

Wisconsin Solar Electric Market Status Report

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Overview

- Focus on Energy Program
- Solar Electric Installation Statistics
- Other programs, Incentives and Economics
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- System Economics



Key Market Barriers

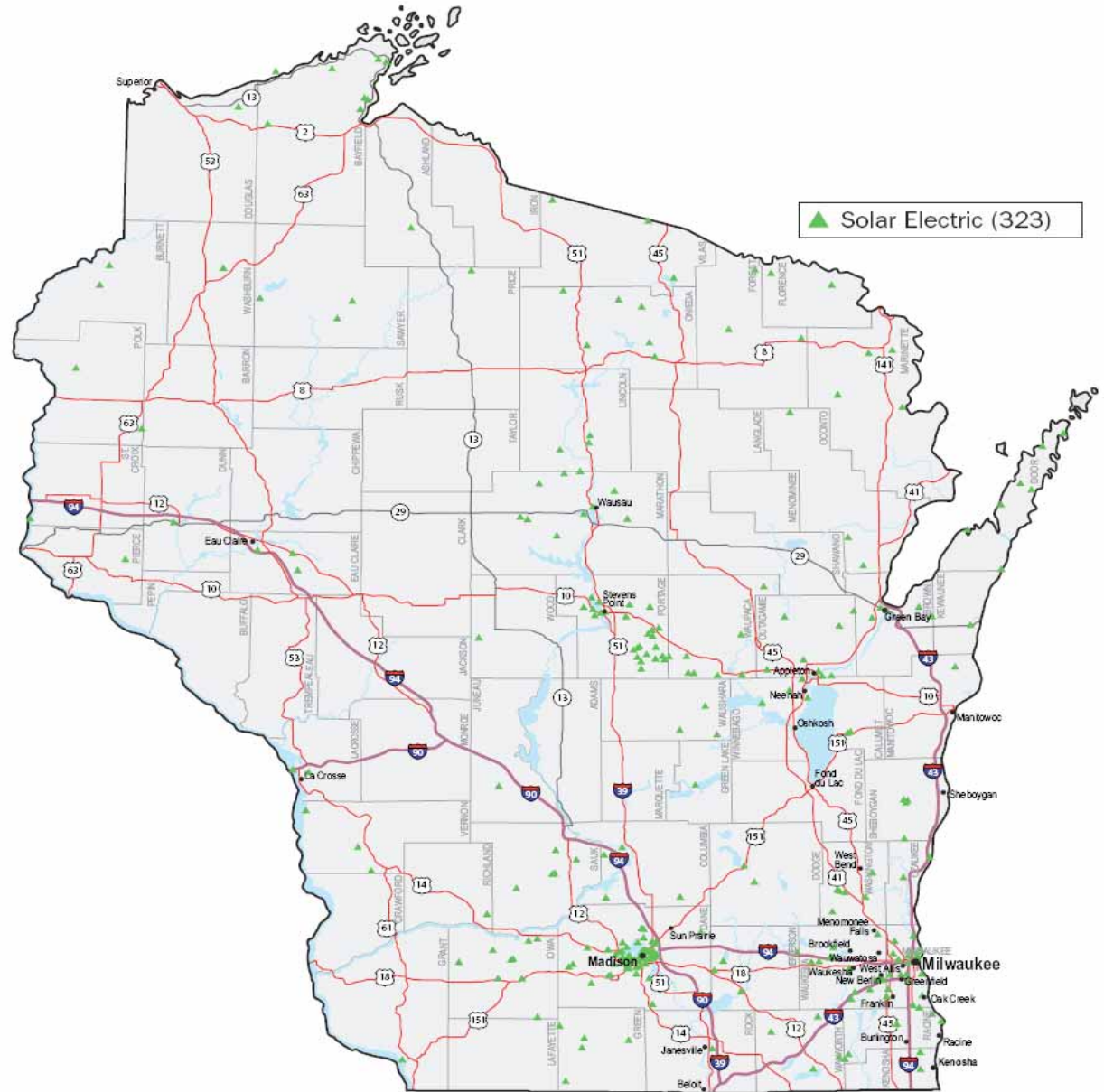
- Information
- Infrastructure – installers, building professionals...
- Institutional – Interconnection, insurance, net metering, zoning...
- Financial – high prices



Focus on Energy

Solar Electric Installations

2002
to
2007



Focus on Energy Solar Electric Program

- Information:
 - www.focusonenergy.com, 800 7627077
- Site Assessments
- Installer support: training, incentives, advertising cost-share, etc.
- Facilitation
- Incentives (20% to 25% of system cost)
- Budget: \$1.5 million/year
 - Incentives: \$1.23 million/year

WI Solar Electric Systems

Statistics

Annual Installation Summary, professionally installed

	2002	2003	2004	2005	2006	2007
Number	15	36	38	37	78	99
KW	24	62	85	66	264	465
Ave size (kW)	1.62	1.73	2.24	1.79	3.38	4.7
Cost/kW	\$11,037	\$10,043	\$9,384	\$11,086	\$9,043	\$8,411

Installed capacity growing 80% per year!

