

**Minnesota Public Utilities Commission
Certificate of Need Application for a Solar
Energy Conversion System**

**Louise Solar Project, LLC
Mower County, Minnesota
Submitted February 11, 2021
Docket No. IP-7039/CN-20-646**

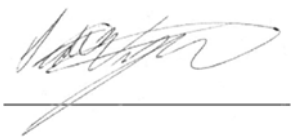
Louise Solar Project, LLC
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Project Name: Louise Solar Project

Project Location: The Project's footprint spans approximately 613 acres in Lodi and Adams Townships in Mower County, Minnesota

Applicant: Louise Solar Project, LLC, c/o EDF Renewables, Inc.

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ACRONYMS

2016 Quad Report	Minnesota Department of Commerce, Energy Policy and Conservation Quadrennial Report 2016
AADT	Annual Average Daily Traffic
AIMP	Agricultural Impact Mitigation Plan
Alternating Current (AC)	The direction of current flowing in a circuit is constantly being reversed back and forth. See also Direct Current.
Applicant or Louise Solar	Louise Solar Project, LLC
Application	Certificate of Need Application
BMPs	Best Management Practices
BOP	Balance of Plant
C&I	Commercial and Industrial
CN	Certificate of Need
Commission	Minnesota Public Utilities Commission
CO ₂	Carbon Dioxide
CPP	Clean Power Plan
CUP	Conditional Use Permit
dBA	The dBA scale is A-weighted decibels
Decibel (dB)	A logarithmic unit used to express the absolute level of sound pressure, using the ratio between power and intensity.
Direct Current DC	The unidirectional flow of electric charge. Direct current is produced by sources such as batteries and solar cells.
DOC-EERA	Minnesota Department of Commerce Energy Environmental Review and Analysis
EDFR	EDF Renewables, Inc.
EIA	U.S. Energy Information Administration
EPA	U.S. Environmental Protection Agency
ER	Environmental Review
ESA	Endangered Species Act
Exemption Request	Request for Exemption from Certain Certificate of Need Application Content Requirements
GHG	Greenhouse Gas
IPaC	Information for Planning and Conservation
IRPs	Integrated Resource Plans
ITC	Investment Tax Credit
kV	Kilovolt
kW	Kilowatt

kWh	Kilowatt hour
L 10	Ten Percent of Any Hour
L 50	Fifty Percent of Any Hour
LEGF	Large Electric Generating Facility
LEPGP	Large Electric Power Generating Plant
LHVTL	Large High Voltage Transmission Line
MBS	Minnesota Biological Survey
Minn. R.	Minnesota Rules
Minn. Stat.	Minnesota Statutes
MISO	Midcontinent Independent System Operator
MNDNR	Minnesota Department of Natural Resources
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
Megawatt (MW)	A megawatt is a unit for measuring power that is equivalent to one million watts.
Megawatt hours (MWh)	Equal to 1,000 kilowatts of electricity used continuously for one hour. It is about equivalent to the amount of electricity used by about 330 homes during one hour.
NAC 1	Noise Classification Area 1
NLEB	Northern long-eared bat
NPC	Native Plant Community
NPDES	National Pollutant Discharge Elimination System
NRIS	Network Resource Interconnection Service
NWI	National Wetlands Inventory
O&M	Operations and Maintenance
POI	Point of Interconnect
PPA	Power Purchase Agreement
Preliminary Development Area	That portion of the Project Area currently anticipated to be occupied by the Project
Project	Louise Solar Project
Project Area	Approximately 613-acre area of privately-owned land for which Louise Solar Project, LLC has leases and purchase options to allow siting and construction of the Project.
PV	Photovoltaic
RECs	Renewable Energy Credits
RES	Renewable Energy Standard
RFP	Request for Proposal

SCADA	Supervisory Control and Data Acquisition
SES	Solar Energy Standards
SMMPA	Southern Minnesota Municipal Power Agency
S-RECs	Solar Renewable Energy Credits
SWPPP	Storm Water Pollution Prevention Plan
TWh	Terawatt hours
USDA	United States Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WCA	Wetland Conservation Act
WNS	White-nose Syndrome

