

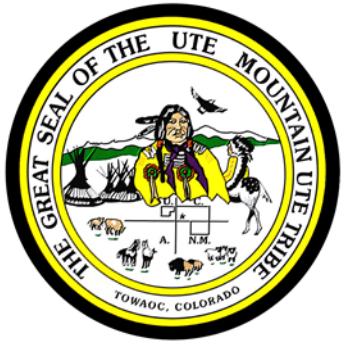
Department of Energy Office of Indian Energy Program Review 2022

Ute Mountain Ute Tribe's
White Mesa Solar Initiative
Towaoc Housing Solar Initiative
And Clean Energy Transition

Scott Clow

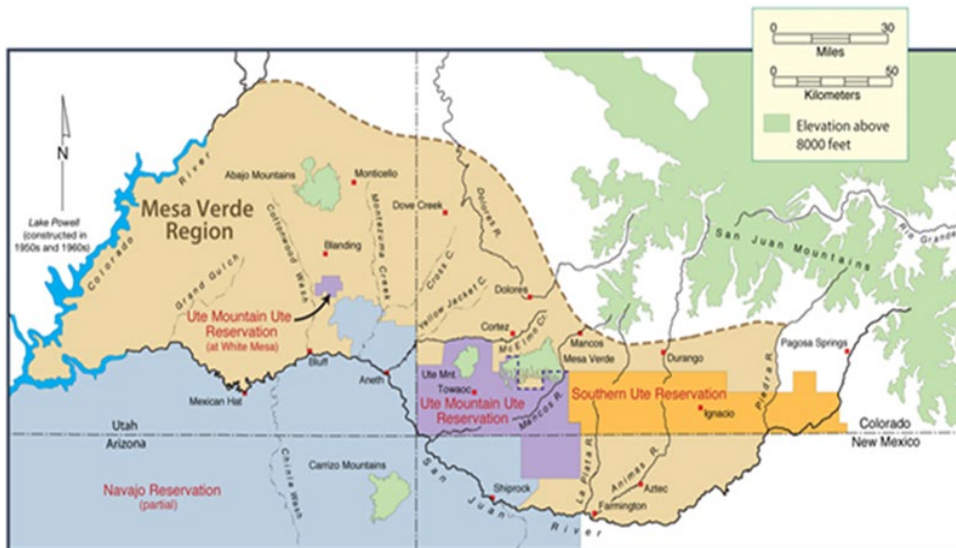
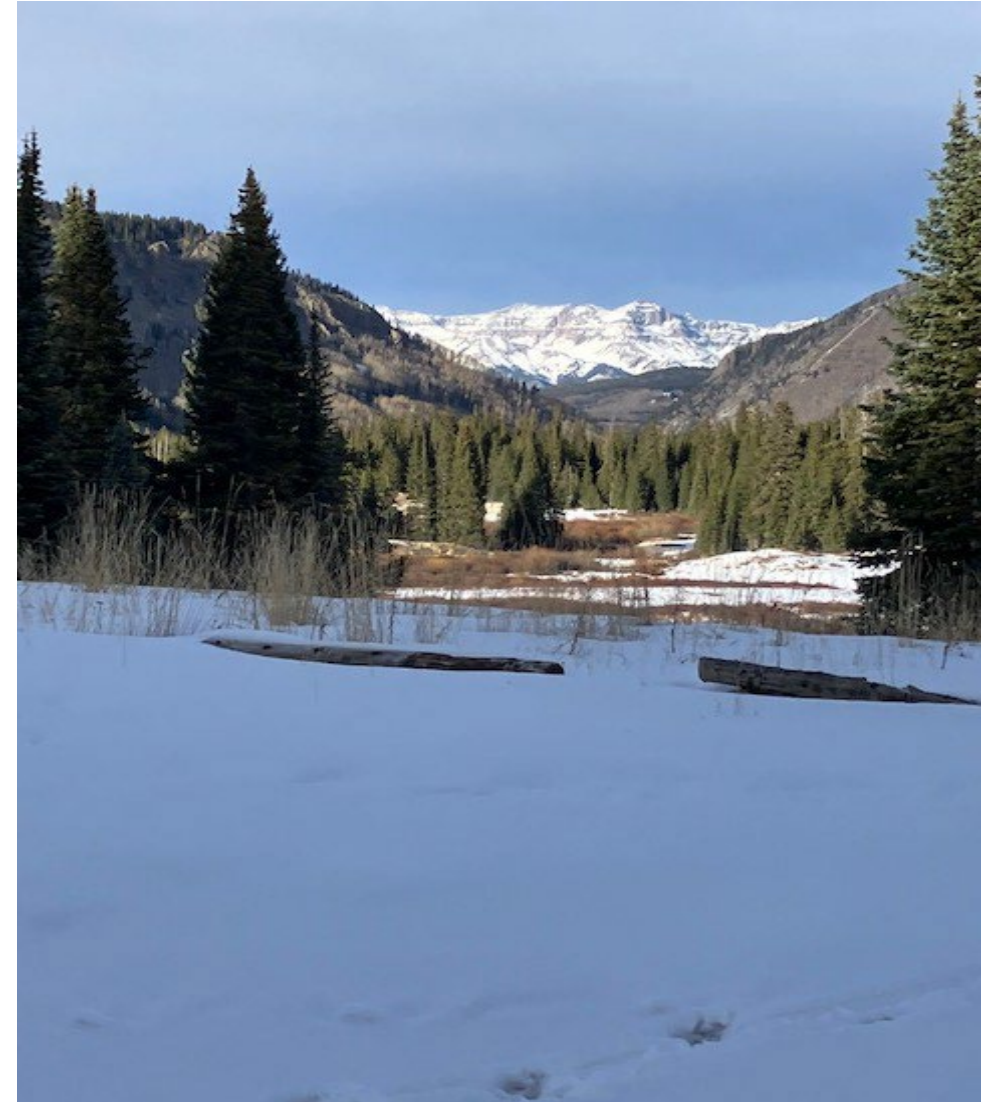
Environmental Programs Director

