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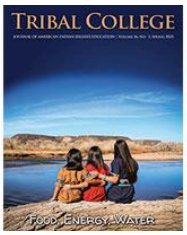

Solar Power to the People: Building Trusting, Lasting Partnerships at United Tribes Technical College

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Jerremy E. Guinn, Ryan Warner, Jim Kambeitz, and Sheridan McNeil ♦ February 21, 2025

TCU NEWS ROUNDUP

She's on a Scholarship at a Tribal College in Wisconsin. The

One of the first things you will see when you arrive on the campus of United Tribes Technical College (UTTC) is a collection of three large solar arrays fanning out like a headdress over the UTTC Skills Center. This building has been the training hub for professional trades such as carpentry, welding, automotive, commercial vehicle driving, heavy equipment operation, and sustainable agriculture. Most recently, renewable energy, like the solar modules hovering over the building, mark the new energy future—and UTTC is leading the way in North Dakota, having more solar installations than any other college in the state.

Renewable energy is ever-present on the UTTC campus today. However, few people know that this movement is the result of a unique relationship that blossomed on campus. Starting as a conversation among friends, the dream grew to become a powerful partnership between educators and professionals, forming an expanding circle that includes UTTC, local tribal nations, Lightspring Solar, and Indigenous-led nonprofits like Indigenized Energy and Sage Development Authority. The dream behind these partnerships was to create solar friends, solar warriors, and

Trump Administration Suspended the USDA Grant That Funded It.

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a sustainable solar family by training a small workforce in solar energy.

What began as a rough plan to slap a few donated solar panels onto an old box trailer to demonstrate solar energy to local communities quickly turned into an innovative exercise of community design and build with classroom and hands-on training in solar basics and installation, as well as the creation of the college's first mobile science, technology, engineering, and mathematics (STEM) solar outreach vehicle. These efforts launched something bigger than anyone expected. Over the past five years, the partnership has collaborated on numerous impactful projects on campus and in tribal communities. The partners have co-authored several major proposals and secured over $6.5 million for solar implementation and training activities, worked with other organizations to provide formal solar apprenticeships, and established a collaboration founded on trust. They have grown and learned together, and they are grounded in a shared dedication to tribal communities. Today, the partnership continues to grow and expand, building toward the potential transformation of the region's landscape.

ALIGNING THE STARS

In 2019, Sheridan McNiel, whose Dakota name is Oyate Ohowicada Win, served as UTTC's director of career and technical education. He teamed with Jim Kambeitz and Ryan Warner of Lightspring Solar to work on strategies for bringing solar energy training to UTTC. Lightspring was a new company leading the early cusp of the modern solar energy movement in North Dakota. With as much annual solar irradiance as Florida, North Dakota has great solar potential but ranks dead last in the country for solar megawatts installed and the total number of solar installations (Solar Power Guide, 2024). Lightspring was

The Digital Story Keeper

March 3, 2025 | By Brianna G. Reed

"After the espresso runs dry and the writers hit their word counts, I shutter the storefront, dim the lights. I walk back to my studio carefully, scanning patches of ice…"

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building its company based on community engagement and education, energy sovereignty for all, and a strong dedication to tribal communities. Lightspring wanted to decolonize energy development, building solar in a way that would resonate with both Indigenous and non-Indigenous North Dakotans while keeping local people first every step of the way. To counter the dominant extraction models of energy development, partners agreed they would need to build a local workforce and invest in growing the local knowledge base and keeping capital in the community.

The shared vision was to develop a workforce of solar specialists so North Dakotans could build their own solar and lead the future solar energy industry in their state instead of hiring people from the outside. To achieve this goal, community training was needed, and it made sense to involve UTTC students and faculty. A key to the relationship, and one of the primary reasons the partnership was established in the first place, was how the team at Lightspring Solar engaged with UTTC in a spirit of learning, reciprocity, and shared growth.

After first meeting at the water protector camps on Standing Rock, UTTC and Lightspring maintained communications that eventually led to formal work together. As a start-up company, the Lightspring team was learning more about various solar applications, energy utilities, and the variety of policies and interconnection agreements that support or deter solar applications. The team at Lightspring Solar took the time to become part of the community at UTTC and part of the communities Lightspring serves, working with the tribes to provide services, attending community events, focusing on building a workforce of tribal members to do the work in tribal communities, and dedicating themselves to the long-term maintenance and sustainability of the operations. The partnership has developed into one that is solid and enduring.

