



# Addressing Regulatory Challenges to Tribal Solar Deployment

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**Abstract.** Although Tribal land represents more than 5% of the solar photovoltaic technical potential in the United States, this resource is largely untapped due to a range of barriers, including complex project economics, Tribal technical and human resource capacity, project funding and financing obstacles, and regulatory challenges.

To identify and better understand the regulatory barriers, the National Renewable Energy Laboratory (NREL) and the Midwest Tribal Energy Resources Association (MTERA) engaged Tribes, utilities, and regulators. Funded by the U.S. Department of Energy, the 3-year effort seeks to address regulatory challenges or barriers that affect Tribal solar projects differently—specifically or disproportionately because they are located on Tribal lands.

This paper, largely excerpted from a comprehensive (draft) guidebook released by NREL and MTERA, provides an overview of 13 key regulatory barriers identified through this research, as well as potential short- and long-term solutions. In addition, the paper points to potential pathways for addressing key barriers through case studies highlighting successful Tribal solar projects along with considerations for stakeholders working with Tribes. These resources can support stakeholders in creating meaningful relationships and pursuing workable solar projects.

**Keywords:** Tribal solar development · Tribal sovereignty · Tribal energy resources

## 1 Introduction: Project Overview and Goals

Tribal land in the United States represents approximately 2% of the country's total landmass and holds more than 5% of solar photovoltaic (PV) potential (Doris et al. 2013). This resource is largely untapped. Many Tribes are actively seeking to engage in solar development. A review of 35 Tribal strategic energy plans in 2019 revealed 32 of 35 Tribes were exploring solar options for their communities. Many Tribes also cited regulatory hurdles to achieving these goals.

In 2020, the Midwest Tribal Energy Resources Association (MTERA) and the National Renewable Energy Laboratory (NREL) launched a joint effort to unlock some

of this potential by bringing regulatory, utility, and other stakeholders together to articulate key barriers to Tribal solar adoption and develop replicable solutions. Funded by the U.S. Department of Energy’s Solar Energy Technologies Office, the 3-year project seeks to help expand an emerging market by increasing institutional capacity and developing frameworks, trainings, and a technical document repository for regulatory bodies, utilities, and Tribes.

**The goal was to address regulatory challenges or barriers that affect Tribal solar projects differently—specifically or disproportionately because they are located on Tribal land**

These effects can be due to Tribal sovereignty<sup>1</sup> and associated legal and jurisdictional differences between these projects and non-Tribal projects off Tribal land. They can be due to land management, permitting, or ownership differences between Tribal and non-Tribal land. They can also be related to common Tribal circumstances that affect Tribes’ abilities to pursue policy change.

This paper highlights the 13 significant regulatory challenges and associated solutions identified through this project and documented in the resulting (draft) guidebook, *Addressing Regulatory Challenges to Tribal Solar Deployment* (Beshilas et al. forthcoming).

In addition to offering a high-level summary of proposed solutions to common challenges outlined in the guidebook, this paper aims to improve stakeholders’ understanding of unique aspects of developing solar on Tribal land, and to help stakeholders work together on future policy solutions.

## 2 Regulatory Dimensions

This project considers regulatory barriers from various dimensions, including project scale and jurisdictional level (Table 1).

**Table 1.** Regulatory jurisdiction at various levels.

Jurisdictional level	Organization	Regulatory jurisdiction
Tribal	Tribal government	Develops and enforces all Tribal codes, regulations, and policies on Tribal trust land. Note: Tribal utilities have different governing structures and may or may not be regulated by the Tribe, a separate governing board, or a Tribal utility commission

(continued)

<sup>1</sup> Tribal sovereignty refers to the legal right of Tribes to govern themselves and regulate their internal affairs. Some Tribes or Tribal members may understand sovereignty to include energy independence or the ability of a Tribe to control all aspects of their energy use and supply.

**Table 1.** (continued)

Jurisdictional level	Organization	Regulatory jurisdiction
Local utility	Cooperative local utility (or similar) governing board	Some electric cooperatives are not regulated by the state utility commission; for these, the board of directors or similar body is the jurisdictional authority. Note: State-regulated utilities develop and implement processes such as interconnection procedures in response to a state regulator or governing board
Local	County	Develops and enforces building codes, including electrical codes, that local electric utilities may default to for interconnection
State	State public utility commission	Regulates the programs, rates, rules, policies, and services of certain electric utilities (often investor-owned utilities [IOUs]; sometimes cooperatives or other)
Regional	Independent system operator/ regional transmission operator	Has governing structures and jurisdiction over processes for interconnection or with participating utilities; ultimately regulated by the Federal Energy Regulatory Commission (FERC)
Federal	FERC	Regulates the transmission and wholesale of electricity and natural gas in interstate commerce; regulates the interconnection process for connections to the bulk (interstate) power system

