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## **Analyzing Regional Demand for Green Power – Western Wisconsin Renewable Energy Survey Report**

By Shelly Hadley; David Trechter; James Janke; Denise Parks and Ramona Gunter

Hadley, Janke, Parks and Gunter are Researchers at the University of Wisconsin (UW)-River Falls and Trechter is Director of UW-River Falls Survey Research Center/Chair, Agricultural Economics Department, UW-River Falls.

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# **Analyzing Regional Demand for Green Power - Western Wisconsin Renewable Energy Survey Report**

**Shelly Hadley  
David Trechter  
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## Executive Summary

In January 2008, the Survey Research Center (SRC) at the University of Wisconsin – River Falls mailed surveys to 145 public entities in western Wisconsin seeking input on their current and potential demand for electricity generated from renewable or “green” sources. The initial mailing was followed by post card reminders, a second survey mailing, and phone calls to non-responding organizations. The overall response rate was a strong 61 percent (88 completed questionnaires). The estimates provided in this report should be accurate to within plus or minus 6.6 percent.

Public organizations (municipalities, hospitals/clinics, schools and universities) were asked to complete a one-page questionnaire designed to determine current demand for energy coming from renewable sources and anticipated future demand for energy from such sources. A limited number of organizations were able to provide information regarding the total kilowatt-hours of electricity used by their organization and the percentage coming from renewable sources for the calendar year 2006. Most organizations, however, signed a release that allowed their energy provider to give this information to the SRC. Ten utility providers were contacted requesting assistance with the study. All ten of the providers contacted cooperated by sending the requested information. This step in the process, however, was a lengthy one. Collecting this information from energy providers added an additional thirteen weeks to the study. This report summarizes the 88 questionnaires that were returned.

- Most organizations have not set a goal for kilowatts coming from renewable sources in the future. Only three percent reported setting a goal, and of those, goals ranged from 25% to 100% renewable energy use.
- None of the organizations (with renewable energy goals) reported a preference for or importance of producing such energy on-site (e.g. solar panels on their roof). Three organizations (with renewable energy goals) do have a preference for sourcing that energy from a Wisconsin provider and two organizations want to purchase energy from a provider within their county.
- These public organizations do not appear to be very price sensitive when it comes to purchasing renewable energy. Few organizations would change their renewable energy block purchase if the price increased or decreased by one dollar (based on variations from a common price for energy blocks of \$3.00/300 kWh).
- The average kilowatt-hours of electricity used by an organization for the calendar year 2006 was 1,812,889 kWh/year. The highest usage reported was 16,316,356; the lowest reported was 7,360 kWh/year. Of the electricity used, the average percentage coming from renewable sources was 7.32%. The highest percentage reported was 25%, the lowest 2.5%.

This survey indicates that most public organizations have not set a goal for kilowatts coming from renewable sources in the future, nor do they know their annual energy usage. Both of these factors highlight a need for increased education and information regarding renewable energy resources.

Finally, the responses summarized in this report are from public entities who responded to the survey. As such, the SRC cannot state if private companies are more likely to have set renewable energy goals. Therefore, the conclusion that increased education is needed regarding renewable energy at western Wisconsin public organizations may not apply to all sectors.

## **Background**

One of the most significant lessons for potential renewable energy developers is that renewable energy products, project and business success is highly dependent upon identification, quantification and qualification of markets. One way to improve your understanding of local markets for renewable energy is to work with a University Extension office or other agency to implement a survey. This project provides a template for developing such a survey and includes a step by step guidebook for implementing such as survey.

For renewable energy, doing market analysis is often more challenging than other forms of business. Headlines that focus upon “dramatic” trends and events, misleading conventional wisdom, and a history of cheap energy have distorted many consumer perceptions regarding energy consumption and options. Good market information is difficult to obtain. What information does exist is often proprietary and not widely available for specific geographic markets. A local survey can help you get a more realistic idea of what the actual market is for renewable energy in your community or region.

