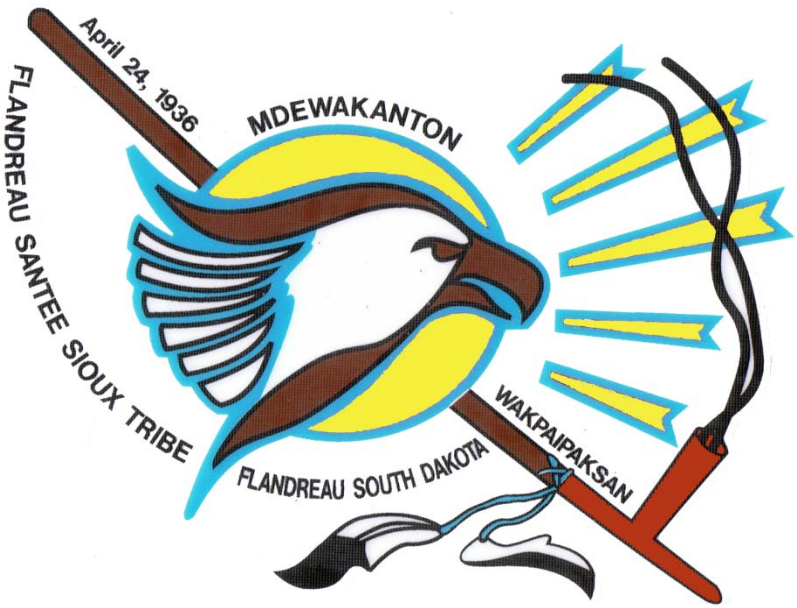
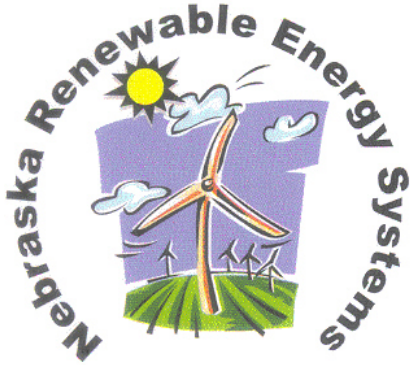
The **Flandreau Santee Sioux Tribe of South Dakota** and **Nebraska Renewable Energy Systems** present: a case study on the benefits and nuances of behind-the-meter projects and why they work.





FSST is a recipient of DOE's "Energy Infrastructure Deployment on Tribal Lands – 2019" grant.

The funds awarded are being used to implement the Tribe's 2019 solar project.


North Dakota
Montana
Minnesota
Wyoming
Iowa
Nebraska
Standing Rock IR
Grand R.
Mobridge
Great
Moreau R.
Cheyenne River IR
Plains
Belle Fourche
Cheyenne R.
Belle Fourche R.
Spearfish
Sturgis
Black
Hills
Box Elder
Rapid City
Mt. Rushmore
Jewel Cave
Custer SP
Wind Cave NP
Hot Springs
Badlands NP
Pine Ridge IR
Rosebud IR
Bad R.
Pierre
Coteau du Missouri
Lower Brule
Crow Creek IR
White R.
Missouri R.
Yankton IR
Yankton
Aberdeen
Lake Traverse IR
Coteau des Prairies
Milbank
Watertown
Big Sioux R.
Huron
Brookings
James R.
Flandreau IR
Madison
Dell Rapids
Mitchell
Sioux Falls
Brandon
Tea
Harrisburg
Canton
Vermillion R.
Vermillion
State of South Dakota
- Interstate Hwy.
- US Highway
- State line
- County line
- Nat'l Pk, Mon. or Mem.
- State Park
- Indian Reservation
50 Miles
100 Kilometers

