

INTRODUCTION

Contained in this application is a request for approval of State Energy Program (SEP) funds under the American Recovery and Reinvestment Act (ARRA) to support a comprehensive solar energy and economic development program focusing on job creation, education, renewable power production, and scientific efforts to reduce the cost and increase the efficiency of solar energy. We believe the targeted use of these federal resources has the potential to enhance the unique economic and renewable-energy activities already underway in our state, accelerate the market transformation that is occurring nationally, and address President Obama's short-term goals in economic stimulus and long-term objectives in expanding renewable energy production and use, both in Tennessee and nationwide.

BACKGROUND

As a prelude to our request, allow us to share recent developments that have established Tennessee as a leader in promoting cleaner and more efficient energy use leading up to enactment of the ARRA. Under the leadership of our Governor and the Tennessee General Assembly, our state has made major strides in encouraging energy efficiency and conservation and promoting renewable energy. Perhaps most notably in the efficiency category, the state in 2008 established the Energy Efficient Schools Initiative (EESI) using approximately \$90 million in excess proceeds from our state's lottery program to fund energy-efficient retrofits of public school buildings across Tennessee. The first round of EESI grants is currently being awarded to all school districts across the state under this forward-looking program.

Concurrent with efforts to improve energy conservation in our schools, Tennessee established the Governor's Task Force on Energy Policy to explore additional statewide strategies, including: Advancing efforts by state government to lead by example in retrofitting its largest buildings with more energy efficient equipment and appliances and purchasing more fuel efficient vehicles in its fleet; formally designating the clean-energy technology sector as eligible for our state's emerging industry tax credit; and, in the interest of promoting statewide energy efficiency, establishing a residential building code in areas of the state where no minimum standards exist. Legislation is currently before the General Assembly to accomplish these goals and more.

It is important to note that the State of Tennessee's investments in energy efficiency are ongoing. Currently, we are examining options for programming up to \$38 million held in our petroleum violation escrow (PVE) accounts to undertake additional allowable energy related activities, such as the provision of low-interest loans for small- and medium-sized commercial and industrial firms seeking to make energy efficiency improvements in their facilities. Our detailed plans for use of these resources will be included in Tennessee's upcoming application for regular SEP formula funds and in the state's PVE annual report. The General Assembly has authorized the Energy Policy Office to program remaining funds in our PVE accounts as part of the state budget for the 2009-10 fiscal year, which began July 1, 2009.

Additionally, the state has focused significant resources in promoting cleaner and independent sources of energy in the transportation sector. In 2007, Tennessee invested approximately \$70 million to establish the Tennessee Biofuels Initiative between the University of Tennessee (UT) and Oak Ridge National Laboratory (ORNL). The resulting activities led to a partnership between DuPont Danisco Cellulosic Ethanol, LLC, and Genera Energy, LLC, representing the UT Research Foundation. Last October, the partnership began developing a pilot-scale cellulosic ethanol biorefinery and research and development facility. The state's investments successfully leveraged a \$135- million investment by the U.S. Department of Energy (DOE) to create a Bioenergy Research Center at ORNL.

More recently, we began exploring opportunities to accelerate the development of electric vehicles, including those that will be produced by Nissan, which in 2008 completed the relocation of its North American headquarters to Middle Tennessee. The General Assembly approved the Governor's request to appropriate approximately \$5 million from our PVE accounts to participate in a DOE-approved multistate electric vehicle project led by Electric Transportation Engineering Corp., based in Phoenix, Ariz., and Nissan North America, based in Franklin, Tenn. The ARRA-funded project, announced in August, is being described as the largest deployment of electric vehicles and infrastructure ever undertaken.

