864 publicly owned vehicles in TN and 4,278,956 public owned vehicles across the states, through information exchange, outreach and education activities.

While the City of Chattanooga has already reduced electricity demand at municipal facilities (including the Moccasin Bend regional wastewater treatment facility) by 27% (27 gigawatt hours annually) since 2012 (data source: Electric Power Board (EPB)), the City's municipal fleet of over 2,000 vehicles, supporting equipment, apparatuses and infrastructure is currently almost entirely powered by gasoline and diesel fuels. Collectively, this translates into over 700,000 gallons of gasoline and over 620,000 gallons of diesel used annually to power the fleet (*average for years 2019, 2022, 2023). This translates into approximately 12,000 metric tons of carbon dioxide emitted into the atmosphere each year (source: EIA).

2.4. Project Approach

In this project, the team will create an innovative electric vehicle (EV) testbed including City of Chattanooga and City of Nashville for pilot demonstrations of various EVs in diverse public fleet applications, and share the best practice/lessons and valuable real-world vehicle data with broad stakeholders to help them make informed decision to advance the electrification of public fleets.

The following tasks will be undertaken to establish an effective EV testbed: 1) Infrastructure Setup: Install charging stations (both public and private) at the testbed location. Implement smart charging infrastructure to monitor usage patterns and optimize charging. 2) Fleet Acquisition: Collaborate with City of Chattanooga and City of Nashville to acquire a fleet of EVs for testing. Include various types of EVs (pickup trucks, SUVs, electric buses, etc.) to assess different use cases. 3) Data Collection and Monitoring: Equip EVs with telematics devices to collect real-time data on battery performance, range, and charging behavior. Monitor charging sessions, energy consumption, and vehicle health. 4) User Engagement and Education: Involve the community by organizing workshops, webinars, and ride-and-drive events. Educate users about EV benefits, charging etiquette, and incentives. 5) EV demonstration: Evaluate EV performance under different conditions (temperature, terrain, traffic). Assess range, acceleration, braking, and handling. Test charging stations for reliability, speed, and compatibility with various EV models. Explore fast charging options and interoperability. 6) Policy and Regulation Assessment: Collaborate with policymakers to understand regulatory challenges and propose solutions. Evaluate existing incentives, rebates, and tax breaks for EV adoption. 7) Data Analysis and Decision Support: Analyze collected data to inform stakeholders about EV performance, charging behavior, and user satisfaction. Provide decision-makers with insights to shape future policies and investments.

2.5. Proposed Technology

According to HIS Markit data, there are over 22 million medium-and heavy-duty vehicles currently on road in the United States and providing solutions to reduce their carbon footprint is critical to achieving our nation's emission reduction goals. Retrofit solutions aim to alleviate the two key challenges faced by fleets in switching to electric: the incremental cost of new EVs; and, long lead times due to limited availability. The ability to utilize retrofit solution allows fleets to electrify their existing assets, significantly lower capital requirements and reduce the time to deploy zero-emission alternatives.

For the four electric shuttle buses to be deployed in the P&R application, the proposed retrofit solution is the 4th generation e-drive system provided by Phoenix Motorcars with varied battery pack sizes, offering a 115 to 150-mile range on a single charge. Equipped with 100 kW CCS fast charging capability, fleet owners may be able to further extend daily usage by gaining as much as 60% SOC in less than an hour using opportunity charging. Based on the fleet customers' experience, the conversion to electric can potentially reduce maintenance costs by about 75% and lower fuel costs by about 80%, compared to an equivalent internal combustion engine vehicle. Regarding the EV charging infrastructure, the project team proposed of installing 4 19.2-kW level-2 charging stations, which is capable of completely charging riders' EV during daytime and completely charge the electric shuttle buses over the nights.

For the other public vehicle applications in City of Chattanooga, the project team proposes to deploy 8 electric SUVs with electric range up to xx miles per full charge and 4 F150 Lightning electric pickup truck which is capable of providing up to xx miles per full charge and with the capabilities to power other loads via its vehicle-to-load feature.

The Volkswagen ID.4 is an affordable all-electric SUV that combines practicality with the benefits of electric mobility. The 2024 VW ID.4 Pro SUV has estimated range of 291 miles, powered by a 82-kWh battery pack. The Volkswagen ID.4 SUV is indeed suitable for public fleet applications. It has been chosen by companies such as Siemens for their fleet electrification due to its good

combination of range, charging speed, trunk capacity, and price. The ID.4's spacious interior, strong driving performance, and quick-charging capability make it a practical choice for everyday use in a fleet setting.

The Ford F-150 Lightning is an all-electric pickup truck with the following key features: 1) Power and Performance: The F-150 Lightning is equipped with two electric motors that deliver a targeted 563 horsepower and 775 lb.-ft. of torque, offering an exhilarating drive experience. 2) Range: It offers two battery options: the Standard-Range Battery which can deliver up to 230 miles per charge, and the Extended-Range Battery which offers an estimated range of up to 320 miles. 3) Capability: The truck is designed with a high-strength, military-grade aluminum alloy body and a new frame that supports a maximum 2,000-pound payload and up to 10,000-pound towing capacity. 4) Technology: The F-150 Lightning features an array of connected, intelligent features that improve over time via over-the-air software updates. It also includes the FordPass app for seamless access to charging stations and remote vehicle controls. The truck comes with a high-tech frunk (front trunk), the ability to power your home if needed, and available BlueCruise for true hands-free driving on the highway.

The Ford F-150 Lightning electric pickup truck is indeed suitable for public fleet applications. It has been recognized for its potential to help city governments and other public entities electrify their fleets. The F-150 Lightning offers a combination of range, power, and versatility that aligns with the needs of various city operations. Its ability to power tools and appliances directly from the truck is particularly beneficial for worksites. Additionally, the lower operational costs due to reduced fuel and maintenance expenses make it an economically attractive option for fleets.

Cities like Portland, Oregon, and Charlotte, North Carolina, have already incorporated the F-150 Lightning into their fleets, utilizing its extended-range battery and power export capabilities to support their sustainability goals and operational requirements. With these considerations, the F-150 Lightning stands out as a strong candidate for public fleet electrification efforts.

[insert a figure that include retrofit electric shuttle bus, VW ID.4, electric pickup trucks]

The project team will conduct two electric vehicle outreach and education events throughout the year in TN including not only in Cities of Chattanooga and Nashville, but also other urban/rural cities in TN. These events and activities will include: 1) Community Workshops and Forums: Organize workshops to educate the public about EV technology, benefits, and incentives. Host forums for community members to ask questions and discuss EV-related topics. 2) Test-Drive Programs: Offer opportunities for the relevant stakeholders to test-drive EVs to gain firsthand experience. Use a fleet of EVs to demonstrate their performance and features in various scenarios. 3) Educational Materials and Resources: Develop and distribute educational materials such as brochures, flyers, and online content. Create interactive digital materials and experiences to engage different fleet owners/managers/drivers. 4) School and University Partnerships: Partner with local schools and universities (TTU, Chattanooga State Community College) to integrate EV education into STEM curricula. Encourage student projects and research focused on EV technology and its impact. 5) Information Sharing and Outreach: Share data and insights from the testbed project with the community through regular updates. Utilize social media and local media outlets to reach a wider audience.

The training to be developed and conducted in the proposed EV testbed project will include the following key components: 1) Workforce Development: Focus on building a skilled workforce capable of designing and developing and serving EVs, as well as installing and maintaining

charging infrastructure. Develop curricula that address the demands of the EV industry and conduct marketing for EV-related training and job opportunities. 2) Technical Training (by partnering with local community colleges): Provide technical training for the operation, maintenance, and repair of EVs and charging stations. Offer certification programs for technicians and engineers specializing in EV technology. 3) Educational Outreach: Create educational opportunities to address EV adoption issues, such as range anxiety and cost concerns. Engage with schools and universities to integrate EV technology into STEM programs and research initiatives. 4) Public Awareness Campaigns: Conduct public awareness campaigns to promote the benefits of EVs and the importance of sustainable transportation. Utilize various media platforms to reach a broad audience and encourage community participation. 5) Stakeholder Engagement: Involve key stakeholders, including automotive OEMs, suppliers, clean city coalitions, and national labs, in collaborative efforts for EV research, development, outreach, and education. 6) Hands-On Experience: Deploy a small fleet of electric vehicles, including different models and types, to provide hands-on experience for trainees. Use the testbed to collect and analyze data on EV performance, which can inform training programs and best practices. 7) Policy and Regulation Education: Educate participants on relevant policies and regulations that impact EV deployment and infrastructure development in various Drive Electric TN working groups. 8) Business and Economic Training: Offer training on the business aspects of EVs, including cost-benefit analysis, financing, and economic incentives.

