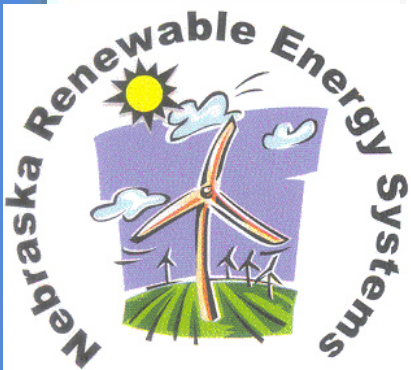


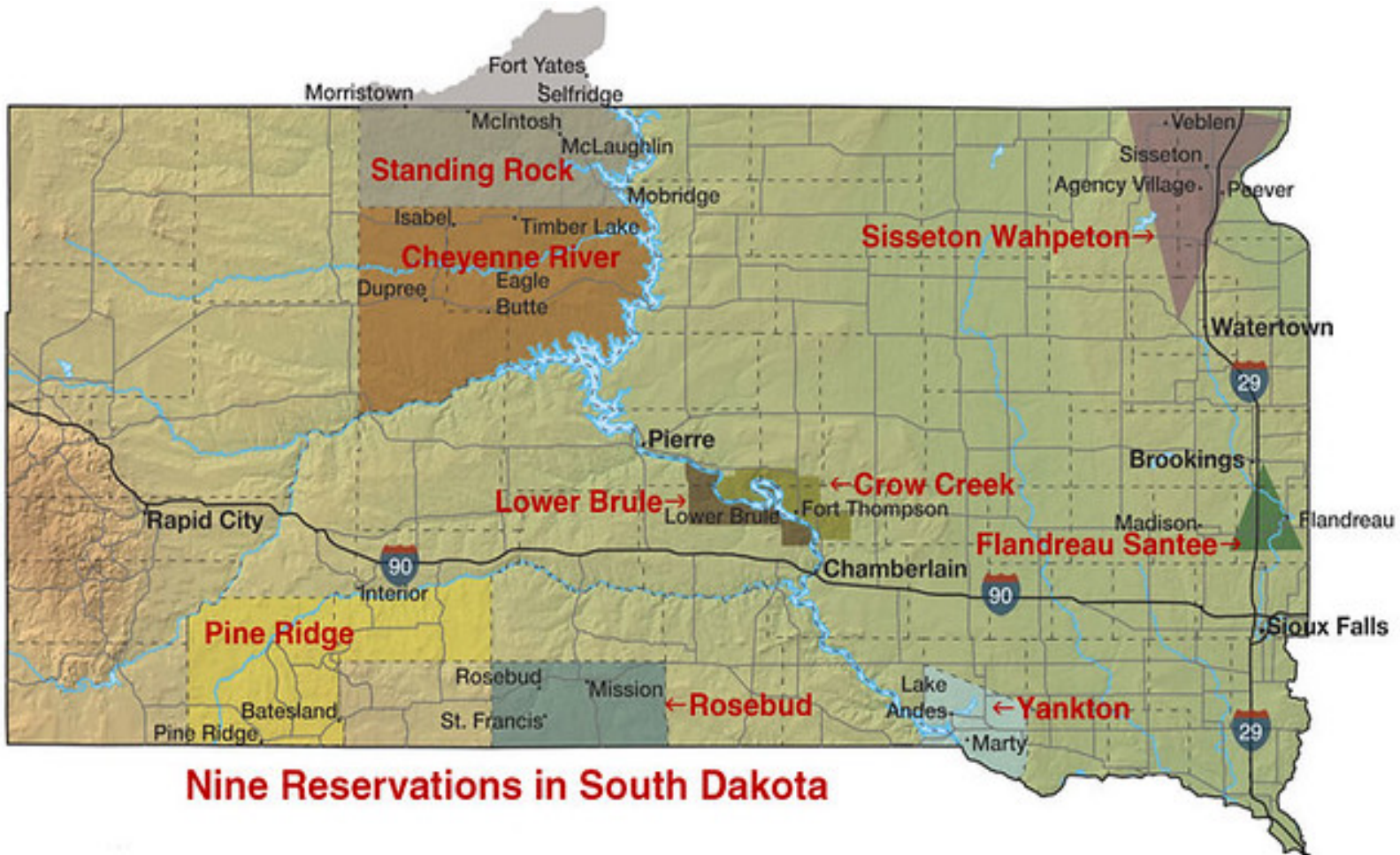
# ***Flandreau Santee Sioux Tribe***



Flandreau, South Dakota

# Location

Flandreau is the smallest Tribe both land and population located in eastern South Dakota



# History

- The Flandreau Santee Sioux Tribe is comprised primarily of descendants of “Mdewakantonwan”, a member of the Isanti division of the Great Sioux Nation, and refer to themselves as Dakota, which means friend or ally. The Flandreau Santee Sioux Indian Reservation is 2,500 acres of land located along and near the Big Sioux River in Moody County, South Dakota, in a region known as the Prairie Coteau, which consists primarily of undulating or gently rolling land. At European contact, the Dakota lived in Minnesota and Wisconsin. After many years of semi-nomadic existence, and due to pressure from white settlers, the Santee ceded their land and entered a reservation in 1851
- In 1862, the Santee revolted against reservation life, when the government did not meet its treaty obligations and white traders refused to allow food and provisions to be distributed. This uprising, led by Little Crow, was quickly crushed. Twelve hundred Indians, many innocent of any involvement in the uprising surrendered. Over 306 were sentenced to death by a military tribunal, and after President Lincoln granted some pardons, 38 were hung on December 26, 1862. The remaining survivors were shipped to concentration camps (prisons), in Davenport, Iowa and Ft. Thompson, South Dakota.
- In 1866, the Ft. Thompson and Davenport groups were re-united at Santee Agency at the mouth of the Niobrara in Nebraska. One third were converted to Christianity. In 1869, twenty-five families gave up tribal rights and annuities to become citizens, and acquired homesteads along the Big Sioux River at an area that would become Flandreau, South Dakota
- They soon built their little Presbyterian Church in what was to become Flandreau and that fall, were joined by 15 additional families. This church, built in 1873, is one of the oldest continually used churches in South Dakota. The graveyard memorializes many of those early Christian names who shared in the journey from Mankato to Flandreau. In 1934, the Flandreau Santee Sioux Tribe was formally organized and recognized under the authority of the Indian Reorganization Act of 1934.





# Today

Currently the land base has grown to approximately 5000 acres

Membership approximately 750

On Reservation Membership is about 310 Adults to 150 minors

FSST like other Tribes rely on federally funded programs for many of its government entities but are doing everything they can in the ventures of Economic Development to become as self sufficient as possible.

