State of Solar

- Solar industry as a whole is doing very well
  - Over 100,000 individual solar systems will be installed by year's end
  - A solar project will be installed, on average, every four minutes in the U.S
  - Solar installations up 76% in 2012 and 30% in 2013
- Industry in Wisconsin has had some major set-backs
  - WPS net metering ruling by the PSC
  - Helios files for bankruptcy
  - Focus on Energy has suspended the solar incentive for the remaining part of 2013.

State	Net metering grade	Interconnection grade
Illinois	B	B
Iowa	B	B
Michigan	B	C
Minnesota	B	C
Wisconsin	C	D

"Freeing the Grid", a report by the Vote Solar Initiative and the Interstate Renewable Energy Council, Inc.(IREC)

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MadiSUN SOLAR ENERGY PROGRAM

Madisun Solar Program

CITY OF MADISON, WI
PHOTOVOLTAIC ASSESSMENT MODEL

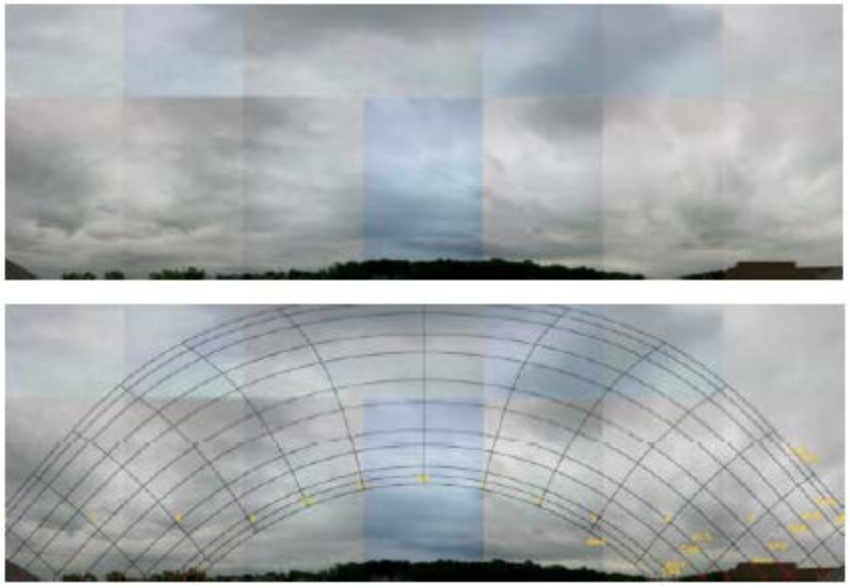
April 2013

Do the bright thing.

Madisun Solar Program

4.80 kW Sharp System Flush on Roof

Energy Production, Cost, Economics and Environment	
Energy Production	
Solar PV system rated capacity (kW - DC)	4.8
Estimated annual output (kWh/yr)	5,942
First Year Energy Production Value ($)	$885
Cost	
Estimated solar PV installed cost	$26,736
Federal tax credit	$8,021
Focus on Energy rebate (pre tax value)	$5,760
System cost after all incentives (does not include depreciation)	$12,955
Value	
GROSS value of energy production over 30 years (NPV)	$35,080
NET system value over 30 year system life (NPV)	$20,161
your pre-purchased energy price with a solar PV system ($/kWh)	$0.090
Environment	
CO_2 emission offset (tons/year)	6.6
Assumptions	
System cost per kW	$5,570
Electric rate in current year ($/kWh)	$0.149
Estimated electric rate price inflation (%/year)	5.30%
Panel efficiency degradation (%/year)	0.50%