2.6. Community Engagement

Engaging community members and stakeholders in the design and demonstration of the proposed EV testbed is crucial for ensuring the infrastructure meets the needs and expectations of the community. The following strategies will be adopted to engage with community stakeholders affected by the project.

- Identify Disadvantaged Communities: Start by identifying communities that may be most impacted by the EV infrastructure. This helps ensure that the benefits of EVs are equitably distributed.
- Initial Education and Outreach: Conduct educational sessions to inform the community about the benefits and implications of EV testbeds. This can help in building interest and support.
- Inclusive Decision-Making: Designate community members to serve in decision-making roles. This empowers them and ensures their voices are heard in the planning process.
- Ongoing Engagement: Hold regular engagement activities throughout the implementation process. This helps in maintaining transparency and allows for continuous community feedback.
- Validate Benefits Through Implementation: Discuss and validate the benefits of the EV testbed with the community throughout the implementation. This can help in adjusting strategies to maximize benefits.
- Update Approaches: Be open to updating implementation approaches based on community feedback to ensure the testbed serves its intended purpose effectively.
- Use of Playbooks: Utilize resources like the “Public Electric Vehicle Charging Infrastructure Playbook” which provides interactive resources to help communities plan and build the infrastructure needed to support a zero-emission transportation system.

- **Proof-of-Concept Testbeds:** leverage the learning from the previous EV testbed projects such as the DOE VTO-funded EV Demonstration Testbed (led by PI of this proposal) in the Upper Cumberland Region of Tennessee, which provides experience, research, demonstration, and educational opportunities to address EV adoption issues.

2.7. Project End Goals

The end goal of this project is to develop a successful EV testbed that includes representative cities such as City of Chattanooga and City of Nashville to create best practice/lessons and duplicable playbooks that can help broad public fleet managers across State of TN and the entire nation make informed decision in adoption and implementation of various types of EVs for diverse applications.

2.8. Project Outcomes

The project outcomes of the proposed testbed project include: 1) **Accelerating EV Adoption in Public Fleet Applications:** The project aims to speed up the adoption of EVs by promoting awareness among public vehicle fleets and communities. 2) **Reducing Costs and Emissions:** By introducing EVs, the project expects to lower operational/maintenance costs, fossil fuel consumption, and harmful emissions, thereby improving public health and fuel diversity in Cities of Chattanooga and Nashville. 3) **Infrastructure Development:** The project facilitates the development of EV charging infrastructure to enable sustainable operations of publicly owned electric vehicles. 4) **Economic Boost:** It supports Tennessee's corridor development and workforce development initiatives and has the potential to boost economic development for municipalities of different sizes. 5) **Collaborative Research and Education:** The project fosters collaborations between universities, automotive OEMs and suppliers, clean city coalitions, and national labs for EV research, outreach, and education. 6) **Data Collection and Analysis:** Comprehensive data is collected and analyzed to report the operation cost, issues, and performance of EVs to help potential public fleet owners and the general public (with similar vehicle duty cycles and utilization rate) make informed decisions regarding EV adoption and implementation.

2.9. Project Outputs

Project outputs of the proposed testbed project include:

- 1) Successful of Deployment of 12 light-duty EVs (including 8 electric SUV and 4 electric pickup trucks) and 4 retrofitted all-electric shuttle buses for testing and demonstration.
- 2) Successful Installation of 16 EV charging stations (including 10 in City of Chattanooga and 6 in City of Nashville). In City of Nashville, the 4 19.2-kW level-2 charging stations and 2 DCFC stations will be shared by publicly owned vehicle fleets and general EV users.
- 3) Produce duplicable fleet electrification playbooks (including short-term and long-term) that can be adopted by other public and private fleet owners for advancing EV adoption and implementation.
- 4) **Data Collection:** Gathering comprehensive data on the operation cost, issues, and performance of EVs and other conventional vehicles to inform potential fleet owners and the public about EV adoption and implementation.
- 5) **Educational Outreach:** Create and participate in 20 regional information exchange, outreach and educational events to help stakeholders learn about EV technology, benefits, and the purpose of the testbed project.

6) Community benefit planning and implementation: The project team will create and implement a community benefit plan to ensure that the underserved communities receive the benefits from this project.

2.10. Project Innovations and Replicability

2.11. Justice40

- Identify applicable disadvantaged communities (DACs) to which the anticipated project benefits will flow.
- Identify applicable benefits that are quantifiable, measurable, and trackable, including, at a minimum, a discussion of the relevance of each of the eight DOE Justice40 Initiative benefits outlined in Section I Background and Context.

The proposed EV testbed project can offer significant benefits to disadvantaged communities, which are described as below: 1) Health Improvements: EVs can help reduce exposure to harmful air pollutants, which is particularly beneficial for communities that often bear the brunt of environmental problems. Transitioning to electric transportation can lead to fewer asthma attacks, respiratory issues, and premature deaths. 2) Economic Advantages: EVs can lower vehicle fueling costs significantly due to their higher efficiency and the lower cost of electricity compared to gasoline or diesel fuel. This can help alleviate budget challenges for community services. 3) Resilience Against Disasters: With two-way charging capabilities, EVs can make electric power grids more resilient, protecting communities against power outages that can disrupt access to essential services. 4) Educational Opportunities: especially in areas where a high percentage of the population is classified as low-income. 5) Economic Development: Urban and rural communities can benefit from economic development opportunities by providing EV charging stations, which can attract regional travelers and revenue for local businesses. 6) Environmental Justice: EV adoption can offer environmental justice by reducing pollution in overburdened communities, which are predominantly communities of color and low-income areas. These benefits highlight the potential of EV testbed projects to not only improve the quality of life in disadvantaged communities but also to contribute to broader goals of sustainability and equity. The metrics of community benefits provided by this project are summarized in the table below.

Table 1 Metrics and expectations of community benefits provided by the project.

Metric Category	Metric Description [please add numbers of each metrics that apply to this project]
Energy Democracy	<ul style="list-style-type: none"> • Number of organizations with a funded role in the project who represent a DAC: 2 • Project dollars budgeted [\$] for organizations who represent a DAC: [\$865,592 + \$679,540 = \$1,545,132] • Total number of outreach/education events: 20 • Number of outreach/education events designed to benefit members of DACs: 15 • Total number of people reached through outreach/education events: 2,500 • Number of stakeholder engagement events designed to benefit members of DACs: 10

	<ul style="list-style-type: none"> Total number of people reached through stakeholder engagement events: 1,500
Technical Assistance	<ul style="list-style-type: none"> Number of fleets who were provided technical assistance: 2 Number of fleets who were provided technical assistance which represent a DAC: 2 Number of non-fleet organizations who were provided technical assistance: 20 Number of non-fleet organizations receiving technical assistance which represent a DAC: 10
Workforce Training	<ul style="list-style-type: none"> Number of workforce development events provided: 6 Number of workforce development events primarily serving DACs 6 Number of attendees receiving workforce development training: 80 Project \$ allocated for training events for people who work or live in DACs: [TTU, PMC, TCF]
Energy Burden	<ul style="list-style-type: none"> Net gasoline gallon equivalent (GGE) reduced annually for an underserved community Reduced transportation energy burden for an underserved community
Environmental: Vehicle Emissions Reductions	<ul style="list-style-type: none"> Reduction in PM 2.5 in an underserved community Reduction in NOx annually in an underserved community Reduction in GHG annually in an underserved community

• **A description of how and when anticipated benefits are expected to flow to DACs.**

The anticipated benefits from the proposed EV testbed project to disadvantaged communities are expected to flow through various initiatives and programs. Here's how and when these benefits are projected to be realized, upon successful implementation and the active participation of the communities involved:

- **Immediate to Short-Term:** As soon as the EV testbed project is initiated, communities can start experiencing improved air quality due to reduced emissions from traditional vehicles. This can lead to immediate health benefits.
- **Mid-Term:** Economic benefits such as job creation in the EV sector and reduced transportation costs can be realized within a few years as the infrastructure for EVs expands and becomes more accessible.
- **Long-Term:** Over time, as EV adoption increases, there will be a cumulative effect on health improvements, economic savings, and environmental sustainability. This can lead to a significant reduction in healthcare costs and an overall increase in the quality of life.
- **Strategic Investments:** The U.S. Department of Energy has allocated funds specifically for projects that expand community e-mobility access and provide clean, reliable energy. These investments aim to ensure that 40% of the benefits of clean energy and climate solutions are delivered to disadvantaged communities.
- **Community Engagement:** Effective community engagement strategies are essential for ensuring that the benefits of EV infrastructure are equitably distributed. This includes

involving members of disadvantaged communities in decision-making processes and responding to their specific needs.

