Final Report

Project Title:	Grow Solar Wisconsin Team
Covering Period:	2/15/12 to 4/30/13
Date of Report:	5/13/13
Recipient:	Midwest Renewable Energy Association
Award Number:	DE-EE0005686
Working Partners:	Madison Solar Consulting (Co-PI), City of Milwaukee, RENEW Wisconsin, Sustainable Resources Group
Cost-Sharing Partners:	Midwest Renewable Energy Association, City of Milwaukee, City of Madison, City of Marshfield, Marshfield Utilities, Sustainable Marshfield Committee, and UW-Extension

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Project Objectives:

1. Establish best practices for streamlining and standardizing the solar permitting process
2. Survey Wisconsin's solar stakeholders to identify and prioritize current issues with interconnection processes and standards, author report identifying key issues and best practices, and distribute to key stake holders
3. Use collaborative techniques to develop clear strategies to improve Wisconsin's interconnection and net metering standards
4. Establish best practices for improved net metering standards and articulate it in relevant regulatory proceedings
5. Increase the solar financing options available in Wisconsin through the replication of existing successful pilot programs in Madison and Milwaukee
6. Clarify the legality of third party power purchase agreements
7. Create model solar zoning language and solar ready building codes
8. Disseminate programs results

Background:

The Grow Solar Wisconsin Team is working to reduce the cost of photovoltaic (PV) system installations through the removal of process and institutional barriers. Our goal is to move the market in Wisconsin beyond its reliance on financial incentives. Through a collaborative effort of advocacy groups, education groups, the Wisconsin Distributed Resources Collaborative (WIDRC), cities and municipalities, utilities, the Public Service Commission of Wisconsin (PSCW), and the Wisconsin State Energy Office, the Team will develop streamlined and consistent practices to bring down the installed costs of solar electric systems. Additionally, by utilizing a quality improvement approach, we will build a model that can be easily, and affordably, replicated by cities and municipalities across the nation.

Significant Accomplishments:

Permitting Processes

Task 1.1 Streamline Local Permitting Processes
Subtask 1.1.1 Form working groups within Milwaukee and Marshfield to identify the activities problems associated with the current solar permitting lead-time
Subtask 1.1.2 Using the quality improvement methodology; work with each jurisdictional team to develop and analyze a process map for efficiencies, and to recommend solutions.
Subtask 1.1.3 Compare process maps across jurisdictions, and create a subset of standardized process and forms that all jurisdictions can implement.
Subtask 1.1.4 Make available results from Subtask 1.1.3 to relevant stakeholders.

Task 1.2 Expand to Neighboring Communities
Subtask 1.2.1 Approach twenty communities near each participating jurisdiction and recruit seven to ten communities to explore uniform permitting standards
Subtask 1.2.2 Collect data, and develop and analyze a process map for each neighboring community participant
Subtask 1.2.3. Make available process maps to relevant stakeholders.
Subtask 1.2.4. Promote progress with an online map on Team's "Grow Solar Wisconsin" Toolbox website.

Accomplishments

Milwaukee, lead Amy Heart (City of Milwaukee/Milwaukee Shines)
The City of Milwaukee developed a new solar permitting process based on the Solar ABCs expedited solar permit. At the beginning of the development process, the City of Milwaukee hosted a Solar Permitting Working Group meeting on July 12, 2012. 30 people attended the session that consisted of a mix of City staff (permitting, planning, inspection, historic preservation, forestry), solar installers, Focus on Energy (state energy program) representatives, large solar customers, and We Energies (utility) representatives. The group mapped the current process of obtaining a solar permit, and clarified requirements such as installer credentials, supporting documentation needed, and fees. The working group addressed topics such as pressure points or bottlenecks in the process, fees, how to clarify requirements, and options for submitting permits to ensure quick approvals.

As a result of this first meeting, City staff developed an "Online Solar Permitting Resource" that allows installers and customers a quick way to find answers to solar related questions in Milwaukee. This online resource outlines all the solar electric and solar hot water installation requirements in City of Milwaukee, provides all the forms and process for permit submittal and inspection, and provides process and details on the interconnection requirements with We Energies, the local utility.

The City of Milwaukee created a:

- Step-by-step Permit Process to guide installers and customers through the City's process. The step-by-step process is posted online and provides direct links to all applications and documents needed.
- Installer Checklist for contractors to download to make sure they have all the information and documentation required to eliminate multiple trips or confusing conversations with City planning staff.

- Map of the current solar permit and inspection process.
- Enacted an "Expedited Solar Permit, based on the Solar ABCs example, which would allow for same-day approval for certain roof-mounted systems. This permit combines both electrical and building permit to reduce paperwork for installers and speed approval time.
- The solar permit cost was reduced (under $100 for both the electrical and building permit).

The City of Milwaukee also provided training for City staff on permitting and inspection requirements. Participants included department managers, front-line staff, and inspectors. This training explained the new documents and process, the technology, and ensured all staff would be on the same page for requirements and enforcement of inspections. These trainings will occur annually for staff to provide any updates or address any issues. Additionally, historic preservation staff worked with the solar program manager to develop a clear process for identifying potential projects that would need historic preservation input.

Marshfield, lead Bryant Moroder (Sustainable Resources Group)
A Project Charter was developed through several meetings with Marshfield staff and discussions with installers. The Project Charter:

- Helped guide the project's implementation and was used as a waypoint if project implementation became difficult.
- Defined the team members and their role.
- Defined the boundaries of what the project. (Changes that would require zoning code and state statue were excluded from consideration.)

Local installers and solar experts were recruited to provide input and insights. Through a data collection process involving team meetings and discussions about procedures, with various stakeholders including installers and utilities, a solar permit process map began to emerge. This process map was used to identify procedures that were redundant and did not add value.

Over the course of several meetings, we examined the process for permitting in greater detail with solar installers and Marshfield Utilities staff. Findings from best-practice research were presented and considered when specific issues and opportunities emerged.

