

**FINANCIAL ASSISTANCE  
FUNDING OPPORTUNITY ANNOUNCEMENT**



**U.S. Department of Energy  
Energy Efficiency and Renewable Energy**

**Clean Energy Manufacturing Innovation Institute**

**Funding Opportunity Announcement Number: DE-FOA-0000683**

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**Issue Date: 05/09/2013**

**Letter of Intent Due Date\*: 07/11/2013, 5:00 PM Eastern Time**

**Full Application Due Date: 08/29/2013, 5:00 PM Eastern Time**

**\*Applicants must submit a Letter of Intent by the due date to be eligible to submit a Full Application**

## REGISTRATION REQUIREMENTS

There are several one-time actions before submitting an Application in response to this Funding Opportunity Announcement (FOA), as follows:

- Register and create an account on EERE Exchange at <https://eere-exchange.energy.gov/>. This account will then allow the user to register for any open EERE FOAs that are currently in EERE Exchange. It is recommended that each organization or business unit, whether acting as a team or a single entity, use only one account as the contact point for each submission.

The applicant will receive an automated response when the Application is received. This will serve as a confirmation of receipt. Please do not reply to the automated response. The applicant will have the opportunity to re-submit a revised Application for any reason as long as the relevant submission is submitted by the specified deadline. The Users' Guide for Applying to the Department of Energy EERE Funding Opportunity Announcements is found at <https://eere-exchange.energy.gov/Manuals.aspx>.

The EERE Exchange registration does not have a delay; however, the remaining **registration requirements below could take several weeks to process and are necessary in order for a potential applicant to receive an award under this announcement**. Therefore, although not required in order to submit an Application through the EERE Exchange site, **all potential applicants lacking a DUNS number, or not yet registered with SAM or FedConnect should complete those registrations as soon as possible**.

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

- Obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number (including the plus 4 extension, if applicable) at <http://fedgov.dnb.com/webform>.
- Register with the System for Award Management (SAM) at <https://www.sam.gov>. Designating an Electronic Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in SAM registration. Please update your SAM registration annually.
- 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/PublicPages/FedConnect\\_Ready\\_Set\\_Go.pdf](https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf).
- Register in Grants.gov to receive automatic updates when Amendments to this FOA are posted. However, please note that letters of intent and full applications will not be accepted through Grants.gov. <http://www.grants.gov/>. See the Organization Registration Checklist at [http://www.grants.gov/assets/organizationregcheck\\_092112.pdf](http://www.grants.gov/assets/organizationregcheck_092112.pdf). The Applicant User Guide which contains more information about organization registration is at [http://www.grants.gov/assets/GrantsGov\\_Applicant\\_UserGuide\\_R12.1.0\\_V2.1.pdf](http://www.grants.gov/assets/GrantsGov_Applicant_UserGuide_R12.1.0_V2.1.pdf).

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## **SECTION I – FUNDING OPPORTUNITY DESCRIPTION**

### **A. Summary**

Manufacturing converts a wide range of raw materials, components, and parts into finished goods that meet market expectations. The manufacturing sector provides about 12% of U.S. Gross Domestic Product (GDP), employs nearly 12 million Americans today and will be critical to future U.S. global economic competitiveness and job growth. Technology-based productivity improvements have consistently driven job growth over time across the economy.<sup>1</sup> In addition, the manufacturing sector develops and produces many of the technologies that advance the competitiveness and growth of the entire economy, including the service sector; every dollar spent in manufacturing generates 1.35 dollars in additional economic activity.<sup>2</sup>

In recognition of the vital role an advanced manufacturing sector has in the U.S. economy and national security, and to support the growing resurgence of U.S. manufacturing after years of decline, President Obama proposed a National Network for Manufacturing Innovation (NNMI).<sup>3</sup> The NNMI will enable a robust national innovation system supported by the creation of a network of regional Institutes for Manufacturing Innovation that will enable the transition of products and technologies from research to the marketplace. At the technical core of each Institute is shared research, development and demonstration (RD&D) infrastructure that contains equipment and resources accessible to external parties for technology development that would otherwise be cost prohibitive, particularly for small and medium-sized enterprises (SMEs). The Department of Energy (DOE) supports the development of innovative next generation manufacturing processes and production technologies through the creation of collaborative communities with shared RD&D infrastructure, like manufacturing demonstration facilities. Work conducted at these types of facilities reduces technical risks and enables business case development to support further private investment. Public-private shared RD&D infrastructure devoted to advanced manufacturing has been a key recommendation of both industry and academia.<sup>4</sup>

The mission of the Department of Energy (DOE) is to ensure America's security and prosperity by addressing its energy, environmental, and nuclear challenges through transformative science and technology solutions.<sup>5</sup> Transforming and securing the nation's energy systems and maintaining U.S. leadership in clean energy and high value

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<sup>1</sup> National Science and Technology Council. "A National Strategic Plan for Advanced Manufacturing." Web. February 2012. [http://www.whitehouse.gov/sites/default/files/microsites/ostp/iam\\_advancedmanufacturing\\_strategicplan\\_2012.pdf](http://www.whitehouse.gov/sites/default/files/microsites/ostp/iam_advancedmanufacturing_strategicplan_2012.pdf)

<sup>2</sup> President's Council of Advisors on Science and Technology. "Report to the President on Capturing Domestic Competitive Advantage in Advanced Manufacturing." Web. July 2012. [http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast\\_amp\\_steering\\_committee\\_report\\_final\\_july\\_17\\_2012.pdf](http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast_amp_steering_committee_report_final_july_17_2012.pdf)

<sup>3</sup> The White House. Office of the Press Secretary. "President Obama to Announce New Efforts to Support Manufacturing Innovation, Encourage Insourcing." March 9, 2012. <http://www.whitehouse.gov/the-press-office/2012/07/17/fact-sheet-white-house-advanced-manufacturing-initiatives-drive-innovati>

<sup>4</sup> President's Council of Advisors on Science and Technology. "Report to the President on Capturing Domestic Competitive Advantage in Advanced Manufacturing." Web. July 2012. [http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast\\_amp\\_steering\\_committee\\_report\\_final\\_july\\_17\\_2012.pdf](http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast_amp_steering_committee_report_final_july_17_2012.pdf)

<sup>5</sup> U.S. Department of Energy. 2011 Strategic Plan. [http://energy.gov/sites/prod/files/2011\\_DOE\\_Strategic\\_Plan\\_.pdf](http://energy.gov/sites/prod/files/2011_DOE_Strategic_Plan_.pdf)

technologies requires domestic manufacturing of technologies that produce, move, and use clean energy at a meaningful scale. A robust and competitive domestic manufacturing base is critical for national security both because it can reduce our dependence on oil and ensures domestic supplies of key products.

Investment in innovative advanced manufacturing technologies helps maintain the competitiveness of U.S. producers to ensure growth in manufacturing investment and employment. Last year, a record \$269 billion was invested globally in clean energy technologies,<sup>6</sup> and trillions of dollars will be invested in the coming decades. A core thrust for the Office of Energy Efficiency and Renewable Energy (EERE) is to maintain U.S. global competitiveness in clean energy and manufacturing is an important part of the path forward. EERE launched its Clean Energy Manufacturing Initiative to increase domestic manufacturing competitiveness.

Central to this Initiative is the work of the Advanced Manufacturing Office (AMO) which co-invests with private and public partners to improve U.S. competitiveness, save energy, create high-quality domestic manufacturing jobs and ensure global leadership in advanced manufacturing and clean energy technologies. AMO invests in research, development and demonstration of innovative, next generation manufacturing processes and production technologies at a convincing scale to improve efficiency and reduce emissions, industrial waste and the life-cycle energy consumption of manufactured products. The goal of AMO is to reduce life-cycle energy consumption of manufactured goods by 50 percent over 10 years for AMO supported technologies.

Through this Funding Opportunity Announcement (FOA) AMO and its partners will co-invest in a Clean Energy Manufacturing Innovation Institute (Institute) to support U.S. prosperity and security; and that will contribute to the creation of the NNMI. The primary goals of the Institute are to revitalize American manufacturing and support domestic manufacturing competitiveness by driving innovation, and developing and accelerating adoption of next generation manufacturing technologies that will increase energy productivity, improve product quality, reduce cost, waste or pollution leading to increased domestic production capacity, jobs for American workers and impact regional economic development.

The focus of this Institute will be wide bandgap (WBG) semiconductors for power electronic devices, a foundational technology that is broadly applicable and pervasive in multiple industries and markets with potentially transformational technical and economic impact.

## **B. Background**

### **Energy, Manufacturing and Innovation**

Energy efficient production methods, clean energy technologies, low-cost production techniques, and energy efficient products manufactured domestically are critical to U.S. competitiveness. “Energy costs are a major contributor to manufacturing costs and

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<sup>6</sup> Bloomberg New Energy Finance. "Finance data from the Market Sizing tool for Insight clients of Bloomberg New Energy Finance, accessed 3/5/13." <https://www.bnef.com/MarketSizing/Finance>

technology innovations that steeply reduce energy consumption in industrial and manufacturing processes can give American manufacturers competitive advantages in the global marketplace.”<sup>7</sup> As an example, energy represents 60 percent of operating costs in the chemicals industry and even higher percentages for the petrochemical subsector.<sup>8</sup>

U.S. industry consumes approximately 30 quadrillion Btu (quads) of energy per year,<sup>9</sup> almost one third of all energy used in the United States. Process improvements and innovation can lead to reductions in energy use in the industrial and manufacturing sectors and also impact energy consumption on a life-cycle basis for manufactured goods in other sectors such as transportation and electricity.

Life-cycle energy consumption is the total amount of energy needed to acquire and process raw materials, manufacture, use and dispose (end-of-life) of products.<sup>10</sup> Advanced manufacturing technologies can impact energy intensity in the production, use phase and end-of-life stage for a product, with the net effect of an overall life-cycle reduction in energy consumption. Examples of the impact of advanced manufacturing across different product life-cycle phases are given below:

- Production phase - the use of membranes for separations during production instead of distillation, a traditionally energy intensive process, which reduces the amount of energy required to make intermediate or fine chemicals.
- Use phase - production of lower cost, high quality LEDs to enable widespread use energy efficient lighting (77% less primary energy than incandescent bulbs in the use phase on a levelized lifetime basis of MJ/20 million lumen-hours).<sup>11</sup>
- End-of-life phase - development of improved sorting technologies to enable higher levels of aluminum recycling at lower energy intensity than aluminum production from raw minerals.

## **National Network for Manufacturing Innovation**

The inter-agency Advanced Manufacturing National Program Office (AMNPO) has led the formation of the NNMI concept gathering input from hundreds of private sector, academics, state government and other stakeholders through a series of public workshops and a formal Request for Information. During this time, as a parallel activity, the Administration called for the launch of a competitively selected proof of concept. In August 2012, the interagency National Additive Manufacturing Innovation Institute (NAMII) was launched in

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<sup>7</sup> U.S. House. Committee on Appropriations. Energy and Water Development Appropriations Bill, 2013 (to Accompany H.R. 5325) Together with Additional Views. 112<sup>th</sup> Congress. 2d Session. Report 112-462. Washington: GPO, 2012. GPO.

U.S. Government Printing Office. Web. 2 May 2012. (85). <http://www.gpo.gov>

<sup>8</sup> Energy Information Administration. International Energy Outlook 2011.” Web. Released 19 September 2011. <http://www.eia.gov/forecasts/ieo/industrial.cfm>

<sup>9</sup> Energy Information Administration. “Annual Energy Outlook 2012.” Table C2. Web. DOE/EIA-0383 (2012) [http://www.eia.gov/totalenergy/data/monthly/pdf/sec2\\_3.pdf](http://www.eia.gov/totalenergy/data/monthly/pdf/sec2_3.pdf)

<sup>10</sup> Navigant Consulting. “Life-Cycle Assessment of Energy and Environmental Impacts of LED Lighting Products.” Prepared for the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy. Buildings Technology Program. Web. August 2012 (9). [http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/2012\\_LED\\_Lifecycle\\_Report.pdf](http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/2012_LED_Lifecycle_Report.pdf).

<sup>11</sup> Navigant Consulting. “Life-Cycle Assessment of Energy and Environmental Impacts of LED Lighting Products.” Prepared for the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy. Buildings Technology Program. Web. August 2012 (36). [http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/2012\\_LED\\_Lifecycle\\_Report.pdf](http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/2012_LED_Lifecycle_Report.pdf).

Youngstown, OH.<sup>12</sup> The combined stakeholder feedback and experience gained from the launch of NAMII was critical in defining the Institute concept and the formulation of the NNMI. The result of these efforts is formalized in the National Science and Technology Council report published January 2013, “National Network for Manufacturing Innovation: A Preliminary Design.” The report summarizes the NNMI and Institute concepts as follows:

*“The Federal investment in the National Network for Manufacturing Innovation (NNMI) serves to create an effective manufacturing research infrastructure for U.S. industry and academia to solve industry-relevant problems. The NNMI will consist of linked Institutes for Manufacturing Innovation (IMIs) with common goals, but unique concentrations. In an IMI, industry, academia, and government partners leverage existing resources, collaborate, and co-invest to nurture manufacturing innovation and accelerate commercialization.*

*As sustainable manufacturing innovation hubs, IMIs will create, showcase, and deploy new capabilities, new products, and new processes that can impact commercial production. They will build workforce skills at all levels and enhance manufacturing capabilities in companies large and small. Institutes will draw together the best talents and capabilities from all the partners to build the proving grounds where innovations flourish and to help advance American domestic manufacturing.”*<sup>13</sup>

Through the creation of Institutes and NNMI, DOE, AMNPO and its partner agencies seek to ensure U.S. prosperity and security to support innovative, advanced manufacturing technologies that will enhance domestic advanced manufacturing competitiveness and create jobs for American workers.

## **Institute Overview**

This section summarizes the overall vision for Institutes and the NNMI as articulated in the NSTC “National Network for Manufacturing Innovation: Preliminary Design” report and provides a high level framework for the Institute that is the goal of this FOA. Institutes will create, showcase, and deploy new capabilities, new products, and new processes that can impact commercial production. They will build workforce skills at all levels and enhance manufacturing capabilities in companies large and small. Institutes will draw together the best talents and capabilities from all the partners to build the proving grounds where innovations flourish and to help advance American domestic manufacturing

Institute leadership must be capable of leading an industry-wide technology, workforce development and infrastructure agenda that strongly leverages industry consortia, regional clusters, and other resources in science, technology, and economic development. Institutes will have a strong management team and strong organizational director. Governance of the Institute will be clearly defined and the Institute will have a well-defined operational plan that will enable the Institute to maintain relevance to stakeholders over time. Institutes will

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<sup>12</sup>The White House. Office of the Press Secretary. “We Can’t Wait: Obama Administration Announces New Public-Private Partnership to Support.” August 16, 2012 <http://www.whitehouse.gov/the-press-office/2012/08/16/we-can-t-wait-obama-administration-announces-new-public-private-partners>

<sup>13</sup>National Science and Technology Council. “National Network for Manufacturing Innovation: A Preliminary Design.” January 2013. [http://www.whitehouse.gov/sites/default/files/microsites/ostp/nstc\\_nnmi\\_prelim\\_design\\_final.pdf](http://www.whitehouse.gov/sites/default/files/microsites/ostp/nstc_nnmi_prelim_design_final.pdf)

be expected to be financially sustainable within five to seven years of launch through income-generating activities including member fees, intellectual property licenses, contract research, and fee-for-service activities, as examples. Participants in the Institute may engage and conduct work at an Institute using a variety of contracting and collaboration instruments. The Institutes are of a size and scale to provide long-term economic impact in the region and nationally.