Finally, Tennessee is committed to growing the clean energy technology sector of the state's economy. A June 10, 2009 report by the Pew Charitable Trusts found that Tennessee is one of only three states in the country - including Colorado and Oregon - that enjoy a large and fast-growing clean energy economy. Tennessee's economic development strategy has generated notable success in recruiting renewable-energy firms, marked by billion-dollar investments in our state by two of the solar industry's largest suppliers. Within the past year, Hemlock

Semiconductor and Wacker Chemie AG, both producers of polycrystalline silicon, a key precursor element in photovoltaic solar panels, announced plans to bring thousands of jobs to Tennessee as the U.S. solar market expands. Hemlock Semiconductor will construct its production facility in Middle Tennessee and Wacker Chemie will open a production site in Southeast Tennessee. Their arrival in the Volunteer State is in part attributable to an innovative green-energy tax credit approved by the General Assembly last year. The companies' decisions, we believe, reflect a confidence in Tennessee's commitment to making further investments that encourage the development of solar energy. We also believe current conditions in the solar industry hold the potential for future growth in our state.

Looking ahead, the State of Tennessee's challenge is to leverage and build on the current momentum created by activities and investments already underway in our state in energy efficiency and conservation and renewable energy. In considering options for use of ARRA funds, we saw two fundamental paths: Augment existing substantial programs and seed smaller new initiatives, both of which are expected to occur using funds held in our

PVE accounts; or pursue the targeted use of additional federal resources to advance our state's existing renewable energy and economic development strategy, which aligns with the President's key short- and long-term economic stimulus and renewable energy goals. We believe the latter option is the best approach.

PROPOSAL

Guided by the increasingly bright prospects of continued growth in the solar industry in Tennessee, we are proposing to use the state's SEP funds under ARRA to build on our current efforts by establishing a comprehensive solar energy and economic development program focusing on job creation, education, renewable power production, and technology commercialization efforts to reduce the cost and increase the efficiency of solar energy, which in part will encourage energy efficiency and conservation by supplanting the use of electricity generated by fossil fuels. Our proposed use of ARRA funds is part of a broader strategy to stimulate short-term economic activity, position Tennessee to support expansion of the solar industry, and help accelerate the national market transformation in a manner that will create jobs and ensure a clean energy future.

Specifically, Tennessee's proposed solar initiative consists of two integrated projects: The Tennessee Solar Institute at UT and ORNL; and the West Tennessee Solar Farm near Brownsville, a five-megawatt multi-acre power generation facility. Short-term, the projects will go hand-in-hand in creating or supporting jobs in construction, manufacturing and installation, and scientific efforts to reduce the cost and increase the efficiency of solar energy. Long-term, the combined investments are designed to strengthen Tennessee's position as a national energy research hub and emerging force in the U.S. solar industry. Each project is described below in detail.

ECD is responsible for the overall administration of the Volunteer State Solar Initiative (VSSI) including working closely with all sub-recipients, preparing and reviewing program performance reports, budgeting, contracting and contracts management activities, providing support and program guidance to sub-recipients, measurement and verification of energy performance reporting by sub-recipients. Additionally, ECD oversees all monitoring and compliance activities associated with NEPA, Davis-Bacon, Buy American, and Historic Preservation.

TENNESSEE SOLAR INSTITUTE

The Tennessee Solar Institute at UT and ORNL is a new initiative that will serve as a center for excellence to spur accelerated growth in Tennessee's burgeoning solar industry and a crossroads for a wide range of solar related activities in the Volunteer State. Among other purposes, it will bring together scientists, engineers and technical experts with business leaders, policymakers, and industry workers to help speed the deployment and of solar photovoltaic (PV) technology. It will be a home for regional and state initiatives that foster the creation of new businesses. By establishing strategic industry partnerships across the solar value chain, the Institute will provide technical assistance and workforce development to solar industry firms, assist in technology commercialization, help improve facilities and manufacturing processes, and undertake other efforts to help grow the solar industry in Tennessee.

A wide range of activities will be conducted as part of the Institute's overall mission through UT and ORNL. For the purposes of expending SEP-ARRA funds, the State of Tennessee proposes using the Institute to administer or coordinate two specific

activities deemed allowable under DOE regulations and SEP-ARRA guidelines: "Solar Innovation Grants" and "Solar Installation Grants," which are described below. The net result of these activities will encourage energy efficiency and conservation by supplanting the use of electricity generated by fossil fuels.