- **Timeline:** The timeline for these benefits can flow to the DAC during the 36-month project period. The long-term benefits of this project will be received by the DACs beyond this timeframe.

3. Market Transformation Plan

The Market Transformation Plan section should include the following information:

3.1. Approach to ensuring long-term, market transforming impacts.

The project aims to create a scalable EV testbed for public fleet applications to benefit broad public fleet stakeholders and EV market. A strategic and multifaceted approach will be implemented to including the following strategies: 1) **Policy Alignment and Support:** Align the testbed project with national and local policies that support sustainable transportation and climate goals. Advocate for continued government incentives and subsidies to encourage EV adoption and infrastructure development. 2) **Consumer Engagement and Education:** Educate consumers about the benefits of EVs, including cost savings and environmental impact. Engage with communities to understand their needs and concerns, ensuring that EV solutions are tailored to meet those needs. 3) **Infrastructure Investment:** Invest in charging infrastructure to support the widespread use of EVs, focusing on accessibility and convenience. Develop smart grid technologies to manage the increased demand for electricity due to EV charging. 4) **Technology and New Mobility Mode Advancement:** Foster innovation in battery technology and charging systems to improve range, reduce costs, and shorten charging times. Encourage the development of new business models that can support the EV ecosystem, such as shared EV charging hub at Park and Ride facility. 5) **Collaboration and Partnerships:** Build partnerships between government, industry, academia, and non-profits to share knowledge and resources. Collaborate on research and development efforts to push the boundaries of EV technology and its applications. 6) **Monitoring and Evaluation:** Implement robust monitoring and evaluation mechanisms to track the progress and impact of the testbed project. Use data-driven insights to refine strategies and ensure that the project remains aligned with long-term market transformation goals.

3.2. Long-term impacts from the project activities on the problem being addressed;

The proposed EV testbed project will have transformative impacts on the market of public fleet electrification in several ways: 1) **Acceleration of EV Adoption:** The proposed testbed project can increase awareness and acceptance of EVs among consumers and fleet owners, leading to a broader adoption of electric vehicles. 2) **Reduction of Operational Costs:** By demonstrating the cost-effectiveness of EVs in real-world scenarios, the proposed testbed project can show potential savings in fuel and maintenance, influencing the market to consider EVs as a viable alternative to traditional vehicles. 3) **Innovation in Technology:** Testbeds serve as a platform for testing and improving EV technologies, such as battery performance and charging infrastructure, which can lead to further technology advancements that benefit the entire automotive industry. **Policy and Regulation Influence:** The outcomes of testbed projects can inform policymakers and regulators, potentially leading to supportive policies that further encourage EV adoption and market growth. 4) **Economic Development:** Successful EV testbeds can stimulate local economies by creating jobs in the EV sector and attracting investments in clean energy technologies. 5) **Environmental Benefits:** As more EVs replace internal combustion engine vehicles, there will be

a significant reduction in greenhouse gas emissions and other pollutants, contributing to a cleaner environment.

These impacts are crucial for transitioning to a sustainable transportation future and can help overcome current challenges such as high total ownership costs and charging infrastructure concerns. The proposed testbed project is essential in navigating the transforming landscape of the EV market and ensuring that the transition benefits all stakeholders involved.

3.3. Disseminating project learnings and post-award sustainability

To broadly disseminate the learnings, insights, best practices, and outcomes of an EV testbed project, and to ensure the sustainability and expansion of deployments, training, outreach, and education programs after the project period, the following approaches can be adopted for the dissemination of project findings and ensure sustainability and post-project expansion.:

Dissemination Strategy: 1) Documentation: Maintain thorough documentation of all project phases, including planning, implementation, challenges, and outcomes, in the quarterly report and project management plan. **2) Publishing:** Regularly publish white papers, case studies, and reports detailing project insights and results. **3) Conferences and Workshops:** Present findings at industry conferences, workshops, and webinars to reach a wide audience. **4) Partnerships:** Collaborate with academic institutions, industry partners, and government agencies to share knowledge. **5) Online Platform:** Create a dedicated public-facing project website or online portal to share resources, updates, and interactive learning tools. **6) Social Media:** Utilize social media channels to engage with the community and share success stories and educational content. **7) Community Engagement:** Host community forums and town hall meetings (e.g., annual Tennessee Sustainable and Transportation Forum and the annual Tennessee SMART Mobility Expo) to discuss project impacts and gather feedback.

Post-project Sustainability and Expansion 1) Training Programs: a) Develop a train-the-trainer program to empower participating public fleets to continue education efforts. b) Create in-person/online courses and certifications to ensure ongoing access to training materials. **2) Outreach Programs:** a) Establish a network of EV ambassadors who can promote EV adoption and share testbed learnings. b) Partner with local businesses and organizations to host informational events and demonstrations. **3) Education Programs:** a) Integrate EV technology and sustainability topics into TTU's vehicle engineering curriculums and university research programs. **4) Project Deployments:** a) Seek additional funding or grants to continue successful deployments and explore new sites (scale-up demonstration). b) Encourage public-private partnerships to invest in the expansion of EV infrastructure. **5) Monitoring and Evaluation:** a) Implement a robust monitoring system to track the long-term impacts of the testbed project. b) Use data-driven insights to refine strategies and secure support for future initiatives. By implementing these strategies, the project can create a lasting impact that extends beyond its initial scope, enabling other communities to replicate its successes and contributing to the broader transformation of the market towards sustainable electric mobility for public fleets.

4. Workplan (Approximately 35% of the Technical Volume)

4.1. Buy America Requirements for Infrastructure Projects

In this project, the project team will develop EV charging infrastructure in City of Nashville which will be open to the public. Thus, this project involves infrastructure projects that are required to meet Buy America requirement. The project team will take the following steps to meet the

requirement. 1) Understand the Requirements: Familiarize the entire project team with the specific Buy America provisions that apply to your project. This includes knowing the percentage of domestic content required for various components and the conditions under which waivers may be granted. 2) Source Domestic Materials: Ensure that all iron, steel, and manufactured products used in the project are produced in the United States. This also applies to construction materials as defined by the Build America, Buy America Act (BABA). 3) Waivers and Exceptions: Be aware of any waivers that may apply to this project. For instance, there are limited waivers for EV chargers under certain conditions, and de minimis waivers for small amounts of non-compliant materials. 4) Certification: When submitting a proposal for federal procurements, it may be required to complete a certification, such as the Buy American Certificate or the Trade Agreements Act Certificate. 5) Compliance and Documentation: Maintain thorough documentation to prove compliance with Buy America requirements. This includes records of material purchases, manufacturing processes, and certifications. 6) Regular Updates: Stay informed about any changes to the Buy America requirements, as these can affect the procurement process and the eligibility of certain products or materials

4.2. Project Summary by Budget Period

4.3. Project Schedule

4.4. Work Breakdown Structure (WBS)

The following tasks will be conducted:

All Budget Periods

Overall Project Management and Planning

The recipient will perform project management activities to include project planning and control, subcontractor control, financial management, data management, management of supplies and/or equipment, risk management, and reporting as required to successfully achieve the overall objectives of the project.

Task 0.0 – Project Management and Planning:

The Recipient shall develop and maintain the Project Management Plan (PMP). The content, organization, and requirements for revision of the PMP are identified in the Federal Assistance Reporting Checklist and Instructions. The Recipient shall manage and implement the project in accordance with the PMP.