Through shared RD&D infrastructure and capabilities at its core, like a manufacturing demonstration facility, an Institute will enable demonstration of advanced manufacturing technologies at a scale significant enough to establish technical feasibility and enable business case development to attract further private investment. Each Institute will be organized to foster an open exchange of pre-competitive manufacturing best-practices and know-how -- including design and processing tools, qualification and certification approaches, and fabrication costing methods -- while protecting company proprietary intellectual property. Each Institute will include business models to allow manufacturers of all sizes access to and use of the shared RD&D infrastructure, as well as guide and train participants. The Institute will also provide the opportunity for equipment suppliers and partners to improve their own technologies by learning from other users. An Institute engages the manufacturing community at all levels of the supply chain, from large companies, potential end users, to researchers and SMEs involved in critical development work and who will support the transition to commercial applications, to ensure the Institute is focused on industry relevant problems and increase likelihood of success.

The Institute will support applied research, development and demonstration projects that enable new processes, equipment, design tools, and capabilities for innovative production or materials technologies; accelerate certification and qualification of processes and products; maintain data and models; assist in the development of testing protocols and standards; and demonstrate the transition of innovations to the commercial market as appropriate for the technology focus area.

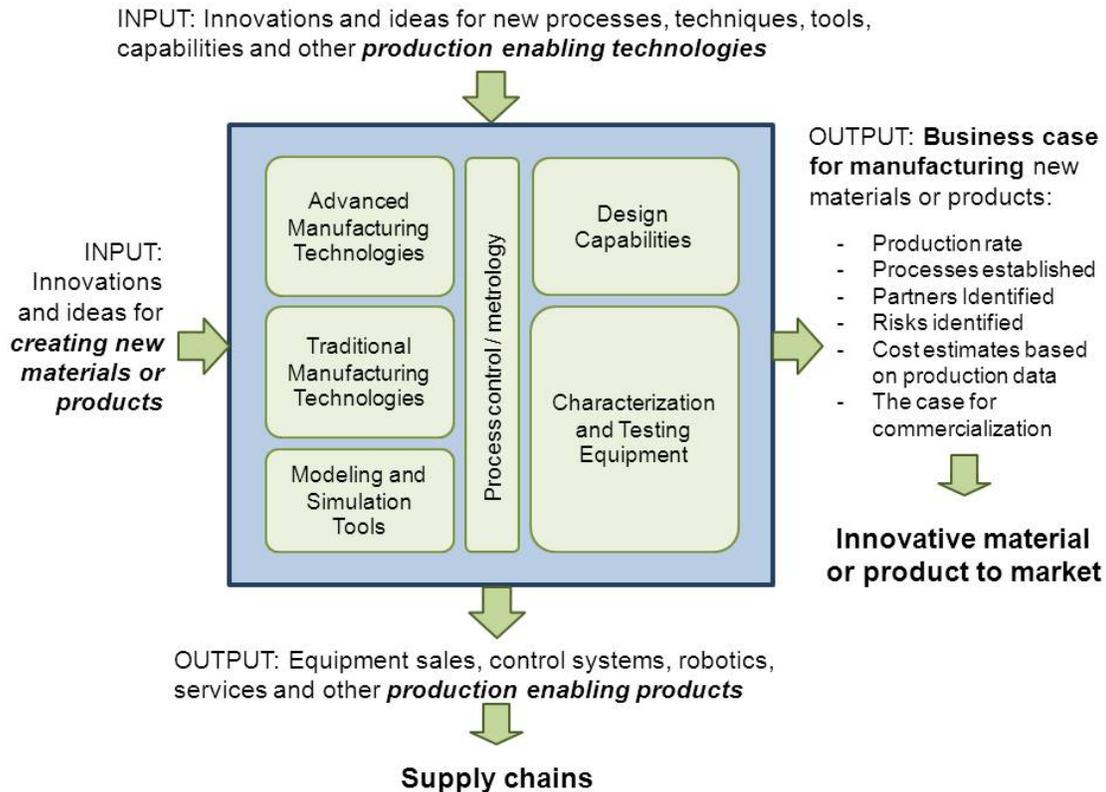
The Institutes will engage with the broader community by hosting interns and guest workers from industry, academia, and government to accelerate pre-competitive development of advanced manufacturing technologies, as well as support educational and workforce development of the manufacturing community around the Institute. Each Institute will interact and engage with other national, regional and local resources and facilities and participate in the National Network for Manufacturing Innovation.

A key aspect of the design and planning for each proposed Institute is the establishment of technical objectives and the aligning of resources and capabilities to meet those goals as appropriate to the selected foundational technology area. The adequacy of the application with respect to technical capabilities, and ease of access and effective use of resources to support the Institute objectives will be critical review criteria in this FOA.

### **Shared RD&D Infrastructure**

A critical element of the Institute model is the establishment and operation of shared RD&D infrastructure. Each Institute supports collaboration between process and product developers to foster innovation. A model for the shared RD&D infrastructure of the Institute is shown in Figure 1, with examples of the capabilities that may be included. Not every Institute will

require each type of capability represented in the diagram and the list is not exhaustive. Other capabilities or functionality may be required to be successful. It may not be realistic or cost-effective for an Institute to house the complete set of capabilities needed within the physical walls of the Institute. An Institute will leverage existing infrastructure and establish partnerships with laboratories, test facilities and other centers to supplement the capabilities within the Institute as needed and as practical.



**Figure 1. Diagram of the shared RD&D infrastructure of an Institute (as an example)**

As illustrated by Figure 1, the output from either the horizontal or vertical path is an impact to supply chains and markets through adoption of innovative products. The horizontal path through the diagram describes the potential path for a product-focused participant where the outcome is development of a business case for private sector investment and demonstration of technical feasibility of production at meaningful scale for that technology or market application. The Institute provides users affordable access to a set of alternate physical and virtual tools to manufacture, optimize, and evaluate production of new materials, devices, or components. These tools enable developers and innovators to rapidly adopt new technologies, optimize processes, reduce technical risk to encourage investment, understand cost of production at scale, and implement those innovations into the marketplace.

The vertical path through the diagram outlines how process-focused participants might benefit from the Institute. Equipment and tool suppliers may provide test or production units for use within the Institute providing exposure to new users, enabling application for new products, innovations in equipment design or operation, improvements such as modified control systems, automation or use of robotics that may lead to additional sales, new designs and other benefits. The development of these process related innovations and ideas to

production-relevant scales enables rapid deployment of production enabling technologies into supply chains.

### C. Technology Topic Area Details: Wide Bandgap Semiconductor Power Electronic Devices

#### Introduction

As silicon (Si) approaches its theoretical performance limits, wide bandgap (WBG) semiconductors are becoming increasingly important in next generation power electronics. Due to bandgaps significantly greater than Si (1.1 eV), WBG semiconductor-based devices can operate at temperatures above 150°C, have longer lifetimes at higher operating voltages (> 1 kV to tens of kV), and switch at higher frequencies (tens of kHz to tens of GHz) with lower power losses than Si-based solid-state technologies. In addition to the significant use-phase energy intensity reductions proven in solid-state lighting,<sup>14</sup> WBG semiconductors also offer similar opportunities in power conversion dependent clean energy sectors.

Electricity is the fastest-growing form of end-use energy worldwide<sup>15</sup> with 30% of all electric power currently generated using power electronics somewhere between the point of generation and distribution, and expected to grow to 80% by 2030.<sup>16</sup> Silicon carbide (SiC) and gallium nitride (GaN) are beneficial for next generation power electronics to improve and accelerate both grid integration and interface of renewables,<sup>17,18</sup> deployment of electric drive vehicles,<sup>19</sup> as well as, in the defense industrial base, industrial-scale variable-speed motors and data centers. Improved performance and increased energy savings of WBG-based power conversion will therefore support the President's goal to double American energy productivity by 2030<sup>20</sup> and also impact the approximately 40 quadrillion Btu (quads) per year, or 40% of primary energy, used to produce electricity.<sup>21</sup>

For example, according to Yole Development, a 25% reduction in world energy consumption can be achieved by 2025 if GaN achieves widespread adoption in both power electronics and solid-state lighting.<sup>22</sup> Furthermore, WBG-based power electronics offer tremendous market potential. For example, GaN and SiC are projected to garner 22% of the \$15 B discrete

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<sup>14</sup> Office of Energy Efficiency and Renewable Energy, Building Technologies Program. "Solid-State Lighting Research and Development: Multi-Year Program Plan," April 2012. (Washington, DC: U.S. Department of Energy), [http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/ssl\\_mypp2012\\_web.pdf](http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/ssl_mypp2012_web.pdf).

<sup>15</sup> U.S. Energy Information Administration. "Annual Energy Outlook 2012." Table C2. Web. DOE/EIA-0383(2012) [http://www.eia.gov/totalenergy/data/monthly/pdf/sec2\\_3.pdf](http://www.eia.gov/totalenergy/data/monthly/pdf/sec2_3.pdf)

<sup>16</sup> L.M. Tolbert, et al., "Power Electronics for Distributed Energy Systems and Transmission and Distribution Applications: Assessing the Technical Needs for Utility Applications." 2005. [http://www.theeestory.com/files/PE\\_20For\\_20DE\\_20and\\_20T\\_D\\_20Applications\\_20\\_ORNL-TM-2005-230\\_.pdf](http://www.theeestory.com/files/PE_20For_20DE_20and_20T_D_20Applications_20_ORNL-TM-2005-230_.pdf)

<sup>17</sup> Office of Electricity Delivery and Energy Reliability, *Power Electronics Research and Development Program Plan*, April 2011 (Washington, DC: U.S. Department of Energy), [http://energy.gov/sites/prod/files/oeprod/DocumentsandMedia/OE\\_Power\\_Electronics\\_Program\\_Plan\\_April\\_2011.pdf](http://energy.gov/sites/prod/files/oeprod/DocumentsandMedia/OE_Power_Electronics_Program_Plan_April_2011.pdf).

<sup>18</sup> Office of Energy Efficiency and Renewable Energy, Sunshot Initiative, "Sunshot Vision Study," February 2012. (Washington, D.C.: U.S. Department of Energy), <http://www1.eere.energy.gov/solar/pdfs/47927.pdf>.

<sup>19</sup> Office of Energy Efficiency and Renewable Energy, Vehicle Technologies Program, *Multi-Year Program Plan 2011-2015*, December 2010 (Washington, DC: U.S. Department of Energy), [http://www1.eere.energy.gov/vehiclesandfuels/pdfs/program/vt\\_mypp\\_2011-2015.pdf](http://www1.eere.energy.gov/vehiclesandfuels/pdfs/program/vt_mypp_2011-2015.pdf).

<sup>20</sup> "The President's Plan for A Strong Middle Class & A Strong America," February 2013, [http://www.whitehouse.gov/sites/default/files/docs/sotu\\_blueprint\\_2013.pdf](http://www.whitehouse.gov/sites/default/files/docs/sotu_blueprint_2013.pdf).

<sup>21</sup> U.S. Energy Information Administration. "Annual Energy Outlook 2012." Table C2. Web. DOE/EIA-0383(2012) [http://www.eia.gov/totalenergy/data/monthly/pdf/sec2\\_3.pdf](http://www.eia.gov/totalenergy/data/monthly/pdf/sec2_3.pdf)

<sup>22</sup> Yole Development, CS Substrate Market Report, Lyon, France, 2010.

power electronics components market by 2020 with a 9% compound annual growth rate.<sup>23</sup> However, many challenges remain across the manufacturing supply chain shown in Figure 2 that must be addressed before WBG-based technologies gain their full energy savings and market potential.

Materials, Wafers & Epitaxy	Devices & Components:	Packaging & Modules:	Subsystems & Systems:
<p><u>Examples:</u></p> <ul style="list-style-type: none"> <li>• SiC/SiC</li> <li>• GaN/Si</li> <li>• GaN/Al<sub>2</sub>O<sub>3</sub></li> <li>• GaN/SiC</li> <li>• GaN/GaN</li> </ul>	<p><u>Examples:</u></p> <ul style="list-style-type: none"> <li>• Diodes (PiN, Schottky)</li> <li>• Transistors (MOSFET, JFET, IGBT, BJT)</li> <li>• Thyristors (GTO)</li> </ul>	<p><u>Examples:</u></p> <ul style="list-style-type: none"> <li>• Switches</li> <li>• Inverters</li> <li>• Amplifiers</li> </ul>	<p><u>Examples:</u></p> <ul style="list-style-type: none"> <li>• Electric Drive Vehicles (Inverters, Converters, Chargers)</li> <li>• Motors</li> <li>• Solar Inverters</li> <li>• Wind Inverters</li> </ul>

**Figure 2. WBG Power Electronics Supply Chain**

### Manufacturing Challenges

Overall cost reduction and establishment of a definitive value proposition compared to Si-based solutions to enable widespread adoption into clean energy end-use systems (i.e. industrial motors, electric drive vehicle power electronic modules, including converters and inverters, as well as solar and wind inverters, including microinverters, AC modules, and higher voltage inverters to remove the need for step-up transformers for grid interconnection)<sup>24,25</sup> requires reproducibility and manufacturability at high volumes. Despite superior performance, end-user customers necessitate near cost parity with Si for adoption of WBG devices into their systems, creating a bottleneck in the supply chain.<sup>26</sup> The *core challenge* for cost-reduction in WBG-based power electronics is the development and scale-up of high volume and low cost manufactured device designs, packaging, and modules for systems-level operational and spatial requirements with broad enough end-use system applicability. Furthermore, since direct chip-on-chip replacement of Si for WBG semiconductors is not optimal, the development and demonstration of new circuit designs and topologies that optimally utilize SiC and GaN is necessary.<sup>27</sup> In addition, testing procedures and communication of device requirements and performance specifications

<sup>23</sup> D. Cline, et al., “Beyond Silicon: Plotting GaN and SiC’s Path within the \$15 Billion Power Electronics Market,” March 2012, (Boston, MA: Lux Research Inc.), [www.luxresearchinc.com](http://www.luxresearchinc.com).

<sup>24</sup> L.M. Tolbert, et al., “Power Electronics for Distributed Energy Systems and Transmission and Distribution Applications: Assessing the Technical Needs for Utility Applications.” 2005. [http://www.theeestory.com/files/PE\\_20For\\_20DE\\_20and\\_20T\\_D\\_20Applications\\_20\\_ORNL-TM-2005-230\\_.pdf](http://www.theeestory.com/files/PE_20For_20DE_20and_20T_D_20Applications_20_ORNL-TM-2005-230_.pdf)

<sup>25</sup> D. Cline, et al., “Beyond Silicon: Plotting GaN and SiC’s Path within the \$15 Billion Power Electronics Market,” March 2012, (Boston, MA: Lux Research Inc.), [www.luxresearchinc.com](http://www.luxresearchinc.com).

<sup>26</sup> “Wide Bandgap Semiconductor for Clean Energy Workshop: Summary Report,” July 2012, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Advanced Manufacturing Office.

<sup>27</sup> L.M. Tolbert, et al., “Power Electronics for Distributed Energy Systems and Transmission and Distribution Applications: Assessing the Technical Needs for Utility Applications.” 2005. [http://www.theeestory.com/files/PE\\_20For\\_20DE\\_20and\\_20T\\_D\\_20Applications\\_20\\_ORNL-TM-2005-230\\_.pdf](http://www.theeestory.com/files/PE_20For_20DE_20and_20T_D_20Applications_20_ORNL-TM-2005-230_.pdf)

between device engineers and end-use customers related to system-level requirements is also needed. Such performance and reliability testing specifications must be developed in the temperature, current, voltage, and frequency ranges over which WBG devices exhibit superior performance to Si-based devices.<sup>28</sup>

Similar to the challenges that the domestic Si industry faced two decades ago,<sup>29</sup> increased investment and competition from overseas threatens the existing U.S. foothold in the supply chain and future manufacturing and export opportunities. A WBG semiconductor Institute offers the opportunity to tackle this challenge by employing existing manufacturing capabilities, with relevant assets that may be underutilized in their present configuration, to revitalize geographic regions. For example, the transition to the current state-of-the-art Si wafers (12-inch), could permit the leveraging, with necessary modifications, of idle Si foundry lines utilized for the wafer sizes (6- and 8-inch) required to pursue WBG-based device maturation efforts.