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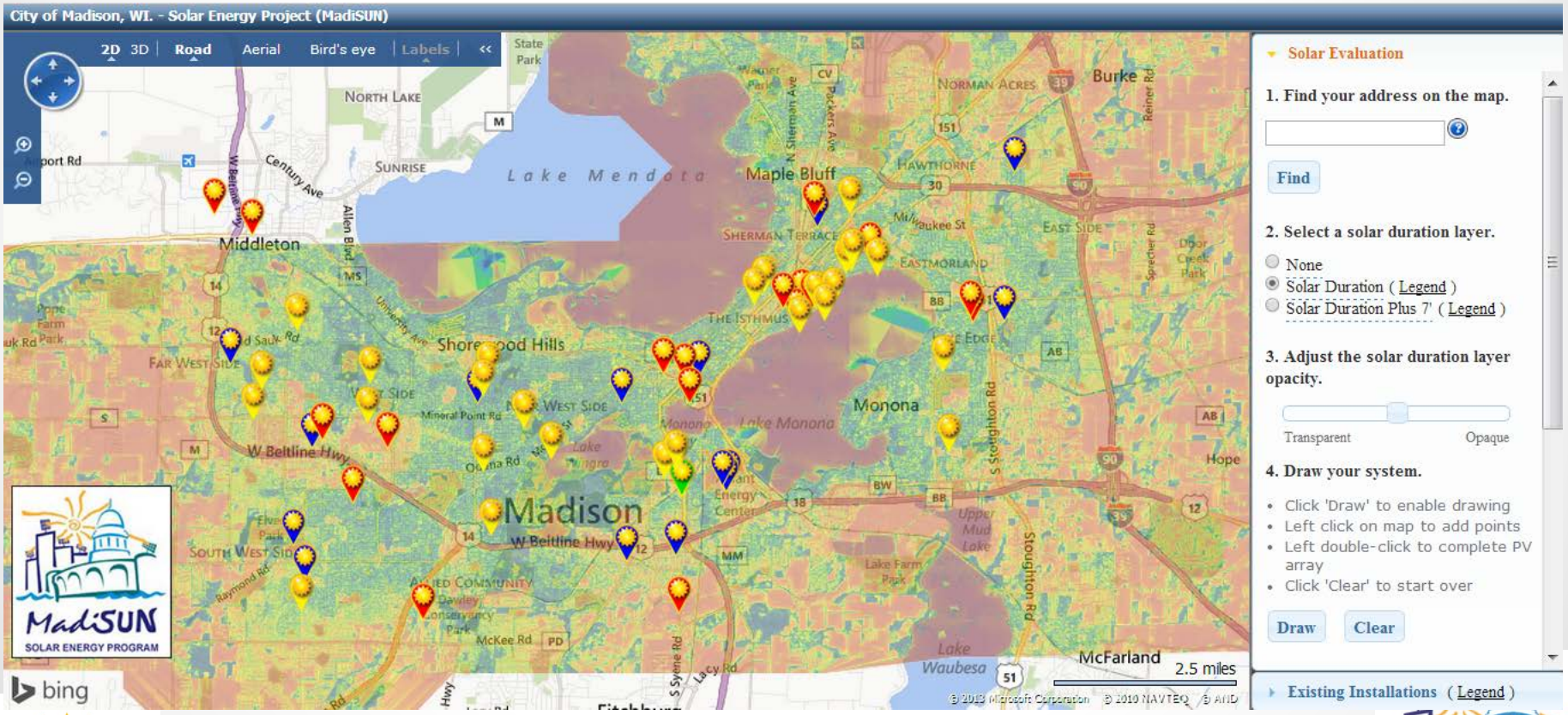
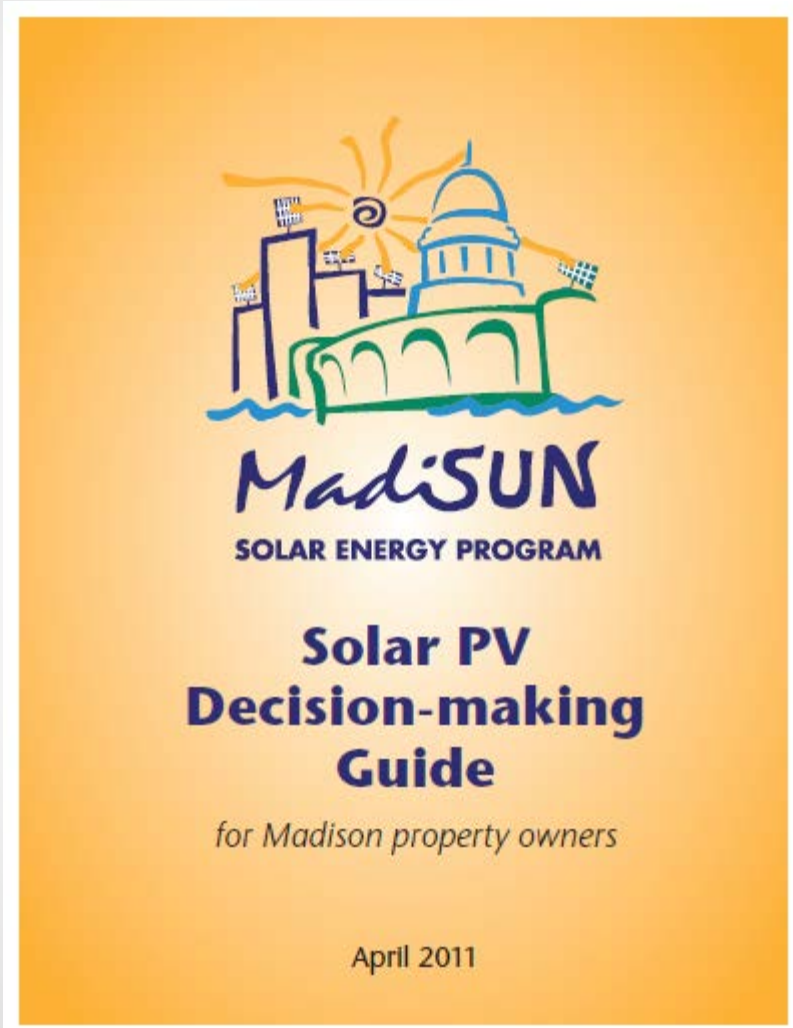
Madisun Solar Program



