

## **SOLAR TEST-BED PROJECT**

**Grant Agreement No. E14.001.00/Fayetteville/2009/4**

*ICMA Quarterly Report*

*Jan 1, 2010- March 31, 2010*

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I. **Introduction** *(One-two paragraph summary of project. This will most likely stay the same for each subsequent report.)*

The Fayetteville Public Library (AR), in partnership with the City of Fayetteville, is enhancing its green initiatives and building upon its USGBC LEED Silver certification for its library facility by developing a renewable energy system that will assist the University of Arkansas and local green industry in bringing solar energy R&D to market. The project will include an inverter that is 99 percent efficient and 48 solar arrays generating 10 kilowatts of renewable energy. It will also provide a public education tool for renewable energy in a region where no significant renewable energy exists, a test facility for local products being developed at the Arkansas Research and Technology Park, a source of renewable energy for the library and, thereby, reduction of utility use for library operations, and an opportunity to partner with the Arkansas Energy Office, Arkansas Power Electronics International, the National Center for Reliable Electrical Power Transmission and the University of Arkansas.

The goals of the project are to: *(List project goals as stated in proposal)*

- 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 & Carbon Footprint – Improve the sustainability of the library’s 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.

**II. Major Accomplishments/Activities** *(Include information about activities and accomplishments from the reporting period and list any activities projected for the next period)*

1. Began weekly project meetings with key partners. Topics included:
  - a. Design review
  - b. Partnerships
  - c. Publicity / promotion
  - d. Budget
  - e. Timeline
2. PV panels
  - a. Negotiated a significant discount from BP Solar by leveraging partnerships and replicated projects with the City and the University
  - b. Ordered sixty (60) 215 watt panels at \$34,740
  - c. Saved approximately \$18,000 off of list price
3. Identified an off-the-shelf PV array mounting structure from Unirac
  - a. Negotiated a 60% discount
  - b. Purchase order generated
4. Completed PV panel electrical configuration
5. Secured partnership with Garver Engineering to provide oversight on electrical engineering including direct involvement with the student design team and electrical design review
6. Completed structural analysis
  - a. Structural mounting design presented delays while challenges were addressed and eventually overcome
  - b. Completed structural load-bearing analysis of the existing roof system
  - c. Overcame major challenge regarding “roof penetrations” – how many were needed and at what cost each – which are required to mount the frame to the roof
7. Held first design review walkthroughs
  - a. Electrical contractor
  - b. Roofer
8. Discovered several key elements for installation had been omitted from project planning and budget
  - a. Revisited project plans
  - b. Adjusted purchasing of key components
  - c. Negotiated for discounts
  - d. Acquired additional partners
  - e. Authorized use of existing operating budget through delay of other projects
  - f. Shifted timeline

Projected activities for the next period:

1. Public design review to be held on 4/17/10
  - a. Will be held in conjunction with the Library's "Green Your Life Series," which grew out of this project and involves several partners
2. Educational kiosk
  - a. Design content
  - b. Launch
  - c. Coordinate content with library website
3. Construct mounting system
4. Install PV system
5. Connect PV system to grid-tie system (puts electricity into the building)
6. Implement public education events, including tours
7. Press conference / publicity to include all partners

### **III. Progress against Performance Measures**

The timetable slipped significantly due to technical issues around the structural analysis and electrical design. An engineering firm had to be identified to review the student work around the roof penetrations. Purchasing a key component, the frame system, was dependent upon this review. This firm had to be willing to donate their time or significantly reduce their rates for this work as it was a non-budgeted expense. To find a firm in possession of the needed skills with little notice, a tight turnaround for the work and no funding was a daunting challenge and involved much time. Each partner worked to identify a suitable firm and then negotiate partnership and pricing for this professional assistance. Ultimately, an Arkansas-based firm, Garver Engineering, joined the team and donated a large portion of their services.

Purchasing components also slipped on the time frame as we negotiated for partnership with the vendors and the best possible pricing to leverage grant funding. Our success includes \$18,000 savings in solar (PV) panels and a 60% discount on the frame.