# Today Cont.

- Flandreau is one of the first tribes in the nation (this side of the Mississippi) to open a casino.
- We also (like others) have a gas station and truck stop.
- We rely on agricultural leases and are beginning the process possibly entering the hemp arena as the majority of our land is agricultural.
- We've expanded in many social areas including a newly built Clinic via the Joint Venture Program.

# Thank You

- As stated earlier we are doing everything in our power to become as self sufficient as possible. We can't thank the Dept. of Energy enough for its assistance in helping us attain that goal by giving us a chance to get our foot in the door with our first swing at renewable energy. We know with Local leadership, community, and most of all DOE support we will give maximum effort to make this step one in our renewable energy efforts.

On behalf of the entire Executive Committee, Pidamaya (Thank You)

Sincerely,

Ryan Kills-A-Hundred

FSST Treasurer

# Mission

- FSST was awarded a topic 2 grant project with DOE to deploy solar at 11 sites
- These applications were selected from the entire spectrum of Tribal opportunities and selected for best effect
- FSST maintenance will provide all installation services and NRES will provide training and technical support and facilitate wholesale purchases of solar materials.
- Local deployment of solar increases Tribal independence and keeps money on the reservation



# Project salient points

- Some 'high' electrical rates were discovered at several Tribal locations.
- Usage summaries have been examined for cost and trend analysis
- System size estimates have been made based on policy, cost and site factors.
- System sizes could be increased in some cases, but should stay less than 100kw
- SD interconnection policy is very limiting, so proper system sizing is vital for proper economic return

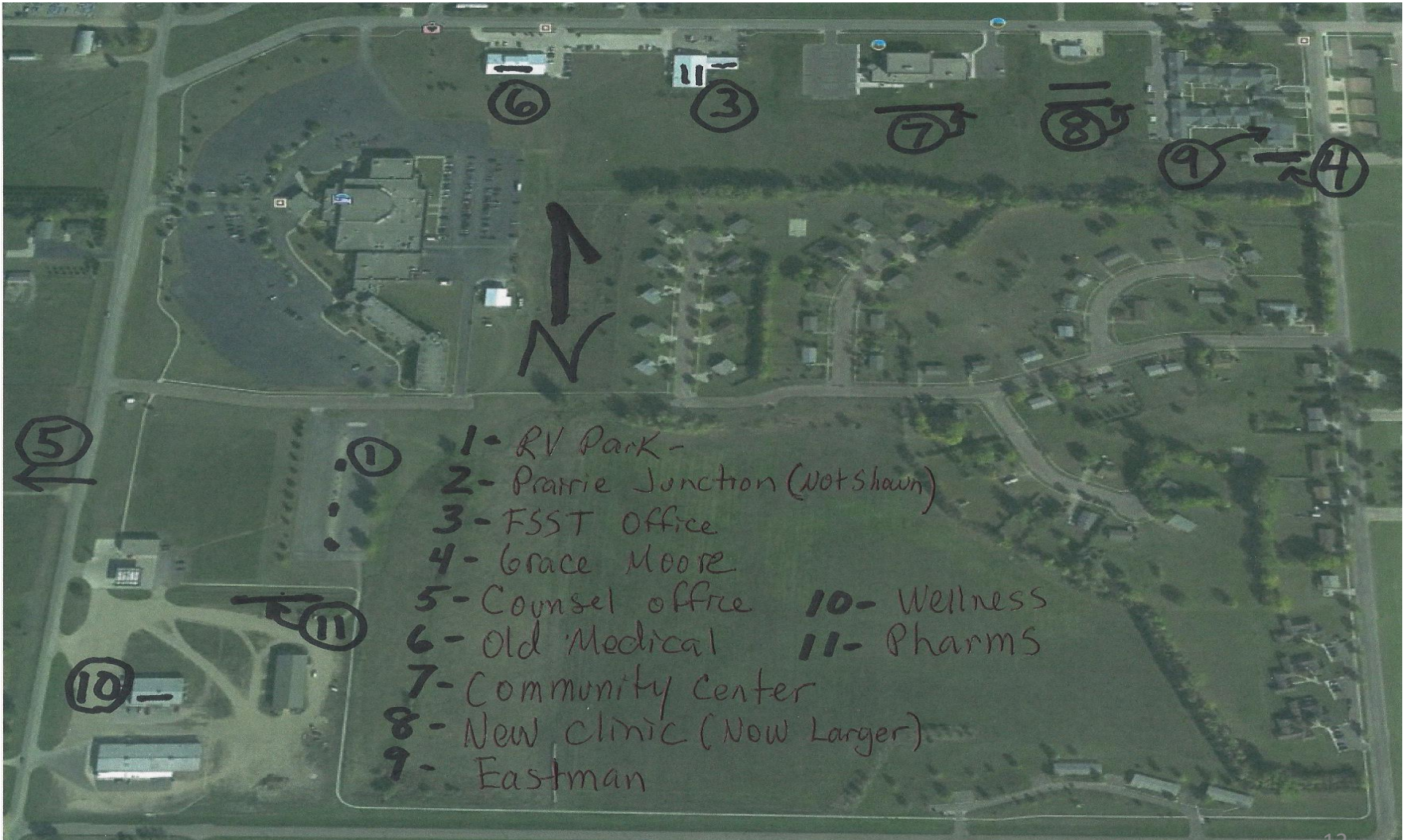
# Location Opportunities

- Two locations are recommended for Casino
- Nine locations are recommended for the Tribe
- Some of the roofs are 'solar ready' with S-5
- Still some additional locations in the 'bullpen'
- Pow Wow grounds excluded because of policy
- Proposed systems are 'right sized' for the locations to eliminate excess energy delivered to grid, designed for retail offset.

