



TECHNICAL SUMMARY

Questions?

Contact research.dot@state.mn.us.

Technical Liaison:

Siri Simons, MnDOT
Siri.Simons@state.mn.us

Investigator:

Gabriel Chan, University of Minnesota

PROJECT COST:

\$75,000



An energy partnership could strengthen the government-to-government relationship between Minnesota and the Red Lake Nation.

Exploring a State-Tribal Partnership to Advance Energy Goals

What Was the Need?

MnDOT's sustainability goals include using renewable energy for 25% of its annual power demand by 2025. While the agency subscribes to community solar gardens under a program created by the Minnesota Legislature in 2013, it needs additional approaches to reach its renewable energy goals.

The Red Lake Nation, home to the Red Lake Band of Chippewa Indians, is a sovereign tribal government in Minnesota. State agencies, including MnDOT, are mandated by state statute and executive order to pursue and to strengthen government-to-government relationships with tribal governments. MnDOT has [policies](#) to consult, coordinate and cooperate with tribes on areas of mutual interest.

The Red Lake Nation is exploring the development of a solar project on tribal land. MnDOT has an opportunity to enter into a virtual power purchase agreement (VPPA) with the Red Lake Nation for the purchase of solar electricity. A VPPA is a unique contracting method in which the tribe would develop the project, produce the electricity and sell it into the wholesale energy market. MnDOT would pay a fixed price to purchase the energy and renewable energy credits, and would continue to buy power from the regional utility provider. When the market price is greater than MnDOT's fixed price, the tribe would pay MnDOT the difference. If the market price is lower, MnDOT would pay the tribe the difference.

A VPPA would support the Red Lake Nation's sovereignty and further the government-to-government relationship, advance shared renewable energy goals and split economic value and risk between MnDOT and the tribe. MnDOT wanted to assess the feasibility of a renewable energy partnership with the Red Lake Nation.

What Was Our Goal?

The goal of this project was to estimate and analyze the performance and economics of a tribally owned solar array from which MnDOT could purchase renewable energy.

What Did We Do?

The project began with a review of examples of VPPAs nationwide. Following this review, modeling from the National Renewable Energy Laboratory provided an initial analysis of the solar proposal, estimating the technical and economic performance of a proposed energy project.

An estimation of MnDOT's current and future energy demand indicated how much electricity the agency could purchase from the tribe. From this estimate, investigators calculated the potential avoided long-term greenhouse gas (GHG) emissions and the financial benefit of avoided emissions based on the federal social cost of carbon measure.

To understand the economic value of the VPPA to MnDOT, researchers examined the project development cost based on the tribe's preliminary project designs and predicted wholesale market energy prices over time. Assumptions of fuel prices, technology cost, power demand and policies provided the basis for modeled energy prices under several scenarios.

MnDOT has a unique opportunity to make progress toward its renewable energy goals and enhance the government-to-government relationship with the Red Lake Nation. Initial analyses of an innovative energy partnership indicate potential mutual and multiple benefits for MnDOT and the tribe.

“It’s exciting to learn about the potential for a partnership with a tribal nation on an innovative renewable energy project with social, environmental and economic benefits. We look forward to bringing together a team to explore how we can operationalize the research findings.”

—**Siri Simons**,
Sustainability Program
Supervisor, MnDOT Office
of Sustainability and
Public Health

“This state-tribal partnership has significant potential for numerous positive benefits and could serve as a model for other states and tribes to meet their sustainability goals while advancing their government-to-government relationships.”

—**Gabriel Chan**,
Associate Professor,
University of Minnesota
Humphrey School of
Public Affairs

Produced by CTC & Associates for:

Minnesota Department
of Transportation
Office of Research & Innovation
MS 330, First Floor
395 John Ireland Blvd.
St. Paul, MN 55155-1899
651-366-3780
www.mndot.gov/research



A community solar garden like this one in Afton, Minnesota, allows subscribers in the same or an adjacent county to purchase power while renewable energy credits are retained by the servicing utility. With a VPPA, MnDOT would receive the energy credits while still purchasing power from its regular utility provider.

After estimating the ranges of costs and benefits of the proposed project, investigators explored additional resources and solutions to lower project costs and support a strong state-tribal partnership.

What Did We Learn?

The exploration of a potential energy partnership revealed numerous possible benefits. In addition to a unique opportunity to advance the government-to-government relationship, the tribe could exercise its sovereignty and serve as a model for tribal energy development.

MnDOT could buy up to an estimated 60% of the project’s output to serve the agency’s energy demand. While MnDOT’s costs could be \$220,000 to \$660,000 per year, depending on energy prices, investigators identified various business model innovations, financial incentives and grants that could save the agency \$131,000 per year.

Over the VPPA time frame, between \$1 million and \$9.4 million could be saved in avoided GHG emissions, depending on the social cost of carbon, which fluctuates periodically.

Based on these analyses and lessons learned from an existing VPPA involving a government entity, researchers provided three primary recommendations to advance the project’s predevelopment stage:

- **Identify agency interests and values to be served by the partnership.** Assemble a project team involving staff from MnDOT and the Red Lake Nation, and involve legal and financial experts early.
- **Communicate the benefits of a VPPA.** A VPPA is well-suited to incentivize renewable energy projects and further the state-tribal government-to-government relationship. Because a VPPA is not a widely used tool and involves some financial risk, internal agency outreach and discourse is warranted to educate staff about the operation and benefits of this contract.
- **Work with energy and financial consultants** to further assess uncertainties, scenarios and risk thresholds in detail before setting a final fixed price.

What’s Next?

This study provided specific direction that MnDOT can use to further analyze a potential VPPA with the Red Lake Nation and identify the financial benefits and risks to the agency. MnDOT will continue to explore this innovative renewable energy solution with the added benefits of enhancing tribal sovereignty and state-tribal relations.

This Technical Summary pertains to Report 2023-12, “Assessing a Solar Project and a Virtual Power Purchase Agreement Between the Red Lake Nation and the Minnesota Department of Transportation,” published March 2023. More information is available at mdl.mndot.gov.