## 2.1 Options for Tribes to Engage in the Regulatory Process

Regulatory challenges are largely relevant at the outset of the solar project development process, but addressing them proactively can avoid additional unforeseen obstacles. Options for Tribes to engage in the regulatory process include:

- Participating in utility or regulatory workshops or planning processes, submitting comments into processes, or serving on an advisory group or board
- Meeting one-on-one with representatives of the regulatory body or utility to discuss policy and Tribal priorities
- Codifying intentions, Tribal authority, and clear development parameters and processes in Tribal policy (e.g., engage in strategic energy planning; develop Tribal codes regulating electricity standards, rights-of-way, rates)
- Working with a national association or other organization to develop model policy language; working with relevant governing body to implement
- Intervening in a regulatory proceeding
- Petitioning the state to open a new matter for hearing.

In addition to the approaches above, Tribes can form electric utilities to establish an entity with a long-term mission to participate in the regional electric market and associated policy discussions that affect the Tribe.

There are also different types of policy solutions: short-term options or workarounds and options that require more time, resources, and commitment.

## 3 Regulatory Challenges and Solutions for Tribal Solar Development

Through a series of Tribal listening sessions and stakeholder engagements, NREL and MTERA researchers identified the following 13 regulatory barriers to Tribal solar development, along with potential solutions.

**Barrier 1: Lack of Tribal Representation in Utility, State, or Federal Energy Policy Decision-Making Processes.** This barrier applies at all scales and jurisdictions. Short-term regulatory solutions may include:

- Outreach from Tribal staff or leadership to elected and appointed officials with information about Tribal perspectives or priorities
- Tribal liaison positions.

Long-term regulatory solutions could include:

- Tribal members run for or get appointed to office
- Generic dockets (Table 2).

**Table 2.** Comparison of stakeholder perspectives contributing to Barrier 1.

Tribal	Regulator	Utility
Tribes are often left out of the process, or do not have staff time or expertise, or financial resources, to engage with the process	Regulators must engage Tribes in the same way they engage with all other parties	Tribes may not be interested in participating in the utility planning processes
When Tribes do engage, they feel that their concerns are not considered	Regulators must engage all parties in a narrowly prescribed manner inside the confines of specific regulatory proceedings	Tribal and utility goals are different

**Barrier 2: Tribal Government or Enterprise Leadership and Staff Energy-Related Technical Capacity.** This barrier applies at all scales and involves Tribal government or enterprise jurisdiction. The short-term solution is securing support from Tribal leadership (resolutions) for solar work. Long-term solutions can include:

- Undertaking long-term planning initiatives
- Prioritizing energy by fully or partially funding an energy-related Tribal government position (Table 3).

**Table 3.** Comparison of stakeholder perspectives contributing to Barrier 2.

Tribal	Regulator	Utility
Tribes are often understaffed and under-resourced, and may not have relevant prior technical experience, making it difficult to engage in solar project development	Regulatory bodies may believe that it would be helpful if Tribes had energy experts with time and resources to devote to energy projects and decision-making process engagement	Utility staff may believe that it would be helpful if Tribes had energy experts with time and resources to devote to energy projects and decision-making process engagement

### Case Study: Eastern Band of Cherokee Indians

#### Long-Term Stepwise Strategy Alleviates Tribal Capacity Challenges

The Eastern Band of Cherokee Indians (EBCI) Tribal Council passed a resolution in 2006 promoting a healthy, sustainable natural environment, setting a long-term energy vision, and enabling a project team to apply for a U.S. Department of Energy grant to move forward with strategic energy planning.

In 2007, EBCI established an Energy Committee, and in 2009 it completed a strategic energy plan and invested in a long-term energy coordinator position within the Tribal government. These actions addressed the Tribe's significant capacity challenges, enabling sustained effort and providing project and policy continuity. After completing an energy efficiency retrofit of nine buildings, which cut consumption by more than 30%, EBCI set its sights on solar.

This stepwise, deliberate process, with engagement of key decision makers across government and economic operations, was critical to the smooth execution of a 700-kW solar array at EBCI's Cherokee Valley River Casino, which offsets nearly 10% of electricity usage across the casino, hotel, and two administrative buildings.