# Royal River Opportunities

- Large users of Casino and Hotel were not considered at this time.
- Rates are high for small commercial sites.
- Larger cap for interconnection exists at Prairie Junction, 100kW. Excellent visibility from I-29.
- RV Park will provide excellent visibility and 'green camping'
- Shade structure mountings provide dual purpose application and serve to integrate solar into the everyday tribal areas

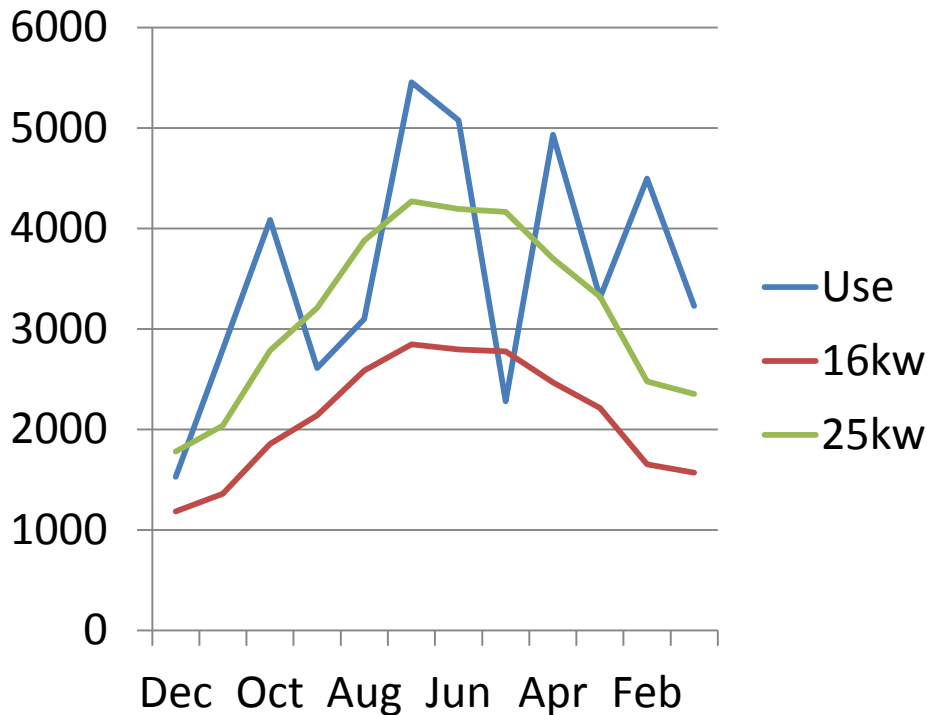
# The Square





# RV Park

- Pole mounted systems would provide shade and power offset, 16-25kW recommended
- Pole mounts much stronger than old versions



# RV Park



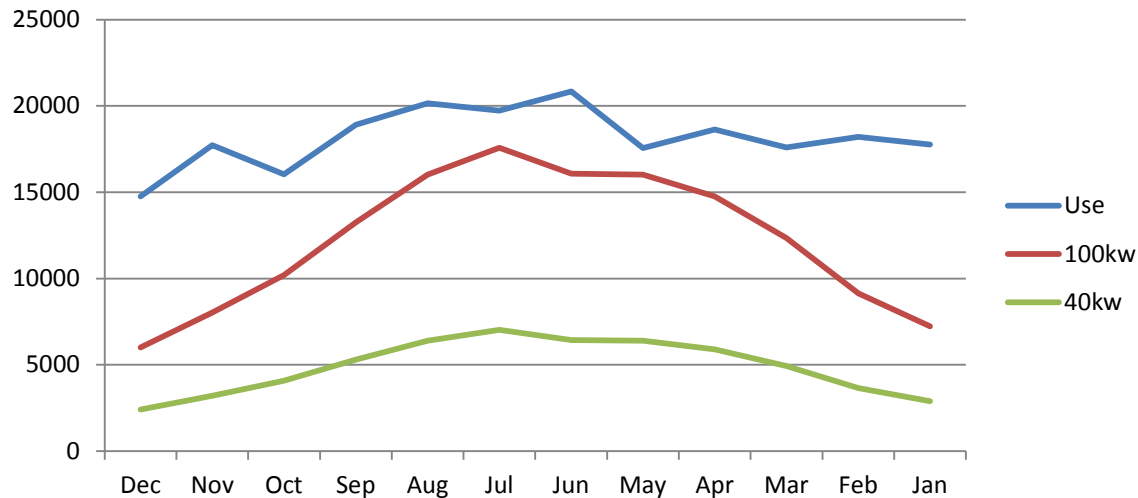


# RV Park Pole Mounted Solar



# Prairie Junction

- Power cost is high with high energy use.
- Ground mount solution on south side is best location
- 60kW selected
- May be designed as shade structure