APPLICATION CONTENT REQUIREMENTS COMPLETENESS CHECKLIST

Minnesota Rule	Required Information	Application Section(s)	Exemption Granted
7849.0120	Criteria – Probable result of denial would be an adverse effect upon the future adequacy, reliability, or efficiency of energy supply to the applicant, the applicant’s customers, or to the people of Minnesota and neighboring states		
A(1)	Accuracy of the applicant’s forecast	4.1/6.0	No
A(2)	Effects of applicant’s existing or expected conservation programs and state and Federal conservation programs	4.1	No
A(3)	Effects of promotional practices on demand	4.1/3.2.2	No
A(4)	Ability of current and planned facilities, not requiring certificates of need, to meet future demand	5.2.1.7.5	No
A(5)	Effect of proposed facility in making efficient use of resources	4.1	No
7849.0120	Criteria – A more reasonable and prudent alternative has not been demonstrated		
B(1)	Appropriateness of size, type, and timing	4.2.1	No
B(2)	Cost of facility and its energy compared to costs of reasonable alternatives	4.2.2	No
B(3)	Effects of the facility upon natural and socioeconomic environments compared to the effects of reasonable alternatives	4.2.3	No
B(4)	Expected reliability compared to reasonable alternatives	4.2.4	No
7849.0120	Criteria – Facility will provide benefits to society		
C(1)	Relationship of proposed facility to overall state energy needs	4.3.1	No
C(2)	Effects of facility upon the natural and socioeconomic environments compared to the effects of not building the facility	4.3.2	No
C(3)	Effects of facility in inducing future development	4.3.3	No
C(4)	Socially beneficial uses of the output of the facility, including to protect or enhance environmental quality	4.3.4	No
D	Facility or suitable modification will not fail to comply with relevant policies, rules, and regulations of other state and Federal agencies and local governments	4.4	No
7849.0210	Filing Fees and Payment Schedule	2.4	No
7849.0240	Need Summary and Additional Considerations		
Subp. 1	Need Summary – summary of major factors justifying need for facility	3.1	No
Subp. 2(A)	Additional Considerations – Socially beneficial uses of the output of the facility, including to protect or enhance environmental quality	3.2.1	No
Subp. 2(B)	Additional Considerations – Promotional activities that may have given rise to the demand for the facility	3.2.2	Yes

Minnesota Rule	Required Information	Application Section(s)	Exemption Granted
Subp. 2(C)	Additional Considerations – Effects of the facility in inducing future development	3.2.3	No
7849.0250	Proposed LEGF and Alternatives Application		
A(1)	Description – Nominal generating capability and effects of economies of scale on facility size and timing	5.1.1	No
A(2)	Description – Anticipated operating cycle, including annual capacity factor	5.1.2	No
A(3)	Description – Type of fuel, reason for selection, projection of availability over life of facility, and alternative fuels	5.1.3	No
A(4)	Description – Anticipated heat rate	5.1.4	No
A(5)	Description – Anticipated areas where facility will be located	5.1.5	No
B(1)	Discussion of Alternatives – Purchased power	5.2.1.1	Yes
B(2)	Discussion of Alternatives – Increased efficiency of existing facilities	5.2.1.2	Yes
B(3)	Discussion of Alternatives – New transmission lines	5.2.1.3	Yes
B(4)	Discussion of Alternatives – New generating facilities of a different size and energy resource	5.2.1.4-10	Yes - partial
B(5)	Discussion of Alternatives – Reasonable combination of alternatives	5.2.1.10	Yes
C	Proposed Facility and Alternatives	5.3	
C(1)	Capacity cost in current dollars per kilowatt	5.3.1	Yes - partial
C(2)	Service life	5.3.2	Yes - partial
C(3)	Estimated average annual availability	5.3.3	Yes - partial
C(4)	Fuel costs in current dollars per kilowatt hour	5.3.4	Yes - partial
C(5)	Variable operating and maintenance costs in current dollars per kilowatt hour	5.3.5	Yes - partial
C(6)	Total cost in current dollars of a kilowatt hour provided by it	5.3.6	Yes - partial
C(7)	Estimate of its effect on rates system-wide and in Minnesota	5.3.7	Yes
C(8)	Efficiency, expressed for a generating facility as the estimated heat rate	5.3.8	Yes - partial
C(9)	Majoring assumptions made in providing information in subitems (1) to (8), including projected escalation rates for fuel costs and operating and maintenance costs, as well as projected capacity factors	5.3	Yes - partial
D	System Map	5.4	Yes
E	Other relevant information about the facility and alternatives that may be relevant to a determination of need	-	-
7849.0270	Peak Demand and Annual Consumption Forecast		
Subp. 1	Scope – Application shall contain pertinent data concerning peak demand and annual electrical consumption within the applicant’s service area and system	6.0	Yes
Subp. 2	Content of Forecast	6.0	Yes

