

RENEWABLE ENERGY STORIES

FIRST UNITARIAN SOCIETY



NANCY VEDDER-
SHULTS

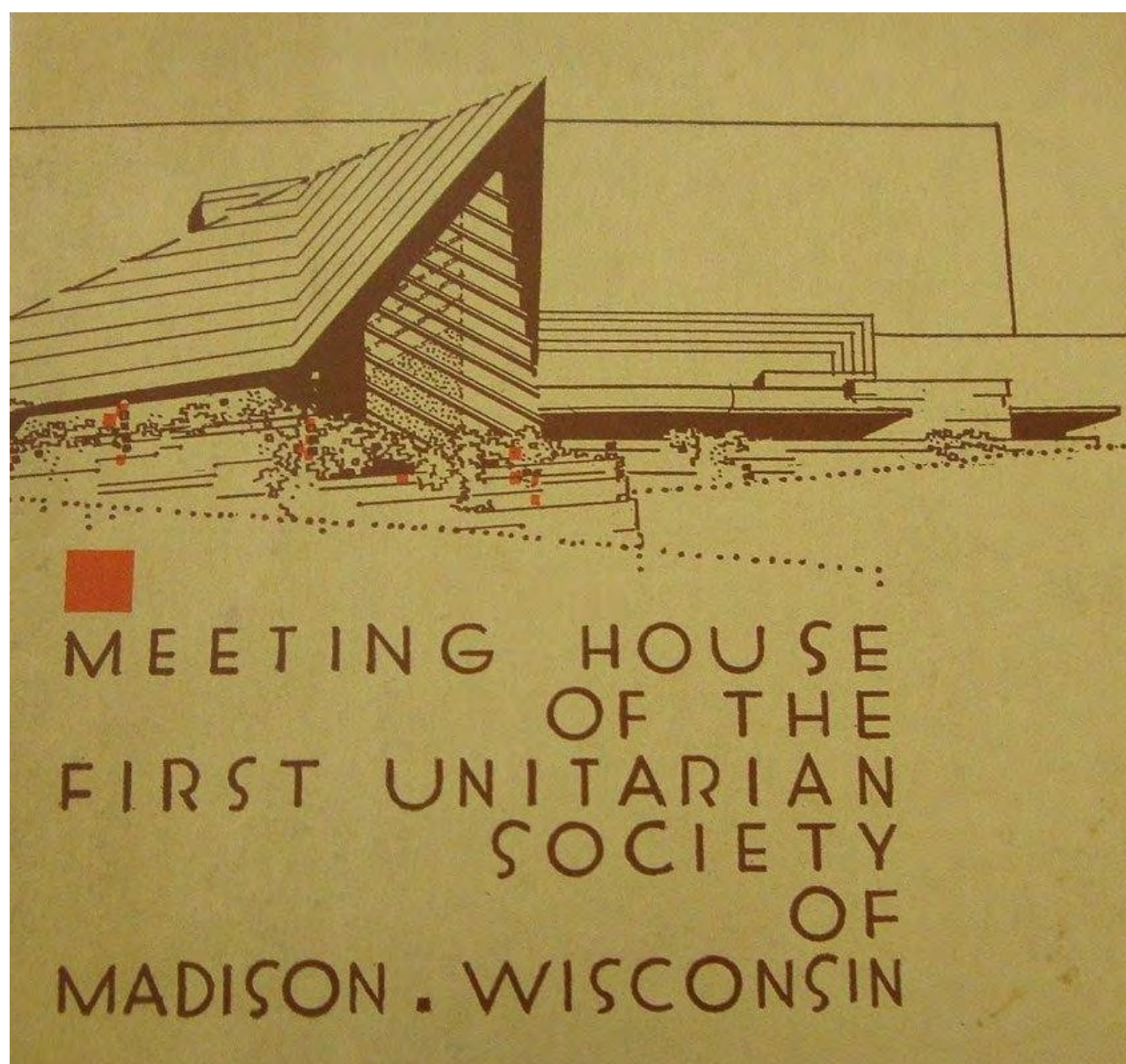


A Sustainable Addition to an Iconic House of Worship

Nancy Vedder-Shults for the First Unitarian Society of Madison

Renewable Energy Summit

January 16, 2020



Opening day program, 1951. Building designed by Frank Lloyd Wright and built by Marshall Erdman.