Task 0.1- Kick-Off Meeting:

The Recipient will participate in a project kickoff meeting with the DOE within 30 days of project initiation.

Budget Period 1: EV Testbed Development

Task 1.1 – EV Charging Infrastructure Development:

Subtask 1.1.1 – The recipient will identify EV charging station sites and develop EV charging infrastructure in Chattanooga, TN

Subtask 1.1.2 – The recipient will identify EV charging station sites and develop EV charging infrastructure in Nashville, TN

Task 1.2 – EV Acquisition and Instrumentation:

Subtask 1.2.1 – The recipient will acquire 14 EVs (including 10 electric SUV, 4 pickup trucks, and 2 shuttle buses) for Cities of Chattanooga and Nashville, TN

Subtask 1.2.2 – The recipient will instrument all EVs with data acquisition system

Task 1.3 – EV Demonstration:

Subtask 1.3.1 – The recipient will demonstrate 12 EVs (including 10 electric SUV and 4 pickup truck) in public fleets in Chattanooga TN

Subtask 1.3.2 – The recipient will demonstrate 2 electric shuttle buses in Park and Ride service in Nashville, TN.

Task 1.4 – Data Collection and Analysis:

Subtask 1.4.1 – The recipient will collect data from EVs, baseline vehicles, and deployed EV charging stations.

Subtask 1.4.2 – The recipient will conduct surveys or interviews with the shuttle bus riders, EV drivers and fleet managers before and after the vehicle demonstration;

Subtask 1.4.3 – The recipient will analyze the data collected during Budget Period 1.

Task 1.5 – Information Exchange, Outreach, and Education

Subtask 1.5.1 – The recipient will create and manage a public facing project website

Subtask 1.5.2 – The recipient will host and participate in regularly occurring public events (e.g., EV demonstrations and EV ride and drive) and EV-related annual forums and expo;

Subtask 1.5.3 – The recipient will integrate public fleet study into TTU’s vehicle engineering curriculum for training automotive engineers;

Subtask 1.5.4 – The recipient will provide other workforce training opportunities (e.g., workshops) to public fleet stakeholders (e.g., drivers, technician/mechanics, fleet managers);

Budget Period 2: EV Testbed Demonstration

Task 2.1 – EV Charging Infrastructure Demonstration:

Subtask 2.1.1 – The recipient will demonstrate EV charging infrastructure in Chattanooga, TN

Subtask 2.1.2 – The recipient will demonstrate EV charging infrastructure in Nashville, TN

Task 2.2 – EV Acquisition and Instrumentation:

Subtask 2.2.1 – The recipient will acquire 2 additional electric shuttle buses for Nashville, TN

Subtask 2.2.2 – The recipient will instrument achieve data acquisition system for the 2 electric shuttle buses

Task 2.3 – EV Demonstration:

Subtask 2.3.1 – The recipient will demonstrate 12 EVs (including 10 electric SUV and 4 pickup truck) in public fleets in Chattanooga, TN

Subtask 2.3.2 – The recipient will demonstrate 4 electric shuttle buses in Park and Ride service in Nashville, TN.

Task 1.4 – Data Collection and Analysis:

Subtask 2.4.1 – The recipient will collect data from EVs, baseline vehicles, and deployed EV charging stations.

Subtask 2.4.2 – The recipient will conduct surveys or interviews with shuttle bus riders. EV drivers and fleet managers before and after the vehicle demonstration.

Subtask 2.4.3 – The recipient will analyze the data collected during Budget Period 2.

Task 2.5 – Information Exchange, Outreach, and Education

Subtask 2.5.1 – The recipient will manage a public facing project website;

Subtask 2.5.2 – The recipient will host and participate in regularly occurring public events (e.g., EV demonstrations and EV ride and drive) and annual EV-related forums and expo;

Subtask 2.5.3 – The recipient will integrate public fleet study into TTU’s vehicle engineering curriculum for training automotive engineers;

Subtask 2.5.4 – The recipient will provide other workforce training opportunities (e.g., workshops) to public fleet stakeholders (e.g., drivers, technician/mechanics, fleet managers);

Budget Period 3: EV Testbed Demonstration

Task 3.1 – EV Charging Infrastructure Demonstration:

Subtask 3.1.1 – The recipient will demonstrate EV charging infrastructure in Chattanooga, TN

Subtask 3.1.2 – The recipient will demonstrate EV charging infrastructure in Nashville, TN

Task 3.2 – EV Demonstration:

Subtask 3.2.1 – The recipient will demonstrate 12 EVs (including 10 electric SUV and 4 pickup truck) in public fleets in Chattanooga, TN

Subtask 3.2.2 – The recipient will demonstrate 4 electric shuttle buses in Park and Ride service in Nashville, TN.

Task 3.3 – Data Collection and Analysis:

Subtask 3.3.1 – The recipient will collect data from EVs, baseline vehicles, and deployed EV charging stations.

Subtask 3.3.2 – The recipient will conduct surveys or interviews with shuttle bus riders. EV drivers and fleet managers before and after the vehicle demonstration.

Subtask 3.3.3 – The recipient will analyze the data collected during Budget Period 3.

Task 3.4 – Information Exchange, Outreach, and Education

Subtask 3.4.1 – The recipient will manage a public facing project website;

Subtask 3.4.2 – The recipient will host and participate in regularly occurring public events (e.g., EV demonstrations and EV ride and drive) and annual EV-related forums and expo;

Subtask 3.4.3 – The recipient will integrate public fleet study into TTU’s vehicle engineering curriculum for training automotive engineers;

Subtask 3.4.4 – The recipient will provide other workforce training opportunities (e.g., workshops) to public fleet stakeholders (e.g., drivers, technician/mechanics, fleet managers);

4.5. Milestone Summary and Go/No-Go Decision Points

The milestone summary and Go/No-Go Points for the three project periods are shown in

Table 2 Milestone summary and Go/No-Go Points for Project Period 1

Milestone	Type	Description
Data collection and analysis plan completed	Technical	Plan for data collection from baseline vehicles and EV, has been created and implemented. Data analysis plan for both

		baseline vehicles and EVs has been created and implemented.
Information Exchange, Outreach, and Education Completed	Technical	Public facing website has been launched and project findings have been regularly shared via the website; information exchange with stakeholders at the first public forum has been completed; 4 outreach activities have reached the targeted cities; Two workshops have been offered to public fleet for training drivers and fleet managers. At least 15 students are trained with EV fleet cases via TTU's vehicle engineering program.
Milestone Title	DEI	TBA
EV Testbed Development	Go/No Go	Public fleet EV testbed has been established and demonstrated. Successful installation of all planned EV charging infrastructure and the deployment of at least 10 EVs. Pilot demonstration verifies that an $\geq 50\%$ reduction of GHG emissions and lower TCO are achievable.

Table 3 Milestone summary and Go/No-Go Points for Project Period 2

Milestone	Type	Description
Data collection and analysis completed	Technical	EV operational and charging data have been collected from 16 EVs. Total cost of ownership analysis for baseline vehicles and EVs has been completed. Design of short-term fleet electrification plan has been completed.
Information Exchange, Outreach, and Education Completed	Technical	Public facing website has been regularly updated with project findings; information exchange with stakeholders at the second public forum has been completed; 4 additional outreach activities have been created targeted cities; Two additional workshops have been offered to public fleet for training drivers and fleet managers in TN. At least 15 students are trained with EV fleet cases via TTU's vehicle engineering program.
Milestone Title	DEI	TBA

EV Testbed Development	Go/No Go	Successful operation and maintenance of all planned EV charging infrastructure and the deployment of all 16 EVs in six target applications. Pilot demonstration verifies that an $\geq 50\%$ reduction of GHG emissions and lower TCO are achievable.
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Table 4 Milestone summary and Go/No-Go Points for Project Period 3

Milestone	Type	Description
Data collection and analysis completed	Technical	EV operational and charging data have been collected from 16 EVs. Total cost of ownership analysis for baseline vehicles and EVs has been completed. Design of long-term fleet electrification plan has been completed.
Information Exchange, Outreach, and Education Completed	Technical	Public facing website has been regularly updated with project findings; information exchange with stakeholders at the third public forum has been completed; 4 additional outreach activities have been created targeted cities; Two additional workshops have been offered to public fleet for training drivers and fleet managers in TN; At least 15 students are trained with EV fleet cases via TTU's vehicle engineering program.
EV Testbed Development	Technical	Successful operation and maintenance of all deployed EV charging infrastructure and the deployment of all 16 EVs in six target applications. Pilot demonstration verifies that an $\geq 50\%$ reduction of GHG emissions and lower TCO are achievable.
Milestone Title	DEI	TBA

