U.S. DEPARTMENT OF ENERGY

FOREST COUNTY POTAWATOMI
Keeper of the Fire

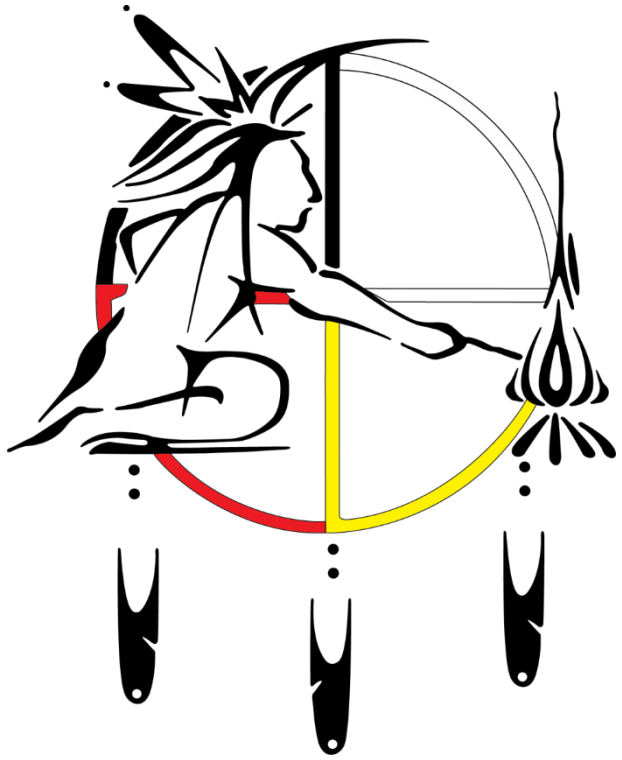
Department of Energy Program Review November, 2024