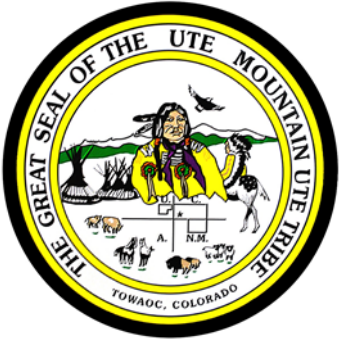
November 14, 2022



Ute Mountain Ute Tribe

- Originally, the Utes were seven Bands in CO and UT
- Weenuche Band is UMUT
- 582,321 Acres of Land
- Land Base in Colorado, New Mexico, Utah
- 7,700 acre Farm and Ranch Enterprise
- Hotel and Casino, Travel Centers, RV Park
- Weeminuche Construction Authority
- Tribal Park and Tourism
- 70+ years of Oil and Gas Leases and Royalty

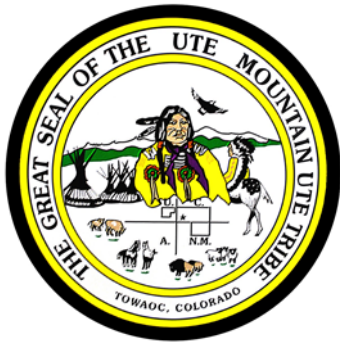




Snapshot of the Ute People



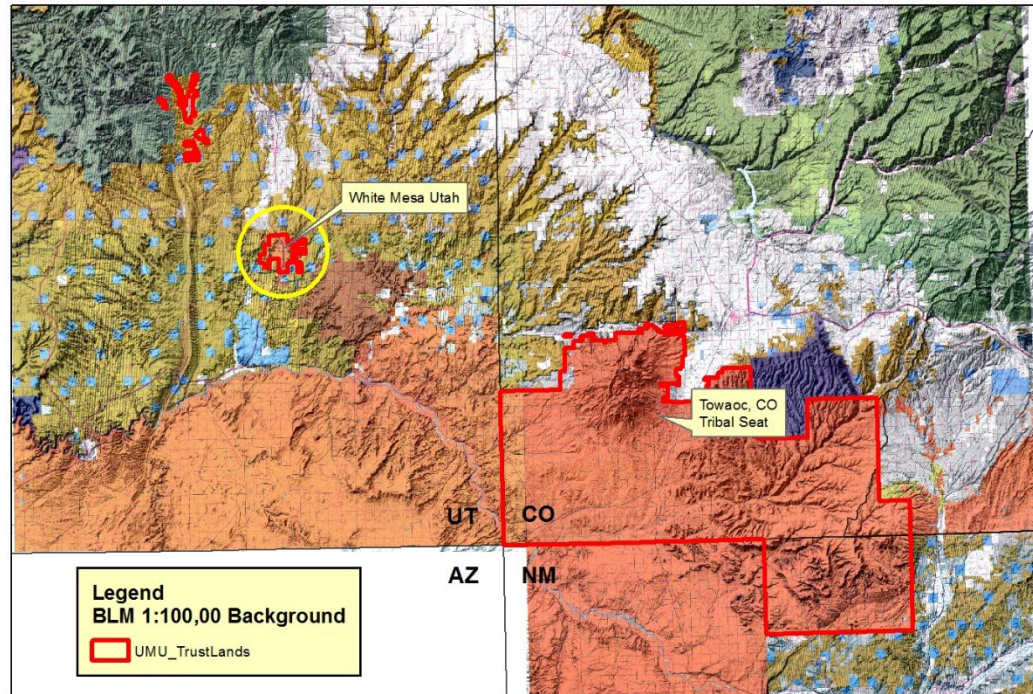
- ▶ Originally Hunters and Gatherers
- ▶ 2,100 Ute Mountain Ute Tribal Members
- ▶ 55 Years of Age, Life Expectancy
- ▶ 26 Years of Median Age
- ▶ 37.8% Poverty vs. 12.5% in Colorado
- ▶ \$13K Per Capita vs. \$42K in Colorado