### **Focus and Impact**

The focus of an Institute in WBG semiconductor power electronics for device fabrication and manufacturing will require circuit design, packaging, and module manufacturing capabilities as well as wafer test metrology equipment to verify wafer quality throughout the photolithographic and chemical processing steps. Furthermore, the development of standard packaging technologies, modeling, and lifetime reliability studies, as well as a centralized testing capability for devices will reduce the need for duplicative capital investments from users. As such, an Institute should offer in-house design capabilities for users, as well as common fabrication and testing equipment for the community. The Institute is also envisioned to initiate and establish long-term device and system reliability testing, including simulation and modeling capabilities, to identify and couple failure mechanisms to device- and systems-level performance, as well as to benchmark and develop both testing and performance standards for the industry as a whole and the operational requirements necessary for the relevant applications, including electric drive vehicles, solar, and wind power conversion. In this role, the Institute could convene the community to undertake WBG technology and manufacturing roadmapping activities to translate recent accomplishments and plan future activities, similar to the International Technology Roadmap for Semiconductors (ITRS) and other such efforts. Competitively-selected projects utilizing the Institute's capabilities should include solving existing technical challenges in packaging and device design, such as gate drivers, that can then be translated into the Institute's knowledge base for testing and incorporating into end-systems.

The Institute must possess a strong technical focus on GaN- and/or SiC-based device manufacturing with the potential for transformative technical and economic impact across multiple power electronics-based industries and markets. Targeted technical and economic impacts are reduced energy use, cost, pollution, improved efficiency and product quality, and a more competitive and fully integrated domestic manufacturing supply chain to meet increasing global demand. An Institute and its members will need to be well integrated across the supply chain (Figure 2) to ensure wafers demonstrating the current state-of-the art

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<sup>28</sup> Wide Bandgap Semiconductor for Clean Energy Workshop: Summary Report," July 2012, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Advanced Manufacturing Office.

<sup>29</sup> C.W. Wessner, A.W. Wolff, "Rising to the Challenge: U.S. Innovation Policy for Global Economy," 2012 (Washington, D.C.: National Academies Press).

growth technologies are utilized in its device design, fabrication, and testing activities. However, materials growth or wafer processing improvements (i.e. defect density reduction, film thickness, yield, and diameter increases) are excluded from the scope of this FOA and the Institute's purpose.

Commercialization of foundational technologies results in cascading market effects. Diffusion of the technology or its variants into multiple markets leads to widespread deployment and the creation of new markets for technologies associated with and/or dependent upon the foundational technology. A foundational technology enables associated technologies to penetrate existing markets that are currently cost or otherwise prohibitive and entirely new markets are anticipated to arise as a result of the technology's effect on industrial systems. An Institute in WBG focused within the device and module manufacturing portion of the supply chain should enable such effects, and strong proposals should include pathways and a strategy to ensure these outcomes.

#### **D. Funding Opportunity Announcement Goals**

The goal of this Funding Opportunity Announcement (FOA) is to establish a Clean Energy Manufacturing Innovation Institute (Institute) to support U.S. prosperity and security; and that will contribute to the creation of the National Network for Manufacturing Innovation (NNMI). The primary goals of the Institute are to revitalize American manufacturing and support domestic manufacturing competitiveness by driving innovation, and developing and accelerating adoption of next generation manufacturing technologies that will increase energy productivity, improve product quality, reduce cost, waste or pollution leading to increased domestic production capacity, jobs for American workers and regional economic development.

The Institute established through this FOA will focus on wide bandgap (WBG) semiconductors for power electronic devices, as described in Section I.C. WBG semiconductors for power conversion are a foundational technology that is broadly applicable and pervasive in multiple industries and markets with potentially transformational technical and economic impact. Due to their superior power conversion properties, accelerated adoption of WBG semiconductors can lead to increased clean energy generation and U.S. energy productivity as described in the section above. The Institute will leverage existing U.S. technological leadership and strength in this field and, where applicable, apply knowledge and leverage assets from the Si industry to overcome key manufacturing and cost barriers in mid-stream device design, packaging, reliability and testing standards elements of the supply chain. The Institute will accelerate market penetration and establish the value proposition for end-use adoption to increase product sales of these next generation power conversion technologies and retain U.S. leadership through development and support of a fully integrated domestic supply chain.

To achieve these goals, consistent with the technology focus area as described in Section I.C, the Institute created through this FOA will:

- a) be a financially self-sustaining, world-leading innovation hub, that brings together private and public entities to co-invest in the development and deployment of innovative next generation manufacturing technologies which will lead to

*increased domestic production capacity, increased energy productivity, measurable commercialization success and support national needs;*

- b) support shared RD&D infrastructure that enables affordable access to physical and virtual tools as well as expertise to reduce the cost and risk of commercialization, address technical challenges that may arise from scale-up and production at a manufacturing relevant scale and provide data to enable business case development;
- c) enable applied RD&D projects (TRL/MRL 4-7)<sup>30</sup> that support new processes, equipment, design tools, and capabilities for innovative production or materials technologies; accelerate certification and qualification of processes and products; maintain data and models and develop testing protocols and standard as appropriate for the technology area;
- d) define clear policies and strategies for participation by a wide range of stakeholders in the Institute, in particular, to engage SMEs through outreach and intermediaries, including programs like the NIST MEP Center network where appropriate, and provide sufficient financial and contractual mechanisms for all stakeholders along the supply chain including end-users to benefit from the Institute resources;
- e) provide capabilities for and collaboration in open, pre-competitive work, among multiple parties in an Intellectual Property (IP) protected environment, as well as proprietary activities as appropriate to engage stakeholders as relevant to the technology area;
- f) establish a technical education and workforce development plan to support technical and career education that will leverage relevant existing resources like the NSF ATE Centers, industry validated certifications and apprenticeship programs, etc. to develop the workforce needed to serve in our nation's high value, next generation manufacturing facilities, as appropriate to the technology area; and
- g) leverage relevant existing private and public sector resources and facilities such as NSF ATE Centers, NIST MEPs, national laboratories, university centers and other government investments.

**Funding from this FOA (including required cost share) is NOT permitted (or allowed) for construction of new buildings or for major renovation of existing buildings.**

Allowable costs include those necessary to house the Institute (including a possible lease for the first five years of the project), to make minor renovations as needed, and to purchase research equipment and instrumentation. Costs for new construction (including new buildings or additions to existing buildings) will not be allowed in the Institute award.

Applicants with existing facilities and operations must clearly demonstrate how the Institute will differ from the purpose of existing facilities and staff, as well as outline how the proposed new procedures and capabilities are in line with the goals of this FOA.

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<sup>30</sup>National Science and Technology Council. "National Network for Manufacturing Innovation: A Preliminary Design." January 2013. [http://www.whitehouse.gov/sites/default/files/microsites/ostp/nstc\\_nnmi\\_prelim\\_design\\_final.pdf](http://www.whitehouse.gov/sites/default/files/microsites/ostp/nstc_nnmi_prelim_design_final.pdf)

## **SECTION II – AWARD INFORMATION**

### **A. Type of Award Instrument**

#### **Cooperative Agreements or Technology Investment Agreements**

DOE anticipates awarding cooperative agreements or technology investment agreements (TIAs) under this program announcement. For either type of award, the DOE Specialist and DOE Project Officer will negotiate a Statement of Substantial Involvement with the Recipient prior to award (see 10 CFR 600.5(b) and 603.105(a)).

TIAs are a type of assistance instrument used to support or stimulate research projects involving for-profit firms, especially commercial firms that do business primarily in the commercial marketplace. TIAs are different from grants and cooperative agreements in that the award terms may vary from the Government-wide standard terms (see DOE TIA regulations at 10 CFR Part 603). The primary purposes for including TIAs in the type of available award instruments are to encourage non-traditional Government contractors to participate in this Research, Development and Demonstration (RD&D) program and to facilitate new relationships and business practices. A TIA can be particularly useful for awards to consortia (see 10 CFR 603.225(b) and 603.515, Qualification of a consortium).

An applicant may request a TIA if it believes that using a TIA could benefit the RD&D objectives of the program (see 10 CFR 603.225) and can document these benefits. If an applicant is seeking to negotiate a Technology Investment Agreement, the applicant must include an explicit request in its Full Application. After an applicant is selected for award, the Contracting Officer will determine if awarding a TIA would benefit the RD&D objectives of the program in ways that likely would not happen if another type of assistance instrument were used (e.g., cooperative agreement subject to all the requirements of 10 CFR Part 600). The Contracting Officer will use the criteria in 10 CFR 603, Subpart B to make this determination.

### **B. Estimated Funding**

#### **Amount Multiple Year Awards**

Approximately \$14 million is expected to be available upon initial award, with an anticipated \$14 million per year available in the following four years, for a total of up to \$70 million over five years of funding. DOE funding will be provided on an annual basis and will be contingent upon meeting the agreed upon accomplishments and milestones. Applicants should plan for equal funding per year but be able to accommodate in the spend plan a variable funding profile with higher levels early in the award time frame.

**Funding for all awards and future budget periods is also contingent upon the availability of funds appropriated by Congress for the purpose of this program and the availability of future-year budget authority.**

### **C. Anticipated Maximum and Minimum Award Size**

- Ceiling (i.e., the maximum amount for an individual award made under this announcement): \$70.0 million in federal funds total.
- Floor (i.e., the minimum amount for an individual award made under this announcement): \$25.0 million in federal funds total.

### **D. Expected Number of Awards**

DOE anticipates making 1 award under this announcement.

### **E. Anticipated Award Size**

DOE anticipates that this award will be up to \$70 million of federal funds for the total project period of five years, up to \$14 million per year. **Funding for all awards and future budget periods are contingent upon the availability of funds appropriated by Congress for the purpose of this program and the availability of future-year budget authority.**

### **F. Period of Performance**

DOE anticipates making an award that will run up to 60 months over four budget periods or phases. The first budget period will cover a period of approximately 18 months; the second and third budget periods will each cover a period of approximately 12 months; the fourth budget period will cover a period of approximately 18 months, for a total 60 month project period. Continuation from one budget period to the next will be contingent upon satisfactory performance of each budget period, a go/no-go decision review completed at least 30 days prior to the close of the budget period and contingent upon the availability of funds appropriated by Congress for the purpose of this program and the availability of future-year budget authority. At the go/no-go decision points, DOE will evaluate project performance, project schedule adherence, meeting milestone objectives, compliance with reporting requirements, and overall contribution to the program goals and objectives. As result of this evaluation, DOE will make a determination to continue the project, re-direct the project, or discontinue funding the project at the time of the go/no-go decision point.

### **G. Type of Application**

DOE will accept only new applications under this announcement (i.e., applications for renewals of existing DOE funded projects will not be considered).

### **H. Environmental Review in Accordance with National Environmental Policy Action (NEPA)**

The federal funds distributed under this FOA are subject to the National Environmental Policy Act, 42 U.S.C. §§ 4321 et seq. (NEPA). NEPA requires federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions. For additional background on NEPA, please see DOE's NEPA website, at <http://nepa.energy.gov/>.

While NEPA compliance is a federal agency responsibility and the ultimate decisions remain with the federal agency, all projects 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.

## **I. Performance of Work in the United States**

EERE strongly encourages interdisciplinary and cross-sectoral collaboration spanning organizational and national boundaries. Such collaboration enables the achievement of scientific and technological outcomes that were previously viewed as extremely difficult, if not impossible.

EERE requires all work under EERE funding agreements to be performed in the United States – i.e., prime recipients must expend 100% of the total project cost in the United States.

Applicants and prime recipients may request a waiver of this requirement. Applicants requesting a waiver at the time of application must include a written waiver request in the Full Application. If, subsequent to receiving an award, a prime recipient wishes to apply for a waiver, it must submit its waiver request in writing to the assigned DOE Contracting Officer. The DOE Contracting Officer has discretion to waive this requirement if he/she determines that it will further the purposes of this FOA and is otherwise in the interests of EERE. See Section IV.C.11 of the FOA for waiver request information.

## **SECTION III - ELIGIBILITY INFORMATION**

### **A. Eligible Applicants**

#### **1. Individuals**

U.S. citizens and lawful permanent residents are eligible to apply for funding as a prime recipient or subrecipient.

**2. Domestic Entities** For-profit entities, educational institutions, and nonprofits<sup>31</sup> that are incorporated (or otherwise formed) under the laws of a particular State or territory of the United States are eligible to apply for funding as a prime recipient or subrecipient.

State, local, and tribal government entities are eligible to apply for funding as a prime recipient or subrecipient.

DOE/NNSA Federally Funded Research and Development Centers (FFRDCs) and DOE Government-Operated Government-Owned laboratories (GOGOs) are eligible to apply for funding as a prime recipient or subrecipient.

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<sup>31</sup>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.

Non-DOE/NNSA FFRDCs and non-DOE GOGOs are eligible to apply for funding as a subrecipient, but are not eligible to apply as a prime recipient.

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

### **3. Foreign Entities**

Foreign entities, whether for-profit or otherwise, are eligible to apply for funding under this FOA.

Other than as provided in the “Individuals” or “Domestic Entities” sections above, all prime recipients receiving funding under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. If a foreign entity applies for funding as a prime recipient, it must designate in the Full Application a subsidiary or affiliate incorporated (or otherwise formed) under the laws of a State or territory of the United States to be the prime recipient. The Full Application must state the nature of the corporate relationship between the foreign entity and domestic subsidiary or affiliate. Foreign entities may request a waiver of this requirement in the Full Application. See Section IV.C.11 for waiver request information. The DOE Contracting Officer has discretion to waive this requirement if he/she determines that it will further the purposes of this FOA and is otherwise in the interests of EERE.

A foreign entity may receive funding as a subrecipient.

### **4. Incorporated Consortia**

Incorporated consortia, which may include domestic and/or foreign entities, are eligible to apply for funding as a prime recipient or subrecipient. For consortia incorporated (or otherwise formed) under the laws of a State or territory of the United States, please refer to “Domestic Entities” above. For consortia incorporated in foreign countries, please refer to the requirements in “Foreign Entities” above.

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

### **5. Unincorporated Consortia**

Unincorporated consortia, which may include domestic and foreign entities, must designate one member of the consortium to serve as the prime recipient/consortium representative. The prime recipient/consortium representative must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. The eligibility of the consortium will be determined by the eligibility of the prime recipient/consortium representative under Section III.A of the FOA.

Upon request, unincorporated consortia must provide the DOE Contracting Officer with a collaboration agreement, commonly referred to as the articles of collaboration, which sets out the rights and responsibilities of each consortium member. This agreement binds the

individual consortium members together and should discuss, among other things, the consortium's:

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

## **B. Cost Sharing**

Recipient cost share must be at least 50% of the total allowable costs of the project (the total allowable costs of the project is the sum of the Government share, which includes FFRDC contractor costs if applicable, and the recipient share of allowable costs) and must come from non-federal sources unless otherwise allowed by law. (See 10 CFR Parts 600.123, 600.224, 600.313 and 603.415 for the applicable cost sharing requirements.) The minimum 50% cost share amount applies to both Cooperative Agreements and Technology Investment Agreements.

## **C. Other Eligibility Requirements**

Applicants must submit a Letter of Intent by the due date set forth on the FOA cover page to be eligible to submit a Full Application.

Entities that propose a team or consortium must designate a lead organization, with strong technical leadership. Applications must be submitted, on behalf of the team members, by the lead organization who is the prime applicant on the application and DOE will enter into a prime award relationship with the designated lead organization.

Authorizations for DOE/NNSA National Laboratory and FFRDC involvement:

**A DOE/NNSA FFRDC contractor is eligible to apply for funding or be proposed as a team member under this announcement** if its cognizant Contracting Officer provides written authorization and this authorization is submitted with the application. If a DOE/NNSA FFRDC contractor is selected for award, the proposed work will be authorized under the DOE work authorization process and performed under the laboratory's Management and Operating (M&O) contract. The following wording is acceptable for the 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, will not adversely impact execution of the DOE assigned programs at the laboratory.”

Value/Funding. The value of, and funding for, the FFRDC contractor portion of the work will not normally be included in the award to a successful applicant. Usually, DOE will fund a DOE FFRDC contractor through the DOE field work proposal (FWP) system and other FFRDC contractors through an interagency agreement with the sponsoring agency. FWP and other documents will be requested from successful applicants during award negotiation.