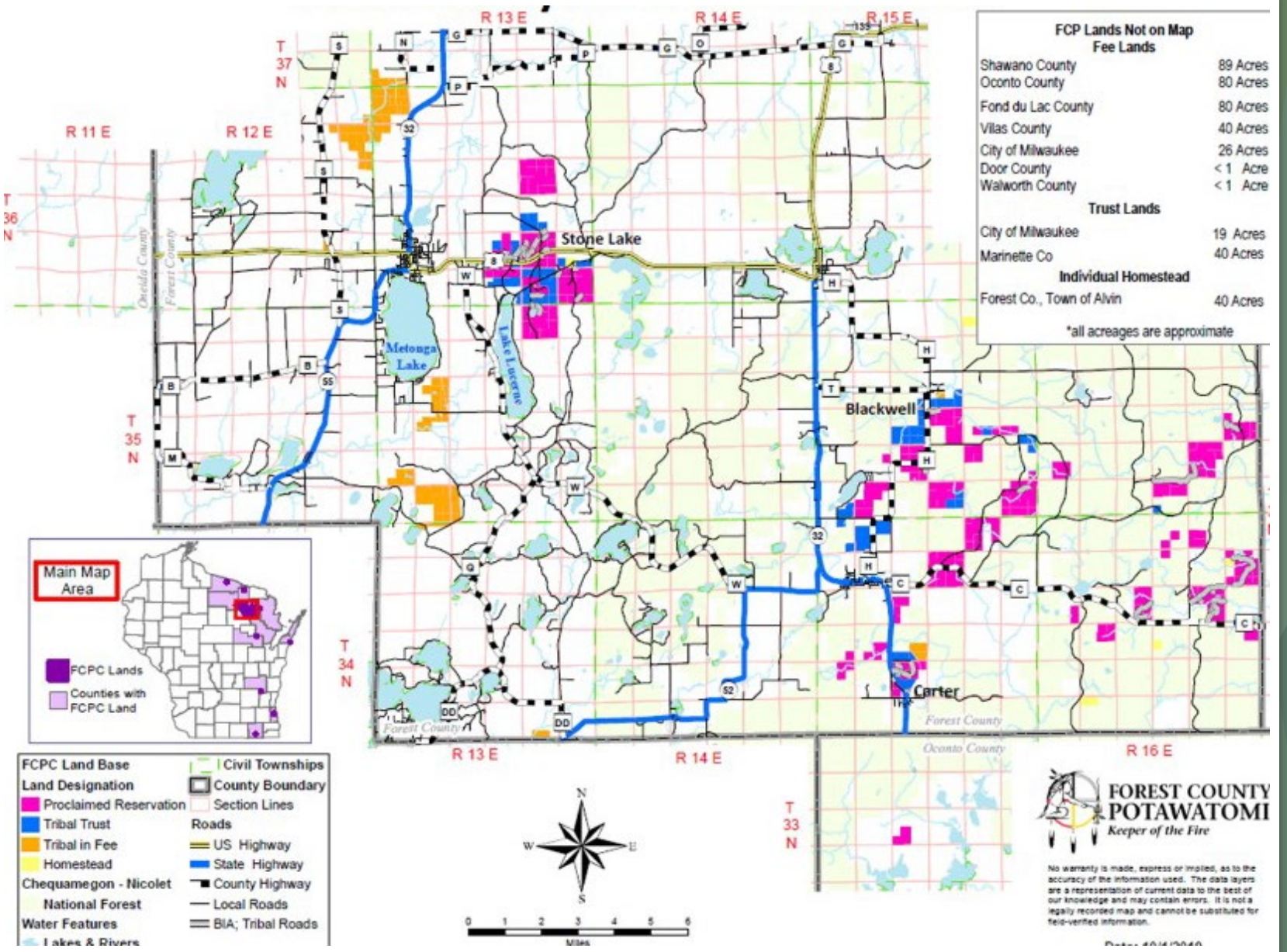
Forest County Potawatomi Community

Forest County Potawatomi Community

The Potawatomi were once a part of a historical confederacy made up of the Ojibwa, Odawa and Potawatomi Nations known as the Council of the Three Fires.

- Ojibwa: “Older Brother” and “Keeper of the Faith”
- Odawa: “Middle Brother” and “Keepers of the Trade”
- Potawatomi: “Little Brother” and “Keeper of the Fire”




FCP Lands Not on Map
Fee Lands
Shawano County 89 Acres
Oconto County 80 Acres
Fond du Lac County 80 Acres
Vilas County 40 Acres
City of Milwaukee 26 Acres
Door County < 1 Acre
Walworth County < 1 Acre
Trust Lands
City of Milwaukee 19 Acres
Marinette Co 40 Acres
Individual Homestead
Forest Co., Town of Alvin 40 Acres
*all acreages are approximate
R 11 E
R 12 E
R 13 E
R 14 E
R 15 E
R 16 E
T 37 N
T 36 N
T 35 N
T 34 N
T 33 N
Stone Lake
Metonga Lake
Lake Lucerne
Blackwell
Carter
Forest County
Oconto County
Oneida County
Main Map Area
FCPC Lands
Counties with FCPC Land
FCPC Land Base
Land Designation
Proclaimed Reservation
Tribal Trust
Tribal in Fee
Homestead
Chequamegon - Nicolet National Forest
Water Features
Lakes & Rivers
Civil Townships
County Boundary
Section Lines
Roads
US Highway
State Highway
County Highway
Local Roads
BIA; Tribal Roads
N
W
E
S
0 1 2 3 4 5 6
Miles
FOREST COUNTY POTAWATOMI
Keeper of the Fire
No warranty is made, express or implied, as to the accuracy of the information used. The data layers are a representation of current data to the best of our knowledge and may contain errors. It is not a legally recorded map and cannot be substituted for field-verified information.

Environmental Mission Statement

The traditional values of the Forest County Potawatomi Community teach us to **respect all living things, to take only what we need from mother earth, and to preserve the air, water, and soil for our children.**

Reflecting these values, we take leadership in creating a sustainable and healthy world. We resolve to reduce our own environmental impacts and to take steps to remedy the impacts of others.