Minnesota Rule	Required Information	Application Section(s)	Exemption Granted
Subp. 3	Forecast Methodology	6.0	Yes
Subp. 4	Data Base for Forecasts	6.0	Yes
Subp. 5	Assumptions and Special Information	6.0	Yes
Subp. 6	Coordination of Forecasts with Other Systems	6.0	Yes
7849.0280	System Capacity	7.0	Yes
7849.0290	Conservation Programs	8.0	Yes
7849.0300	Consequences of Delay	9.0	Yes
7849.0310	Environmental Information – Provide environmental data in response to part 7849.0250, Item C, or 7849.0260, Item C, and information as requested in part 7849.0320 to 7849.0340	10.0, 11.0	No
7849.0320	Generating Facilities		
A	Estimated range of land requirements, including water storage, cooling systems, and solid waste storage	11.1	No
B	Estimated amount of vehicular, rail, and barge traffic generated by construction and operation of facility	11.2	No
C	Fossil-fuel facilities – Fuel	11.3.1	No
D	Fossil-fuel facilities – Emissions	11.3.2	No
E	Water Use for Alternate Cooling Systems	11.4	No
F	Sources and types of discharges to water	11.5	No
G	Radioactive releases	11.6	No
H	Types and quantities of solid wastes in tons/year	11.7	No
I	Sources and types of audible noise attributable to facility operation	11.8	No
J	Estimated work force required for facility construction and operation	11.9, 11.10	No
K	Minimum number and size of transmission facilities required to provide a reliable outlet for the generating facility	11.11	No
7849.0330	Transmission Facilities	5.2.1.9	Yes
7849.0340	No-Facility Alternative	5.2.1.8	Yes

LOUISE SOLAR PROJECT

1.0 EXECUTIVE SUMMARY

Louise Solar Project, LLC (Louise Solar or Applicant), submits this Application (Application) for a Certificate of Need (CN) to the Minnesota Public Utilities Commission (Commission), pursuant to and in accordance with Minn. Stat. § 216B.243 and Minn. R. Ch. 7849. Louise Solar respectfully requests that the Commission issue a CN for the Louise Solar Project (Project), a solar energy conversion facility with a 50-megawatt (MW) alternating current (AC) nameplate capacity and associated facilities, in Lodi and Adams Townships, Mower County, Minnesota. The Project is a “large energy facility,” as defined in Minn. Stat. § 216B.2421, subdivision 2(1) and a “large electric generating facility” as defined in Minn. R. 7849.0010, subpart 13. Louise Solar will apply for a Site Permit pursuant to the Minnesota Power Plant Siting Act (Minn. Stat. § 216E) and Minn. R. Ch. 7850.

2.0 INTRODUCTION

2.1 THE LOUISE SOLAR PROJECT

Louise Solar is an independent power producer that proposes to construct and operate the Project at a site within Lodi and Adams Townships, Mower County, Minnesota (Map 1). The power generated by the Project will be offered for sale to Minnesota utilities and corporate purchasers that have identified a need for additional renewable energy.

Louise Solar has obtained leases and purchase options for approximately 613 acres of privately-owned land in Mower County, Minnesota (Project Area). Based on preliminary design, Project facilities will cover approximately 325 acres of the Project Area (Preliminary Development Area). There are approximately 288 acres of the Project Area for which Louise Solar has site control but are currently not contemplated for occupation by solar facilities (Map 2). The total nameplate capacity for the proposed Project facilities is 50 MW AC.

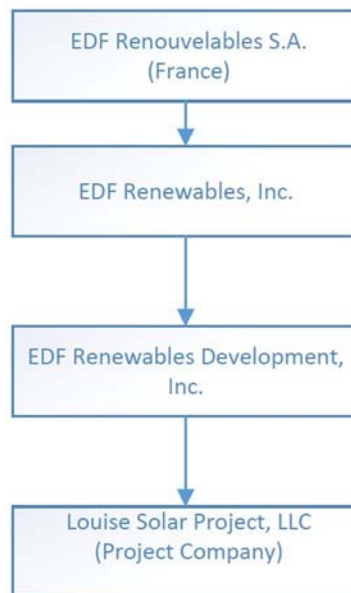
Louise Solar has not made a final selection of solar panels but anticipates using approximately 157,000 panels for the Project. In addition to solar panels, the Project will consist of an electrical collection system, access roads, substation and interconnection facilities, an Operation and Maintenance (O&M) facility, and other infrastructure typical of a utility-scale solar facility. The Project will include a proposed approximately 700-1,000-foot long above-ground, 161-kV transmission line that is needed to interconnect the Project to the grid at ITC Midwest’s Adams Substation located immediately adjacent to the eastern Project Area boundary. The proposed Project transmission line is planned to be a 161 kV line spanning less than 1,500 feet and thus will not trigger the need for a Route Permit from the Commission. The planned Project transmission line is further exempt from CN requirements because it does not meet the voltage and length requirements of a large energy facility under Minnesota Statutes §216B.2421, subd. 1. Louise Solar plans to construct the Project on a schedule that facilitates an in-service date in 2022 or 2023.