A draft document was created to define the procedure that included instructions and requirements based on the outcomes of previous meetings. This document helped stakeholders begin to visualize the process and created additional opportunities for refinement. A key goal was to have specific solar permit application that would collect all pertinent information on one simple form. Over the subsequent months, refinements to document and the process occurred through several facilitated meetings. Grow Solar Wisconsin worked with Marshfield team to identify and address longstanding habits of procedure that according to local installers added significant burden to the permitting process. For example, Marshfield staff considered requiring a Professional Engineer stamp and conduct a pre-inspection visit for every permit application as a preventive measure.

To address these issues, we examined and presented the Marshfield staff with cost on what these additional requirements would add to a residential solar project. It took a significant amount of effort to get staff to move from a position of risk avoidance to a more customer-oriented approach.

The final result of the effort was the Marshfield Solar Guidebook, the first of its kind in Wisconsin. The Guidebook consists of the following components and is intended as a reference for both installers and code officials:

- Eligibility Requirements – Projects that meet specific criteria only should use the Guidebook instructions.
- Important Information – An overview of state and local laws and statues pertaining to residential PV
- Project Milestones – A step-by-step process for submitting residential solar permits including contract information and documentation required.
- Solar Permit Application
- Sample Drawings and Templates– Detailed sample installation drawing, structural information worksheet, electrical diagrams (Solar ABC's) and site plan
- Certificate for Electrical Service form
- Directions and map to City of Marshfield

The document was published on the City of Marshfield's website.

Madison area, lead Bryant Moroder (Sustainable Resources Group)

The City of Madison, as a Solar America Community, worked between 2008 and 2010 to improve their solar electric permitting process. However, the on-going concerns of local installers with Madison's permitting requirements indicate that these efforts could be further improved.

SolarStruc

SolarStruc is an innovative analytical software package developed by City of Madison staff to calculate rooftop loads for solar installations and streamline permitting on engineered truss roof systems. Unfortunately, little effort had been made to provide installers with the appropriate training on how and when to use this tool.

Using the services of the Madison City Channel, a 38-minute SolarStruc training video was developed, featuring SolarStruc's developer. The training video and the SolarStruc tool are now available online, allowing other jurisdictions to learn how to properly use the tool. As a result, in the City of Madison, installers that properly use the SolarStruct can significantly reduce the time needed to assemble their permit package. Their use of SolarStruc also reduces the time code officials spend reviewing structural information.

Online Permits

When the project began, only over-the-counter submittals were accepted by the City of Madison. Now solar permits can be submittal online. Through coordinated project planning, City IT staff and planning department launched an online option in 2013. Local solar electric system installers were asked to beta-test and provide feedback before the new online submittal system was widely available.

Furthering Regional Consistency

Both local installers and code officials identified that a major barrier to an expedited permitting process was time spent determining and adapting to the various procedures and specific requirements of each jurisdiction. The GSW Team's approach to improve residential solar PV permitting used techniques

based on quality improvement, not individual knowledge or using Dane County (home of Madison Wisconsin) as a test case.

Permitting related data for 27 Dane County jurisdictions was gathered to define the inconsistency problems. The jurisdiction's approval procedures and other requirements were found to vary significantly. Over half of the jurisdictions, most of the smaller villages and towns, used privately contracted permitting service providers. These private firms, compensated through a fee-for-service arrangement, have less interest in streamlining the procedures.

Individual municipalities were contacted once specific permitting issues and inconsistencies were better understood. Efforts were made to contact code officials, typically building inspectors, but also administrators and community sustainability or environmental initiative leaders.

Given the limitation of project's resources, the nine largest jurisdictions in Dane county (who account for about two-thirds of the county's population) were invited to create a more standardized and uniform solar regional permitting process. To ensure they understood the GSW Team's expectations, each jurisdiction was provided with a project proposal, which included a schedule of activities, an estimated deadline and the specified hours of commitment need to complete the project. The activities included attending several trainings about permitting best practices, several meetings to discuss and resolve major issues and an on-going commitment to provide contributions to informational documents (e.g. Guidebook). All of the nine jurisdictions indicated an initial willingness to participate and eight jurisdictions followed through with that commitment.

The Grow Solar Wisconsin work with the Dane County jurisdictions included:

1. Engaging local installers to bring real-world experiences into the project. With relatively little quantitative data to support the permitting challenge, installers could identify problems that occurred more frequently and had the biggest impact on their permitting costs.
2. Identifying, understanding and showcasing best practices from across the country. The GSW Team utilized the following opportunities to introduce permitting best practices:
    - At Grow Solar Wisconsin's *Solar Powering Your Community* conference in October 2012, Bill McGovern from the International Association of Electrical Inspectors (IAEI) and Jeff Fecteau from Underwriters Laboratories (UL) provided a day-long training through the Solar 3.0 initiative.
    - Local code officials were given a brief training on how to use the National Training and Education Resource PV Online course.
    - The following experts presented at a day-long GSW training in January, 2013:
        - Bill Brooks, Brooks Engineering presenting on Solar ABC's Expedited Permitting
        - Julie Brazeau, Midwest Renewable Energy Association presenting on Solar Systems and NEC
        - Alan Harper, City of Madison Building Inspector presenting on SolarStruc.
        - Amy Heart, City of Milwaukee and Matt Tucker, City of Madison presenting on Zoning Best Practices.

    Copies of these trainings were also made available on the Grow Solar Wisconsin web-based toolkit.

3. Emphasize adopting new procedures and requirements consistent with regional practices. The strategy of isolating a specific practice by an individual municipality as an outlier among regional peers (often these individuals that carry a "we've always done it this way" mentality) encourages the outlier to seriously consider a change in practice. With some minor exceptions, this approach worked successfully.

One of the jurisdictions' most deliberated issues was the use of the Solar ABC's expedited permitting guidelines for structural considerations regarding point-load limits. They were also concerned about State level approval. These were the main reasons that the Solar ABC's were not fully adopted.