We encourage others to do the same. We also seek legislative and policy changes that protect the environment for all people, including generations to come.

(Adopted November 20, 2008)

Project 1: **Community Scale Solar**

Background 2019 Community Scale Solar

- FCPC's solar PV projects have developed over 2 MW of behind the meter generation at individual sites.
- On the reservation in Forest County Wisconsin, the majority of government buildings have energy use offset by solar between 17 and 99.9%
- The new grant is providing additional 1.1 MW of solar PV energy for 9 buildings

Project Revisions

- Site adjustments due to tariff issues, zoning concerns, engineering challenges, and construction schedules
- New sites were added to absorb over 334 kW of PV at the FCPC RG facility including the Carter Convenience Store and the Stone Lake Wastewater Treatment Facility, and the Community Center along with the Wgema Gym and fleet garage.
- Other sites were enlarged.
- Regulatory challenges in Milwaukee forced the movement of 334 kW to other sites.

Solar Sites and Install Capacity

Solar Array sites	Current kW Solar to Install	Second Change to kW Solar to Install	First Change to kW Solar to Install	Original kW to Install	Change Notes	Mount Type
FCPC Bingo 1721 W Canal St. Milwaukee, WI	323.1	323.1	323.1	280	Increased kW	Roof
Potawatomi Carter Casino & Hotel (PCCH) 616 Highway 32, Wabeno, WI	227	339.9	249.9	197	Increased kW	Roof
Carter Wastewater Treatment Plant 3909 Industrial Park Rd, Wabeno, WI	40.3	40.3	40.3	20	Increased kW	Roof
Stone Lake Church 5132 Jaeger Rd, Crandon WI	9.43	9.43	9.43	8	Increased kW	Roof
(Modified Site) Aquaponics 3389 County Highway H, Laona, WI	60	133.7	85.3	60	Stayed the same	Roof
(New location) Carter C-Store 614 WI Highway 32, Wabeno, WI	63.2	63.2	63.2	0	New location	Roof
(New location) Stone Lake Wastewater Treatment 8138 Mish ko Swen Dr., Crandon, WI	97.4	97.4	41.9	0	New location	Roof
(New location) Community Center The Place Where Everyone Comes To Play Rd, Crandon, WI	273.9	0	0	0	New location	Roof
(New location) Fleet Garage The Place Where Everyone Comes To Play Rd, Crandon, WI	24.9	0	0	0	New location	Roof
(New Location) Wgema Gym	57	0	0	0	New location	Roof
~~Removed site Wgema Campus~~	0	0	~~334.9~~	~~255~~	Removed site	~~Ground~~
~~(Removed Site) Carter Church~~	0	0	~~0~~	~~8~~	Removed site	~~Roof~~
~~(Removed Site) FCPC Renewable Generation Biodigester Facility~~	0	0	~~0~~	~~240~~	Removed site	~~Ground~~
Total kW Solar to be Installed (Net Increase of ~80 kW	**1176.23**	**1,007**	**1,148**	**1,068**		

PROJECT GOAL

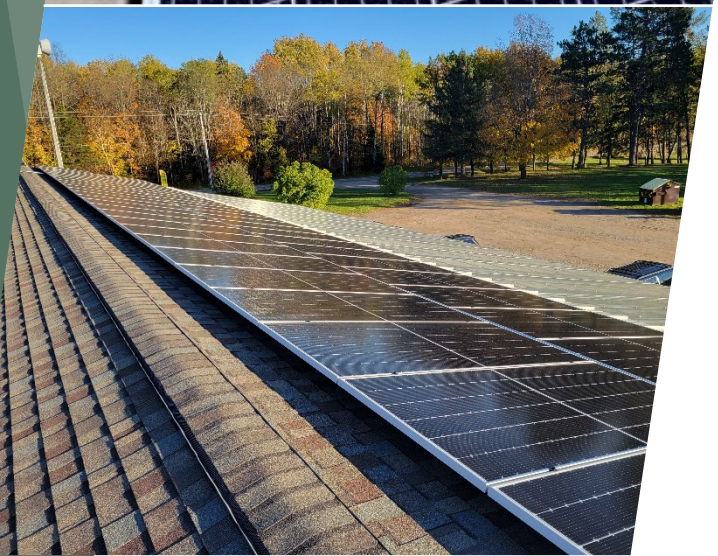
- Install 1.1 MW of solar generation at 9 sites.
- Tribe anticipates substantial energy offset, ranging from 4.2 – 99.9% grid electricity reduction at the selected sites.
- This focuses on the Tribe's goal of achieving 100% carbon-neutrality.
- This project further instills tribal energy sovereignty.