The Project falls within the definition of a Large Electric Power Generating Plant (LEPGP) in the Power Plant Siting Act and therefore requires a Site Permit from the Commission prior to

construction. Louise Solar submitted a request to the Minnesota Department of Commerce, Energy Environmental Review and Analysis (DOC-EERA) for a size determination on August 4, 2020 in accordance with Minn. Stat. § 216E.021. DOC-EERA issued its size determination on September 10, 2020. Louise Solar plans to file a large electric power generating plant site permit application for the Project under docket number IP-7039/WS-20-647. Minn. R. Ch. 7850 provides for three different procedures for obtaining a site permit: full review, alternative review, and local review. In accordance with Minn. Stat. § 216E.04, subd. 2(8), Louise Solar is seeking approval of its site permit application under the alternative review process provided for under Minn. Stat. § 216E.04 and Minn. R. 7850.2800–7850.3900. Louise Solar filed a Notice of Intent to Submit a Site Permit Application under the Alternative Permitting Process to the Commission on December 10, 2020. The Site Permit is the only site approval needed for construction of the Project (Minn. Stat. § 216E.10, subd. 1).

2.2 APPLICANT INFORMATION

Louise Solar is a wholly owned subsidiary of EDF Renewables, Inc. (EDFR). EDFR is a world leader in renewable energy electricity with its United States headquarters located in San Diego, California. EDFR North America is a market leading independent power producer and service provider that delivers grid-scale power, including wind, solar photovoltaic, and storage. EDFR’s gross installed capacity is 12,607 MW worldwide, with net installed capacity standing at 8,123 MW and gross capacity under construction at 5,041 MW. The following ownership chart shows the ownership structure for Louise Solar:



While neither Louise Solar nor EDFR currently operate any other solar energy generating systems in Minnesota that were permitted or otherwise subject to the jurisdiction of the Commission, EDFR has permitted over 1,200 MWs of large wind energy conversion systems in Minnesota, including the Lakefield, Red Pine, Wapsipinicon, and Nobles Wind Projects. EDFR is also currently planning the Andyville Solar Project, an up to 100 MW PV solar-energy generating system and accompanying 161 kV transmission line in Mower County, Minnesota through its

subsidiary Andyville Solar Project, LLC; Byron Solar Project, an up to 200 MW PV solar-energy generating system and accompanying 345 kV transmission line in Olmsted and Dodge Counties, Minnesota through its subsidiary Byron Solar Project, LLC; and Minneota Solar, an up to 200 MW solar-energy generating system in Lyon County, Minnesota.

2.3 PROJECT CONTACTS

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2.4 FILING FEES AND PAYMENT SCHEDULE (MINN. R. 7849.0219)

The total fee for the CN Application and the schedule for payment are shown in **Table 1**. The fee determination for the Project is based on a capacity of 50 MW, per the requirements of Minn. R. 7849.0210, subp. 1. The payment schedule is based on Minn. R. 7849.0210, subp. 2.

Table 1: Certificate of Need Application Schedule of Payments

Fee Calculation	Amount
Fee Calculation Equation	\$10,000 + \$50/MW
Due with CN Application	\$3,125.00
Due 45 days after Application submittal date	\$3,125.00
Due 90 days after Application submittal date	\$3,125.00
Due 135 days after Application submittal date	\$3,125.00
Total Calculated Fee	\$12,500.00

2.5 EXEMPTION REQUEST

Minn. R. Ch. 7849 sets forth the data an applicant must provide in a CN application. An applicant may be exempted from providing certain information if the applicant requests an exemption in writing that shows that the data requirement is either unnecessary to determine the need for the proposed facility or may be satisfied by submitting another document. Minn. R. 7849.0200, subp. 6.