In an effort to address the specific structural issues, Qualtim, a Madison engineering firm that specializes in trust roof testing and light frame roofing was engaged as a project partners. Initial results can be found in the Qualtim "Investigative Report" and next-steps are detailed in the Qualtim "Phase 2 Proposal".

The participating jurisdictions found that they could agree on documentation requirements within the submittal plans, interpretation of NEC and inspection procedures.

The main purpose of the Solar Permitting Guidebook ("Guidebook") is to create uniformity and to eliminate the confusing variety of permitting requirements for small residential solar PV installations throughout the region.

The City of Madison's experience with permitting solar electric systems was used by the GSW team to help educate other Dane County jurisdictions. This peer-to-peer learning was highly effective and efficient, and helped other jurisdictions feel comfortable with permitting changes. Also the City of Madison, while reviewing their own process, realized that some of their requirements were no longer needed, and they further streamlined their own process. This includes requirements for site-plans, permit sign-off by the Director of Planning and one-line diagrams.

The Guidebook consists of the following components and is intended as a reference for both installers and code officials:

- Important Information - State laws and statues pertaining to residential PV
- Project Milestones – A four step process for submitting residential solar permits
- Important Municipal Zoning Considerations – Additional requirements for common zoning issues for specific jurisdictions
- Documents Required – A detailed list of required documentation for Standard and Non-Standard (i.e. special zoning district, ground-mount or mounted beyond envelop of the roof) installations
- Contact Information – Phone, address, email, hours of operation, links to zoning and municipal code and other important information and links
- FAQ's – Answers to more than 40 common electrical and structural questions
- Drawings – Detailed sample roof drawings for truss and rafter systems
- Site Plans – Examples and templates for site plans including non-flush mounts, ground mounts, outside the roof envelop and in special zoning districts
- PV Electrical Inspection Checklist – A checklist for installers and code officials

- Solar Struc – Information about SolarStruc and links to download and to view the tutorial

It is expected that all participating jurisdictions will publish this document on their permitting/planning websites.

Attempts to work with utilities to implement consistent practices were relatively unsuccessful as many of the issues identified are also interconnection issues and included in State Law (PSC 119). The region's utilities were generally willing to accept standardize forms (line drawing from Solar ABC's, site diagram from Solar ABC's and interconnection application form from the Public Service Commission of Wisconsin (PSC)) and use one list of interconnection points of contact (kept by the PSC).

Interconnection

Survey Lead: Niels Wolter (Madison solar consulting)
Interconnection standards modifications Lead: Don Wichert (RENEW Wisconsin)

Task 1.3 Identify Wisconsin's Top Interconnection Issues and distribute best practices to key stake holders
Subtask 1.3.1.
Survey The Team will survey Wisconsin solar stakeholders (installers, utility representatives, city staff) to identify concerns with current interconnection processes and standards.
Subtask 1.3.2
Report - Summarize survey results with recommended solutions based on Best Practices (will focus on the issues noted in the Keys and Fox report)
Subtask 1.3.3
Information Dissemination - The survey's findings and best practices will be shared with WIDRC, utility representatives, Public Service Commission of Wisconsin, state energy office, and posted on the "Grow Solar Wisconsin" website.

Accomplishments
The interconnection survey was developed based on the reviews of Keyes and Fox LLP and the experiences of Wisconsin based stakeholders. The survey included some non-solar electric issues.

The survey was distributed twice by email to stakeholder groups. Stakeholder groups include: Wisconsin Solar Email List, Wisconsin Small Wind Email List, Bioenergy Email List, WIDRC member Email List, Solar Installers, and MREA's Training Network. It is estimated that 200 to 300 individuals, with an interest in interconnection, participate in these email lists. A total of 18 individuals responded.

All Wisconsin Distributed Resources Collaborative (WIDRC) members and survey respondents were invited to participate in a follow up Task Force.

The report summarizing the results of the survey was completed in April 2012 and was widely distributed and posted on the GSW website. The survey and the responses formed the basis for the Task 2.5 activities.

Task 2.5 Review and Recommend Changes to Interconnection Standards
Convene a Task Force to create a timeline for implementation of strategies to achieve best standards for

interconnection.

Subtask 2.5.1

Interconnection standards survey - Research interconnection standards and related information.

Subtask 2.5.2

Information exchange webpage - Research interconnection standards and related information.

Subtask 2.5.3

Issues limiting interconnection changes - A Task Force will use a facilitated process to identify issues (barriers) that limit changes to the current interconnection practices.

Subtask 2.5.4

Developing potential strategies - Use facilitated process to develop strategies to overcome identified barriers.

Subtask 2.5.5

Implementation approaches - Develop approaches to implement strategies to overcome barriers that will be identified by the Task Force in three categories: 1) those that require legislation, 2) those that require administrative rule changes and 3) those that can be changed by unanimous consent in a legally binding memorandum of understanding.

Subtask 2.5.6

"Best Interconnection Standards" report - The Task Force will develop final report and a PowerPoint presentation of the issues, strategies, processes and results will also be assembled. To be posted to the information exchange webpage.

Accomplishments

A subcommittee/taskforce of WIDRC members was to be formed to update Wisconsin's interconnection rules. The findings of this survey were to be used to inform the WIDRC subcommittee. Utility WIDRC members were unwilling to participate in the subcommittee.

As an alternative, RENEW Wisconsin (RENEW) organized a task force of interested parties to develop the recommendations for interconnection updates. These recommendations are to be presented using three approaches:

- Work on legislation (statewide requirements)
- Work through the PSC and make modifications to rules
- Work on something in between – work with the PSC and with the co-ops to sign an MOU

RENEW's Interconnection Task Force held their first of six regular monthly meeting in late June 2012. The Keyes & Fox report suggested 3 primary and 4 secondary recommendations for WI. RENEW focused on these and the 17 items highlighted by the Wisconsin survey.

