focus on energy℠
Partnering with Wisconsin utilities

Characterizing the Renewable Energy Landscape in Wisconsin

Environmental and Economic Research and Development Program

TETRA TECH

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6410 Enterprise Lane, Suite 300 | Madison, WI 53719
Tel 608.316.3700 | Fax 608.661.5181

tetratech.com

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ACRONYMS, ABBREVIATIONS, & DEFINITIONS

Acronym/Abbreviation	Definition
EERD	Environmental and Economic Research and Development
GIS	Geographic Information System
MSA	Metropolitan Statistical Area
PV	Photovoltaic
RECIP	Renewable Energy Competitive Incentive Program
RFP	Request for Proposals

1.0 EXECUTIVE SUMMARY

Focus on Energy's (Focus) Renewable Energy program offers incentives through two separate channels—a prescriptive model for residential and commercial customers (Renewable Rewards), and a semiannual request for proposal process for commercial customers (RECIP).

Residential and commercial customers seeking to participate in Renewable Rewards work with trade allies to select eligible solar electric systems or geothermal heat pumps for their site. To participate, customers notify Focus on Energy of their intent to participate in the program by submitting a reservation application, proposal documentation, and proof of an initial investment of at least $500. Once Focus on Energy approves the application, the trade ally must complete the project within three months, at which point the customer submits an incentive application to receive payment of their incentive, summarized in Table 1-1.

Table 1-1. Renewable Rewards Incentives

Renewable System	Customer Type	Incentive
Solar electric	Residential	12% of installed cost (up to $2,000)
	Commercial	12% of installed cost (up to $4,000)
Geothermal heat pump	Residential	$650
	Commercial	$650

Participation in RECIP follows a separate path. Focus on Energy issues semiannual requests for proposals, inviting interested commercial customers to submit renewable project applications. Included in these applications are applicants' proposed incentive levels ($/kWh and/or $/Therm), which are ultimately calculated on first year net energy savings achieved by selected projects. Focus on Energy typically limits proposals to six system types,[1] incentives cannot exceed 50 percent of the total project cost, and no customer may receive more than $400,000 in energy efficiency incentives from Focus on Energy in any calendar year.

1.1 FINDINGS

The Tetra Tech team provides the following findings as a result its exploratory GIS analysis and examining of historical tracking data, its in-depth interviews, and its comparative research of renewable energy programs. Throughout the report, counties designated as "low population" counties are those not included in a metropolitan statistical area (MSA). A full list of county characteristics is provided in Appendix B.

1.1.1 GIS and Historical Tracking Data Analysis Findings

- Trade allies that serve counties with lower populations travel approximately twice as far to their projects compared to trade allies whose projects are mainly within urban areas. Approximately 38 percent of active trade allies during the years of the analysis served only counties in MSAs

[1] Eligible technologies typically include biogas, biomass, geothermal, solar photovoltaic, solar thermal, and wind systems.

(i.e. high population counties), while the remainder served either solely counties not contained within an MSA (i.e. low population areas) or a combination of high and low populations area.

- While high numbers of solar PV projects implemented through Renewable Rewards occur in population centers, when data are normalized for the number of residents within a county, many counties with low populations have a relatively high number of solar PV projects per 10,000 residents. For example, Forest County, which has the fifth lowest population of all counties in Wisconsin, had the highest rate of solar PV projects (68 projects for each 10,000 residents). Overall, counties with low populations had 5.1 solar PV projects installed per 10,000 residents, while counties in MSAs installed 2.9 solar PV projects per 10,000 residents.
- Satisfied trade allies can drive renewable installations during a multi-year period. Among counties with high population-normalized installation rates, several trade allies installed more than 80 percent of all projects. These trade allies were repeat participants over a multi-year span, highlighting the value of satisfied and engaged trade allies to the success of the renewable programs.
- The RECIP program has progressively expanded its footprint towards northern Wisconsin over time to serve more Focus on Energy customers, while still providing program services to the main population centers in Brown, Dane, Milwaukee, and Waukesha Counties.

1.1.2 In-Depth Interview Findings

- Focus on Energy Program Participants are highly satisfied with the Renewable Energy program offerings. All ten participant interview respondents rated their satisfaction at strong levels; six participants ranked their overall program satisfaction a 5 on a 5-point scale, while four participants rated their program satisfaction at a four. Respondents were especially pleased with their experience with trade allies, the Focus on Energy staff (where applicable), and the equipment they chose to install.
- Participants experience the most challenge within the program participation process when working with their utility to connect their renewable energy project. Both RECIP and Renewable Rewards participants mentioned barriers working with their utility to physically connect their installation to the grid, negotiating buyback agreements and/or overcoming challenges with their utility meter in connection with the project.

1.1.3 Comparative Research Findings

- Prescriptive renewable incentives noted in our Comparative Research are often comparable to what has been recently offered by Focus on Energy's Renewable Rewards program. The exception is geothermal incentives, which are notably lower in Wisconsin compared to surrounding states. Other geothermal programs reviewed during this research varied in how they assess geothermal incentive awards, basing the award on unit efficiency levels or as a percentage of total project costs.
- Our comparative research suggested that benchmarked RFP-style programs evaluate potential projects on several criteria, including objective and subjective metrics such as technical and financial feasibility, environmental and community impacts, and job creation. This differs slightly from the Focus on Energy RECIP program in Wisconsin where project cost-effectiveness is the key project approval metric.

- Benchmarked RFP-style programs incorporate review processes and procedures that foster transparent application and review processes, such as posting information about how projects are scored, examples of successfully funded projects, and answers to applicant questions on their website. While the Focus on Energy program does post answers to applicant questions on their website, working to increase application review transparency of the Focus on Energy RECIP program through some of these other methods might serve to help reduce some of frustration with the application/review process noted by Wisconsin's trade allies in the evaluation interviews.

1.1.4 Recommendations

- *Continue to foster relationships with trade allies, providing outreach and education around Focus on Energy's renewable portfolio.* The GIS analysis of past trade ally participation identified a handful of extremely active trade allies that accounted for a high percentage of installations in specific counties. More importantly, these trade allies installed projects over a span of several years, indicating their satisfaction with the program. Continuing to work closely with perennial participants, which act as local ambassadors of the program, will provide a future pipeline of projects and allow a direct feedback mechanism for the most engaged trade allies.

- *Streamline the RECIP application process.* While many trade allies mentioned that the Renewable Rewards online application process was simple and straightforward, the opposite was true of the RECIP applications. Trade allies described the process and requirements as time-consuming and inconsistent from year-to-year. Reviewing the RECIP application process, including identifying possible portions of the process that are not essential, could increase participation among trade allies.[2]

- *Explore adding additional evaluation criteria to RECIP application scoring.* Several benchmarked RFP-style programs use criteria in addition to cost-effectiveness, including technical/financial feasibility, impacts, and potential job creation. While these scoring criteria may not be allowable in the current regulatory framework in Wisconsin, investigating the benefits and costs associated with expanding the existing application scoring could amplify the reach of projects Focus on Energy considers, both geographically and functionally.

- *Increase RECIP scoring transparency where possible.* One of barriers described by trade allies participating in RECIP is not understanding why an application is not awarded. Consider offering post-award opportunities for trade allies such as webinars or meetings to share more information about scoring criteria and award outcomes to improve trade allies' understanding of scoring requirements and ultimately, program satisfaction.

- *Consider partnering with participating Focus on Energy utilities to streamline utility interconnection processes and/or offer additional utility interconnection support to renewable energy program participants.* Participants noted that there are opportunities for improvements that could be made to clarify the process of physically connecting their installation to the grid, negotiating buyback agreements and/or understanding utility meter requirements.

- *Evaluate ongoing renewable energy research opportunities in Wisconsin and incorporate it in future program planning and marketing.* For example, opportunity exists to assess Wisconsin's

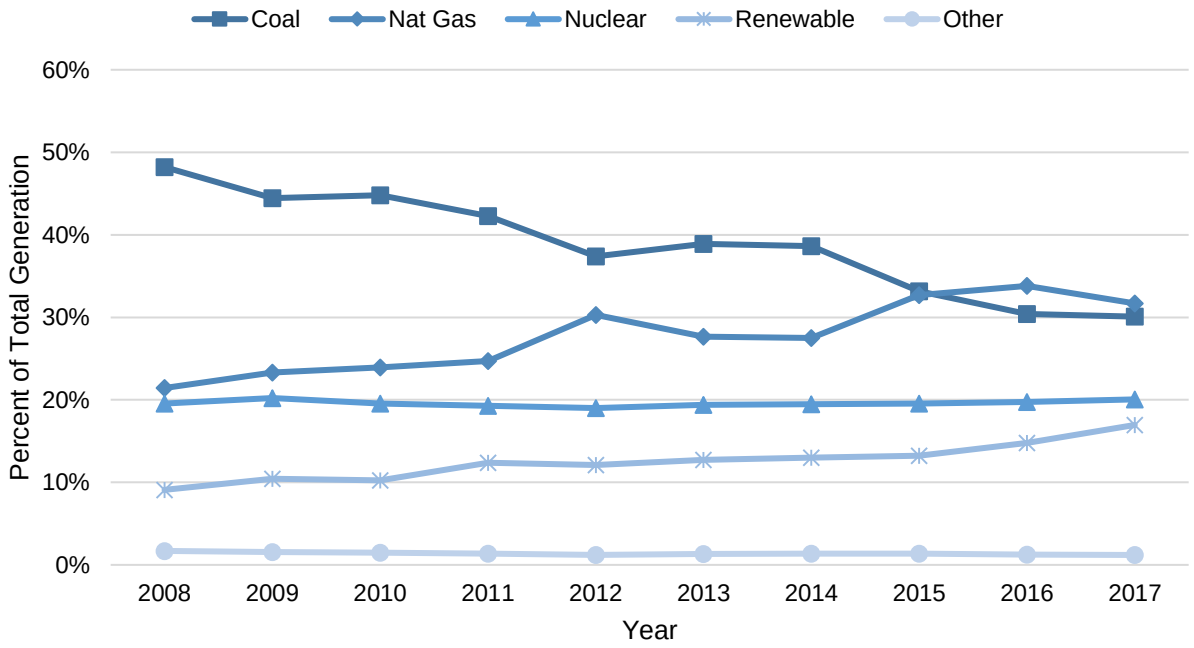
[2] In the time between our conversations with trade allies and the finalization of this report, the Wisconsin PSC accepted several of Focus on Energy's proposed changes to RECIP, one of which included a reduction in the application effort for all RECIP projects.

solar potential using data behind the NREL solar irradiance tool to assess solar potential against existing installations in Wisconsin and identifying areas of remaining opportunity. Discrete areas of the state or counties lacking in solar installations, but possessing good solar potential, could present a valuable program marketing or messaging opportunity in future program years.

2.0 INTRODUCTION

In 2017, slightly more than 17 percent of all energy production in the US came from renewable resources, up from 10 percent in 2010.[3] During this same period, the share of renewable energy in Wisconsin's mix of generation sources increased from 4.9 percent to 8.7 percent of statewide generation.[4]

Figure 2-1. United States Net Generation by Energy Source, All Sources (2008–2017)



As shown, the United States' mix of electric generation sources fluctuates to reflect changes in pricing and markets of fuels used to produce power. Policy goals can also induce movements in energy markets, including promoting energy efficiency and renewable energy through a combination of incentives, rebates, and/or tax credits federally and at the state and local levels.

In Wisconsin, Focus on Energy provides energy efficiency programs, including programs promoting adoption of renewable energy systems. To support their portfolio of programs, Focus on Energy issued a request for concept papers for the Environmental and Economic Research and Development Program (EERD) in September 2017. One of the topic areas that Focus on Energy identified as high priority involved investigating the renewable energy programs design and the characterization of the renewable energy landscape in Wisconsin.

Tetra Tech provided a two-page submission to the request and was selected to respond to a subsequent request for proposals in November 2017, at which point Tetra Tech provided a full project proposal centered around analyzing trends in participation of the renewable energy programs offered by Focus on Energy.

[3] EIA Electric Power Monthly. Table 1.1. Net Generation by Energy Source: Total (All Sectors), 2008-April 2018.
[4] EIA Profile of Wisconsin & *2011 Wisconsin Energy Statistics*.

The Program Administrator for Focus on Energy's EERD Program, APTIM, selected the Tetra Tech proposal in December 2017 and work began in January 2018.

The analysis plan provided in the proposal and subsequently agreed upon between Tetra Tech and Focus on Energy center around five main researchable tasks, to be summarized and delivered in final draft report in July 2018, with a final report to follow in September 2018.

- Literature review of research related to renewable energy programs
- GIS analysis
- Analysis of historical tracking data
- Trade ally and participant in-depth interviews
- Comparative program research

3.0 LITERATURE REVIEW

In the United States, federal and state subsidies have existed for renewable power since the 1970s. Federally, the Renewable Energy Tax Credit, initially created in 2005 and having undergone several extensions and expansions since, provides a 30 percent tax credit for installations of several different technologies on residential properties. Around the same time as federal tax credit took full effect, at the state and local level, many jurisdictions created renewable energy programs that provided direct rebates to customers that installed renewable energy systems. Policymakers, program administrators, and environmental groups have been interested in the link between financial incentives and adoption of renewable technologies, and several researchers have analyzed the correlation between the policies and installations.

Lantz and Doris documented that in October 2008, states and local utilities administered 228 renewable energy rebate programs throughout the United States. California's solar PV rebate program, which began in 1998, started by offering residents rebates up to $3.00 per watt, which subsequently increased to $4.50 in 2001. During this same period, solar PV installations grew from 30 to 300 per month. Other states with early renewable energy rebate programs, specifically solar PV, included New Jersey and Oregon, where solar PV programs began in 2001 and 2003, respectively. While states experimented with varying levels of incentives using a combination of tax credits and rebates, the overall effect of these types of programs was succinctly summarized by Lantz and Doris, as they synthesized their analysis in the following statement: "the success of prominent state rebate programs in stimulating PV installations is clear."

Subsequent analyses attempted to identify characteristics of states that correlated with high levels of solar deployment. Using a sample of ten states with solar PV programs, Sarzynski confirmed many bivariate relationships that would be expected regarding solar PV system deployment. Her analysis found the following characteristics to be indicative of states with relatively high levels of solar PV systems:

- states with larger populations have more solar deployment
- states with higher average income have more solar deployment
- states with higher electricity or natural gas prices have more solar deployment
- states that need to import higher levels of energy have stronger solar deployment
- states with better solar resources have stronger solar deployment
- states with a more liberal citizenry have stronger solar deployment

Additional research conducted by Sarzynski et al. analyzed the efficacy of four separate incentives (income tax incentives, cash incentives, sales tax incentives, and property tax incentives), finding states with cash incentives experienced higher levels of solar PV adoption, while tax incentives were statistically insignificant predictive variables.

Kwan's analysis combined state, local, and utility incentives available to residential customers and created a dollar-per-kilowatt measure, ultimately finding that increases in the value of incentives led to statistically significant increases in the deployment of solar installations.

Doris and Chavez found no correlation between the value of incentives and increased market penetration. However, the authors did note that "in areas with limited financial resources, policies that

are low-cost to government have been illustrated to effectively support markets for distributed generation."

Bauner and Crago used an option value framework to analyze the decisions of households to install solar PV systems, quantifying the option value multiplier and adoption rate. They found that net present value of benefits from installation of a solar PV system must be approximately 1.8 times greater than the investment costs for the installation to occur. Further simulations showed that without tax credits and rebates, the median adoption time increased by 110 percent compared to situations where these financial incentives existed.

Renewable energy programs through the United States continue to evolve and take different forms, often providing different incentive and funding mechanisms. Borlick Associates found that total incentives for customer-owned residential solar PV varies substantially among states, identifying four contributing factors responsible for these differences:

- different state direct and renewable energy certificate incentives for residential solar energy
- different residential retail tariff designs
- different avoided utility costs
- different contract pricing strategies for third-party owned facilities

More recently, Bower reported that focusing on technological resources is the most influential incentive strategy for statewide renewable energy production, finding a positive correlation and statistically significant relationship between the total number of incentives available and the per capita renewable energy output of a state. The author's final paragraph summarizes his findings concisely, stating, "It is not money that causes increased production of renewable energy. It is *education*."

4.0 GIS ANALYSIS & ANALYSIS OF HISTORICAL TRACKING DATA

This section provides maps and accompanying GIS analysis of Focus on Energy's renewable energy participation. First, we provide a description of data sources and methodology. Next, we provide maps related to RECIP participation, providing several different characterizations of program participation since 2013. Lastly, we map Renewable Rewards participation and segment the data to analyze intersections of technology and geography.

