

Wood County Renewable and Sustainable Committee

Date: Friday, July 12, 2019

Time: 10:00 am

Location: Room 115, Wood County Courthouse

- 1) Call to order
- 2) Identify who will take meeting minutes
- 3) Identify Chair and Vice Chair
- 4) Public comments
- 5) Review committee composition and charge
- 6) Review current Wood County energy initiatives
 - a. Wood County energy website
 - b. Wood County efficiency and renewable grant program
 - c. SolSmart
 - d. National Renewable Energy Labs (NREL)
- 7) Future agenda items
- 8) Next meeting
- 9) Adjourn



Renewable and Sustainable Committee

Draft: Role and Responsibilities of the Renewable and Sustainable Committee

Prepared by: Jason R. Grueneberg, Director of Planning & Zoning – 2019-6-4

1. Review annual County grant requests
 - a. Annual Sustainable and Renewable Grant requests
 - b. Annual Lean Process Improvement Grant requests
- ~~2. Identify sources of renewable and sustainable grants~~
- ~~3. Promote sustainable and renewable programs~~
 - ~~a. SolSmart resource/implementation~~
 - ~~b. Property Assessed Clean Energy (PACE)~~
 - ~~c. Solar Group Buy~~
 - ~~d. Choose to Reuse~~
 - ~~e. Clean Sweep~~
 - ~~f. Consider implementation of Green Tier Legacy County~~
4. Serve as conduit for renewable and sustainable projects for consideration brought forward by County Board Supervisors and staff, as well as the general public
5. Create web page sharing sustainable and renewable resources (almost complete)
- ~~6. Set examples for residents and businesses – catalyst projects~~
- ~~7. Provide and facilitate sustainable and renewable resources~~
8. Develop a sustainable and renewable plan/strategy for Wood County – Adoption by Executive Committee and County Board
 - a. Develop a sustainable and renewable Capital Improvement Plan
- ~~9. Establish sustainable and renewable goals~~
10. NOTE: Meet quarterly or as-needed
11. NOTE: No budget anticipated – Budget considerations could include continuing education opportunities as well as funds to be applied towards planning activities to be facilitated by a consultant



Renewable and Sustainable Committee

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Prepared by: Jason R. Grueneberg, Director of Planning & Zoning – 2019-4-3

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Wood County Renewable and Sustainable - Current Initiatives

June 2019

1. Efficiency and renewable grants
 - a. \$25,000 in grant funds can be requested through the county for department heads to use on projects.
 - b. Application deadline is in September.
 - c. **R&S committee** Are more outreach efforts needed prior to the application deadline?
 - d. **R&S committee** to review grant applications and make recommendations to Executive Committee.
2. SolSmart
 - a. County is seeking "solar-ready" designation at the Gold level.
 - i. Requires permitting and ordinance review, setting goals, and 200 points that include outreach/education efforts.
 - ii. County has the needed 150 points but still needs to complete some required actions.
 - iii. **R&S committee** needs to set goals.
3. National Renewable Energy Labs (NREL)
 - a. Technical and economic analysis of solar photovoltaic (PV) options were offered at no cost to the county with participation in SolSmart.
 - b. Analysis occurred at 4 of 5 county sites including Red Sands, NEPCO Park, County Highway Dept., and Norwood facilities. Recommendations were not yet optimized by NREL to balance electrical use and system output.
 - c. NREL cost and payback time did not include RECIP grants that could provide up to 50% cost share for larger projects.
 - d. **R&S committee** should review options and make recommendations to Executive Committee.
4. County Energy Website providing information and guidance related to energy efficiencies and renewable energy.
 - a. Initiated through SolSmart effort
<https://www.co.wood.wi.us/Departments/UWEX/Energy.aspx>
 - b. **R&S committee** should periodically recommend updates.



County of Wood

Courthouse - 400 Market Street

Wisconsin Rapids, WI 54495-8095

2019 Wood County Renewable and Sustainable Grant (RSG)

Applicant Organization: [Click here to enter text.](#)

Contact Person/Title: [Click here to enter text.](#)

Contact Person Telephone: [Click here to enter text.](#) Email: [Click here to enter text.](#)

The purpose of the 2019 Renewable and Sustainable Grant (RSG) Fund

The purpose is to promote creative and innovative approaches that implement renewable and sustainable practices in Wood County government departments and facilities. Wood County is making \$25,000 available in 2019 for renewable and sustainable projects that can serve as catalysts for future renewable and sustainable projects. Grant requests can be made for any amount of \$25,000 or less. A department may submit more than 1 project application and multiple RSG projects may be funded.

****Grant applications are due by May 24th, 2019 at 4:30pm, and can be submitted to the Wood County Clerk's Office.***

Sustainable practices meet today's needs without compromising the ability of future generations to meet their own needs.

Renewable resources are commodities or resources that are replaceable or replenishable by biological reproduction or reoccurring processes.

Request Overview - Provide a summary overview of your proposed project and explain how it is consistent with the purpose of this grant fund.

Criteria	4 (Excellent)	3 (Above Average)	2 (Average)	1 (Unsatisfactory)	Score
Innovation is apparent. Activities/strategies are creative and unique. Demonstrates how the project is consistent with the grant goals.	Highly creative, unique and/or innovative. May serve as catalyst for future renewable and sustainable projects.	Somewhat creative, unique and/or innovative. May be something done before but contains some originality.	Few components contain creative, unique or innovative approaches.	Lacks creativity or innovation. Common request.	

(If you require additional space, attach separate sheet.)

Return on Investment - Explain how the proposed project will provide a Return on Investment (ROI) to Wood County. ROI should address the measurable financial impact to the County, as well as any non-financial impacts. ROI can be measured over an extended period of time of 1 year, 5 years, and 10 years or longer if necessary. Please be as specific as possible.

Criteria	4 (Excellent)	3 (Above Average)	2 (Average)	1 (Unsatisfactory)	Score
Clearly identifies the need of the proposed project and how it will accomplish the goal of the grant while providing a return on investment to Wood County.	Clearly identifies specific data that shows how the project will provide a ROI while aligning with the purpose of the grant.	Specific with some data to support the proposed project and how it will provide a return on investment.	Mentions a general statement of need but provides no supporting data.	Provides no information on the need of the project or how the project will provide a return on investment.	

(If you require additional space, attach separate sheet.)

Leveraged or Matching Funds – Are leveraged funding sources or matching funds being applied to the proposed project? If so please explain the amount of funding and the source.

Criteria	4 (Excellent)	3 (Above Average)	2 (Average)	1 (Unsatisfactory)	Score
Clearly identifies any leveraged or matching fund sources being applied to the proposed project.	Clearly identifies leveraged or matching funds with supporting data.	Specific sources for leveraged or matching funds with some supporting data.	Mentions leveraged or matching funds with no supporting data.	Provides no leveraged or matching funds.	

(If you require additional space, attach separate sheet.)

Project Funding Request Summary

(If you require additional space, attach separate sheet.)

	Requested Funding	Total Organization Budget	Other Funding – e.g. grants, volunteers, donations
Wages & Benefits			
Office Supplies & Expenses			
Professional Services			
Conferences & Dues			
Misc. or Other			
Total			

Project Reporting Requirement – On approval of the grant funding request, the applicant will submit a 1-page timeline and implementation strategy to the Executive Committee. On completion of the RSG Grant, a 1-page summary will be prepared and presented to the Wood County Executive Committee to be reviewed at their regularly scheduled June meeting.

SOLSMART APPLICATION:

Modified Pathway



The Modified Pathway is designed for communities that do not control permitting, planning and zoning, and/or inspection processes. If your community does control these processes, please use our Standard Designation application.