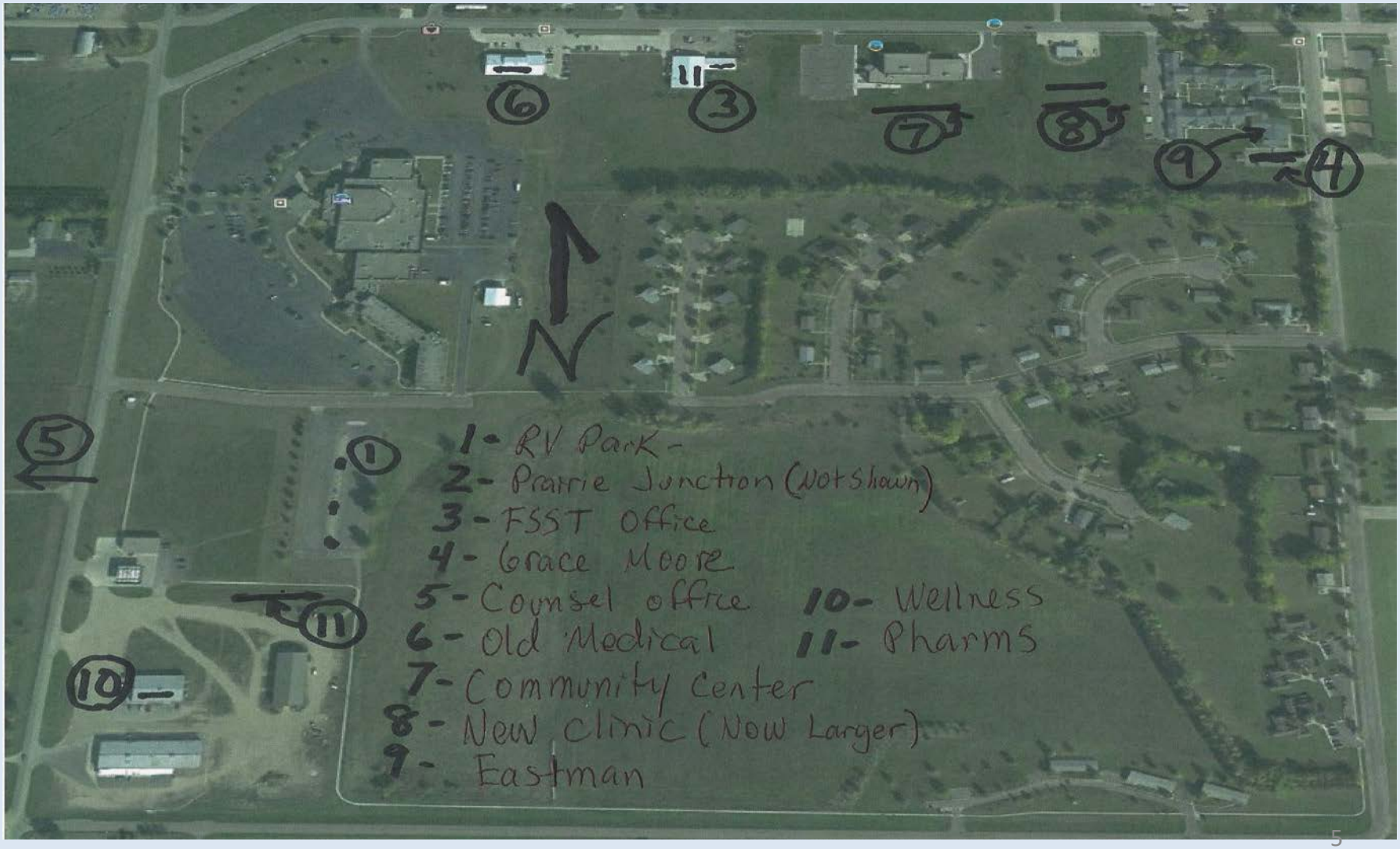
FSST's Commitment to Building Energy Infrastructure

- The Flandreau Santee Sioux Tribe Utility Commission was est. in 2018 to improve the Tribe's energy infrastructure by
  - conservation
  - investing in sustainable and clean energy where feasible, and
  - becoming energy independent
- The 2019 solar project meets these goals

2019 Solar Project Goals

- 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 with a ‘behind the meter’ approach.
- 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

The Square


1- RV Park -
2- Prairie Junction (Not shown)
3- FSST Office
4- Grace Moore
5- Counsel office
6- Old Medical
7- Community Center
8- New clinic (Now Larger)
9- Eastman
10- Wellness
11- Pharms

Technical Factors

- Some ‘high’ electrical rates were discovered at several Tribal locations.
- Usage summaries have been examined for cost and consumption 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 40-50kw
- SD interconnection policy is very limiting, so proper system sizing is vital for proper economic return.