UNITARIAN MEETING HOUSE

HAS BEEN DESIGNATED A

NATIONAL HISTORIC LANDMARK

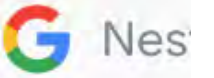
DESIGNED BY RENOWNED ARCHITECT FRANK LLOYD WRIGHT FOR THE FIRST UNITARIAN SOCIETY OF MADISON, THE MEETING HOUSE IS AN INNOVATIVE BUILDING THAT HAS INFLUENCED RELIGIOUS ARCHITECTURE WORLDWIDE SINCE THE MID-TWENTIETH CENTURY. COMPLETED IN 1951, THE MEETING HOUSE USES A DIAMOND SHAPE AS THE BASIC BUILDING FORM; A SOARING ROOF EVOKES THE STEEPLE AND SHELTERS THE CHAPEL AND PARISH HALL WITHIN A SINGLE UNIFIED STRUCTURE.

2004

NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

A Green Addition to Frank Lloyd Wright's Meeting House

Architects of the First Unitarian Society's new eco-friendly addition find inspiration in the ideas of original architect Frank Lloyd Wright



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PHOTO OF THE









Madison Gas and Electric
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Madison, WI 53701-1231

Please return top portion with payment.

See back of bill for more information and important telephone numbers.

Service Address 900 UNIVERSITY BAY DR 0139045 C 53705		Customer FIRST UNITARIAN SOCIETY TD:32 BILLED:01/22/18		Next Reading Date 02/16 0001094928	Account Number 10956118
Number of Days	Reading Dates Present Previous	Readings Present - Previous x	Constant = Use x Therm Factor =	Gas Only Therms	AMOUNT

YOUR BILL AT A GLANCE

BALANCE FORWARD	NO. OF GAS METERS	GAS BILL	NO. OF ELEC METERS	ELEC BILL	ACCOUNT BALANCE
\$0.00	1	\$1,207.23	1	\$3,453.54	\$4,660.77

PREVIOUS ACCOUNT BALANCE					\$ 4,623.83
01/08/18 PAYMENT RECEIVED - THANK YOU					\$ 4,623.83CR
BALANCE FORWARD					\$ 0.00
GAS: COMMERCIAL AND INDUSTRIAL SERVICES					
30 01/17 12/18 92534 90994 1.260 1940 CCF 1.049 2035 THERMS	Commercial & Industrial Distribution Service (GSD-1)				
System Connection and					
Customer Service Charge	30 DAYS	AT \$	.80000	\$	24.00
Distribution Service	2035 THERMS	AT \$	.14530	\$	295.69
Gas Supply Service (FS-1)					
Administrative Charge	2035 THERMS	AT \$	.01350	\$	27.47
Natural Gas Service	2035 THERMS	AT \$	.42264	\$	860.07
Subtotal Gas Meter	061656	-----		\$	1,207.23
ELECTRIC: COMM & IND TIME-OF-USE (CG-4B)					
30 01/17 12/18 34107 0 1.000 34107 KWH	Three-Phase Grid Connection and				
Customer Service Charge	30 DAYS	AT \$	6.32048	\$	189.61
State Low-Income Asst Fee	30 DAYS	AT \$	.16447	\$	4.93
Distribution Service					
Customer Maximum Demand	96.0 KW/DAY	AT \$	.08480	\$	244.22
Distribution Charge	34107 KWH	AT \$	.01029	\$	350.96
Electricity Service					
Maximum On-Peak Demand	71.0 KW/DAY	AT \$	.34530	\$	735.49
Base Energy All KWH Chg	34107 KWH	AT \$	.04186	\$	1,427.72
On-Peak 1 (10AM-1PM)	2887 KWH	AT \$	.04617	\$	133.29
On-Peak 2 (1PM-6PM)	4760 KWH	AT \$	.04617	\$	219.77
On-Peak 3 (6PM-9PM)	3127 KWH	AT \$	.04617	\$	144.37
Fuel Cost Surcharge	18696 KWH	AT \$	.00017	\$	3.18
Subtotal Electric Meter	329353	-----		\$	3,453.54
TOTAL CHARGES FOR SERVICE THIS MONTH -----					
					\$ 4,660.77
ACCOUNT BALANCE -----					
					\$ 4,660.77

Annual electric usage = ~360,000 kWh (~\$40,000)