4.1 DATA SOURCES AND METHODOLOGY

Using information provided by Focus on Energy, the Tetra Tech team created two separate datasets, one containing RECIP applicant information, and one containing Renewable Rewards participant information. We compiled RECIP information from applications submitted to the program between 2013 and 2017, totaling 401 projects.

Program tracking data used to create maps related to the Renewable Rewards program contained projects dating back to 2011 and had renewable energy projects across many different programs in the Focus on Energy portfolio. At the direction of APTIM, we removed records associated with the following programs, retaining only those recorded under Renewable Rewards:

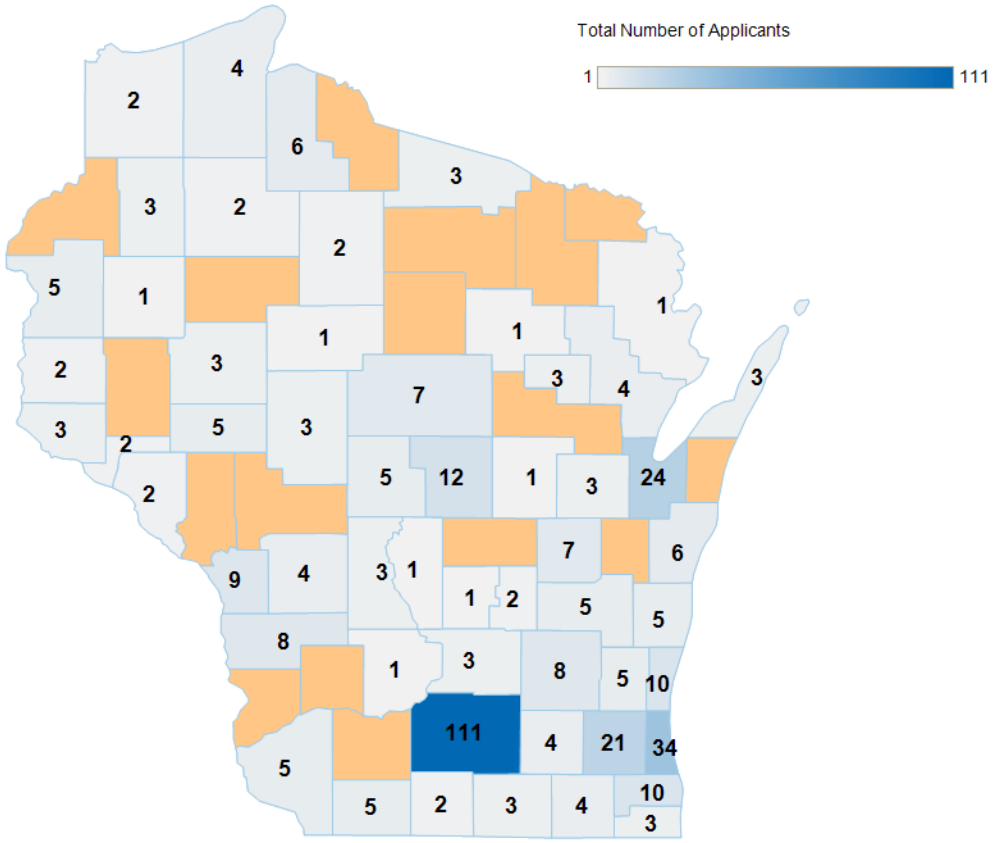
- Agriculture Custom Energy
- Business Incentives
- Commercial Custom Energy
- Design Assistance
- Design Assistance—Residential
- Industrial Custom Energy
- Large Energy User
- Local Government Custom Energy
- Multifamily—New Construction
- Multifamily Energy Savings
- New Homes
- Non-Local Government Custom Energy
- RECIP—Agriculture, Schools and Government
- RECIP—Business Incentives
- RECIP—Large Energy Users

The Tetra Tech team incorporated publicly available datasets as well. When these are used in the report, the original data sources are provided in the graphic or a footnote.

4.2 RECIP MAPS

Figure 4-1. Total RECIP Applications by County (2013–2017)

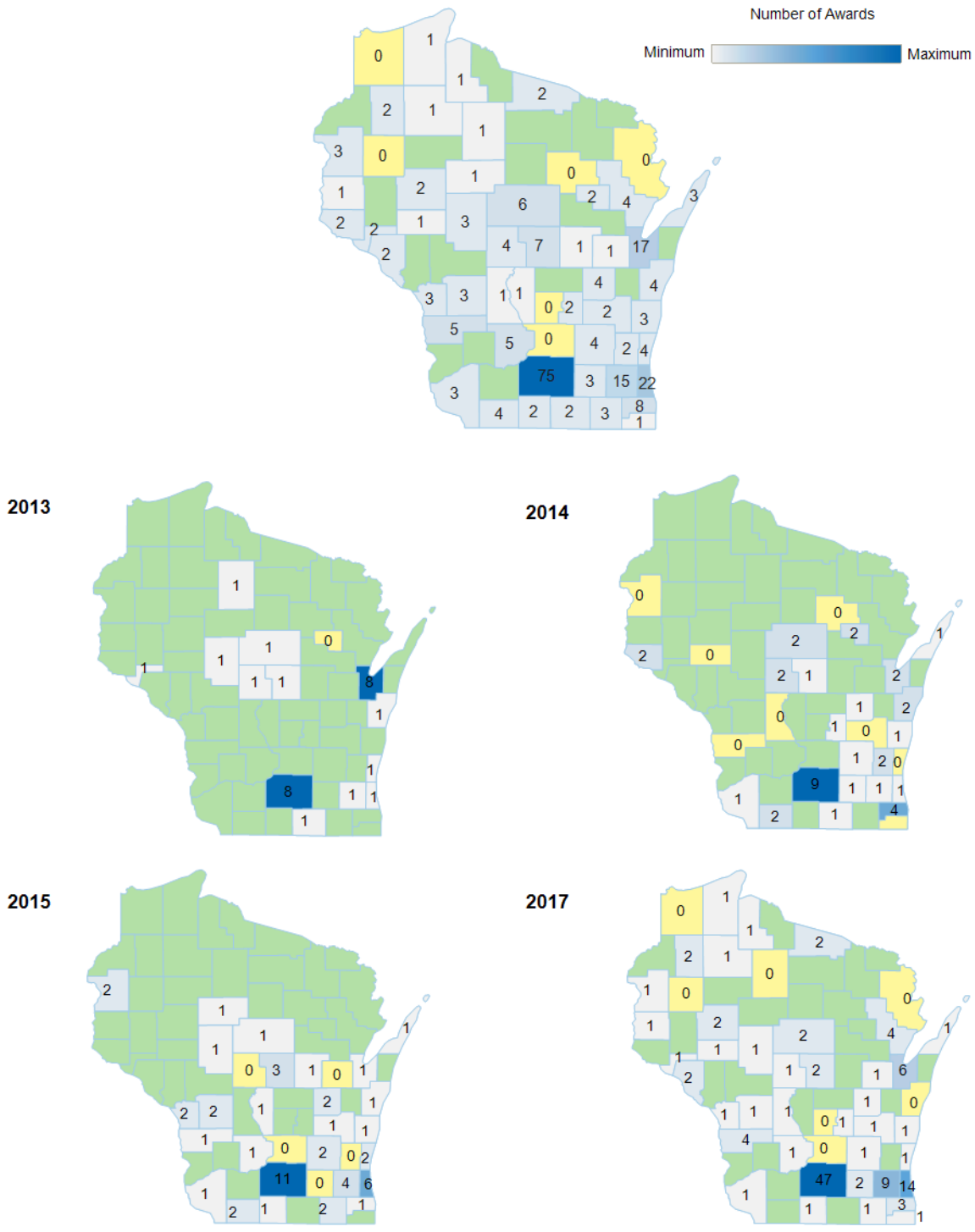
Number of Applications Submitted in Each County*



*Counties in orange had zero applications.

Figure 4-1 provides a summary view of RECIP applications throughout Wisconsin between 2013 and 2017. Counties in orange represent counties without a project application, while remaining counties are shaded blue in relation to the total number of RECIP applications coming from each respective county. At 111 applications, Dane County submitted the highest number of projects to the program. Other counties with a relatively high number of applications include Brown, Milwaukee, and Waukesha Counties. In total, these four counties submitted 190 project applications (47 percent of all applications). These four counties also represent the counties with four highest populations in the state, totaling 2.2 million residents (37 percent of the total population in Wisconsin). Between 2013 and 2017, a total of 17 counties, equating to 7 percent of Wisconsin's population (405,000 residents), had zero applications for the RECIP program. If Dane County, a true outlier in this data, is removed, the largest three counties (Brown, Milwaukee, and Waukesha) accounted for 27 percent of applications and 33 percent of the applying population.

Figure 4-2. Number of Awarded RECIP Projects, by County and Year (2013–2017)



*Counties in green had zero projects awarded.

Figure 4-2 provides a summary of the number of awarded projects for each county between 2013 and 2017, as well as separate annual snapshots for each year of the program since 2013. Overall, the map follows Figure 4-1 closely. In addition to the 17 counties without any submitted RECIP applications, six

counties submitted applications but did not receive a RECIP award between 2013 and 2017 (the counties—Barron, Columbia, Douglas, Langlade, Marinette, and Marquette Counties—are shaded in yellow in Figure 4-2).

Based on program tracking data, it appears the RECIP program has progressively expanded its footprint towards northern Wisconsin while still providing program services to the main population centers in Brown, Dane, Milwaukee, and Waukesha Counties. Since 2013, each year's data contains projects in a growing number of counties, indicating the RECIP program is expanding throughout Wisconsin. In 2017 the program awarded projects in 39 counties, up from 13 counties in 2013, as shown in Table 4-1.

Table 4-1. Number of Counties with At Least One RECIP Award (2013–2017)

Year	Counties with 1+ RECIP Award	Population Represented	Percent of Participating Population in Four Largest Counties[5]
2013	13	2,815,794	76.1%
2014	21	3,623,037	59.1%
2015	27	3,861,590	55.5%
2017	39	4,630,557	46.2%

While the information detailed in Table 4-1 shows that projects in only 13 counties received awards in 2013, the maps in Figure 4-3 provide additional context around this total. Specifically, the map detailing 2013 projects indicates that applications were submitted from 14 separate counties.

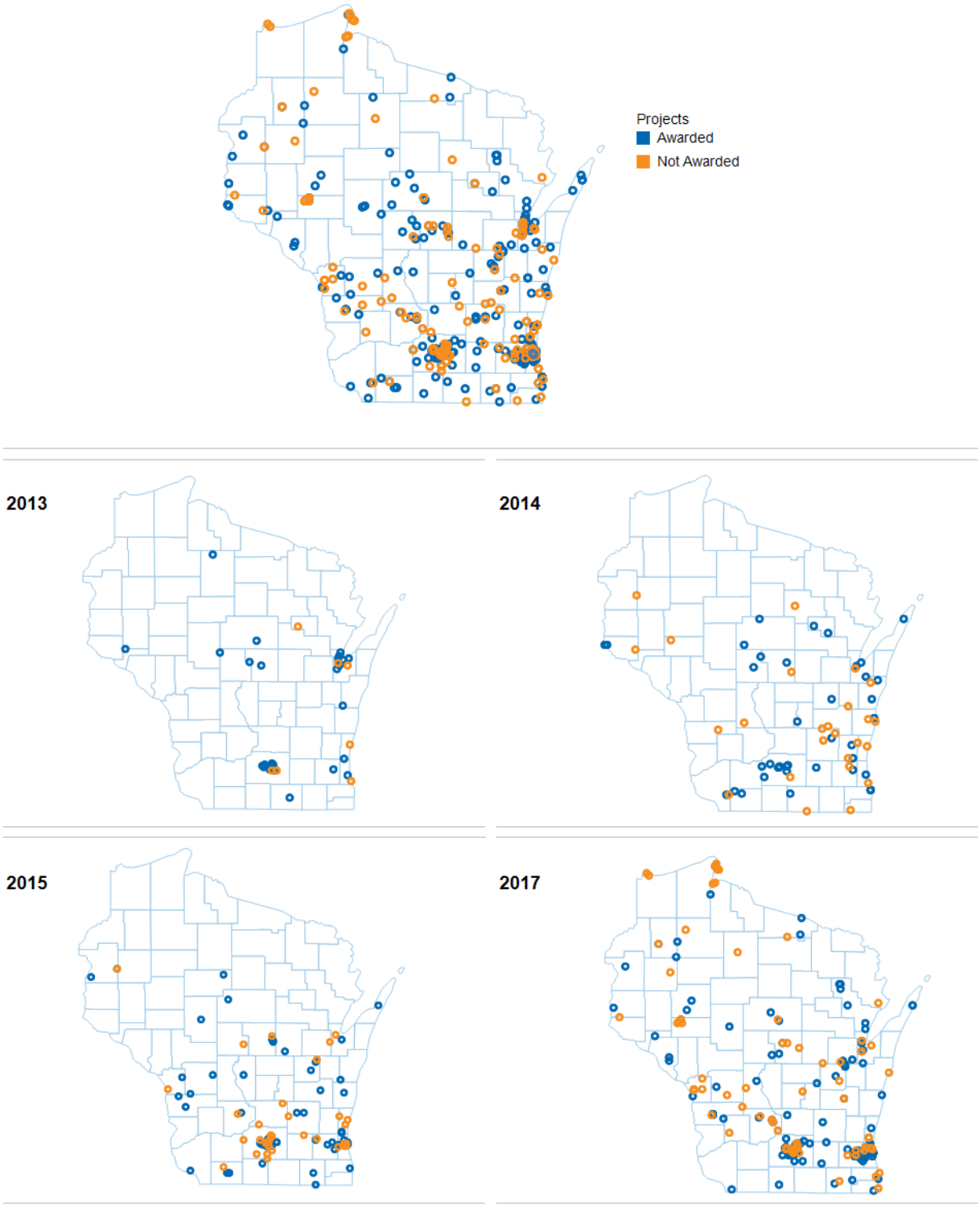
Table 4-2 provides annual comparisons of the total applications submitted to the RECIP program to the number of awarded projects. While the total number of applications was at its lowest in 2013, during the first year in the data, almost 80 percent of applications were awarded projects. Subsequent years converged around 60 percent of applications receiving an award.

Table 4-2. RECIP Applications and Awards (2013–2017)

Year	Applications	Awards	Percent Awarded
2013	34	27	79.4%
2014	65	40	61.5%
2015	92	55	59.8%
2017	210	129	61.4%
Total	**401**	**251**	**62.6%**

[5] Brown, Dane, Milwaukee, and Waukesha Counties.

Figure 4-3. Awarded vs. Non-Awarded RECIP Projects, by County and Year (2013–2017)



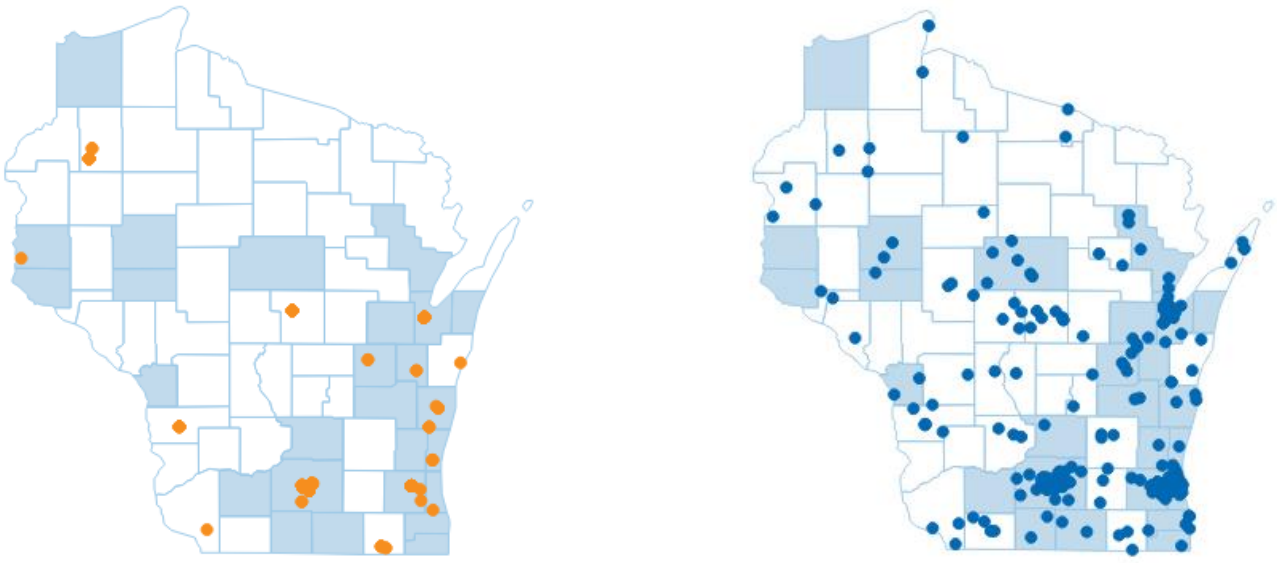
4.2.1 RECIP Trade Allies

The US Census Bureau identifies metropolitan statistical areas (MSAs) within states and regions to assist in measuring areas that contain a substantial population[6] nucleus and have adjacent communities with a high degree of economic and social integration. The Tetra Tech team employed the Census Bureau's MSAs to serve as a proxy to delineate urban and rural areas of the state. In Wisconsin, 26 counties are MSAs, accounting for 31 percent of the total area in the state and more than 74 percent of the total population living in Wisconsin.