Madisun Solar Program



Grow Solar Wisconsin

"Supports 22 regional teams to spur solar power deployment by… **standardizing permitting,** zoning, metering and connections processes – and improving financing options to reduce barriers and lower cost for residential and small commercial rooftop solar systems..."

U.S. DOE press release Dec 1, 2011

Madisun Solar Program

- Solar Group Buying (“Solarize”)
  - o Started in Portland
  - o Dozens or more programs nationally
  - o Improves customer acquisition process
  - o Great way to get undecided to take action

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Pricing

- Discounted base package
  - Additional cost added for custom solutions or upgrades
  - Volume pricing for different levels of participation

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Why Solarizing Programs Work

- Expert + collective experiences
  - Assurances, safety in numbers
- Affordable
  - Pre-negotiated discounts
  - Competitive bidding process
- Faster Adoption
  - Limited time offers

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Approaches

- Community-based
- Fee-based
- Solar contractor sponsored

Design Considerations

- What level of commitment from potential participants should be required?
- What are the vendor responsibilities?
- Who will be responsible for selecting the vendor and how?
- How long should the program be opened for applicants?
- How and with whom will you celebrate?

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MadiSUN Case Study

- First group solar project in WI
- 250 homeowners
- 100 workshop attendees
- 20 participants
- 3 installers
- Average price: $5.48 per watt
- Average savings: 10%
- Impact: 78kW, 10% increase in residential solar PV

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Willy Street Co-op Case Study

- Selection Committee
  - 2 solar "experts"
  - 5 Co-op members considering solar
  - 1 Co-op staff
  - 1 previous group buy participant

Weighted value as determined by the committee	Vendor Selection Criteria
	Cover Letter & General
6	Firm Profile
11	Personnel/Qualifications
18	Project Experience
6	References
9	Customer Service
6	Local Residency
5	Employment Practices
12	Equipment
27	Pricing
100	**Total possible points**