On August 5, 2020, Louise Solar submitted a Request for Exemption from Certain Certificate of Need Application Content Requirements (Exemption Request). In its Exemption Request, Louise Solar requested that the Commission grant exemptions, pursuant to Minn. Stat. § 216B.243 and Minn. R. 7849.0200, from certain CN data requirements that are not necessary to determine the need for an independent power production facility or a renewable energy facility designed to satisfy the RES or the Solar Energy Standards (SES) requirements set forth in Minn. Stat. § 216B.1691, or other clean energy standards.

On September 21, 2020, the Commission issued an order granting Louise Solar the exemptions it requested in its Exemption Request, consistent with the recommendations filed by the Department of Commerce, Division of Energy Resources.¹ Where appropriate in this Application, Louise Solar will reference the specific exemptions granted by the Commission.

3.0 NEED SUMMARY AND ADDITIONAL CONSIDERATIONS (MINN. R. 7849.0240)

3.1 NEED SUMMARY

Louise Solar is proposing to construct this facility to sell energy, capacity and renewable energy credits, either bundled or unbundled, to one or more electric utilities and/or commercial customers. Louise Solar is actively marketing the Project to a number of potential off-takers and may sell the power in the form of a Power Purchase Agreement (PPA), or the Project could be owned directly by a utility. Utilities and other customers seeking to diversify and build their energy generation portfolios are attracted to solar energy projects because of long-term, fixed, competitive pricing, high capacity value, environmental benefits, and existing and potential renewable energy policies. The proposed Project would install 50 MW of solar generating capacity in Minnesota that would contribute to satisfying utilities' and consumers' demands for renewable energy and meet utility renewable requirements or individual sustainability goals.

The demand for PV in Minnesota has increased rapidly in recent years.² According to the Minnesota Department of Commerce's most recent³ Energy Policy and Conservation Quadrennial Report, Minnesota solar capacity increased from 13.8 MW in 2013 to 246 MW in December 2016, an increase of 1,700 percent, with 209 MW installed in 2016 alone.⁴ Additionally, the 2016 Quad report states that “[a]ging infrastructure,” “federal EPA regulations on existing electric generating units to reduce carbon dioxide emissions,” and “the extension of renewable tax credits” are “driving a shift toward less carbon-intensive generation.”⁵

As Minnesota's utilities strive to achieve ambitious renewable energy targets, “aggressive renewable additions”⁶ will be necessary. For example, Xcel Energy's “Upper Midwest Integrated Resource Plan” alone calls for 80 percent carbon emissions reductions by 2030, and 100 percent reductions by 2050. By Xcel Energy's estimation, these are “some of the most ambitious carbon

¹ Order Approving Exemptions to Certain Filing Requirements, *In the Matter of the Application of Louise Solar Project, LLC for a Certificate of Need for the 50 MW Louise Solar Project in Mower County, Minnesota*, Docket No. IP-7039/CN-20-646 (Sept. 21, 2020) (eDockets No. 20209-166711-01).

² MINNESOTA DEPARTMENT OF COMMERCE, Energy Policy and Conservation Quadrennial Report 2016 at 28 (Sept. 29, 2017), <https://www.leg.state.mn.us/docs/2017/mandated/170938.pdf> (hereinafter, the “2016 Quad Report”).

³ As of the date of filing, the 2020 version of the Quadrennial Report is not available.

⁴ 2016 Quad Report at 25.

⁵ 2016 Quad Report at 11.

⁶ Xcel Energy, Upper Midwest Integrated Resource Plan 2020-2034 (July 1, 2019), *available at* <https://www.xcelenergy.com/staticfiles/xcel-responsive/Company/Rates%20&%20Regulations/The-Resource-Plan-No-Appendices.pdf>.

reduction goals of any utility in the U.S.”⁷ Translating these goals into action, Xcel Energy’s preferred plan proposes to add 3,500 MW of cost-effective, utility-scale solar generation by 2030 and approximately 2,250 MW of wind by 2034.⁸

Similarly, other Minnesota utilities are advancing efforts to transition to renewable energy. Otter Tail Power will be at 30% renewable energy by 2022, and ALLETE’s Minnesota Power is targeting 50% renewables by end of 2021.⁹ Likewise, Southern Minnesota Municipal Power Agency (SMMPA) announced its plan for a 90 percent reduction in carbon dioxide emissions from 2005 levels and 80 percent carbon-free energy on an annual basis in 2030.¹⁰ Additionally, the Minnesota Transmission Owners’ Biennial Transmission Report’s compliance filing outlining gaps between existing and planned transmission lines and the transmission system that will be required to meet the companies’ publicly stated clean energy goals lists the following clean energy goals of Minnesota utilities:

- Dairyland Power Cooperative is transitioning to a more diverse generation portfolio, with carbon reduction and system reliable stated as “central issues”;
- Great River Energy has a goal to serve its all-requirements member-owner cooperatives with energy that is 50 percent renewable by 2030;
- Minnesota Municipal Power Agency has a goal to have 100 percent renewable generation “when economical”;
- Minnkota Power Cooperative is committed to finding opportunities to reduce carbon emissions; and
- Rochester Public Utilities has a goal to transition to 100 percent renewable energy by 2030.¹¹

Louise Solar is well-positioned to help meet the resource needs of Minnesota’s electric utilities.