Steps Taken

- RFP for solar installer/contractor circulated in 2019.
- Contractor chosen and construction is underway.
- Installations are planned and approved with minor modifications.
- NEPA review is complete.
- Interconnection agreements are completed but for the carter casino.
- Site specific permits have been obtained.
- 8 Solar sites have been completed.
- All sites are substantially complete.
  We are currently finalizing one interconnection.

Setback

- Historic Preservation Society zoning
- Moving and changing solar sites
- Adding an additional contractor
- Adjusting solar installation sizes
- Supply chain issues
- Utility upgrades

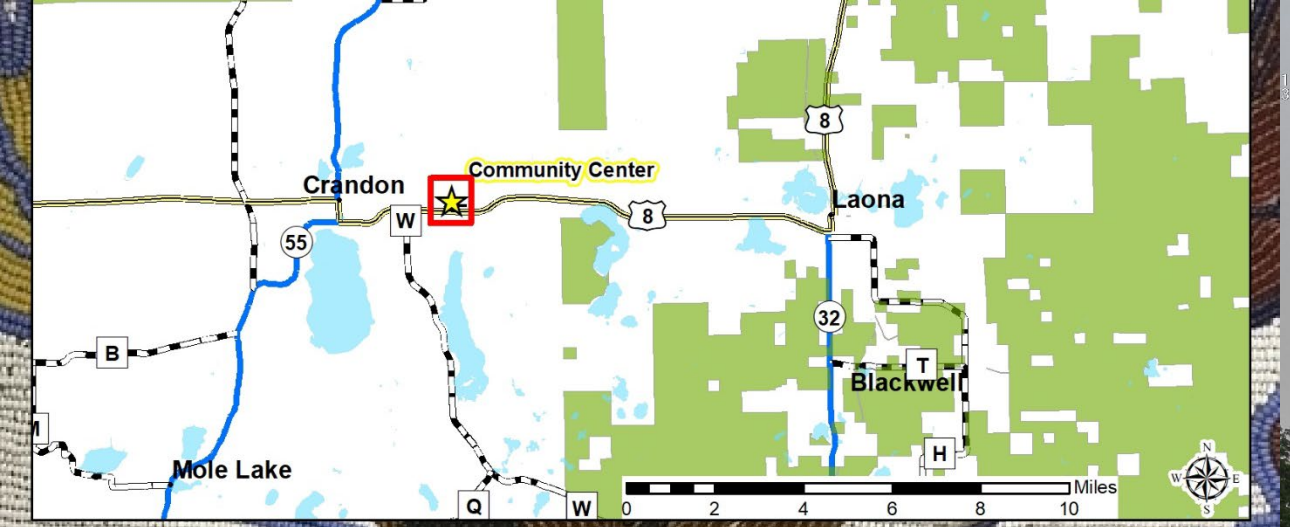


NEXT STEPS

1. Finalize one interconnection and upgrade meter at one location.
2. Conduct quality control inspections of the solar installations.
3. Monitor the solar generation

When life gives you lemons, we made lemonade in the form of 400 kW of solar that's been installed on the Community Center instead of the original 200 kW