There are three levels of SolSmart designation for communities – below are the requirements for each:

BRONZE:

- Complete four prerequisite actions:
 - Solar Statement (PR-1)
 - Planning and zoning guidance (PR-2)
 - Inspection checklist (PR-3)
 - Permitting training (PR-4)
- Earn a total of 40 points from actions across the four Special Focus Categories: Solar Rights; Utility Engagement; Community Engagement; and Market Development and Finance.

SILVER:

- Fulfill SolSmart Bronze prerequisites.

- Complete the Silver planning prerequisite (PR-5).
- Earn 80 points overall from actions taken in the Special Focus Categories.

GOLD:

- Fulfill SolSmart Silver prerequisites.
- Earn 150 points overall from actions taken in the Special Focus Categories.

SPECIAL AWARDS:

- Communities that earn 60% of the points in a given category are eligible for special recognition.

Community Data

Community applying:

State:

Community website:

Population:

Other solar awards/recognition earned by community:

kW of installed solar or number of installations:

Contact Information

Local contact:

Contact title:

Organization:

Department:

Contact email:

Contact phone:

☐ I am authorized to apply for and seek recognition for my community.

☐ I understand that community data submitted through this application will be shared online.

SOLAR STATEMENT (PR-1)

PR-1: Solar Statement – Required for all levels of designation

Our Solar Statement: *(Cut and paste your Solar Statement in the box below)*

Communities interested in pursuing SolSmart designation must indicate their commitment to supporting solar development in their community.

These letters should include:

- *A commitment to participate in the SolSmart designation process*
- *A statement of solar goals, areas of focus or community priorities (e.g. Encouraging solar PV development on vacant lots or supporting non-profit led initiatives)*
- *Past achievements or programs related to solar PV and/or renewable energy*
- *Commitment to tracking metrics related to solar PV and/or provide benchmark of available solar metrics (i.e. number of installed municipal systems or growth in residential installations)*
- *A commitment of staff time and resources to improve the local environment for solar PV*

These letters do not need to be more than a page in length. SolSmart encourages you to use the [Solar Statement template](#).

Documentation: *(Please share a link to a public webpage where your Solar Statement is displayed or attach it as a document.)*



ADDITIONAL PREREQUISITES

- To earn SolSmart Bronze designation - complete **PR-2, PR-3, and PR-4.**
- To earn SolSmart Silver designation - complete all Bronze prerequisites and **PR-5.**

Action	Points	We've done this!	Documentation
<p>Planning and Zoning Guidance</p> <p>PR-2: Provide guidance on planning, zoning and development best practices to communities in the county through webinars, in-person meetings, one-on-one calls or trainings.</p>	Req'd for Bronze	<input type="checkbox"/>	Share link:
<p>Inspection Checklist</p> <p>PR-3: Collaborate with local inspection departments to develop an inspection checklist for the region, and share results publicly through webinars, in-person meetings, training and/or the county's website. Encourage communities to integrate the checklist into their inspection processes.</p>	Req'd for Bronze	<input type="checkbox"/>	Share link:
<p>Permitting Training</p> <p>PR-4: Host regional training or discussion on best practices in permitting for communities in the county.</p>	Req'd for Bronze	<input type="checkbox"/>	Share link:
<p>Silver Planning Prerequisite</p> <p>PR-5: Incorporate solar into county-wide comprehensive plans and/or economic development plans, including quantifiable targets or metrics.</p>	Req'd for Silver & Gold	<input type="checkbox"/>	Share link:


SPECIAL FOCUS CATEGORIES

- To earn SolSmart Bronze designation – **achieve 40 points** (and complete PR-1, PR-2, PR-3 and PR-4).
- To earn SolSmart Silver designation – **achieve 80 points** (and complete all Bronze prerequisites and PR-5).
- To earn SolSmart Gold designation – **achieve 150 points** (and complete all Bronze and Silver prerequisites).


Special Focus: Solar Rights

Action	Points	We've done this!	Documentation
SR-1: Conduct review of state policies related to protecting rights of property owners to install solar and solar system owners' right to sunlight on their property. Make this information available to residents.	5	<input type="checkbox"/>	Share link:
SR-2: Provide consumer protection resources on solar PV which help consumers make informed solar PV purchasing decisions.	5	<input type="checkbox"/>	Share link:
SR-3: Develop local process to enable solar rights through a solar access ordinance.	10	<input type="checkbox"/>	Share link:
SR-4: Offer procedure for recording solar easements for property owners.	10	<input type="checkbox"/>	Share link:
SR-5a: Engage homeowners and neighborhood associations and discourage unnecessarily restrictive requirements for solar PV through meetings with leadership.	10	<input type="checkbox"/>	Share link:
➤ Earn additional points: SR-5b: Encourage subdivisions to consider shared solar allowances.	5	<input type="checkbox"/>	Share link:
➤ Earn additional points: SR-5c: Work with homeowners associations to develop appropriate guideline documents for solar PV.	5	<input type="checkbox"/>	Share link:
Total Points: Add up the total number of points you believe you have achieved in this category.			


Special Focus: **Utility Engagement**

Action	Points	We've done this!	Documentation
U-1: Review best practices for integrating interconnection with electrical inspections and share best practices with staff.	5	<input type="checkbox"/>	Share link:
U-2: Discuss community or shared solar PV programs with the local utility.	10	<input type="checkbox"/>	Share link:
U-3a: Engage and communicate with the utility on community goals for solar PV, net metering, and interconnection processes.	10	<input type="checkbox"/>	Share link:
 Earn additional points: U-3b: Coordinate with regional organizations or other local governments to engage utilities.	5	<input type="checkbox"/>	Share link:
U-4: Coordinate utility and city inspections for solar PV, reducing the total number of inspections needed.	20	<input type="checkbox"/>	Share link:
U-5: Launch and support a utility-provided community solar program.	20	<input type="checkbox"/>	Share link:
Total Points: Add up the total number of points you believe you have achieved in this category.			

Special Focus: Community Engagement

Action	Points	We've done this!	Documentation
CE-1: Convene an active energy task force or solar working group that meets at least three times per year.	10	<input type="checkbox"/>	Share link:
CE-2: Create a solar landing page on local government's website with information on the community's solar goals and local resources for solar development.	10	<input type="checkbox"/>	Share link:
CE-3: Encourage solar PV on non-profit or community facilities through fee waivers, technical assistance, or other support.	10	<input type="checkbox"/>	Share link:
CE-4a: Support or host a community-group purchase program (e.g., Solarize).	20	<input type="checkbox"/>	Share link:
 Earn additional points: CE-4b: Design program or create financing support options to encourage low-to-moderate income participation in community solar initiatives.	10	<input type="checkbox"/>	Share link:
CE-5a: Host a solar workshop open to the general public and/or local government staff explaining solar PV opportunities and policies.	5	<input type="checkbox"/>	Share link:
CE-5b: Create and distribute educational materials at relevant community events and through local government channels.	5	<input type="checkbox"/>	Share link:
CE-5c: Establish partnerships with local non-profits or organizations on solar PV with multi-year goal or planned initiatives.	5	<input type="checkbox"/>	Share link:
CE-5d: Publicly encourage community solar projects or solar PV projects on community facilities.	5	<input type="checkbox"/>	Share link:
CE-5e: Engage the community in robust, ongoing discussion around climate, energy, or sustainability plans.	5	<input type="checkbox"/>	Share link:
CE-6: Create and publish job training and placement opportunities for solar in coordination with local community colleges.	20	<input type="checkbox"/>	Share link:
CE-7: Conduct feasibility analysis for solar PV on brownfields, landfills, formerly contaminated lands and/or other under-utilized properties.	10	<input type="checkbox"/>	Share link:
CE-8: Install or lease land for solar PV development on brownfields, landfills, formerly contaminated lands and/or other under-utilized properties.	20	<input type="checkbox"/>	Share link:
CE-9: Engage with regional organizations on advancing solar PV policies in the region including, but not limited to, unified permitting processes and group procurement opportunities.	20	<input type="checkbox"/>	Share link:
CE-10: Demonstrate activity in state-level conversations regarding solar PV.	20	<input type="checkbox"/>	Share link:
CE-11: Create and/or share an interactive solar map for your community.	20	<input type="checkbox"/>	Share link:
Total Points: Add up the total number of points you believe you have achieved in this category.			