The team routinely communicates with UTTC's Intertribal Research and Resource Center (IRRC), the Land Grant office, maintenance and facilities, as well as the campus planner's and president's offices, ensuring all the right people are informed and on the same page. Over time, Lightspring Solar has grown from a team of two to over a dozen employees, successfully managing multiple projects including those on UTTC's campus. At the same time, UTTC staff have become increasingly educated in solar potential and how solar can be implemented in the routine schedules of the institution's maintenance and operations.

MODELING A SOLAR SOLUTION

The drive for sustainability and a transition away from fossil fuels has been integral to campus planning at UTTC for many years. The college's relationship with solar energy and modeling sustainability dates back to at least 2008 ("Solar Heat," 2008), when Lakota Solar Enterprises (now Red Cloud Renewables) in Pine Ridge, South Dakota, designed solar thermal collectors for heating single housing units on campus. Photovoltaic solar cells provide a solution that contributes to reducing electric costs of specific buildings, reduces reliance on fossil fuel-driven grid energy, and pushes the campus toward a carbon-neutral future.

In the spring of 2019, UTTC hosted the first solar installer career and technical training workshop in partnership with Lightspring Solar, Indigenized Energy, and Solar Bear, a company from Red Lake, Minnesota. The partners donated time, solar materials, and labor. UTTC provided space, tools, textbooks, materials, and staff for a week-long, hands-on training and offered continuing education credits to participants. Approximately 30 participants recruited broadly from the Bismarck area, tribal communities in North Dakota and from the UTTC student body attended

Employment Opportunities

Natural Resources Instructor
March 11, 2025

Assistant Professor of Practice, Lodging and Hospitality Operations
March 10, 2025

Extension Educator - Forest Dependent Wildlife
March 7, 2025

Ecologist Instructor-9month
March 7, 2025

MUSEUM STUDIES FACULTY

and received training in foundations of electricity and basics of solar energy and photovoltaic cells. Far exceeding initial hopes that at least a handful of participants would attend, there was a waiting list within days of advertising the training. The great interest in the workshop led to a second phase with hands-on training.

During the summer of 2019, UTTC hosted phase two of the solar installer career and technical training workshop in partnership with Lightspring Solar, Indigenized Energy, Sojourn Architects, and Rock Industries. The goal of the week-long workshop was to design and build a 3.1kW mobile off-grid solar trailer with 20kWh energy storage. UTTC offered continuing education credits to 30 participants. Indigenized Energy donated 10 solar modules, and Lightspring Solar donated the design, engineering, coordination, and training instruction and also led the installation team of solar students. UTTC provided the trailer, inverter, and batteries, as well as electrical hookup labor, enabling the trailer to power the powwow arena lights at the first solar-powered powwow. Rock Industries provided cutting and welding services for the frame and Sojourn Architects provided CAD designs and time-in construction.

The "Solar Roller," a mobile trailer outfitted with solar panels, powered UTTC's 50th anniversary powwow.

Emerging from the workshop was a group of participants who gained knowledge and experience in installation and

March 6, 2025

Assistant Director - Native American House

March 6, 2025

THOUGHTS OF AN INDIGENOUS INTROVERT

They Wore Moccasins

November 15, 2023 | By Markus Altaha

Put your Crocs in four-wheel drive, lace up your sneakers, pull up your boots, and "rock your mocs" every chance you get. We have stereotypes to break and haters to prove wrong.

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problem-solving throughout a rigorous week. The result that rolled out was a mobile solar trailer that would become known as the “Solar Roller.” The trailer is a visible, public example of the application of solar power to address specific needs, including off-grid operation, single housing unit scale design, and versatility to meet the customized needs of community members. The partnership packed the Solar Roller with STEM outreach modules. It is used annually at the UTTC International Powwow, the Bismarck Public Schools Back-to-School Bash, UTTC student welcome events, IRRC Haunted Trail and Boo Walk events, and various other activities. Moreover, the Solar Roller serves as the main booth for outdoor STEM outreach. Building on the successes of the Solar Roller workshops and momentum created at the powwow, the partnership began exploring other ways to demonstrate the power of solar energy on campus on a larger scale. Because the Skills Center is the first building people see upon entering campus, the partnership began discussing ideas for solar implementation. A funding source was identified to meet the project’s needs, but the deadline for the required proposal was less than 48 hours away. This was one of the first challenges for the partnership: How would the partnership function under pressure? How would the partners communicate to reach a common goal?