Project 2: **Community Center Solar and Energy Efficiency Measures (EEMs)**



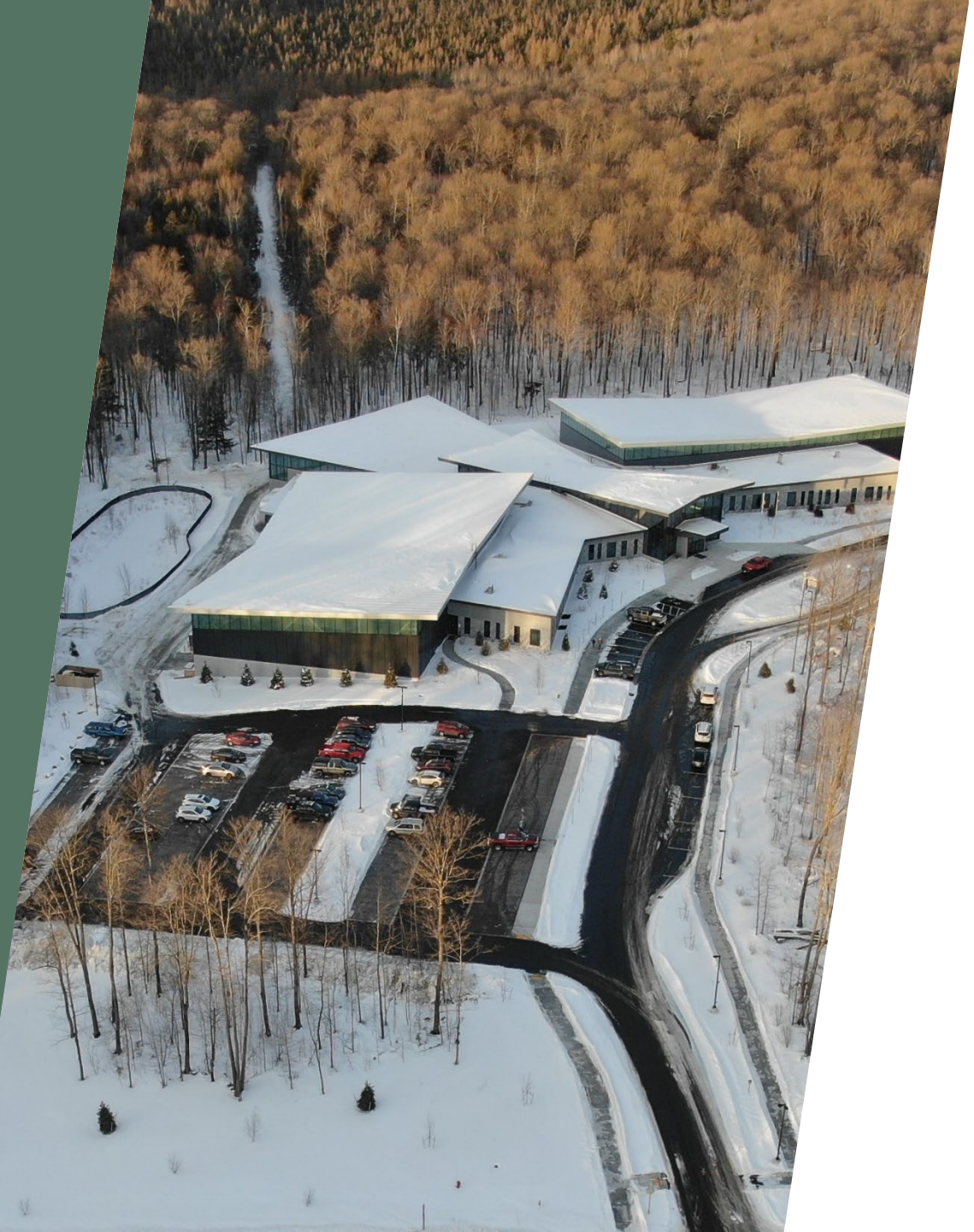
FOREST COUNTY POTAWATOMI
LAND INFORMATION

Project Goals

- Based on the Tribe's environmental mission and FCPC values, the Tribe set specific project goals for options selection, such that each option must:
  - Minimize building energy demand;
  - Pay for itself over its lifespan;
  - Be technologically deployable within the construction timeline; and
  - Be grant eligible.
- In addition, any renewable energy generation system selected must:
  - Preserve the landscape; and
  - Must not discourage Tribal members from visiting the community center.

