

## Final Progress Report

**Project Title:** National Database of Utility Rates and Rate Structure

**Covering Period:** October 1, 2011 to August 30, 2014

**Date of Report:** November 14, 2014

**Recipient:** Illinois State University

**Award Number:** DE-EE0005350

**Working Partners:**

**Cost-Sharing Partners:**

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**Project Objective:** The overall goal of this project is to design, populate, and maintain a complete national database of utility rates and rate design for making economic decisions regarding solar photovoltaic (PV) systems. This project will result in a comprehensive, reliable, easy-to-use and interpret database of utility rates and rate structure.

**Background:** One of the key informational barriers for consumers, installers, regulators and policymakers, is the proper comparison cost of utility-supplied electricity that will be replaced with a Photovoltaic (PV) system. Oftentimes, these comparisons are made with national or statewide averages which results in inaccurate comparisons and conclusions. Illinois State University seeks to meet the need for accurate information about electricity costs and rate structure by building a national database of utility rates and rate structures. The database will build upon the excellent framework that was developed by the OpenEI.org initiative and extend it in several important ways. First, the data will be populated and monitored by a team of trained regulatory economists. Second, the database will be more comprehensive because it will be populated with data from newer competitive retail suppliers for states that have restructured their electricity markets to allow such suppliers. Third, the University and its Institute for Regulatory Policy Studies will maintain the database and ensure that it contains the most recent rate information.

**Work Accomplished for this Grant:** The following tasks were planned for this grant. Below each task is a summary of what was accomplished under that task:

#### Task 1.0 Design compatible database structure

Originally, we were going to create a duplicate website to use at Illinois State University. We ultimately decided to keep that database on the NREL OpenEI.org site. The difficulties of syncing the two databases and maintaining consistency proved too great. NREL allowed our programmers access to their servers and code so that we could design a compatible database structure. We actually made 3 upgrades to the database structure to allow for entry for rates that were incompatible with the database structure that was in place at the time that the grant started. For example, approximately 20% of utilities have tiered demand charges in their rate structures. The initial database could not accommodate that rate structure. We worked with NREL and existing software users of the database (System Advisory Model and BEOpt) to coordinate updates to the database and create new interfaces to allow this software to read the new database fields. As a result of staying on the NREL site, all database entries were “live” as soon as they were initially entered. Approved rates were ones that went through the full quality control process.

#### Task 2.0 Design back-end interface

Illinois State University IT professionals developed new data entry interfaces that were compatible with the new database structures and allowed students to easily enter the rates in the database. New tabs were built into the user interface to allow easy navigation and facilitate data entry.

#### Task 3.0 Design training materials

Training materials consisting of Powerpoint presentations, a training manual, and sample exercises demonstrating different utility rate designs were developed by the Executive Director. These materials were updated every summer and fall as new students became employed to work on the project. Each employee received a copy of the materials.

#### Task 4.0 Design user interfaces

Illinois State University IT professionals developed new user interfaces that were compatible with the new database structures and allowed software developers to easily read the data in the database. New “APIs” were developed each time the database was updated. We also developed a “clone” button that would duplicate a rate for easy updating while also linking the new rate to the old rate. New displays of the data were developed for users searching for rates one at a time online. Both internal and external user interfaces were based on an open-source, on-line software platform.

#### Task 5.0 Design user manual

A user manual was developed and updated throughout the project and posted on the OpenEI website.

#### Task 6.0 Train associates and assistants

The database was populated and quality controlled by a trained group of graduate and undergraduate students. Because students graduate or move on to other projects, students were trained at the beginning of the summer and the beginning of the fall semester. Experienced students helped to mentor newer students.

#### Task 7.0, 10.0, 13.0 Populate database

This project utilized a well-trained student workforce to populate the database. Graduate students from the Master's Degree Program in Electricity, Natural Gas and Telecommunications Economics and undergraduate students in Economics and Renewable Energy were employed to populate and quality control the rates.

#### Task 8.0, 11.0, 14.0 Quality control and rate changes

We initially underestimated the time that it would take to quality control all the rates. This led to backlogs in the system. The Executive Director hired and trained fulltime workers to help in the quality control process. Any systematic errors in the data entry were shared with all the data entry people to cut down on the amount of errors.

#### Task 9.0, 12.0, 15.0 Publicize database

In the first year, it was difficult to publicize the database because so few rates had been entered at that point. David Loomis made presentations at the following conferences:

- October 23, 2013 at Solar Power International, Chicago, IL.
- January 29, 2013 at the EUEC Conference, Phoenix, AZ.
- June 13, 2012 at the Department of Energy SunShot Conference, Denver, CO.
- April 26, 2012 at the IRPS Conference, Springfield, IL.

He also co-wrote the following article to publicize the existence of the database:

Loomis, D. G. and Bowden, N. S. (2013). Nationwide Database of Electric Rates to Become Available, *Natural Gas & Electricity*, 30 (5), 20-25.

#### **Significant Accomplishments This Grant:**

1. The database is fully populated. Through October 31, 2014, a total of 47,202 utility rates were entered and totally quality-controlled. Less than 1% of the utility rates are incompatible with the existing rate database structure. A total of 2,790

utilities had all their rates entered, quality control checked and approved in the OpenEI database.

2. We continue to contact utilities that don't have their rates listed on a website. Some utilities have taken down their rates from the internet and refuse to provide their rates to us when asked. This constitutes less than 100 utilities that are serving ultimate customers.
3. We created a process to obtain the URLs of all the approved rates and monitor them through Website Watcher software. So far, we don't have the personnel to update rates more frequently than with a six month lag.
4. The cloning button was developed and implemented. We are using this button to save old rates on the system and link the old and new rates. This cloning button will populate most of the data fields and save data entry time when updating rates.

**Status:** The database is fully populated and current (with a six month lag) as of the end of August. Rates that were six months old are being checked and updated if necessary through the end of October.

**Plans for the Future:** The following activities were planned for the future:

1. Continue data entry, quality control and approval of rates that last checked six months ago. Users and non-users of the database would like rates updated more frequently than a six-month lag. We will continue to look for funding to allow more frequent updating of the database.
2. Continue to contact utilities that don't have rates listed on their websites.
3. As funds allow, Illinois State University will continue to fund a limited number of students after the grant runs out on August 31, 2014.

**Patents:** None

**Publications/Presentations/Travel:**

None

**Status Summary Tables:**

Update the attached Excel spreadsheet "Qtrly Report Template\_Part 2". Note there are 3 tabs for all work through the reporting quarter.

Please note: The Excel file MUST be submitted in Excel and uploaded with the quarterly report. It may not be write-protected or converted to PDF.