# Prairie Junction

Energy cost is 10 cents/kWh year round

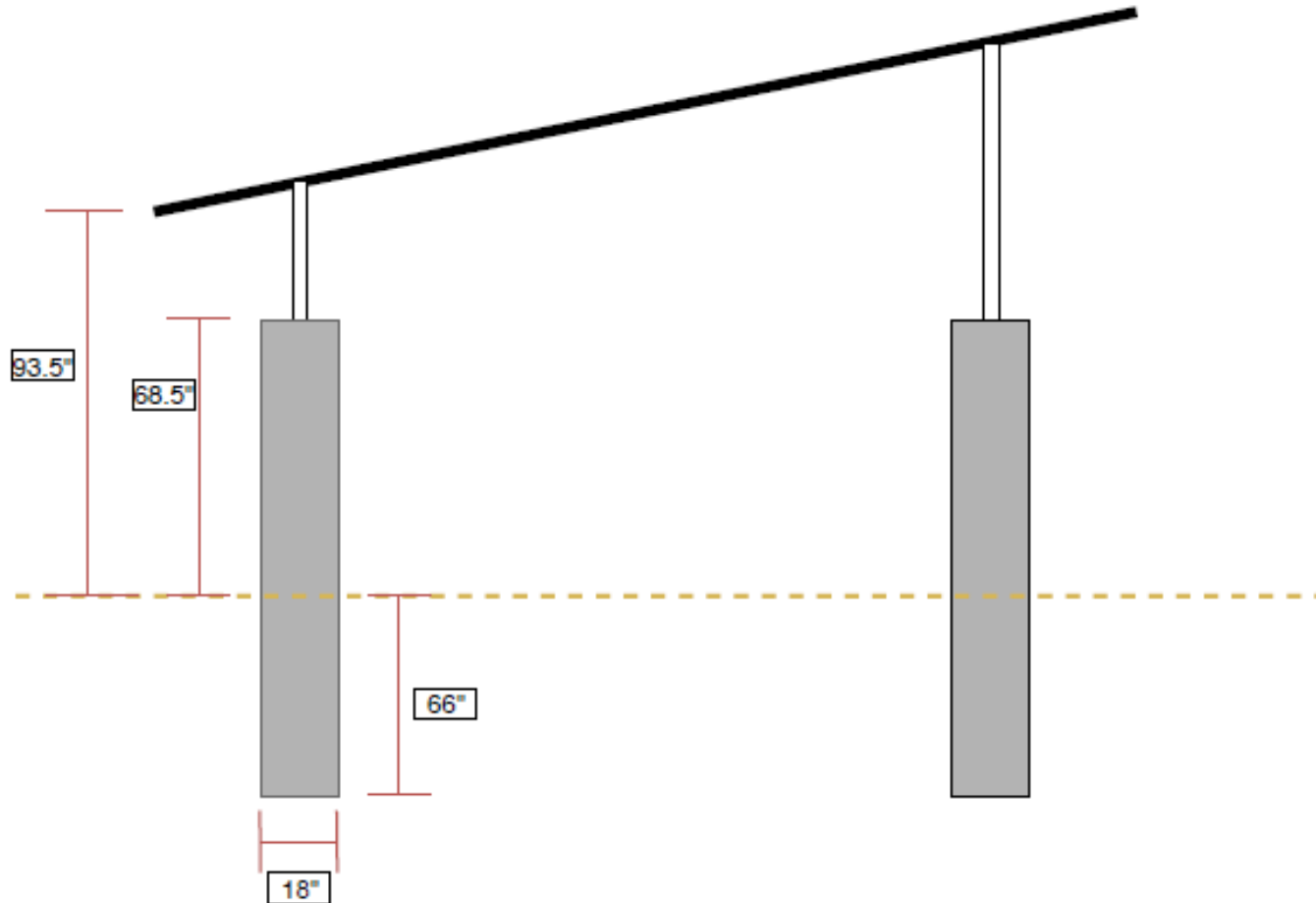
Sioux Valley allows 100kW

Excellent visibility from Highway

View from I-29N



# Dual purpose shade structure

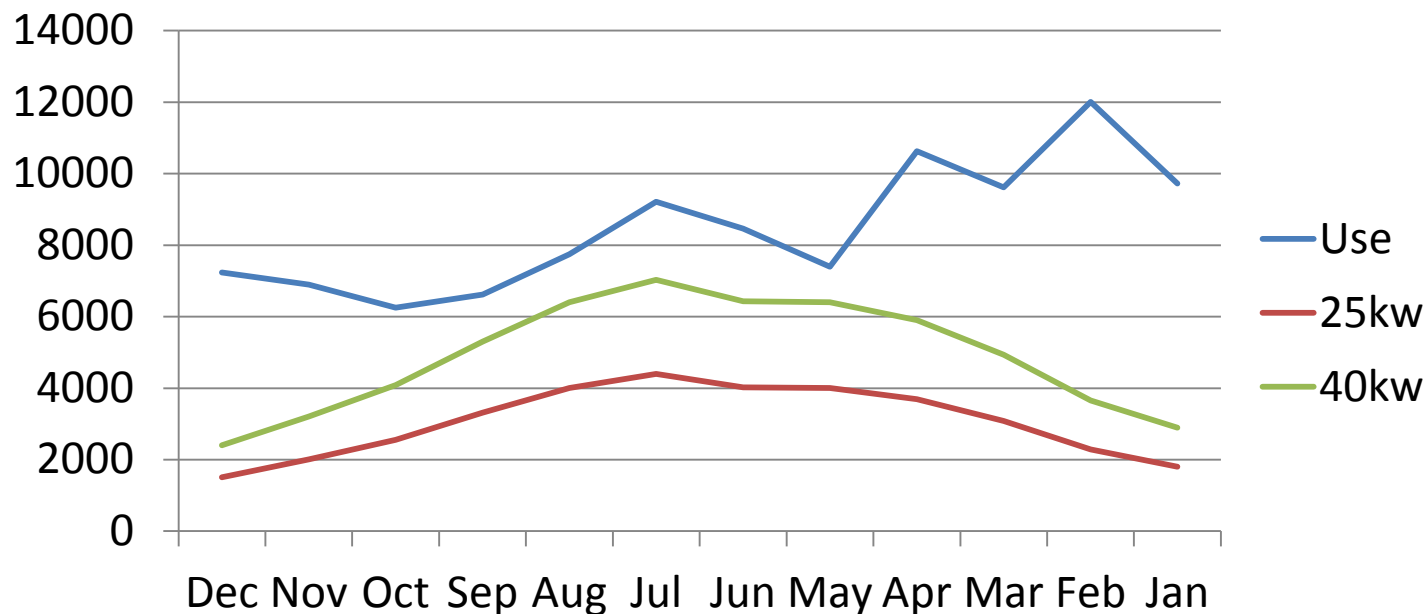


# Integrating Solar into Human Space



# FSST Tribal Office

- Excellent standing seam roof
- 100MwH/yr usage, high cost at 9.6cents/kWh
- Easy to install on all three roofs, 40kW size



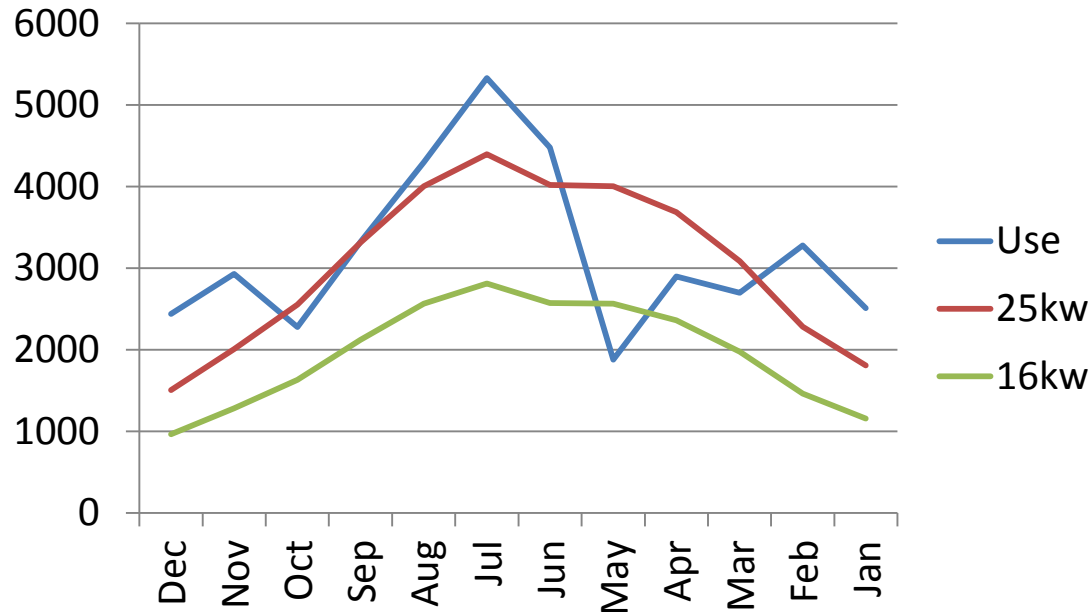


# Tribal Office



# Grace Moore

- Consumption is small, but cost is high.
- Parking lot shade structure would make a bold statement, but concerned elderly drivers
- Shade structure with 16kw selected