Developing renewable energy projects requires not only raising significant amounts of capital and complying with a multitude of regulations, but also requires identifiable market opportunities. In order to encourage renewable energy business development, economic development educators and others can assist by helping to overcome the hurdle of inadequate market information. If a potential developer is able to have confidence in the nature, scale and scope of potential markets, they have the opportunity to develop a stronger business model and plan. Confidence in the characteristics of markets also helps satisfy concerns in the financial markets regarding size and riskiness of a project’s potential revenue stream.

One promising market for renewable energy developers is thought to be local units of government. Local governments are under pressure by their constituencies to provide leadership on energy issues and climate change. Often times these concerns lead to policies requiring the local or state unit of government to source a given percentage of renewable energy by a certain date. Conducting a comprehensive study of municipal and institutional demand for “green” energy can serve as an important step in identifying and characterizing a potentially significant local market for renewable energy.

The scope of this case study research includes Western Wisconsin target markets that are familiar with providing information to the public: municipalities, public and non-governmental institutions. These potential markets, should they express a desire to purchase renewable energy, would also represent financially stable and potentially, long-term customers.

The information and analysis from primary research such as this survey can provide prospective developers insight regarding the scope and scale of renewable energy markets. Using this information to develop marketing strategy, revenue projections and project development plans can form the basis for a successful renewable energy firm, and perhaps a significant industry in the region.

## **Survey Purpose**

The motivation for this study was to obtain increased knowledge of actual and potential demand for green power in western Wisconsin. The survey was designed to determine current demand for energy coming from renewable sources and anticipated future demand for energy from such sources among key public organizations in western Wisconsin. UW-Extension chose to work with the Survey Research Center

(SRC) at the University of Wisconsin – River Falls to survey public organizations regarding green power within western Wisconsin.

## Survey Methods

In January 2008, the Survey Research Center (SRC) at the University of Wisconsin – River Falls mailed surveys to 145 public entities in western Wisconsin seeking their input on the current and potential demand for green power within western Wisconsin. After two weeks, the SRC mailed postcards to organizations in which a completed questionnaire had not been received. A second questionnaire was sent to remaining non-respondents in February. Follow-up phone calls were made in late February and early March to organizations who had not returned the survey to the SRC. In some cases, the phone calls led to a third survey being sent to an organization for completion. The SRC received a total of 88 completed questionnaires from organizations for a 61 percent response rate. The estimates provided in this report are expected to be accurate to within plus or minus 6.6 percent with 95 percent confidence.

**Appendix A contains a copy of the survey questionnaire.**

## Profile of Respondents

The target population of this study was public organizations in western Wisconsin counties served by the West Central Wisconsin Regional Planning Commission (WCWRPC). In particular, county governments, school districts, municipalities, hospitals/clinics, and post-high school educational organizations were included in the study. The SRC identified the individuals within the targeted organizations from whom we could obtain the needed information (i.e., city engineer, district administrator, clerk/treasurer etc.). Table 1 summarizes the total population and response by each type of public organization. Of the 88 responses we received, 38 came from municipalities (43 percent of the sample), 35 from school districts (40 percent), 5 from counties (6 percent), 5 from hospitals/clinics (6 percent), and 5 from post-high school institutions (6 percent). School districts had the highest response rate and hospitals/clinics the lowest.

<b>Table 1: Population and Response</b>				
<b>Type of Organization</b>	<b>Total Population</b>	<b>Total Response</b>	<b>Percentage Returned by Type of Org.</b>	<b>Percentage of Sample</b>
Municipalities	67	38	57%	43%
School Districts	44	35	80%	40%
Counties	7	5	71%	6%
Hospitals/Clinics	16	5	31%	6%
Post-High School Educ. Instit.	11	5	45%	6%
<b>TOTAL</b>	<b>145</b>	<b>88</b>	<b>61%</b>	<b>100%</b>