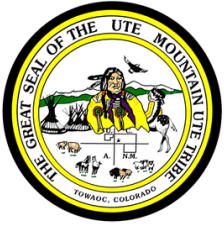


White Mesa Solar Initiative



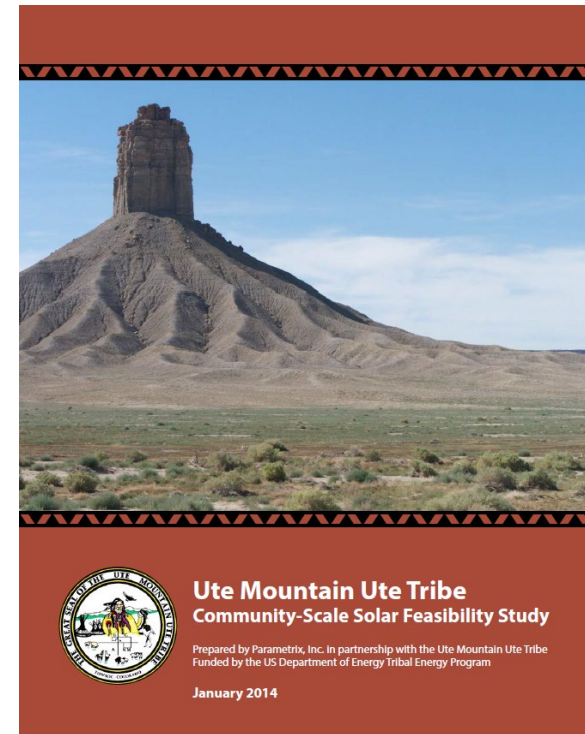
Ute Mountain Ute
Reservation Trust Lands





White Mesa Solar Initiative

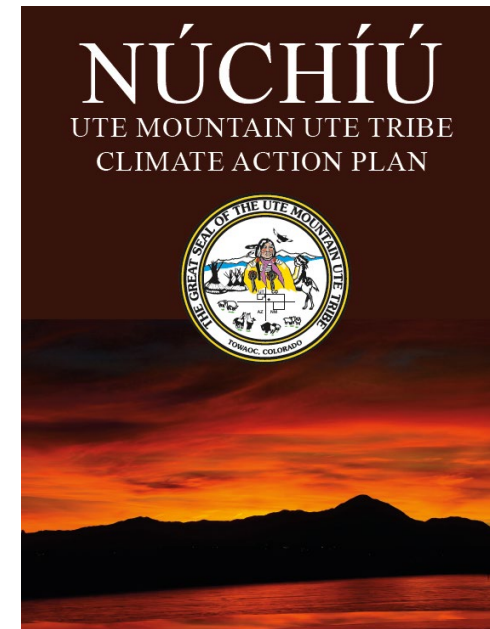
- **High Level Goals & Outcomes:**
 - Actualize phase II of 2014 Feasibility Study; enhance with facility installations
 - Provide paid job skills training for Tribal members (intern positions) in solar installation, maintenance and repair, and additional Grid Alternatives led training through TERO, Temporary Worker Program, and for volunteers.
 - Off-set all government buildings in White Mesa, and substantial percentage of load. 2019 usage at 207,000 KWh, \$20k
 - Aiming for design to offset 95% of load
 - Set UMUT on a path to energy independence; save tribe an estimated \$22,000 in energy expenses annually
 - **“Net-Zero” Goal**
 - Transition tribal energy economy from exclusively fossil fuels to renewable energy revenue (Stepping Stone)

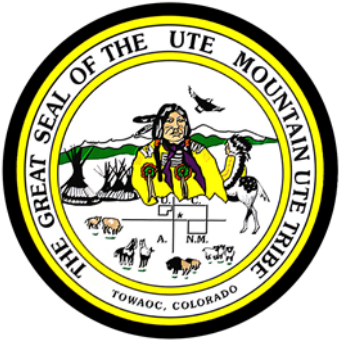


Ute Mountain Ute Tribe Community-Scale Solar Feasibility Study

Prepared by Parametrix, Inc. in partnership with the Ute Mountain Ute Tribe
Funded by the US Department of Energy Tribal Energy Program