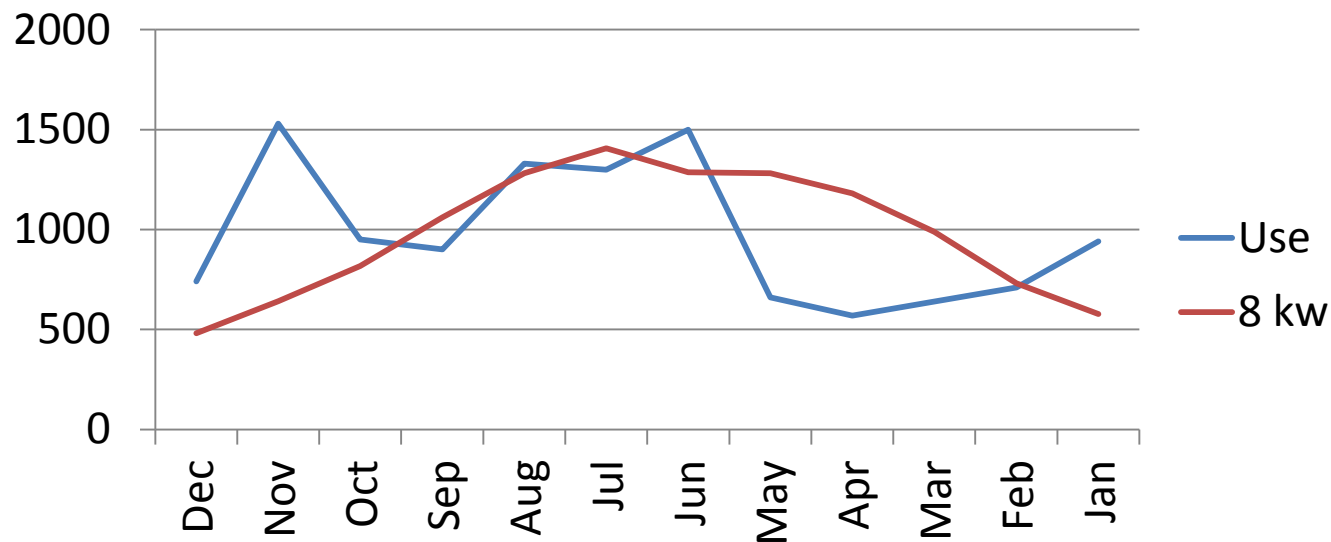


# Grace Moore



# Counsel Office

- Very small consumption, but at the higher cost bracket
- Easily done as part of a bigger project





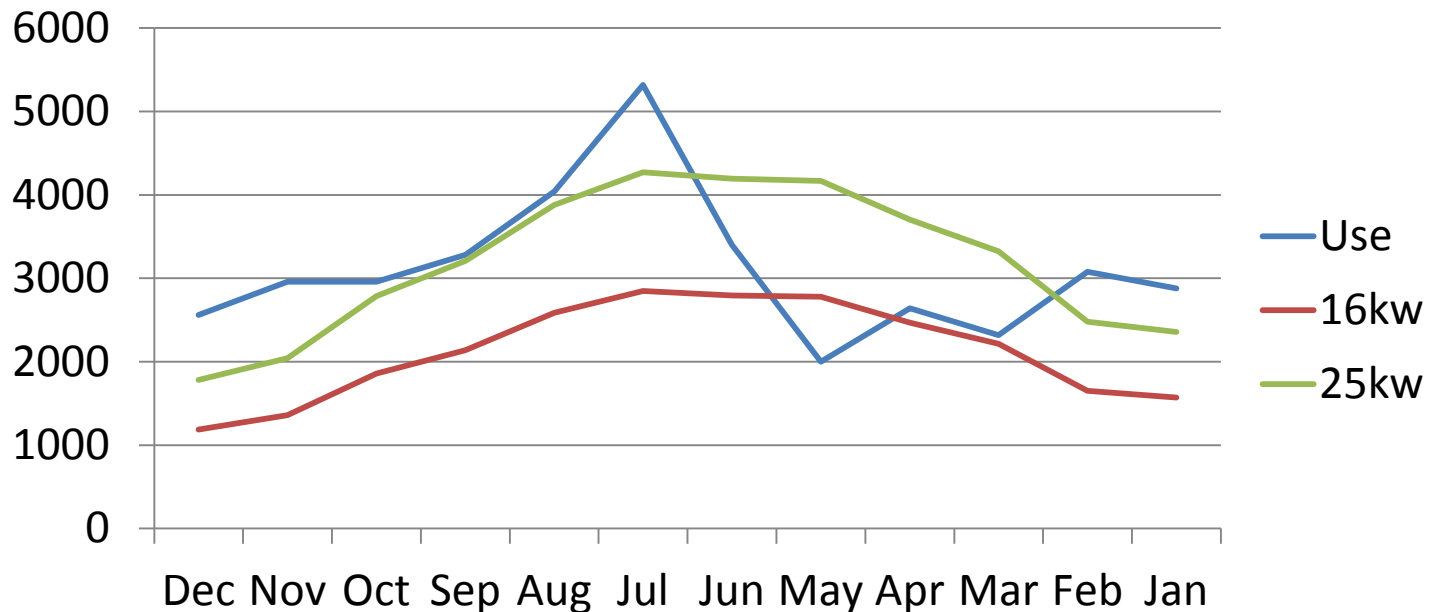
# Counsel Office

Small application with highly visible results  
More cost effective as a component of large project



# Old Medical Facility

- Has excellent standing seam roof, southern exposure and 9.3cent/kWh power
- Former site of pole mounts, which can be re-utilized if desired. 16kw up to 20kW size