## Background

### Renewable Portfolio Standard

Suppliers of electric energy that serve western Wisconsin are under state mandates to have a minimum percentage of the energy they deliver coming from renewable resources. In 1998, the state of Wisconsin passed legislation that set a 50-megawatt renewable capacity target for part of the state that was to be on line by 2000. The state enacted a second renewable portfolio standard (RPS) statute applicable statewide requiring that renewable energy make up 2.2 percent of retail electric sales in Wisconsin by 2011. In March 2006, Wisconsin increased its RPS to 10 percent by 2015.<sup>1</sup> According to October 2007 Public Service Commission of Wisconsin (PSC) data, Wisconsin utilities generated about four percent of the state's electricity from renewable resources, less than half of the renewable portfolio standard requirements for the year 2015.<sup>2</sup>

Xcel Energy was the utility provider for 53% of responding organizations. Their renewable portfolio standard is as follows: The new renewable portfolio standard (RPS) requires Northern States Power Company (wholly owned subsidiary of Xcel Energy Inc. which distributes its electricity to retail customers in northwestern Wisconsin and in the western portion of the Upper Peninsula of Michigan.) to have a total of 12.85% of retail sales from renewable sources by 2015. This is a six percent increase from their current baseline of 6.85%. The baseline value is comprised of the average renewable sales, as a percentage of total retail sales, for the calendar years 2001, 2002, and 2003.<sup>3</sup>

### Current Demand and Future Demand for Renewable Energy by Public Entities in Western Wisconsin

A set of public entities were identified to focus on in this project. Schools (including post-secondary institutions), hospitals/clinics, counties, and incorporated municipalities in western Wisconsin counties served by the West Central Wisconsin Regional Planning Commission (WCWRPC) were selected. The organizations were asked the following about current and future energy use in their organization:

- Has the public entity set a goal for kilowatts coming from renewable sources in the future?
- If a goal has been set, what is that goal in terms of the number or percent of kilowatts coming from renewable sources and what is the timeline to achieve this goal?
- Does the organization's energy policy place any emphasis or importance on sourcing energy on site, or purchasing from a provider within their county, or within Wisconsin?
- If the prices of purchasing renewable energy blocks would increase/decrease by one dollar, how much would the organization reduce/increase their renewable energy block purchase?
- Calendar year 2006 total kilowatt-hours of electricity use
- Of the electricity used, what proportion came from renewable sources?

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<sup>1</sup> [http://www.ucsusa.org/assets/documents/clean\\_energy/Wisconsin.pdf](http://www.ucsusa.org/assets/documents/clean_energy/Wisconsin.pdf)

<sup>2</sup> Public Service Commission of Wisconsin (October 4, 2007). "PSC Releases Results on Renewable Energy Compliance." Press Release  
<http://psc.wi.gov/pdf/files%5CNews%20Releases%5C2007%5C10%20October%5CRenewable%20Portfolio%20Standards%20Compliance.pdf>

<sup>3</sup> Information provided by Mgr. of Regulatory. Xcel Energy. Northern States Power Company based in Minneapolis, Minnesota is a subsidiary of Xcel Energy.

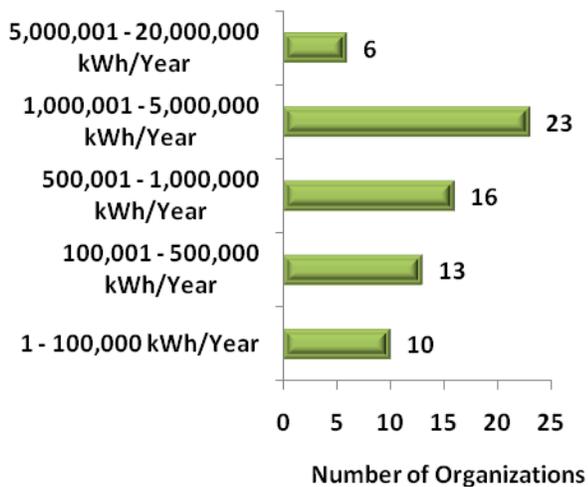
## Kilowatt-Hours of Electricity

Obtaining an organization’s electricity usage has been a somewhat challenging endeavor. Most organizations were not able to provide directly their electricity usage or the percentage that comes from renewable sources. A “don’t know” option was provided that also requested the organization to give the SRC permission (signature, title, and name of their utility provider) to access electricity usage information from their energy provider.