To meet this challenge, each member of the partnership focused on their piece of the project with frequent contact throughout the evening hours, bouncing questions off of each other to quickly develop a compelling and highly technical case for installation of solar panels and a battery storage system to support the energy needs of the Skills Center, provide a demonstration site for discussing solar energy with tribal members, and work toward the ultimate energy goal of the institution. Working directly with UTTC’s president, Leander “Russ” McDonald, the partnership was able to navigate both the funding agency’s

submission platform and UTTC's internal requirements to get a strong proposal in under the deadline.

The UTTC Skills Center has served as a regional hub for career and technical education. Today, it is also where students take courses in renewable energy trades.

In the summer of 2020, UTTC received a grant from the Tribal Solar Accelerator Fund, part of GRID Alternatives, to install a 24kW DC elevated solar array above the UTTC Skills Center Building with a 34.2kWh energy storage system and monitoring eGauge. The initial design called for a rooftop-mounted solar panel installation, but further design planning and innovations identified a unique opportunity to develop a pier installation, with the panels being placed atop large racking piers. The design offered an opportunity to take full advantage of year-round solar by enabling broader adjustments of the panel angle. In the fall, the panels can be moved by a simple hand-crank mechanism to a 60-degree angle, which not only more directly aligns the panels to the lower sun angle during the winter months but also reduces concerns about snow buildup, as snow and ice slide off at the steeper angle. During the spring, the panels are moved to 20 degrees, a flatter angle that aligns with the summer sun, which places it more directly overhead. During the summer, the panels also provide shade along the sidewalk entrance to the building. Lightspring Solar performed the design work, provided the third hands-on solar training, and installed the solar system with former UTTC students and other

community members. Enhancing the community education approach, the Skills Center electrical data is provided in real time on a monitor in the hallway, increasing energy literacy through passive, informal education for all members of the community who visit the building.

To assist in guiding preparations for future projects and funding opportunities, the partnership initiated a full-campus energy audit and feasibility study in the summer and fall of 2023. Lightspring Solar took the lead in conducting the audit of more than 50 campus buildings and residential housing units and preparing the technical assessment and final energy audit report, the *United Tribes Technical College Campus Energy Survey and Renewable Energy Feasibility Study* (UTTC, 2023). UTTC received a grant to perform a campus-wide feasibility study to understand current and projected campus-wide energy consumption as well as available avenues to lower carbon emissions through the deployment of distributed energy resources (DERs) and energy efficiency improvement and building-level monitoring, automation, and optimization strategies. Lightspring Solar performed the feasibility study. The study identified several priority buildings that would provide the greatest energy savings for the campus. The primary high-energy consumers were the largest buildings on campus: the Science and Technology Center, the Education Building, and the Louis Goodhouse Wellness Center. The study also identified utility requirements, constraints, and reimbursement structures for feeding electricity back to the grid and it produced a cash flow analysis to illustrate how investments in renewable energy could pay off over time.

In 2023-2024, UTTC's Land-Grant program designed and built the NetZero Greenhouse, a building that generates 100% of its energy onsite, reducing the college's carbon footprint and further modeling renewable energy solutions.

Lightspring designed and installed the 43.2 kW DC solar photovoltaic ground mount system. The first of its kind at a tribal college, the NetZero Greenhouse takes the partnership's commitment to energy sovereignty and resilience to the next level (Fiori, 2024).

In the summer of 2024, an opportunity to address energy needs at the largest STEM facility on campus was realized. The Science and Technology Center is approximately 25,000 square feet and houses the IRRC and academic programs for environmental science, fisheries and wildlife, pre-engineering, computer information systems, criminal justice, and business. Although the building's energy needs are supplemented by geothermal energy, the structure still consumes a high amount of energy each year. To help the institution offset these costs and work toward its goal of carbon neutrality, the partnership proposed a plan for a 79.2 kW DC solar rooftop system. It was installed in August and September of 2024 and was commissioned with the local utility in October 2024. During the electrical interconnect, power to the building had to be interrupted so the electrician could make the connections. This presented a deep concern for researchers who had collected hundreds of sensitive samples over the summer that were being stored in -200 degree Celsius and -800 degree Celsius freezers. Lightspring worked closely with the electrician, UTTC's facilities department, and research faculty to test the backup generators and ensure no samples were lost during the transition. The shutdown went off without a hitch thanks to the extra efforts of the Lightspring team.