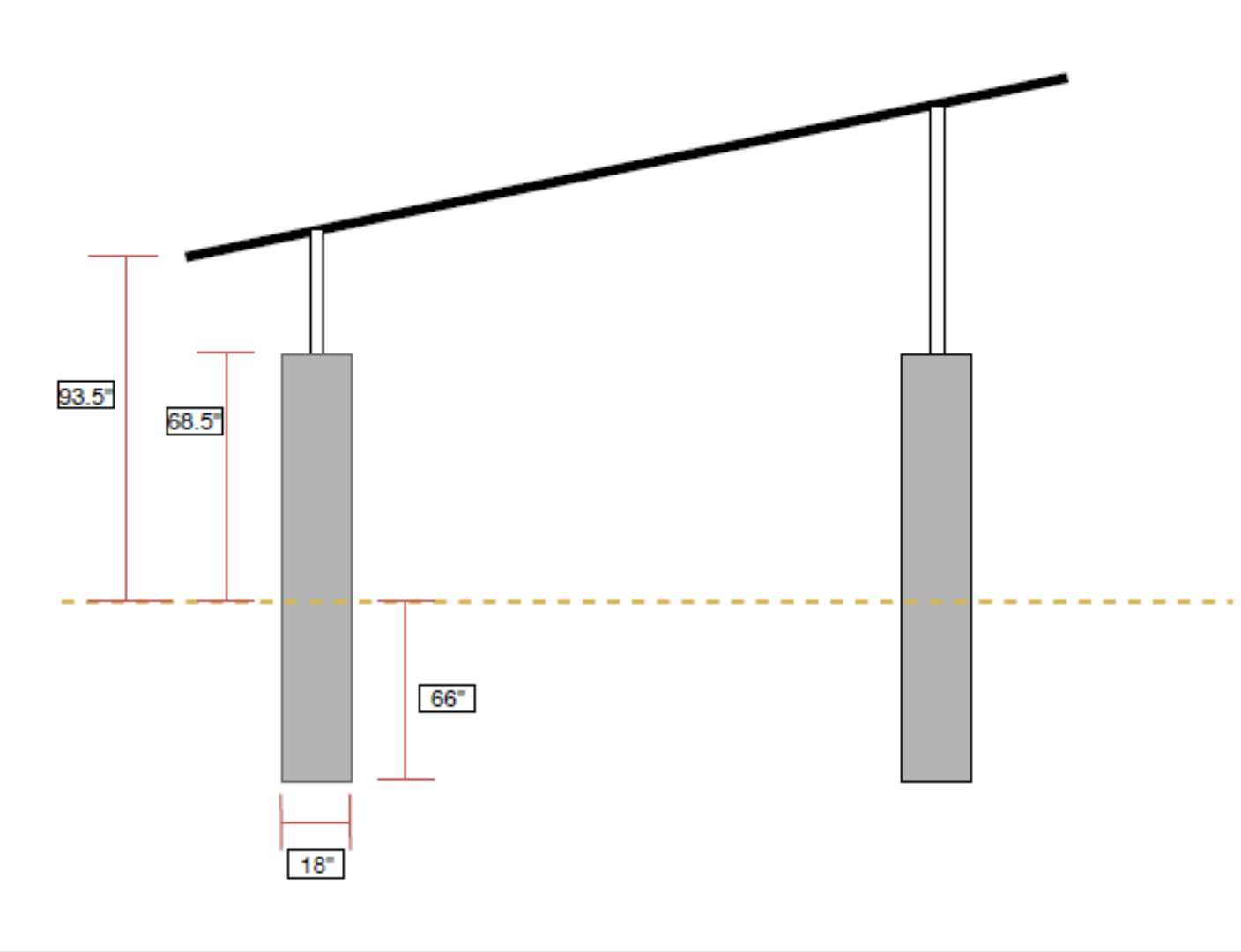
Technical Factors, cont.

- Climate (harsh winters and a lot of sun exposure)
- Site 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.

Technical Factors, cont.

- 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

Dual purpose shade structure



Integrating Solar into Human Space

Summary

22-Apr-19		Power	Annual	
Annual Analysis		**Produced**	**Site Usage**	
Location	**KW**	**MwH/yr**	**MwH/yr**	**Type**
RV Park	12	18	43MWh	Pole
Prairie Junction	60	88	218MWh	Ground
FSST Office	40	59	102MWh	S-5 Roof
Grace Moore	16	24	38MWh	Pole
Counsel Office	4	6	12MWh	Pole
Old Medical	16	24	37MWh	S-5 Roof
Community Ctr	40	59	365MWh	Ground
New Clinic	60	88	596MWh	Ground
Eastman	10	15	27MWh	Roof
Wellness +	20	30	34MWh	S-5 Roof
Pharms	40	59	91MWh	Ground
Totals/Average	318	470	1563 MWh	

Ground Mount

Pole Mount

S-5 Roof

Administrative Factors

- FSST Maintenance Dept. is well-staffed with years of experience in various construction projects
- FSST has an in-house legal department
- FSST has a good relationship with its partners
  - City of Flandreau
  - Missouri River Energy Services
  - Sioux Valley Energy
  - Basin Electric Power Cooperative
  - Moody County (for building permits)
- Access to storage

Administrative Factors, cont.

- Access to professional services
  - NRES provides consulting
  - licensed electricians
- Effects of COVID-19 pandemic on project schedule
- Novelty project for this area
  - Some increased costs (and reduced profits) for partners
  - Delays

Closing remarks

- Looking for new energy opportunities
- Learning to think ahead about energy
- Paving the way for others' solar projects