January 2014





Workforce Development

- Interns to be hired
- Training to be provided by GRID
- OSHA and Solar Installation



Annual Production Report produced by Cody Arnold

Community Center Ute's - White Mesa, 37.463552, -109.467005

Report		L101 System Metrics	
Project Name	Ute's - White Mesa	Design	Community Center
Project Address	37.463552, -109.467005	Module DC Powerplate	4311 kW
Prepared By	Cody Arnold carnold@folsonlabs.com	Inverter AC Powerplate	366.8 kW Load Factor 1.20
		Annual Production	48,465 kWh
		Performance Ratio	79.8%
		Availability	1.8121
		Weather Dataset	TMY, 10km Wind (37.45, -109.45, NREL, Golangol)
		Simulator Version	4.2.0.0 (15-446) Solar-APP3 (2019-1942-4852)

Project Location

L101 Monthly Production

Month	Production (kWh)
Jan	3,500
Feb	4,000
Mar	6,000
Apr	6,500
May	7,000
Jun	7,500
Jul	7,000
Aug	6,500
Sep	5,500
Oct	4,500
Nov	3,500
Dec	3,000

Source of System Loss

Loss Source	Percentage
Temperature	8.4%
Reflection	3.7%
Selling	2.8%
Insolation	2.8%
Mismatch	1.9%
Optimiser	1.5%
Wiring	1.1%
Cabling	0.9%
Inverters	0.8%
AC System	0.6%
Shading	0.2%

Annual Production

Description	Output	% Ratio
Annual Global Horizontal Irradiance	1,895.3	
POA Irradiance	2,544.5	2.4%
Shaded Irradiance	2,038.8	-1.2%
Irradiance after Reflection	1,864.6	-1.7%
Irradiance after Soiling	1,825.5	-2.0%
Total Collector Irradiance	1,825.0	0.8%
Powerplate	85,494.7	
Output at Irradiance Levels	81,240.7	-2.0%
Output at Cell Temperature Derate	75,894.7	-6.4%
Output After Mismatch	75,894.6	0.0%
Optimiser Output	75,280.9	-1.2%
Optimal DC Output	75,276.2	-0.1%
Controlled DC Output	75,875.0	-0.8%
Inverter Output	64,826.4	-8.8%
Energy to Grid	85,494.3	-0.5%

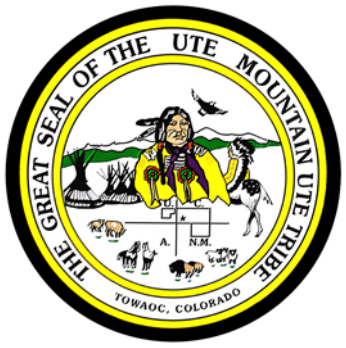
Temperature Metrics

Avg. Operating Ambient Temp	10.2 °C
Avg. Operating Cell Temp	35.4 °C

Resource Metrics

Operating Hours	4564
Scheduled Hours	4564

© 2020 Folsom Labs 1/3 January 23, 2020

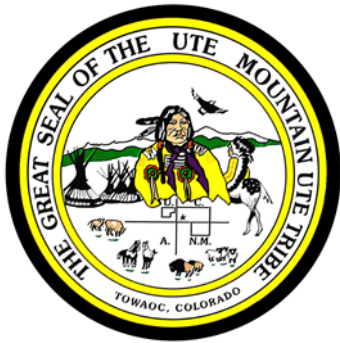


White Mesa Solar Initiative

- 7 meters in White Mesa Ute Community
- 144-DC PV facility installations
- Grid Alternatives as partner, EPC
- Local Electric Company – Rocky Mountain Power (subsidiary of PacifiCorp)

White Mesa Community Solar Overview Map





Cost Share Reduction!



The Deputy Secretary of Energy
Washington, DC 20585
January 11, 2021

Manuel Heart
Chairman
Ute Mountain Ute Tribe
125 Mike Wash Road Tribal Complex
Towaoc, CO 81334

SUBJECT: Cost Share Reduction Request Determination
Applicant: Ute Mountain Ute Tribe
Application Title: Solar Photovoltaic Deployment for Seven Government
Facilities in White Mesa, Utah.
Pending Award Number: DE-IE0000135

Dear Chairman Heart:

Thank you for submitting a cost share reduction request to the U.S. Department of Energy (DOE) Office of Indian Energy Policy and Programs (Office of Indian Energy) for your application previously selected for negotiation of award under Funding Opportunity Announcement (FOA) DE-FOA-0002168.