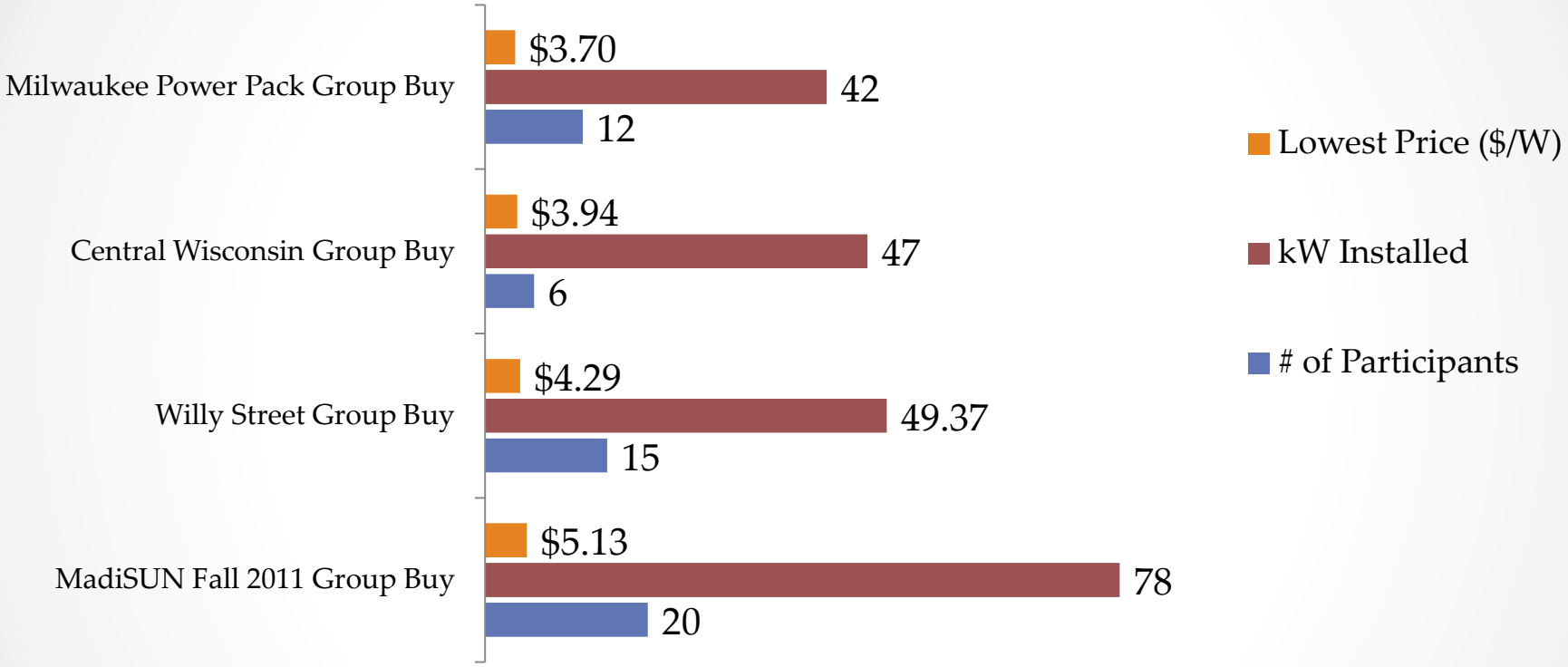

"We get lots of positive comments even though there were people in the condo assoc who were skeptical. There are other condo units who are interested in looking into solar - we give them your name with very positive recommendations."


“We are very happy with our system. The first year we produced a slight surplus of power over what we used.”

"We are very happy with our system…. The installer did a terrific job with our installation."


“My 3.6 kw system is working fantastic”

Results


Milwaukee Power Pack Group Buy
$3.70
42
12
Central Wisconsin Group Buy
$3.94
47
6
Willy Street Group Buy
$4.29
49.37
15
MadiSUN Fall 2011 Group Buy
$5.13
78
20
Lowest Price ($/W)
kW Installed
# of Participants

Key Lessons Learned

- Identify who is going to fill key responsibilities
  - Sponsor - creditable, active outreach partner
  - Project leader - on-call point-person, negotiate w/installers, navigating incentive programs
  - Technical expert - technical and economical feasibility
- Limited time offer
- Problem resolution

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Improvements

- Neighborhood-based
- Leverage previous participants results
- Collaboration with the County
- Partnership with a member based organization that can provide financing

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Solar Loan Program

- Milwaukee Shines Loan Loss Reserve
  - Leverages 20:1 $100,000 City = $2 million in solar loans
  - Low interest rate: (Prime plus 2.25%) 3.5%-5.5%
  - Loosened underwriting criteria
  - No money down, no home equity

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Solar Loan Program

- Typical Scenario:
  - Homeowner purchases a 3kW system at a group buy price of $12,000
  - 15 year loan at 5.25%
  - Loan payment $32/month more than their monthly utility bill
  - Assumes Focus incentive
- Survey: Would you be willing to pay a $40 monthly loan payment higher than your current monthly utility bill in order to have solar PV (electric) on your roof?
  - **25% of respondents said “yes”**

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Questions?

Thanks

$50,000 solar LLR

	Solar Loan Program*	Municipal Owned Roof-top Solar**
kWh/year saved	330,000	20,812.5
C02 ton/year reduced	365.65	23.05

*75 solar loans, average 3kw @ $4,000/kw each
**One 16.65 kW @ $3000/kW