SOLAR INNOVATION GRANTS

To encourage growth in Tennessee's solar industry, the State of Tennessee proposes using a portion of its SEP-ARRA funds to establish a "Solar Innovation Grants" program for qualifying Tennessee solar industry firms seeking technical assistance, facility or process improvements, workforce development and other support allowable under DOE regulations and SEP-ARRA guidelines. This proposal will accelerate market transformation toward renewable energy and fits within SEP-ARRA goals and objectives because it encourages energy efficiency and conservation and supplants the use of electricity generated by fossil fuels. Solar Innovation Grants will be administered by the Tennessee Solar Institute at UT and ORNL under a contract with the Department of Economic and Community Development (ECD).

Activities eligible for Solar Innovation Grants will include:

Technical Assistance: Qualifying solar industry firms or firms engaged in solar-related business activities may access grants to support use of the following technology commercialization services: conducting energy assessments or audits; launching energy efficiency/renewable energy (EE/RE) benefit promotional and marketing activities or campaigns; engaging in, responding to or leveraging funding opportunities for EE/RE measure projects; and conducting feasibility studies to facilitate access to capital and credit for EE/RE measure projects. The Tennessee Solar Institute will issue a Request for Proposals for Technical Assistance Innovation Grants on behalf of ECD. ECD estimates ten (10) \$100,000 Technical Assistance Innovation Grants will be awarded.

Facilities and Equipment Improvements: Qualifying firms may access grants in order to implement, expand, upgrade or demonstrate EE/RE products, equipment and materials for use in their operations. Specifically, grants will be used to employ EE/RE measures by purchasing and installing equipment. Results will be measured

by capturing baseline data and measuring EE/RE progress or variance from the baseline in areas such as oil displacement, efficiency improvements and energy conservation. The Tennessee Solar Institute will issue a Request for Proposals for Facilities and Equipment Improvement Innovation Grants on behalf of ECD. ECD estimates ten (10) \$500,000 Facilities and Equipment Improvement Innovation Grants will be awarded.

Renewable Energy Products: Qualifying firms may access grants in order to acquire, upgrade or demonstrate renewable energy products, equipment and materials for use in their operations, provided that any energy-generation demonstration must be small scale. "Small scale" is defined as appropriately sized units on existing rooftops and parking shade structures, or 60kW systems or smaller installed on the ground within the boundaries of an existing facility. The Tennessee Solar Institute will issue a Request for Proposals for Renewable Energy Product Innovation Grants on behalf of ECD. ECD estimates that ten (10) \$150,000 Renewable Energy Product Innovation Grants will be awarded.

Process Improvements: Qualifying firms may access grants in order to make production, manufacturing, assembly or distribution processes be less energy-intensive by conducting industrial energy audits and through the purchase and installation of energy efficient and renewable energy equipment and materials, including reasonable design costs. The Tennessee Solar Institute will issue a Request for Proposals for Process Improvement Innovation Grants on behalf of ECD. ECD estimates that ten (10) \$500,000 Process Improvement Innovation Grants will be awarded.

Technology Improvements: Qualifying firms may access grants in order to interact with resources that can analyze existing techniques or technologies in the interest of speeding the improvement and deployment of commercially available EE/RE techniques and technologies. SEP-ARRA funds will cover travel, conference, database research and other ancillary costs, to facilitate such interactions. The Tennessee Solar Institute will issue a Request for Proposals for Technology Improvement Grants on behalf of ECD. ECD estimates that ten (10) \$100,000 Technology Improvement Innovation Grants will be awarded.

