

A Solar Story

Here is a photo narrative of the process for design and installation of a solar system at a residence in Ypsilanti MI



September 15 2012

This project is sponsored by the ILDC / Lighting and Energy Demonstration project ILDC@illuminart.net





- ▶ Pay my Bill
- ▶ View my Bill
 - Analyze My Bill
- ▶ Ways to Pay
- ▶ Payment Programs
- ▶ Meter Reading
- ▶ Electric Rates
- ▶ Gas Rates
- Rate Selector
- Help Center / Complaints
- Video Help Center
- How Rates are Set

1st Step

Analysis of usage history to determine system size requirements

Obtain information from the energy company of the history of energy used, on line. Then, design the system to equal the average, annual capacity.

Annual Comparison



This comparison report reflects activity for your current service address(es) only. The monthly amounts are based on the time your service was billed. Symbols in the report body are defined at the bottom of the report.

[Would you like more information on ho](#)

Account Number: [REDACTED]

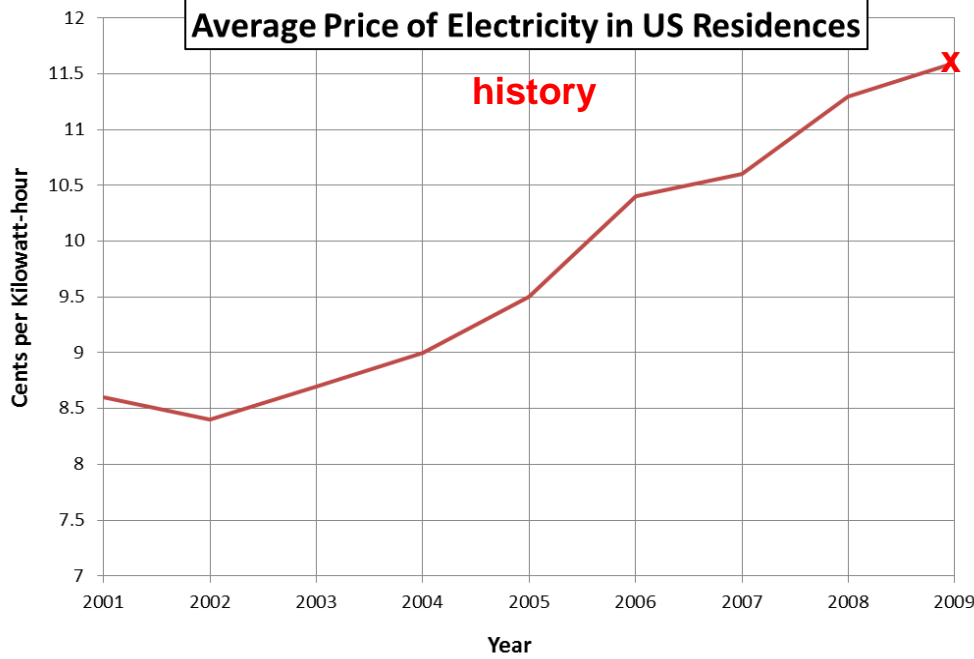
Comparison Report as of: Jun 29, 2011 2:50 PM