Special Focus: Market Development and Finance

Action	Points	We've done this!	Documentation
MDF-1: Provide resources on active solar installers and/or local incentives for solar PV.	5	<input type="checkbox"/>	Share link:
MDF-2: Make solar PV metrics publicly available.	5	<input type="checkbox"/>	Share link:
MDF-3: Provide information to consumers about different solar PV financing options, including commercial options, such as Property Assessed Clean Energy (PACE) financing.	5	<input type="checkbox"/>	Share link:
MDF-4: Conduct feasibility analysis for solar PV installations on public facilities.	10	<input type="checkbox"/>	Share link:
MDF-5: Install solar PV on local facilities.	20	<input type="checkbox"/>	Share link:
MDF-6a: If applicable, provide PACE financing in your community.	10	<input type="checkbox"/>	Share link:
 Earn additional points: MDF-6b: Demonstrate that PACE financing has been used to finance solar PV in your community.	10	<input type="checkbox"/>	Share link:
MDF-7: Provide local incentives (i.e. permit fee waivers or rebates) or locally-enabled finance (e.g., a revolving loan fund) for solar PV.	20	<input type="checkbox"/>	Share link:
MDF-8: Engage local banks, credit unions, foundations and/or community funds about lending for solar PV projects through in-person meetings, discussions, and/or workshops.	20	<input type="checkbox"/>	Share link:
MDF-9: Demonstrate that the community's installed per capita capacity is above top 20% of states (>99 watts/person).	20	<input type="checkbox"/>	Share link:
MDF-10: Integrate solar PV with other distributed or emerging technologies such as storage, combined heat and power systems or electric vehicles in at least one installed or proposed project.	20	<input type="checkbox"/>	Share link:
MDF-11: Develop feasibility analysis or planning for resilient solar technologies for critical facilities and emergency planning such as solar and storage.	20	<input type="checkbox"/>	Share link:
Total Points: Add up the total number of points you believe you have achieved in this category.			

INNOVATIVE ACTIONS

The actions identified in the categories above represent many of the most common and impactful efforts communities are taking to reduce soft costs and make going solar easier and more affordable for residents. However, we know that communities across the country are developing innovative ways to help reduce soft costs. If your community has taken action to reduce soft costs that wasn't captured in the above application, please share it with us in the table below. Innovative actions will be reviewed by a team of solar experts and each action may be worth up to 20 points.

Category	Action(s)	Documentation
Solar Rights		Share link:
Utility Engagement		Share link:
Community Engagement		Share link:
Market Development and Finance		Share link:

DESIGNATION CHECKLIST

	Points	Step Completed
SOLAR STATEMENT		
PR-1: Solar Statement	Required for Bronze	<input type="checkbox"/>
ADDITIONAL PREREQUISITES		
PR-2: Planning and Zoning Guidance	Required for Bronze	<input type="checkbox"/>
PR-3: Inspection Checklist	Required for Bronze	<input type="checkbox"/>
PR-4: Permitting Training	Required for Bronze	<input type="checkbox"/>
PR-5: Planning	Required for Silver & Gold	<input type="checkbox"/>
SPECIAL FOCUS CATEGORY POINTS		
Solar Rights	Points:	<input type="checkbox"/>
Utility Engagement	Points:	<input type="checkbox"/>
Community Engagement	Points:	<input type="checkbox"/>
Market Development and Finance	Points:	<input type="checkbox"/>
Total Points	0	
Need 40 for Bronze, 80 for Silver, and 150 for Gold.		

SOLAR-READY COMMUNITIES

In Wisconsin, installation of renewable energy systems is projected to increase in coming years. This increase is driven by the reduction in costs of solar arrays, decommissioning of obsolete coal and nuclear power plants, and increases in renewable energy goals by utilities. The size of solar photovoltaic systems (PV) range from smaller residential/business systems to those that comprise many acres. Due to the workforce and economic benefits, it is anticipated siting large-scale solar farms will become competitive in future years.

To best position Wood County, solar-ready designation through SolSmart is being pursued. SolSmart is a program funded by the US Department of Energy. www.solsmart.org Mid-State Technical College and the Midwest Renewable Energy Association are already performing activities which can apply towards some of the SolSmart designation requirements for the county.

The primary elements of SolSmart designation include:

Community Engagement

Make information about solar PV easily accessible to interested people and businesses. It is anticipated that this will be accomplished through a webpage on the county website, discussions with local municipalities, and assistance with informational and training programs.

Planning and Zoning Guidance

Work with interested municipalities to provide guidance for becoming solar-ready. In general, interested municipalities would review their ordinances for unforeseen impediments to installation of solar PV. Permitting processes should also be streamlined. Incorporating solar into municipal or strategic plans is also beneficial.

Municipalities obtaining the SolSmart designation are also eligible to receive in-depth technical assistance from the National Renewable Energy Lab (NREL). NREL provides economic assessments and technical feasibility analysis for solar PV on municipal-owned buildings or land.

Wood County municipalities interested in learning more about becoming a solar-ready community can contact:

Nancy Turyk, Community Development Educator, UW-Extension Wood County
715-421-8445 | nturyk@co.wood.wi.us

Jason Grueneberg, Director of Planning and Zoning, Wood County
715-421-8466 | jgrueneberg@co.wood.wi.us

University of Wisconsin, United States Department of Agriculture and Wisconsin Counties Cooperating. University of Wisconsin-Extension provides equal opportunities in employment and programming, including Title IX and ADA. Please make requests for reasonable accommodations to ensure equal access to educational programs as early as possible preceding the scheduled program, service or activity.



Wood County, Wisconsin

SolSmart PV Screening

June 2019

NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.

Disclaimer

This document was prepared as an account of work sponsored by an agency of the United States government. Neither the United States government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States government or any agency thereof.

- The analysis is based on projections, estimates or assumptions made on a best-effort basis, based upon expectations of current and future conditions at the time they were developed.
- The analysis was prepared with information available at the time the analysis was conducted. Analysis results could be different if new information becomes available and is incorporated.
- This analysis relies on site information provided to NREL by Wood County that has not been independently validated by NREL.