Cost Share. The applicant's cost share requirement will be based on the total cost of the project, including the applicant's and the FFRDC contractor's portions of the effort.

Responsibility: The applicant, if successful, 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 applicant and the FFRDC contractor.

**Non-DOE/NNSA FFRDCs and non-DOE GOGOs are not eligible for funding as a prime applicant but are eligible for funding as a team member on another entity's application.** Participation by a non-DOE FFRDC will be authorized through an Interagency Agreement. 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 and where applicable, is authorized to carry out the activities under the proposed project and accept funds from another agency. 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 assigned programs at the laboratory. THIS LABORATORY IS AUTHORIZED TO PERFORM THE WORK PROPOSED IN THE APPLICATION SUBMITTED UNDER DOE FUNDING OPPORTUNITY ANNOUNCEMENT # DE-FOA-0000683 BY THE FOLLOWING STATUTORY AUTHORITY [insert Statute name, citation, and section]\_\_\_\_\_.”

**A non-DOE federal agency is not eligible for funding as a prime applicant but is eligible for funding as a team member on another entity's application.** Participation by a non-DOE federal agency will be authorized through an Interagency Agreement. A cognizant Contracting Officer from the federal agency must submit a signed legal opinion that lists its statutory authority to carry out the proposed project, explains how it would meet the statutory authority under the proposed project, and explains the authority by which the agency can accept federal funds from another agency (i.e., explain how accepting the award would not be considered supplanting funds). The opinion should include the following acknowledgement,

“THIS AGENCY IS AUTHORIZED TO PERFORM THE WORK PROPOSED IN THE APPLICATION SUBMITTED UNDER DOE FUNDING OPPORTUNITY ANNOUNCEMENT # DE-FOA-0000683 BY THE FOLLOWING STATUTORY AUTHORITY [insert Statute name, citation, and section]\_\_\_\_\_.”

DOE reserves the right to contact the applicant to further clarify whether the applicant or its team members have the necessary authority to accept funds under the DOE award and carry out the proposed activities.

#### **D. Questions Regarding Eligibility**

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

### **SECTION IV – APPLICATION AND SUBMISSION INFORMATION**

#### **A. Address to Request Application Forms**

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

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

*(e.g. ControlNumber\_LeadOrganization\_Project\_Part\_1, Part\_2, etc.)*

#### **B. Letter of Intent (Mandatory)**

Applicants are required to submit a Letter of Intent by the due date set forth on the FOA cover page. The Letter should not contain any proprietary or sensitive business information. **Applicants must submit a Letter of Intent by the Due Date set forth on the FOA cover page to be eligible to submit a Full Application. The Letter of Intent should not contain any proprietary or sensitive business information.** A control number will be issued when an Applicant begins the Letter of Intent submission process. This control number must be included in the Full Application documents, as described in paragraph C.

The Letter of Intent must not exceed three (3) pages, including cover page, charts, graphs, maps, and photographs when printed using standard 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right), single spaced. **The font must not be smaller than 11 point.** Do not include any Internet addresses (URLs) that provide information necessary to review the letter. Save the information in a single file named “Control#\_Institution\_LetterofIntent.pdf.”

The Letter of Intent must include the following information:

1. Prime Applicant Name (Lead Organization)
2. Organization Director – technical lead for the Institute (Name, Phone Number and email address)
3. Anticipated team members (organizations)

4. Name of the proposed Institute
5. 5-10 keywords describing the focus of the Institute within the topic area
6. Estimated total DOE funding request
7. Description of the focus of the Institute within the topic area, potential impact of the Institute, technical objectives of the Institute, overall approach to achieve the goals of this FOA and high level summary of planned resources and facilities

Letters of Intent must be submitted via the EERE eXCHANGE at <https://eere-exchange.energy.gov/>.

### **C. Full Application Content and Form (Mandatory)**

**Only applicants who have submitted a timely Letter of Intent will be eligible to submit a Full Application. All documents in the Full Application must be formatted such that they can be printed on standard 8.5” by 11” paper with 1” margins (top, bottom, left and right), single spaced, with font not smaller than 11 point.**

You must complete the mandatory forms and any applicable optional forms, in accordance with the instructions on the forms and the additional instructions below, as required by this FOA. **Files that are attached to the forms must be in Adobe Portable Document Format (PDF) unless otherwise specified in this announcement.**

You must complete the following application forms found on the EERE Exchange website at <https://eere-exchange.energy.gov/>, in accordance with the instructions. **Applicants will receive a Control # once they “Apply to this FOA” on the EERE Exchange website and should include the Control # in the file name, as indicated below. A control number was issued when the Applicant began the Letter of Intent submission process. This control number must be included in the Full Application documents, as described below.**

#### **1. SF-424 – Application for Federal Assistance (Mandatory)**

Complete all required fields in accordance with the instructions on the form. The list of certifications and assurances in Field 21 can be found at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms>, under Certifications and Assurances. Note: The dates and dollar amounts on the SF 424 are for the complete project period and not just the first year, first phase or other subset of the project period. Save the information in a single file titled **“ControlNumber\_LeadOrganization\_App424.”**

#### **2. Project Summary/Abstract File (Mandatory)**

The project summary/abstract must contain a four (4) page summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that includes the following information:

- i. EERE Exchange Control number;
- ii. Name of the Prime Applicant (Lead Organization);

- iii. Organization Director (Technical Lead from the Prime Applicant);
- iv. Major participating organizations;
- v. Institute leadership team members;
- vi. Name of the Institute;
- vii. Proposed project period of performance and budget (DOE funds and non-federal cost share funds);
- viii. Objectives of the project; and
- ix. Description of the project, including methods to be employed, the potential impact of the project (e.g., energy savings, greenhouse gas (GHG) reduction, benefits to U.S. competitiveness as described in the goals of this FOA).

Applicants are cautioned that this document must not include any proprietary information, trade secrets, or other confidential business, financial or sensitive information as the Department may make it available to the public if an award is made. The project summary must not exceed 4 pages when printed using standard 8.5” by 11” paper with 1” margins (top, bottom, left and right), single spaced, with font not smaller than 11 point. Save the information in a single file titled **“ControlNumber\_LeadOrganization\_Summary.”**

### **3. Project Narrative File (Mandatory)**

The project narrative must not exceed 60 pages, including charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right), single spaced with font not smaller than 11 point. A cover page and table of contents must be included at the beginning of the project narrative but neither will count against the page limit. Furthermore, information required in Appendices 1 through 10, except as otherwise noted, is not subject to the above project narrative page limit. Unless otherwise noted, the Appendices to the Project Narrative are limited to 50 pages in total. **EVALUATORS WILL REVIEW ONLY THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCES.** Do not include any Internet addresses (URLs) that provide information necessary to review the application. See Section VIII.D. and Appendix B for instructions on how to mark proprietary application information, and for restrictions on Personally Identifiable Information. Save the information in a single file titled **“ControlNumber\_LeadOrganization\_Project.”**

**Note: The maximum file size that can be uploaded to the EERE Exchange website is 10MB. Files in excess of 10MB cannot be uploaded, and hence cannot be submitted for review. If a file exceeds 10MB but is still within the maximum page limit specified in the FOA it must be broken into parts and denoted to that effect. (e.g. ControlNumber\_LeadOrganization\_Project\_Part\_1, Part\_2, etc.)**

The project narrative must include:

- Cover Page (1 page):

The Project Narrative cover page should indicate the name and type of prime applicant (lead organization), the announcement number, the name of the Institute, and contact information for both the Organization Director (technical lead) and business points of contact for the prime applicant (names, titles, addresses, telephone and facsimile numbers, and electronic mail addresses). The cover page should also identify the name and type of organization for all other participants (subrecipients).

- Executive Summary (1-3 pages)

The executive summary should summarize the content of the Project Narrative section in 1 to 3 pages. The executive summary must contain a summary of the proposed activity.

- Merit Review Criterion Discussion:

The section should be formatted to address each of the merit review criteria and sub-criterion listed in Section V.A. below. Provide sufficient information so that reviewers will be able to evaluate the application in accordance with these merit review criteria. **DOE WILL EVALUATE AND CONSIDER ONLY THOSE APPLICATIONS THAT ADDRESS SEPARATELY EACH OF THE MERIT REVIEW CRITERIA AND SUB-CRITERIA.**

The review criteria are based on the narrative requirements stated below that specifically delineate the expected scope of the narrative based on the specific topics of the Institute initiative. See Section V.A. for the detailed description of the merit review criteria and sub-criteria.

- 1. Institute Objectives and Impact to U.S. Manufacturing:

This section will provide a detailed description of the:

- i) Institute objectives

In this section provide a detailed description of the proposed Institute objectives and how the proposed Institute will meet the goals of the FOA as defined in Section I.D. The applicant's detailed description of the technical challenges in WBG semiconductor power electronics and detailed evidence demonstrating an in-depth understanding of industry needs that will accelerate domestic adoption of advanced manufacturing technologies will be important factors in evaluating applications.

To achieve the goals of the FOA consistent with the technology focus area as described in Section I.C include in the proposal:

- a) A detailed description of how the Institute will be a financially self-sustaining, world-leading innovation hub, that brings together private and public entities to co-invest in the development and deployment of innovative next generation manufacturing technologies which will lead to *increased domestic production capacity, increased energy productivity, measurable commercialization success and support national needs;*

- Explain how the value of the Institute will be more than the sum of the individual activities.
  - Describe the technical challenges for WBG semiconductor power electronics and how the Institute will overcome these technical challenges.
  - Identify the role for the Institute in the context of current and future RD&D
  - Concisely describe short, medium and long term technical objectives for the Institute.
- b) Describe how the shared RD&D infrastructure will support the Institute objectives and goals of the FOA, and how the shared RD&D infrastructure enables affordable access to physical and virtual tools as well as expertise to reduce the cost and risk of commercialization, address technical challenges that may arise from scale-up and production at a manufacturing relevant scale and provide data to enable business case development;
- c) Describe how the Institute will enable applied research, development and demonstration projects (TRL/MRL 4-7)<sup>32</sup> that support new processes, equipment, design tools, and capabilities for innovative production or materials technologies; accelerate certification and qualification of processes and products; maintain data and models and develop testing protocols and standard as appropriate for the technology area
- Describe the initial RD&D project plan, how projects will be selected, whether the Institute will conduct RD&D activities directly, and concisely describe 3-5 potential projects that may begin in the first year of operation to make the Institute relevant in a timely manner.
- d) Provide a description of how the Institute will engage with stakeholders, define clear policies and strategies for participation by a wide range of stakeholders in the Institute, in particular, to engage SMEs through outreach and intermediaries, including programs like the NIST MEP Center network where appropriate, and provide sufficient financial and contractual mechanisms for all stakeholders along the supply chain including end-users to benefit from the Institute resources.
- e) Provide an overview of the proposed capabilities for and collaboration in open, pre-competitive work, among multiple parties in an Intellectual Property (IP) protected environment, as well as proprietary activities as appropriate to engage stakeholders as relevant to the technology area. A detailed IP management plan is required in Appendix 3 in and a summary is required in part 4 of the Project Narrative.
- f) Provide a technical education and workforce development plan to support technical and career education that will leverage relevant existing resources like the NSF ATE Centers, industry validated certifications and apprenticeship programs, etc. to develop the workforce needed to serve in our nation's high value, next generation manufacturing facilities, as appropriate to the

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<sup>32</sup>National Science and Technology Council. "National Network for Manufacturing Innovation: A Preliminary Design." January 2013. [http://www.whitehouse.gov/sites/default/files/microsites/ostp/nstc\\_nnmi\\_prelim\\_design\\_final.pdf](http://www.whitehouse.gov/sites/default/files/microsites/ostp/nstc_nnmi_prelim_design_final.pdf)

technology area. The plan must provide clear career pathways with multiple entry and exit points for students and incumbent workers, and should delineate clear learning progressions for educational content.<sup>33</sup>

Explain how the Institute will disseminate training or curriculum materials. When public funding directly supports the workforce training within the Institute, it is further expected that new learning materials/curriculum developed are to be shared with the public as appropriate. As a condition of the receipt of this award, the Awardee (and sub-awardees) will be required to license, under a Creative Commons Attribution License (Content Created By - CCBY) to the public the creative “works” related to learning materials and curriculum developed in performance of the award generated directly with the support of the Federal funding under a Creative Commons Attribution License (Content Created By - CCBY). This CCBY license allows subsequent users to copy, distribute, transmit and adapt the copyrighted work and requires such users to attribute the work in the manner specified by the Awardee. Notice of the License shall be affixed to the creative “work.” Only creative “work” that is developed in the performance of or under the award by the Awardee with Federal Award funds is required to be licensed under the CCBY license. Pre-existing copyrighted materials licensed to, or purchased by the grantee/Awardee from third parties remain subject to the IP rights the grantee/Awardee receives under the terms of the particular license or purchase. For more information on this License, please visit <http://creativecommons.org/licenses/by/3.0/>

**Note:** While the Institute should address higher level education and include these activities in the plan as appropriate, applicants should note that DOE funds can only be used for activities that directly support the project (e.g. costs incurred by graduate students directly supporting the project based on the hours worked).

g) Explain how the Institute will leverage relevant existing private and public sector resources and facilities such as NSF ATE Centers, NIST MEPs, national laboratories, university centers and other government investments.

ii) Impact estimates

For all estimates, provide references for market data, trends, technical data, etc. and clearly state all assumptions for any calculations made. The magnitude of the estimates and adequacy for the justification of the estimates and assumptions are important merit review criteria.

Estimate for the potential impact of the Institute to support U.S. manufacturing competitiveness, at a minimum, consider the following aspects:

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<sup>33</sup> National Research Council. National Academies Press. 2012. *A Framework for K-12 Science Education: Practices, Crosscutting Concepts and Core Ideas*.

- Number of current applications/products relevant to the Institute objectives and anticipated new or increased application/product use enabled by successful development and commercialization work at the Institute.
- Size of the relevant markets/sectors in U.S. dollars and growth projections over the next 10 years for each application/product identified and market penetration for the identified applications/product - with and without advancement through work at the Institute. List the applicable NAICS codes for the impacted industries/markets identified.
- Identify the cost and technical targets needed to achieve the estimated market penetrations. Provide estimates for increase in domestic production capacity and energy productivity, as well as domestic job creation, impact to trade balance and/or GDP, and regional economic development for relevant industries and in total for all measures as a result of successful technology deployment and commercialization from Institute related activities over ten years. Provide any additional anticipated impacts as a result of the Institute success.
- If relevant, specifically identify and quantify the domestic production benefits from participation by foreign-based entities.

Provide estimates for the impact of the Institute for:

- The potential aggregate cumulative: energy savings (TBTU), reduction in GHG (tons of CO<sub>2</sub> equivalent) and water use (Billions of Gallons) on a life-cycle basis over ten years enabled by work at the Institute relative to existing available technologies.

- 2. Capabilities and Resources:

The appropriateness of the capabilities and quality of the resources in the proposed Institute will be key factors in judging the merit of the application. The experience of the managing organization(s) in leading public private partnerships, and technical expertise of the team are expected to be a predictor for success. The appropriateness and breadth of the physical and virtual resources available to users at sufficient scale and capacity will be critical for effectively developing, commercializing, and scaling up new manufacturing technologies of high impact.

This section must include:

- A description of the, technical and business expertise and capabilities of the Lead Organization, Organization Director and key personnel who will lead and/or manage the Institute. In particular provide a description of their experience in managing public-private partnerships or multi-user facilities, as well as technical capabilities.
- Provide a description of all proposed partners/participants in the Institute their role and what capabilities they will provide.
- Provide a detailed description of the shared RD&D infrastructure that will be a part of the Institute and how it will enable technical work at the

Institute. Detailed information about the resources is to be provided in Appendix 8. The quality and appropriateness of resources that will be made available as part of the Institute will be key review criteria.