As Deputy Secretary of Energy, I have the delegated authority to determine whether requests for cost share reductions are necessary and appropriate. Your request for reduced cost share was carefully reviewed in accordance with the criteria published on the Office of Indian Energy website. Based on that review, I have determined that a cost share of 20% will be applied to your pending award.

I sincerely hope that this cost share reduction helps to alleviate the financial impacts of COVID-19 on your tribe and helps to ensure the successful completion of the project. DOE values its partnership with you and your tribe and, through awards like this, strives to help meet your energy development goals.

The Office of Indian Energy will reach out to your DOE grant manager regarding the next steps to incorporate this cost share reduction into your pending award. Any questions can be sent to TribalGrants@hq.doe.gov, and if you do so, please include your DOE Project Officer and Project Monitor on your correspondence.

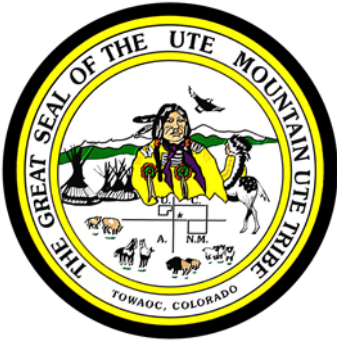
Sincerely,



Mark W. Menezes

cc: Kevin Frost, Director of the Office of Indian Energy
Bernadette Cuthair, Director of Planning & Development

- Originally 50/50
- Reduced to 80/20
- Tribe's Return on Investment
 - Originally 11 years
 - Now 3.2 Years