Beyond aiding with utility compliance towards voluntary renewable commitments and Minnesota’s existing renewable energy standards, Louise Solar can also help meet other state policies and goals. For example, Minn. Stat. § 216C.05 identifies energy planning and policy goals

⁷ *Id.*

⁸ Xcel Energy, 2020-2034 Upper Midwest Integrated Resource Plan Supplement (June 30, 2020), *available at* <https://www.xcelenergy.com/staticfiles/xeresponsive/Company/Rates%20&%20Regulations/Resource%20Plans/Upper-Midwest-Energy-Plan-Supplement-063020.PDF>.

⁹ Minnesota Power (ALLETE), *EnergyForward*, <https://www.mnpower.com/Environment/EnergyForward>.

¹⁰ Southern Minnesota Municipal Power Agency, *SMMPA plans to be 80% carbon-free in 2030* (Feb. 5, 2020), *available at* <https://smmpa.com/news/2020/2/5/smmpa-plans-to-be-80-carbon-free-in-2030#:~:text=The%20plan%20would%20result%20in,an%20annual%20basis%20in%202030>.

¹¹ Compliance Filing, *In the Matter of the Minnesota Transmission Owners’ 2019 Biennial Transmission Projects Report*, Docket No. E002/M-19-205 (Aug. 14, 2020) (eDockets No. 20208-165906-02).

that include “the development and use of renewable energy resources wherever possible.”¹² In addition, Minn. Stat. § 216H.02 sets forth greenhouse gas emissions reductions goals and planning requirements. Minnesota has thus far fallen short of reaching these goals, and in the Minnesota Pollution Control Agency’s 2019 Greenhouse Gas Legislative Report, the Minnesota Pollution Control Agency (MPCA) details that Minnesota’s greenhouse gas (GHG) reductions thus far have declined 12% versus 2005 levels. This is notably below “goal of a 15% emissions reduction by 2015,”¹³ and suggests that Minnesota will risk missing its goal of 30 percent reduction by 2025 without significant additional progress. By providing additional, carbon-free generation, Louise Solar can help further eliminate carbon dioxide and other greenhouse gas emissions from Minnesota’s power sector, where significant emissions continue to originate. Similarly, Governor Walz issued Executive Order 19-37 establishing a Climate Change Subcabinet to “[i]dentify policies and strategies that will put Minnesota back on track or meet or exceed” those goals.¹⁴ Governor Walz recently announced a set of policy proposals that are designed to lead Minnesota to 100 percent clean energy in Minnesota’s electricity sector by 2040.¹⁵ Given that just over 25 percent of Minnesota’s electric generation came from clean energy at the time of Governor Walz’s announcement,¹⁶ Minnesota will need additional renewable generation like that provided by the Project to meet this goal. President Biden issued Executive Order 14008 (“Tackling the Climate Crisis at Home and Abroad”) promoting renewable energy development - in addition to directing the United States on a path to achieve “net-zero emissions, economy-wide, by no later than 2050,” it sets out to attain “a carbon pollution-free electricity sector no later than 2035.”¹⁷

Clean energy requirements in Minnesota and neighboring states further demonstrate the need for the Project. Thirty-seven U.S. states, eleven of which are Midcontinent Independent System Operator (MISO) states, currently have either mandated or voluntary renewable portfolio standards or policies.¹⁸ This includes Minnesota. The Minnesota Legislature established interim milestones to ensure that utilities make progress toward the “25 by ‘25” requirement, which includes the requirement to have 20 percent of the electric utility’s total retail electric sales be generated by renewable sources by 2020 and 25 percent of sales to be generated by renewable

¹² Minn. Stat. § 216C.05, subd. 1.

¹³ Minnesota Pollution Control Agency & Minnesota Department of Commerce, *2019 Greenhouse Gas Legislative Report* (Jan. 2019), <https://www.pca.state.mn.us/sites/default/files/lraq-2sy19.pdf>.