Workforce Development: Qualifying firms may access grants in order to conduct education and training activities for their employees related to the sale, installation, and maintenance of solar systems and equipment. Examples of possible activities

include training for solar PV installers and technicians and other certification approved by the North American Board of Certified Energy Practitioners (NABCEP). In certain instances, SEP-ARRA funds may be used to host meetings and conferences and cover costs such as material purchases, space rentals, travel expenses and instructor fees. NEPA categorical exclusions are expected in loan and grant programs for "training programs."

Contemplated activities will fall within this general scope. A detailed scope of intended training objectives will be developed post-award. The Tennessee Solar Institute will issue a Request for Proposals for Workforce Development Innovation grants on behalf of ECD. ECD estimates that twenty (20) \$50,000 grants Workforce Development Innovation grants will be awarded.

SOLAR INSTALLATION GRANTS

To speed the deployment of solar energy, the State of Tennessee proposes using a portion of its SEPARRA funds to establish a "Solar Installation Grants" program for qualifying Tennessee businesses to help fund the purchase and installation of small-scale solar PV systems. This proposal fits within SEPARRA goals and objectives because it encourages energy efficiency and conservation and supplants the use of electricity generated by fossil fuels. Solar Installation Grants will be administered through the State's existing Tennessee Clean Energy Technology Grant Program (TN-CET) in partnership with the Tennessee Solar Institute. Installation Grants will be small scale. "Small scale" will be defined as appropriately sized units on existing rooftops and parking shade structures, or 60kW systems or smaller installed on the ground within the boundaries of an existing facility.

Guidelines for Solar Installation Grants will include:

- **Eligible Participants:** For-profit retail, industrial or commercial businesses licensed to do business in Tennessee as well as non-profit and not-for-profit organizations. Farms are eligible provided that at least 51% of income is generated from farming operations.
- **Eligible Systems:** Small-scale solar PV systems installed either on or adjacent to buildings located in Tennessee and used by the applicant for retail, commercial and/or industrial purposes. Installation Grants will be small scale. "Small scale" will be defined as appropriately sized

- units on existing rooftops and parking shade structures, or 60kW systems or smaller installed on the ground within the boundaries of an existing facility.
- **Maximum Award:** Small-scale PV systems will be reimbursed on a sliding-scale, per watt basis. Applicants may receive no more than five (5) Installation Grants.
 - **Other Requirements:** Grants will be paid on a reimbursement basis after certifications of completion and support documentation have been provided. Systems and installations must meet applicable local building codes and have required permits. Contractors or installers must be licensed, bonded and insured, and preferably certified by NABCEP.

In addition to the grant activities, the Institute plans to support and promote the solar industry in Tennessee through a multiple efforts, including: host regional solar industry summits, conducting a solar workforce needs assessment, providing solar workforce training workshops across the state, and developing a database of solar industry experts in key technologies and services.

Institute activities such as those described above will speed the deployment of and accelerate advances in energy efficiency and renewable energy initiatives. More broadly, the Institute's efforts will result in a heightened understanding and acceptance of solar energy across the state, region and nation. The Institute will attract additional solar industry investment in Tennessee.

As the Institute develops, the State may identify additional activities allowable under DOE regulations and SEP-ARRA guidelines. As additional activities are identified, the State may request funding consideration under revised plans.

WEST TENNESSEE SOLAR FARM

The West Tennessee Solar Farm near Brownsville is envisioned as a five-megawatt multi-acre power generation facility located on a piece of property in Haywood County, Tennessee, adjacent to Interstate 40. The Farm will be comprised of approximately 22,300 panels and demonstrate a range of commercially available