Combining the MSA data with RECIP data, we mapped the location of all participating trade allies and awarded projects onto two separate maps, while also showing MSAs in background in Figure 4-4. The first map, displaying the location of all participating trade allies in orange, shows that trade allies are mostly located within MSAs. The second map, which depicts projects awarded through RECIP in blue, shows that approximately 50 percent of projects were implemented in counties comprising MSAs and 50 percent were in counties outside of MSAs.

Figure 4-4. Participating RECIP Trade Allies (Orange) and Accepted Projects (Blue) (2013–2017)

Counties in Metropolitan Statistical Areas Shaded



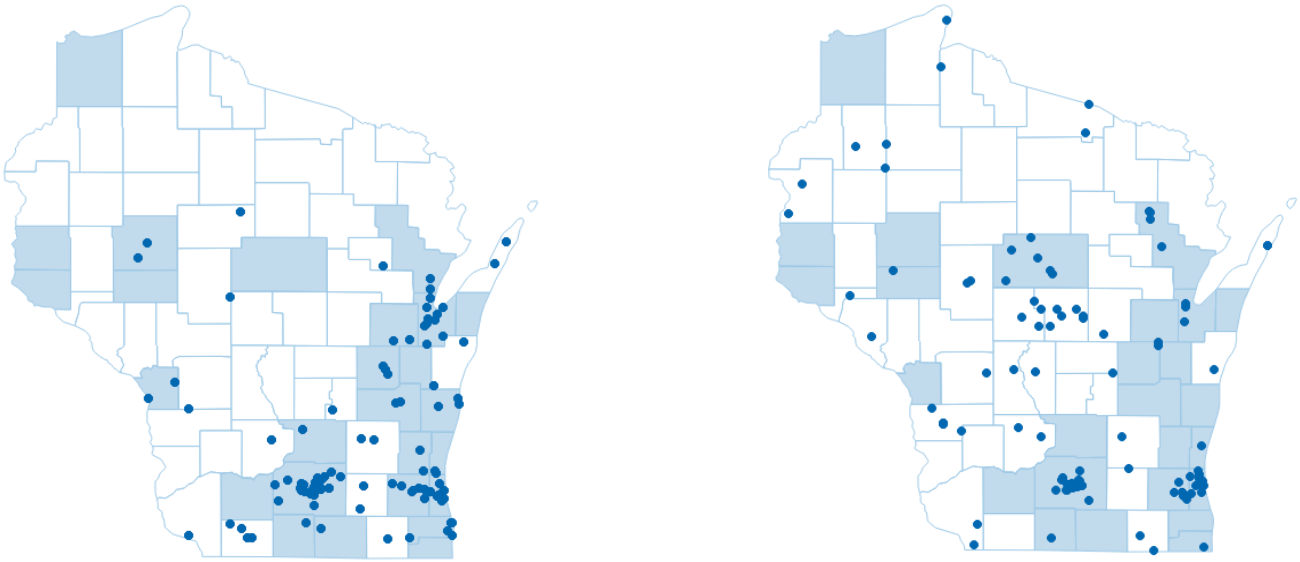
Tetra Tech further explored the relationship between trade allies, their location relative to population centers, and the projects they implement. To do this, we split RECIP projects into two separate groups: those implemented by trade allies that are located within an MSA, and those implemented by trade allies whose physical company address is not within an MSA. Figure 4-5 shows the two separate groups side-by-side. Based on the mapping, it is apparent that trade allies located within MSAs tend to implement projects within MSAs—that is, they are less likely to undertake projects in rural areas than trade allies located outside of a MSA. This relationship is supported by program tracking data as well—on average, trade allies located outside an MSA traveled approximately 71 miles to a project, while those within an MSA traveled an average of only 42 miles.

[6] Each metropolitan statistical area must have at least one urbanized area of 50,000 or more inhabitants. Source: https://www.census.gov/programs-surveys/metro-micro/about.html.

Figure 4-5. Awarded RECIP Projects (2013–2017)

Counties in Metropolitan Statistical Areas Shaded

Implemented by Trade Ally Located within MSA Implemented by Trade Ally Located Outside MSA



4.3 RENEWABLE REWARDS MAPS

Figure 4-6. Renewable Rewards Projects by Technology (2011–2017)

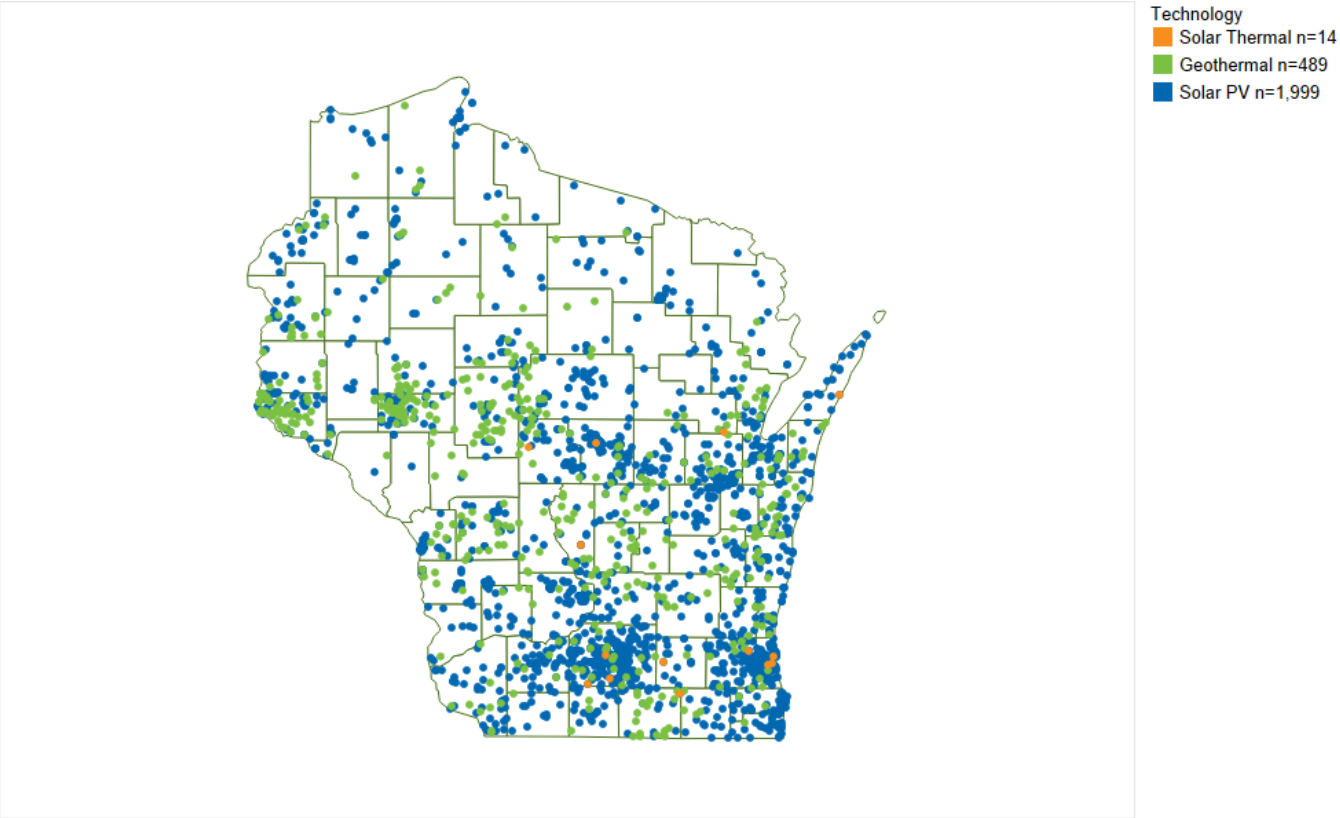


Figure 4-6 details all renewable projects that received incentive payments through Focus on Energy since 2011 (excluding RECIP projects). Most of the projects were solar photovoltaic systems, with just under 2,000 projects occurring since 2011. Geothermal projects were also popular—almost 500 separate projects throughout Wisconsin installed ground source heat pumps through Focus on Energy. Much like the RECIP data, the installations mapped in Figure 4-6 tend to cluster around population centers in southcentral/southeast Wisconsin and the Green Bay area.

Figure 4-7. Renewable Rewards Projects by Technology and Year (2011–2017)

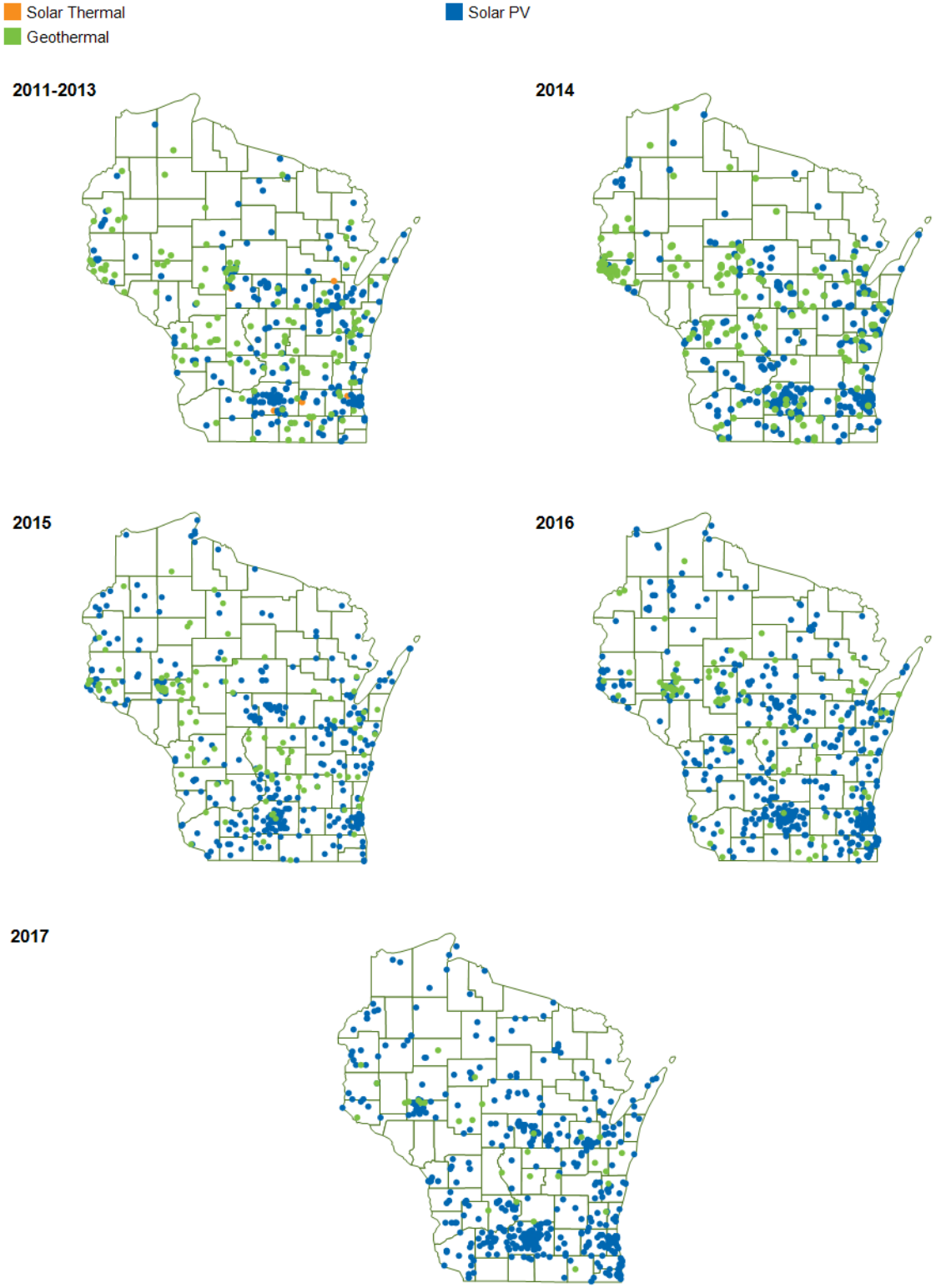
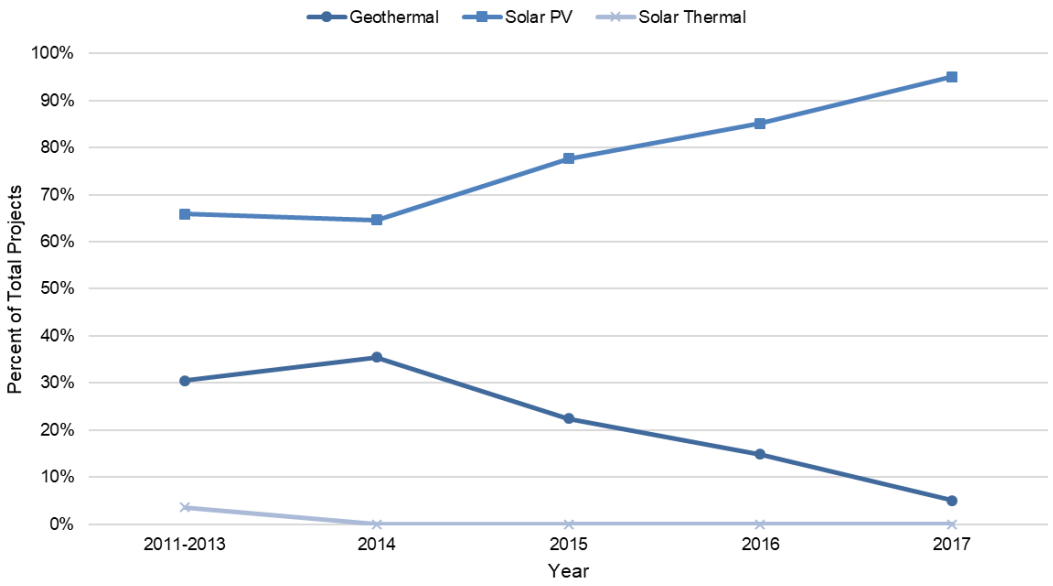


Figure 4-7 disaggregates projects by year, providing annual snapshots of installations throughout Wisconsin. A noticeable difference between the first cell, showing activity in 2011 through 2013, and each remaining year is the lack of solar thermal projects after 2013. Conversely, the rise in Solar PV projects is clear, while the installation rate of geothermal projects declines relative to solar PV throughout the years, leading to a decrease in renewable energy technology diversity in the state. The increase in Solar PV projects is likely market-driven, as solar panel prices have also declined over the years depicted here. The relative decline in geothermal projects coincides with national trends—between 2010 and 2017, geothermal energy production increased only 1.4 percent over eight years, a compound annual growth rate of 0.2 percent.[7] Moreover, the decreasing price of natural gas between 2010 and 2017 likely kept some potential customers from pursuing geothermal system installation. During this eight year period, natural gas prices decreased more than 40 percent in real terms.[8] Figure 4-8 provides details on the relative composition of Renewable Rewards projects since 2011, and shows that solar PV projects have increased in popularity each year since 2014.

Figure 4-8. Renewable Rewards Mix of Technologies by Year



Overall, Focus on Energy succeeded in promoting non-RECIP renewable projects throughout a high portion of the state. In 2014, ten counties had no Renewable Rewards projects through Focus on Energy. Most recently, seven counties (Buffalo, Florence, Jackson, Juneau, Lafayette, Menominee, and Trempealeau) did not have any Renewable Rewards projects in 2017, though these counties represent only 2 percent of the total population in Wisconsin.

[7] EIA Monthly Energy Review. August 2018. Table 10.1. Renewable Energy Production and Consumption by Source.
[8] EIA U.S. Natural Gas Electric Power Price. August 31, 2018.