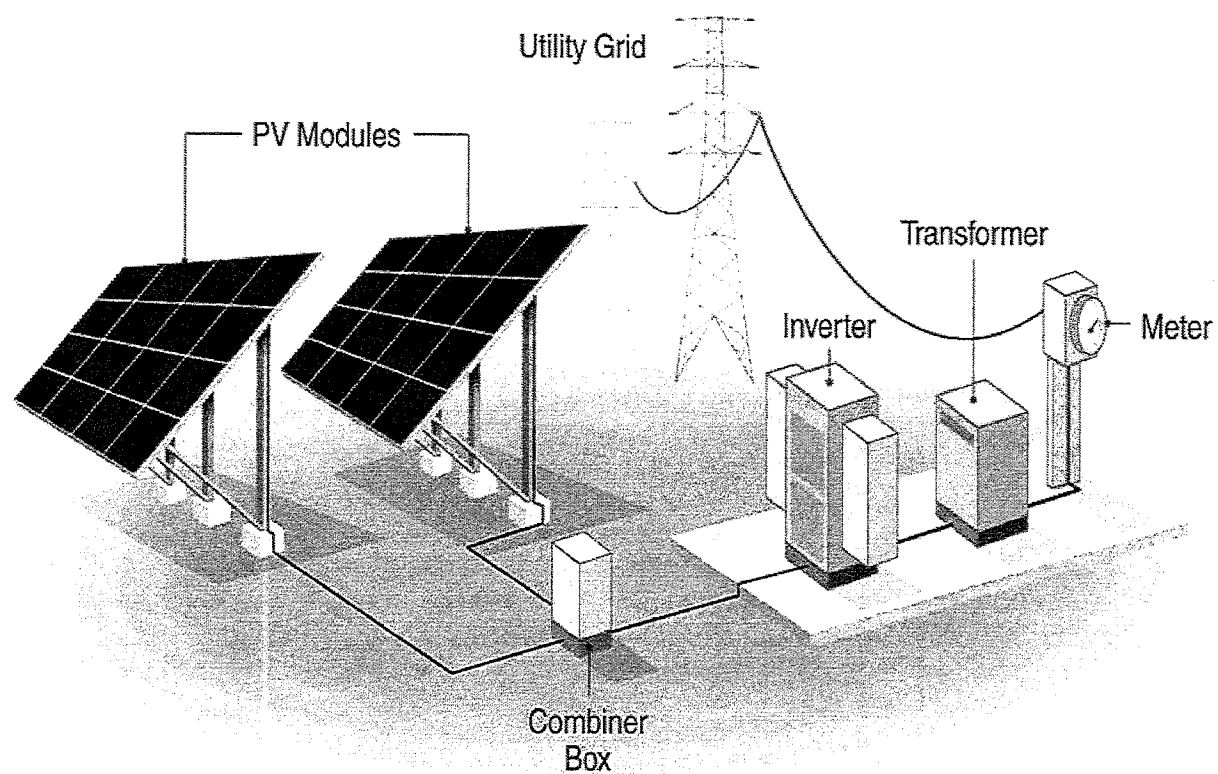
Presentation Contents

- Input Data
 - Study Overview
 - PV Overview
 - PV Resource Overview
 - Electric Load
 - Utility Rate
 - Analysis Assumptions
- Initial Results
 - Discuss inputs to SAM model
 - Discuss possible parametrics

Study Overview

- As part of the SolSmart designation program, NREL is providing participating counties with screenings for solar photovoltaics (PV) opportunities
- The purpose of this screening is to evaluate the techno-economic viability of on-site PV under two financing scenarios
 - Direct purchase
 - Financed by a 3rd party through a Power Purchase Agreement (PPA)
- This screening should be treated as an initial step to prioritize and focus additional, in-depth analysis of potential renewable energy projects

Grid-Tied PV Array Diagram



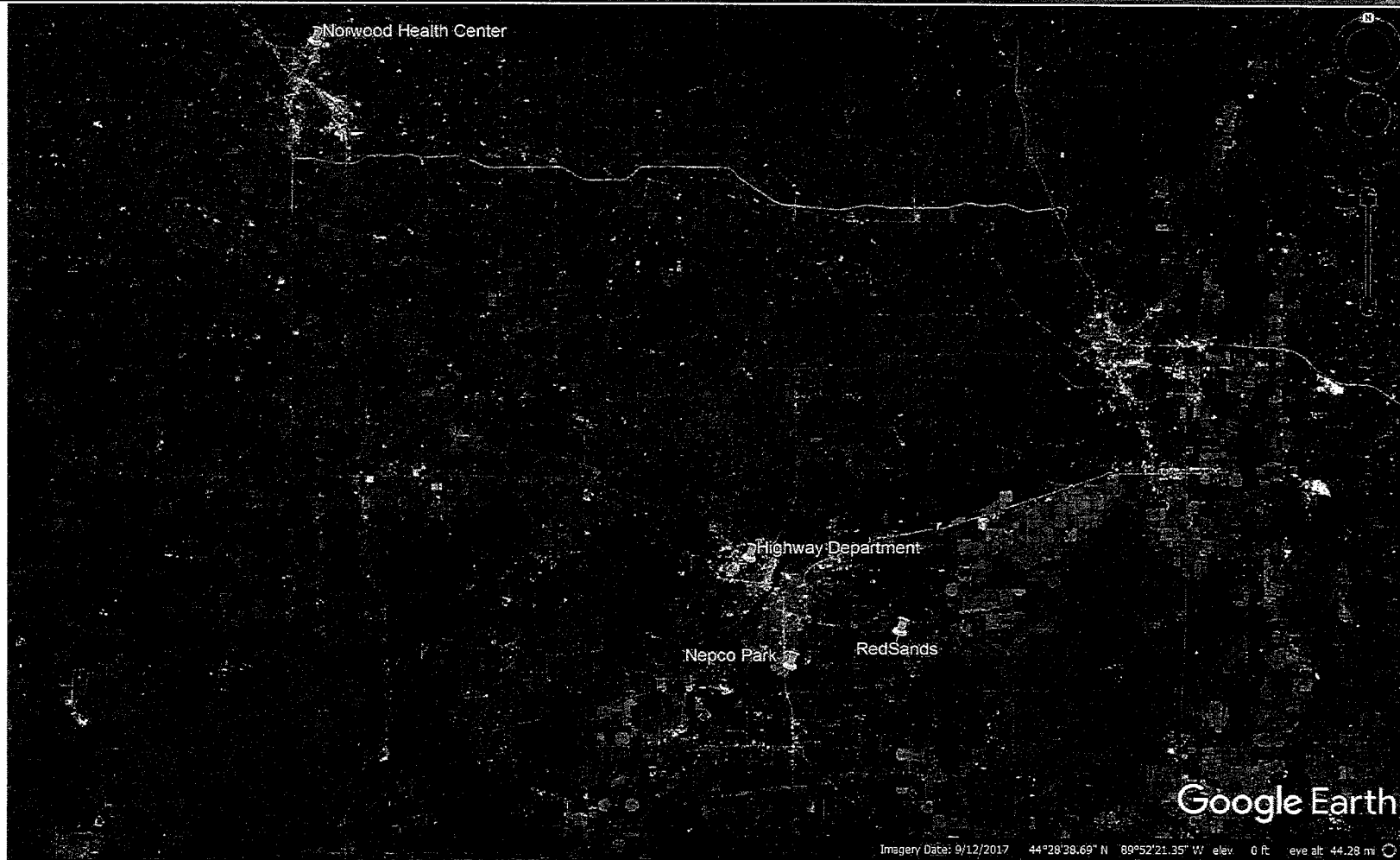
PV Resource Data

- Hourly weather data for Wisconsin Rapids, WI was used in the analysis (TMY file)
- The average annual solar radiation is 4.55 kWh/m²/day
 - US high: Phoenix, AZ = 6.57 kWh/m²/day
 - US low: Buffalo, NY = 3.99 kWh/m²/day

Month	Solar Radiation (kWh / m ² / day)
January	2.56
February	3.70
March	4.95
April	5.21
May	5.92
June	6.37
July	6.59
August	5.83
September	5.17
October	3.59
November	2.60
December	2.16
Annual	4.55

Source: PVWatts

Wood County Sites



Potential Areas for PV – Red Sands

Water Works and Lighting Commission (WWL&C) \$0.1096 per kWh (Energy Charge) No Demand Charges



Water Works and Lighting Commission
221 16th Street South P.O. Box 399
Wisconsin Rapids, WI 54495-0399
(715) 423-6300 www.wwlnc.com
Pay by Phone 888-228-1362

WOOD COUNTY PARKS & FORESTRY
111 W JACKSON ST
WISCONSIN RAPIDS WI 54495-8095



Billing Summary	
Statement Date	02/26/2019
Due Date	03/16/2019
BILLING SUMMARY	
Balance From Last Billing	32.74
Payment 02/06/19	-32.74
Balance Before Billing	0.00
Current Charges	30.77
TOTAL AMOUNT	30.77

Our rates are always available to you online at www.wwlnc.com. For electric rates, click on the ELECTRIC tab from our homepage. When the dropdown menu appears, choose the "Electric Rates" option and a list of all of our rates will appear. For water rates, click on the WATER tab from the homepage. When the dropdown menu appears, choose the "Water Rates" option and a list of our water rates will appear. Clicking on a rate provides all of the details on how that rate is calculated.