Project Title: Charging Tennessee: Advancing Public Vehicle Fleet Electrification

DE-FOA-0003250: Topic Area of Interest 3: Clean Transportation Demonstration and Deployment

Control Number: 3250-1575

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Team Member Organizations and Project Locations

Tennessee Technological University (TTU, lead, Location: Cookeville, TN)
Nashville Department of Transportation (NDOT, Nashville, TN)
Nashville Electric Service (NES, Nashville, TN)
City of Chattanooga (Chattanooga, TN)
Electric Power Board of Chattanooga (EPB, Chattanooga, TN)
Volkswagen Group of America, Inc. (VW, Chattanooga, TN)
Oak Ridge National Laboratory (ORNL, Oak Ridge, TN)
East Tennessee Clean Fuels Coalition (ETCFC, Knoxville, TN)
Middle-West Tennessee Clean Fuels Coalition (MWTFCF, Nashville, TN)

Background: Public vehicle fleets include a broad range of vehicles from light-duty (LD) vehicles that serve public works to medium-duty (MD) and heavy-duty (HD) transit vehicles. Public vehicle fleets contribute significantly to the greenhouse gas emissions, as there is a total of nearly 5 million vehicles (federal, state, and municipal), in addition to public transit and other fleet types. For rapidly growing large cities like Nashville, a park-and-ride system (P+R), has become an integral part of transportation infrastructure. A P+R system (including 15 MD traditional shuttles), has been deployed by Nashville Department of Transportation (NDOT) to serve diverse commuters. In the P+R system, commuters drive to a central parking location and leave their cars in designated park-and-ride lots, and then board a bus from that location to reach their final destination within the city. While electrifying P+R systems can help create a more sustainable, efficient, and healthy future for urban transportation, there are limited number of electrified P+R systems deployed in U.S. to help make informed decision in P+R system electrification. For many medium-sized cities like City of Chattanooga, hundreds to thousands of public vehicles have been deployed to serve various public works. Currently, as is the case with many municipalities across the country, Chattanooga faces many real challenges to meeting operational and capital budget needs. As such, the City is focusing its electrification efforts on the over 300 eligible light-duty vehicles whose functions can be met with EV technology.

Project Goal and Proposed Technologies: To address the abovementioned challenges, the goal of this project is to deploy and demonstrate electric public vehicle fleets in two of the most rapidly growing cities in TN including Nashville and Chattanooga. On one side, an electric P+R system will be established to downtown Nashville that will deploy electric shuttle buses while providing charging capabilities to the commuters for EV charging, as shown in Figure 1. Four electric shuttle buses will be deployed and demonstrated in four P+R routes in downtown Nashville. Six charging stations (4 high-power level-2 charging stations and 2 DCFC stations) will be developed for overnight charging of the electric shuttle buses at the parking lot of P+R. Additional 4 charging stations will be deployed at the centralized parking facility to support EV charging for the commuters. Such electric P+R system can serve as a centralized charging hub for low-income commuters who may own EVs but do not have dedicated charging stations. On the other side, a fleet of 12 light-duty EVs (including electric sedan/hatch back, SUV, pickup truck) will be deployed by City of Chattanooga as a pilot group of public vehicles to serve five different departments and divisions, as shown in Figure 1, including Department of Community Development, Department of Waste Resources, Department of Public Works, Department of Parks and Outdoors, and City Internal Mail Services. Charging infrastructure will be developed in City of Chattanooga via partnership with EPB of Chattanooga to support charging of EV fleets.

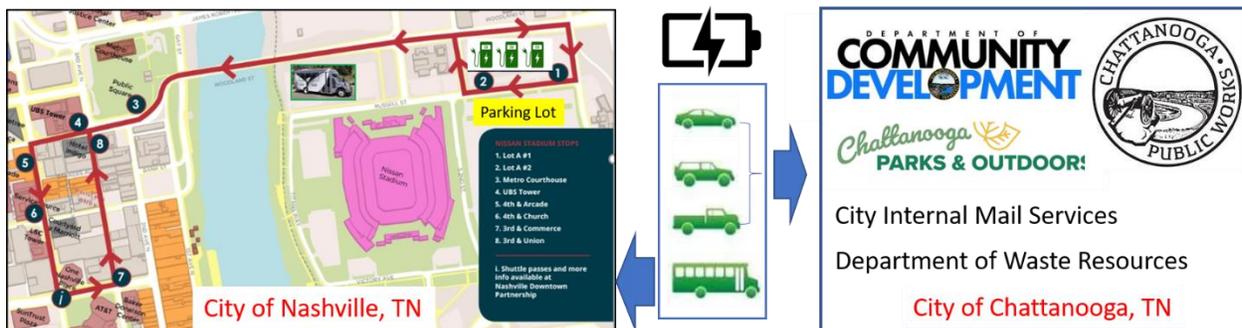


Figure 1 Electrification of Public Vehicle Fleets in Nashville and Chattanooga, TN

Project Team: A strong project team has been assembled to conduct this project, including

- Tennessee Technological University (leading organization of this proposal), to oversee project implementation, lead pilot demonstration of EV fleet and fleet study, outreach and education.
- East TN Clean Fuels Coalition (one of the leading Clean-city coalitions in U.S.) and Middle-West TN Clean Fuels Coalition, to support EV fleet studies, outreach and education.
- Nashville Department of Transportation, to implement electric P+R service in Nashville
- Nashville Electric Service and Electric Power Board of Chattanooga as the power distribution companies to support EV charging infrastructure development and energy and grid studies.
- Volkswagen Group of America, Inc. and Phoenix Motorcars, as vehicle OEM to support data collection and electric shuttle bus operation.
- Oak Ridge National Lab, to support data analyses and operational optimization.

Project tasks: the project goal will be achieved via the following tasks:

1) EV acquisition and demonstration: This task will include **a)** acquisition of four electric shuttle buses (a 141-kWh battery, up to 150 miles per full charge) for NDOT P+R service; **b)** acquisition of 12 light-duty EVs for City of Chattanooga public fleet service; **c)** instrument all EVs with data acquisition system for data collection and analysis; **d)** demonstrate the four electric shuttle buses in the four P+R routes in downtown Nashville, TN; **e)** demonstrate light-duty EVs in seven various public applications (within 5 different departments) by Chattanooga's municipal fleet.

2) Charging infrastructure development and demonstration: This task will include: **a)** development and deployment of EV charging infrastructure that including 4 19.2-kW level-2 charging stations and 2 DCFC stations along NDOT P+R route in Nashville to support electric shuttle bus operation; **b)** development and deployment of 10 level-2 charging stations (non-networked) in City of Chattanooga's fleet facility to support light-duty EV operation.

3) Data collection and analysis, and operational optimization: this task will include: **a)** collecting diverse operational data from electric shuttle bus in four diverse routes and light-duty EVs with comprehensive seasonal and traffic factors. **b)** provide comprehensive data analysis to quantify the benefits of electric shuttle bus and light-duty EVs (fuel saving, total cost of ownership, eco-driving/routing, driving behavior study); **c)** Based on the data analysis results, the project team will optimize EV operation (driving, routing, charging schedules). **d)** Based on the pilot demonstration, the project team will develop plan for 100% fleet electrification for NDOT's P+R system (15 shuttle buses in total) and City of Chattanooga (over 300 eligible light-duty vehicles whose functions can be met with EV technology).

4) Information exchange, outreach and education: **a)** Share successful stories, project findings, observations, best practices and lessons learned with broad stakeholders including urban communities using P+R service, municipal fleet managers, and policy makers across TN and other states; **b)** Conduct various outreach activities (EV Ride-n-Drive/Show-n-Tell, webinar series, local/regional EV chapter development) to educate stakeholders.