- Applicants must clearly differentiate between any existing and anticipated financial or physical resources and how the Institute will operate as a separate entity (Appendix 8).
- Summarize the letters of commitment from organizations or individuals who are prepared to use/participate the facility within the first year of operation and their commitment as appropriate to support domestic manufacturing competitiveness through increased domestic manufacturing capacity, U.S. job creation, etc. from Appendix 10.

**Funding from this FOA (including Recipient cost share) is NOT permitted (or allowed) for construction of new buildings or for major renovation of existing buildings.** Strategies for development of the Institute may include leasing buildings. Allowable costs include those necessary to house the Institute (including a possible lease for the first five years of the project), to make minor renovations as needed, and to purchase research equipment and instrumentation. Costs for new construction (including new buildings or additions to existing buildings) will not be allowed in the Institute award.

- 3. Approach and Management Plan:

- i) Operating Model

A critical aspect of the mission of the Institute initiative is creating an environment that incentivizes external entities to access the Institute and its resources. In this section:

- Provide an summary of the proposed participation structure (i.e. tiered membership structure, pay-for-use arrangements, etc.) and the benefits and restrictions for each level of participation including IP rights (consistent with the requirements set forth in Section VIII).
- Describe how the shared RD&D infrastructure will be accessible to the different types of entities based on the intended structure of the Institute (members, external entities, SMEs, universities, etc.).
- Describe how the Institute will be managed and enable users, members or other external entities to access the Institute, handle potential conflicts, prioritize and manage technical work in the facility, establish and track performance metrics for projects to determine success and impact that will support Institute metrics and goals of the FOA.
- In particular address how the Institute will encourage participation by SMEs (examples include providing free or low-cost access to the shared infrastructure, low barrier entry fees to membership, job swapping arrangements between Institute and SME staff, engagement of the MEP Centers, etc.).

- If the applicant anticipates significant involvement of foreign-based entities, the management plan must describe how the Institute will handle participation of foreign-based entities as users, members or otherwise engage in RD&D activities at the Institute or in connection with the Institute to ensure domestic production benefits.

ii) Governance and Management:

A well-managed organization or coalition will be able to efficiently use Institute funds to accomplish the stated objectives and serve the needs of its members, users, or participants. Given the mix of public and private funding that is required for the Institute the application must address how decisions will be made and the direction and vision of the Institute executed. The application must:

- Outline a proposed governance structure and detail a plan to establish that governance structure, explain how decisions will be made and how any governing entities/advisory boards will function and what authority they will have.
- Describe the proposed structure to accommodate federal government agency participation in the governance of the Institute. It is highly recommended to include a dedicated federal government advisory board or provide significant representation of the relevant federal government agencies on any governance board that may be established.
- Provide a proposed organizational chart to show the proposed management and staffing structure of the Institute including external advisory/governing boards.
- Provide in the project management plan a list of the proposed Institute metrics, including but not limited to technical targets, impact to U.S. manufacturing, energy productivity goals, management performance, financial performance, industry participation especially SMEs, and education and outreach.
- Describe how Institute performance will be tracked and evaluated, describe plans for program reviews, etc. frequency and methodology for how they will be conducted.
- Provide projected annual budgets for the period of the award (five years), the Budget Summary is to be included in Appendix 2.
- An overall timeline and project plan must be provided including the major goals, milestones, and decision points as outlined in the Project Plan in Appendix 4.
- A detailed risk assessment and risk mitigation plan for the technical, economic and operational aspects of the proposed Institute must be provided.

- 4. Summary of Intellectual Property (IP) Management Plan:

This section of the Project Narrative must include a detailed summary of the IP Management Plan. The summary should at a minimum address the items outlined below. Each application must also include a final IP Management Plan or a draft IP Management Plan that will form the basis of the final IP Management Plan between the members of the consortia or team. This plan is required as Appendix 3 to the Project Narrative. The Project Team must submit the final and executed Intellectual Property Management plan to EERE within six weeks of the effective date of the EERE funding agreement. In view of the FOA's objectives, it is expected that the IP management plan will support domestic manufacturing and encourage participation by domestic industry in the Institute.

The award will set forth the treatment of and obligations related to intellectual property rights between EERE and the individual members. The IP Management Plan should describe how the members will handle intellectual property rights and issues between themselves while ensuring compliance with Federal IP laws, regulations, and policies (see Section VIII of this FOA for more details on applicable Federal IP laws and regulations) and support of the FOA's objectives.

The IP Management Plan must address, at least, the following:

- The treatment of confidential information between members (e.g., the use of non-disclosure agreements);
- The treatment of background IP (e.g., any requirements for identifying it or making it available);
- The treatment of inventions made under the project (e.g., any requirements for disclosing to the other members, filing patent applications, paying for patent prosecution, and cross-licensing or other licensing arrangements between the members);
- The treatment of data produced, including software, under the project (e.g., any publication process or other dissemination strategies, copyrighting strategy or arrangement between members) including:
  - licensing new learning materials and curriculum to the public under a Creative Commons Attribution License (CCBY) and
  - specific datasets to be delivered in an open, machine-readable format to publically accessible data discovery platforms like [www.OpenEI.org](http://www.OpenEI.org), [www.data.gov](http://www.data.gov) or equivalent open web technologies in order to further this objective of the FOA.
- Any technology transfer and commercialization requirements or arrangements between the members;
- The treatment of any intellectual property issues that may arise due to a change in membership of the consortia or team;
- The handling of conflicts of interest; and

- The handling of disputes related to intellectual property between the members.

Note: When public funding directly supports the research effort within the Institute, it is further expected that some portion of or all of the results are to be shared with the greater manufacturing community and the public as appropriate. An additional objective with regard to public funding is to ensure that the underlying data for such projects be made available in an open and digitally accessible manner that also protects confidentiality (see the open data initiatives summarized in the Administration’s Digital Government strategy: <http://www.whitehouse.gov/sites/default/files/omb/egov/digital-government/digital-government.html>).

- 5. Transition Plan (5 page limit):

Creation of financially viable organizations that will have a significant and enduring impact on the U.S. manufacturing sector is a key goal of the Institute initiative. This section must not exceed five pages and should describe the sustainability plan for the proposed Institute past the award period, including:

- realistic strategies to increase revenue in later years of the award period in order to achieve financial self-sufficiency within five years from dedicated Institute funding.
- the proposed sources of funding/revenue model which will support the Institute operations beyond the award period,
- the strategy to keep the Institute relevant to industry, what resources will support Institute operations beyond the award period and how will manufacturing professionals will be recruited and trained over time to support the Institute.
- projected profit and loss for three years after the initial five year award period demonstrating how the Institute will maintain financial self-sufficiency, to be provided in Appendix 2.

**All the components of the Project Narrative (listed above) must be within the Narrative 60-page limit.**

### **Appendices**

In addition to the contents of the Project Narrative described above, Appendices identified below (1 through 10) are mandatory and are limited to 50 pages in total, unless otherwise noted. The Appendices do NOT count in the separate Project Narrative page limit, unless otherwise noted. Save the Appendices in a single file titled “ControlNumber\_LeadOrganization\_Appendices.”

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

*(e.g. ControlNumber\_LeadOrganization\_Project\_Part\_1, Part\_2, etc.)*

**Appendix 1: Bibliography & References Cited (Not subject to Appendices page limit)**

Provide a bibliography of any references cited in the project narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. Include only bibliographic citations. Applicants should be especially careful to follow scholarly practices in providing citations for source materials relied upon when preparing any section of the application.

**Appendix 2: Budget Summary**

In simple tabular form, provide a high-level summary of the proposed budget for the Institute that includes the DOE and cost share funding and capital and operational expenses by year. This information should be broken down and listed by technical objectives for the Institute, with a separate line for general overhead as needed. Budget information should be presented as both annual funding and the cumulative funding over the five-year award period. This high level Budget Summary is required in addition to the Budget (SF424A) and Budget Justification. Also provide the anticipated funding plan for continued operation of the Institute after the initial five year award period for an additional three years.

**Appendix 3: Intellectual Property (IP) Management Plan (Not subject to Appendices page limit)**

Provide a final IP Management Plan or draft IP Management Plan that will form the basis of the final IP Management Plan between the members of the consortia or team. At a minimum, the IP Management Plan must address the considerations listed under the Project Narrative - Merit Review Criterion Discussion section part 4 for this FOA. Also provide copies of any other IP agreements relevant to the merit review (e.g., memorandum of understandings, non-disclosure agreements) in Appendix 3. See Section VIII, Part F for more information on the IP requirements under this FOA.

**Appendix 4: Project Management Plan**

This section should outline as a function of time, year by year, all the major activities or phases of the proposed Institute, including the major goals, milestones, and decision points. Targets for the planned development of capabilities, capacity, and usage of facilities managed by the organization should be included, where applicable. The successful applicant will be expected to employ standard project management discipline and must use this project management plan to report progress.

**Appendix 5: Biographical Sketches (Not subject to Appendices page limit)**

Provide a resume for each key person proposed, including subrecipients and consultants if they meet the definition of key person. A key person is any individual who contributes in a substantive, measurable way to the management of the organization. Resumes should be tailored to provide information relevant to the specific organizational role. The biographical information for each resume must not exceed 2 pages when printed on 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right), single spaced, with font not smaller than 11 point and should include the following information, if applicable:

**For key personnel identified in this file, indicate the intended position in the management structure, including the Organization Director and/or primary executive officer(s).**

*Professional Experience:* Beginning with the current position list, in reverse chronological order, management and technical positions with a description of responsibilities and accomplishments. Emphasize experience that is relevant to the person's position within the proposed organization.

*Education and Training.* Undergraduate, graduate and postdoctoral training; provide institution, major/area, degree and year.

*Manufacturing-Relevant Activities:* Provide up to five examples of prior projects demonstrating relevant professional experience related to the effort proposed.

*Key Publications.* List publications related to the proposed organization only. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, year of publication, and website address, if available electronically. Patents, copyrights and software systems developed may be provided in addition to, or substituted for, publications.

#### **Appendix 6A: Organization Director Statement of Employment**

For the Organization Director, submit documentation stating that the proposed Organization Director is either currently an employee of the prime applicant, or has committed to accept employment with the prime applicant, if the applicant receives an award. The statement of employment, or letter of commitment to accept employment, is limited to one page and must be signed by both the Organization Director and an authorized representative of the prime applicant.

#### **Appendix 6B: Individual Commitment Statements**

For each senior/key person, provide a current signed and dated commitment statement that reflects their commitment to this project, including their individual level of time commitment, for a minimum period of five years. Multiple personnel representing the same institution may sign the same letter of commitment, as applicable. Each letter of commitment is limited to one page.

#### **Appendix 7: Current and Pending Support**

Provide a list of all current and pending support (both federal and non-federal) for the identified Organization Director, other senior/key persons, including subrecipients and consultants, for ongoing projects and pending applications. For each organization providing support to the key personnel, show the total award amount for the entire award period (including indirect costs) and the number of person-months per year to be devoted to current and pending projects by the senior/key person. Concurrent submission of an application to other organizations for simultaneous consideration will not prejudice review.

## **Appendix 8: Location, Facilities & Other Resources**

Discuss the plans for locating the Institute. This includes identification of the site or sites where the major activities of the organization will take place and how the site(s) will be acquired (use of space provided by the host institution(s), leased space, or combinations of these and other options) and prepared for use by the organization. The application should describe the proposed size, conceptual layout, and development strategy (including summary-level scope, schedule and cost estimates including alteration and/or renovations for the space, i.e., the estimated cost to build out the space) for the space needed to house and support the program(s) identified in the narrative. Plans for acquisition of major equipment and instrumentation must be included.

Identify current facilities and resources that will be used for the Institute. This information will be used to assess the capability of the organizational resources, including subrecipients resources, available to perform the effort proposed. Identify the facilities to be used (e.g. Laboratory, Computer, Office, and Other). If appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project as well as the source of funding for these current facilities. Describe only those resources that are directly applicable to the proposed work. Describe other resources available to the project (e.g., machine shop, electronic shop) and the extent to which they would be available to the project. List major items of equipment already available for this project and, if appropriate, identify location and pertinent capabilities.

## **Appendix 9: Statement of Conflict of Interest**

Identify potential, apparent, or actual organizational and individual conflicts of interest and proposed mitigation plans. This shall include applicants, their team members, and senior/key personnel named in the application. Negative responses are also required. Prior to award, DOE reserves the right to require the submission of a Conflict of Interest Management Plan describing the applicant's approach to identifying and managing conflicts of interest.

## **Appendix 10: Commitment Letters from Third-Parties Contributing to Cost Sharing and Others (Not subject to Appendices page limit)**

The application must include a tabular summary of types of cost share – cash, services or property with the proposed dollar amount by third party source as supported through the Letters of Commitment. Applications must include a letter from each third-party contributing cost share (i.e., a party other than the organization submitting the application) stating that the third-party is committed to providing a specific minimum dollar amount of cost share. Each application must include a tabular summary of the cost-share contributions including: (1) the name of the organization; (2) the proposed dollar amount to be provided; and (3) the proposed type of cost share – cash, services, or property. Letters of Commitment from parties participating in the project, exclusive of vendors, who will not be contributing cost share, but will be integral to the success of the project (e.g. Users), must be included as part of this Appendix to the Narrative. Letters of Commitment from entities who plan to use the facility within the first year of operation are required.

#### 4. Statement of Project Objectives (SOPO) (Mandatory):

The Statement of Project Objectives should be provided in a similar format as the SOPO template shown in Appendix D – Statement of Project Objectives (SOPO) Template. The SOPO must be detailed for the first proposed budget period (approximately 18 months); the balance of the project can be more generally described. The SOPO must address how the project objectives will be met. It must contain a clear, concise description of all activities to be completed during the project performance and follow the requirements in the template. The SOPO may be released to the public by DOE, in whole or in part, at any time. Therefore, it must not contain proprietary or confidential business information. Save this information as a single Word file titled “**ControlNumber\_LeadOrganization\_SOPO.**”

#### 5. Budget File (Mandatory)

##### **SF 424 A Excel, Budget Information – Non-Construction Programs File**

You must provide a separate budget for each budget period requested and a cumulative budget for the total project period. Use the SF 424 A Excel, “Budget Information – Non Construction Programs” form on the DOE Financial Assistance Forms Page at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms>.

You may request funds under any of the Object Class Categories as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable federal cost principles, and are not prohibited by the funding restrictions in this announcement (see Section IV.G). Save the information in a single Excel file titled “**ControlNumber\_LeadOrganization\_SF424A.**”

#### 6. Budget Justification File (PMC 123.1) (Mandatory)

##### **PMC 123.1 (OMB Number 1910-5162) Budget Justification File**

You must justify the costs proposed in each Object Class Category/Cost Classification category using the PMC 123.1 Budget Justification File. Detailed budget information should be provided for the first budget period (approximately 18 months) and summary estimates for the subsequent budget periods. Save the budget justification information in a single file titled “**ControlNumber\_LeadOrganization\_Budget.**”

#### 7. Subaward Budget File(s) (If Applicable)

You must provide a separate budget (i.e., budget for each budget period proposed and a cumulative budget) for each subrecipient that is expected to perform work estimated to be more than \$100,000 or 50 percent of the total work effort (whichever is less). Use the SF 424 A Excel for Non Construction Programs. These forms are found on the DOE Financial Assistance Forms Page at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms>. Save each Subaward budget in a single file titled “**ControlNumber\_LeadOrganization\_Subrecipient\_SF424A.**”

A PMC 123.1 Budget Justification file for the subaward budget is also required. The budget justification must include the same justification information described in Paragraph 6- above. Save each Subaward budget justification in a single Excel file titled **“ControlNumber\_Subrecipient\_Budget.”**

**8. Budget for DOE/NNSA Federally Funded Research and Development Center (FFRDC) Contractor File (If Applicable)**

If a DOE FFRDC contractor is to perform a portion of the work, you must provide a DOE Field Work Proposal (FWP) in accordance with the requirements in DOE Order 412.1 Work Authorization System. The DOE Order 412.1, Work Authorization System and the DOE O 412.1, Field Work Proposal form are available at the following link, under “DOE Budget Forms”: <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms>. Save the Field Work Proposal in a single file titled **“ControlNumber\_LeadOrganization\_FFRDC\_FWP.”**

**9. Authorization for non-DOE or DOE/NNSA FFRDCs (If Applicable)**

Save the Authorization for non-DOE or DOE FFRDCs or non-DOE Federal agencies as specified in Section III.C. Other Eligibility Requirements, in a single file titled **“ControlNumber\_LeadOrganization\_FFRDC.”**

**10. SF-LLL Disclosure of Lobbying Activities (If applicable)**

If applicable, complete the SF- LLL. Applicability: If any funds other than federal appropriated funds have been paid or will be paid to any person 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 the grant/cooperative agreement, you must complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying." If applicable, save the SF-LLL in a single file titled **“ControlNumber\_LeadOrganization\_SFLLL.”**

**11. Waiver Request- (a) Foreign Entities and (b) Performance of Work in the United States (If Applicable)**

(a) Foreign Entities As set forth in Section III.A.3, all prime recipients receiving funding under this FOA must be incorporated (or otherwise formed) under the laws of a State or territory of the United States. If a foreign entity applies for funding as a prime recipient, it must designate in the Full Application a subsidiary or affiliate incorporated (or otherwise formed) under the laws of a State or territory of the United States to be the prime recipient.