Decision Making

Improve / Add	Measure #	Option	Annual therms Saved	Annual kWh Saved	Cost	30 Yr Cost Savings	Payoff Year
Walls	1	R-21.85	610		4,545	10,914	13
	1	R-28.1	929		9,090	14,454	16
	1	R-34.35	1,103		13,383	14,571	18
Windows	2	U-0.20	6,677		158,146	11,071	29
Roof	3	R-37.5	454		12,087	-581	31
	3	R-40	883		24,584	-2,206	32
	3	R-42.5	1,261		49,168	-17,210	39
Under Slab	4	R-10	13,537		43,900	299,173	6
	4	R-20	18,049		87,800	369,622	9
Edge / BG	5	R-15	198		5,159	-141	31
	5	R-20	441		9,055	2,121	27
Boiler	6	Condensing	7,419		31,750	156,272	8
Pool	7	70% ERV	55,000		19,250	1,374,634	1
Light	8	Controls		103,120	20,000	268,659	4
Solar PV	9	200 kW		216,449	188,674	522,304	10
Total			**89,950**	**319,569**	**577,226**	**2,702,044**	**8**



Progress
200 kW Solar PV System

- Solar is installed and operating.
- FCPC received $35,648 in incentives for EEMs from the state run energy efficiency program – Focus on Energy and is expecting to receive $46,000.00 for the 200 kW of solar to be installed.
- Completed the installation of 200 kW more solar to the building for a total of 400 kW to produce 100% of daytime energy needs
- **Currently working on designing additional features including potential system upgrades to better track production and EEM performance.**

Lessons Learned

- Aligning the grant application with a tight new building construction schedule is very difficult.
- Difficultly separating incremental prices of EEM upgrades from general construction budget.
- Getting the inverters to talk with other systems via the net is very challenging.

Reasoning for the need of the Community Center

- https://www.facebook.com/fcpotawatomi/videos/207965054712974/?extid=CL-UNK-UNK-UNK-IOS_GK0T-GK1C&ref=sharing

NEW DOE ENERGY EFFICIENCY PROJECT 3 2023

Control Number: 2975-1515

FOREST COUNTY POTAWATOMI COMMUNITY
Milwaukee Hotel and Casino HVAC Efficiency Upgrades
TOPIC AREA 1.B

Project Summary

The Forest County Potawatomi Community (FCPC) project will install nine energy efficiency measures focused on the HVAC system at the Milwaukee Potawatomi Hotel and Casino (PHC), which is the Tribe's largest energy demanding facility. The project goal is to promote FCPC energy sovereignty through the installation of cost-effective energy efficiency measures. This goal would be achieved through the following objective: Save 959,040 kWh and 263,000 therms in the first year of operations after the installation of all 9 EEMs.