RENEW decided that the best way to move forward was to submit a petition to the PSC to open a docket on amending the interconnection rules. According to the PSC, if a rule amendment docket were opened, interconnection rule changes could take a year to be implemented.

A draft of the petition, which included ten specific recommended amendments, was completed in December 2012. The draft was shared with Wisconsin utilities, but no comments were received. The petition was reviewed by other parties, including ELPC, and was finalized.

At the RENEW Energy Policy Summit, in January 2013, RENEW began collecting statements of support for the petition. Some of the strongest supporters of the petition were from the biogas industry. (Thus,

including the other renewable technologies in the interconnection activities strengthened the petition.)

The petition and a letter of support with 87 participants were submitted to the Public Service Commission of Wisconsin on February 22. The petition serves as a "Best Interconnection Standards" report for Wisconsin.

The PSC made an initial decision on the petition in mid April 2013. The PSCW is interested in an investigation to open an interconnection docket, and wanted to hear from other stakeholders, including the electric utilities. RENEW will be participating in the interconnection amendment docket investigation and will organize Wisconsin's renewable energy community to work toward improvements in Wisconsin's interconnection rules.

All key materials are posted on the Grow Solar Website.

Planning and Zoning

Milwaukee, lead Amy Heart (City of Milwaukee/Milwaukee Shines)

Task 4.1 Create Model Solar Zoning Language
Create Model Solar Zoning Language that is compliant with the State Statute, and can be easily incorporated into zoning ordinances across the state. The Model Solar Zoning Language and accompanying materials will be posted on the "Grow Solar Wisconsin" website.
Task 4.2 Create Model "Solar-Ready" Building Codes
Build upon the work started to create a Solar Ready Building Checklist and Model Solar Ready Building Code. Both items will be part of the "Grow Solar Wisconsin Toolbox."

The City of Milwaukee developed and adopted a solar zoning ordinance. The ordinance updates all city-zoning sections to reflect the state's solar access laws found in Wis. Stat. §66.0401. The zoning ordinance reflects the language in the state statute that provides:

- No City of Milwaukee resident or business owner will be restricted, either directly or in effect, to install or use a solar energy system as defined above, unless the restriction satisfies one of the following conditions:
  1. Serves to preserve or protect the health, safety, and welfare of the general public.
  2. Does not significantly increase the cost of system or significantly decrease its efficiency.
  3. Allows for an alternative system of comparable cost and efficiency.

The Milwaukee Common Council approved a solar zoning ordinance in December 2012. The Milwaukee Historic preservation staff worked to develop a process for approvals/reviews of solar permits that reflect the state statute.

This Milwaukee solar zoning ordinance was used as a template and shared with other Wisconsin municipalities to replicate to ensure compliance with the state statute and help clarify and zoning questions that may come up in municipalities.

Additionally, the City of Milwaukee worked with students at UW-Milwaukee's School of Urban Planning and Architecture to develop a solar-ready building checklist and recommended solar-ready building codes. The students held a public input session to get feedback from the industry on the draft documents. The checklist is provided online as recommended guidance for area architects and

developers. The checklist is also shared with other Wisconsin municipalities. The City of Milwaukee Department of City Development is using the draft solar-ready building codes to develop incentive-based program to implement over the next year or two.

Net Metering

Lead: Michael Vickerman (RENEW Wisconsin)

Task 2.1 Create a Wisconsin Policy Road Map

1. Prepare an issue brief on net energy billing and circulate it to stakeholders.
2. Analyze specific net energy billing issues, which need to be addressed in rate cases in 2012.
3. Assess the need for an overarching set of policies that, longer-term, would expand options and opportunities for prospective customer-generators.
4. Create presentation on the road map for the Energy Fair and other opportunities for briefing stakeholders and legislators.
5. Prepare a road map-style report and associated presentation that (1) informs public policy for expanding and strengthening net energy billing

Task 2.2 Collaborate with State Policymakers on Model Net Metering Policies in Utility Rate Cases

1. Identify model policies for inclusion in 2012 rate cases.
2. Review individual utility rate filings and take note of any utility initiatives with respect to net energy billing.
3. Establish intervener-full party status in upcoming rate cases.
4. Identify installers, system owners and prospective customer-generators who would submit testimony in support of model net energy billing policies.
5. In consultation with attorneys, devise intervention plan for witnesses, testimony content, and briefs.
6. Draft and submit testimony; manage testimony preparation by allied. Witnesses; complete interventions
7. Develop scorecard for tabulating positive decisions arising from interventions.

Task 2.3 Formulate a Memorandum of Understanding Among Utilities

Working through the WIDRC:

1. Organize a group of utility representatives, PSCW staff, installation contractors, energy service companies and renewable energy advocates.
2. This group will craft an agreement for strengthening net metering practices based on a collaborative process.

Accomplishments

Both the Net Energy Metering (NEM) issue brief and NEM related issues for the MOU for WIDRC members were prepared and distributed. These documents summarize the GSW NEM Policy Road Map.

RENEW developed a score card ranking Wisconsin's investor-owned utilities regarding their support of renewable energy technologies including their net metering practices. This scorecard includes NEM, will be updated annual, and is supported by a news release and other outreach materials.

RENEW distributed a draft MOU to WIDRC members but WIDRC utility members were uninterested. Thus, Using the MOU with WIDRC member utilities, to help standardize Wisconsin's NEM policies was not viable.

RENEW intervened in two NEM rate cases as a fully party with limited success.

RENEW filed a request for intervener compensation for NEM legal work for the We Energies (WE) and Wisconsin Public Service (WPS) rate cases. RENEW asked the PSC to approve $20,000 for each utility intervention. The PSC approved a total of $4,000 for net metering work, a dramatic reduction from RENEW's original request.

We Energies (WE) proposed to:

- Keep the NEM system ceiling at 20 kW;
- Credit excess output at its avoided energy cost;
- Institute annual true-up to calculate the system's net generation;
- Screen net metering applications to ensure that system output does not exceed annual consumption;
- At the end of the 12 month billing cycle, any excess generation accrued is "lost to the customer" and is effectively donated to the utility.