Service: ELECTRIC		Service Address: 7113 SOUTH PARK RD				Description:				
Meter	Rate	Beginning Reading			Ending Reading			Unit	Used	Totals
		Date	Reading	Type	Date	Reading	Type			
11355169	SL	01/15/2019	30040	REG	02/15/2019	30228	REG	1.0	188 kWh	
Energy Charge										
188 kWh x 0.1096										
20.60										
Power Cost Adjustment										
188 kWh x -0.0039										
-0.73										
Electric Service Charge										
10.00										
Commitment To Community										
0.90										
Service Subtotal										
30.77										

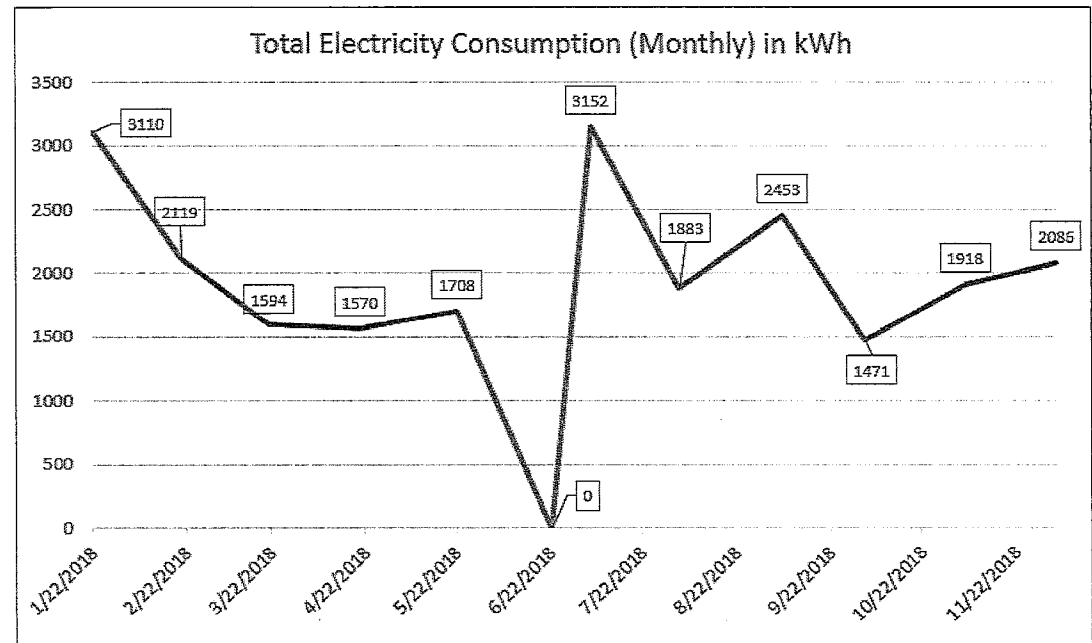
Potential Areas for PV – Red Sands

Site-specifics	Proposed PV System Size
Land PV available (Dark Blue)	kW
Roof PV available (Light Blue)	14 kW
Carport PV available (Pink)	kW
Total PV available	14 kW



Potential Areas for PV – Nepco Park

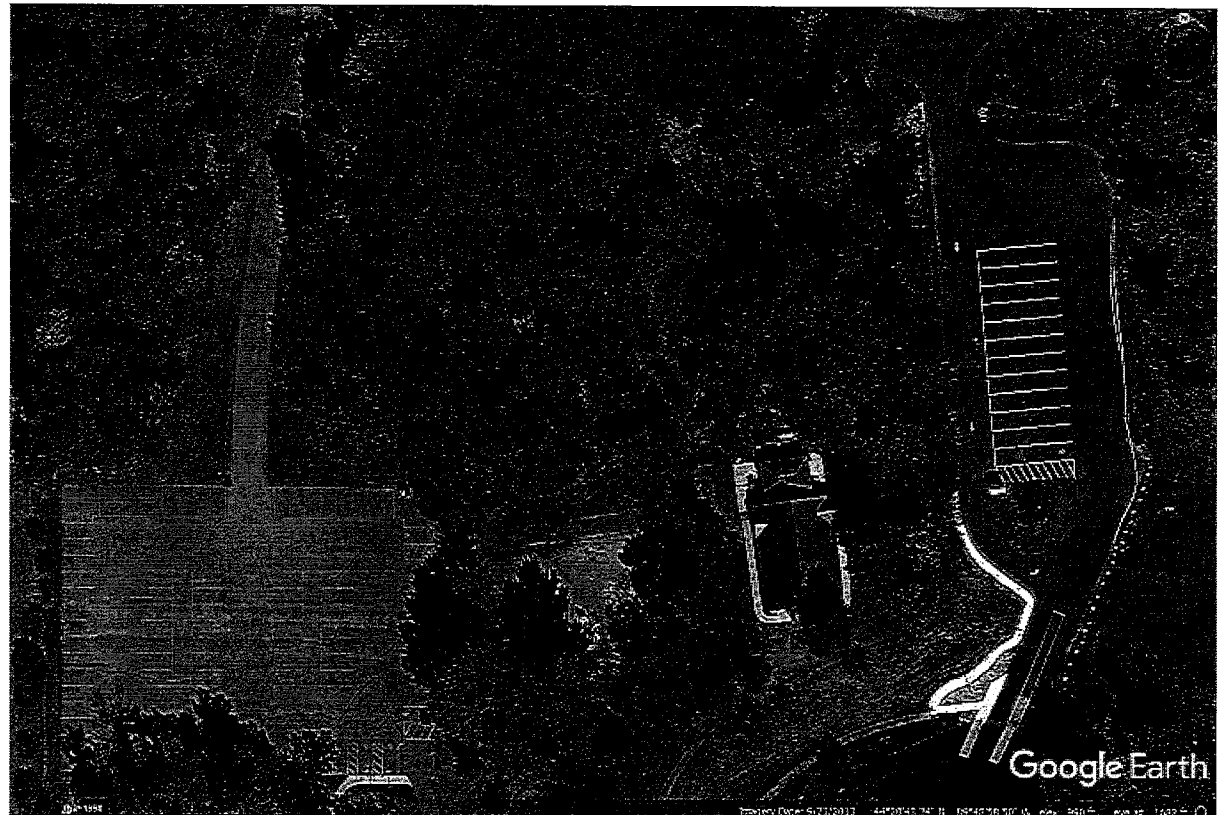
Utility	Charges
Alliant Energy	\$0.1142 per kWh (Energy Charge) No Demand Charges



Assumed average of May and July's electricity consumption for June month: 2,430 kWh


Potential Areas for PV – Nepco Park

Site-specifics	Proposed PV System Size
Land PV available (Dark Blue)	0 kW
Roof PV available (Light Blue)	0 kW
Carport PV available (Pink)	33 kW
Total PV available	33 kW



Potential Areas for PV – Highway Department

Utility	Charge
Water Works and Lighting Commission	\$0.0825 per kWh (Energy Charge) \$7 per kW (Demand Charge)