To seek a waiver of this requirement, the Applicant must submit an explicit waiver request in the Full Application, which includes the following information: entity name, country (or state) of incorporation, description of the work to be performed by that entity, and the Countries in which the work will be performed. In the waiver request, the Applicant must demonstrate to the satisfaction of EERE that it would further the purposes of this FOA and is otherwise in the interests of EERE to have a foreign entity serve as the prime recipient. The Contracting Officer may require additional information before

considering the waiver request. Save the Waiver Request(s) in a single PDF file titled “ControlNumber\_LeadOrganization\_Waiver.”

(b) Performance of Work in the United States Section II.G requires that all work under EERE funding agreements to be performed in the United States – i.e., prime recipients must expend 100% of the total project cost in the United States.

To seek a waiver of this requirement, the Applicant must submit an explicit waiver request in the Full Application, which includes the following information: the countries in which the work will be performed, a description of the work to be performed outside the U.S., and the rationale for performing the work overseas. In the waiver request, the Applicant must demonstrate to the satisfaction of the EERE that a waiver would further the purposes of this FOA and is otherwise in the interests of EERE. For example, an Applicant may seek to demonstrate the United States economic interest will be better served through a greater percentage of work performed outside the United States (e.g., provide evidence that expertise to develop a technology exists only outside the United States, but that ultimate commercialization of the technology will result in substantial benefits to the United States such as improved electricity reliability, increased employment, increased exports of U.S.-manufactured products, etc.). The Contracting Officer may require additional information before considering the waiver request. Save the Waiver Request(s) in a single PDF file titled “ControlNumber\_PerformanceofWork\_Waiver.”

### Summary of Required Forms/Files

Your application must include the following documents:

<b>Name of Document</b>	<b>Format</b>	<b>File Name</b>
SF 424 - Application for Federal Assistance	PDF	ControlNumber_LeadOrganization_App424
Project Summary/Abstract File	PDF	ControlNumber_LeadOrganization_Summary
Project Narrative File	PDF	ControlNumber_LeadOrganization_Project
Appendices 1-10 (one file – if larger than 10MB see instructions above)	PDF	ControlNumber_LeadOrganization_Appendices
Statement of Project Objectives (SOPO)	Word	ControlNumber_LeadOrganization_SOPO
SF 424A Excel – Budget Information for Non-Construction Programs File	Excel	ControlNumber_LeadOrganization_SF424A
PMC 123.1 Budget Justification File	Excel	ControlNumber_LeadOrganization_Budget
Subaward Budget File(s), if applicable PMC 123.1 Budget Justification(s), if applicable	Excel	See instructions
Budget for Federally Funded Research and Development Center (FFRDC) Contractor File, if applicable.	PDF	See instructions

Authorization from cognizant Contracting Officer for FFRDC, if applicable.	PDF	ControlNumber_LeadOrganization_FFRDC
SF-LLL Disclosure of Lobbying Activities, if applicable.	PDF	ControlNumber_LeadOrganization_SF LLL

#### D. Submissions from Successful Applicants

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

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

#### E. Submission Dates and Times

Applicants are responsible for meeting each submission deadline as set forth on the FOA cover page. Applicants should not wait until the last minute to begin the submission process. During the final hours before the submission deadlines, applicants may experience server/connection congestion that prevents them from completing the necessary steps in EERE-E Exchange to fully submit their applications. **Therefore, Applicants are strongly encouraged to begin submitting their applications at least 48 hours in advance of the submission deadline. The Letter of Intent and Full Application must be submitted via EERE EXCHANGE at <https://eere-exchange.energy.gov/>.**

#### F. Intergovernmental Review

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

#### G. Funding Restrictions

**Funding for all awards and future budget periods are contingent upon availability of funds appropriated by Congress for the purpose of this program and the availability of future year budget authority.**

Cost Principles. Costs must be allowable in accordance with the applicable federal cost principles referenced in: 2 CFR 220 for Educational Institutions; 2 CFR 225 for State, Local, and Indian Tribal Governments; 2 CFR 230 for Non Profit Organizations and FAR Part 31 for commercial organizations.

Pre-award Costs. Recipients may charge to an award resulting from this announcement pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award and no earlier than the selection date, if the costs are allowable in accordance with the applicable federal cost principles referenced in 10 CFR Part 600. Recipients must obtain the prior approval of the Contracting Officer for any pre-award costs that are for periods greater than this 90 day calendar period.

Pre-award costs are incurred at the applicant's risk. DOE is under no obligation to reimburse such costs if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

National Environmental Policy Act (NEPA) Requirements. The federal funds distributed under this FOA are 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 DOE completing the NEPA review process.

DOE does not guarantee or assume any obligation to reimburse costs where the recipient incurred the costs prior to receiving from the DOE Contracting Officer a written authorization. If the applicant carries out activities that may have an adverse effect on the environment or limit the choice of reasonable alternatives prior to receiving such written authorization from the DOE Contracting Officer, the applicant is doing so at risk of not receiving federal funding and such costs may not be recognized as allowable cost share.

Likewise, if a project is selected for negotiation of award, and the recipient moves forward with activities that are not authorized for federal funding by the DOE Contracting Officer in advance of the NEPA determination, the recipient is doing so at risk of not receiving federal funding and such costs may not be recognized as allowable cost share. Nothing contained in the pre-award cost reimbursement regulations or any pre-award costs approval letter from the DOE Contracting Officer override these NEPA requirements to obtain the written authorization from the DOE Contracting Officer regarding a final NEPA determination prior to taking any action that may have an adverse effect on the environment or limit the choice of reasonable alternatives.

## **H. Submission and Registration Requirements**

### **1. Where to Submit**

**LETTERS OF INTENT AND FULL APPLICATIONS MUST BE SUBMITTED UNDER THIS ANNOUNCEMENT THROUGH EERE EXCHANGE at <https://eere-exchange.energy.gov/> TO BE CONSIDERED FOR AWARD prior to the Application due date and time.** You cannot submit a Letter of Intent or an Application through EERE Exchange unless you are registered. Please read the registration requirements below carefully and start the process immediately. Letters of Intent or Applications submitted by any other means will not be accepted.

If you have problems completing the registration process or submitting your application, send an email to the EERE Exchange helpdesk at [EERE-ExchangeSupport@hq.doe.gov](mailto:EERE-ExchangeSupport@hq.doe.gov).

It is the responsibility of the applicant to verify successful transmission, prior to the Application due date and time.

## 2. Registration Process Requirements

There are several one-time actions that must be completed before submitting an Application in response to this Funding Opportunity Announcement (FOA), as follows:

- Register and create an account on EERE Exchange at: <https://eere-exchange.energy.gov/>. This account will then allow the user to register for any open EERE FOAs that are currently in Exchange. It is recommended that each organization or business unit, whether acting as a team or a single entity, use only one account as the appropriate contact point for each submission.

The applicant will receive an automated response when the Letter of Intent or Application is received. This will serve as a confirmation of receipt. Please do not reply to the automated response. The applicant will have the opportunity to re-submit a revised Letter of Intent or Application for any reason as long as the relevant submission is submitted by the specified deadline. The Users' Guide for Applying to the Department of Energy EERE Funding Opportunity Announcements is found at <https://eere-exchange.energy.gov/Manuals.aspx>.

The EERE Exchange registration does not have a delay; however, the remaining **registration requirements below could take several weeks to process and are necessary in order for a potential applicant to receive an award under this announcement.** Therefore, although not required in order to submit an Application through the EERE Exchange site, **all potential applicants lacking a DUNS number, or not yet registered with SAM or FedConnect should complete those registrations as soon as possible.**

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

- Obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number (including plus 4 extension, if applicable) at <http://fedgov.dnb.com/webform>.
- Register with the System for Award Management (SAM) at: <https://www.sam.gov>. Designating an Electronic Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in SAM registration. Please update your SAM registration annually.
- 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/PublicPages/FedConnect\\_Ready\\_Set\\_Go.pdf](https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf).

- Register in Grants.gov to receive automatic updates when Amendments to this FOA are posted. However, please note that applications will not be accepted through Grants.gov. [http://www07.grants.gov/applicants/email\\_subscription.jsp](http://www07.grants.gov/applicants/email_subscription.jsp)

### 3. Electronic Authorization of Applications and Award Documents

Submission of an application and supplemental information under this announcement through electronic systems used by the Department of Energy, including EERE Exchange, constitutes the authorized representative's approval and electronic signature. Submission of award documents, including modifications, through electronic systems used by the Department of Energy, including FedConnect, constitutes the authorized representative's approval and acceptance of the terms and conditions of the award. Award acknowledgement via FedConnect constitutes the authorized representative's electronic signature.

## SECTION V - APPLICATION REVIEW INFORMATION

### A. Criteria

#### 1. Initial Compliance Review Criteria

Prior to a comprehensive merit evaluation, DOE will perform an initial compliance review of the full application to determine that: (1) the applicant is eligible for an award; (2) the information required by the announcement has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of the funding opportunity announcement. If an application fails to meet these requirements, it may be deemed non-responsive and eliminated from full Merit Review.

#### 2. Merit Review Criteria

Full applications will be evaluated against the merit review criteria shown below. The five merit review criteria are individually weighted as a percentage of the total score in the evaluation as indicated below. The sub-criteria under each of the five main criteria are not individually weighted.

#### **Criteria 1: Objectives and Impact to U.S. Manufacturing      Weight: [30%]**

- Responsiveness to the goals of the FOA and consistency with the WBG semiconductor power electronics focus as described in Section I.C.
  - Quality of the overall approach for the proposed Institute to the develop and deploy innovative next generation manufacturing technologies which will lead to *increased domestic production capacity, increased energy productivity, measurable commercialization success and support national needs*;
  - Degree to which the Institute will provide value that is more than the sum of the individual activities.

- Degree to which the applicant demonstrates a deep and technical understanding of challenges in the technology area and industry needs. The adequacy of the description of the role of the Institute within the context of current and future RD&D work in the technology focus area.
- Quality of the short, medium and long term technical objectives for the Institute.
- Adequacy of the proposed RD&D infrastructure to support Institute objectives and goals of the FOA.
- Quality of the RD&D project plan, how projects will be selected, any proposed direct RD&D work by the Institute and the quality of the potential projects for the first year of operation.
- Quality of the stakeholder engagement plan, in particular with SMEs and ability to engage stakeholders along the supply chain including end-users.
- Degree to which the Institute will provide capabilities for and collaboration in open, pre-competitive work, among multiple parties in an Intellectual Property (IP) protected environment, as well as proprietary activities as appropriate to engage stakeholders as relevant to the Institute objectives and goals of the FOA
- Quality of the education and workforce development plan to support technical education and career training. Extent to which the Institute will leverage existing resources and support dissemination of curriculum materials.
- Degree to which the Institute will leverage existing resources and facilities as appropriate, including but not limited to the NSF ATE Centers, NIST MEP Centers, national laboratories, and other government investments.
- Extent to which the applicant demonstrates the potential impact of the Institute on U.S. manufacturing competitiveness, in particular to increase energy productivity and domestic production capacity and impact domestic job creation, trade balance and/or GDP, as well as regional economic development as a result of successful technology deployment and commercialization from Institute related activities over ten years.
- If the proposal includes participation of foreign-based entities, the adequacy of the justification for their participation and the estimated domestic production benefits.
- Extent to which the applicant demonstrates the potential impact of the Institute for aggregate cumulative energy savings (TBTU) and reduction in GHG (tons of CO2 equivalent) and water use (Billions of Gallons) on a life-cycle basis over ten years relative to existing available technologies.
- The adequacy and reasonableness of assumption in estimating the potential impact of the Institute.

**Criteria 2: Capabilities and Resources**

**Weight: [30%]**

- Caliber, leadership, technical capabilities and successful track record of the Lead Organization, Organization Director and key personnel. Adequacy of experience in successfully managing a collaborative and/or multi-user facility environment.

- Extent to which the necessary management, business, technical, and intellectual property personnel for supporting a high likelihood of success have been identified. Ability to attract and collaborate with the most qualified individuals and organizations in the country.
- Quality of the Institute partners/participants and their planned contributions to the Institute.
- Adequacy of the description of and quality of the shared RD&D facilities, capabilities, and related personnel for executing the proposed scope of work and their relevance for supporting the objectives of the Institute and the goals of the FOA.
- Degree of clarity in the differentiation between existing and new infrastructure and resources.
- Degree of support as evidenced by letters of commitment from planned users/participants within the first year of operation and their commitment to support domestic manufacturing competitiveness demonstrated by increased U.S. production capacity, U.S. job creation, etc.

**Criteria 3: Approach and Management Plan**

**Weight: [20%]**

- Extent to which the proposed operations structure will support the goals of the FOA and objectives of the Institute and incentivize private sector participation.
- Strength of methodology for selecting and prioritizing work, handling potential conflicts of interest, enabling access to Institute resources and tracking performance.
- Strength of the strategy and planned activities to encourage SMEs participation in the Institute.
- Adequacy of the plan to handle participation of foreign-based entities and ensure domestic production benefits.
- Reasonableness and effectiveness of governance/management approach and structure to enable strategic decision-making and inclusion of federal government input/direction. Quality of the proposed organization structure to support Institute objectives.
- Degree to which the governance structure will enable adaptability to changing industry conditions and needs, including the adequacy of periodic review processes and decision criteria.
- Adequacy of the proposed performance metrics and how metrics will be tracked to gauge success of the Institute and impact in the technology area.
- The appropriateness of the proposed budget, including new capital equipment requirements and the degree to which equipment manufacturer participation is leveraged. As appropriate, the degree to which the Institute operations and infrastructure will be segregated from existing organizational activities and funds not related to the formation and support of the Institute.

- Adequacy and credibility of the project plan for all activities, including well-developed key milestones and decision points. Reasonableness of the plan to support the creation and operation of shared RD&D infrastructure within a realistic yet aggressive time frame.
- Adequacy of the risk assessment and mitigation plan for technical, economic and operational aspects of the Institute.

**Criteria 4: Intellectual Property (IP) Management Plan**                      **Weight: [10%]**

- Adequacy of the IP management plan for supporting the needs of the Institute, its participants, and the broader U.S. manufacturing sector. Extent to which the IP management plan will incentivize private sector involvement.
- Quality of the IP Management plan and consistency with DOE IP requirement set forth in Section VIII.F. for:
  - The treatment of confidential information between members (e.g., the use of non-disclosure agreements);
  - The treatment of background IP (e.g., any requirements for identifying it or making it available);
  - The treatment of inventions made under the project (e.g., any requirements for disclosing to the other members, filing patent applications, paying for patent prosecution, and cross-licensing or other licensing arrangements between the members);
  - The treatment of data produced, including software, under the project (e.g., any publication process or other dissemination strategies, copyrighting strategy or arrangement between members), including licensing new learning materials and curriculum to the public under a Creative Commons Attribution License (CCBY) and specific datasets to be delivered in an open, machine-readable format to publically accessible data discovery platforms like [www.OpenEI.org](http://www.OpenEI.org), [www.data.gov](http://www.data.gov) or equivalent open web technologies;
  - Any technology transfer and commercialization requirements or arrangements between the members;
  - The treatment of any intellectual property issues that may arise due to a change in membership of the consortia or team;
  - The handling of conflicts of interest; and
  - The handling of disputes related to intellectual property between the members.
- Extent to which the IP Management Plan and any other IP agreements (attached in Appendix 3 of the Narrative) demonstrate that the IP issues inherent with collaborations and/or multi-user facilities are addressed.