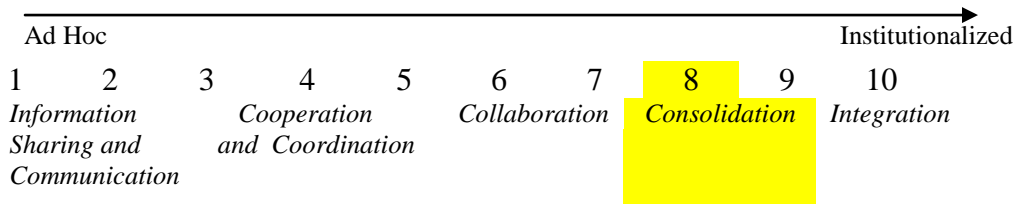
All components have been ordered and installation is slated for June.

### **IV. What have you learned?**

1. On a scale of 1 to 10, please indicate the current level of partnership between the local library and its primary local government partner for planning and implementing this grant project.

See below for a description of the scale and examples of activities associated with each level of partnership. Please note that each level includes and builds on the activities associated with the levels below it. If activities from more than one

level apply to your partnership, choose the level that is most applicable to your situation (i.e., has the most items that are true). For example, if everything about “Cooperation and Coordination” is true for you and one part of “Collaboration” is true, you might choose “4.”



Level of Partnership <sup>1</sup>	Examples of Activities
Information Sharing and Communication	<ul style="list-style-type: none"> <li>▪ Talk with one another as needed about the grant project</li> <li>▪ Share information as needed about the project</li> <li>▪ Help with the project on an ad hoc basis</li> </ul>
Cooperation and Coordination	<ul style="list-style-type: none"> <li>▪ Executive project team formed, including representatives from library and local government, and meets occasionally</li> <li>▪ Joint planning and operation of some project components</li> <li>▪ Factor in what is happening in both entities (library and local government) when planning and operating project</li> </ul>
Collaboration	<ul style="list-style-type: none"> <li>▪ Regular meetings of executive project team</li> <li>▪ Shared ownership of project</li> <li>▪ Both entities contribute their expected share of effort for project planning and operation</li> <li>▪ Both entities identify other possible ways of working together beyond the grant project</li> </ul>
Consolidation	<ul style="list-style-type: none"> <li>▪ Regular and open communication between library and local government in other areas beyond the grant project</li> <li>▪ Joint planning on other efforts beyond the grant project</li> <li>▪ Library leadership has a seat at the table during some local government decision-making processes</li> </ul>
Integration	<ul style="list-style-type: none"> <li>▪ Both entities identify shared priorities and jointly develop &amp; implement projects or activities to address them</li> <li>▪ Cross-staffing to plan and operate other efforts beyond the grant project</li> <li>▪ Library leadership always has a seat at the table during local government decision-making processes</li> </ul>

2. Why was this level chosen? What, if anything, has changed regarding the level of partnership during the quarter?

We remain consistent at level 8 – “Consolidation” – as there have been no changes. Every opportunity to meet with and travel with the local government partner should be seized. Our city is facing budget shortfalls and talking mid-year cuts. Because the library has a “seat at the table” and is involved in these discussions first-hand, we can plan and are prepared for the eventuality. Also,

<sup>1</sup> Adapted from Konrad, E. (1996). A multidimensional framework for conceptualizing human services integration initiative. *New Directions for Evaluation*, 69, 5-19.

seek out ways to have local government officials involved in what might be routine ways at the library, e.g. including them in a press conference or inviting them to an event. Finally, demonstrate the library's relevance in concrete ways; we provided full-text articles on how municipalities are coping with budget cuts within one business day of this being on the mayor's staff meeting agenda.

3. What are you learning in the implementation of this program that might be useful for other communities looking to implement similar programs? What would you tell another community about partnering between the library and local government based on what you've learned so far?

Challenges are probably inevitable in a large-scale and complex project. Look for the opportunities that are hidden within those challenges. Be honest about difficulties and share the situation with all partners. Ask for help in working toward a shared solution. Don't blame each other, even when something is clearly someone else's fault. Instead, acknowledge the reality, recommit to the partnership and work through it together. Always remember that while it is about the project, it's also (and maybe more so) about the relationships.