Water Works and Lighting Commission
 221 16th Street South P.O. Box 399
 Wisconsin Rapids, WI 54495-0399
 (715) 423-6300 www.wwlwc.com
 Pay by Phone 888-228-1362

0324

Account Number: 263485000 Page 1 of 2

Statement Date 02/26/2019 Due Date 03/16/2019

BILLING SUMMARY

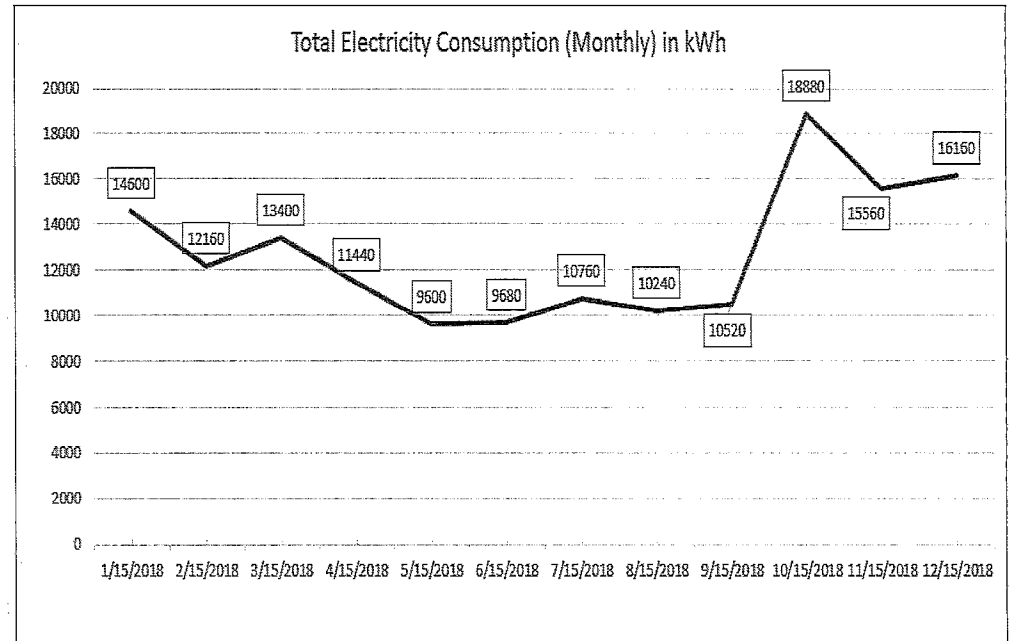
Balance From Last Billing	2,300.88
Payment 02/08/19	-2,300.88
Balance Before Billing	0.00
Current Charges	2,799.14
TOTAL AMOUNT DUE	2,799.14

Our rates are always available to you online at www.wwlwc.com. For electric rates, click on the ELECTRIC tab from our homepage. When the dropdown menu appears, choose the Electric Rates option and a list of all of our rates will appear. For water rates, click on the WATER tab from the homepage. When the dropdown menu appears, choose the Water Rates option and a list of our water rates will appear. Clicking on a rate provides all of the details on how that rate is calculated.

WOOD COUNTY HIGHWAY COMMISSION
 555 17TH AVE N
 WISCONSIN RAPIDS WI 54495-1902



Services: ELECTRIC		Service Address: 555 17TH AVE N		Description:	
Meter	Rate	Beginning Reading	Ending Reading		
		Date	Reading	Type	Date
11224844	C1	01/15/2019	31791	REG	02/15/2019
			32200	REG	
				40.0	18760 KWH
				18,760 kWh x 0.0825	1,547.70
				Power Cost Adjustment	-73.15
				18,760 kWh x -0.0039	34.00
				Electric Service Charge	
				Demand Charge	61.8 kW x 7.00
					432.60
				Commitment To Community	10.00
				Service Subtotal	1,951.14



Potential Areas for PV – Highway Department

Site-specifics	Proposed PV System Size
Land PV available (Dark Blue)	174 kW
Roof PV available (Light Blue)	187 kW
Carport PV available (Pink)	29 kW
Total PV available	390 kW



Potential Areas for PV – Norwood Health Center

Marshfield Utilities

On-Peak Energy: \$0.059 per kWh
Off-Peak Energy: \$0.05 per kWh
On-Peak Demand Charges: \$7 per kW
Distribution Demand Rate:
\$1.5 per kW



2000 S. Central Ave.
P.O. Box 670
Marshfield, WI 54449-0670
(715) 387-1195

Account #	Billing Date
217978	03/29/19
Amount Due By APRIL 16, 2019 6,499.12	

05260 AV 3 0.0000 2-05260

NORWOOD HEALTH CENTER
1600 N CHESTNUT AVE
MARSHFIELD WI 54449

Please let us know if your contact information (phone, cell, email or mailing address) has changed.
If moving, please visit www.marshfieldutilities.org and complete the required application.
If making a partial payment, you must indicate what service or address you want to be paid.

Please return this portion with your payment. THANK YOU.

NORWOOD HEALTH CENTER
ACCOUNT NUMBER: 217978
STATEMENT DATE: 03/29/19
PREVIOUS BALANCE 14,756.57
PAYMENT(S) - THANK YOU 14,756.57
NEW CURRENT CHARGES 6,499.12
AMOUNT DUE 6,499.12

Make/Service Description	Prev Read	Cur Read	Mult/Unit	Days/Allow	Charges
ELECTRIC 20649	02/21/19	03/21/19		28 DAYS	
CUSTOMER CHARGE					100.00
CP2- ON PEAK ENERGY	0000000	0000122	300	36600	2,159.40
54600 KWH @ 0.059000					
CP2- ON PEAK DEMAND		.570	300	171.000	1,197.00
171 KW @ 7.000000					
CP2- OFF PEAK DEMAND		.522	300	156.600	
DISTRIBUTION DEMAND					824.25
540.5 KW @ 1.500000					
CP2- OFF PEAK ENERGY	0000000	0000155	300	46500	2,325.00
46500 KWH @ 0.050000					
KVAR ENERGY	0023469	0023566	300	37880	
POWER FACTOR (CORRECTED TO 95.0% POWER FACTOR FROM 91.05%)					52.20
PUBLIC BENEFITS CHARGE					49.84
POWER COST ADJUSTMENT					91.41
WOOD COUNTY TAX @ .025					.00
WISCONSIN SALES TAX @ .05					.00

TOTAL FOR: 1600 N CHESTNUT AVE 6,499.12 X

RECEIVED
APR 1 - 2019

BY: _____

APPROVED _____

Total Electricity Consumption (2017 and 2018) in kWh



Potential Areas for PV – Norwood Health Center

Site-specifics	Proposed PV System Size
Land PV available (Dark Blue)	284 kW
Roof PV available (Light Blue)	262 kW
Carport PV available (Pink)	0 kW
Total PV available	546 kW



Monthly Electricity Use (kWh)

Electricity Use in kWh				
Utility	(WWL&C)	(Alliant Energy)	(WWL&C)	(Marshfield Utilities)
Month	Red Sands	Nepco Park	Highway Department	Norwood
January	200	3,110	14,600	110,993
February	191	2,119	12,160	93,305
March	156	1,594	13,400	100,428
April	210	1,570	11,440	89,910
May	259	1,708	9,600	112,489
June	330	2,430	9,680	155,069
July	539	3,152	10,760	160,911
August	1,602	1,883	10,240	141,457
September	365	2,453	10,520	154,518
October	299	1,471	18,880	98,629
November	259	1,918	15,560	86,569
December	200	2,086	16,160	89,287
Total	4,610	23,064	153,000	1,393,564

- 2018 monthly electricity use data were provided by the site
- The monthly data was inputted into the solar PV modeling to determine:
 - The percentage PV contributes to the overall annual electrical load
 - If the PV system over-produces electricity and by how much