## Criteria 5: Transition Plan

Weight: [10%]

- Likelihood that the project can achieve financial self-sufficiency from dedicated federal funding within five years.
- The adequacy of the description of the funding/revenue model which will support Institute operations beyond the award period.
- Adequacy of the planned resources (staff, physical equipment, etc.) to support Institute operations beyond the award period. Adequacy of the recruitment and training plan of additional manufacturing professionals and to refresh ideas of importance to industry over time to keep the Institute relevant.
- Reasonableness of the extended profit and loss estimates for an additional three years beyond the award period.

## Other Selection Factors

The selection official may consider the following program policy factors in the selection process:

- U.S. Geographic Diversity.
- Program Diversity. DOE Advanced Manufacturing Office intends to support a mix of Institute and other activities that best addresses the overall needs of the manufacturing industry and complement ongoing and anticipated EERE supported activities.
- High Leveraging of Federal Funds. The proposed Institute leverages federal funds to optimize advancement of programmatic goals by proposing cost share above the required minimum and is appropriate for the maturity of the technology under development.

## B. Review and Selection Process

### 1. Merit Review

Applications that pass the initial compliance review will be subjected to a merit review in accordance with the guidance provided in the “Department of Energy Merit Review Guide for Financial Assistance”. This guide is available at:  
<http://energy.gov/sites/prod/files/meritrev.pdf>.

**It is very important that those documents, Project Abstract and Project Narrative file, that will be used during the Merit Review Process do not contain any Personally Identifiable Information as described in Appendix B.**

As part of the merit review process, EERE may invite one or more of the top ranked applicants to participate in a final phase of the merit review evaluation process – Oral Presentations. Oral Presentations are distinct from and more formal than pre-selection clarifications (See Section V.B.2). The top ranked applicant(s) will meet with the Merit Review Panel to allow the Merit Review Panel to seek clarification on the contents of the Full Applications and otherwise ask questions regarding the proposed project. The

information provided by applicants to EERE through Oral Presentations is incorporated in their applications and contributes to the merit review evaluation and EERE's selection decisions.

EERE will arrange to meet with the invited applicants in person at EERE's offices or a mutually agreed upon location. EERE may also arrange pre-selection site visits to certain Applicants' facilities. In the alternative, EERE may invite the top ranked applicants to participate in a one-on-one conference with EERE via webinar, videoconference, or conference call.

EERE will not reimburse Applicants for travel and other expenses relating to the Oral Presentations and site visits, nor will these costs be eligible for reimbursement as pre-award costs.

EERE may obtain additional information through Oral Presentations and site visits that will be used to make a final selection determination. EERE may select applications for funding and make awards without Oral Presentations and site visits. Participation in an Oral Presentations or site visits with EERE does not signify that Applicants have been selected for award negotiations.

## **2. Pre-Selection Clarification**

EERE may determine that pre-selection clarifications are necessary from one or more applicants. These pre-selection clarifications will solely be for the purposes of clarifying the application, and will be limited to information already provided in the application documentation. 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 EERE's written clarification questions or video or conference calls with EERE representatives; however, in rare circumstances the clarifications could be conducted through in person-meetings at EERE or applicant site.

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. Selection for participation in pre-selection clarifications does not signify that applicants have been selected for negotiation of award or that an applicant is among the top ranked applications. EERE will not reimburse applicants for travel and other expenses relating to the pre-selection clarifications, nor will these costs be eligible for reimbursement as pre-award costs.

Pre-selection clarifications may occur before, during or after the Merit Review Phase.

## **3. Selection**

The Selection Official may consider the merit review recommendation, program policy factors, and the amount of funds available.

#### **4. Discussions and Award**

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including, but not limited to: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 10 CFR Parts 600 and 603 as applicable; (4) additional information and clarification is required to validate and understand the application and proposed scope of work, budget, or other information; and/or (5) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

#### **C. Anticipated Notice of Selection and Award Dates**

DOE anticipates notifying applicants selected for award by the end of November 2013 and making an award by the end of January 2014, contingent upon successful completion of negotiations with the applicant, and the availability of funds appropriated by Congress for the purpose of this program and the availability of future-year budget authority.

### **SECTION VI - AWARD ADMINISTRATION INFORMATION**

#### **A. Notice of Selection**

##### **1. Notice of Selection**

###### **Selected Applicants Notification**

DOE will notify applicants selected for negotiation of award. This notice of selection is not an authorization to begin performance. (See Section IV.G with respect to the allowability of pre-award costs.)

###### **Non-selected Notification**

Organizations whose applications have not been selected will be advised as promptly as possible. This notice will explain why the application was not selected.

##### **2. Notice of Award**

A Financial Assistance Award or Assistance Agreement issued by the Contracting Officer is the authorizing award document. It normally includes, either as an attachment or by reference: (1) Special Terms and Conditions; (2) Applicable program regulations, if any; (3) Application as approved by DOE; (4) DOE assistance regulations at 10 CFR Parts 600 and 603 as applicable; (5) National Policy Assurances To Be Incorporated As Award Terms; (6) Budget Summary; (7) Federal Assistance Reporting Checklist, which identifies the reporting requirements; and (8) Statement of Project Objectives.

For grants and cooperative agreements made to universities, non-profits and other entities subject to OMB Circular A-110, the Award also includes the Research Terms and

Conditions and the DOE Agency Specific Requirements located at:  
<http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp>.

## **B. Administrative and National Policy Requirements**

### **1. Administrative Requirements**

The administrative requirements for DOE grants and cooperative agreements are contained in Title 10 CFR Part 600 (See: <http://www.eCFR.gov>). Grants and cooperative agreements made to universities, non-profits and other entities subject to Title 2 CFR are subject to the Research Terms and Conditions located on the National Science Foundation web site at: <http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp>. TIAs are subject to the regulations at 10 CFR Part 603.

### **DUNS and SAM Requirements**

Additional administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR, Part 25 (See: <http://www.eCFR.gov>). Prime recipients must keep their data at SAM current. SAM is the government-wide system that replaced the CCR. If you had an active registration in the CCR, you have an active registration in SAM. Subrecipients at all tiers must obtain DUNS numbers and provide the DUNS to the prime recipient before the subaward can be issued.

### **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. (See: <http://www.eCFR.gov>). Prime recipients must register with the new FSRS 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 the SAM.

### **Subcontracts and Agreements with DOE National Laboratories**

Please be advised that those entities that form teams with DOE National Laboratories in which the Laboratory is a Prime Recipient (i.e., lead participant) will be required to enter into subcontracts or agreements with the Laboratory. As such, the terms and conditions of the Management and Operating contract between the Laboratory and the Department of Energy will be in effect for any subcontracts and agreements, and not the traditional provisions associated with a financial assistance award. National Laboratories acting as Prime Recipients must make all applicable terms and conditions available to their potential subcontractors or potential parties to an agreement prior to submission of their applications. Any entities considering such teaming arrangements should request the Laboratory to provide the applicable terms and conditions prior to the Prime Recipient submitting a response to this FOA.

## 2. Special Terms and Conditions and National Policy Requirements

The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at:

<http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms>.

The National Policy Assurances To Be Incorporated as Award Terms are located at

<http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms>

### Applicant Representations and Certifications

#### Corporate Felony Conviction and Federal Tax Liability Representations (March 2012)

By submitting an application in response to this FOA the Applicant represents that:

1. It is **not** a corporation that has been convicted (or had an officer or agent of such corporation acting on behalf of the corporation convicted) of a felony criminal violation under any federal law within the preceding 24 months,
2. **No** officer or agent of the corporation have been convicted of a felony criminal violation for an offence arising out of actions for or on behalf of the corporation under federal law in the past 24 months,
3. It is **not** a corporation that has any unpaid federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

For purposes of these representations the following definitions apply:

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

### 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>.

## 3. Lobbying Restrictions

By accepting funds under this award, you agree 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.

#### **4. Statement of Substantial Involvement**

DOE, in providing project management oversight of the organization, will be substantially involved in the Institute award by participating in the following, including but not limited to: observer on management boards; review and approval of projects planned by the organization to reach programmatic goals; review of organization progress based on metrics; and participation in go/no go decision points and peer reviews – any of which may lead to redirecting efforts – as the organizations work toward focusing on specific technological pathways leading to the increased strength and growth of the U.S. manufacturing base. If a consortium includes DOE FFRDCs, DOE will be substantially involved to ensure the efficient and effective interaction between the organization and the lab(s). DOE has the right to intervene in the conduct or performance of project activities for programmatic reasons. Intervention includes the interruption or modification of the conduct or performance of project activities. Please refer to 10 CFR 600.5 (b) for additional information describing substantial involvement.

#### **C. Reporting**

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement.

### **SECTION VII - QUESTIONS/AGENCY CONTACTS**

#### **A. Questions**

Questions regarding the content of this announcement must be submitted to: [FOA0000683@go.doe.gov](mailto:FOA0000683@go.doe.gov) not later than 5 business days prior to the application due date.

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

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

## SECTION VIII - OTHER INFORMATION

### **A. Amendments**

Amendments to this announcement will be posted on the EERE eXCHANGE web site and the Grants.gov system. However, you will only receive an email when an amendment or an announcement is posted on these sites if you register for email notifications for this FOA in Grants.gov. DOE 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 announcements.

### **B. Government Right to Reject or Negotiate**

DOE reserves the right, without qualification, to reject any or all applications received in response to this announcement 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 other than the Contracting Officer, either explicit or implied, is invalid.

**Funding for all awards and future budget periods are contingent upon availability of funds appropriated by Congress for the purpose of this program and the availability of future year budget authority.**

### **D. Treatment of Application Information**

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

Applicants should not include trade secrets or commercial or financial information that is privileged or confidential in their applications unless such information is necessary to convey an understanding of the proposed project or to comply with a requirement in the FOA. Applications containing trade secrets or commercial or financial information that is privileged or confidential, which the applicant does not want disclosed to the public or used by the Government for any purpose other than application evaluation, must be marked as described in this section.

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

Notice of Restriction on Disclosure and Use of Data:

Pages [list applicable pages] of this document may contain trade secrets or commercial or financial information that is privileged or confidential and is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes or in accordance with a financial assistance or loan agreement between the submitter and the Government. The

Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source. [End of Notice]

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

In addition, each line or paragraph containing trade secrets or commercial or financial information that is privileged or confidential must be marked with brackets or other clear identification, such as highlighting.

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

When a FOIA request covers information submitted to EERE by an applicant and the cognizant EERE FOIA Officer cannot make an independent determination regarding the public releasability of this information, the cognizant EERE FOIA Officer will contact the submitter (the applicant) and ask for comment regarding the redaction of information under one or more of the nine FOIA exemptions. However, the cognizant EERE FOIA Officer will make the final decision regarding FOIA redactions. Submitters are given a minimum of 7 days to provide redaction comments and if EERE disagrees with the submitter’s comment, EERE will notify the submitter of the intended public release no less than seven (7) days prior to the public disclosure of the information in question. (10 CFR Part 1004.11).

## **E. Evaluation and Administration by Non-Federal Personnel**

In conducting the merit review evaluation, the Government may seek the advice of qualified non-federal personnel as reviewers. The Government may also use non-federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting its application, consents to the use of non-federal reviewers/administrators. Non-federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing an application. Non-federal personnel conducting administrative activities must sign a non-disclosure agreement.

## **F. Intellectual Property Developed under this Program**

Patent Rights. The government will have certain statutory rights in an invention that is conceived or first actually reduced to practice under a DOE award.

For a cooperative agreement, the Bayh-Dole Act (35 U.S.C. 202) provides that a domestic small business, university or a non-profit recipient will have the option to retain title to their own inventions, subject to the Government retaining a government purpose license, march-in rights and a U.S. preference in licensing. The patent clause that will apply may be found at

## 10 C.F.R. Part 600 Appendix A to Subpart D, PATENT RIGHTS-SMALL BUSINESS FIRMS AND NONPROFIT ORGANIZATIONS.

For recipients who are not subject to the Bayh-Dole Act, 42 U.S.C. 5908 provides that title to such inventions vests in the U.S., unless DOE grants a patent waiver pursuant to 10 C.F.R. 784. For this FOA, DOE intends to issue a class patent waiver that will make available to those recipients who are not subject to the Bayh-Dole Act will also have the option to retain title to their own such inventions, subject to the same government retained rights identified above and provided they are cost sharing at least 50 percent and they agree to substantially manufacture new technology created under an award resulting from this FOA in the U.S. or provide other economic benefits to the U.S.

Those who are not subject to Bayh-Dole or do not meet the criteria of the class waiver, may request a waiver of all or any part of the rights of the U.S. in inventions conceived or first actually reduced to practice in performance of an agreement as a result of this announcement, in advance of or within 30 days after the effective date of the award. Even if such advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver of the rights of the U.S. in the title to identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the award. Any patent waiver that may be granted is subject to certain terms and conditions as stipulated in 10 CFR 784.

This FOA allows applicants to request a TIA. In a TIA, the patent rights are negotiable and may not be subject to the requirements of the Bayh-Dole Act or 42 U.S.C. 5908. If a TIA is awarded, therefore, a patent waiver will not be needed. If DOE determines it is appropriate to award a TIA, patent rights will be negotiated pursuant to the guidance set out in 10 C.F.R. 603.840 through 10 C.F.R. 603.875.

Determination of Exceptional Circumstances. DOE may issue a Determination of Exceptional Circumstances (DEC) (under 35 U.S.C. 202) that would apply to all awards, including sub-awards, under this FOA. The DEC, if issued, may specify requirements for supporting certain manufacturing activities in the United States regarding products embodying or produced through use of the subject inventions.

Rights in Technical Data. Normally, the government has unlimited rights in technical data developed under a DOE agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE's own needs or to ensure the commercialization of technology developed under a DOE agreement.

This program is covered by a special protected data statute.

The provisions of the statute provide for the protection from public disclosure, for a period of up to 5 years from the date of its development, of first-produced data that would be trade secret, or commercial or financial information that is privileged or confidential, if the information had been obtained from a non-federal party. In order to obtain the five years of protection, the protected data must be marked in accordance with the intellectual property provision of the agreement. Generally, the provision entitled, Rights in Data – Programs Covered Under Special Protected Data Statutes, (10 CFR 600 Appendix A to Subpart D), will apply to an award made under this announcement. This provision will identify data or

categories of data first produced in the performance of the award that will be made available to the public, notwithstanding the statutory authority to withhold data from public dissemination, and may also identify data that will be recognized by the parties as protected data. For DOE National Laboratories and FFRDCs, the data rights clause in Applicant's Management and Operating (M&O) Contract will apply.

Copyright. The Recipient and Subrecipients may assert copyright in educational or learning materials developed under the award without EERE's permission only if the Recipient and Subrecipients agree to license the materials to the public under a Creative Commons Attribution License (CCBY). (see <http://creativecommons.org/licenses/by/3.0/> for more information on license).

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

#### **G. Notice Regarding Eligible/Ineligible Activities**

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

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

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

#### **I. Notice of Potential Disclosure under Freedom of Information Act**

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

## REFERENCE MATERIAL

### Appendix A – Definitions\*

\*Unless otherwise referenced herein, the following definitions control.

**“Amendment”** means a revision to a Funding Opportunity Announcement

**"Applicant"** means the legal entity or individual signing the Application. This entity or individual may be one organization or a single entity representing a group of organizations (such as a Consortium) that has chosen to submit a single Application in response to a Funding Opportunity Announcement.