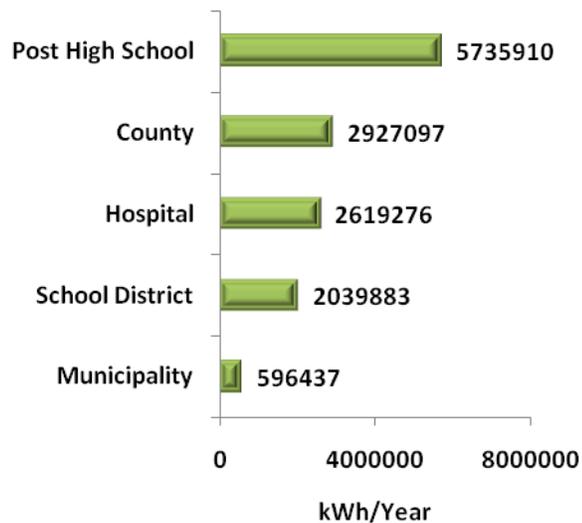
Three-fourths of participating organizations gave the SRC permission to access information from their utility provider. Based on provider data received from the organizations, ten utility providers were contacted requesting assistance with the study. Most utility providers were asked to provide information for one or two entities; however, one provider was requested to provide information for 47 public organizations.

Electricity usage data from sixty-eight organizations shows that annual kilowatt-hours of electricity used in calendar year 2006 ranged from 7,360 kWh/year to 16,316,356 kWh/year (Chart 1). On average, the typical organization used 1,812,889 total kilowatt-hours of electricity in calendar year 2006.<sup>4</sup> Only two organizations had electricity usage of 10,000 kWh or less while nearly half (43%) of the 68 organizations report using one million or more kWh/year. The average electricity usage by type of organization can be found in Chart 2.

**Chart 1: Total Kilowatt-Hours of Electricity in Calendar Year 2006 for 68 Western Wisconsin Public Entities**



**Chart 2: Average Kilowatt-Hours of Electricity in Calendar Year 2006 by Organization Type**

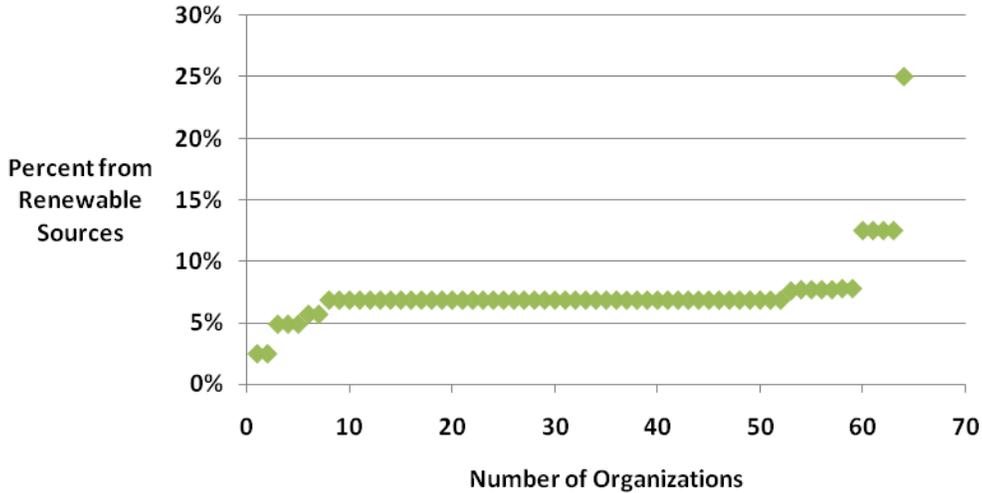


<sup>4</sup> Meter read dates were variable. For example, some organizations have their meters read early in the month (reflecting energy use in the previous month) and other later in the month (reflecting energy use in current month). The SRC attempted to make the energy usage information as uniform as possible for analysis.

## Percentage from Renewable Sources

Organizations were asked what percentage of the electricity they used in 2006 came from renewable sources. We received renewable energy usage information for 64 organizations. The lowest renewable energy usage reported (above zero) was 2.5%, the highest 25%, and the average 7.32% (Chart 3).<sup>5</sup> It should be noted that not all energy providers in the region have programs that allow customers to buy additional blocks of renewable energy.