Solar Electric Systems 2002 to 2008

Grid Connected, no batteries, professionally Installed

	Number of Systems	Cost per kW	Cost per kW of Module	Cost per kW of inverter	Labor per kW installed	
Fixed Mounted	165	\$7,979	\$4,734	\$867	\$1,271	
Max		\$17,396	\$8,600	\$3,261	\$6,716	Rack Cost per kW
Min		\$4,589	\$2,000	\$346	\$ -	
STD		\$1,597	\$772	\$323	\$803	
Dual Axis Tracking	52	\$10,564	\$4,546	\$966	\$1,566	
Max		\$15,578	\$10,200	\$2,953	\$5,817	\$5,700
Min		\$7,375	\$3,182	\$550	\$349	\$696
STD		\$1,609	\$1,118	\$412	\$883	\$755

Solar Electric Systems Installed 2007

Residential Systems

- 79 systems
- 303 kW
- 3.8 kW each
- \$8,725/kW

Non Residential Systems

- 20 Systems
- 162 kW
- 8.1 kW each
- \$7,930/kW



Incentives and Economics

Organizations Offering Solar Electric Programs

- We Energies: solar electric buy back rate, non profit grants, Solar Decade conference, workshops, etc.
- MGE: solar buyback rate, etc.
- Wisconsin Public Service: SolarWise for Schools
- City of Madison: US DOE Solar City Funding

Organizations initiating solar programs

- Alliant Energy
- Xcel Energy
- City of Milwaukee - Solar City

Solar Electric Buy Back Rates

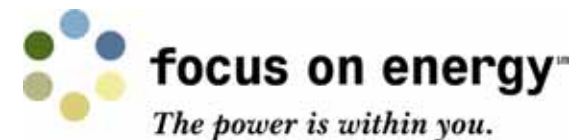
- Available today: We Energies, MG&E
- In current rate case: Alliant, River Falls
- Voluntary
- 22.5 to 25 cents per kWh
- Rate good for 10 years
- 100% of power generated
- Added to voluntary green rate
- Customers can drop out
- New systems only
- Min. and Max. system sizes
- Total participation capped

2 kW Residential System – 2400 kWh/year

- Competitive installed price: \$16,000
 - Focus on Energy Cash back reward: \$3,600
 - Federal Tax Credit: \$2,000
- Final cost to customer: \$10,400
- Solar buy back rate: \$0.25/kWh for ten years
 - Value: \$600/year
- 20 yrs to cost recovery (~1/2 of system life)



Braus Home, Madison



2 kW Business System – 2400 kWh/year

- Competitive installed price: \$16,000
 - Focus on Energy Cash back reward: \$2,225
 - Federal Tax Credit: \$4,800
 - Federal 5 yr depreciation: \$5,150
- Final cost to customer: \$3,825
- Solar buy back rate: \$600/year
- Under 10 years to cost recovery



Solar Flair, installed by
Lake Michigan Wind and Sun

WE Energies Non-Profit Grant

- At WE customer non-profit and government owned sites
- Covers half the system cost after Focus on Energy Incentives




Urban Ecology Center, Milwaukee

2 kW Non Profit System – WE customer

- Competitive installed price: \$16,000
 - Focus on Energy Cash back reward: \$4,800
 - Federal Tax Credit: \$0
 - Federal 5 yr depreciation: \$0
 - We Energies Non-Profit Grant: \$5,600
- Final cost to customer: \$5,600
- Solar buy back rate: \$600/year
- About 10 years to cost recovery

We Energies' Solar Energy Development Program

- Funds: Fully Obligated
- Large systems: 100 to 400 kW (ac)
- Incentive: \$5/watt (ac) * design factor
- Total systems funded:  MW (ac)

- One System installed: GE Health Care
- Several systems in process:
 - three Kohls systems
 - Others to be announced

GE Health Care System

- Owned by GE Health Care, Waukesha
 - GE collects all tax benefits and incentives
- 134 kW (dc) or ~103 kW (ac)
- 672 GE Energy 200 watt modules
- WI largest system