In response to WE's proposals, RENEW took the following positions:

- Failure to compensate renewable energy system owners for all kWh produced would be a radical departure from previous practices;
- Requested the PSC to order WE to offer a genuine net metering tariff specifying the following:
    - System ceiling of 100 kW;
    - 12-month true-up period (what MGE and Xcel offer);
    - Compensation for excess generation at the utilities' avoided cost;
    - As solar likely to be constitute more than 90% of the generation produced under a NEM tariff, LMP's at daytime hours should be the foundation of an avoided cost tariff, not average LMP's; and
    - Credit for reducing need for moving electricity through transmission and distribution lines.

RENEW's Michael Vickerman provided testimony on We Energies' proposed net metering service in September 2012, as did one leading installer, Jim Funk of Energize LLC. WE submitted testimony rebutting RENEW's direct testimony. In response, RENEW submitted surrebuttal testimony. Testimony submitted by PSC staff was supportive of the positions taken by RENEW.

WE's Reply Brief did not press its previous position that surplus generation should be forfeited to the utility. However, the utility held firm on two positions: that 20 kW remain the threshold for NEM systems and that the avoided cost of energy should be a based on average locational marginal prices (LMPs) instead of daytime LMPs. The PSC ruled favoring all elements of WE's Reply Brief. In addition, the PSC ordered the utility to compensate producers for any excess generation.

In response to the PSC's ruling, RENEW submitted a petition for a re-hearing so asking the PSC to accept additional evidence regarding the 20 KW ceiling and WEPCO's use of average marginal prices for crediting excess production. The PSC turned down RENEW's petition for reconsideration or re-hearing the WE rate case. RENEW's attorney feels the PSC is vulnerable to a legal challenge with the WE NEM rate case. RENEW may go forward with a legal challenge.

Wisconsin Public Service (WPS)

- Did not propose changing its current practice of calculating the net every month and crediting any overage at its avoided energy cost.
- Proposed to limit the maximum amount of NEM customers taking service under its tariff to 0.5% of the utility's total peak capacity.
- Proposed an 8-year period for allowing NEM customer-generators to remain under its pre-existing tariff, in which all output was credited at the utility's full energy cost. The grandfathering period would end in 2021.
    - However, the grandfathering offer applies only to pre-April 2011 systems that produce less than 200% of their annual electricity usage.

In response to WPS's positions, RENEW took the following positions:

- Supported a 12-month true-up period (in line with MGE and Xcel's service);
- Opposed a cap on overall participation levels;
- Though supportive of grandfathering systems installed before April 2011, it opposed provisions to limit grandfathering applicability to systems producing less than 200% of the customer's energy use.

In mid-September, WPS floated a proposal to freeze rates for one year. WPS's proposal did not contain any changes to its NEM service. The PSC sought comments on WPS' rate freeze proposal. RENEW asked the PSCW to direct WPS to change its true-up cycle from monthly to annual. The PSCW brushed aside this request and approved the WPS rate freeze proposal.

RENEW is surveying the NEM landscape in 2013, and believes that WPS, Xcel and perhaps MGE will file for new rates. RENEW will use the GSW NEM lessons learning going forward.

Financing Options: Group Purchase

Task 3.1 Replicate Community Solar - Solar Group Purchase Program
3.1 Milwaukee and Marshfield: Implement a residential group purchase program to create a volume discount savings for solar customers and reduced complexities of the solar purchasing process.
2.1 & 3.2 Madison
Implement a residential group purchase program in partnership with a local financial institution and targeted at their members/customers.
All Jurisdictions: Lessons learned from the process will be included in an update of the Solar Group Purchasing Guide.

Accomplishments

Milwaukee, lead Amy Heart (City of Milwaukee/Milwaukee Shines), Nick Korth (MREA)

The City of Milwaukee worked with MREA to develop a new solar purchase program launched in 2Q 2012, called the Milwaukee Power Pack. The initiative helped lower the cost of solar installations while supporting the local solar manufacturing market as well as the local installer base. The pilot program was launched on May 1, 2012 and closed on July 31, 2012. It was coupled with Milwaukee Shines Solar Financing, which can provide low-interest loans for the balance of a system's cost.

As part of the Milwaukee Power Pack, Milwaukee collaborated with Ingeteam (solar inverter manufacturer) and Helios Solar Works (solar panel manufacturer) to offer a Milwaukee made solar electric system for customers. Seven local NABCEP certified installers signed on as Milwaukee Power Pack providers.

Free weekly educational sessions, Solar Power Hours, radio interviews, and posters and grocery bag leaflets (at Outpost Food Stores) were used to market the program. Over 80 people expressed interest, with 10 installations.

Milwaukee developed and conducted a survey of customers, installers and manufacturers to assess the pilot project. Based on the findings a second phase of the pilot was offered from October 2012 to December 2012. There were 10 installations during the program.

The City of Milwaukee presented on the Milwaukee Power Pack at the ASES' annual solar conference (April 2013). Milwaukee also met with representatives from City of Chicago Sustainability Office, Minnesota, Sonoma County in California, and the Massachusetts energy program, to discuss replication of the Milwaukee Power Pack solar group buy program.

Marshfield, lead Bryant Moroder (Sustainable Resources Group)
Launched in a standing-room-only presentation, at the Marshfield Sustainability Expo, the Marshfield solar group-buying project began with significant community interest. The City of Marshfield Sustainability Committee and Central City Credit Union were key partners in providing outreach support and informational meeting space for the project.

After several informational meetings, potential participants were asked to voluntarily participate in the selection process. Lower than average electricity rates and a diversity of project interest from small to large and rooftop and ground-mount posed created challenges for this project. Throughout the project, we received significant positive attention from the local media, including a front-page story in the Sunday edition of the Marshfield Herald, brought on by our own press releases and contacts made by project participants.