"The commissioning and dedication of the Tribe's 705-kW solar PV system was a monumental achievement for the Tribe, as it was the first utility-scale system deployed on EBCI lands," said Joey Owle, Secretary of Agriculture and Natural Resources. "We demonstrated our ability to partner, plan, design, construct, and manage a solar PV system that is achieving the Tribe's previously targeted goals."

**Barrier 3: Tribes Served by Multiple Utilities.** This barrier applies at the distributed, facility, and behind-the-meter scales and involves local utility jurisdiction. The short-term solution is early engagement with utilities during project development. Long-term solutions can include:

- Forming a Tribal utility
- Developing Tribal utility codes (Table 4).

**Table 4.** Comparison of stakeholder perspectives contributing to Barrier 3.

Tribal	Regulator	Utility
It is challenging to manage government budgets and logistics for implementing projects when a Tribe is served by more than one utility with different sets of rules	Regulators or states manage the charters for utilities, as well as any additions or changes to a utility's service territory. The regulator does not direct changes in the territory	The utility's service territory is typically dictated by the state or is historical. Serving part of a Tribal territory is likely not an issue that concerns the utility

**Barrier 4: Net Metering Limits or Lack of a Net-Metering Policy.** This barrier applies at the distributed, facility, and behind-the-meter scales (often referred to as “rooftop” solar) and involves the jurisdiction of the local utility, governed by the state or the utility’s board of director (if a cooperative or a municipal utility). The short-term solution may be to split projects into smaller sizes to meet size caps. The long-term solution can be to work with utility or state rulemaking proceedings to modify or establish net-metering rules (Table 5).

**Table 5.** Comparison of stakeholder perspectives contributing to Barrier 4.

Tribal	Regulator	Utility
<p>Net-metering rules that provide a time-guaranteed high dollar value per kilowatt-hour produced provide strong economic support for developing behind-the-meter solar</p>	<p>Net-metering rules need to be in place so utilities, consumers, and the companies installing behind-the-meter solar have a structure in which to operate and a stable set of fiscal conditions to use in calculating the project’s economic impacts</p>	<p>Net metering has historically been an incentive for consumers to build solar. The effective price utilities compensate net-metered consumers is higher compared to the price of utility-scale generating facilities (or utility-owned facilities). As more consumers take advantage of a net-metering program, the incumbent utility’s revenue decreases, making it harder for the utility to pay for the fixed costs of building and maintaining electric infrastructure</p>
<p>Weak net-metering rules (low dollar value, “avoided cost,” or no time guarantee) make the projects harder to make sense economically</p>		
<p>Lack of net-metering rules, net-metering project size caps, or lack of virtual net-metering mean that a solar array must be sized so that all of the generation is used on-site to capture its value</p>		

**Barrier 5: Limit of Third-Party Ownerships.** This barrier applies at the distributed, facility, and behind-the-meter scales and involves the jurisdiction of the state regulator. Short-term solutions can include:

- Early engagement with utility during project development

- Cooperative group of investors.

Long-term solutions can include:

- State legislature creates policy ownership
- Judicial ruling
- Regulatory change (Table 6).

**Table 6.** Comparison of stakeholder perspectives contributing to Barrier 5.

Tribal	Regulator	Utility
Because Tribes cannot take advantage of tax credits, a third-party ownership arrangement can help make projects more cost-effective. Therefore, Tribes may want to use a third-party arrangement	The state regulator may consider a third-party owner a “utility.”	When the definition of third party is unclear, the utility can choose to prevent third-party ownership
Tribes could be considered a third party		

**Barrier 6: Distributed Generation Interconnection Requirements.** This barrier applies at the distributed scale and involves the jurisdiction of the of the local utility regulatory board or state. The short-term solution is to work with the utility to determine project-specific solutions. The long-term solution may be to establish Tribal laws and regulations for interconnection rules and procedures (Table 7).

**Table 7.** Comparison of stakeholder perspectives contributing to Barrier 6.

Tribal	Regulator	Utility
Unclear interconnection policies and processes can prevent or delay projects	Utilities need to deliver affordable electricity to all customers, and any policies developed are typically meant to be equally applied across all customers in a particular customer class	Policies that have not been needed in the past may be time-consuming to develop or may disadvantage the utility and transfer costs to other customers, which the utility may be legally prohibited from doing

**Barrier 7: Tribal Utility Formation Desire Conflicts with Existing Net-Metering Agreements.** This barrier applies at the distributed scale and involves the jurisdiction of the utility and Tribe. Short-term solutions can include:



- Honoring arrangements for specific installations
- Evaluating project economics based on timing of system takeover.

The long-term solution may be for the Tribal utility to take over the electrical system (Table 8).