Residential Electric Service - 6232 MUNGER RD YPSILANTI, MI 48197-9026

Residential Electric Service - 6232 MUNGER RD YPSILANTI, MI 48197-9026

	Usage in KWH			Amount Billed			Days Billed		
	2011	2010	2009	2011	2010	2009	2011	2010	2009
JAN	795	953	1674	\$103.44	\$129.95	\$216.57	33	35	35
FEB	846	804	1122	\$102.45	\$101.81	\$142.85	35	30	30
MAR	440	773	1009	\$65.77	\$105.31	\$130.75	27	30	28
APR	617	966	861	\$89.24	\$131.76	\$110.61	29	32	33
MAY	655	877	798	\$95.43	\$120.75	\$102.79	33	29	32
JUN	746	—	609	\$109.64	—	\$80.34	30	—	28
JUL	—	—	813	—	—	\$105.15	—	—	34
AUG	—	2495	946	—	\$341.78	\$124.86	—	93	33
SEP	—	586	684	—	\$79.80	\$95.75	—	29	27
OCT	—	594	757	—	\$81.49	\$104.90	—	29	29
NOV	—	627	763	—	\$89.70	\$105.68	—	29	29
DEC	—	656	833	—	\$93.49	\$114.97	—	29	29
TOTAL	4,099	9,331	10,869	\$565.97	\$1,275.84	\$1,435.22	187	365	367
30-Day Average**	658	767	888	\$90.80	\$104.86	\$117.32			

Average Price of Electricity in US Residences



The Business Case.. Basics

The solar system is designed / sized to generate equal KWH as used in 2010 based on the DTE annual use report

System Costs

- Equipment; panels, racks, hardware \$18,842.00
- Electrical labor / wiring, panels \$ 3394.00
- Install labor / supports, rack assembly \$ 1400.00
- Permits misc \$ 300.00

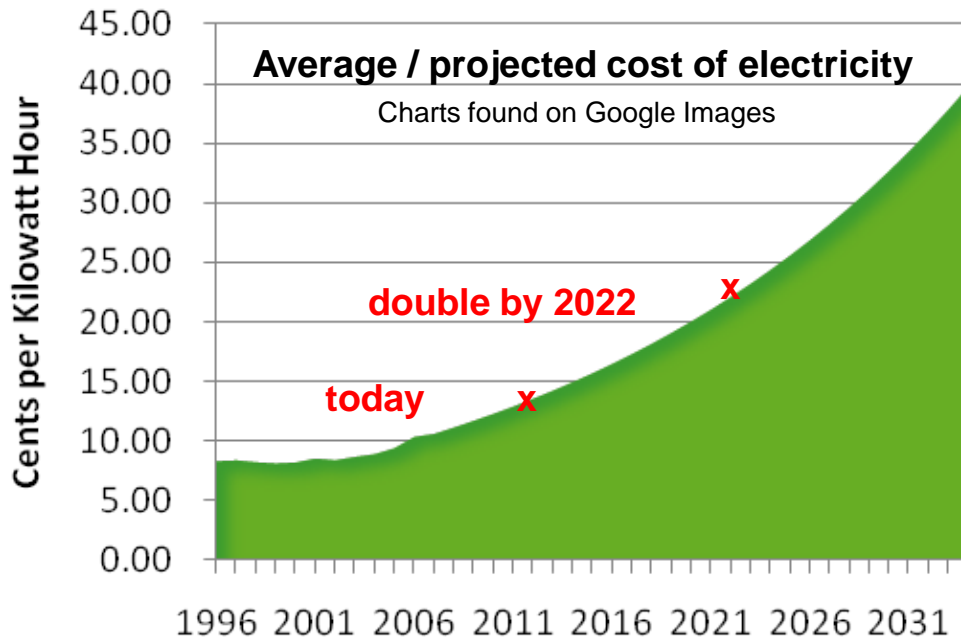
Sub Total \$ 23,936.00

Fed Energy Tax Credit 30% \$ 7,180.00

Total cost to owner \$ 16,755.00

Average / projected cost of electricity

Charts found on Google Images



Annual electrical rate billed in 2010 \$ 1275.00
(see previous page)