The **impacts of EERE funding** include: 1) helping urban/suburban residents, fleet owners, and government agencies to significantly accelerate EV adoption; 2) supporting smooth transition from fossil fuel-based economy to clean energy economy and create new job opportunities in EV sector; 3) reducing fossil fuel consumption and greenhouse gas emissions, and improving fuel diversity, environmental quality and public health in urban areas; 4) improving mobility equity for the underserved and economically disadvantaged communities in urban community; 5)

facilitating collaborative opportunities between university, automotive EV OEMs, national lab, and other stakeholders to serve rapidly growing EV industry and clean energy economy.

Project Team Qualifications: The team will be led by Project PI, **Prof. Pingen Chen** at TTU. Prof. Chen is a well-recognized expert for his research on alternative fuel vehicles including EV and battery technology development, EV fleet study, and EV ecosystem development. Dr. Chen has been serving as PIs and co-PI of several DOE-funded pilot EV demonstration projects in underserved communities (rural and/or low-income) in Appalachian region. Dr. Chen will leverage his knowledge and experience in EV fleet study and EV-ecosystem from current project and is well positioned to lead the proposed public fleet electrification project. **Co-PI, Dr. Wan Li** is a Research Associate Staff Member in the Mobility and Energy Transitions Analysis (META) group at ORNL. Her research interests focus on traffic system modeling and simulation, urban transportation network operation and control, data-driven spatiotemporal forecasting, and transportation big data analytics. In particular, she is interested in integrating data driven methods, optimization algorithms, and big data analytics tools into intelligent transportation systems to explore how they could support the research and benefit the development of smart cities. **Mr. Jonathan G. Overly** has been in the advanced fuels and vehicles industry since 1997 and founded the nonprofit East Tennessee Clean Fuels Coalition in 2001. He has decades of project management experience and is heavily involved in the Drive Electric TN (DET) initiative both overseeing operations and in participating in multiple working groups and specific activities including the development of DET chapters (including in urban and rural areas), green fleet studies, infrastructure planning and siting, and organizing DET's Utilities Working Group. **Mr. Casey Hopkins** (co-PI) is currently serving as the Program Manager & Grant Coordinator at Nashville Department of Transportation. He has broad knowledge and experience in alternative fuel vehicles (such as EVs) and relevant fueling infrastructure development. He will support P+R system electrification in this project. **Mr. Erik Schmidt** (co-PI) is currently serving as the Director of Sustainability, City of Chattanooga, TN. Mr. Schmidt is leading several smart city initiatives in City of Chattanooga to adopt EVs and development charging infrastructure. He will lead the public fleet electrification efforts in Chattanooga in this project. The project will also receive strong support from vehicle OEMs like **VW** (major EV OEM) and Phoenix Motorcars and major electric power distribution companies such as NES in Nashville and EPB in Chattanooga.

Equipment, Facilities and Prior Experience: The research team has adequate access to the necessary equipment, facilities, and expertise for EV charging station development, EV deployment and demonstration, data acquisition and storage, workforce training, outreach activities. The PI and co-PIs will effectively coordinate with the two Clean Cities Coalitions in the state. The project team has abundant prior experience on directing and conducting research projects closely related to this proposal in terms of challenge, risk, and complexity. The PIs anticipate manageable key technical risks/issues associated with the proposed project with the team members' broad and in-depth expertise in the relevant areas.

Budget: The total budget will be \$2,163,012 with DOE funding of \$999,976 and cost share of \$1,163,036 from the project team. The budget will mainly cover the costs for charging station development, acquisition and maintenance of EVs, staff support from Clean Cities Coalitions, graduate student and faculty supports, time of PI/co-PIs, travel, outreach activities, and supplies.

Potentially Duplicative Funding Notice

1. Name of Organization:

Nashville Department of Transportation and Multimodal Infrastructure

2. Description of Potential Overlap with Other Active Awards of Federal Funds:

There will be no overlap with other federal funds as we do not currently manage a shuttle bus electrification grant project.

3. State how it will ensure any project funds (i.e., recipient cost share and federal funds) will not be used for identical cost items under multiple awards:

We do not currently manage a shuttle bus electrification project.

Disclosure of Lobbying ActivitiesComplete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352
(See reverse for public burden disclosure)

1. Type of Federal Action: a. contract ___c___ b. grant c. cooperative agreement d. loan e. loan guarantee f. loan insurance	2. Status of Federal Action: a. bid/offer/application ___a___ b. initial award c. post-award	3. Report Type: a. initial filing ___a___ b. material change
4. Name and Address of Reporting Entity: ___ Prime ___x___ Subawardee Tier ___1___, if Known: Metropolitan government of Nashville-Davidson County 1 Public Square, Nashville TN 37201-5007 Congressional District, if known: TN-007, TN-006, TN-005	5. If Reporting Entity in No. 4 is Subawardee, Enter Name and Address of Prime: Tennessee Technological University 1 William L. Jones Drive Cookeville, Tennessee 38505-0001 Congressional District, if known: TN006	
6. Federal Department/Agency: US Department of Energy	7. Federal Program Name/Description: Fiscal Year 2024 Vehicle Technologies Office (VTO) Technology Integration (TI) Funding Opportunity Announcement CFDA Number, <i>if applicable</i> : 81.086	
7. Federal Action Number, if known: DE-FOA-0003250	9. Award Amount, if known: \$	
10. a. Name and Address of Lobbying Registrant <i>(if individual, last name, first name, MI):</i> Ana Cruz 601 Thirteenth St NW Suite #250s Washington, D.C. 20005	b. Individuals Performing Services <i>(including address if different from No. 10a)</i> <i>(last name, first name, MI):</i> Ana Cruz	
11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.	 Signature: _____ Print Name: Casey Hopkins _____ Title: __Policy Manager__ Telephone No.: _615-880-1676_____ Date: 4/19/2024	

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Standard Form - LLL (Rev. 7-97)**

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitations for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Included prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, State and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.

(b) Enter the full names of the individual(s) performing services, and include full address if different from 10(a). Enter Last Name, First Name, and Middle Initial (MI).
11. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB control Number. The valid OMB control number for this information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, DC 20503

TENNESSEE TECH UNIVERSITY – PROPOSAL SUBRECIPIENT COMMITMENT			
1. TO BE COMPLETED BY TENNESSEE TECH BEFORE SENDING TO SUBRECIPIENT:			
Prime Sponsor:	U.S. Department of Energy		
TTU Principal Investigator:	Pingen Chen	PI Email Address:	pchen@tntech.edu
Office of Research Contact:	Mark Lynam		
2. TO BE COMPLETED BY PROPOSED SUBRECIPIENT:			
Subrecipient Institution:	Metropolitan Government of Nashville-Davidson County		
Principal Investigator (name and email):	Casey Hopkins casey.hopkins@nashville.gov		
Institutional Address with Zip + 4:			
1 Public Square, Nashville TN			
Congressional District Organization:	TN-007	DUNS #:	LGZLHP6ZHM55
EIN #	62-0694743	CAGE Code (Sam.gov)	3QKW8
Project Title:	Charging Tennessee: Advancing Public Vehicle Fleet Electrification		
Required proposal documents attached: <input checked="" type="radio"/> Scope of work <input type="radio"/> Budget & budget justification <input type="radio"/> Other documents as required by agency			
NOTE: Period of performance & budget information may be revised upon receipt of award.			
PERIOD OF PERFORMANCE	TOTAL SUBRECIPIENT COSTS	Direct Costs	\$500000
01/01/2025-12/31/2027	\$500000	F&A	\$
Do you have a Negotiated Indirect Cost Rate Agreement with a U.S. cognizant agency (e.g., ONR, DHHS, etc.)? (Note: Sponsor or funding opportunity restrictions on indirect costs take precedence.)			
<input checked="" type="radio"/> YES: Provide the URL or a copy with form:			
<input type="radio"/> NO: Unless other restrictions or sponsor conditions exist, the Uniform Guidance (2 CFR 200.331 (a)(4)) <i>de minimus</i> 10% MTDC indirect cost rates will apply.			
Cost Sharing	<input checked="" type="radio"/> YES	Amount:	\$ 500000
(If applicable, cost sharing amounts and justification must be included in the Subrecipient's budget.)			
3. REQUIRED SUBRECIPIENT CERTIFICATIONS			
AUDIT: Is Subrecipient subject to Uniform Guidance 2 CFR 200.331 Subpart F – Audit Requirements?			
<input checked="" type="radio"/> YES: Most recent fiscal year audit completed: https://www.nashville.gov/departments/finance/division-accounts/single-audit-report			
<input type="radio"/> NO: TTU requires Subrecipient to complete a financial status questionnaire as well as a limited scope audit before a subaward will be issued.			
PHS/NIH, NSF: Has Institution implemented a written policy for Investigator Financial Disclosure and Conflict of Interest consistent with agency requirements?		<input checked="" type="radio"/> Yes	<input type="radio"/> No <input type="radio"/> N/A
NSF, USDA-NIFA: Institution certifies that a Responsible Conduct of Research (RCR) Training Plan is in place consistent with agency requirements.		<input checked="" type="radio"/> Yes	<input type="radio"/> No <input type="radio"/> N/A
Subrecipient or Subrecipient Principal Investigator Debarred or Suspended		<input type="radio"/> Yes	<input checked="" type="radio"/> No
Human Subjects	<input type="radio"/> Yes <input checked="" type="radio"/> No	If Yes: FWA #	Human Stem Cells <input type="radio"/> Yes <input checked="" type="radio"/> No
Animal Subjects	<input type="radio"/> Yes <input checked="" type="radio"/> No	If Yes: Assurance #	Animals Euthanized? <input type="radio"/> Yes <input checked="" type="radio"/> No
The appropriate program and administrative personnel of the institution involved in this application are aware of the sponsoring agency's guidelines and are prepared to enter into good faith negotiations to establish the necessary inter-institutional agreement(s). The institution makes all applicable assurances/certifications.			