Net Metering

- Wisconsin offers net metering to customers of IOUs and municipal utilities for systems ≤ 20 kW
- However, some utilities allow net metering for systems larger than 20 kW (e.g., Xcel Energy, We Energies, and Madison Gas and Electric)
- Discuss with respective utilities and understand more about procedures and rules

WWLC:

Shawn Reimer Shawn.Reimer@wrwwlc.com 715-422-9039 is the primary contact and will assist with any questions or information regarding interconnection

Alliant Energy:

Call on **1-800-972-5325** and they will revert back in 5 days

Marshfield Utilities:

Call on (715) 387-1195

<https://www.nrel.gov/solar/rps/wi.html>

<http://programs.dsireusa.org/system/program/detail/235>

<http://apps.psc.wi.gov/vs2010/tariffs/default.aspx?tab=1> (Sell Rates/ \$ per kWh credited by the utility for excess generation)

Financing Scenarios and Incentives

- Two financing scenarios:
 - Direct purchase financed with debt
 - County-owned
 - County/non-profits are ineligible for federal tax incentives
 - Third party financing:
 - Developer and its investor partners are eligible for tax incentives (bonus depreciation, Federal Investment Tax Credit [ITC]), and the benefits of these incentives can be passed to the city through a lower Power Purchase Agreement (PPA) price.
 - Developer requires a rate of return assumed to be 8% [PV Project Finance in the United States (NREL, 2016), a report that benchmarks solar financing costs]
- Incentives:
 - Federal Investment Tax Credit: 30% of the installed cost of PV available to tax-paying entities until end of 2019 and will decrease thereafter
 - Modified Accelerated Cost-Recovery System (MACRS): Ability to recover investments in solar PV systems through depreciation deductions; assume 5-year schedule and 100% bonus depreciation
 - Renewable Rewards Program: \$ 4,000 (Commercial) ; Maximum Incentive amount from selected utilities
<http://programs.dsireusa.org/system/program/detail/740>
 - ***Under Renewable Energy Competitive Incentive Program (RECIP), county is eligible for maximum incentives up to 50% of the project cost, or \$400,000***

Technical Assumptions

	Assumption	Source
Technology	System on Rooftop Carports PV System on Ground Areas	
Panel Tilt	<ul style="list-style-type: none"> Follow the roof pitch on pitched rooftops 10 degrees on flat roofs/carports 35 degrees on ground areas to allow for snow shedding 	
Azimuth	180 degrees when able to Follows roof orientation for pitched roofs	
Degradation Rate	0.5%	SAM default
Total Installed Cost	\$1.83/Wdc \$2.83/Wdc for Carports	U.S. Solar Photovoltaic System Cost Benchmark: Q1 2018; Ran Fu, David Feldman, and Robert Margolis, https://www.nrel.gov/docs/fy19osti/72399.pdf
Operations and Maintenance Cost	\$13/kW-yr.	NREL ATB
Weather Data	4.55 kWh/m ² /day	TMY hourly data for Wisconsin Rapids, WI
<u>Electricity Escalation Rate</u>	2.5%	Assumed; need to clarify with respective utility and from past bills[Important parameter which has a major impact on the economics]
Incentives	\$4,000 (maximum) from selected utilities	http://programs.dsireusa.org/system/program/detail/740
<u>Total system losses</u>	14.08%	SAM Defaults [would impact solar generation, if changed]

Financial Assumptions (Direct Purchase Model)

	Assumption	Source
Debt Percentage	100%	
Loan Term	25 years	
Loan Rate	3%/yr.	
Analysis Period	25 years	
Real Discount Rate	3.0%	Energy Price Indices and Discount Factors for Life-Cycle Cost Analysis – 2018 Annual Supplement to NIST Handbook 135, Priya D. Lavappa Joshua D. Kneifel, https://nvlpubs.nist.gov/nistpubs/ir/2018/NIST.IR.85-3273-33.pdf
Nominal Discount Rate	2.8%	https://nvlpubs.nist.gov/nistpubs/ir/2018/NIST.IR.85-3273-33.pdf
Average Inflation Rate	-0.2%	https://nvlpubs.nist.gov/nistpubs/ir/2018/NIST.IR.85-3273-33.pdf
Federal Income Tax Rate	0%/yr.	Non-profit
State Income Tax Rate	0%/yr.	Non-profit
Sales Tax	0%	Non-profit
Property Tax	0%	County owns site
Cost of Acquiring Financing	\$0	
Construction Financing	None	
Reserve Accounts	None	
Return on Equity	0%	
Federal ITC	0%	
MACRS	No	

Financial Assumptions (PPA Model)

	Assumption	Source
IRR Target	8%	NREL
IRR Target Year	25	
Analysis Period	25 years	
Inflation	-0.2%	https://nvlpubs.nist.gov/nistpubs/ir/2018/NIST.IR.85-3273-33.pdf
Real Discount Rate (Host)	3.0%	https://nvlpubs.nist.gov/nistpubs/ir/2018/NIST.IR.85-3273-33.pdf
Nominal Discount Rate (Host)	2.8%	https://nvlpubs.nist.gov/nistpubs/ir/2018/NIST.IR.85-3273-33.pdf
Federal Income Tax Rate	21%/yr.	New federal tax code
State Income Tax Rate	4%	https://www.bankrate.com/finance/taxes/state-taxes-wisconsin.aspx
Sales Tax	0%	
Property Tax	0%	County owns site
Real Discount Rate (Developer)	8%	NREL
Cost of Acquiring Financing	\$0	
Construction Financing	None	
Reserve Accounts	None	
Return on Equity	0%	
Federal ITC	30%	
MACRS	Yes	
Sales tax	0 %	http://programs.dsireusa.org/system/program/detail/3223

Host: Wood County

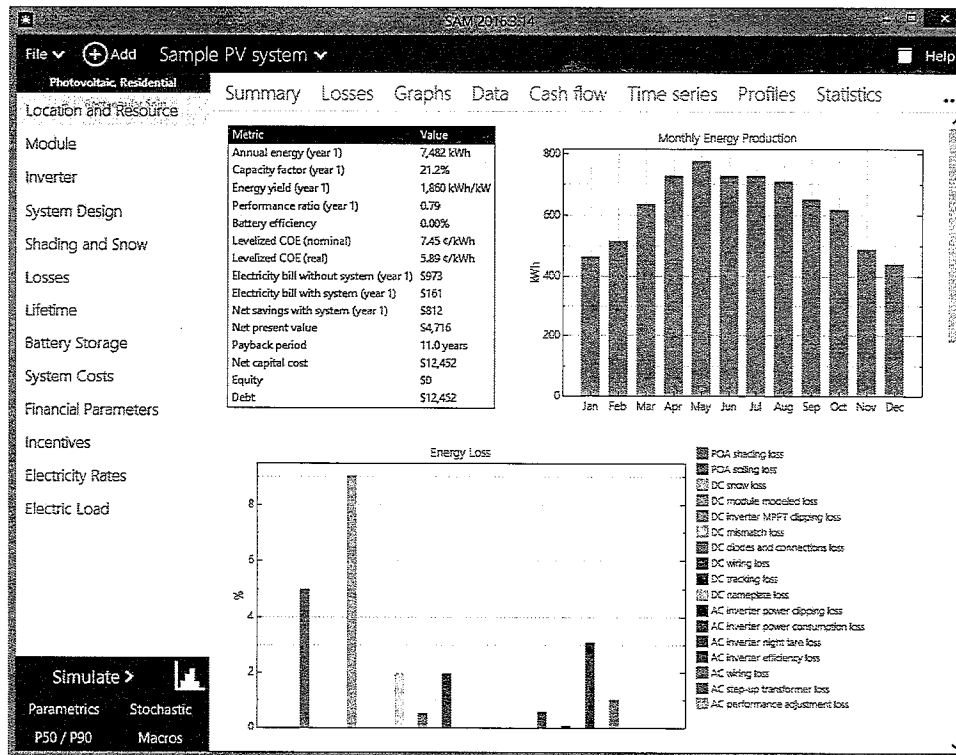
Developer: 3rd Party



SAM Analysis

System Advisor Model (SAM)