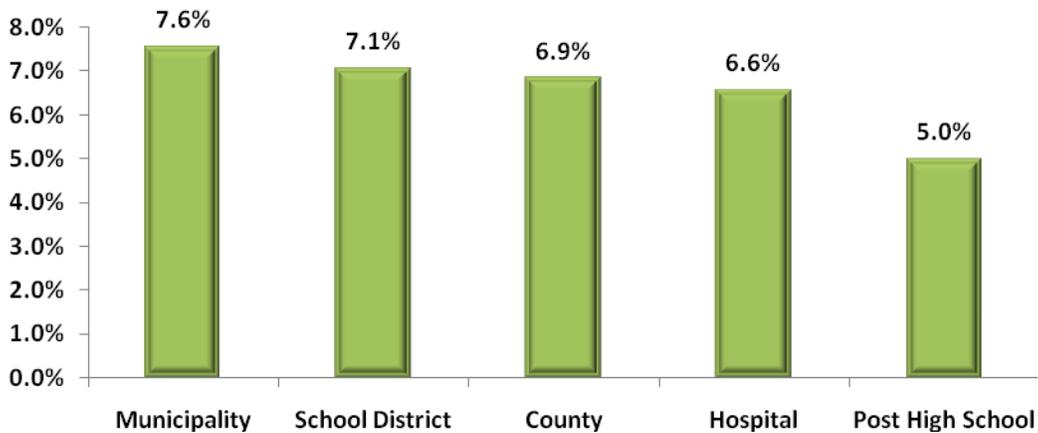
**Chart 3: Percentage of Electricity Used Coming From Renewable Sources for Calendar Year 2006**



◆ At least 2.2% of the Electricity Sold in 2011 Must Be Derived from Renewable Energy Resources Based on Wisconsin's Renewable Portfolio Standard (RPS). Wisconsin Has Increased Its RPS to 10% by 2015.

The average percentage of electricity used coming from renewable sources by type of organization is shown in Chart 4.

**Chart 4: Average Percentage of Electricity Used Coming From Renewable Sources for Calendar Year 2006 by Organization Type**



<sup>5</sup> In the case of renewable energy usage, Xcel Energy (the utility provider of over a majority of responding organizations) informed the SRC that it would be appropriate to use a 6.85% baseline from renewable sources for their Wisconsin accounts.

## Goal for Kilowatts Coming From Renewable Sources

The first section of the survey presented questions regarding an organization’s goal for renewable energy usage. Three percent of organizations reported that their organization has set a goal for kilowatts coming from renewable sources in the future. A school district, a county, and a post high-school institution reported renewable energy organization goals.

Only two organizations provided the actual ‘annual percentage of use’ that their organization has set as a goal for kilowatts from renewable energy sources. Both were educational institutions, one a school district (with a goal of 25%), the other a higher education institution (with a goal of 100%). With such few organizations reporting renewable energy goals, there are ample opportunities for educational efforts to help organizations identify renewable energy goals. However, as noted earlier, not all energy providers in the region have programs that allow customers to buy additional blocks of renewable energy. In order to expand the use of renewable energy beyond the legislatively mandated level of 10% by 2015, providers will need to be persuaded to offer renewable energy purchase programs.

### Achieve Goal

Three organizations provided the actual year that they hope they will achieve their goal for renewable energy source usage. One organization wants to meet their goal this year, 2008; another in 2010 and the third in 2012.

### Energy Source Emphasis

To gauge the energy policies behind an organization’s renewable energy goal, we asked respondents if they place any emphasis or importance

<b>Table 2: Energy Source Emphasis</b>			
	<b>Count</b>	<b>Yes</b>	<b>No</b>
On site (ex. solar panels on roof)	3	0%	100%
Purchasing from provider within county	3	67%	33%
Purchasing from provider within Wisconsin	3	100%	0%

on getting renewable energy from particular sources. None of the three organizations that responded to this question report placing emphasis on “on site” energy sources. All three organizations said that they placed importance on purchasing from a provider in Wisconsin and two organizations placed emphasis on purchasing from a provider within their County (Table 2). In short, the few public organizations with renewable energy goals are interested in generating their own kilowatts but would like to see the economic stimulus created by their purchase to benefit their local area or the state of Wisconsin generally.