Return on initial investment IF rates were to remain the same. 13.14 years

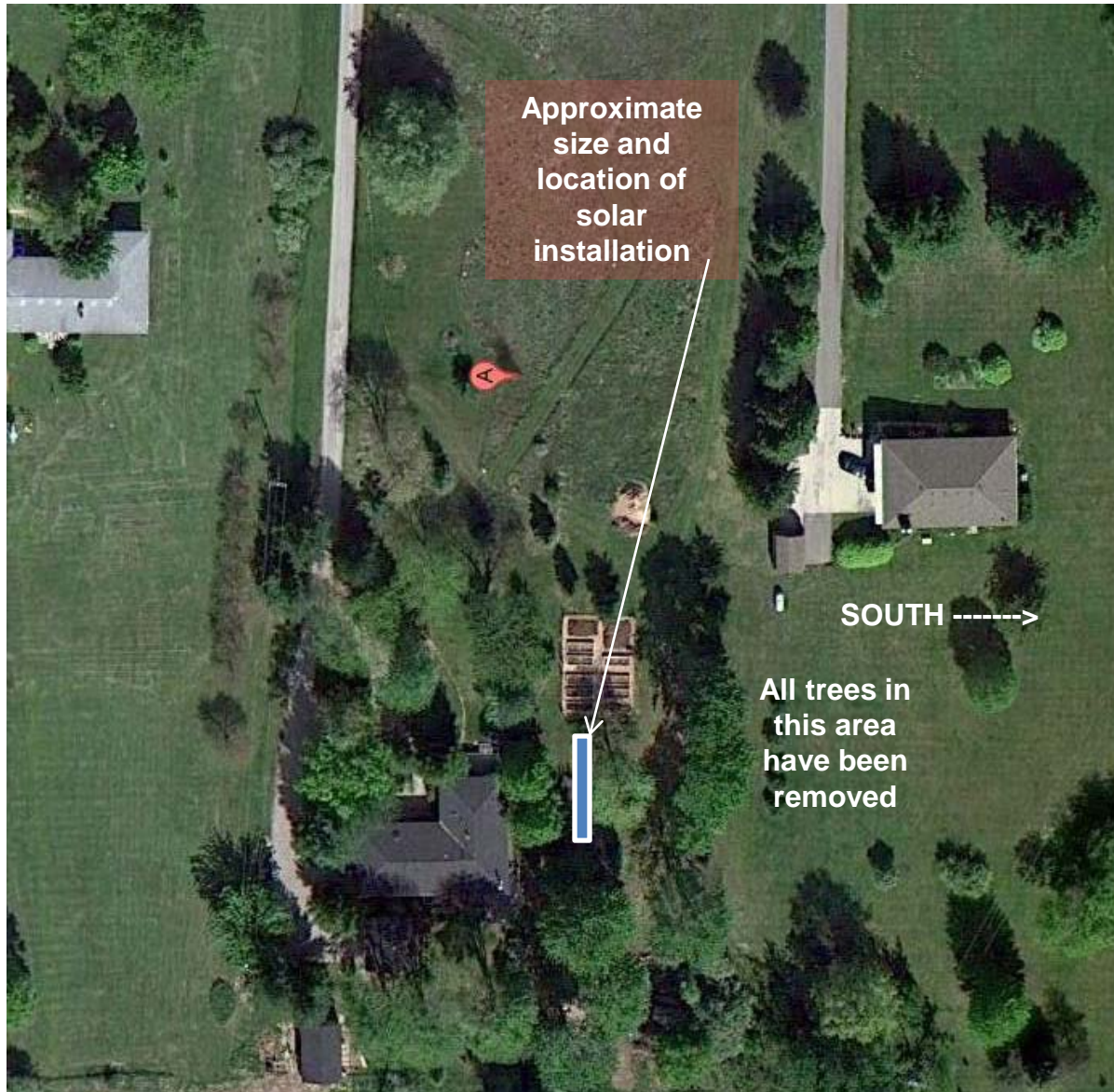
A 13 year ROI at 2010 rates

We estimate a 9 year ROI with inflation and rate hikes

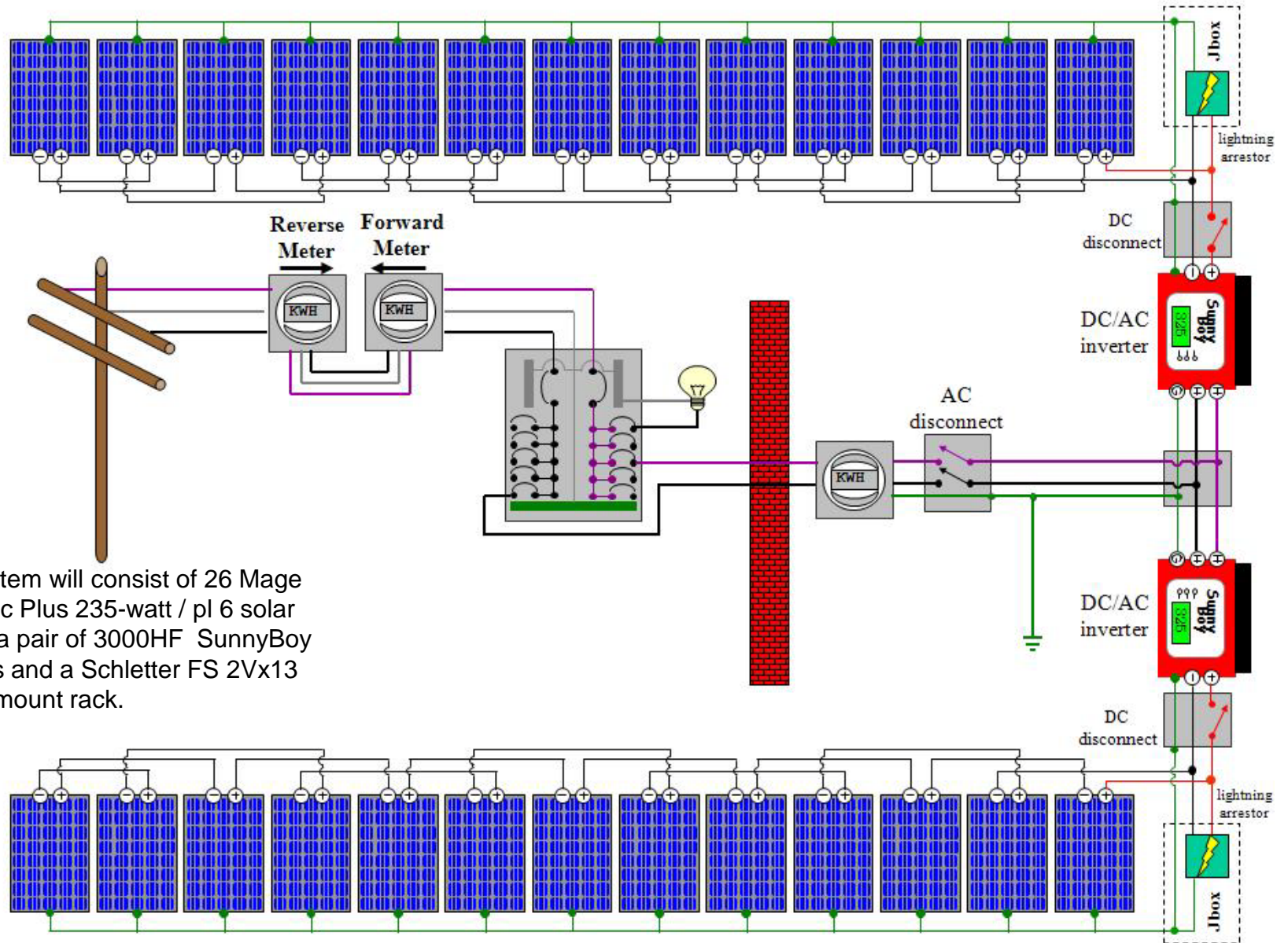
Comments / considerations

- Solar is a tangible asset unlike the stock market
- Electrical costs will keep going up / not down
- You will always need and use electricity
- The system is warranted for 30 years with a useable life of 40
- Solar is becoming progressively more efficient (smaller panel sizes) and less expensive to buy

System Location



System Schematic by Solar Ypsi



This system will consist of 26 Mage Powertec Plus 235-watt / pl 6 solar panels, a pair of 3000HF SunnyBoy inverters and a Schletter FS 2Vx13 ground mount rack.

