Renewable Development Fund
Project EP3-12
Milestone 4 Report – 02/26/10
PUBLIC

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Project Title: A Solar Electric Solution for Residential Markets

Contract Number: EP3-12  Milestone: 4  Report Date: 02/05/2010

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Congressional District for Corporate office: 5
Congressional Districts for Project location: Overall, across the Twin Cities, but for both installations corresponding to Milestone 4 - Districts 3 & 4.

Executive Summary

The goal of this project, as stated in the proposal submitted on July 17, 2007, is “to demonstrate the commercial viability of providing solar-generated electricity to homes and small businesses based on a leasing and service package”. In addition, the "project will provide distribute residential solar energy through rooftop-mounted photovoltaic solar panels" and the importance of the project is to overcome pricing and capitalization barriers in this market, which have been documented to be the biggest obstacles to solar expansion.

The key objective of the project is to install 280 KW of solar capacity in approximately 30 to 40 sites distributed across the Twin Cities. The exact number of installation sites will depend on the actual number of panels in each site.

The delivery of 280 KW will be grouped into 15 milestones, with the fourth milestone requiring the installation of 5.6 KW in two solar residential sites.

The rest of this report will be dedicated to describe the technical details, what went well, what did not, lessons learned, etc.
As a reference to the reader, the first install was 2.7KW in St. Paul and the second 2.7KW in Bloomington, totaling 5.4 KW.

Technical Progress

From a technical perspective, both installations were successful with no major issues. As stated in previous reports, the process begins with permit requests and equipment ordering, in particular, building permits from each City, electrical permits from the State and submittal of Xcel Interconnection Agreement. On installation day, the process entails mounting and flashing of standoffs and railings, installation of micro-inverters and panels and electrical conduits/circuits to the home’s electrical service. After installation, inspections were conducted and an Xcel Area Engineer was scheduled for testing and commissioning. All inspections were conducted successfully and the resulting signed documents from Xcel are enclosed to this report in Appendix A (confidential information, given that it includes customer data).

The systems are fully monitored with the Enphase Enlighten systems. For a real time view of both, please click on the following links. Please note the panel-by-panel electricity generation display and the buttons for “Time-lapse: Today’s Power/Power Last 7 days”, which are particularly insightful: http://enlighten.enphaseenergy.com/public/systems/mHyQ2329

For the second system: http://enlighten.enphaseenergy.com/public/systems/WtDB2884
Project Benefits

Project benefits are:

1. Demonstration of the viability of ‘solar-as-a-service’
2. Delivery of 280KW of generating capacity, which will count towards the Xcel Energy goal for Renewable Energy Standard
3. Green job generation
4. Generation of clean electricity for a minimum of 15 years

Given that 18.225 KW out of a total 280 KW have been delivered so far, the project benefits have been only partly achieved. In reference to benefit 3, green job generation, we report six Full-Time-Equivalent green jobs generated: Project Manager, Project Administrator, Project IT development and support, Crew Supervisor, and two Site Assessors/Installers. In addition, part-time electricians have been sub-contracted for each installation.

Project Findings – what went well and what to improve on

As we started the solar PV installation phase, the following went well:

- Installation of components and monitoring integration was seamless.
- Install methods and techniques have greatly improved.

Project findings to improve upon:

- Difficult roof pitch mixed with cold weather and snow extended the estimated installation time.

Project Lessons Learned

Market pricing for commercial properties

FreEner-g has found it necessary to make a pricing adjustment in order to meet the commercial market price sensitivity. As commercial customers are bottom-line entities, they are generally unwilling to accept an increase their O&M costs with a solar lease. The new pricing is described below.

In contrast, residential customers are still willing to pay a premium and our solar lease price is 49% above current electricity rates, as the willingness-to-pay survey had showed at the beginning of this project.
The lease terms for commercial properties are 20 years in length (instead of the 15 years in the residential lease) with a deposit due at the time of the signing of the lease contract. There are currently two monthly lease plans available for commercial properties:

- **Plan A** is a monthly lease option that is equal to the cost of the electricity (both energy and demand) provided by the solar system, per the current Xcel Energy rate tariffs. The FreEner-G lease payments will increase for the first five years to match the Xcel rate pricing. After that, the lease price will be fixed for the remaining 15 years.

- **Plan B** is a monthly lease option that is discounted 20% from the current Xcel rates (combined energy and demand charges). In Plan B, the lease payment will increase for all 20 years to match Xcel rate increases.
Appendix A – Xcel Energy signed Interconnection Agreements – *Not included, due to confidential nature*