**Table 8.** Comparison of stakeholder perspectives contributing to Barrier 7.

Tribal consumer	Regulator	Utility
If an existing Tribal solar energy project has negotiated favorable net-metering arrangements, the Tribe may seek to keep the arrangement if the Tribe takes over the electric utility to continue generating as much revenue from the project as possible	The Tribal enterprise would be governed by a Tribal Utility Board or Tribal Council, outside the jurisdiction of state and/or federal regulators	Utilities would typically resist customer departure. However, in the case of a Tribe with several robust net-metering arrangements, the utility may be willing to negotiate a streamlined exit

**Barrier 8: Tribes Served by Cooperative Utilities That Are Not State Regulated.** This barrier applies at all scales (although it is more relevant at the distributed scale) and involves the jurisdiction of the incumbent cooperative utility. Short-term solutions can include:

- Connecting with National Rural Electric Cooperative Association experts
- Working with cooperatives to form mutually beneficial arrangements.

No applicable long-term solutions were identified (Table 9).

**Barrier 9: Distributed Solar Program Incompatibility with Tribal Facility Circumstances.** This barrier applies at the distributed, facility, and behind-the-meter scales and involves the jurisdiction of the local utility. Short-term solutions can include:

- Submitting comments on rulemaking to FERC
- Submitting comments to regional organizations

A long-term solution can be to create Tribal building codes so buildings are “solar-ready” (Table 10).

**Table 9.** Comparison of stakeholder perspectives contributing to Barrier 8.

Tribal	Regulator	Utility
When a co-op utility is not state-regulated, the Tribe may have little ability to participate in or influence decision processes and co-op planning without going to FERC	The co-op regulatory board is responsible for rulemaking to self-regulate the co-op	The co-op utility is regulated by a board, and decisions are made at that level
		Many co-ops have very limited staff and financial resources and face financial constraints to enabling noncooperative electricity generation projects

**Table 10.** Comparison of stakeholder perspectives contributing to Barrier 9.

Tribal	Regulator	Utility
Grid-delivered electricity can be expensive for Tribes in both absolute and relative terms, as many Tribal residents are remotely located. Residential, rooftop solar can be desirable from a personal standpoint in addition to the technology's alignment with common Tribal goals of energy independence and environmental protection	Regulatory perspective does not apply for this barrier as regulatory commissions are not usually involved in rooftop solar rules, but local regulations do matter	Tribal rooftop solar is another manifestation of a larger trend: increased distributed generation. As the entity responsible for maintaining the stability and integrity of the grid, utilities are primarily concerned with the ripple effects of rooftop solar on electrical infrastructure, especially the distribution system

**Barrier 10: Nontaxability of Tribes and Investment Tax Credit Rules.** This barrier applies at all scales and involves federal jurisdiction via federal tax laws. Short-term solutions could include:

- Developing taxable entities
- Forming tax partnerships.

Long-term solutions could involve federal legislation (Table 11).

**Barrier 11: Lack of Options for Selling Utility-Scale Output (Without Being Connected to the Market).** This barrier applies at the utility scale and involves utility, state, and federal jurisdiction. The short-term solution may be to work with state regulators or utility for near- or mid-term opportunities. Long-term solutions can include:

**Table 11.** Comparison of stakeholder perspectives contributing to Barrier 10.

Tribal	Regulator	Utility
Tribal governments do not pay federal taxes so cannot take advantage of the federal solar investment tax credit (ITC), making solar installations functionally more expensive	Not applicable	Not applicable
A cash grant in lieu of a tax credit enables Tribal governments to leverage federal solar incentives		

- Participating in utility resource planning and advocating for Tribally sited projects
- Effecting changes in federal legislation (Table 12).

**Table 12.** Comparison of stakeholder perspectives contributing to Barrier 11.

Tribal	Regulator	Utility
It can be challenging for projects on Tribal land to compete with projects off Tribal land due to additional permitting, the National Environmental Protection Act process, and other steps	The regulatory role is to support utility buildout of resources that will provide the greatest reliability at the least cost. Other factors and values can also be considered, but their influence on the decision process must go through a customary regulatory proceeding	Projects typically have to be proven to the state regulator or utility board to be cost-competitive. This does not typically consider values like local economic development or historically disadvantaged communities. Utilities may have an interest in supporting Tribal solar projects for Tribes whose land they cross with rights-of-way or they have a legal and material interest in

**Case Study: Saginaw Chippewa Indian Tribe of Michigan  
Tribe Leverages Its Sovereignty To Produce and Market Energy**

When the Saginaw Chippewa Indian Tribe of Michigan started planning a casino and hotel expansion in 2012, it discovered the increased electricity usage would require a network upgrade to the electrical distribution facilities owned by its local utility.