Casey Hopkins
 Authorized Administrative or Representative Signature
 (a person authorized to submit proposals on behalf of your organization)

4/18/2024

Date

Printed Name and Title: Casey Hopkins

Phone: 931-307-5367

Transparency of Foreign Connections

NOTE: U.S. National Laboratories, domestic government entities, and institutions of higher education are only required to respond to items 1, 2 and 9. If you are such an entity, please explicitly state so in your response to item 1.

1. Entity name, website address and physical address:

Domestic Government Entity
Nashville Department of Transportation and Multimodal Infrastructure
750 S. 5th Street, Nashville TN
<https://www.nashville.gov/departments/transportation>

2. The identity of all owners, principal investigators, project managers, and senior/key personnel who are a party to any *Foreign Government-Sponsored Talent Recruitment Program* of a foreign country of risk (i.e., China, Iran, North Korea, and Russia):

N/A

3. The existence of any joint venture or subsidiary that is based in, funded by, or has a foreign affiliation with any foreign country of risk:

4. Any current or pending contractual or financial obligation or other agreement specific to a business arrangement, or joint venture-like arrangement with an enterprise owned by a foreign state or any foreign entity:

5. Percentage, if any, that the proposed recipient or subrecipient has foreign ownership or control:

6. Percentage, if any, that the proposed recipient or subrecipient is wholly or partially owned by an entity in a foreign country of risk:

- 7. Percentage, if any, of venture capital or institutional investment by an entity that has a general partner or individual holding a leadership role in such entity who has a foreign affiliation with any foreign country of risk:**

- 8. Any technology licensing or intellectual property sales to a foreign country of risk, during the 5-year period preceding submission of the proposal:**

- 9. Any foreign business entity, offshore entity, or entity outside the United States related to the proposed recipient or subrecipient:**

No.

- 10. Complete list of all directors (and board observers), including their full name, citizenship and shareholder affiliation, date of appointment, duration of term, as well as a description of observer rights as applicable:**

- 11. Complete capitalization table for your entity, including all equity interests (including LLC and partnership interests, as well as derivative securities). Include both the number of shares issued to each equity holder, as well as the percentage of that series and all equity on a fully diluted basis. Identify the principal place of incorporation (or organization) for each equity holder. If the equity holder is a natural person, identify the citizenship(s). If the recipient or subrecipient is a publicly traded company, provide the above information for shareholders with an interest greater than five percent:**

- 12. A summary table identifying all rounds of financing, the purchase dates, the investors for each round, and all the associated governance and information rights obtained by investors during each round of financing:**

- 13. An organization chart to illustrate the relationship between your entity and the immediate parent, ultimate parent, and any intermediate parent, as well as any subsidiary or affiliates. Identify where each entity is incorporated:**

NOTE: DOE reserves the right to request additional or clarifying information based on the information submitted.

Instructions and Summary

Award Number: _____
 Award Recipient: _____

Date of Submission: _____
 Form submitted by: _____

(May be award recipient or sub-recipient)

Please read the instructions on each worksheet tab before starting. If you have any questions, please ask your DOE contact!

1. If using this form for award application, negotiation, or budget revision, fill out the blank white cells in workbook tabs a. through j. with total project costs. If using this form for invoice submission, fill out tabs a. through j. with total costs for just the proposed invoice and fill out tab k. per the instructions on that tab.
2. Blue colored cells contain instructions, headers, or summary calculations and should not be modified. Only blank white cells should be populated.
3. Enter detailed support for the project costs identified for each Category line item within each worksheet tab to autopopulate the summary tab.
4. The total budget presented on tabs a. through i. must include both Federal (DOE) and Non-Federal (cost share) portions.
5. All costs incurred by the preparer's sub-recipients, vendors, and Federal Research and Development Centers (FFRDCs), should be entered only in section f. Contractual. All other sections are for the costs of the preparer only.
6. Ensure all entered costs are allowable, allocable, and reasonable in accordance with the administrative requirements prescribed in 2 CFR 200, and the applicable cost principles for each entity type: FAR Part 31 for For-Profit entities; and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.
7. Add rows as needed throughout tabs a. through j. If rows are added, formulas/calculations may need to be adjusted by the preparer. Do not add rows to the Instructions and Summary tab. If your project contains more than three budget periods, consult your DOE contact before adding additional budget period rows or columns.
8. **ALL budget period cost categories are rounded to the nearest dollar.**

BURDEN DISCLOSURE STATEMENT

Public reporting burden for this collection of information is estimated to average 24 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Office of Information Resources Management Policy, Plans, and Oversight, AD-241-2 - GTN, Paperwork Reduction Project (1910-5162), U.S. Department of Energy, 1000 Independence Avenue, S.W., Washington, DC 20585; and to the Office of Management and Budget, Paperwork Reduction Project (1910-5162), Washington, DC 20503.

SUMMARY OF BUDGET CATEGORY COSTS PROPOSED

The values in this summary table are from entries made in subsequent tabs, only blank white cells require data entry

Section A - Budget Summary						
		Federal	Cost Share	Total Costs	Cost Share %	Proposed Budget Period Dates
Budget Period 1		\$137,540	\$250,000	\$387,540	64.51%	Example!!! 01/01/2014 - 12/31/2014
Budget Period 2		\$42,000	\$250,000	\$292,000	85.62%	
Budget Period 3		\$0	\$0	\$0	0.00%	
Total		\$179,540	\$500,000	\$679,540	73.58%	
Section B - Budget Categories						
CATEGORY	Budget Period 1	Budget Period 2	Budget Period 3	Total Costs	% of Project	Comments (as needed)
a. Personnel	\$0	\$0	\$0	\$0	0.00%	
b. Fringe Benefits	\$0	\$0	\$0	\$0	0.00%	
c. Travel	\$0	\$0	\$0	\$0	0.00%	
d. Equipment	\$317,540	\$292,000	\$0	\$609,540	89.70%	
e. Supplies	\$0	\$0	\$0	\$0	0.00%	
f. Contractual						
Sub-recipient	\$0	\$0	\$0	\$0	0.00%	
Vendor	\$70,000	\$0	\$0	\$70,000	10.30%	
FFRDC	\$0	\$0	\$0	\$0	0.00%	
Total Contractual	\$70,000	\$0	\$0	\$70,000	10.30%	
g. Construction	\$0	\$0	\$0	\$0	0.00%	
h. Other Direct Costs	\$0	\$0	\$0	\$0	0.00%	
Total Direct Costs	\$387,540	\$292,000	\$0	\$679,540	100.00%	
i. Indirect Charges	\$0	\$0	\$0	\$0	0.00%	
Total Costs	\$387,540	\$292,000	\$0	\$679,540	100.00%	

Additional Explanation (as needed):

Cost Share

PLEASE READ!!!