Free software that combines detailed performance and financial models to estimate the cost of energy for systems



<http://sam.nrel.gov/download>

Technologies

- Photovoltaics, detailed & PVWatts
- Battery storage
- Concentrating solar power
- Wind
- Geothermal
- Biomass
- Solar water heating

Financials

- Behind-the-meter
- residential
- commercial
- Power purchase agreements
- single owner
- equity flips
- sale-leaseback
- Simple LCOE calculator

SAM Runs

- Direct Purchase assuming each site is handled as individual site
 - 4 direct purchase analyses (1 for each site)
- PPA assuming all potential areas for PV are aggregated and assuming all of the electricity generated will be purchased by Wood County
 - 3 PPA analyses (Ground mount, Carport, and Roof mount)
 - Assumption: There are three different utilities with different rate structures. To reduce the complexity of the analysis, one retail rate was assumed across all 4 sites which is not the real scenario.



SAM Results

SAM Analysis Results –Direct Purchase for 4 Sites

Metric	RedSands	Nepco Park	Highway Department				Norwood Health Center		
Type	Roof mount	Carport	Ground mount	Carport	Roof mount	Combined	Ground mount	Roof mount	Combined
PV Size (kW)	14	33	174	29	187	390	284	262	546
PV System Annual Energy Production Year 1 (kWh)	17,348	40,692	241,520	36,146	231,720	509,000	394,204	323,073	717,277
Annual Energy Load, (kWh)	4,610	26,494	153,000				1,393,564		
Percent Load Met by PV System Year 1 (%)	376%*	153%*	157%*	24%	151%*	333%*	28%	23%	51%
Levelized COE Nominal (cents/kWh)	4.37	8.04	4.95	7.96	5.54	-	4.95	5.57	-
Net Capital Cost (\$)	12,782	46,774	158,862	41,105	170,731	-	259,292	239,206	-
Loan Percent (%)	100%	100%	100%	100%	100%	-	100%	100%	-
Net Present Value (\$)	24,944	45,345	207,235	22,336	210,431	-	213,656	151,436	-
Simple Payback (years)	7	10.1	8.9	12.6	9.1	-	10.9	12.1	-

*PV is over-producing and Wood County would have to find other sites to use the electricity generated by these PV systems or ***reduce the PV system size***

Parametric Analysis for Direct Purchase: Highway Department (Ground mount only)

Variables	Inputs Varied			Outputs	
	PV Installed Cost	Loan Rate	Electricity Escalation Rate	NPV(\$)	Simple Payback Period (yrs.)
PV Installed Cost	1.2	3%	2.50%	262,791	6.0
PV Installed Cost	1.5	3%	2.50%	235,939	7.4
PV Installed Cost	1.83	3%	2.50%	207,235	8.9
PV Installed Cost	2.1	3%	2.50%	183,161	10.0
PV Installed Cost	2.4	3%	2.50%	156,309	11.3
Loan Rate	1.83	1.50%	2.50%	233,178	8.85
Loan Rate	1.83	2%	2.50%	224,808	8.85
Loan Rate	1.83	2.50%	2.50%	216,158	8.85
Loan Rate	1.83	5%	2.50%	168,949	8.85
Loan Rate	1.83	6%	2.50%	148,356	8.85
Electricity Escalation Rate	1.83	3%	0%	136,561	9.93
Electricity Escalation Rate	1.83	3%	1%	171,087	9.45
Electricity Escalation Rate	1.83	3%	1.50%	190,301	9.24
Electricity Escalation Rate	1.83	3%	2%	210,958	9.04
Electricity Escalation Rate	1.83	3%	3%	257,092	8.67

- All the electricity is assumed to be consumed
- PV installed cost and the loan rate have a large impact on NPV
- Lowering the PV installed cost and increasing the electricity escalation rate lowers the simple payback period
- The loan rate does not affect the simple payback, which only considers the installed cost and the value of the electricity generated

Parametric Analysis for Direct Purchase: Norwood Health Center (Ground mount only)

Variables	Inputs Varied			Outputs	
	PV Installed Cost	Loan Rate	Electricity Escalation Rate	NPV(\$)	Simple Payback Period (yrs.)
PV Installed Cost	1.2	3%	2.50%	304,333	7.5
PV Installed Cost	1.5	3%	2.50%	260,505	9.2
PV Installed Cost	1.83	3%	2.50%	213,656	10.9
PV Installed Cost	2.1	3%	2.50%	174,363	12.4
PV Installed Cost	2.4	3%	2.50%	130,536	13.9
Loan Rate	1.83	1.50%	2.50%	256,000	10.92
Loan Rate	1.83	2%	2.50%	242,337	10.92
Loan Rate	1.83	2.50%	2.50%	228,219	10.92
Loan Rate	1.83	5%	2.50%	151,165	10.92
Loan Rate	1.83	6%	2.50%	117,555	10.92
Electricity Escalation Rate	1.83	3%	0%	85,548	12.71
Electricity Escalation Rate	1.83	3%	1%	131,332	11.89
Electricity Escalation Rate	1.83	3%	1.50%	156,807	11.54
Electricity Escalation Rate	1.83	3%	2%	184,196	11.22
Electricity Escalation Rate	1.83	3%	3%	245,358	10.65

- All the electricity is assumed to be consumed
- PV installed cost and the loan rate have a large impact on NPV
- Lowering the PV installed cost or increasing the escalation rate lowers the simple payback period
- The loan rate does not affect the simple payback, which only considers the installed cost and the value of the electricity generated

SAM Analysis Results – PPA for Aggregated Sites based on type

Metric	Ground mount	Carport	Roof mount
PV Size	458	62	463
(kW)			
PV System Annual Energy Production Year 1	635,724	77,277	577,088
(kWh)			
Annual Energy Load	1,574,239	1,574,239	1,574,239
(kWh)			
Percent Load Met by PV System Year 1	40%	5%	37%
(%)			
PPA Price Year 1	9.82	16.36	11.38
(cents/kWh)			
Net Capital Cost to Developer	816,507	174,742	862,301
(\$)			
Developer Net Present Value	10,405	2,173	10,990
(\$)			
Host Net Present Value	-30,007	-98,551	-196,835
(\$)			

Buy Rate: \$0.08/kWh

Sell Rate: \$0.08/kWh

Load is aggregated across all 4 sites

Three different PV technologies and three different rate structures makes this PPA analysis challenging and might not reflect an actual scenario

Key takeaways

- Under Renewable Energy Competitive Incentive Program (RECIP), county is eligible for maximum incentives up to 50% of the project cost, or \$400,000.
- Wood County should maximize RECIP incentive.
- After factoring the RECIP incentive, all the sites in the direct purchase scenario are economically favorable with positive NPVs and shorter payback periods.
- Wood county should work with respective utilities and check net metering limits and the buy-back rates.
- Three different PV technologies and three different rate structure makes the PPA analysis challenging and might not reflect actual scenarios. As modeled, the aggregated sites under the PPA structure are not economically favorable. Under the 3rd party model, the RECIP incentive would *not* be applicable [should confirm with Focus Energy].
- Wood County can work with respective site's utility to install solar PV systems and contribute towards the renewable energy target.

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www.nrel.gov



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