¹⁴ Executive Order 19-37 (Dec. 2, 2019).

¹⁵ Office of Governor Tim Walz, *Governor Walz, Lieutenant Governor Flanagan, House and Senate DFL Energy Leads Announce Plan to Achieve 100 Percent Clean Energy in Minnesota by 2040* (Jan. 21, 2021), available at <https://mn.gov/governor/news/?id=1055-463873>.

¹⁶ *Id.*

¹⁷ Executive Order 14008 (Jan. 27, 2021), <https://www.govinfo.gov/content/pkg/FR-2021-02-01/pdf/2021-02177.pdf>.

¹⁸ National Conference of State Legislatures, *State Renewable Portfolio Standards and Goals* (Apr. 17, 2020), <https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx>; *MTEP18 MISO Transmission Enhancement Plan*, at 182. Accessed online February 2, 2021. Retrieved from <https://cdn.misoenergy.org/MTEP18%20Full%20Report264900.pdf>.

sources by 2025. As shown in **Table 2**, utilities¹⁹ in Minnesota are also required to provide 1.5 percent of their total retail electrical sales from electricity generated by solar energy by the end of 2020.²⁰ Minnesota’s Legislature has declared that the energy goal of the state is to have ten percent of the retail electric sales in Minnesota be generated by solar energy by 2030.²¹ Renewable resources, such as the Project, are needed to meet these clean energy requirements in both Minnesota and neighboring states.

The Minnesota Legislature has also considered legislation that would increase Minnesota’s renewable energy requirements by compelling utilities to obtain additional electricity from renewable sources beyond that currently required by the RES and further reduce carbon from energy sources. For example, the Minnesota Legislature considered bills that would have increased the RES to 50 percent²² or establish a 100 percent carbon free standard by 2050.²³ Although these types of measures have not yet passed, their continued consideration shows that utilities need to prepare for a potential increase to the RES and plan to reduce carbon emissions from energy sources by seeking additional renewable energy generation sources beyond what the RES currently requires. The Minnesota Legislature is currently considering proposed legislation that would quicken the push for carbon-free energy in Minnesota.²⁴

Table 2: Solar Energy Standard Milestones

Year	Utility Requirement
2020	1.5%
2030	10%

Jurisdictions surrounding Minnesota also have renewable policies. For example, the North Dakota legislature codified the national “25 by ‘25” initiative, with the stated goal that, “not later than January 1, 2025, the agricultural, forestry, and working land of the United States should provide from renewable resources not less than twenty-five percent of the total energy consumed

¹⁹ Minnesota Power, Ottertail Power Company, and Xcel Energy are subject to the SES. The SES statute excludes cooperative and municipal utilities.

²⁰ Minn. Stat. § 216B.1691, subd. 2f(a).

²¹ Minn. Stat. § 216B.1691, subd. 2f(e).

²² H.F. No. 1772, 90th Legis. (Feb. 27, 2017).

²³ H.F. No. 1671, 91st Legis. (Feb. 25, 2019). *See also* H.F. No. 1405, 91st Legis. (Feb. 19, 2019), which would impose requirements on utilities, the Commission, and the Department of Commerce to encourage the transition to renewable energy if enacted.

²⁴ *See, e.g.*, H.F. No. 164, 92nd Legis. (Introduced Jan. 19, 2021) (update and expand the state’s energy conservation programs to include electrification measures and higher energy savings goals for utilities); H.F. No. 10, 92nd Legis. (Introduced Jan. 7, 2021) (require utilities to generate 100 percent of their electricity from carbon-free resources by 2040).

in the United States[.]”²⁵ Additional renewable resources will be needed to meet the 25 by ’25 initiative in North Dakota and similarly situated states.

Under current state policies, the total United States renewable portfolio standard demand will increase from 310 terawatt hours (TWh) in 2019 to 600 TWh in 2030.²⁶ Given existing renewable energy capacity, an additional 270 TWh increase in renewable resources will be required to meet demand through 2030.²⁷ In addition, the regional transmission grid is being expanded to deliver renewable energy generation in a cost-effective manner.²⁸ Although the current Production Tax Credit and Investment Tax Credit for renewables are set to begin a phasedown in upcoming years, many utilities in MISO are developing long-term resource plans, which include increased levels of renewable energy such as solar.²⁹ Recent solar pricing has shown that the costs of energy and capacity of utility scale solar are on par with those of gas peaking and combined cycle.³⁰

In addition to traditional utility demand for renewable energy, a growing number of corporations are turning to renewable energy to save money on energy and meet sustainability goals. Commercial and industrial (C&I) customers either purchase renewable energy directly or obtain renewable benefits and cost savings through financially settled contracts, sometimes called virtual PPAs. Similarly, many utilities are creating “green tariffs,” which allow customers to purchase up to 100 percent renewable energy from the utility. Corporations such as Apple, Google and Facebook, along with many others, have recently set goals to obtain 100 percent of their energy from renewables. These clean energy goals fuel the demand for corporate renewables procurement and subsequent PPAs.