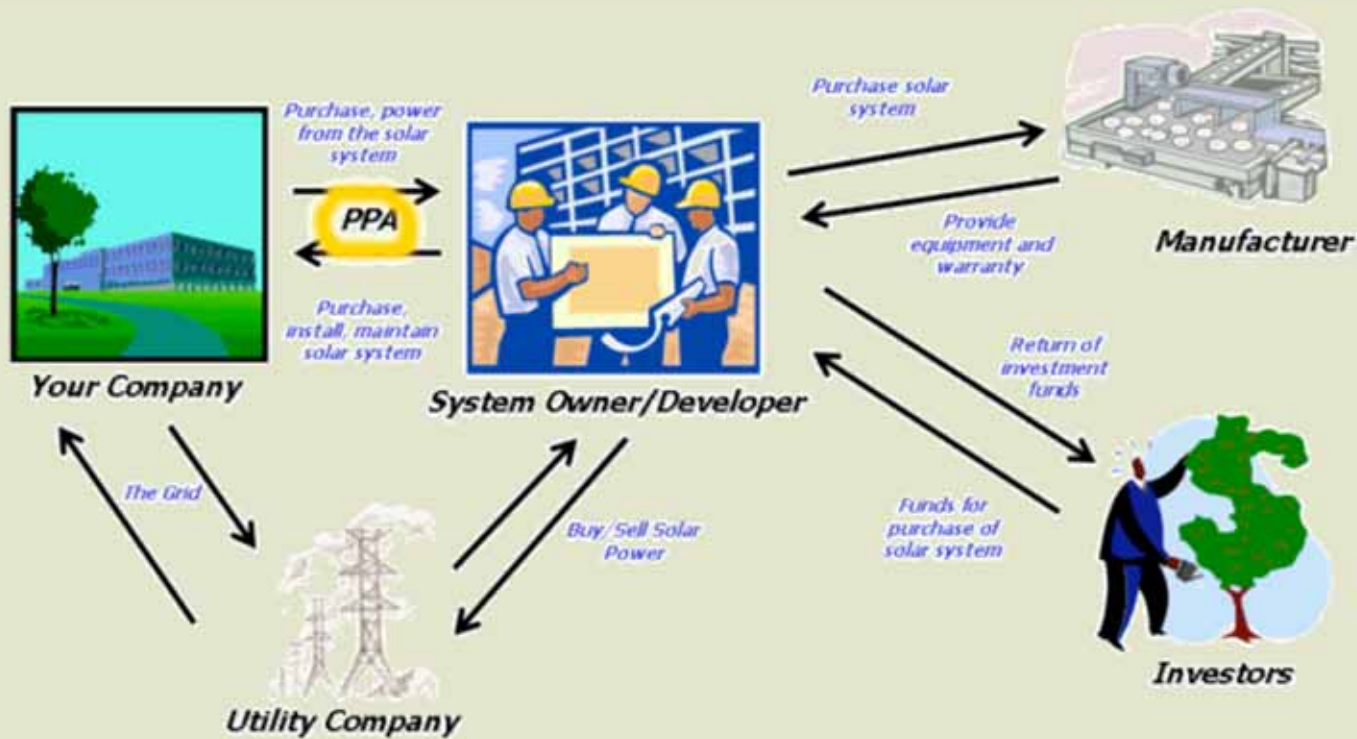
Kohl's Solar Electric Systems

- Located at: Sussex Store, Southwest, Waukesha Store, Milwaukee Photo Studio
- Owned by SunEdison – third party owner
- Kohls' buys the power from SunEdison
 - 15 year contract
 - For less than grid power



California Kohl's store
Source: Kohl's

Business Model: Power Purchase Agreement



WI Solar Electric Businesses



2007 Solar Electric Systems per Installer

	Installed	To be installed		Installed	To be installed
Arch Electric*	1	2	Next Step Energy	3	2
5. Energize*	4	4	Power Control		5
Energy Concepts		1	Prairie Solar	1	2
2. Full Spectrum Solar*	17	8	3. PV Systems*	16	5
Go Solar*	1		Progressive	1	
Great Northern Solar*	3	2	Seventh Generation	2	
1. H&H Electric*	14	13	Simply Solar	2	
Habi-tek*	1		SOLutions*	1	
Harvestar Energy	3	2	Stiegler Electric	3	3
4. LMW&S*	6	4	Sun & Daughters	4	
Legacy Solar	1	1	Timmerman's Talents		1
New Solar		3	WI Power Control*	5	

2007 Installations and Installers

- 24 active installers
- 9 NABCEP certified installers
- 89 (simple grid connected) systems installed
 - 72 (81%) by NABCEP certified installers
- 58 (simple grid connected) systems to be installed
 - 40 (69%) by NABCEP certified installers
- 212 days between application and installation approval



Solar Electric Site Assessors

- Siting, sizing, shading, economics... summarized in a report
- Midwest Renewable Energy Association (MREA) Coursework and Certification
- WI Solar Electric Site Assessors
 - Residential: 53
 - Non-residential: 11
- Focus on Energy Co-funds cost
- Path into the solar installation & consulting career

WI Solar Electric Manufacturing

- Magnetek, Inverters
 - HQ: Menomonee Falls
 - Large inverters 30 to 500 kW
 - Distribute, service & maintain Aurora Line Inverters
 - 3 kW to 6 kW
 - Sold by PowerOne
- Racking?
- Balance of system components?
- Metering systems?



What to Remember

- Prices falling
 - New incentives and financing models
 - Sales booming
 - Need to grow solar electric sector (manufacturing)
-
- Focus is here to help



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