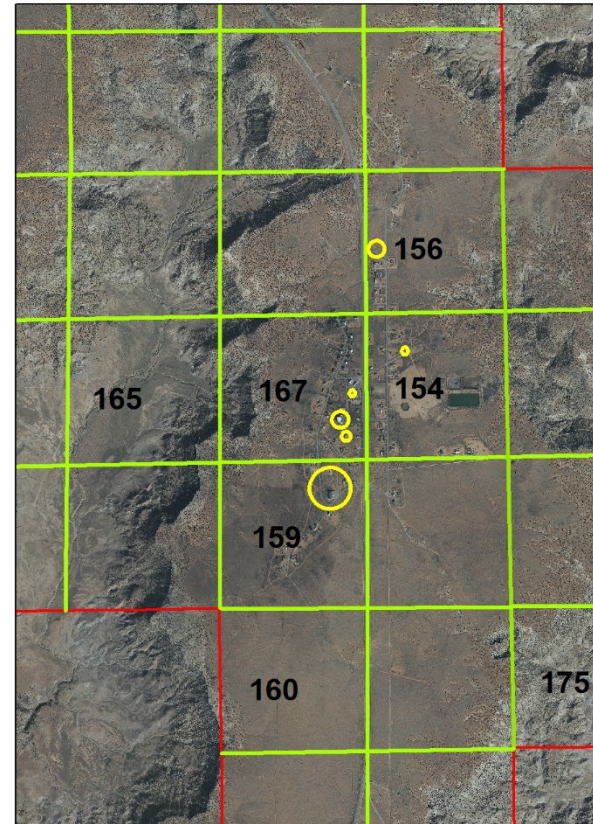


Progress in early 2022

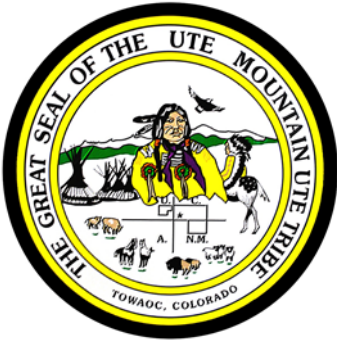
Possible Project Changes

Project Economic Summary	Community Center	Diabetes Center	Education Building	EPD & Vocational Rehab	North Well	Public Works and South Well	Wood Yard	
Address (See attached map)	Willow St, White Mesa	Willow St, White Mesa	Mesa View Drive, White mesa	1398 Hwy 191, White Mesa	Beaver Lane, White Mesa	Willow St, White Mesa	Wood Pile Rd, White Mesa	Summary
System Size (kW)	43.1	2.8	47.6	7.5	16.8	23.8	1.26	142.86
Estimated Annual Production (kWh)	69480	5300	72020	1396	33270	39480	2490	153956
PV Racking/Mounting	GROUND	GROUND	GROUND**	GROUND	GROUND	ROOF	GROUND	6 GROUND, 1 ROOF
# of Modules	123	8	136	2	48	68	4	389
Module Rating (W)	350	350	350	350	350	350	315	-
Average Utility Rate (\$/kWh)	\$0.08	\$0.13	\$0.09	\$0.51	\$0.14	\$0.10	\$0.16	\$0.17
Average Annual Savings	\$5,787	\$691	\$6,224	\$718	\$4,793	\$3,961	\$390	\$22,565
Estimated System Cost	\$130,127.34	\$8,453.75	\$143,713.72	\$22,643.97	\$50,722.49	\$71,856.86	\$3,804.1	\$431,322.31
Simple Payback in Years	22	12	23	32	11	18	10	19
DOE Grant Allocation	\$65,063.67	\$4,226.87	\$71,856.86	\$11,321.98	\$25,361.24	\$35,928.43	\$1,902.0	\$215,661.16
System Cost After DOE	\$65,063.67	\$4,226.87	\$71,856.86	\$11,321.98	\$25,361.24	\$35,928.43	\$1,902.0	\$215,661.16
Simple Payback in Years w/DOE Funding	11	6	12	16	5	9	5	10
Funding Cost-Share	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
System Cost After DOE and Other Funding	\$65,063.67	\$4,226.87	\$71,856.86	\$11,321.98	\$25,361.24	\$35,928.43	\$1,902.0	\$215,661.16
Simple Payback in Years w/DOE & Foundation Funding	11	6	12	16	5	9	5	10
2019 Electricity Usage (kWh)	86,520	5,980	69,560	306	15,920	26,291	2,587	207,164
2019 Electricity Costs (\$)	\$7,206	\$780	\$6,012	\$157	\$2,293	\$2,638	\$406	\$19,492
% Energy Offset	80%	89%	104%	456%	209%	150%	96%	74%
% Cost Savings	80%	89%	104%	456%	209%	150%	96%	116%
Ute Mountain Ute Cost	\$98,264.00							\$
Total Cost	431,322.31							

White Mesa Solar Initiative
Ground Mount Project Locations
Tribal Allotment Land Status



- Utah Schedule 136 policies for deployment of renewable projects, “Transition Program for Customer Generators”
- This may allow us to consolidate to one or two systems
 - Allocate savings to certain meters and bills
 - Make installation more efficient and cost effective
 - Fewer interconnections
 - Less line loss

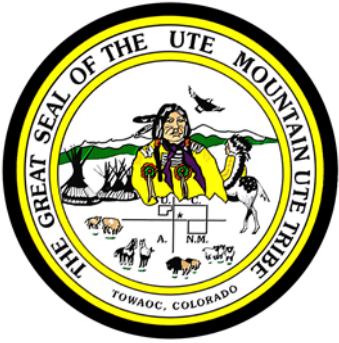


Progress in 2022 –

- Consolidated interconnection Applications prepared – 2 systems, submitted in July
- Applications REJECTED!
- Met with Rocky Mountain Power and Grid in August
 - “You can connect 10KW...”
- System Impact Study Needed
 - Substation backflow concerns
 - \$5000 down payment, potential ~\$10,000 cost
 - Waiver of Sovereign Immunity in Document going to Tribal Council November 22
 - Outcome to determine if any upgrades to substation are needed
 - Upgrades to RMP substation could be pricey, prohibitive to project budget
 - May also present an opportunity for future larger project preparation



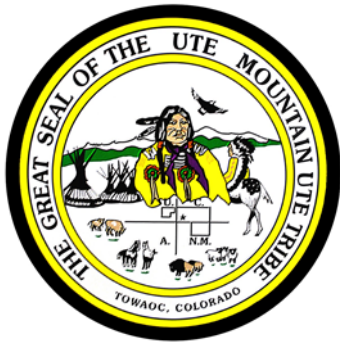
PUT ON THE BRAKES!



Truly Cleaner Energy

- Neighbor to White Mesa Ute Community is the White Mesa Uranium Mill
- One of the Tribe's major concerns and environmental justice issues
- No free lunch- PV Equipment, Li, V





Pivot to Towaoc

Cost share reduction!

DOE: \$432,661

Tribe: \$111,679

Total: \$544,340

Similar reduction of
ROI for Tribe as WMSI

- Originally planned to have 20 individual rental homes solarized
- 23 installed after design and cost considerations
- 60 KW Supportive Housing Unit apartment building almost online



Ute Mountain Ute Tribe UMUT Towaoc Housing Solar Initiative TOPIC AREA 1a: Energy Generating Systems

Control Number: 2317-1548

Project Summary

The Ute Mountain Ute Tribe (UMUT) is pursuing a **Topic Area 1a: Energy Generating Systems** initiative through which it will address energy challenges in the highly rural, high-poverty, remote UMUT Reservation community of Towaoc (Colorado), bringing solar photovoltaic systems to 20 homes managed by the UMUT Housing Authority as well a Supportive Housing building. The goal of this initiative is to reduce the Tribe's dependence on outside energy sources, support UMUT Tribal Sovereignty; and realize energy cost savings for 20 homes and a Supportive Housing building managed by the UMUT Housing Authority. Installation of the 140 kW-DC of solar PV will save 222,585 kWh/year and \$24,484.