Figure 4-9. Solar PV Renewable Rewards Project (2011-2017)

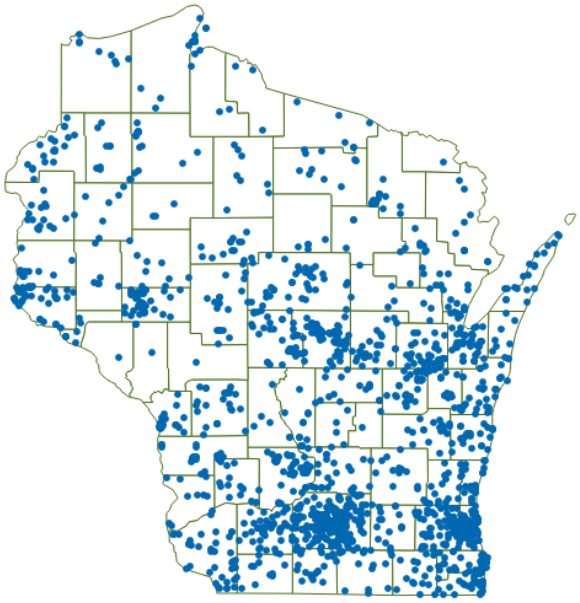


Figure 4-9 focuses solely on solar PV installations implemented through Renewable Rewards between 2011 and 2017. While a high number of projects occur in population hubs—Dane County, Milwaukee County, and Brown County appear to support high numbers of installations—there is a high ratio of projects to population in several more rural counties. In fact, once project data are normalized by county populations, many counties towards the lower end of the population distribution have a higher ratio of solar PV projects per 10,000 residents than more populous counties. Table 4-3 shows the ten counties with the high number of solar PV projects per 10,000 residents. The four most populous counties, Brown, Dane, Milwaukee, and Waukesha, had an average of 3.1 projects per 10,000 residents (rates of 1.7, 6.4, 2.3, and 1.4 projects per 10,000 residents, respectively). Appendix A provides a full list of counties and project installation rates normalized for population.

Table 4-3. Counties with Highest Rate of Solar PV Projects per 10,000 Residents

Renewable Rewards (2011–2017)

County	Solar PV Projects	Population	Population Rank	Projects per 10,000 Residents
Forest	62	9,064	68	68.4
Iowa	55	23,654	48	23.3
Portage	100	70,447	23	14.2
Burnett	20	15,213	62	13.1
Pepin	7	7,307	69	9.6
Vernon	29	30,814	42	9.4
Pierce	38	41,238	35	9.2
Richland	16	17,476	56	9.2

County	Solar PV Projects	Population	Population Rank	Projects per 10,000 Residents
Bayfield	13	14,891	64	8.7
Grant	42	52,214	27	8.0

Figure 4-10. Geothermal Renewable Rewards Projects (2011–2017)

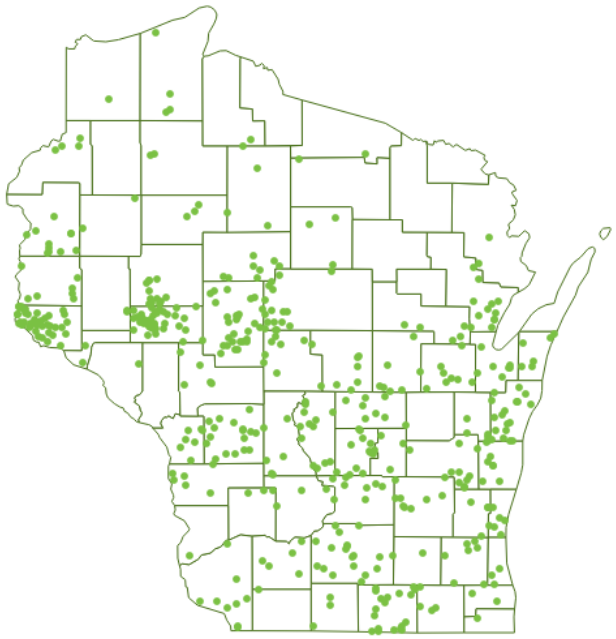


Figure 4-10 maps all geothermal projects that received Renewable Rewards funding between 2011 and 2017. Overall, 63 counties had at least one geothermal project that participated in Renewable Rewards, while 9 counties[9] did not have any geothermal projects. With 44 projects, Eau Claire County had the highest total number of projects, while Pierce County had the highest ratio of projects to population, with more than 10 geothermal projects for every 10,000 residents. Despite comprising only 3 percent of the state's population, three counties combined for almost a quarter of all installations during the period analyzed, with 24 percent of all projects occurring in either Eau Claire, Pierce, or Clark County. The four most populous counties had a total of 37 geothermal installations during this period, or less than 0.2 projects per 10,000 residents.

The relatively high installation rates in Eau Claire, Pierce, and Clark County were driven by a handful of active trade allies—in Eau Claire County, one trade ally installed 35 of 44 eligible geothermal projects, in Pierce County, a separate trade ally installed 30 of 42 geothermal projects, and in Clark County, two trade allies combined to install 24 of 29 rebated geothermal projects. In addition, all of these trade allies worked on rebated projects across at least three consecutive years, indicating their endorsement of the program.

[9] Door, Florence, Forest, Iron, Langlade, Menominee, Trempealeau, Washburn, and Winnebago Counties.

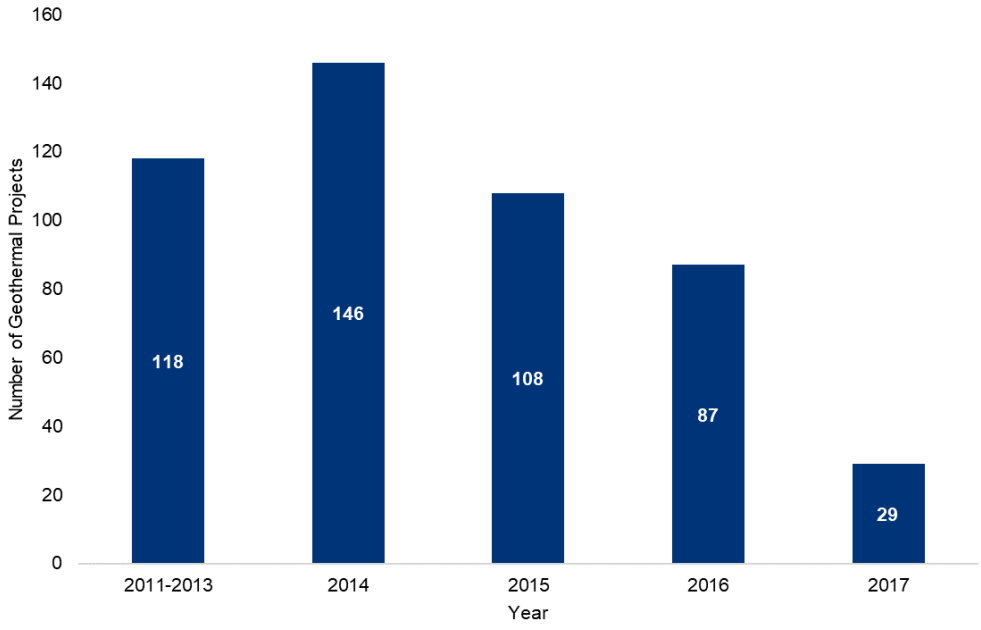
Table 4-4. Counties with Highest Rate of Geothermal Projects per 10,000 Residents

Renewable Rewards (2011–2017)

County	Geothermal Projects	Population	Population Rank	Projects per 10,000 Residents
Pierce	42	41,238	35	10.2
Marquette	13	15,067	63	8.6
Clark	29	34,557	41	8.4
Adams	13	20,069	53	6.5
Eau Claire	44	102,965	14	4.3
Monroe	18	45,623	30	3.9
Taylor	8	20,439	51	3.9
Waushara	8	24,162	47	3.3
Oconto	12	37,430	38	3.2
Price	4	13,517	66	3.0

Much like Table 4-3, Table 4-4 provides details for the counties with the highest number of geothermal installations per 10,000 residents. Again, normalizing the data to control for population shows that rates of projects are typically higher is less populated areas.

Figure 4-11. Renewable Rewards Geothermal Projects by Year



The total number of geothermal projects installed through Renewable Rewards has declined annually since 2014, as shown in Figure 4-11. A corresponding decrease occurred in the number of counties with at least one geothermal installation during each of the years in Figure 4-11. Between 2011 and 2013, 49 counties had at least one geothermal project. This number decreased each year through

2017, when 23 counties had a geothermal installation, as shown in Table 4-5. This trend corresponds with the geothermal market nationally, where geothermal energy production has been essentially stagnant since 2010. Additionally, the dip in installations in 2017 is likely linked to the expiration of federal geothermal tax credits, which were excluded from the extension of other renewable tax credits in 2016. Geothermal tax credits returned with the Bipartisan Budget Act of 2018, signed in February 2018.

Table 4-5. Number of Counties with At Least One Geothermal Project, by Year

Renewable Rewards (2011–2017)

Year	Counties	Projects
2011–2013	49	118
2014	42	146
2015	41	108
2016	36	87
2017	23	29

5.0 TRADE ALLY & PARTICIPANT IN-DEPTH INTERVIEWS

5.1 INTRODUCTION

As part of the evaluation for Focus on Energy's renewable energy programs, the EM&V team conducted in-depth interviews with RECIP and Renewable Rewards program participants, and with trade allies who have implemented projects for customers through either the Renewable Rewards or RECIP programs.

The evaluation team completed ten interviews with trade allies, and those trade allies represent approximately one third of trade allies who submitted projects under both programs in recent years. Trade ally interviews were completed between May 31 and July 2, 2018. Eight of the ten trade allies interviewed had participated in both the Renewable Rewards and RECIP programs; these respondents provided information on both programs. The two remaining trade allies each participated in only one of the programs: one participated in RECIP only, and the other participated solely in Renewable Rewards. These interviews investigated sources of awareness and program marketing, participation experiences, education and outreach, market impacts, and program satisfaction.

Trade allies interviewed represent a diverse mix of renewable energy contractors across the state; Table 5-1 summarizes the key characteristics of the interviewed trade allies.

Table 5-1. Key Trade Ally Interview Respondent Characteristics

Characteristics	Description
Technology Type	Nine of the ten trade allies interviewed are solar energy developers and contractors, with one trade ally focusing on the engineering and development of anaerobic digesters
Size	Interviewees varied in size from seven to approximately 75 full-time employees
Location & Service Territory	Varied; located across Wisconsin, and represented both urban and rural service areas
Offers Out-of-State Service?	Eight of ten trade allies reported also providing services outside of Wisconsin. Of those who completed projects outside of the state, the most frequently mentioned states were Illinois, Nebraska, and Minnesota

The evaluation team completed ten interviews with program participants of RECIP (6) and Renewable Rewards (4). Participant interviews followed a similar line of questioning as used in the trade allies where possible; In particular, we investigated sources of program awareness and marketing, participation experiences, and program satisfaction. Participant interviews were completed between July 2 and July 17, 2018. All in-depth interviews for this research project were semi-structured using an interview guide, but evaluators were permitted to follow the flow of the interview and modify questions as needed to fit the interviewee's circumstance. Therefore, not all questions included in the guide may have been asked of all respondents and additional topics may be explored over the course of individual interviews.

5.1.1 Recommendations Provided via Trade Allies and/or Participants

Trade allies had very specific feedback and recommendations on how the program could potentially be improved. Nine of ten of the trade allies interviewed provided at least one suggestion for improvements

to either the design or operations of the Renewable Rewards and/or RECIP programs. Based on those recommendations and additional information gathered as through the in-depth interview process, the Tetra Tech team provides the program recommendations listed below:[10]

- *Provide trade allies with greater transparency around RECIP application scoring and feedback.* None of the trade allies interviewed knew why some applications were approved while others were not, leading to confusion about how to improve the quality of submitted projects. Trade allies reported spending a substantial amount of time on project applications and felt frustrated when applications were rejected without knowing why. For example, one trade ally spent weeks building Excel spreadsheets to compare submitted projects that had received RECIP funding with projects that had not been awarded funding; despite this targeted effort, he was still uncertain about how the applications were scored and what his firm could do to improve. In addition to reducing trade ally frustration, increasing transparency around application scoring could allow trade allies to screen out projects that are unlikely to receive funding on the front end of the application process, thus reducing Focus on Energy staff administrative burden.

- *Consider accepting RECIP grant applications on a rolling basis or be mindful of the timing of RECIP applications and grant rewards.* Several trade allies experienced difficulties with the timing of the RECIP application process in the past. Commonly cited concerns included: uncertainty around if (and when) RECIP applications would be accepted and difficulties around the time of year that awardees were announced. Specifically, one contractor explained that several of his clients were awarded RECIP grants in late fall; however, construction and installation of the projects could not begin until spring due to cold temperatures. By the time that construction could commence on the projects, many of the customers were either feeling less excited about the project or had already committed project funding to other projects, resulting in fewer renewable energy projects being completed. Not only did the contractor lose work (scheduled project and application time/effort), but the total amount of RECIP funds were not utilized.

- *The uncertainty of RECIP funding greatly affects the timing and implementation of renewable energy projects.* Trade allies typically experience a rush of paperwork and project development activities once a RECIP funding round and application deadline is announced. This can overwhelm some trade allies—one interviewee estimated that it takes approximately 720 hours to assemble all of their RECIP applications per cycle—and causes projects to all be in the same stage (development, application, construction, etc.) at the same time. Staggering projects would allow trade allies to work more consistently throughout the year. Trade allies also mentioned a common sales tactic among contractors where contractors aggressively market RECIP to customers and submit RECIP applications on behalf of these customers who might not be convinced to install renewable energy programs. After the grants have been awarded, the contractors then aggressively try to commit these customers to the proposed projects. This type of sales tactic decreases the chances of customers who are genuinely interested in renewable energy from getting the grant, while potentially leaving grant money unused if awarded projects ultimately fail to go forward with the program. Additionally, customers who are set on installing a renewable energy system wait for a RECIP grant to be announced before going forward with

[10] Between the time of interviewing trade allies and completing this report, the Wisconsin Public Service Commission accepted several changes to RECIP for the 2019-2022 Quadrennial Planning Period, many of which were mentioned by trade allies during interviews. The PSC accepted changes around consistently offering RECIP funding rounds three times per year, creating a dual-tiered funding approach to future rounds of RECIP, and reducing the effort required to apply for RECIP funding, shifting the emphasis towards quantitative measures.

their project. This causes projects to be deferred, and potentially abandoned if not awarded a RECIP grant.

- *Consider increasing the incentive levels under the Renewable Rewards program.* Trade allies described the incentive levels as light and felt that they are too low to make a significant difference to customers. This is particularly true for small to mid-size commercial customers, who are typically less able to finance the upfront costs of a renewable energy system as compared to larger businesses. One trade ally also described an issue related to the sizing of commercial systems: the system size required to meet the incentive ceiling of $4,000 is often too small for the customer's needs. Yet, the incentive fails to encourage commercial customers to build a bigger system.
- *For Renewable Rewards, consider basing incentive levels on performance rather than system cost.* Trade allies observed that incenting the spending amount does not necessarily result in better performance and is partially subject to differences in installation and other ancillary costs. Additionally, some customers might want renewable energy systems, but their systems might fail to qualify for Focus on Energy incentives because they do not meet certain program criteria (e.g. east-west facing, slope and shading requirements). They went on to advocate that basing incentive levels on performance would encourage these customers to install renewable energy systems without sacrificing generation.

  This is increasingly important as more customers implement solar projects; as people with "ideal" locations install solar systems, the customers left are more likely to be people with less ideal conditions. Four of the comparative programs evaluated base incentive rates on performance, all of which measure performance in kWh generated. Programs identified differed on how kWh was calculated: two programs estimate annual energy production (by using tools such as NREL's Photovoltaic Watts calculator), one program deems rates based on the brand of the system installed, and one program bases the incentive on actual kWh generated by the system and credits the customer monthly for the energy generated. Three trade allies mentioned serving customers whose solar systems do not qualify for Focus incentives because they do not meet eligible criteria. These customers wanted to install solar systems that were either east-west facing or on differently oriented roofs that did not meet program criteria. Under a performance-based incentive scheme, these projects could receive a rebate commensurate with the amount of energy able to be produced under such sub-optimal conditions.