We focused on two factors critical in the customer's "go" or "no-go" decision-making process: their sites solar resource and project cost. Given that Marshfield includes a large rural area and only one installer is located in Marshfield, a site assessment and cost estimate can take an installer 4-5 hours per potential participant. Using a simplified cost estimate spreadsheet, we enlisted and trained two volunteers. Volunteer A was a retired plant manager and Volunteer B a retired CPA.

After attending an informational session, Volunteer A visited the prospective participant's property and took shading measurements. In some instances, Volunteer A was able to notify the potential participant of poor solar access and thus eliminate the need for further consideration. Using average cost data and the size of estimated solar array, Volunteer B entered these variables, location specific variables and

eligible incentives into the cost estimate tool, then generated and sent a cost estimate report to the potential customer.

Able Energy, a Wisconsin-based installer was the selected contractor. Discounted pricing for the project participates was estimated to be approximately 10%.

Results: 6 residential projects, 47kW solar installed, $3.59/w (lowest price reported).

Madison, lead Bryant Moroder (Sustainable Resources Group)
In response to concerns that previous group buying efforts took business away from other installers, our project focused on offering the benefits of group buying to a specific target audience.

We found our partner in the Williamson Street Grocery Cooperative (Willy St. Co-op). The Willy St. Co-op is a full-scale grocery that is well known and recognized for their commitment to sustainability, equity and local foods with a membership of over 25,000 individuals. The Willy St. Co-op was a model partner because they provided: outreach support through on-site promotions, social media and print media, event space used for informational meetings and related project meetings and a target market of potential solar customers.

A volunteer committee that represented the Co-op and its members was established to determine the vendor selection criteria and to select the vendor. The committee consisted of Willy Street Co-op staff, two Co-op members who had already owned solar and four Co-op members, each of which had expressed interested in a previous solar group buying project in Madison.

The committee members were provided with an initial list of potential vendor selection criteria. After several discussions, the final criteria for vendor selection were determined. Full Spectrum Solar, a full-service Madison-based was the selected contractor by interested Coop members. Discounted pricing for the project participates was estimated to be approximately 10%.

We used the committee members to promote the project directly to the target group. At informational meetings, committee members spoke about how and why the contractor was chosen. As some members began joining and installing, we shared their story and photos with other members.

Results: 15 residential projects, 49kW solar installed, $4.29/w (lowest price reported)

Financing Options: Third Party Ownership (a.k.a., Clean Energy Choice (CEC))

Lead: Michael Vickerman (RENEW Wisconsin)

Task 2.4 Clarify Third-Party Ownership Contracting Questions Through a PSC Proceeding

1. Prepare an issue brief summarizing the importance of clarifying/resolving legal ambiguities regarding host customers purchasing energy from third party-owned renewable energy systems located on their property.
2. Review forthcoming PSC memo on the statutory context for such arrangements.
3. Identify individual utility positions on these arrangements.
4. Update issue brief to reflect the memo's conclusions and where individual utilities stand on this matter.

5. Form a working group of stakeholders to determine whether policy changes are needed to facilitate the spread of such arrangements throughout Wisconsin and, if so, identify the most efficient means of effecting such changes.
6. Prepare a report and slide show capturing the working group's findings and recommendations. Distribute report to stakeholders, policymakers and regulators.

Accomplishments

In March 2012, RENEW created and coordinated a CEC working group of 28 stakeholders, (which continues to have monthly meetings.) The group began working on a model policy for exempting third party owners of renewable electric systems from the definition of a public utility and continued fine-tuning the model language over several months. An initial draft was presented to the WIDRC utility members, where it was discussed.

Other (non-GSW) supporters of CEC identified bipartisan pair of legislators who signaled interest in working to carve out a narrow exemption in state law permitting third party arrangements.

The RENEW and the working group developed and vetted a

- Statement of Support
- Issue brief
- Frequently Asked Questions fact sheet
- Talking points
- Composed rebuttals to utility negative talking points

RENEW and other GSW team members met with various stakeholders on CEC to develop a plan for success, targeting Wisconsin Farmers Union, Gundersen Lutheran, Energy Foundation, REAMP Chicago conference attendees, Citizens Utility Board, Dane County, City of Milwaukee, Metropolitan Milwaukee Association of Commerce Southern Wisconsin county economic development agencies, Clean Energy WI coalition, Organic Valley, and Wisconsin Energy Business Association--to develop a plan for success. Outreach targets included Habitat for Humanity, Midwest Food Producers, League of Women Voters, WI Manufacturers & Commerce, Wisconsin League of Municipalities, Dairyland Power Coop, Dane County and WI Technology Council, Johnson Controls, WI Counties Association, Wisconsin Solar Energy Industry Association, etc.

Seventy firms and organizations currently support CEC in Wisconsin. The City of Milwaukee incorporated CEC in its legislative agenda package for 2013.

This CEC was the main topic at a well-attended Solar Power Happy Hour, and a webinar for other stakeholders. RENEW's gave a presentation on CEC during MREA's Energy Fair, Grow Solar Conference, RENEW Energy Summit, Sustainability Summit, and several other events.

At the RENEW Energy Policy Summit on Jan. 11 2013, Former Colorado Governor Bill Ritter, the keynote speaker, urged Wisconsin to adopt a policy authorizing third-party contracting.

A CEC supporter, the WI Farmer's Union, wrote a guest column that appeared in the La Crosse Tribune Op-Ed. RENEW staff provided an interview to Green Tech Media. GSW team members organized a

meeting with the Milwaukee Journal Sentinel editorial board on CEC. The newspaper ran a positive article on March 17 2013.

In January 2013, RENEW met with PSC Head Commissioner, Phil Montgomery to discuss CEC.

RENEW received a REAMP grant to work with four other organization on CEC and other related issues for 2013.