Key Personnel/Organizations

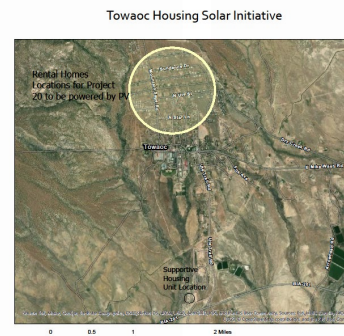
The Ute Mountain Ute Tribe (UMUT) is the lead applicant, under the leadership of Scott T. Clow, UMUT Environmental Programs Director (technical contact). Other key personnel/organizations involved include: Bernadette Cuthair (Business Contact); Ronald Scott (Financial Contact); and Grid Alternatives (Primary Vendor)

Budget

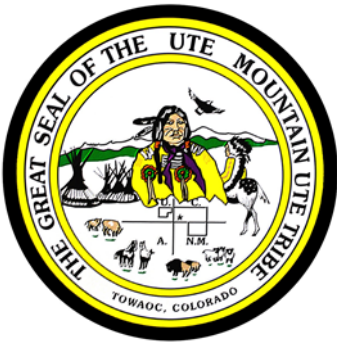
Federal funds requested: \$267,486
Cost-share proposed: \$267,486
Total Project Costs: \$ 534,972

Project Outcomes

The 20 UMUT Housing Authority-managed homes and the Supportive Housing facility used 207,164 kWh of electricity costing \$48,853 in 2019. With the proposed 140 kW-DC solar photovoltaic systems, the Housing Authority will save 222,585 kWh and an estimated \$24,484 per year. These savings will offset an estimated 82% of current usage and 56% on costs. Over the 30-year lifetime of the project, considering decreased production of the system and increases in electricity costs, the UMUT is anticipated to save \$746,000. The project will create four jobs for interns over the 2-year project period and has a payback period of 11 years.



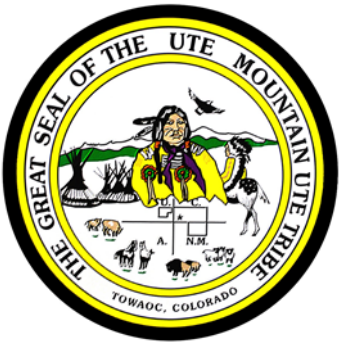
Deployment of this initiative will reduce energy costs for 20 homes and Supportive Housing Unit managed by the UMUT Housing Authority



Towoac Housing Solar Initiative

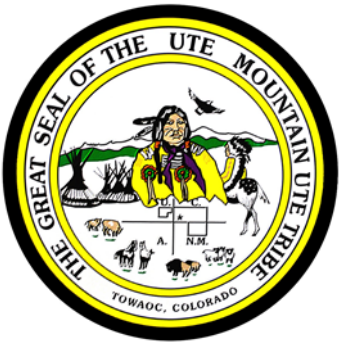
- 11 Trainees (interns) employed for 3 months
- GRID hired
- Higher Education \$ and cost-share reduction
“wobble room” to afford extra workforce development





Towoac Housing Solar Initiative

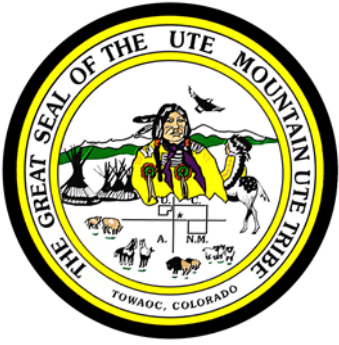




Towoac Housing Solar Initiative – Supportive Housing Unit

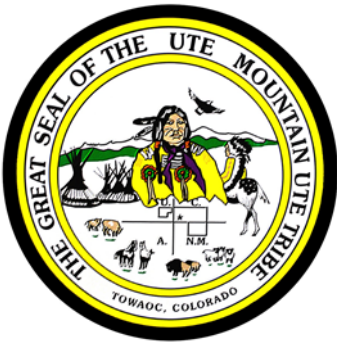
- 60 KW design
- Ground mount
- Anchor screws instead of driven piles