5.1.2 In-Depth Interview Sample Selection

Trade Ally Interviews

The Tetra Tech team selected a sample of participating trade allies using proportional probability sampling. This technique randomly sampled trade allies, but each trade ally's probability of selection was proportional to the savings their projects contributed to the program between 2013 and 2017. Using this sampling method retains the randomness that is ideal for sampling while also ensuring that some influential trade allies are likely to be selected. Overall, we selected a sample of 20 trade allies throughout the state, ultimately completing in-depth interviews with ten trade allies as described earlier in this report section.

Participant Interviews

Participants from the RECIP and Renewable Rewards program were randomly selected by the Tetra Tech team for interviewing among those who had been awarded in 2017. Tetra Tech sampled 15 cases from each of the programs with the target of completing five interviews from each program track.

Participant interviewees mirrored the technology distribution of the renewable energy programs in 2017, which included nearly all solar projects and came from a variety of areas within the state. Where possible, participants were initially contacted by e-mail when the customer had an e-mail available on file to invite them to participate in the in-depth interview.

5.2 PROGRAM AWARENESS, MARKETING, AND RECRUITMENT

Overall, Focus on Energy appears to be a ubiquitous organization across the state, and is well known in the renewable energy and energy efficiency communities. All ten of the trade allies interviewed said that they have been working with Focus on Energy for many years, or at least as long as they have been in the field. More than half of the trade allies interviewed could not recall how they initially heard about Focus on Energy's renewable incentive programs (n=6). One interviewee initially learned about Focus' renewable programs from another trade ally, two interviewees learned about the renewable programs through involvement with Focus on Energy's other rebate programs, and one interviewee reported first learning about the renewable energy programs from a conference or training (Solar Decade, Midwest Renewable Energy Association).

Roughly half (4 of 10) of participants indicated they heard about the program through word of mouth, such as through their solar installer or a local organization such as Sustain Dane. Another four of ten of the participants interviewed for this project indicated that they thought they heard about Focus on Energy through previous program participation. The other two interviewees couldn't remember how they heard about the renewable energy programs specifically; however, several participants confirmed a longstanding relationship with Focus on Energy over the years. In fact, when we asked participants if they had worked with the Focus on Energy program before participating in the renewable energy programs, nine out of ten participants confirmed they had done so.

Half of the trade allies interviewed reported receiving program information from the Focus on Energy website (n=5). Additional sources of program information mentioned were: communications from RENEW Wisconsin (n=2), Focus on Energy email blasts (n=2), and Focus on Energy staff (n=2). All of the trade allies queried felt adequately informed of program changes.

Participants most frequently mentioned that they'd like to hear about future Focus on Energy offerings via e-mail (8 of 10). One participant confirmed they would prefer phone calls from the program, while another respondent simply stated that he "liked the way things are." Nine of ten participants were able to recall how they heard they were awarded a Focus on Energy grant or incentive for their project, and eight of those ten confirmed they received an e-mail or physical letter in the mail detailing their incentive terms. One additional participant described receiving a phone call from Focus with incentive news, while one could not recall. All participants who could recall communicating with the program about their award were satisfied with the notification process. All participants interviewed for this program were the key decision makers for their project, whether it was in their home or at their business.

When we asked participants to detail why they ultimately decided to participate in the Focus on Energy renewable energy Programs and install their renewable energy system, answers varied widely. Three mentioned that they thought it would keep their operating costs down or ultimately save money on their energy bills after the initial payback period; three more mentioned the program incentives. Other answers included wanting to do more after other energy efficiency projects or that "it was the right thing to do."

5.3 EDUCATION AND OUTREACH

When asked about the effectiveness of program marketing by Focus on Energy, most trade allies felt that Focus did very little, if any, program marketing. One trade ally felt that Focus on Energy renewable energy incentives were almost entirely unknown by commercial customers outside of Madison but hypothesized that Madison businesses might be more familiar with the incentives. When asked what Focus on Energy could do to improve program marketing, one trade ally suggested advertising the program through participating utility bill inserts. Another trade ally cautioned marketing the RECIP program unless Focus can confidently project if and when another grant round will happen.

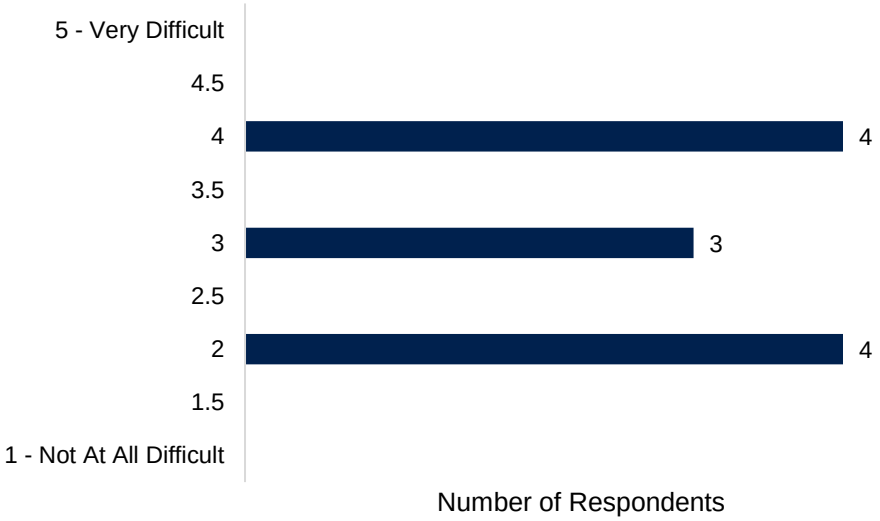
Only one trade ally reported having participated in a training sponsored by Focus on Energy. Other trade allies thought that trainings sponsored by Focus could be useful but did not have any specific recommendations about what kind of trainings might be useful.

5.4 PARTICIPATION PROCESS AND SUPPORT

5.4.1 Trade Ally Program Experience

When asked to identify the easiest part of the programs' processes, trade allies participating in the Renewable Rewards program most frequently mentioned filling out the online application (n=4). In addition, two trade allies mentioned program staff being strict about photos submitted as part of RR applications, and two trade allies stated that they have had difficulties with the format of invoices submitted to RR program staff. Trade allies participating in RECIP identified a desire to see more consistency regarding the application process. One trade ally explained that the requirements for the RECIP applications seem to be slightly different year to year, meaning that his company has to start from scratch each year when drafting RECIP applications. This doesn't allow trade allies to develop any kind of application template, which would likely cut down on the amount of time required to submit applications. Trade ally perceptions of administrative burden is outlined below in Figure 5-1. Trade allies were asked to rate the program's administrative burden on a 5-point scale, with 1 being "not at all difficult" and 5 being "very difficult." Responses ranged between 2 and 4, with a plurality of trade allies characterizing administrative burden as a 2 out of 5.

Figure 5-1. Trade Allies' Perception of Program Administrative Burden



5.4.2 Customer Program Experience

All but one participant confirmed that their equipment was installed and operating as expected. The one respondent who did not affirm this indicated his solar installation was not yet officially complete, as his construction project had experienced a delay. We asked participants to rate their difficulty (or lack of it) on a one to five scale, where one was equal to “not at all difficult” and five was “very difficult”. All but one participant rated their difficulty a one or two, which just one participant giving the experience a three.

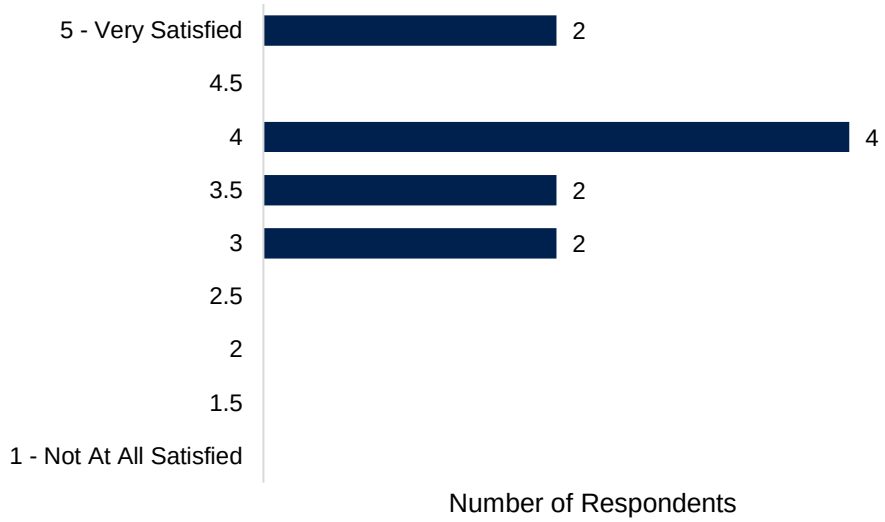
It was clear throughout the participant interviews of both RECIP and Renewable Rewards customers that program trade allies—in particular, the solar installers who helped Renewable Energy customers install their systems—play a key role in supporting participants and removing their barriers through the process. When we asked customers to identify the easiest parts of the participation process, six out of ten participants reported working with their installer made their participation easier. Another two of ten mentioned Focus on Energy staff support—either getting questions answered about the program, paperwork support, etc.—while two participants did not know. All ten participants – of which five respondents had participated through RECIP and half through Renewable Rewards -- rated their program satisfaction a five when asked to rate their satisfaction of the program’s technical support on a scale of one to five where one is ‘not at all satisfied’ and five is ‘very satisfied’.

Answers among participants when we asked them to name the most challenging aspect of program participation varied, and a few participants gave more than one answer. Six of ten participants mentioned their utility presented an installation barrier of some sort, mentioning challenging experiences in “hooking up” their system, negotiating their buyback agreements, or navigating their metering capabilities. Four participants mentioned wanting larger program incentives to assist with project costs, while another two participants expressed some challenges right-sizing their system.

5.4.3 Customer Satisfaction: Trade Ally Perspective

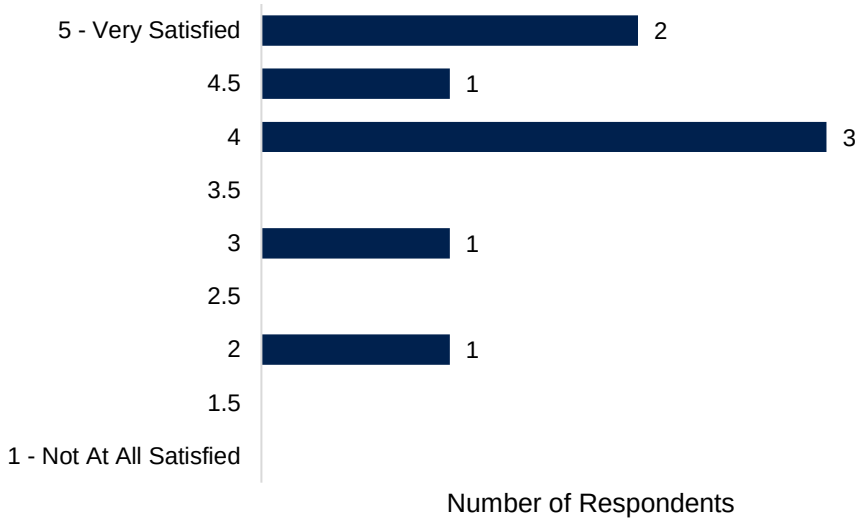
Overall, trade allies described the Renewable Rewards and RECIP programs as critical components in helping to promote renewable energy projects in Wisconsin. One respondent felt that Focus incentives provide an additional boost to renewable projects because it is a cash rebate, as opposed to a tax incentive or other type of financial award. Additionally, trade allies felt that the incentive was a big selling point for some of their past projects. When asked to rate their satisfaction with the program on a scale from 1 to 5, where 1 is “not as at all satisfied” and 5 is very “satisfied”, six trade allies ranked the programs as a 4 or 5 out of 5. Despite recognizing the overall benefits of the programs, four trade allies characterized their satisfaction with the program as less than 4. Trade allies cited the lack of transparency regarding the scoring of RECIP applications and the incentive rates of the Renewable Rewards program as the primary reasons why they rated the program as less than 4. Figure 5-2 highlights trade allies’ overall satisfaction of Focus’ renewable energy programs.

Figure 5-2. Trade Allies' Overall Program Satisfaction



Trade allies were also asked to rate their satisfaction with the technical support offered by the Renewable Rewards and RECIP programs. On a scale of 1 to 5, where 1 is "not at all satisfied" and 5 is "very satisfied", six of eight respondents rated technical support as at least a 4 out of 5. One respondent rated program technical support as a 2 out of 5; this person described the relationship with program staff as "adversarial" after a RECIP grant has been awarded. Specifically, the respondent felt that program staff were not helpful and often stood in the way of completing the project. This respondent's comments described his/her perception of interactions with program staff, rather than one particular incident. Figure 5-3 illustrates trade allies' perception of programs' technical support.

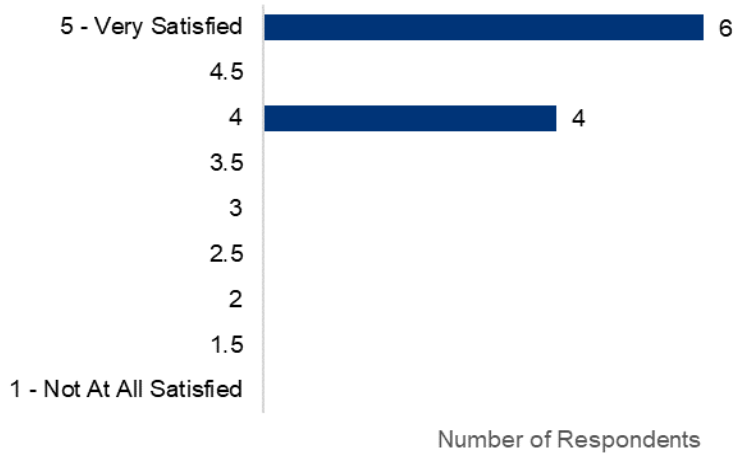
Figure 5-3. Trade Allies' Perception of Technical Support



5.4.4 Customer Satisfaction: Participant Perspective

Focus on Energy Renewable Energy customers are highly satisfied with their program experience when asked to rate their satisfaction with the program overall. Our evaluation team asked them to rate their satisfaction on a scale from 1 to 5, where 1 is "not as at all satisfied" and 5 is very "satisfied". Six participants ranked the program a 5 out of 5, while four participants rated their program satisfaction at a four.

Figure 5-4. Participants' Overall Program Satisfaction



5.4.5 Market Response

Trade allies were divided on whether Focus' renewable energy programs have influenced the types of services provided or the equipment recommended to customers. Two trade allies said that the programs, although helpful to customers, have not influenced the type of services offered or the type of equipment recommended. One trade ally said that they use the same equipment for projects outside of WI and that they do not receive Focus funding as they are not found on Focus' pre-approved list. Three trade allies said that the program has affected the types of services they provide and/or the equipment they recommend, and that they have sold projects that they would not have sold without the incentives.

6.0 COMPARATIVE PROGRAM RESEARCH

In addition to trade ally and participant interviews, the Tetra Tech team conducted a benchmarking exercise to examine program offerings for similar renewable energy technologies across the country. The benchmarking research focused on gathering information on renewable energy programs located in states both similar to Wisconsin and with similar programs in terms of eligible technologies and program structure and delivery. Specifically, information collected for the target programs of interest included:

- **Program design.** Program strategy, program goals, outreach channels, eligibility requirements, incentive structure
- **Program implementation and delivery.** Program procedures, evaluation of potential projects

The research team prioritized incentive programs located in states adjacent to Wisconsin, states or utility areas similar to Wisconsin to terms of solar and geothermal energy potential,[11] and states or utility areas that operate renewable energy incentive programs via an RFP. Once comparable states/regions were identified, the research team examined renewable energy programs in these areas, documenting program structure, delivery model, eligibility criteria, incentive levels and structure, and overall funding levels. Ultimately, the evaluation team collected information on 15 programs offering geothermal incentives, 19 programs offering solar photovoltaic and/or solar thermal incentives, and eight programs operating with an RFP feature. A full table of reviewed programs is located in Appendix B. Table 6-1 provides a list of non-adjacent states identified by Tetra Tech with similar solar resources as Wisconsin.

Table 6-1. Solar Energy Potential by State

State	Annual Average Daily Total Solar Resource ($kWh/m^2/day$)
WI	4.0-4.5
NY	3.4-4.6
DE	3.5-4.7
MD	3.5-4.7
CT	3.3-4.5

Information gathered from these programs was collected by inspecting program documentation provided by each respective administrator website, assessing evaluation documents pertaining to these programs, and, where available, inspection of any public commission documentation. Data on comparable renewable energy programs were collected for the following 12 states:

- Illinois
- Iowa
- Minnesota

[11] Solar and geothermal energy potential were assessed through maps of geothermal and solar resources across the United States available at www.nrel.gov.