Annual carbon emissions from electrical usage = ~520,000 pounds

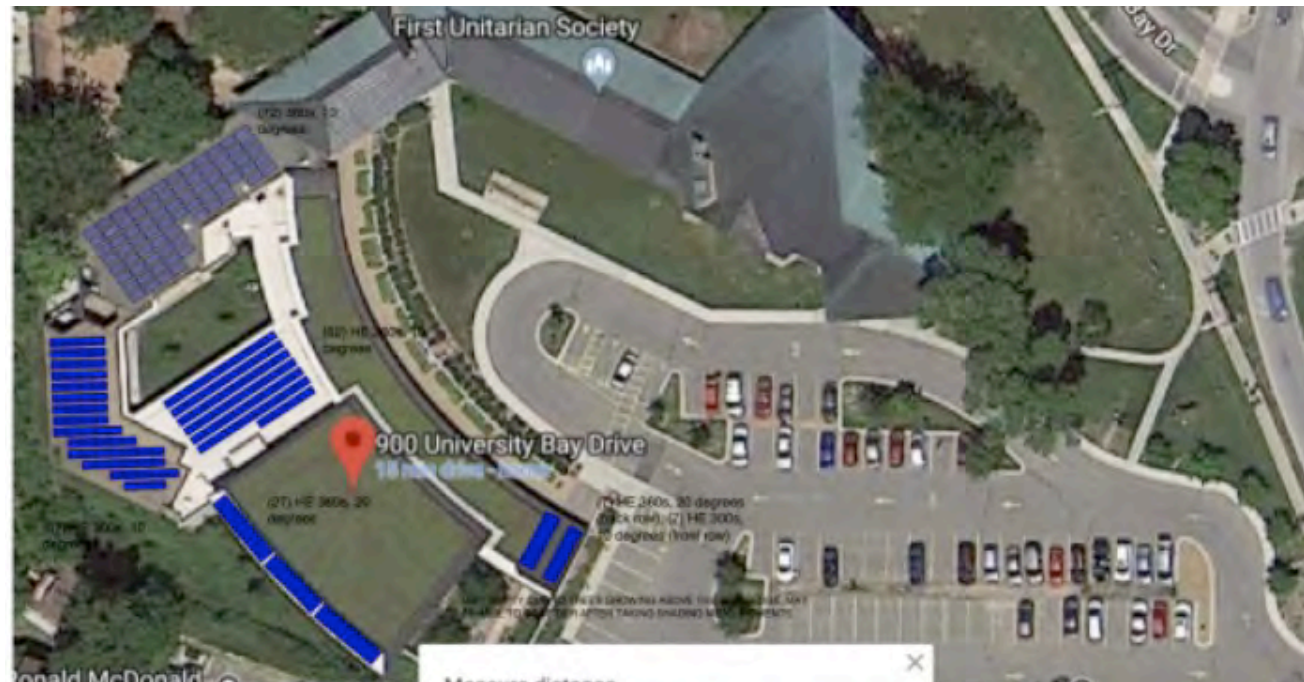


Finally moving forward

- 2017 capital campaign devotes \$35,000 to solar.
- Board creates a Sustainability Task Force.
- Task Force identifies potential sites on flat roofs of 1960s addition, parking lot, and grounds.
- Task Force solicits proposals from four installers, which focus on the flat roof.

Solar proposals

Proposer	Proposed array	Price
Company A	51 kW	\$108,000
Company B	54 kW	\$103,000
Company C	45 kW	\$101,000
Full Spectrum Solar	79 kW (later 83 kW)	\$168,000



Financing

- Solar for Good grant (RENEW Wisconsin)
- Prescriptive grant (Focus on Energy)
- Tax-advantaged financing (Legacy Solar Co-op)
 - FUS Solar LLC
 - Bond sales to parishioners