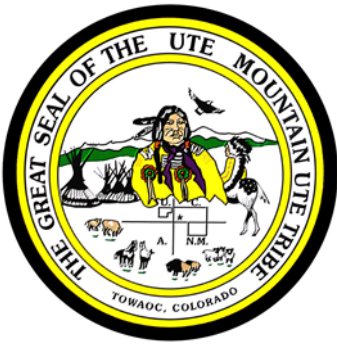
Towoac Housing Solar Initiative – Supportive Housing Unit





Towoac Housing Solar Initiative – Supportive Housing Unit



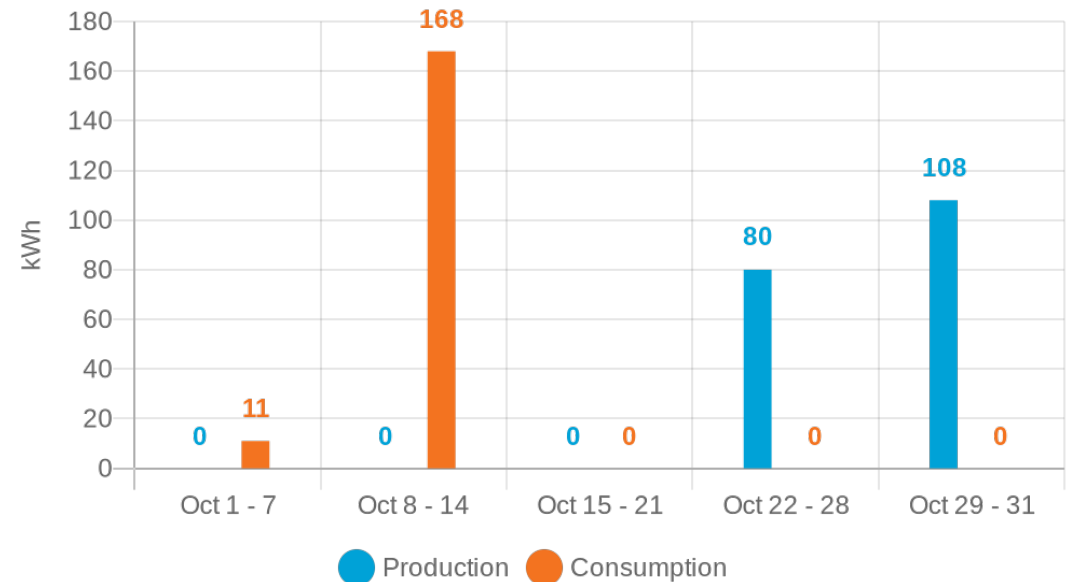


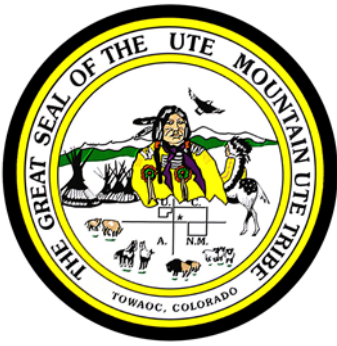
THSI – Real time data application 924 Lafayette St.



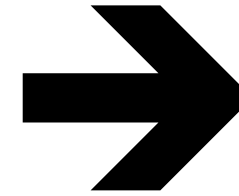
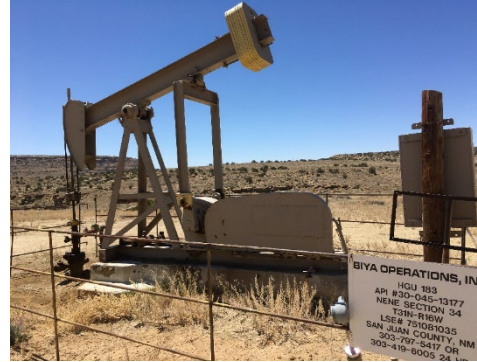
October Numbers

- 189.6 KWh produced
- 179.7 KWh used
- 296 lbs. carbon equivalent
- “99%” energy independent

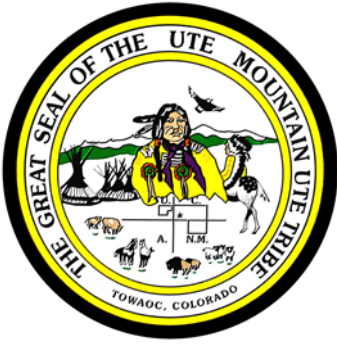




Future of Clean Energy Transition



- Tribe received 1st Commercial Solar Payment for Option to Lease Agreement in late 2021: \$100k
- Just finished two more with same company: \$301k
- Construction timeline autumn 2023
- 600 MW Energy Storage Project
- Small Hydroelectric: 1.4 – 2.0 MW (fee to trust)



Ute Mountain Ute Tribe Renewable Energy



Scott Clow
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sclow@utemountain.org

Thanks for Listening!