- Maryland
- New York
- Vermont
- Connecticut
- Delaware
- Rhode Island
- Montana
- North Dakota
- Oregon

6.1 KEY FINDINGS AND RECOMMENDATIONS

The benchmarking study identified the following key findings and standard practices:

- *The incentive for geothermal systems available through the Renewable Rewards program is lower than most geothermal incentives available through comparable programs.* Benchmarked programs included both uniform, unit-level rebates as well as scaled incentives based on system size and performance. Programs with flat, unit-level rebates averaged $3,500 per geothermal system, while incentives based on efficiency ranged from $200 to $3,200 based EER/COP, with an average of approximately $2,150. This analysis suggests that the $650 rebate via Renewable Rewards was lower than almost all the incentives evaluated, regardless of incentive structure.
- *Benchmarked RFP-style programs evaluate potential projects on several criteria, including objective and subjective metrics.* This differs from the Focus on Energy RECIP program in Wisconsin where projects are reviewed mainly on a basis of project and program cost-effectiveness.
- *Benchmarked RFP-style programs incorporate measures to increase transparency, such as posting information about how projects are scored, examples of successfully funded projects, and answers to applicant questions on their website.*

6.2 DETAILED FINDINGS

Incentive programs covered in this benchmarking effort were primarily categorized into two groups based on program design: prescriptive programs and RFP-style programs. Below are detailed findings from this analysis, summarized by program design and implementation and delivery, for each group.

6.2.1 Geothermal Incentives

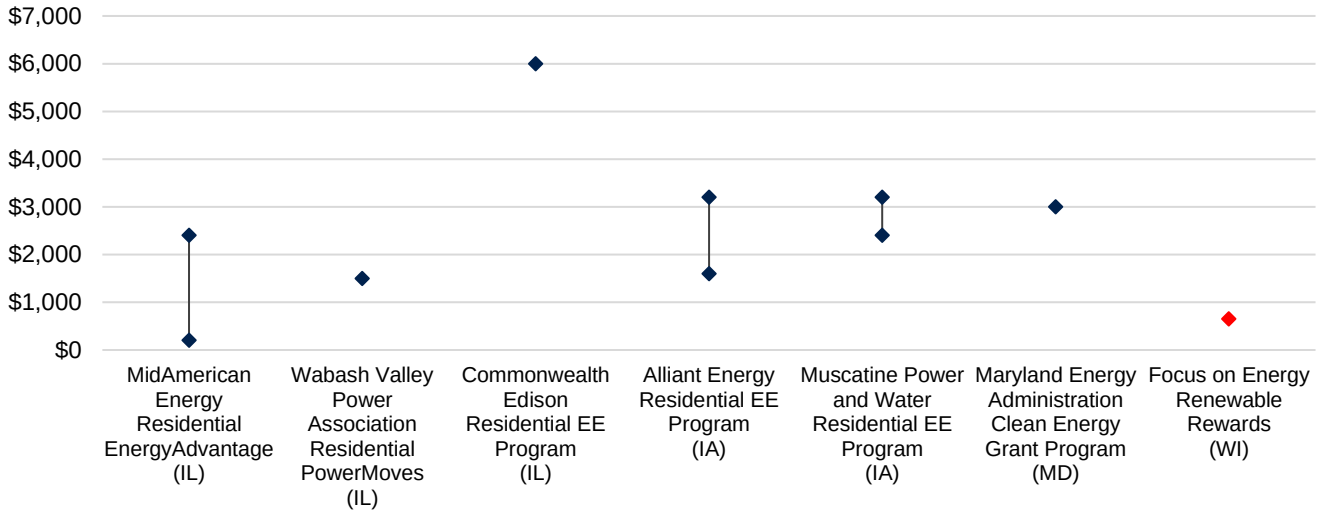
The evaluation team identified 14 programs across five states (Illinois, Iowa, Minnesota, Delaware and Maryland) that provide prescriptive incentives for geothermal heat pumps. All but three of the programs investigated are implemented by utilities, with the exception being three state-run programs. One of the statewide programs, Illinois' Efficient Living Energy Grant, targets low-income residential customers. All

of the programs investigated provide different incentive levels for residential and commercial customers.

6.2.1.1 Incentive Structure

Approximately one third of the programs offer a flat incentive rate for geothermal heat pumps, ranging from $200 to $6,000 per geothermal unit/home (n=5). Of these programs, three base the incentive rate on the efficiency levels of the geothermal unit (i.e. EER and COP). In comparison, Renewable Rewards' incentive for geothermal systems is currently $650, which is lower than most of the benchmarked programs. Figure 6-1 illustrates how Renewable Rewards compares with other renewable energy incentive programs with respect to geothermal incentives.

Figure 6-1. Uniform Incentive Amounts for Geothermal Units, by Program



The remaining 12 programs identified offer a variable incentive based on the size (in tons) of the geothermal unit, ranging from $100 per ton to $800 per ton. A review of Indiana's Residential Geothermal Heat Pump Rebate program found that most residential customers installed a geothermal system measuring between 3 and 5 tons, suggesting that overall residential customers typically receive incentive amounts ranging from $450 to $3,750.

Table 6-2. Variable Incentive Amounts for Geothermal System, by Program

Eligible Customers	State	Program Name	Incentive Rate (per ton)	Estimated Average Rebate†
Commercial Only	IL	Commercial EnergyAdvantage Rebate Program	$150-600‡	$5,250 - $21,000
	IL	Power Moves: Commercial and Industrial	$500-750‡	$17,500 - $26,250
	IL	City of Springfield Commercial Energy Efficiency Rebate Program	$500	$17,500
Commercial and Residential	IA	Cedar Falls Utilities Energy Efficiency Rebate Program	$300-600	Commercial: $10,500 - $21,000 Residential: $1,500 - $3,000

Eligible Customers	State	Program Name	Incentive Rate (per ton)	Estimated Average Rebate†
	DE	Green Energy Program‡	$700-$800	Commercial: $24,500 - $28,000 Residential: $3,500 - $4,000
Residential Only	IL	Jo-Carroll Energy Cooperative Energy Efficiency Program‡	$700	$3,500
	MN	Mora Municipal Utilities Residential Energy Efficiency Program	$200*	$1,000*
	MN	Conserve & Save	$200*	$1,000*
	MN	New Construction Rebate Program/ Triple E New Construction Program‡	$100-200	$500 - $1,000

† Estimated average rebates per project are calculated based on a 35-ton system for commercial customers, and five tons for residential customers.
* Indicates additional incentive amount for higher efficiency equipment.
‡ Some programs have maximum incentive amounts for geothermal projects. Three of the programs calculate maximum incentives as a percentage of total project cost (e.g. 20 percent of total project cost), and two programs cap incentive amounts at a uniform amount.

6.2.2 Solar Incentives

The evaluation team identified 13 programs across six states (Illinois, Minnesota, New York, Maryland, Connecticut, Delaware, and New York) that provide incentives for solar thermal and/or solar photovoltaic projects. Seven of the programs identified are implemented by a state agency or group, followed by six programs which are implemented by utilities. All programs evaluated are focused strictly on promoting renewable energy technologies via incentives and other forms of technical assistance.

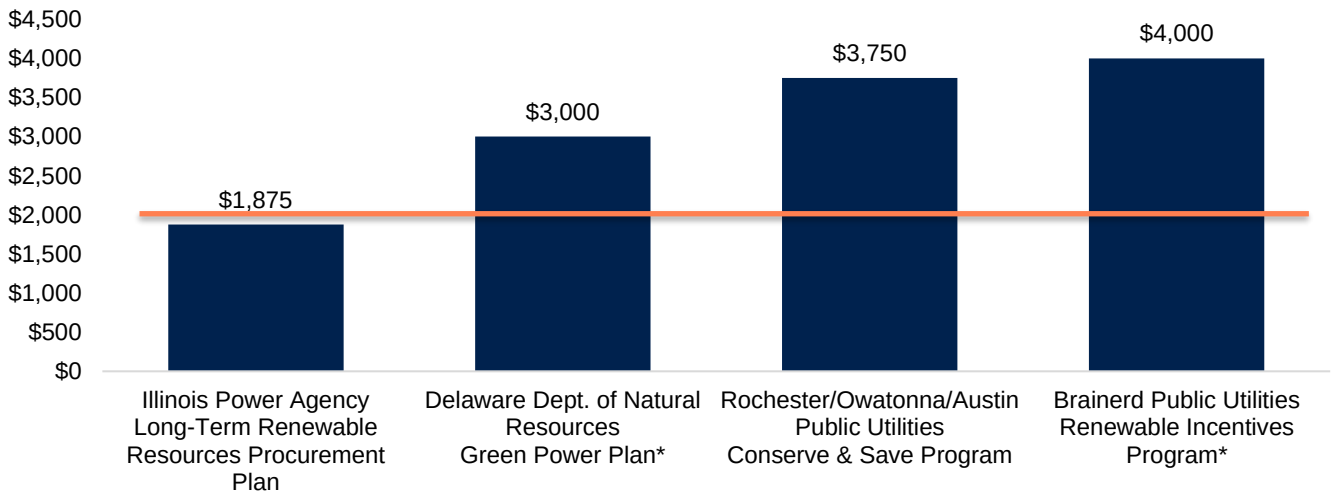
In addition, the programs investigated cater to a wide range of potential customers, including residential (n=9), commercial (n=11), industrial (n=5), and public institutions (n=2).

6.2.2.1 Incentive Structure

Across the programs evaluated, solar incentives are determined in one of three ways: system size, system performance, or via a standard, uniform amount. The most popular incentive structure among the programs analysed was a variable incentive based on installed system size, which was observed in seven of the 13 programs. Figure 6-2 shows the approximate incentive amount a residential customer could expect under each of these programs for a 7.5 kW, solar PV system, with the red line representing Focus on Energy's $2,000 incentive ceiling for residential projects.[12] Compared to similar programs, Focus on Energy's maximum rebate for a residential project is slightly higher than one program, and at least $1,000 lower than the remaining three programs.

[12] Six of the eight programs with variable incentive rates based on system size allow participation by residential customers. The remaining two programs are for commercial customers only.

Figure 6-2. Incentive Rates for Residential Solar PV Projects, Based on Installed System Size†

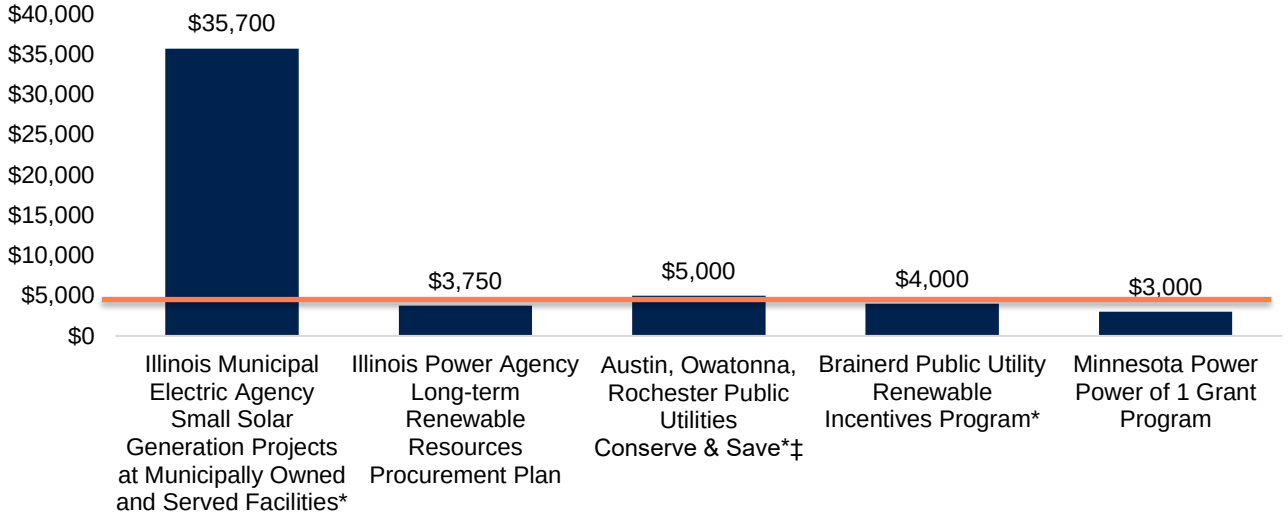


† Estimates are based on a 7.5 kW system, which is the approximate size of a residential system that would reach the $2,000 maximum under Focus on Energy's Renewable Rewards program. This system size assumes having received a 30 percent federal tax incentive as well.
* Indicates program incentive level maximum.

Of the programs that provide incentives for solar thermal projects, all three provide variable incentive levels. Two programs based the incentive on installed system size (i.e. $20/ft^2 and $15/ ft^2 of collector area), and the remaining program bases the incentive on performance ($1/kWh displaced).

All six variable incentive programs allow participation for commercial customers; approximate incentive rates for a 15kW commercial solar PV project are illustrated below. A 15kW system is the approximate system size needed to reach Focus on Energy's $4,000 maximum incentive level for a commercial applicant. This incentive amount appears to be in line with most of the other programs evaluated for a PV system of this size, with the exception being the Illinois Municipal Electric Agency's (IMEA) Small Solar Generation program. IMEA rebates commercial customers $3/watt, with a maximum incentive amount of 75 percent of total project cost.

Figure 6-3. Incentive Rates for Commercial Solar PV Projects, Based on Installed System Size†



†
Estimates are based on a 15kW system, which is the approximate size of a commercial system that would reach the $4,000 maximum under Focus on Energy's Renewable Rewards program. This system size assumes having received a 30 percent federal tax incentive as well.
* Indicates program incentive level maximum.
‡The Conserve & Save program applies to systems measuring less than 10kW.

Five programs base incentives off performance, or how much energy is actually generated by the system. This method is very similar to incentives based on installed system size, but also accounts for other factors affecting energy production, such as tilt, shading, and orientation.

Two programs provide a uniform incentive for customers installing solar technologies: Maryland's Clean Energy Grant Program (CEGP), which offers $500 per solar thermal project and $1,000 for a solar PV project; and Delaware's Green Energy Program, which offers $3,000 per non-residential solar PV project. The Green Energy program offers a variable incentive based on installed system size for residential PV projects.

6.2.3 RFP Programs

The evaluation team identified ten renewable energy programs that award grants to customers via an RFP-driven process. Like Focus on Energy's RECIP, these comparable programs periodically announce grant funding cycles, and accept proposals from customers outlining potential renewable energy projects. Project-awarded grants under these programs tend to be either large in scale, unique to the site on which they are installed, or are considered near-commercial or demonstration-level technologies. In addition to accepting project applications, three programs—Xcel's Renewable Development Program, Portland General Electric's Renewable Development Fund, and North Dakota's Renewable Energy Program—also fund educational projects or project components pertaining to renewable energy, including research & development and higher education block grants. This program feature promotes community engagement with the program and renewable technologies in general, as well as fosters the development of future technologies.

Only three programs in this category allows residential customers to submit applications, and seven of ten programs allow commercial and industrial customers to apply. Two programs specifically target public institutions, government agencies, schools, and tribes.

6.2.3.1 Incentive Structure

All of the benchmarked programs evaluate and score submitted applications on several different criteria. The most frequently cited metrics include: technical feasibility, financial feasibility, anticipated energy generated, and non-energy benefits associated to the project. Most programs also require projects to meet predetermined minimum technical requirements. These requirements are typically technology specific and include could include practices such as requiring a solar PV installation to meet at least 80 percent of the default estimated output, or that equipment be installed by certified professionals. In particular, several programs emphasized the importance of both objective metrics as well as subjective merits, such as environmental and community impacts in the community, and job creation. One program, operated by Portland General Electric, specifically rewards projects that have strong ties to community groups or non-profit institutions, although these groups do not have to be the organization installing the proposed project.

6.2.3.2 Transparency Measures

In addition to providing information about program requirements, publicly posting questions and answers from trade allies improves program transparency by ensuring trade allies receive the same information and promotes a perception of professionalism and objectivity among trade allies.

Several RFP programs also post information about successful past projects on their websites. This serves both to promote the program, as well as to provide potential applicants with models of funded projects.

6.2.3.3 Guaranteed Contracts Also Act as an Incentive

In Vermont, the state operates the Standard Offer Program, which is an RFP-driven program targeted at promoting small-scale renewable energy generation by requiring Vermont distribution facilities to buy renewable energy from grantees for a specified period. Eligible projects must be less than 2.2 MW in size and include the following technologies: solar; wind with a capacity of 100 kW or smaller (“small wind”); wind with a capacity greater than 100 kW up to 2.2 MW (“large wind”); farm methane; landfill methane; food waste anaerobic digestion; biomass; and hydroelectric. Projects must also have a proposed price per kWh that is not higher than program-determined, technology-specific avoided costs. Projects are then ranked on levelized price offered, and by technology type. The program allocates 10 MW annually through the program, which has existed since 2009.[13] In 2018, seven projects (five solar, one small wind, and one food waste) received funding, ranging from $0.0884 to $0.2580 per kWh.