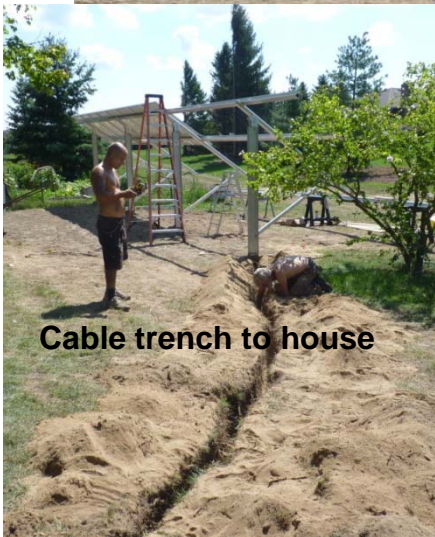
Installation



5' 6" deep holes for vertical supports



Post installation / alignment and vertical leveling



Cable trench to house



Posts setting in concrete



Leveling
bracket adjustment
by Dave Strenski



Frame assembly



Panel installation

26 Panel installation complete



Inverters inside garage wired to the home AC disconnect panels

Inverters

Electrical inspector approval

PITTSFIELD CHARTER TOWNSHIP
BUILDING DEPARTMENT
NOTICE OF INSPECTION RESULTS
APPROVED
DO NOT REMOVE INSPECTION TAGS
ADDRESS *6232 Munster Rd*
FINAL ELECTRICAL
INSPECTION TYPE *PLUMBING*
DATE *9/9/12* PERMIT *PE-12-0209*
INSPECTOR *COOK*