Working from the 2023 energy audit and strategic energy plan, the partnership identified a significant funding source for addressing two energy concerns with a single solution. The first concern was reducing the energy costs of a large campus building and reducing the dependence on fossil fuel-derived energy. The second issue was improving

UTTC's ability to cope with emergencies for the approximately 700 undergraduate and elementary school students, 250 employees, and an additional 300 persons living in family housing. All of them call campus home for the time that they are there as students, family, or employees. As identified in the energy audit, the Louis Goodhouse Wellness Center is one of the primary energy consumers. The building has substantial space for emergency sheltering and a commercial kitchen, as well as housing counseling, health, and wellness staff. However, the building is vulnerable to disruptions to the grid, and power failure could prove catastrophic if sheltering in emergencies. The center was used in 2015 by the University of Mary as a temporary shelter after their campus was evacuated due to a wildfire.

For an application to the Department of Energy's Office of Indian Energy, the partnership designed a solar system that would dramatically reduce energy costs to the college, provide a resilient off-grid emergency shelter in the event of a long-term power interruption, and reduce reliance on fossil fuels. They worked together to draft an application for funding. Each team member took the lead on drafting different sections of the proposal and then all members came together to edit and approve the final documents. UTTC was selected by the Department of Energy Office of Indian Energy to receive a Clean Energy Technology Deployment on Tribal Lands award for integrated energy systems for autonomous operations. Energy bill savings will be put toward establishing a solar maintenance and repair fund at the college to ensure the sustainability of investments that are being made today. The partnership designed a 150kW solar photovoltaic array with a 250kW battery energy storage system, tied together with an OATI GRIDMind controller for autonomous operation. A microgrid controller coordinates components of a microgrid to optimize systems to maintain reactive power when on-

grid, off-grid, or switching between the two states. The grant application was selected for funding with hopes of installation work starting in the spring of 2025.

BUILDING A TRIBAL SOLAR WORKFORCE

UTTC and Lightspring Solar hosted the solar installer career and technical training workshop, offering hands-on training and continuing education credits to participants.

In the summer of 2024, UTTC supplemented apprentices in the Sage Development Corporation on the Standing Rock reservation and Lightspring Solar Apprentice program, entering a new level of workforce training in the region. Recent large-scale investments in solar development include the EPA's Solar for All program, which awarded the Northern Plains Tribal Solar for All program to invest over $135 million for residential solar systems for 14 tribal nations across North Dakota, South Dakota, Montana, Wyoming, and Wisconsin. This historic investment, combined with several others, sets the stage for an immediate and lasting future for solar development in the broader region. But it also illuminates the lack of a trained workforce to handle the energy audits, installations,

monitoring, and maintenance work required for tribal communities.

UTTC, along with its solar and renewable energy partners, is poised to build on its history of micro-credentials and certificates for career and technical education fields, forming a central training center for tribal nations. The college is building training programs that will serve the needs of the new tribal solar workforce. At the Solar Roller kick-off event during UTTC's powwow and the 50th anniversary of the college, the phrase "solar power to the people" passed through the crowd. It was a fitting statement for the beginning of something bigger, as the future of solar turns a corner. Commitment to sustainable energy solutions and community empowerment reflects the Indigenous principle of considering our impact on future generations. Let us be inspired to seek and nurture partnerships prioritizing long-term impact, innovation, and the well-being of future generations. Together, we can create a legacy of positive change that resonates for seven generations and beyond. *Mitakuye Owasin*.

Jeremy E. Guinn, PhD, is the director of the Intertribal Research and Resource Center at United Tribes Technical College; Ryan Warner is co-founder and co-owner of Lightspring Solar in Bismarck, North Dakota; Jim Kambeitz is co-founder and co-owner of Lightspring Solar; and Sheridan McNeil, whose Dakota name is Oyate Ohowicada Win (Respects the People Woman), is the director of tribal partnerships at ND EPSCoR/NDSU RCA.

REFERENCES

Fiori, G. (2024, October 15). UTTC Introduces First Net-Zero Greenhouse at a Tribal College. *Buffalo's Fire*. Retrieved from https://www.buffalosfire.com/ uttc-introduces-first-net-zero-greenhouse-at-a-tribal-college/

United Tribes Technical College. (2023). *United Tribes Technical College Campus Energy Survey & Renewable Energy Feasibility Study*. Bismarck, North Dakota.

Solar Heat at United Tribes and Turtle Mountain. (2008). *Tribal College: Journal of American Indian Higher Education, 19*(3), 46, 48.

Solar Power Guide. (2024, October 15). *Solar Energy Insights.* Retrieved from https://solarpower.guide/solar-energy-insights/states-most-solar-installations

Tribal Landscapes. (2019, Fall). Solar Powered Powwow! United Tribes Technical College. Retrieved from https://old.uttc.edu/irrc-newsletters/

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