### Price Increase/Decrease

A common current price for renewable energy blocks is about \$3.00/300 kWh. Organizations were asked if this price rose to \$4.00/300 kWh by how much do they think their organization would reduce their renewable energy block purchase. The first item in Table 3 summarizes their responses to an increase in the price of block purchases. The majority of organizations are relatively tolerant of price increases associated with renewable energy. Almost three-fourths of organizations (72%) said they would not change their renewable energy block purchase if the price were to increase.

A subsequent question asked if the price of renewable energy blocks decreased from \$3.00/300 kWh to \$2.00/300 kWh by how much do they think their organization would increase their renewable energy block purchase. The results in the second item of Table 3 suggest that while 75% would not increase their purchase, one-fourth would increase their purchase. This shows that while cost may not be the determining factor with respect to the purchase of renewable energy blocks for most organizations, it is still important to a sizeable number.

It should be noted that the prices used in the survey are for illustrative purposes only to examine price sensitivity, what economists call elasticity. Because relatively few organizations currently purchase additional blocks of renewable energy, the results in Table 3 may not truly capture their price sensitivity. There were no statistically significant differences in the responses to these questions based on the type of organization.

<b>Table 3: Renewable Energy Blocks: Increase or Decrease Purchase Based on Price</b>						
	<b>No Change</b>	<b>1-10%</b>	<b>11-25%</b>	<b>26-50%</b>	<b>51-75%</b>	<b>76-100%</b>
Currently a common price for renewable energy blocks is about \$3.00/300 kWh. If this increased to \$4.00/300 kWh by how much do you think your organization would <b>reduce</b> your renewable energy block purchase?	72%	10%	6%	8%	1%	3%
If the price of renewable energy blocks decreased from \$3.00/300 kWh to \$2.00/300 kWh by how much do you think your organization would <b>increase</b> your renewable energy block purchase?	75%	8%	5%	5%	5%	2%

### **Additional Comments**

Although there was not an open-ended comment section on the survey, a few organizations did write comments regarding renewable energy. Their comments are listed below:

From school districts:

“We are using much biomass. We use wood to heat and cool our schools. New absorption chiller.”

“We have received Clean Renewable Energy Bonds (CREB) to build a windmill. We do have a hydroelectric dam.”

From a municipality:

“Some areas are implementing change where possible.”

## Conclusions

The data collected from the Western Wisconsin Renewable Energy survey suggest that more education and information is needed regarding renewable energy resources.

- This survey was designed to determine current demand for energy coming from renewable sources and anticipated future demand for energy from such sources and most organizations did not know their current (2006) usage nor have they set a goal for renewable energy usage.
- None of the organizations (with renewable energy goals) reported placing any emphasis or importance on sourcing energy from on site (such as solar panels on the roof). All three organizations (with renewable energy goals) emphasize sourcing that energy from a Wisconsin provider and two want to purchase energy from a provider within their county.
- Few organizations would change their renewable energy block purchase if the price increased or decreased by one dollar (based on variations from a common price for energy blocks of \$3.00/300 kWh).
- If additional blocks of renewable energy are to be purchased by public organizations, a key provider that serves more than half of the organizations included in this sample would need to be convinced to offer such a program.

It should be noted that the results summarized in this report come from public organizations. We cannot state if private companies are more likely to have set renewable energy goals. So, the conclusion that increased education is needed regarding renewable energy at western Wisconsin public organizations may not apply to all sectors.

The opportunities for additional research are varied. Further understanding of real and potential demand for green power in the Western Wisconsin private sector would complement the research regarding public institutions. In addition, research can be done to identify current and expected future residential renewable energy usage. Finally, this data can provide a baseline for future renewable energy research involving public entities in Western Wisconsin.