EEM	Est. Life (Yrs)	FCPC Cost ($)	Annual Savings ($)	Proj. Pay-back (Yrs)	FCPC Pay-back (Yrs)	FCPC Net Lifetime Savings ($)	FCPC ROI (%)
1. Operate Snowmelt Based on Weather Forecast	7	$1,200	$17,680	0.34	0.07	$122,560	10,213%
2. Implement Chilled Water Supply Temperature Reset	7	$4,600	$5,600	4.11	0.82	$34,600	752%
3. Cycle Hot Water Coil Pumps Based on Mixed Air Temp.	7	$6,200	$9,300	3.33	0.67	$58,900	950%
4. EndoTherm Hotel Heating & Cooling	12	$18,000	$46,060	1.95	0.39	$534,720	2,971%
5. EndoTherm Casino Heating	12	$31,200	$111,800	1.40	0.28	$1,310,400	4,200%
6. EndoTherm Casino Cooling	12	$42,000	$29,000	7.24	1.45	$306,000	729%
7. Install Event Center Occupancy Sensors	25	$55,400	$16,420	16.87	3.37	$355,100	641%
8. Implement Ultralow Temperature Heating	25	$98,200	$51,540	9.53	1.91	$1,190,300	1,212%
9. Install Boiler Economizer to Preheat Domestic Hot Water	25	$123,200	$29,682	20.75	4.15	$618,900	502%
Measurement & Verification	-	$19,400	-	-	-	-$19,400	-
Travel	-	$9,844	-	-	-	-$1,969	-
Total	**21.3**	**$401,369**	**$317,084**	**6.33**	**1.27**	**$4,510,111**	**1,124%**

Key Personnel/Organizations

Applicant: Forest County Potawatomi Community (FCPC), a federally recognized Indian tribe

Project Manager: Jerald Hauber ● 715-478-4704

Business Contact: David Emmerich ● 414-817-8056

Budget

Federal funds requested: $1,605,475

Cost-share proposed: $401,369

Total Project Costs: $2,006,844

Project Outcomes

After the implementation of all 9 EEM's, FCPC anticipates a project lifetime energy savings of 13,488 MWh and 4,288,000 therms, resulting in a lifetime carbon reduction of 22,684 metric tons (MT) of CO_2e. Over the lifespan of the EEMs, the project would save the Tribe $4,510,111, and has a total project payback of 6.33 years and an FCPC payback of 1.27 years. The deployment of the EEMs will assist FCPC in reaching its goal of energy sovereignty through the use of 100% carbon neutral renewable energy, by reducing the load required to offset.

Level II HVAC Energy Audit Results

Energy Saving Strategy	Electrical Savings (kWh)	Demand Savings (kW)	Gas Savings (therms)	Emission Savings (tons CO_2e)
Obtain Specifications for Implementation:				
Operate Snowmelt Based on Weather Forecast	22,000	0	18,000	100
Implement Chilled Water Supply Temperature Reset	56,000	0	0	40
Install Event Center Occupancy Sensors and Implement Scheduling	61,000	10	12,000	100
Cycle Hot Water Coil Pump Based on Mixed Air Temp *	93,000	0	0	60
Implement Ultralow Temperature Heating *	180,000	0	39,000	400
Install Boiler Economizer to Preheat Domestic Hot Water *	(22,960)	0	43,000	200
Install Magnetic Bearing Chiller to Improve Part Load Efficiency *	290,000	100	0	200
Total for all measures above recommended for implementation or study:	**679,040**	**110**	**112,000**	**1,100**
Additional Opportunities:				
EndoTherm Casino Heating *	0	0	130,000	800
EndoTherm Hotel Heating and Cooling *	280,000	0	21,000	300
EndoTherm Casino Cooling *	290,000	0	0	200
Upgrade Cooling Tower to Fluid Cooler * †	700,000	0	0	500

* Further study required, † Incremental cost used, TBD = to be determined

EndoTherm-Hydronic Additive

- Additive for HVAC loops that reduces surface tension and improves heat transfer.
- Organic and non-corrosive additive, around 1% of total volume.