6.2.3.4 RFP Programs Are Used to Promote Specific Types of Projects

Two states—New York and Vermont—periodically announce RFPs targeted at specific renewable energy technologies. In addition to the Standard Offer Program, the state legislature of Vermont also established the Clean Energy Development Fund (CEDF) to increase the development and deployment of cost-effective and environmentally sustainable electric power resources, with an emphasis on promoting renewable energy resources. CEDF operates several renewable energy incentive programs, including RFP-style programs, and this model was specifically identified as a program model of interest by an interviewed Wisconsin trade ally. The primary program under the CEDF umbrella is the Small Scale Renewable Energy Incentive Program (SSREI) which is intended to help residents and business

[13] 2009 30 V.S.A. § 8005a.

owners install renewable energy systems. This program currently targets solar thermal and clean-burning wood systems; solar photovoltaic technology had been eligible under this program in the past, but those rebates were phased out in 2015. Other CEDF programs appear to periodically target different types of renewable energy projects for funding. For example, the most recent request for proposals calls for projects aimed at recovering heat from compost activities; past requests have focused on anaerobic digestion and solar photovoltaic projects, among others.

APPENDIX A: PROJECTS PER 10,000 RESIDENTS

Table A-1 provides a full list of counties in Wisconsin, the number of solar PV projects implemented through Renewable Rewards (2011-2017), county populations, and the number of projects per 10,000 residents between 2011 and 2017.

Table A-1. Solar PV Projects per 10,000 Residents

Renewable Rewards (2011–2017)

County	Solar PV Projects	Population	Population Rank	Projects per 10,000 Residents
Forest	62	9,064	68	68.4
Iowa	55	23,654	48	23.3
Portage	100	70,447	23	14.2
Burnett	20	15,213	62	13.1
Pepin	7	7,307	69	9.6
Vernon	29	30,814	42	9.4
Pierce	38	41,238	35	9.2
Richland	16	17,476	56	9.2
Bayfield	13	14,891	64	8.7
Grant	42	52,214	27	8.0
Adams	16	20,069	53	8.0
Sawyer	13	16,369	58	7.9
Washburn	12	15,648	61	7.7
Door	21	27,587	45	7.6
Waushara	18	24,162	47	7.4
Taylor	15	20,439	51	7.3
Sauk	44	63,949	24	6.9
Dane	340	531,273	2	6.4
Clark	21	34,557	41	6.1
Lafayette	10	16,753	57	6.0
Price	8	13,517	66	5.9
Oconto	22	37,430	38	5.9
Ashland	9	15,714	60	5.7
Monroe	26	45,623	30	5.7
Waupaca	29	51,533	28	5.6
Crawford	9	16,321	59	5.5
Eau Claire	54	102,965	14	5.2
Iron	3	5,726	70	5.2

County	Solar PV Projects	Population	Population Rank	Projects per 10,000 Residents
Green	19	37,075	39	5.1
Wood	37	73,107	22	5.1
Columbia	26	56,927	26	4.6
Manitowoc	33	79,536	21	4.1
Kewaunee	8	20,405	52	3.9
Polk	15	43,481	34	3.4
Calumet	17	49,553	29	3.4
Marquette	5	15,067	63	3.3
Marinette	12	40,491	37	3.0
Oneida	10	35,601	40	2.8
Vilas	6	21,435	49	2.8
Marathon	36	135,603	10	2.7
Langlade	5	19,221	54	2.6
Ozaukee	22	88,314	17	2.5
Shawano	10	41,062	36	2.4
Sheboygan	28	115,427	13	2.4
Jefferson	20	84,625	20	2.4
Milwaukee	218	951,448	1	2.3
Juneau	6	26,274	46	2.3
Racine	44	195,140	5	2.3
Florence	1	4,456	72	2.2
Outagamie	41	184,526	6	2.2
Menominee	1	4,533	71	2.2
Rusk	3	14,127	65	2.1
La Crosse	23	118,122	12	1.9
Douglas	8	43,509	33	1.8
Dodge	16	88,068	18	1.8
Lincoln	5	27,902	44	1.8
Fond du Lac	18	102,144	16	1.8
Barron	8	45,412	31	1.8
Winnebago	29	169,886	7	1.7
Brown	44	260,401	4	1.7
Kenosha	28	168,183	8	1.7
Walworth	17	102,959	15	1.7

County	Solar PV Projects	Population	Population Rank	Projects per 10,000 Residents
St. Croix	14	88,029	19	1.6
Waukesha	57	398,424	3	1.4
Chippewa	9	63,649	25	1.4
Dunn	6	44,704	32	1.3
Washington	17	134,296	11	1.3
Rock	18	161,620	9	1.1
Green Lake	2	18,719	55	1.1
Trempealeau	3	29,633	43	1.0
Buffalo	1	13,099	67	0.8
Jackson	1	20,562	50	0.5

Table A-2 provides a full list of counties in Wisconsin, the number of geothermal projects implemented through Renewable Rewards (2011-2017), county populations, and the number of projects per 10,000 residents between 2011 and 2017.

Table A-2. Geothermal Projects per 10,000 Residents

Renewable Rewards (2011–2017)

County	Geothermal Projects	Population	Population Rank	Projects per 10,000 Residents
Pierce	42	41,238	35	10.2
Marquette	13	15,067	63	8.6
Clark	29	34,557	41	8.4
Adams	13	20,069	53	6.5
Eau Claire	44	102,965	14	4.3
Monroe	18	45,623	30	3.9
Taylor	8	20,439	51	3.9
Waushara	8	24,162	47	3.3
Oconto	12	37,430	38	3.2
Price	4	13,517	66	3.0
Kewaunee	6	20,405	52	2.9
Pepin	2	7,307	69	2.7
Bayfield	4	14,891	64	2.7
Burnett	4	15,213	62	2.6
Polk	11	43,481	34	2.5
Jackson	5	20,562	50	2.4
Juneau	6	26,274	46	2.3

County	Geothermal Projects	Population	Population Rank	Projects per 10,000 Residents
Manitowoc	17	79,536	21	2.1
Rusk	3	14,127	65	2.1
Iowa	5	23,654	48	2.1
Chippewa	12	63,649	25	1.9
Grant	9	52,214	27	1.7
Richland	3	17,476	56	1.7
Vernon	5	30,814	42	1.6
Green Lake	3	18,719	55	1.6
Waupaca	7	51,533	28	1.4
Marathon	17	135,603	10	1.3
Columbia	7	56,927	26	1.2
Sawyer	2	16,369	58	1.2
Shawano	5	41,062	36	1.2
Rock	19	161,620	9	1.2
Wood	8	73,107	22	1.1
Lincoln	3	27,902	44	1.1
Dodge	9	88,068	18	1.0
Portage	7	70,447	23	1.0
Fond du Lac	10	102,144	16	1.0
Green	3	37,075	39	0.8
Calumet	4	49,553	29	0.8
St. Croix	7	88,029	19	0.8
Buffalo	1	13,099	67	0.8
Sheboygan	8	115,427	13	0.7
Ozaukee	6	88,314	17	0.7
Ashland	1	15,714	60	0.6
Sauk	4	63,949	24	0.6
Crawford	1	16,321	59	0.6
Lafayette	1	16,753	57	0.6
La Crosse	7	118,122	12	0.6
Marinette	2	40,491	37	0.5
Vilas	1	21,435	49	0.5
Dunn	2	44,704	32	0.4
Barron	2	45,412	31	0.4

County	Geothermal Projects	Population	Population Rank	Projects per 10,000 Residents
Outagamie	8	184,526	6	0.4
Walworth	4	102,959	15	0.4
Dane	19	531,273	2	0.4
Brown	8	260,401	4	0.3
Washington	4	134,296	11	0.3
Oneida	1	35,601	40	0.3
Douglas	1	43,509	33	0.2
Waukesha	7	398,424	3	0.2
Jefferson	1	84,625	20	0.1
Racine	2	195,140	5	0.1
Kenosha	1	168,183	8	0.1
Milwaukee	3	951,448	1	0.0
Forest	0	9,064	68	0.0
Washburn	0	15,648	61	0.0
Door	0	27,587	45	0.0
Iron	0	5,726	70	0.0
Langlade	0	19,221	54	0.0
Florence	0	4,456	72	0.0
Menominee	0	4,533	71	0.0
Winnebago	0	169,886	7	0.0
Trempealeau	0	29,633	43	0.0

APPENDIX B: COUNTY DEMOGRAPHICS

Table B-1. Wisconsin County Demographics

County	Population	Area (Sq. Miles)	Population Density	Metropolitan Statistical Area
Adams	20,069	646	31	No
Ashland	15,714	1,045	15	No
Barron	45,412	863	53	No
Bayfield	14,891	1,478	10	No
Brown	260,401	530	492	Yes
Buffalo	13,099	672	20	No
Burnett	15,213	822	19	No
Calumet	49,553	318	156	Yes
Chippewa	63,649	1,008	63	Yes
Clark	34,557	1,210	29	No
Columbia	56,927	766	74	Yes
Crawford	16,321	571	29	No
Dane	531,273	1,197	444	Yes
Dodge	88,068	876	101	No
Door	27,587	482	57	No
Douglas	43,509	1,304	33	Yes
Dunn	44,704	850	53	No
Eau Claire	102,965	638	161	Yes
Florence	4,456	488	9	No
Fond du Lac	102,144	720	142	Yes
Forest	9,064	1,014	9	No
Grant	52,214	1,147	46	No

County	Population	Area (Sq. Miles)	Population Density	Metropolitan Statistical Area
Green	37,075	584	63	Yes
Green Lake	18,719	349	54	No
Iowa	23,654	763	31	Yes
Iron	5,726	758	8	No
Jackson	20,562	988	21	No
Jefferson	84,625	556	152	No
Juneau	26,274	767	34	No
Kenosha	168,183	272	618	Yes
Kewaunee	20,405	343	60	Yes
La Crosse	118,122	452	262	Yes
Lafayette	16,753	634	26	No
Langlade	19,221	871	22	No
Lincoln	27,902	879	32	No
Manitowoc	79,536	589	135	No
Marathon	135,603	1,545	88	Yes
Marinette	40,491	1,399	29	No
Marquette	15,067	456	33	No
Menominee	4,533	358	13	No
Milwaukee	951,448	241	3,941	Yes
Monroe	45,623	901	51	No
Oconto	37,430	998	38	Yes
Oneida	35,601	1,113	32	No
Outagamie	184,526	638	289	Yes
Ozaukee	88,314	233	379	Yes
Pepin	7,307	232	31	No

County	Population	Area (Sq. Miles)	Population Density	Metropolitan Statistical Area
Pierce	41,238	574	72	Yes
Polk	43,481	914	48	No
Portage	70,447	801	88	No
Price	13,517	1,254	11	No
Racine	195,140	333	587	Yes
Richland	17,476	586	30	No
Rock	161,620	718	225	Yes
Rusk	14,127	914	15	No
Sauk	63,949	831	77	No
Sawyer	16,369	1,257	13	No
Shawano	41,062	893	46	No
Sheboygan	115,427	511	226	Yes
St. Croix	88,029	722	122	Yes
Taylor	20,439	975	21	No
Trempealeau	29,633	733	40	No
Vernon	30,814	792	39	No
Vilas	21,435	857	25	No
Walworth	102,959	555	185	No
Washburn	15,648	797	20	No
Washington	134,296	431	312	Yes
Waukesha	398,424	550	725	Yes
Waupaca	51,533	748	69	No
Waushara	24,162	626	39	No
Winnebago	169,886	434	391	Yes
Wood	73,107	793	92	No

County	Population	Area (Sq. Miles)	Population Density	Metropolitan Statistical Area
Total	**5,778,708**	**54,158**	**107**	**n/a**

APPENDIX C: COMPARABLE RENEWABLE ENERGY PROGRAMS

Table C-1. Comparable Solar Energy Programs Across the U.S.

Focus
EERD_Append C Tab

Table C-2. Comparable Geothermal Energy Programs Across the U.S.

Focus
EERD_Append C Tab

Table C-3. Comparable RFP-Style Renewable Energy Programs Across the U.S.

Focus
EERD_Append C Tab

APPENDIX D: SURVEY DOCUMENTS

D.1 PROGRAM STAFF INTERVIEW GUIDE

FOCUS ON ENERGY STAFF INTERVIEW GUIDE—Renewable Energy Programs–Final

Interviewee(s)

Interviewer(s)

Program/Area of responsibility

Date(s):

With your permission, I would like to record the interview. Do I have your permission to do so? *[IF NEEDED: We will use the recording for transcription purposes, in order to make sure we accurately represent your responses. No one but evaluation team staff members will listen to the recording.]*

A. Role within Focus on Energy

1) We'd like to begin today by verifying our initial understanding of Focus on Energy's Renewable Program channels, and make sure we have a clear understanding of the program offerings. [PROBE to have brief discussion to confirm our understanding of these program channels, make corrections where necessary].

- **Renewable Rewards**—Residential and commercial customers seeking to participate in Renewable Rewards work with pre-approved trade allies to select eligible solar electric systems or geothermal heat pumps for their site. To participate, customers notify Focus on Energy of their intent to participate in the program by submitting a reservation application, proposal documentation, and proof of an initial investment of at least $500. Once Focus on Energy approves the application, the trade ally must complete the project within three months, at which point the customer submits an incentive application to receive payment of their incentive.

- **RECIP**—Focus on Energy issues semiannual requests for proposals, inviting interested commercial customers to submit renewable project applications. Included in these applications are applicants' proposed incentive levels ($/kWh and/or $/Therm), which are ultimately calculated on first year net energy savings achieved by selected projects. Focus on Energy typically limits proposals to six system types.[14] Incentives cannot exceed 50 percent of the total project cost, and no customer may receive more than $400,000 in combined energy efficiency and renewable energy incentives from Focus on Energy in any calendar year.

[14] Eligible technologies typically include biogas, biomass, geothermal, solar photovoltaic, solar thermal, and wind systems.

2) What are the Focus on Energy program manager's responsibilities and/or roles regarding each of the program channels?

[If not previously explained, probe for the following key pieces of information]

- When became involved
- How have responsibilities/roles changed over time
- On average, what percent of your workload is spent on the program monthly?

3) Let's talk next about the various stakeholders you interact with regarding the program. What are the roles and responsibilities of these other persons / groups? Success of interactions; suggestions for improvements?

- Other Focus on Energy staff connected with delivery of these Renewable Energy Programs
- Trade allies
- Customers

B. Program Design and Marketing

1) Who was involved in the program design? Have any modifications been made to the program design or the last year or two [PROBE for changes in either or both Renewable Rewards / RECIP]?

2) What are the program goals [PROBE: portfolio overall? By channel?]? How are program goals communicated internally and externally? How well has the program overall (or by each channel, if appropriate) been performing in relation to goals? Why?

3) We want to be sure we understand the options for the Renewable Rewards and RECIP program as they stand currently. Can you verify the following program offerings and rebate levels by channel?

Channel	Measure	Sector	Incentive
Renewable Rewards	Solar Electric	Residential	12% of installed cost (up to $2,000)
		Commercial	12% of installed cost (up to $4,000)
	Geothermal Heat Pump	Residential	$650
		Commercial	$650
RECIP	Multiple types	Commercial	$400,000 max; customer cannot receive more than 50% of total project cost.

4) Do you think the incentive levels within each channel are effective in maximizing program participation? If not, why not? What, if any, changes in the incentive levels do you think may be needed?

5) How is the program marketed externally to customers?

- What role does the program website play within program marketing?
- Does Focus on Energy specifically contact customers to encourage program participation within any of these channels?
- Do you target different target markets? Do the marketing efforts vary across Wisconsin in any obvious way (i.e., by county? By utility territory?) How effective have each of these methods been in identifying and enrolling potential participants? Why?
- Do the trade allies who install program-incented equipment also play a role in program marketing?

IF YES:

- Has that changed over time?
- Do they receive program training [IF YES: Please describe that training]?

6) What are major barriers to program participation [PROBE to understand if there are differences by channel]?

- Why do you think customers choose to a) participate or b) not participate?

7) Are there sufficient program resources to meet the programs goals? (Probe: Examples of resources are staff resources, incentives, program partners' support, and marketing materials.)