Legacy Solar Co-op



Ribbon-cutting, October 2019

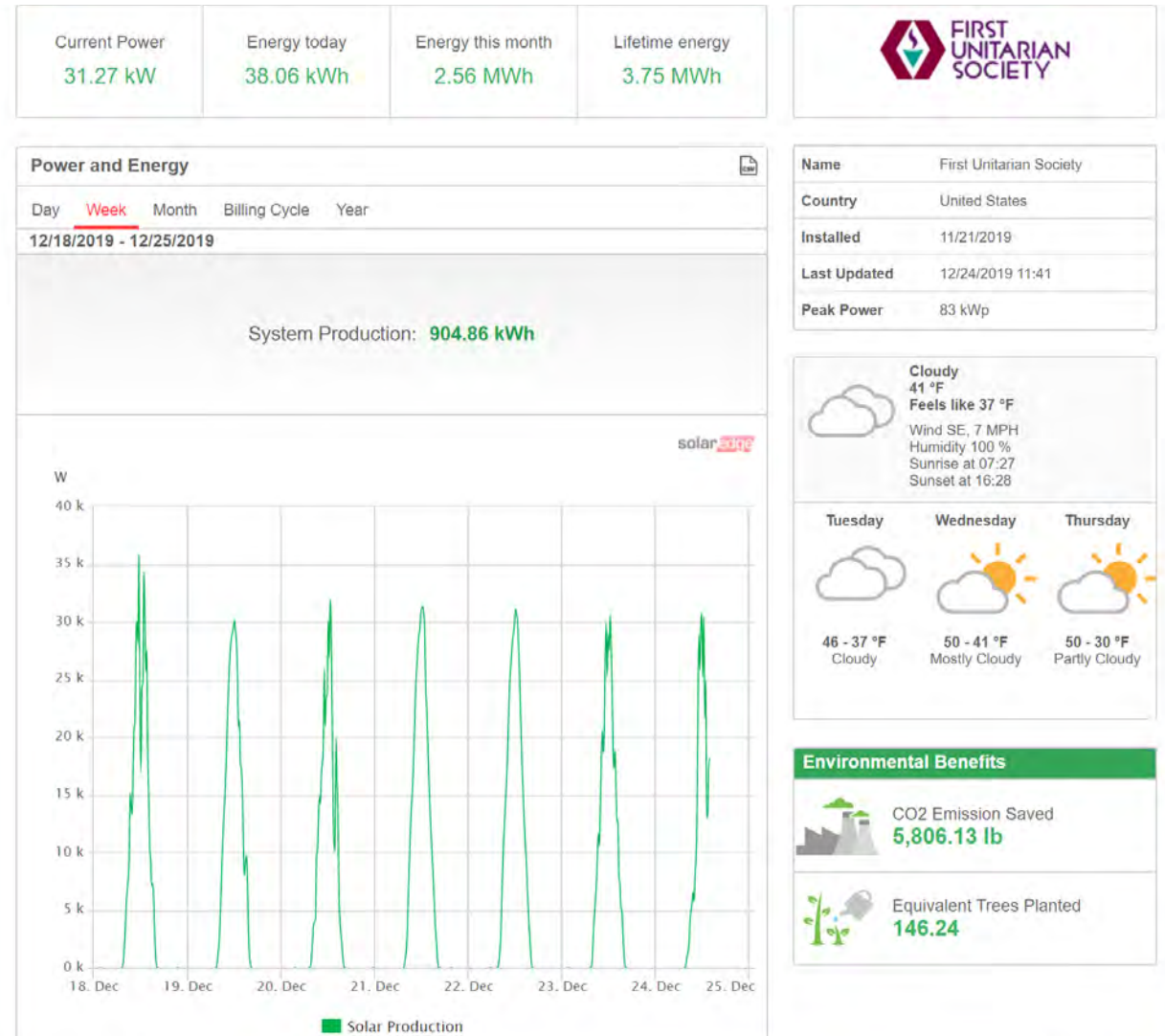


Commissioning, November 2019



Initial production data

- 3,500 kWh generated in Month 1 (November-December)
- Implies annual generation of ~95,000 kWh



Energy efficiency project



SEG (now HGA) engaged in 2017 to evaluate FUS HVAC challenges and excessive electric consumption.

Energy efficiency project

- Airflows properly balanced reducing wasted energy.
- Optimized sensors and controls to retain comfort at reduced energy consumption.
- Identified over designed (2X) geothermal system and provided corrective plan.
- Together with solar, will reduce FUS electric consumption from grid by ~50 percent.

THE KUBALA WASHATKO ARCHITECTS, INC.



FIRST UNITARIAN SOCIETY

SUSTAINABLE FEATURES

Next Steps

FUS wants to “Array it Forward”!

Contact: Nancy Vedder-Shults, nancyv-s@tds.net