Meters and panel outside of garage

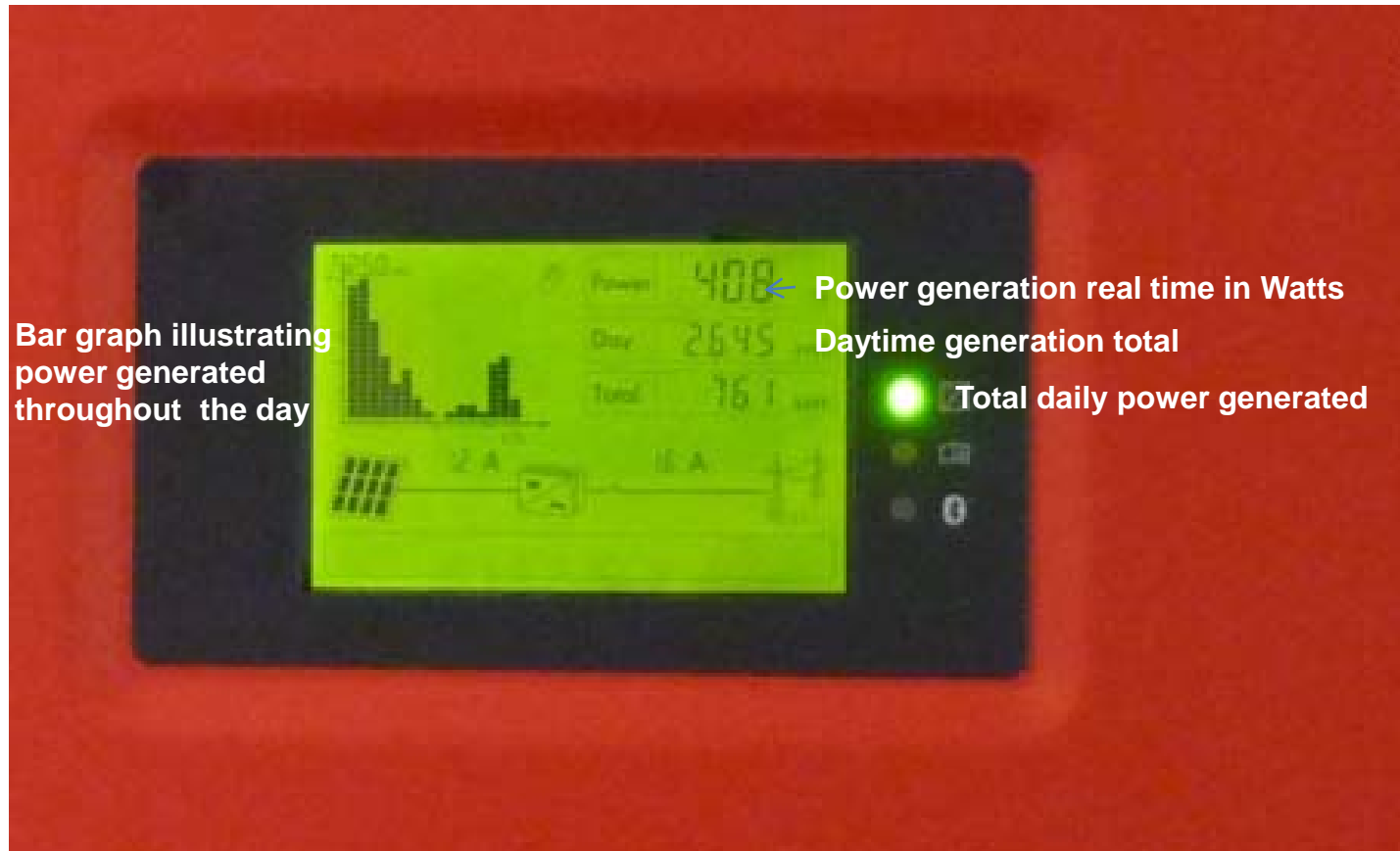


Meter monitor of KW produced
Installed 2 days prior to photo

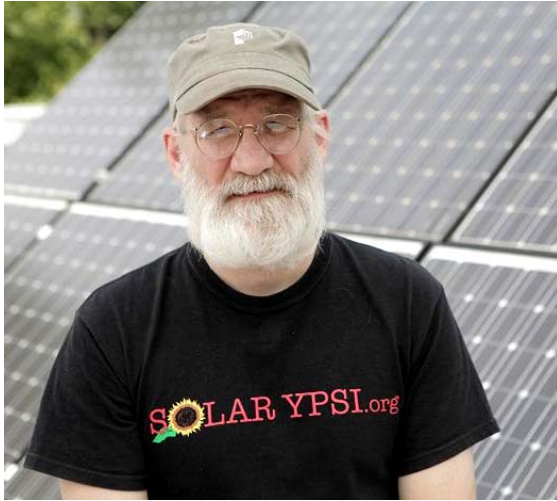


DTE Meter of KWH minus
energy produced by solar

Inverter Display Monitor Reading



The Design and Installation Team



Design / Dave Stenski

Dave has a passion for solar power and SolarYpsi to design and install photovoltaic systems in Ypsilanti. SolarYpsi has reached over 2500 people with their solar power presentations which can be found at www.SolarYpsi.org along with other solar information. Dave holds degrees in Land Surveying, Civil and Mechanical Engineering. His publications include works in the areas of parallel computing, numerical consistency, genomic data searching algorithms, reconfigurable computing, and other computer related topics.



Electrical / John Wakeman

John is owner of SUR Energy, LLC of Ann Arbor and is one of Michigan's pioneering, renewable energy experts. For eleven years John has been successfully designing and installing solar electric systems, and has also done solar thermal systems and small wind power installations.

SUR was the first solar company in Michigan to achieve "NABCEP" designation and become a qualified member of the North American Board of Certified Energy Practitioner.



Construction / Dave Paszkowski

Dave is the owner of DDP Construction in Romulus MI and provides services for; home building, remodeling, commercial buildings and has experience in installation of solar panels, satellite dishes, cable TV and a wide variety of construction projects.

Dave has a BFA degree from Eastern Michigan University and was a teacher at local schools.