Chemical name	Concentration	CAS no.	EINECS no.
Glycoside	≤ 10%	68515-73-1	500-220-1

3.2 Mixture

Type of formulation: Soluble Liquid (SL), concentrated product, to be diluted in use
Further information: ATE_{mix} ≥10,000 mg/kg bw (not classified)
M-factor = not classified

International Chemical Identification	EC No.	CAS No.	%
water	231-792-2	7732-18-5	90-95
glycoside	500-220-1	68515-73-1	5-10

Options Selection and Economics

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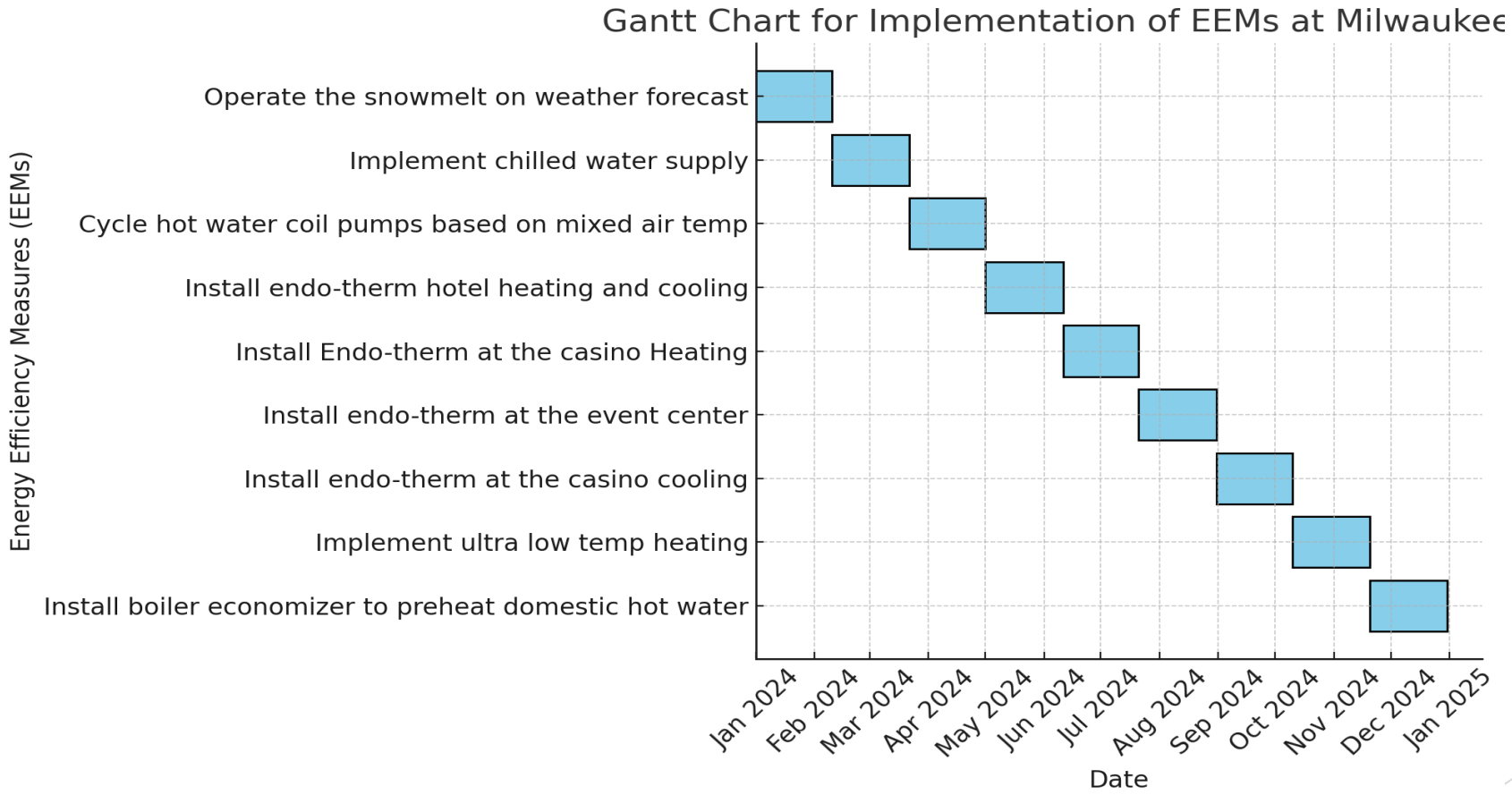
Gantt Chart for EEMs Implementation



Thank You!