1. A detailed presentation of the cash or cash value of all cost share proposed must be provided in the table below. All items in the chart below must be identified within the applicable cost category tabs a. through i. in addition to the detailed presentation of the cash or cash value of all cost share proposed provided in the table below. Identify the source organization & amount of each cost share item proposed in the award.
2. Cash Cost Share - encompasses all contributions to the project made by the recipient, subrecipient, or third party (an entity that does not have a role in performing the scope of work) for costs incurred and paid for during the project. This includes when an organization pays for personnel, supplies, equipment, etc. for their own company with organizational resources. If the item or service is reimbursed for, it is cash cost share. All cost share items must be necessary to the performance of the project. **Vendors may not provide cost share.** Any partial donation of goods or services is considered a discount and is not allowable.
3. In Kind Cost Share - encompasses all contributions to the project made by the recipient, subrecipient, or third party (an entity that does not have a role in performing the scope of work) where a value of the contribution can be readily determined, verified and justified but where no actual cash is transacted in securing the good or service comprising the contribution. In Kind cost share items include volunteer personnel hours, the donation of space or use of equipment, etc. The cash value and calculations thereof for all In Kind cost share items must be justified and explained in the Cost Share Item section below. All cost share items must be necessary to the performance of the project. If questions exist, consult your DOE contact before filling out In Kind cost share in this section. **Vendors may not provide cost share.** Any partial donation of goods or services is considered a discount and is not allowable.
4. Funds from other Federal sources **MAY NOT** be counted as cost share. This prohibition includes FFRDC sub-recipients. Non-Federal sources include any source not originally derived from Federal funds. Cost sharing commitment letters from subrecipients and third parties must be provided with the original application.
5. Fee or profit, including foregone fee or profit, **are not allowable** as project costs (including cost share) under any resulting award. The project may only incur those costs that are allowable and allocable to the project (including cost share) as determined in accordance with the applicable cost principles prescribed in FAR Part 31 for For-Profit entities and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.
6. **NOTE:** A Recipient who elects to employ the 10% de minimis Indirect Cost rate **cannot claim the resulting indirect costs as a Cost Share contribution.**
7. **NOTE:** A Recipient cannot claim "unrecovered indirect costs" as a Cost Share contribution, **without prior approval.**
8. **Each budget period is rounded to the nearest dollar.**

Object Class Category	Organization/Source	Type (Cash or In Kind)	Cost Share Item (Each item must correspond with a project cost declared in the related budget tab - a through i)	Budget Period 1	Budget Period 2	Budget Period 3	Total Project Cost Share
Recipient Cost Share							
a. Personnel							\$0
b. Fringe							\$0
c. Travel							\$0
d. Equipment		Cash		\$250,000	\$250,000		\$500,000
e. Supplies							\$0
f. Contractual (NOT subrecipient provided)							\$0
g. Construction							\$0
h. Other							\$0
i. Indirect							\$0
Total recipient provided cost share				\$250,000	\$250,000	\$0	\$500,000
f. Subrecipient (3rd Party) Cost Share	List your subrecipients providing cost share		For simple cost share contributions from a partner provide the detail below; for complex contributions provide a separate budget justification (if required) or a supplementary detailed explanation				
Sub-Recipient cost share							\$0
Sub-Recipient cost share							\$0
Sub-Recipient cost share							\$0
Sub-Recipient cost share							\$0
Sub-Recipient cost share							\$0
Sub-Recipient cost share							\$0
Sub-Recipient cost share							\$0
Sub-Recipient cost share							\$0
Sub-Recipient cost share							\$0
Sub-Recipient cost share							\$0
Sub-Recipient cost share							\$0
Sub-Recipient cost share							\$0
Sub-Recipient cost share							\$0
Sub-Recipient cost share							\$0
Total - Sub-Recipient provided cost share				\$0	\$0	\$0	\$0
Total Contractual Cost Share (Sum of Recipient and Sub-Recipients)				\$0	\$0	\$0	\$0
Grand Total - Cost Share All Sources			Totals	\$250,000	\$250,000	\$0	\$500,000

Total Project Cost: \$679,540

Cost Share Percent of Award: 73.58%

Additional Explanation (as needed):

d. Equipment

INSTRUCTIONS - PLEASE READ!!!

1. Equipment means tangible personal property (including information technology systems) having a useful life of more than one year and a per-unit acquisition cost which equals or exceeds the lesser of the capitalization level established by the non-Federal entity for financial statement purposes, or \$5,000. Please refer to the applicable Federal regulations in 2 CFR 200 for specific equipment definitions and treatment.
2. List all equipment below, providing a basis of cost (e.g. vendor quotes, catalog prices, prior invoices, etc.). Briefly justify items as they apply to the Statement of Project Objectives. If it is existing equipment, provide logical support for the estimated value shown.
3. During award negotiations, provide a vendor quote for all equipment items over \$50,000 in price. If the vendor quote is not an exact price match, provide an explanation in the additional explanation section below. If a vendor quote is not practical, such as for a piece of equipment that is purpose-built, first of its kind, or otherwise not available off the shelf, provide a detailed engineering estimate for how the cost estimate was derived.
4. Each budget period is rounded to the nearest dollar.

SOPO Task #	Equipment Item	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 1						
3.4.5	EXAMPLE!!! Thermal shock chamber	2	\$70,000	\$140,000	Vendor Quote - Attached	Reliability testing of PV modules- Task 4.3
	Electric Shuttle Bus Conversion Kits	2	\$140,000	\$280,000	Vendor Quote	
	Delivery of Electric Shuttle Buses	2	\$6,000	\$12,000	Vendor Quote	
	19.2kW EV Charging Stations	4	\$6,385	\$25,540	Vendor Quote	
				\$0		
				\$0		
				\$0		
	Budget Period 1 Total			\$317,540		
Budget Period 2						
	Electric Shuttle Bus Conversion Kits	2	\$140,000	\$280,000	Vendor Quote	
	Delivery of Electric Shuttle Buses	2	\$6,000	\$12,000	Vendor Quote	
				\$0		
				\$0		
				\$0		
	Budget Period 2 Total			\$292,000		
Budget Period 3						
				\$0		
				\$0		
				\$0		
				\$0		
				\$0		
	Budget Period 3 Total			\$0		
	PROJECT TOTAL			\$609,540		

Additional Explanation (as needed):

Applicant Name: 0

Award Number: 0

Budget Information - Non Construction Programs

OMB Approval No. 0348-0044

Section A - Budget Summary

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. Budget Period 1				\$137,540.00	\$250,000.00	\$387,540.00
2. Budget Period 2				\$42,000.00	\$250,000.00	\$292,000.00
3. Budget Period 3				\$0.00	\$0.00	\$0.00
4.						
5. Totals				\$179,540.00	\$500,000.00	\$679,540.00

Section B - Budget Categories

6. Object Class Categories	Grant Program, Function or Activity			Total (5)
	Budget Period 1	Budget Period 2	Budget Period 3	
a. Personnel	\$0.00	\$0.00	\$0.00	\$0.00
b. Fringe Benefits	\$0.00	\$0.00	\$0.00	\$0.00
c. Travel	\$0.00	\$0.00	\$0.00	\$0.00
d. Equipment	\$317,540.00	\$292,000.00	\$0.00	\$609,540.00
e. Supplies	\$0.00	\$0.00	\$0.00	\$0.00
f. Contractual	\$70,000.00	\$0.00	\$0.00	\$70,000.00
g. Construction	\$0.00	\$0.00	\$0.00	\$0.00
h. Other	\$0.00	\$0.00	\$0.00	\$0.00
i. Total Direct Charges (sum of 6a-6h)	\$387,540.00	\$292,000.00	\$0.00	\$679,540.00
j. Indirect Charges	\$0.00	\$0.00	\$0.00	\$0.00
k. Totals (sum of 6i-6j)	\$387,540.00	\$292,000.00	\$0.00	\$679,540.00
7. Program Income				\$0

**APPLICATION FOR Fiscal Year 2024 Vehicle Technologies Office (VTO)
Technology Integration (TI) Funding Opportunity Announcement**

METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY



Diana W. Alarcon, Director
Nashville Department of Transportation
and Multimodal Infrastructure

4/29/24

Date