



**ICMA Public Library Innovation Grant Application  
Solar Test-Bed Library Project**

**Project Narrative**

**A. Project Goals**

- Community Partnership – establish new and build upon existing partnerships and collaborations and create new synergy with the public library as the lynchpin
- Local Economic Development – Clean Technology – participate in developing the “Green Valley” in Northwest Arkansas by providing opportunities for local companies to develop and run new solar energy technologies and products and a living laboratory for investors to evaluate these products and putting the public library at the center of these efforts
- Reduced Operation Costs and Carbon Footprint – improve the library’s sustainable operations in order to leverage funding and reduce utility consumption and carbon footprint, and position the public library as a community leader and role model in this area
- Renewable Energy – utilize solar power for library operations and contribute energy to the grid as possible
- Sustainability Education – educate the general public (especially youth), businesses and other libraries about alternative energy sources, in particular solar energy, and motivate them to strive to incorporate them into their lives and operations

**B. Project Description**

The Solar Test-Bed Library Project will further the Fayetteville Public Library’s (FPL) commitment to “green operations” by creating a visible solar application for the community. As a recognized leader in both the local community’s and the state of Arkansas’ green movement and sustainability, the library will be able to apply and amplify community learning opportunities through this project. Additionally, the project will provide a real world application of current research and development occurring at the Arkansas Research and Technology Park (ARTP) in the area of solar-generated energy allowing small businesses in Fayetteville an opportunity to showcase their products and penetrate the renewable energy market. This opportunity is an important growth step for the “Green Valley” network in Northwest Arkansas, which seeks to establish the region as the leader

in the collaboration and commercialization of practical sustainability technology through non-profit coalitions.

The project will be designed and installed by students from the University of Arkansas' (UA) Electrical Engineering Senior Design program with faculty supervision. Initially, the project will include the latest "off the shelf" technology for a grid-tied solar application, including an inverter and 48 solar arrays capable of generating 10 kilowatts of renewable energy.

After six months of monitoring, the project will add a SiC inverter being locally developed by Arkansas Power Electronics International, a burgeoning small business located in the ARTP incubator. The SiC inverter's performance will be compared with the standard inverter to demonstrate differences in efficiency. The solar installation will also gain additional solar arrays over time from thin-cell solar technology currently being developed at the University, allowing real-world testing of thin-cell solar technology.

The Arkansas Energy Office has pledged \$8,500 toward an education kiosk at the library to display real-time energy data from the solar arrays and time-lapse images to illustrate solar tracking, as well as literature on the importance of renewable energy and how the process works. The kiosk feature will make the Solar Test-Bed project immediate and accessible to any of the over 2,000 daily visitors to the Library. A project website will provide information and real-time data. Up-close tours will be provided to stakeholders, students and investors for evaluation and education.

By facilitating this effort, the Fayetteville Public Library and the City of Fayetteville's Office of Sustainability are continuing their commitment to sustainability, educating people and ensuring that small businesses in the clean technology sector are a vital part of Fayetteville's economic future. It would be the first truly joint project between the Library and the City. With a newly elected a mayor and a new Chief of Staff to be hired, such a partnership with this unique and innovative project will further the missions of both organizations and build bridges and relationships.

### **C. Technology**

The initial setup will include a Xantrex GT30 inverter and 48 solar arrays from Kyocera. The solar arrays will be mounted on a frame and rotating mechanism designed by electrical engineering students to follow the sun throughout the day and maximize energy output.

After six months the inverter will be replaced with a SiC inverter developed by a local company, Arkansas Power Electronics International, which is 99 percent

efficient. (Please see the attachment “SiC vs. Si.”) The Solar Test-Bed will also serve as a mechanism for future solar technologies to be tested and displayed as they are developed within local businesses and at the University.

The setup will provide power to the library, reducing utility consumption and carbon footprint. Ideally, power generation will exceed the library’s need in order to allow contribution to the grid.

#### **D. Promotion and Recruitment**

The Solar Test-Bed project will be promoted through the Fayetteville Public Library, the City of Fayetteville, the University of Arkansas, the Fayetteville Economic Development Council and the Fayetteville Chamber of Commerce. The project will have a dedicated educational kiosk at the library and website. The kiosk will focus on local education, and the website will provide information and real-time data to any and all interested people. Outreach will be conducted to identify stakeholders, students and investors for tours. A public program will be held to explain the project to a general audience. FPL Youth Librarians will develop and implement an associated teen workshop and a related children’s activity. Library staff will identify and add books and DVDs on solar power and its practical applications to the library’s permanent collection, which will serve as a long-term community investment.