**"Application"** means the documentation submitted in response to a Funding Opportunity Announcement.

**“Authorized Organization Representative (AOR)”** is the person with assigned privileges who is authorized to submit grant applications through Grants.gov on behalf of an organization. The privileges are assigned by the organization’s E-Business Point of Contact designated in the SAM.

**"Award"** means the written documentation executed by a DOE Contracting Officer, after an Applicant is selected, which contains the negotiated terms and conditions for providing Financial Assistance to the Applicant. A Financial Assistance Award may be either a Grant or a Cooperative Agreement.

**"Budget"** means the cost expenditure plan submitted in the Application, including both the DOE contribution and the Applicant Cost Share.

**"Consortium (plural consortia)"** means the group of organizations or individuals that have chosen to submit a single Application in response to a Funding Opportunity Announcement.

**"Contracting Officer"** means the DOE official authorized to execute Awards on behalf of DOE and who is responsible for the business management and non-program aspects of the Financial Assistance process.

**"Cooperative Agreement"** means a Financial Assistance instrument used by DOE to transfer money or property when the principal purpose of the transaction is to accomplish a public purpose of support or stimulation authorized by federal statute, and Substantial Involvement (see definition below) is anticipated between DOE and the Applicant during the performance of the contemplated activity.

**"Cost Sharing"** means the respective share of Total Project Costs to be contributed by the Applicant and by DOE. The percentage of Applicant Cost Share is to be applied to the Total Project Cost (i.e., the sum of Applicant plus DOE Cost Shares) rather than to the DOE contribution alone.

**“Data Universal Numbering System (DUNS) Number”** is a unique nine-character identification number issued by Dun and Bradstreet (D&B). Organizations must have a DUNS number prior to registering in the SAM. Call 1-866-705-5711 to receive one free of charge.

**“E-Business Point of Contact (POC)”** is the individual who is designated as the Electronic Business Point of Contact in the SAM registration. This person is the sole authority of the organization with the capability of designating or revoking an individual’s ability to conduct SAM transactions.

**“E-Find”** is a Grants.gov webpage where you can search for Federal Funding Opportunities in FedGrants. <http://www.grants.gov/search/searchHome.do>

**“EERE Exchange”** is the Department of Energy, Energy Efficiency and Renewable Energy’s web system for posting Federal Funding Opportunity Announcements and receiving applications.  
<https://eere-exchange.energy.gov/FileContent.aspx?FileID=e10b8886-1826-447d-b1bf-8d9f0bf06f8e>

**“Financial Assistance”** means the transfer of money or property to an Applicant or Participant to accomplish a public purpose of support authorized by federal statute through Grants or Cooperative Agreements and sub-awards. For DOE, it does not include direct loans, loan guarantees, price guarantees, purchase agreements, Cooperative Research and Development Agreements (CRADAs), or any other type of financial incentive instrument.

**“FedConnect”** is where Federal agencies make awards via the web.  
<https://www.fedconnect.net/FedConnect/>

**“Federally Funded Research and Development Center (FFRDC)”** means a research laboratory as defined by Federal Acquisition Regulation 35.017.

**“Funding Opportunity Announcement (FOA)”** is a publicly available document by which a federal agency makes known its intentions to award discretionary grants or cooperative agreements, usually as a result of competition for funds. Funding opportunity announcements may be known as program announcements, notices of funding availability, solicitations, or other names depending on the agency and type of program.

**“Grant”** means a Financial Assistance instrument used by DOE to transfer money or property when the principal purpose of the transaction is to accomplish a public purpose of support or stimulation authorized by federal statute, and no Substantial Involvement is anticipated between DOE and the Applicant during the performance of the contemplated activity.

**“Grants.gov”** is the “storefront” web portal which allows organizations to electronically find grant opportunities from all federal grant-making agencies. Grants.gov is THE single access point for over 900 grant programs offered by the 26 federal grant-making agencies.  
<http://www.grants.gov>

**“Indian Tribe”** means any Indian tribe, band, nation, or other organized group or community, including Alaska Native village or regional or village corporation, as defined in or established pursuant to the Alaska Native Claims Settlement Act (85 Stat. 688)[43 U.S.C. § 1601 et seq.],

which are recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

**"Key Personnel"** mean the individuals who will have significant roles in planning and implementing the proposed Project on the part of the Applicant and Participants, including FFRDCs.

**"Marketing Partner Identification Number (MPIN)"** is a very important password designated by your organization when registering in SAM. The E-Business Point of Contact will need the MPIN to assign privileges to the individual(s) authorized to perform SAM transactions on behalf of your organization. The MPIN must have 9 digits containing at least one alpha character (must be in capital letters) and one number (no spaces or special characters permitted).

**"Organization Director"** refers to the lead technical point of contact/project manager for the Institute.

**"Participant"** for purposes of this Funding Opportunity Announcement only, means any entity, except the Applicant substantially involved in a Consortium, or other business arrangement (including all parties to the Application at any tier), responding to the Funding Opportunity Announcement.

**"Project"** means the set of activities described in an Application, State plan, or other document that is approved by DOE for Financial Assistance (whether such Financial Assistance represents all or only a portion of the support necessary to carry out those activities).

**"Recipient"** means the organization, individual, or other entity that receives a Financial Assistance Award from DOE, is financially accountable for the use of any DOE funds or property provided for the performance of the Project, and is legally responsible for carrying out the terms and condition of the award.

**"Selection"** means the determination by the DOE Selection Official that negotiations take place for certain Projects with the intent of awarding a Financial Assistance instrument.

**"Selection Official"** means the DOE official designated to select Applications for negotiation toward Award under a subject Funding Opportunity Announcement.

**"Substantial Involvement"** means involvement on the part of the Government. DOE's involvement may include shared responsibility for the performance of the Project; providing technical assistance or guidance which the Applicant is to follow; and the right to intervene in the conduct or performance of the Project. Such involvement will be negotiated with each Applicant prior to signing any agreement.

**"System for Award Management (SAM)"** is the primary database which collects, validates, stores and disseminates data in support of agency missions.

**"TBTU"** means trillion BTU (british thermal unit) a unit of measurement for energy

**"Technology Investment Agreement (TIA)"** is a type of assistance instrument used to support or stimulate research projects involving for-profit firms, especially commercial firms that do

business primarily in the commercial marketplace. TIAs are different from grants and cooperative agreements in that the award terms may vary from the Government-wide standard terms (See DOE TIA regulations at 10 CFR Part 603). The primary purposes for including a TIA in the type of available award instruments are to encourage non-traditional Government contractors to participate in an R&D program and to facilitate new relationships and business practices. A TIA can be particularly useful for awards to consortia (See 10 CFR 603.225(b) and 603.515, Qualification of a consortium).

**"Total Project Cost"** means all the funds to complete the effort proposed by the Applicant, including DOE funds (including direct funding of any FFRDC) plus all other funds that will be committed by the Applicant as Cost Sharing.

**"Tribal Energy Resource Development Organization or Group"** means an "organization" of two or more entities, at least one of which is an Indian Tribe (see "Indian Tribe" above) that has the written consent of the governing bodies of all Indian Tribes participating in the organization to apply for a grant or loan, or other assistance under 25 U.S.C. § 3503.

## Appendix B – Personally Identifiable Information

In responding to this Announcement, Applicants must ensure that Protected Personally Identifiable Information (PII) is not included in the following documents: Project Abstract, Project Narrative, Biographical Sketches, Budget or Budget Justification. These documents will be used by the Merit Review Committee in the review process to evaluate each application. PII is defined by the Office of Management and Budget (OMB) and DOE as:

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

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

- a. **Public PII:** PII found in public sources such as telephone books, public websites, business cards, university listing, etc. Public PII includes first and last name, address, work telephone number, email address, home telephone number, and general education credentials.
- b. **Protected PII:** PII that requires enhanced protection. This information includes data that if compromised could cause harm to an individual such as identity theft.

Listed below are examples of Protected PII that Applicants must not include in the files listed above to be evaluated by the Merit Review Committee.

- Social Security Numbers in any form
- Place of Birth associated with an individual
- Date of Birth associated with an individual
- Mother's maiden name associated with an individual
- Biometric record associated with an individual
- Fingerprint
- Iris scan
- DNA
- Medical history information associated with an individual
- Medical conditions, including history of disease
- Metric information, e.g. weight, height, blood pressure
- Criminal history associated with an individual
- Employment history and other employment information associated with an individual
- Ratings
- Disciplinary actions
- Performance elements and standards (or work expectations) are PII when they are so intertwined with performance appraisals that their disclosure would reveal an individual's performance appraisal
- Financial information associated with an individual
- Credit card numbers

- Bank account numbers
- Security clearance history or related information (not including actual clearances held)

Listed below are examples of Public PII that Applicants may include in the files listed above to be evaluated by the Merit Review Committee:

- Phone numbers (work, home, cell)
- Street addresses (work and personal)
- Email addresses (work and personal)
- Digital pictures
- Medical information included in a health or safety report
- Employment information that is not PII even when associated with a name
- Resumes, unless they include a Social Security Number
- Present and past position titles and occupational series
- Present and past grades
- Present and past annual salary rates (including performance awards or bonuses, incentive awards, merit pay amount, Meritorious or Distinguished Executive Ranks, and allowances and differentials)
- Present and past duty stations and organization of assignment (includes room and phone numbers, organization designations, work email address, or other identifying information regarding buildings, room numbers, or places of employment)
- Position descriptions, identification of job elements, and those performance standards (but not actual performance appraisals) that the release of which would not interfere with law enforcement programs or severely inhibit agency effectiveness
- Security clearances held
- Written biographies (e.g. to be used in a program describing a speaker)
- Academic credentials
- Schools attended
- Major or area of study
- Personal information stored by individuals about themselves on their assigned workstation or laptop unless it contains a Social Security Number

## Appendix C – 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, 10 CFR Part 600, use both of the terms in the titles specific to regulations applicable to cost sharing. DOE almost always uses the term “cost sharing,” as it conveys the concept that **non-federal share is calculated as a percentage of the Total Project Cost.**

### How Cost Sharing Is Calculated

As stated above, cost sharing is calculated as a percentage of the Total Project Cost. Following is an example of how to calculate cost sharing amounts for a project with \$1,000,000 in federal funds with a minimum 50% non-federal cost sharing requirement:

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

Example: \$1,000,000 divided by 50% = \$2,000,000

Formula: Total Project Cost (\$) minus federal share (\$) = Non-federal share (\$)

Example: \$2,000,000 minus \$1,000,000 = \$1,000,000

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

Example: \$1,000,000 divided by \$2,000,000 = 50%

**Keep in mind that FFRDC funding is DOE funding.**

### What Qualifies For Cost Sharing

In general, if a cost is allowable under the cost principles applicable to the organization incurring the cost and is eligible for reimbursement under a DOE grant or cooperative agreement, then it is allowable as cost share. Conversely, if the cost is not allowable under the cost principles and not eligible for reimbursement, then it is not allowable as cost share. In addition, costs may not be counted as cost share if they are paid by the federal Government under another award unless authorized by federal statute to be used for cost sharing.

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

- Institutions of Higher Education, Hospitals, and Other Nonprofit Organizations are found at 10 CFR 600.123;
- State and Local Governments are found at 10 CFR 600.224;
- For-profit Organizations are found at 10 CFR 600.313.

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

allowable as cost share. Only the value for the five years of donated maintenance that corresponds to the project period is allowable and may be counted as cost share.

Additionally, DOE 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, DOE generally does not allow pre-award costs prior to the signing of the Selection Statement by the DOE Selection Official.

Following is a link to the DOE Financial Assistance Regulations. You can click on the specific section for each Code of Federal Regulations reference mentioned above.

DOE Financial Assistance Regulations:

<http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&sid=98a996164312e8dcf0df9c22912852b0&rgn=div5&view=text&node=10:4.0.1.3.9&idno=10>

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 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 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 (codified at 2 CFR Part 230) is determined in accordance with the for-profit cost principles in 48 CFR Part 31 in the Federal Acquisition Regulation, except that patent prosecution costs are not allowable unless specifically authorized in the award document.

(b) *Other types of organizations.* Allowability of costs incurred by other types of organizations that may be subrecipients under a prime award is determined as follows:

(i) *Institutions of higher education.* Allowability is determined in accordance with OMB Circular No. A-21 (codified at 2 CFR Part 220) - Cost Principles for Educational Institutions

(ii) *Other nonprofit organizations.* Allowability is determined in accordance with OMB Circular A-122 (codified at 2 CFR Part 230) - Cost Principles for Non-Profit Organizations

(iii) *Hospitals.* Allowability is determined in accordance with the provisions of 45 CFR Part 74, Appendix E, Principles for Determining Costs Applicable to Research and Development Under Grants and Contracts with Hospitals

(iv) *Governmental organizations.* Allowability for state, local, or federally recognized Indian tribal government is determined in accordance with OMB Circular No. A-87 (codified at 2 CFR Part 225) - Cost Principles for State, Local, and Indian Tribal Governments

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

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

- (a) Volunteer services must be documented and, to the extent feasible, supported by the same methods used by the recipient for its own employees.
- (b) The basis for determining the valuation for personal services and property must be documented.

## Appendix D – Statement of Project Objectives (SOPO) Template

### STATEMENT OF PROJECT OBJECTIVES

[Recipient Name]

[Project Title]

**[All of the information to be included in the SOPO should be consistent with the Application upon which the award is based. Please see below for general guidance regarding the SOPO:**

1. The SOPO should be divided into budget periods (BPs). Ideally, phase completion dates should coincide with BP end dates
2. The first budget period (BP1) is anticipated to be approximately 18 months
3. Break up activities/work packages into tasks and subtasks
4. Tasks should not cross budget periods, if work on a task is continued from BP to BP then it would be a new task referencing the work done in the previous BP and expressing what else will be performed during the current BP
5. Keep descriptions of tasks concise and general
6. Include S.M.A.R.T. (Specific, Measurable, Achievable, Relevant, and Timely) milestones for important tasks and include at least one Go/No-Go decision point at the end of each BP
7. Do not include \$ amounts or task completion dates
8. Do not name parties responsible for specific tasks
9. Define all acronyms
10. Do not include any sensitive or IP related information]

#### **A. PROJECT OBJECTIVES**

[Enter a clear and concise statement of the goals and objectives of the project as well as the expected outcomes.]

#### **B. PROJECT SCOPE**

[Include a general overview description of the project. Refer to the DOE Program or Division (for example: Hydrogen, Fuel Cells, and Infrastructure Technologies Program; Buildings and Industrial Technologies Division; etc.) objectives that the project is addressing. This section should be only 1-2 paragraphs long.]

#### **C. TASKS TO BE PERFORMED**

[For each Task and Subtask, enter 1-2 paragraphs describing the purpose, approach, and expected outcomes. Include project milestones (do not include dates), where appropriate. If applicable, the Tasks should be organized by project phases/budget periods which correspond to major project milestones or go/no-go decision points.]

*Below is an example of the type of Task structure desired:*  
PHASE 1 (or BUDGET PERIOD 1) [TITLE OPTIONAL]

**Task 1.0 [Insert Title]**  
[Insert Description]

**Task 2.0 [Insert Title]**  
[Insert Description]

**Subtask 2.1 [Insert Title]**  
[Insert Description]

**Subtask 2.2 [Insert Title]**  
[Insert Description]

**Go/No-Go Decision Point(s):**  
**[Insert proposed minimum BP performance criteria for above Task(s):]**

PHASE 2 (or BUDGET PERIOD 2) [TITLE OPTIONAL]

**Task 3.0 [Insert Title]**  
[Insert Description]

**Task X.0 Project Management and Reporting**

[Include this as the last Task and number it consecutively with the other Tasks. As part or all of the Task Description, include language along the lines of: “Reports and other deliverables will be provided in accordance with the Federal Assistance Reporting Checklist following the instructions included therein.” Additional deliverables (for example, hardware delivered for testing or Peer Review Meetings / Project Review Meetings) not specified in the Reporting Checklist should be included in this Task Description.]

REPEAT STRUCTURE/SECTIONS FOR EACH ADDITIONAL BUDGET PERIOD  
PROPOSED