Financing Options: Loan Programs

Task 3.2 Replicate Direct Financing – Solar Loan Program

3.1 Marshfield

Conduct outreach, educate and work with financial institutions in Marshfield area to eliminate concerns regarding develop a competitive solar loan product, share results and best practices from Milwaukee Shines Program and explore alternative strategies such as energy efficiency type mortgages, utility-supported PACE model and a refinancing product that includes a solar option. Alternatively, if there are no willing financial partners, we will look at nationally available solar loan options and/or require installer(s) selected in the group purchase program (Task 3.1) to provide at least one loan option for participating homeowners.

3.2 Milwaukee

Mentor the other partner cities to develop a pilot loan programs in their jurisdictions. The City of Milwaukee will create a Solar Loan Program Guide, which will contain basic steps and tips for structuring and starting a city-supported solar loan program.

Accomplishments

Milwaukee, lead Amy Heart (City of Milwaukee/Milwaukee Shines)

Milwaukee Shines offered a low interest rate loan program during the GSW contract period. The City of Milwaukee created the *Milwaukee Shines Solar Financing* program to provide a creative, low-interest financing solution for Milwaukee homeowners interested in investing in solar energy.

Milwaukee Shines identified, through surveys of installers and residents, that one barrier to residential solar installations is the ability to secure affordable financing. The City of Milwaukee partnered with Summit Credit Union to offer the low-interest solar loans. Summit Credit Union leveraged funds from *Milwaukee Shines* to offer up to $2 million in solar loans. *Milwaukee Shines Solar Financing* is funded through a start-up donation from We Energies.

During the GSW contract period, 15 homeowners took advantage of the loans; there was interest particularly by homeowners unable to get a home equity loan. Several of the Milwaukee Power Pack system owners took advantage of the low interest rate solar loan.

MILWAUKEE SHINES SOLAR LOAN:

- Eligible Participants: City of Milwaukee owner-occupied residential homes (one-three units)
- Loan Size: Up to $20,000
- Interest Rate: Prime plus 2.25% (currently up to 5.5%)
- Term: Up to 20 years

- No Fees. No penalties for early payments.
- Eligible Installs: Solar electric (up to 6kW) and solar hot water (one-eight panels) installations

Milwaukee Shines presented on the loan program at the League of Wisconsin Municipalities' annual conference and at ASES in April 2013. Milwaukee also met with City of Chicago Sustainability Office to discuss financing programs, and how they can create replicable programs.

Madison, lead Bryant Moroder (Sustainable Resources Group)
In a survey of interested solar customers in the Madison region, found that over two-thirds of households would be willing to pay up to $20 per month to have solar installed on their property. Approximately 20% of respondents would be willing to pay up to $50 per month. With this information in-hand, we met with several banks, two local utilities, a community foundation, Dane County, the City of Madison community development department and a local community development financial institution to explore the possibility of a solar loan product for the Madison market.

In each meeting, we described the favorable market conditions of solar technology, industry trends and economic justification that make solar an attractive product for lending and listened to the ideas and concerns of the meeting participants.

A common solution proposed by the financial institutions was to use a traditional home equity loan or home equity line of credit. Some already offered a slightly lower rate, up to a 0.25% discount, for "green" projects.

The financial institutions commonly requested if there was any comparable market data for homes with a solar installation in the region or state. We are unable to locate any regionally specific study or data set that exists.

Financial institutions said they would be more likely to forward with solar loans if a safety net of a loan loss reserve was available or if they saw competition gain significant market share. Utilities and local community foundation and community development financial institution were not interested. City residential lending programs may be an option for qualifying homeowners, but generally they would prefer to be a lender of last resort.

Focus on Energy Program Support

(State's incentive program for solar electric systems)
Lead: Don Wichert (RENEW Wisconsin)

Task 3.4. Participate in Public Service Commission of Wisconsin (PSC) discussions regarding the future of the Focus on Energy Solar Electric Program
The Team will provide information and insights to the Public Service Commission of Wisconsin as they determine the future of the Focus on Energy Solar Electric program.

Accomplishments

In late 2011 the PSC used an open docket to assess the future of the Focus on Energy renewable technologies including the solar electric program (which was not offering incentives). In January 2012 the GSW team submitted comments and encouraged other solar market leaders to submit their comments and assessments. There is no evidence that comments were used.

In January 2012 GSW member, RENEW, began encouraging the PSC to roll out the new solar electric incentive program. RENEW provided the PSC with a petition signed by over 150 companies and individuals to reinstate the renewable incentives. RENEW then organized a write-in campaign to the PSC that resulted in over 200 comments urging reinstatement of incentives and included a news release on April 2 (Appendix 5). This led to the PSC reinstating the incentives effective July 1, 2012.

RENEW held a webinar with the renewable supply chain to receive input on the program. These suggestions were transferred to the Focus administrator before the new program was announced.

The new Focus on Energy solar electric programs were rolled out on July 1, 2012. But they were very problematic. At this time the GSW Team, lead by RENEW, focused their efforts on working with the Focus on Energy program administrator, Shaw Environmental (now CBI), to improve the solar electric program offerings.

It took months to get the attention of the solar program's administrator, but once they had time they were interested in the GSW support. The GSW Team began by surveying the installers regarding their issues with the new program. A meeting was held with interested installers to coordinate the response to Shaw, and then the GSW, RENEW and installer group met with Shaw on December 5 2012.

Shaw responded positively to many of the recommended changes. As a result of the GSW interactions, significant changes were made to improve the Focus on Energy Solar Electric program. For example:

- The incentive cap on residential system was increased by 100%
- The need to have a permit in place before applying for residential incentive was dropped
- The maximum allowed installation period was lengthened for residential systems
- A greater diversity of commercial system sizes was permitted
- The number of RFP's for non-residential systems to be issued during 2013 was to be increased

The GSW Team now has improved relations with the Focus Solar program administrator and will continue to support them to deliver a successful program. Future feedback meetings between the GSW team and the Focus administrator are being scheduled.