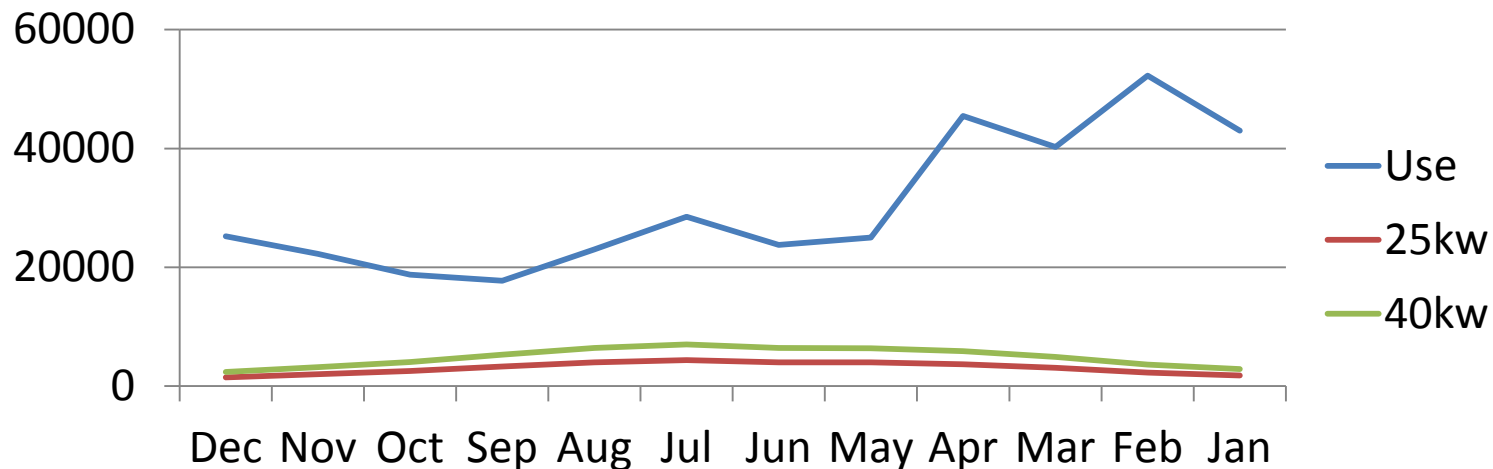
# Old Medical Center





# Community Center

- Power cost is mid-range but use is very high
- Solar shade structure there will serve to be integrated into Tribal events held there
- Rooftop solar possible as second phase



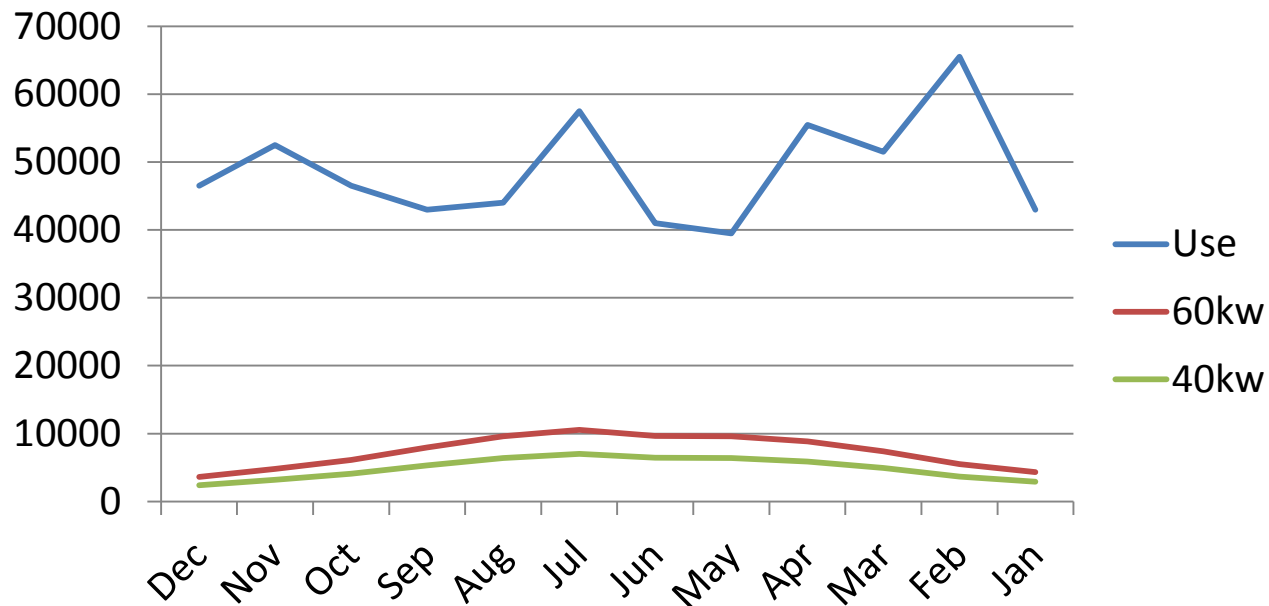
# Community Center, second phase

- Ballasted Membrane roof can use non-penetrating ballasted systems when rock is removed. 40 kW recommended



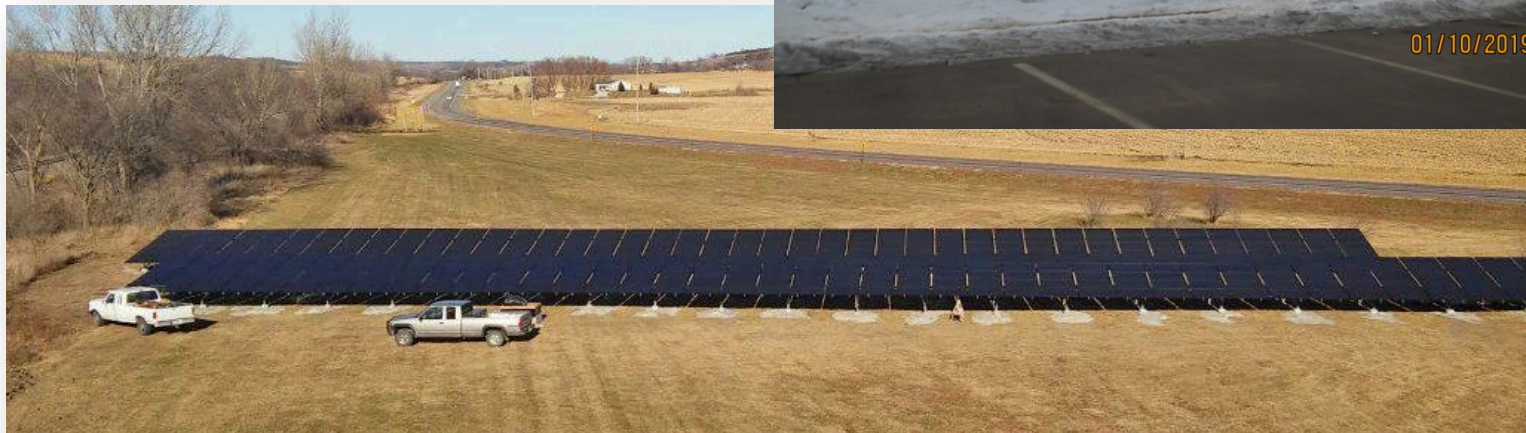
# New Clinic

- Largest Tribal energy user (except casino/hotel)
- High cost, ample roof space, may want ground mount for larger system. 40-100kW
- Outside shade/picnic area potential under array