# Appendix A: Questionnaire

## WESTERN WISCONSIN RENEWABLE ENERGY SURVEY

**\*\*PLEASE RETURN BY FEBRUARY 1, 2008\*\***

Using blue or black ink, please fill the circle that most closely describes your perspective on the following:

Please fill the circle:

Like this: ● Not like this: ✓ ✗ /

- |  |  |  |               |               |               |                |
|--|--|--|---------------|---------------|---------------|----------------|
| <p>1. Has your organization set a goal for kilowatts coming from renewable sources in the future (defined as wind, solar, biomass, or hydro)?</p>  | <p>Yes → <b>Go to Q1a</b></p> <p style="text-align: center;">○</p> | <p>No → <b>Go to Q4</b></p> <p style="text-align: center;">○</p> |               |               |               |                |
| <p>1a. What is your organization's goal for kilowatts from renewable energy sources by <u>annual percentage of use</u>?</p>  | <p>Goal - Annual Percentage of Use _____ %</p>                     |  |               |               |               |                |
| <p>1b. <b>OR</b> by <u>annual kilowatt-hours</u>?</p>  | <p>Goal - Annual Kilowatt-Hours _____<br/>(kWh/year)</p>           |  |               |               |               |                |
| <p>2. By when do you hope to achieve your goal?</p>  | <p>Goal - Year _____</p>   |  |               |               |               |                |
| <p>3. In achieving your organization's goal for renewable energy, does your energy policy place any emphasis or importance on sourcing that energy from:</p>   | <p>Yes</p>   | <p>No</p>  |               |               |               |                |
| <p>a. On site (for example, solar panels on the roof)</p>  | ○  | ○  |               |               |               |                |
| <p>b. Purchasing from a provider within your County</p>  | ○  | ○  |               |               |               |                |
| <p>c. Purchasing from a provider within Wisconsin</p>  | ○  | ○  |               |               |               |                |
| <p>4. Currently a common price for renewable energy blocks is about \$3.00/300 kWh. If this increased to \$4.00/300 kWh by how much do you think your organization would <b>reduce</b> your renewable energy block purchase?</p> | <p>No<br/>Change</p>   | <p>1-10%</p>   | <p>11-25%</p> | <p>26-50%</p> | <p>51-75%</p> | <p>76-100%</p> |
|  | ○  | ○  | ○             | ○             | ○             | ○              |
| <p>5. If the price of renewable energy blocks decreased from \$3.00/300 kWh to \$2.00/300 kWh by how much do you think your organization would <b>increase</b> your renewable energy block purchase?</p>                         | ○  | ○  | ○             | ○             | ○             | ○              |

6. How many total kilowatt-hours of electricity did your organization use in calendar year 2006? \_\_\_\_\_ (kWh/year) Don't Know  
**If you do not know, please fill-in "Don't Know" circle**

6a. Of the electricity used, what percentage came from renewable sources (defined as wind, solar, biomass, or hydro)? \_\_\_\_\_ % Don't Know  
**If you do not know, please fill-in "Don't Know" circle**

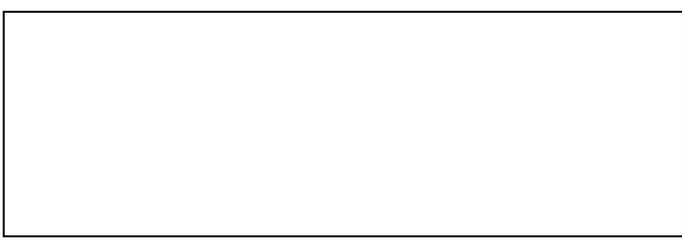
• If you answered "Don't Know" to Question 6 or Question 6a (above), do we have permission to access this information from your energy provider? If yes, please provide your signature and title. Yes No

Signature: \_\_\_\_\_

Title: \_\_\_\_\_

7. Who is your organization's utility provider? \_\_\_\_\_

**Thanks for completing the survey!**  
 Please return your survey by **xxxxxx, 2008** to:  
 Survey Research Center - University of Wisconsin - River Falls  
 410 S. Third St. 124 Regional Development Institute  
 River Falls, WI 54022-5001



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