Outreach and Education

Lead: Elizabeth Hittman (MREA)

MREA lead the creation and implementation of the team logo and growsolar.org website. By September 2012 the Grow Solar website (growsolar.org) was populated with useful materials and operating. Website content continues to be added. The website's content includes all key documents created by the GSW team. The GSW team also created GSW Twitter and Facebook accounts and kept them current.

The GSW team organized the very successful Solar Power Your Community conference (held October 11) with almost 200 professional attendees representing about 20 municipalities, most large electric utilities, educators, solar industry professionals, attorneys and non-profits. The GSW team:

- Set up all conference sessions and keynotes.
- Conference promotion via: website, email lists, newsletters, direct mailings, emails and phone calls to municipalities
- Arranged for the keynote speakers: Paula Mints from Navigant Consulting, Sarah White from Center on Wisconsin Strategy (COWS) and Tom Tansy from Solar 3.0.
- Brought in the Midwest Solar Training Network
- Brought in Tom Tansy from Solar 3.0 to hold concurrent Municipal Inspector training
- Speakers included:
  - Keyes and Fox's principal, Joe Weidman, to present at conference and present at WIDRC meeting.
  - James Tong from Clean Power Finance
  - Wisconsin State Representative, Chris Taylor
  - Bradley Klein, Senior Attorney with Environmental Law and Policy Center
  - Alex Rein from SunPower
  - Casey Johnston, Director of Renewable Energy Programs for ICLEI
  - Grow Solar Wisconsin team members and a number of other educators, attorneys and solar industry professionals.
- Solicited Sponsors and Exhibitors

The GSW team also created issue briefs for all core tasks, developed an overview PowerPoint presentation for all team members to use, wrote summary reports for all tasks, etc. Most of these materials are located on the Grow Solar website.

Publications/Presentations/Travel:

- "Solar group purchase project offered in Marshfield area" Marshfield News Herald, 3/13/2012
- "City connections help with solar power grant" Marshfield News Herald – 2/24/2012
- "Facts, fun abound at Marshfield Green Living & Energy Expo", Marshfield News Herald – 3/26/2012
- Radio interview w/Insight WDLB Radio – 3/23/2012
- Radio Interview, Marshfield Wi, April 25th, Bryant Moroder of SRG, on Solarize Marshfield
- Milwaukee Program Seeks to Boost Solar's Role: WUWM Lake Effect - July, 6 2012
- Milwaukee Shines on 88Nine Radio Milwaukee's Community Stories - June 26, 2012
- New Program Offers Solar for Milwaukee, by Milwaukee: Natural Awakenings - June 2012
- MREA & Milwaukee Shines Launch Pilot Solar Purchase Program: Bay View Compass - May 4, 2012
- Milwaukee Teams with Helios, Ingeteam to Promote Solar: The Business Journal - May 7, 2012
- Cuellar, Marisa. "Group Solar Buying Project Moves Forward in Central Wisconsin." Marshfield News Herald October 20, 2012. http://www.marshfieldnewsherald.com/article/20121021/MNH0101/310210298/Group-solar-buying-project-moves-forward-central-Wisconsin

- "A Little SunShot Funding Grows a Long Way." U.S. Department of Energy SunShot Newsletter. October 18, 2012 Edition. http://apps1.eere.energy.gov/solar/newsletter/detail.cfm/articleId=291
- "Milwaukee Model of Solar Financing" webinar for Applied Solutions (CA), September 26, 2012. http://vimeo.com/50543292. Note: over 80 attendees from around the US.
- *Lake Effect* Interview on Milwaukee Power Pack – 89.7 WUWM - July 6, 2012
- U.S. Department of Energy Secretary Chu Visits Milwaukee - Milwaukee Journal Sentinel - July 12, 2012
- Solar Powering Your Community conference mentioned in the DOE SunShot Newsletter: http://apps1.eere.energy.gov/solar/newsletter/detail.cfm/articleId=291
- SPYC conference mentioned in League of Wisconsin Municipalities Newsletter: http://archive.constantcontact.com/fs051/1102478489879/archive/1110903669151.html
- SPYC mentioned on Wisconsin Radio Network: Moon, Brian. "Shining the light on solar power benefits." http://www.wrn.com/2012/10/shining-the-light-on-solar-power-benefits/
- Milwaukee was featured in Clean Power Finance release of their solar permitting study: Permitting Study Press Release - Clean Power Finance - December 19, 2012
- Milwaukee Solar Industry Heats Up - Milwaukee Biz Times Cover Story - March 2013
- Manufacturing in Milwaukee: An Interview with the CEO of Helios - Department of Energy - February, 8 2013
- Considering Solar for Your Home? - Department of Energy - February 7, 2013
- Milwaukee Installer Reflects on His Career in Solar - Department of Energy - February 5, 2013
- Solar for Milwaukee, By Milwaukee - Department of Energy - February 4, 2013
- Scott Karel: Increase Options for Renewable Energy – La Crosse Tribune - January 16, 2013
- Solar Outside the Sunbelt: Wisconsin – Green Tech Media – January 22, 2013
- Journal Times editorial: Homegrown solar generation makes sense for Wisconsin – Racine Journal Times, March 26, 2013
- Proposed bill looks to light up Wisconsin's solar sector – Milwaukee Journal Sentinel, March 16, 2013

Outreach

The GSW Team spoke at many events around Wisconsin and the region. At MREA Energy Fair, June 2012, the largest renewable energy educational event in Wisconsin, GSW team presented their goals and objectives, Group Solar Purchase, and Third party ownership. This was the first that many solar allies heard the details of the GSW objectives and strategies.

- Other key statewide events included the:
  - RENEW Policy Summits of 2012 and 2013,
  - The Wisconsin Technical College System's Sustainability Summit of 2012 and 2013,
  - Better Buildings Better Business Conference 2013,
  - League of Wisconsin Municipalities 2012, and the
  - ASES conference 2013
  - Wisconsin Credit Union League Annual Meeting 2013