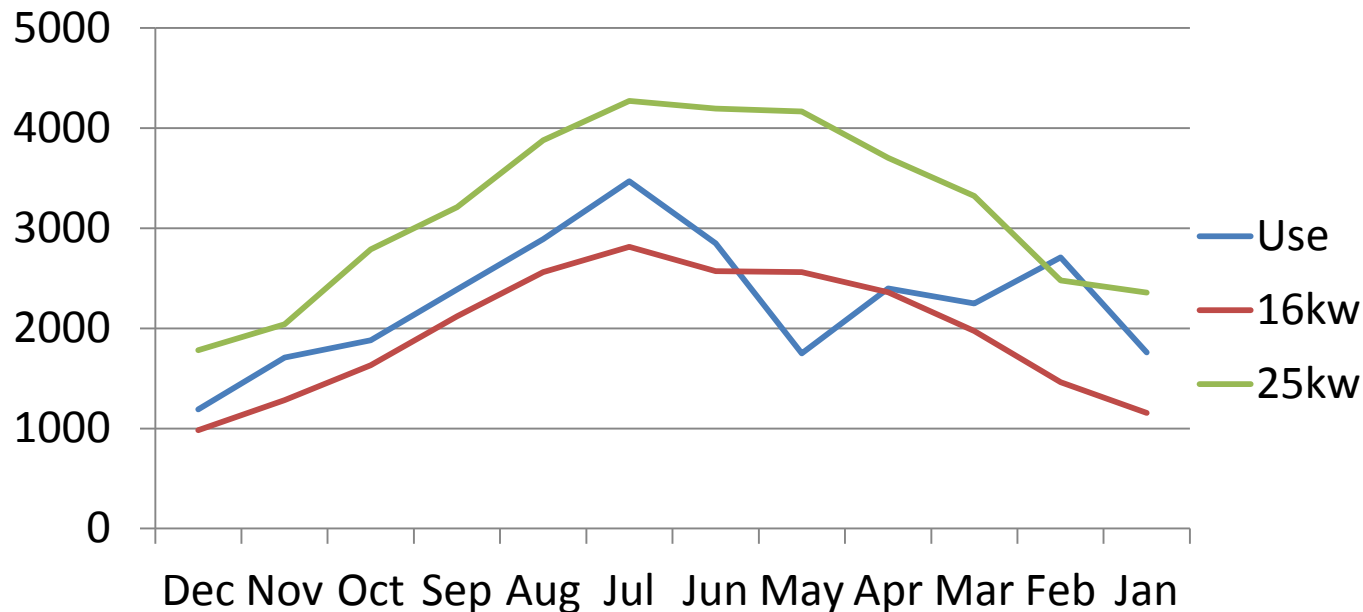
# New Clinic

- Rooftop panel opportunity as phase 2
  - Bore under parking
  - Three phase 208V
  - Sensitivity with X-ray Equipment a concern
- Equipment a concern



# Eastman

- Eastman is metered separately from Grace Moore and has a good roof for a sloped roof mounted system.
- 10kW selected to offset retail power.





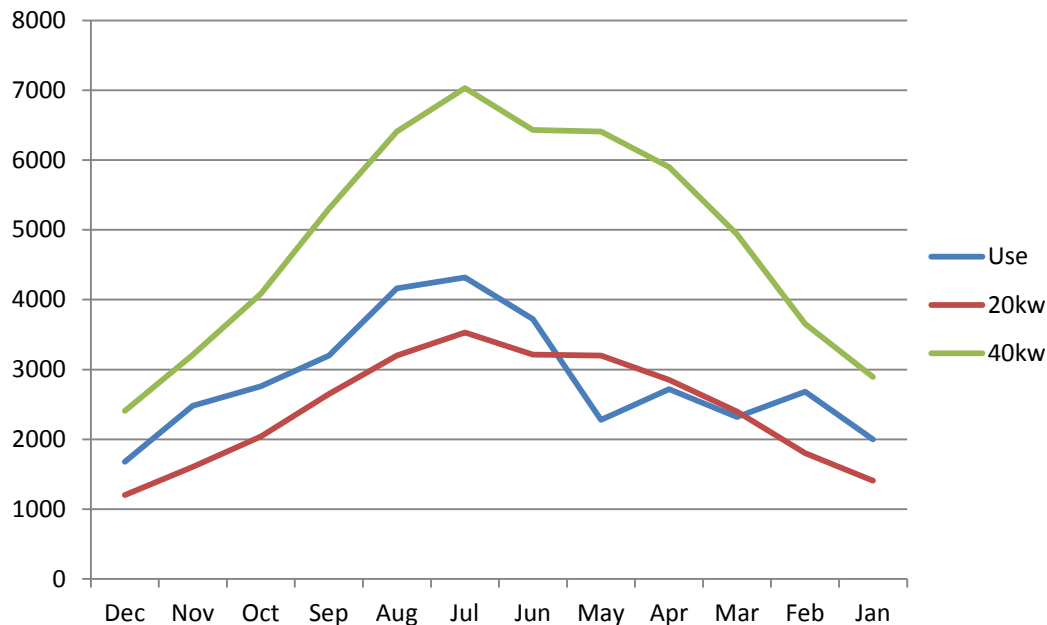
# Eastman





# Wellness Center

- Wellness Center has a standing seam roof for easy panel installation
- Recommend 20-25kw size to maximize offset
- Excellent site for 'hold and use' technology