The Tribe's land is adjacent to the Midcontinent Independent System Operator (MISO) bulk power transmission network, so in 2013, the Tribal Council decided to build its own substation and join MISO as a market participant. It also passed an ordinance creating the Saginaw Chippewa Indian Tribe of Michigan Tribal Electric Authority, which purchases wholesale electricity in the MISO footprint. Under the ordinance, the Tribal utility is authorized to sell power to non-Tribal retail customers as well as the Tribal hotel and casino.

Despite the incumbent utility's initial pushback, the Michigan Public Service Commission had no jurisdiction over the Saginaw Chippewa Indian Tribe of Michigan, a federally recognized Tribe and a sovereign entity. FERC approved the Tribe's interconnection request, paving the way for the Tribe to join MISO.

With its own substation, the Tribe was able to invest in its own infrastructure, exercise its right as a sovereign nation, and can now deliver safe, reliable electricity to Tribal and non-Tribal businesses within the Saginaw Community's Tribal Trust Land near Standish, Michigan.

Because it is not regulated by the state, if the Tribe elects to sell power to non-Tribal businesses within Tribal trust land, it can build its own rate structure and offer more transparency and hedging options in electric service pricing. Its power could potentially be cheaper than incumbent utility pricing, but it would be exposed to real-time power price volatility.

As a market participant of MISO, the Tribe has access to virtual power trading that can be used to help large customers hedge the costs of their electric service. This level of transparency is typically only available to corporations with the largest electric usage, but the Tribal Electric Authority's efficiency makes these potential cost savings available to any business that operates within the Tribe's borders.

Other Tribes could learn from Saginaw Chippewa's experience and replicate the Tribe's model for their own financial gain, said Kevin Blaser, Energy Specialist for the Migizi Economic Development Company (the economic development arm of the Saginaw Chippewa, tasked with diversity and managing the Tribe's nongaming revenue sources)—especially as the electric grid becomes more distributed.

"Unlike gaming, Tribal nations can all participate in energy," he said, pointing out that while there is a limited market for gaming patrons across any given state, there is a lot of demand for energy services that can be provided by energy storage and other market products related to energy.

**Barrier 12: Property Taxation Jurisdiction Questions Cause Double Taxation.** This barrier applies at the utility scale and involves state and Tribal jurisdiction. The short-term solution can be to negotiate a tax-sharing agreement (Table 13).

**Table 13.** Comparison of stakeholder perspectives contributing to Barrier 12.

Tribal	Regulator	Utility
Tribes need to be able to recover tax revenue in the same way that counties and states do to fund services like public safety, road maintenance, and fire prevention, all of which benefit utility-scale renewable energy project owners. Allowing the county/state to tax the project as well results in double taxation	Federal (Bureau of Indian Affairs [BIA]): in 2013, the BIA issued a federal regulation (25 CFR § 162.017) prohibiting local jurisdictions or states from imposing property taxes on projects on Tribal land and Tribal member-owned land on a reservation	If a solar project is taxed by both the Tribe and the state/county, the cost of energy may be prohibitively high or uncompetitive with a project on non-Tribal land that is not double-taxed

**Barrier 13: Lack of Tribal Land Use Planning or Land Entitlement Procedures.** This barrier applies at the utility and distributed scales and involves Tribal and local jurisdictions. The short-term solution may be making ad-hoc decisions about land use. The long-term solution could be to establish land policy to make land-use planning more streamlined (Table 14).

**Table 14.** Comparison of stakeholder perspectives contributing to Barrier 13.

Tribal	Regulator	Utility
It is challenging for a Tribe to complete a solar project if land use planning is difficult or unclear	No relevant perspective from state regulatory authority	A utility may be impacted by this barrier if the utility is working with a Tribe on a solar project
		Projects built on Tribal land may be more expensive if land use is difficult to navigate, making them less cost-competitive in utility requests for proposals

## 4 Conclusion

This paper is based on a forthcoming guidebook that NREL and MTERA wrote detailing 13 key regulatory barriers as well as potential short- and long-term solutions. The *Addressing Regulatory Challenges to Tribal Solar Development* guidebook also points to potential pathways for addressing key barriers through case studies highlighting successful Tribal solar projects along with considerations for stakeholders working with

Tribes. The final section of the guidebook presents issue briefs that provide insight into certain topics and introduce stakeholders to important concepts related to Tribal solar development.

By increasing understanding of issues that are important to Tribes, this information can support all stakeholders in creating meaningful relationships and pursuing workable solar projects.

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