solar techniques and technologies. These will likely include: traditional stationary solar photovoltaic (PV) technology, solar tracking technology, thin-film solar technology, and energy storage technology. The State intends to contract the development, installation and management of the Farm - specifically, the power-generation system - to the University of Tennessee (UT). Under a preliminary agreement, power generated by the Farm will be purchased at a renewable energy price by the Tennessee Valley Authority (TVA), a federally owned utility that is the nation's largest public power company. Proceeds from power sales will be reinvested in the site for maintenance, expansion and improvement. All program income will be handled in accordance with 10 CFR § 600.124. When the power purchase agreement is finalized, the Tennessee Department of Economic and Community Development (ECD) will submit a plan that details how program income will be used for planned maintenance, expansion and improvement of the Farm. Any expansion of the Farm funded through revenue generated by the power purchase agreement will be limited to commercially available technology. The Solar Farm as currently planned is approximately one mile from an independent industrial megasite also planned for the County. The State of Tennessee's FY2009-10 budget includes state funds for the purchase of the land associated with both the industrial megasite and the Solar Farm. There is no link between the power or revenue generated at the Solar Farm with the megasite.

The Solar Farm's purpose and goals align directly with the principles of the Recovery Act, DOE Objectives, and goals of the State Energy Program as outlined in Section 4.2 of the SEP-ARRA Guidance. Specifically: Demonstrate the zero-carbon production of electricity on a highly visible and significant scale that will create jobs, educate the public on the benefits of solar energy, encourage future renewable energy interest and investments across Tennessee and throughout the region, reduce GHG emissions, and increase renewable energy generation. The five-megawatt Farm will be one of the largest solar installations in the Southeastern U.S. – a region that is heavily dependent on carbon-emitting sources for power generation. The Farm will demonstrate that solar technology can be used effectively, with no adverse environmental impact, to generate electricity from sources that do not produce GHG emissions.

The Solar Farm will be a model for utilities seeking to diversify energy generation portfolios in order to comply with new laws, rules or regulations. The Farm will reduce GHG emissions by up to 15 million tons of CO₂ equivalents annually and generate 6 million to 8 million kWh of renewable energy annually. Under a preliminary agreement, power generated by the Farm will be purchased at a renewable energy price by TVA. TVA will purchase the power through an interconnection agreement with a local distributor, Chickasaw Electric Cooperative. From an economic-development standpoint, the Farm will serve as a showcase for

Tennessee-made solar products and components. Product orders will represent a boost in short-term production for manufacturers. Through strategic partnerships, the Farm will demonstrate other products and components made by firms with a presence in Tennessee and the region. Additionally, the Solar Farm may assist in the Solar Institute's technology commercialization efforts by demonstrating improved solar PV technologies and other commercially available technologies that may improve efficiency related to the grid.

Finally, the Solar Farm will have a significant public education mission that will allow citizens and students to gain firsthand exposure to solar energy production in order to better understand its benefits. Each year, more than 9.7 million vehicles will pass by the Farm on the existing Interstate 40 corridor in West Tennessee. Public education activities will occur at a proposed state-funded Information and Welcome Center that will be located directly on I-40, adjacent to the Farm. SEP-ARRA funds will be used to support educational activities at the Farm site and inside the Information and Welcome Center. SEP-ARRA funds will not be used to support construction of or land purchase for the Information and Welcome Center. The Information and Welcome Center will be developed in coordination with the Tennessee Department of Transportation (TDOT) as a pull-through interstate welcome center, resulting in minimal traffic disruption in the immediate area and eliminating the need for local access roads into the site. TDOT or another state entity will coordinate and execute the land acquisition using state funds. Based on a preliminary environment site assessment, there do not appear to be critical environmental issues at the subject site. There is no presence of threatened and endangered species, wetlands, or cultural resources that would be significantly impacted by installation activities. No significant issues are expected with regards to air quality, water or land use, socioeconomics, or environmental justice.

CONCLUSION

Together, we believe the integrated projects constitute a comprehensive solar energy and economic development program that will move Tennessee's economy forward and produce both short-term and long-term economic benefits. The proposal is a natural extension of Tennessee's overall energy strategy, which includes a broad variety of energy efficiency and conservation and renewable energy investments and activities already underway.

Perhaps most important, as stated, our experience gives us confidence that the targeted use of additional federal resources will promote the President's dual objectives to stimulate the U.S. economy and strengthen America's clean energy future.