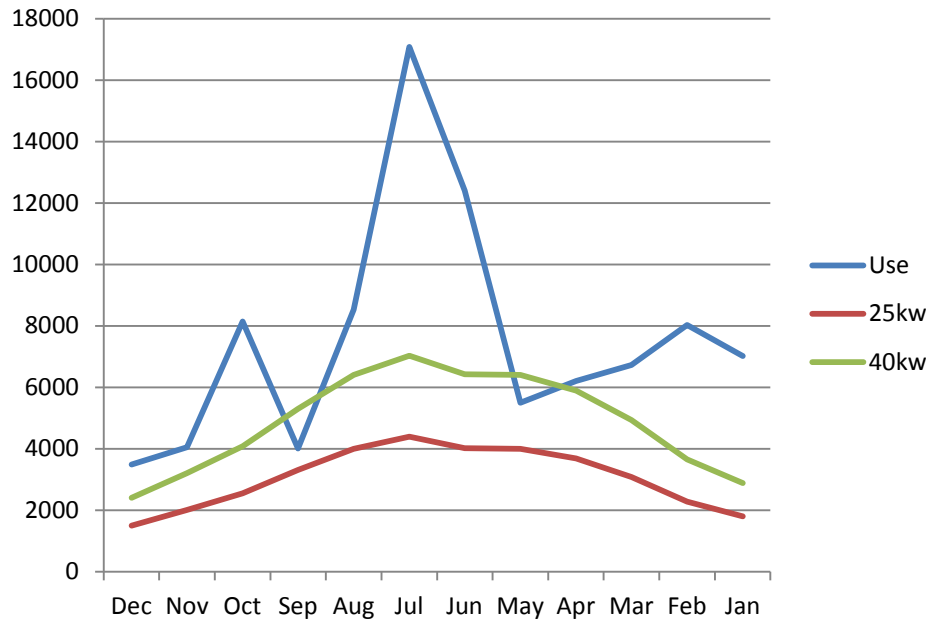
# Wellness Center

- Wellness Center roof could have excellent solar access
- S-5 clamps on standing seam roof make this an easy one to implement.



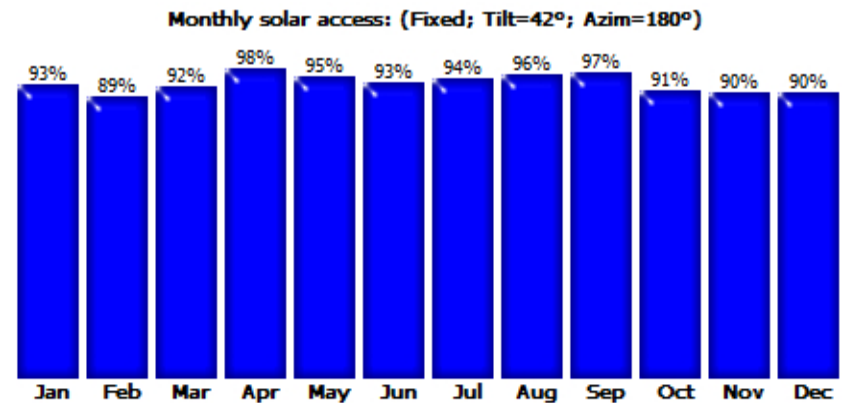
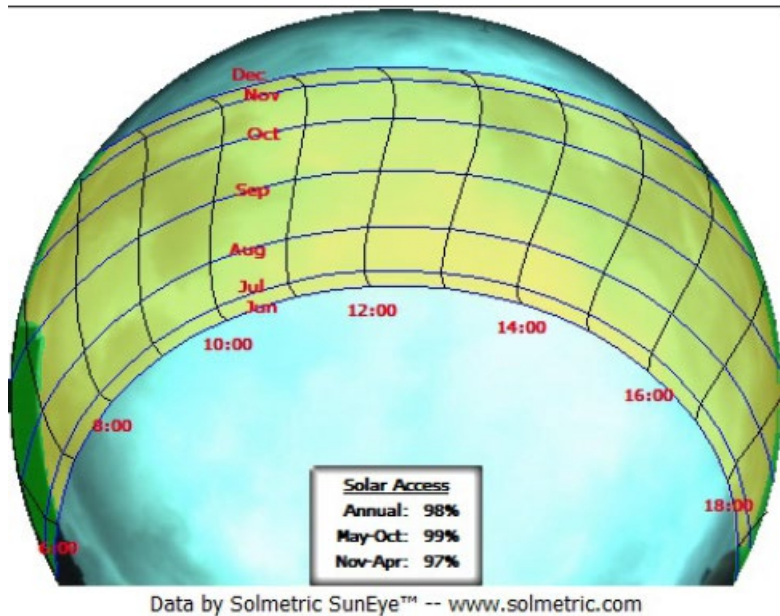
# Pharms facility

- Rooftop not a good support structure
- 3 phase 480V, 20kw X 2
- Expandable
- Peak shaver, phase 1



# Clear Solar access at every site

Solar access shots have been taken at each location to verify solar access of the proposed sites - no guessing



Data by Solmetric SunEye™ -- www.solmetric.com

# Summary

22-Apr-19

	Power	Current	Value of		Installed	Annual				
Annual Analysis	Produced	power cost	power made	Installation	cost/watt	Site Usage	Payback			
Location	KW	MwH/yr	\$/MWh	\$/yr	Cost	\$/watt	MwH/yr	IRR %	years	Type
RV Park	12	18	\$ 96.00	\$ 1,728.00	\$ 33,967.44	\$2.78	43MWh	4.6	15.9	Pole
Prairie Junction	60	88	\$ 100.00	\$ 8,800.00	\$ 128,774.83	\$2.15	218MWh	7.7	12	Ground
FSST Office	40	59	\$ 96.00	\$ 5,664.00	\$ 74,142.00	\$1.85	102MWh	8.9	11	S-5 Roof
Grace Moore	16	24	\$ 96.00	\$ 2,304.00	\$ 53,346.19	\$3.33	38MWh	3.3	17.9	Pole
Counsel Office	4	6	\$ 96.00	\$ 576.00	\$ 13,558.87	\$3.39	12MWh	2.9	18.7	Pole
Old Medical	16	24	\$ 93.00	\$ 2,232.00	\$ 26,134.91	\$1.63	37MWh	9.6	10.3	S-5 Roof
Community Ctr	40	59	\$ 82.00	\$ 4,838.00	\$ 96,207.93	\$2.41	365MWh	4.8	15.6	Ground
New Clinic	60	88	\$ 102.00	\$ 8,976.00	\$ 127,576.03	\$2.13	596MWh	8	11.8	Ground
Eastman	10	15	\$ 96.00	\$ 1,440.00	\$ 22,400.93	\$2.24	27MWh	6.7	13.2	Roof
Wellness +	20	30	\$ 96.00	\$ 2,880.00	\$ 48,898.14	\$2.44	34MWh	6	14	S-5 Roof
Pharms	40	59	\$ 150.00	\$ 8,850.00	\$ 87,205.54	\$2.19	91MWh	12.1	8.6	Ground
<b>Totals/Average</b>	<b>318</b>	<b>470</b>	<b>\$ 100.00</b>	<b>\$ 48,288.00</b>	<b>\$ 712,212.81</b>	<b>\$2.41</b>	<b>1563 MWh</b>	<b>7.3</b>	<b>12.5</b>	



# Ground Mount





# Pole Mount





# S-5 Roof