C. Program Operations

1) What are the participation steps from the customer's perspective? [PROBE: cover differences in process between Renewable Rewards and RECIP]. Have these changed over the last year or two? IF YES, why and how?

2) *[If not discussed specifically earlier in the interview]* What support is provided through the program to trade allies? In what areas could this be improved?

3) What aspects of the program implementation are working well? What aspects could be improved?

4) What do you see as future challenges for the respective channels within this program?

D. Program Data Tracking

1) Please briefly describe how participants and non-participants tracked within each track?

- Who manages or has access to the tracking database?
- Is there anything that would be helpful to track that is not currently available? Or data needed to help support evaluation efforts?
- How easy is it to use the tracking system?

2) We have noted in our initial assessment of the program tracking data that it appears that renewable energy projects are tracked within programs other than Renewable Rewards or RECIP. For example, we see renewable energy projects tracked within the Business Program.

Does this program coordinate with other efficiency programs offered within Focus on Energy or other organizations? [IF YES, clarify which program channel does so, how the coordination happens, and how data tracking issues are generally settled (aka what program is the project attributed to within program tracking data.]

3) What is the program data tracking process for trade allies? For example, does Focus on Energy have a pre-approved trade ally list?

E. Evaluation

1) What are your needs from this project?

2) What do you hope to learn from this project?

3) Within our project, we plan to do secondary research about other Renewable Energy programs that surround Wisconsin, at a minimum. Are there specific programs you know of that you'd like to recommend we include within our research plans?

4) Are there specific program areas / items / perspectives that you want to make sure we touch on within our primary data collection activities with program participants or trade allies working with the program?

D.2 ATRADE ALLY INTERVIEW GUIDE

FOCUS ON ENERGY RENEWABLE ENERGY PROGRAM

TRADE ALLY INTERVIEW GUIDE (FINAL)

Interviewee(s):

Interviewer(s):

Program/Area of responsibility:

Date(s):

A. Background

This guide will be used to understand the perspectives of participating market actors involved with the Focus on Energy Renewable Energy Programs between 2013 and current day. Interviews will be conducted with participating installation contractors that are working or have worked with the program.

Trade allies play a key role in the implementation and delivery of the Focus on Energy Renewable Program options (both RECIP and Renewable Rewards). Trade allies are one of the primary customer outreach arms of the program, informing customers of the program and available program incentives for qualifying renewable energy equipment. Trade allies also commonly build program incentives into their project quotes to customers and help customers complete and submit program paperwork.

In-depth interviews will be conducted by senior Tetra Tech staff via telephone. The interviews will be semi-structured. Therefore, the following interview protocol is only a guide to ensure certain topics are covered, but evaluators will follow the flow of the interview and modify questions as needed to fit the interviewee's circumstance and flow of conversation.

We expect the interviews to take approximately 20 minutes. We will attempt to schedule interviews with respondents in advance to accommodate each trade ally's schedule.

B. Introduction

Hello, may I speak to [_____]? My name is _____, and I'm calling from Tetra Tech on behalf of the Focus on Energy Environmental & Economic Research and Development Program. We are conducting interviews with Renewable Energy installers that work with Focus on Energy's Renewable Rewards and/or Renewable Energy Competitive Incentive Programs.

We would like to ask you some questions about your participation in these programs to help provide insight back to Focus on Energy about your experience with the program, what worked well, or improvements you might recommend. Additionally, we have questions about the program's effect on the market for renewable energy going forward.

Are you the best person at [COMPANY] to talk to about [COMPANY]'s experience with the Focus on Energy Renewable Energy programs?

1) Yes [Continue]

2) No -> Can you tell me who I should speak with? [End call if no one is familiar]

Is this a convenient time for you to talk, or would you prefer to schedule another time?

[Proceed or schedule appointment as appropriate.]

The interview should last about 20 minutes. The information you provide will be treated as confidential and will help Focus on Energy improve their design of renewable energy programs in the future.

[If needed: Offer the contact name from below as the person to contact with any questions about the validity of this research.]

Name	Phone #
Katherine R. Mitchell Program Manager, EERD	608-XXX-XXXX

With your permission, I would like to record the interview. Do I have your permission to do so? [IF NEEDED: We will use the recording to help us compile the results, in order to make sure we accurately represent your responses. No one but Tetra Tech staff will listen to the recording.]

C. Business Scope

I'd like to start with some general information about you and your company.

NOTE TO INTERVIEWER: Verify what the contractors project history with Focus on Energy before you begin the interview. Make brief notes here about number & type of installations, whether a contractor has worked with RECIP, REWARDS, or both, and what years he/she has participated in the program. Then start as needed with questions below.

1) To get us started, could you briefly tell me a little bit about your business and position?

   - (A) How long have you been in business?
   - (B) What type(s) of services do you provide?
   - (C) Do you provide services outside of Wisconsin?
   - (E) How many employees (full-time equivalents) does your company employ?

2) According to our records, and using last year as an example, in 2017 your company installed <list measures> rebated through Focus on Energy's renewable energy programs. What proportion (or percent) of your total projects in 2017 did the rebated projects represent <for each measure>?

3) For 2018, do you expect this percentage to be higher, lower, or about the same? Why do you say that?

1 Higher

2 Lower -> Is there anything Focus on Energy could do to change that?

3 About the same

D. Program Awareness, Marketing, and Recruitment

1) When did you first get involved with Focus on Energy's renewable energy programs? How did you first hear about them?

2) Who do you get most of your program information from? By program information, I mean updates on program requirements, incentive levels, any trainings being offered, for example. (Probe if through Focus on Energy staff or website, program implementation staff at CLEAResult, etc.)

3) Do you feel adequately informed of program changes?

1 Yes

2 No -> (A) How would you like to be better informed of program changes?

4) Besides Focus on Energy, are you involved with any other utility energy efficiency programs—in or outside of Wisconsin?

1 Yes -> (A) Which ones?

2 No

5) Are customers generally aware of the Focus on Energy renewable incentives prior to working with you?

1 Yes

2 No -> (A) How can Focus on Energy increase customer awareness?

6) (A) How do you present the Focus on Energy program rebates to your customers? (Probe: discussion, website information, program materials (get details about what they use, etc.)

(B) Have you ever received marketing materials from Focus on Energy to promote the program?

(C) Which methods do you think are most effective or informative for customers?

7) Do you think Focus on Energy's marketing strategies have been successful in generating program-related activity for you? How could they be improved to better serve you? What additional tools or support could Focus on Energy provide you with to better motivate participation by your customers?

E. Education and Outreach

1) Have you received enough guidance from CLEAResult and/or Focus on Energy when you needed it—especially prior to program participation?

   - (A) IF NO: What support would you like to see added or expanded (and from which entity)?

2) What type of program-specific training was made available to you and your staff, if any? Would you like to see more trainings or outreach activities offered by Focus on Energy to support the Renewable Energy programs?

   - (A) IF YES: What sort of trainings or outreach would you like to see added or expanded?

3) Are there markets that you feel Focus on Energy's Renewable Energy programs are reaching well? Are there markets that you feel the program is not reaching well?

   - Can you identify approaches that might expand the reach of the program into markets that may be underserved by the program?

F. Participation Process and Support

Now I'd like to ask you about the process of working with the Focus on Energy Renewable Energy programs.

1) Thinking of a typical Focus on Energy Renewable Energy project…

   - (A) What is the easiest part of the process?
   - (B) What would you like to see improved?

2) Next, I'm going to ask you a few scale questions. First, using a scale of 1 to 5 where 1 is 'not at all satisfied' and 5 is 'very satisfied' how satisfied are you with the program's technical support?

   - (A) [IF RESPONDENT RATES A 1 OR 2, ASK] What could be done to improve the program's technical support?

3) On a scale of 1 to 5 where 1 is 'not at all difficult' and 5 is 'very difficult', how would you rate the program's administrative requirements (e.g., paperwork) for you?

   - (A) [IF RESPONDENT RATES A 4 OR 5, ASK] What could be done to lessen the administrative burden?

4) On a scale of 1 to 5 where 1 is 'not at all difficult' and 5 is 'very difficult,' how difficult do you find it to motivate customers to purchase renewable energy equipment eligible for program incentives?

- (A) Why is renewable energy equipment (easy / difficult) to sell to customers?
- (B) What are the primary reasons why customers typically want to install a renewable energy system?
- (C) What are the primary reasons why customers typically do not want to install renewable energy equipment?

G. Market Response

1) Have your renewable energy sales changed as a result of the program? If so, how? Which types of equipment have seen the greatest change?

2) How much do you see Focus on Energy's renewable energy programs influencing the services you provide and/or the equipment you offer?

3) If Focus on Energy's programs were not available, would the equipment types or efficiency levels you most strongly recommended be any different? Why or why not? How would they be different?

4) Do you see the program increasing the interest and demand for energy efficient equipment? If so, to what degree—some increase or significant increase? Why do you say that?

5) What issue(s) may affect future program participation? [PROBE: example issues (e.g., changes to building codes and standards promoted in the Midwest, program incentive levels)].

H. Overall Program

Now I'd like to wrap up with a few final questions.

1) Using a five-point scale where 1 means "not at all satisfied," and 5 means "very satisfied," overall, how satisfied are you with Focus on Energy's Renewable Energy programs?

2) If you were to recommend anything to Focus on Energy regarding the program design or operations of its Renewable Energy programs, what would it be?

3) Is there anything else you'd like to share with us about Focus on Energy's Renewable Energy programs?

4) In case we would like to clarify anything we discussed, would it be alright if I contacted you again?

If YES, get best phone number and email address

Those are all the questions I have today. If you think of anything you would like to add, please feel free to contact us. Thank you very much for your time.

D.3 PARTICIPANT SURVEY GUIDE

FOCUS ON ENERGY RENEWABLE ENERGY PROGRAM

PARTICIPANT INTERVIEW GUIDE - FINAL

Interviewee(s):

Interviewer(s):

Program Participated In/Technology installed

Date(s):

A. Background

This guide will be used to understand the perspectives of the Focus on Energy Renewable Energy Programs participants. Interviews will be conducted with participating Focus on Energy customers that have received a program incentive working through the Renewable Rewards or RECIP program within the past year.

In-depth interviews will be conducted by senior Tetra Tech staff via telephone. The interviews will be semi-structured. Therefore, the following interview protocol is only a guide to ensure certain topics are covered, but evaluators will follow the flow of the interview and modify questions as needed to fit the interviewee's circumstance and flow of conversation.

We expect the interviews to take approximately 15 to 20 minutes. We will attempt to schedule interviews with respondents in advance to accommodate each participant's schedule.

B. Introduction

Hello, may I speak to [_____]? My name is _____, and I'm calling from Tetra Tech on behalf of the Focus on Energy Environmental & Economic Research and Development Program. We are conducting interviews with Renewable Energy customers that have participated with either the Focus on Energy Renewable Rewards and/or Renewable Energy Competitive Incentive Programs.

We would like to ask you some questions about your participation in these programs to help provide insight back to Focus on Energy about your experience with the program, what worked well, or improvements you might recommend.

Are you the best person to talk to about participating with the Focus on Energy Renewable Energy programs?

1 Yes [Continue]

2 No -> Can you tell me who I should speak with? [End call if no one is familiar]

Is this a convenient time for you to talk, or would you prefer to schedule another time?

[Proceed or schedule appointment as appropriate.]

The interview should last about 15 to 20 minutes. The information you provide will be treated as confidential and will help Focus on Energy improve their design of renewable energy programs in the future.

[If needed: Offer the contact name from below as the person to contact with any questions about the validity of this research.]

Name	Phone #
Katherine R. Mitchell Program Manager, EERD	608-XXX-XXXX

With your permission, I would like to record the interview. Do I have your permission to do so? [IF NEEDED: We will use the recording to help us compile the results, in order to make sure we accurately represent your responses. No one but Tetra Tech staff will listen to the recording.]

C. Program Awareness & Marketing

1) How did you first hear about Focus on Energy's Renewable Energy programs? When did you first hear about them?

2) Why did you ultimately decide to participate in the program (Probe: Any other reasons?)

3) Prior to participating in the Focus on Energy Renewable Energy program(s), had you previously participated in any of the other Focus on Energy programs? If yes, what impact, if any, did this experience have on your decision to participate in the Renewable Energy program option(s)?

   1 Yes -> (A) Which ones?

   2 No

Note impact other program participation had, if any:

4) How would you prefer to learn about Focus on Energy program options in the future?

D. Project Installation and Verification

Next, I want to ask you more about the equipment you installed or projects you completed as part of your program participation.

1) Our records indicate that you implemented the following projects: (LIST PROJECT(S) IMPLEMENTED)…around [DATE], is this correct?

   1 Yes

   2 No (Probe: what is incorrect?) (record below)

2) Please describe your role in deciding to implement a project through the Focus on Energy Renewable Energy program. [IF RECIP PARTICIPANT or business] Was anybody else in or

outside your organization involved in the decision to participate? (Record names of other decision-makers)

3) On a scale of 1 to 5 where 1 is 'not at all difficult' and 5 is 'very difficult,' how difficult did you find it to purchase renewable energy equipment eligible for program incentives?

- (A) [IF RESPONDENT RATES A 4 OR 5, ASK] What could be done to lessen the administrative burden?

4) Are all of the equipment items you installed through your program participation still in place and operating as intended? If not, how so and why?

1 Yes

2 No (Probe: why?) (record below)

E. Participation Process and Support

Now I'd like to ask you about the process of working with the Focus on Energy Renewable Energy programs.

1) Thinking of your specific Focus on Energy Renewable Energy project…

- (A) What was the easiest part of the process?
- (B) What would you like to see improved?

2) Next, I'd like to understand how much you worked within the actual application process. Did you complete the program application on your own, or did you receive assistance? [IF THE PARTICIPANT RECEIVED ASSISTANCE, PLEASE ASK A AND B; OTHERWISE, MOVE TO QUESTION 3]

2a From whom did you receive assistance?

2b With what did you require assistance?

3) On a scale of 1 to 5 where 1 is 'not at all difficult' and 5 is 'very difficult', how would you rate the program's administrative requirements (e.g., paperwork) for you?

- (A) [IF RESPONDENT RATES A 4 OR 5, ASK] What could be done to lessen the administrative burden?

4) Do you recall how you were notified your project was accepted and your incentive was approved? [If yes, probe for and record details. If no, skip to next section].

F. Project Decision-Making Processes/Participation Experience

Now, I'd like to ask you a few questions about your decision to participate in the Focus on Energy Renewable Energy program.

1) How long after you initially became aware of the Focus on Energy Renewable Energy program did you decide to participate in the program?

2) Did you experience any challenges or difficulties in progressing through the participation process, from start to finish?

3) Using a 1 to 5 scale, where 1 is not at all likely and 5 is extremely likely, how likely is it that you would have implemented the exact same renewable energy projects if you had not received the support from sources like the program implementer and/or your trade ally through the program? (Probe for information about impact of program support: What would you have done differently? Would the timing of the project change?)

__ (1-5)

D DON'T KNOW

R REFUSED

4) Using a 1 to 5 scale, where 1 is not at all likely and 5 is extremely likely, how likely is it that you would have implemented the exact same renewable energy projects if a rebate from Focus on Energy had not been available? (Probe for information about rebates in general: What about the other rebates through the program, specifically? What would you have done differently? Would the timing of the project change?)

__ (1-5)

D DON'T KNOW

R REFUSED

5) Using a scale of 1 to 5 where 1 is 'not at all satisfied' and 5 is 'very satisfied' how satisfied were you with the program's technical support?

- (A) [IF RESPONDENT RATES A 1 OR 2, ASK] What could be done to improve the program's technical support?

6) What hurdles did you face when deciding whether to implement this/these project(s) through the program? (Probe: initial barriers (capital, financing, management, staff resources, economy, etc.) as well as any hurdles faced moving through the participation process)

7) How did the Focus on Energy Renewable Energy program you participated in help you overcome these hurdles?

Finally, I'd like to conclude our interview today by asking you to rate your overall satisfaction with the Focus on Energy Renewable Energy program.

8) Using a 1 to 5 scale, with 1 being very dissatisfied and 5 being very satisfied, how satisfied are you overall with the Focus on Energy Renewable Energy Program you participated in? Why do you say that?

__ (1-5)

D DON'T KNOW

R REFUSED

9) Based on your experiences, which aspects of the Focus on Energy Renewable Energy program you participated in, if any, would you change? Why do you say that? (Probe: anything else?)

Those are all the questions I have today. If you think of anything you would like to add, please feel free to contact us. Thank you very much for your time.

APPENDIX E: BIBLIOGRAPHY

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