4. What will be the long term impact of this program on your community?

We have little new to report in this area. As previously stated, this project is already being replicated by the library's two major partners at two other locations in our city. The City of Fayetteville is using it as a model for a project at the courthouse, which is being funded by the American Recovery and Reinvestment Act. The University of Arkansas is running a concurrent project (although the timeline lags behind ours) at their Research Development Park using the same student teams. Both projects are procuring the same components, but are scaling their installations for their own purposes. We were able to leverage this replication into purchasing power and realized an \$18,000 savings on the solar (PV) panels through combined purchasing.

- a. What, if any, components of the program will continue after the funding period? How will they be sustained?

The library will generate power from this project indefinitely, which will lower its utility costs. The Arkansas Energy Office recently announced rebates available for our type of installation, and we will apply for one. These savings and the potential rebate will be reallocated to other library programs and services. We hope that University of Arkansas professors and students and local solar technology entrepreneurs will continue to utilize the system as a test bed for development and testing of evolving and new components. Maintenance of the system will be funded through the library's regular operating budget. It is hoped

that the system might be expanded in future to generate even more power for the library. The educational component will have a ripple effect in our community. It is hoped that these efforts will empower residents to adopt more sustainable life styles and encourage youth to pursue science, technology and engineering fields.

- b. How likely is it that the library-local government partnership established through the current project will continue beyond the grant period? What would be required to sustain the partnership beyond the grant period?

It is extremely likely. Shared projects are a huge incentive and help, but relationships are what matter.

#### 5. Other comments

Matt Bell, the student involved in the project who was hired as the library's IT intern, exhausted work-study funding this quarter. Instead of losing a valuable team member, the library hired Matt as a temporary employee. He is still the library's IT intern and continues to receive the highest customer service marks from both internal and external customers.

Fayetteville Public Library  
 Project Title: Solar Test-Bed Library Project  
 Project No.: E14.001.00

<b>15. A. Project Budget - Revised April 12, 2010</b>		<b>Green shaded areas indicate changes.</b>	
Description	Cost /Unit	Units	Total
<b>Supplies, Material and Equipment</b>			
Kyocera KD205GX - LP Solar Panel - 205 Watt, 16 Volts	\$579	60	\$34,741.50
Xantrex GT30 Inverter	\$10,739	1	\$10,739.00
Frame and Swivel Materials (Designed, Constructed & Installed by Engineering Students)	\$4,630	1	\$4,360.00
Miscellaneous (Materials for mounting, electrical contractor, etc.)	\$10,020	1	\$10,019.50
<b>Total</b>			<b>\$59,860.00</b>
<b>In-Kind Funding and Labor</b>			
Salary, Executive Director, Fayetteville Public Library	\$53	120	\$6,400.80
Salary, Facilities Manager, Fayetteville Public Library	\$33	200	\$6,588.00
Salary, Director of Operations, Fayetteville Public Library	\$44	40	\$1,744.80
Salary, Director of Administrative Services, Fayetteville Public Library	\$46	10	\$457.70
Salary, Communications & Marketing Manager, Fayetteville Public Library	\$24	20	\$482.80
Salary, Chief of Staff, City of Fayetteville	\$58	64	\$3,682.56
Salary, Sustainability Coordinator, City of Fayetteville	\$36	120	\$4,278.00
Public relations and publicity (newsletter, flyers, etc.)	\$200	1	\$200.00
Public events/library programming	\$125	3	\$375.00
Library materials	\$20	100	\$2,000.00
University of Arkansas Electrical Engineering Senior Design Students	\$4,000	10	\$40,000.00
Salary, University of Arkansas Electrical Engineering Faculty	\$15,000	2	\$30,000.00
Arkansas Power Electronics International, Inc.	\$5,000	1	\$5,000.00
Arkansas Energy Office (Education & Promotion)	\$8,500	1	\$8,500.00
<b>Total</b>			<b>\$109,709.66</b>
Project total			\$169,569.66