According to Wood Mackenzie’s report titled an “*Analysis of Commercial and Industrial Wind Energy Demand in the United States*,” the United States is “at the beginning stage of a corporate renewables procurement boom,” with approximately “85 gigawatts of renewable energy demand” from the “largest U.S. companies” alone through 2030.³¹ Another Wood Mackenzie report titled “*US Corporate Procurement of Wind and Solar 2020*” lists 2019 as “the largest year for megawatts of annual wind and solar C&I capacity additions and the largest year on record for new wind and solar C&I PPAs signed.” These growth trends are expected to continue, and 2020

²⁵ NDCC § 17-01-01.

²⁶ LAWRENCE BERKELEY NAT’L LAB., U.S. RENEWABLES PORTFOLIO STANDARDS at 24 (July 2019). (2020 update is not available as of December 10, 2020).

²⁷ *Id.* at 25.

²⁸ *MTEP 18 MISO Transmission Enhancement Plan* at 42.

²⁹ *MTEP 18 MISO Transmission Enhancement Plan* at 144.

³⁰ Lazard’s Levelized Cost of Energy Analysis 13.0, 2019.

³¹ Wood Mackenzie, *Corporates usher in new wave of US wind and solar growth* (Aug. 20, 2019), <https://www.woodmac.com/our-expertise/focus/Power--Renewables/corporates-usher-in-new-wave-of-u.s.-wind-and-solar-growth/>.

saw an immense demand for C&I renewable energy PPAs. Corporate PPA volumes in MISO have increased each of the past five years and Minnesota has seen an increase in cumulative operational and in-development C&I renewable capacity, which highlights the broader trend of increased demand for renewables across the United States.³² Similarly, according to a 2019 research report, corporate contracts accounted for 22 percent of 2018 power-purchase agreements for renewables in the United States.³³ Further, the buyers are not just large corporations; smaller companies are entering into aggregated purchasing models and further driving additional market expansion.³⁴

Minnesota's largest companies also have aggressive sustainability and carbon reduction goals, as evidenced by their participation in and support of the Minnesota Sustainable Growth Coalition's "*Clean Energy Vision*", which calls for "surpassing the State of Minnesota's current economy-wide greenhouse gas emissions targets of 30 percent reduction by 2025 and 80 percent reduction by 2050."³⁵ EDFR and the Project will help attract and retain corporate entities with Environmental, Sustainability, and Governance goals in Minnesota by providing reliable renewable energy that helps to reduce greenhouse gas emissions.

Given the demand for renewable energy, a market exists for independently produced electricity generated from solar and other renewables, including the 50 MW to be generated by the Project. In sum, Minnesota has a wide array of needs that Louise Solar can help address. The clean, renewable power that Louise Solar will produce can help meet utility commitments, achieve GHG reduction targets, address environmental justice needs, and provide much needed short- and long-term economic benefit.

3.2 ADDITIONAL CONSIDERATIONS

3.2.1 Socially Beneficial Uses of Energy Output

Energy produced by the Project will provide significant, numerous, and varied societal benefits. First, the Project will provide a large amount of renewable energy with minimal environmental impact as well as avoided environmental costs, as discussed in Sections 10 and 11 in this Application. Further, regional and national security and energy reliability can be enhanced through the development of diversified generation resources such as solar energy generation from the Project.

³² *Id.*

³³ Emma Foehringer Merchant, *Corporate Renewables Procurement Accounted for Nearly a Quarter of All Deals in 2018* (Feb. 5, 2019), <https://www.greentechmedia.com/articles/read/corporate-renewables-procurements-quarter-ppa-2018>.

³⁴ Emma Foehringer Merchant, *2018 Was Record Year for Corporate Clean Energy Contracts* (Jan. 31, 2019), <https://www.greentechmedia.com/articles/read/reports-confirm-a-record-year-for-corporate-clean-energy-contracts#gs.nxat51>.

³⁵ Minnesota Sustainable Growth Coalition, *Clean Energy Vision*, <https://environmental-initiative.org/work/minnesota-sustainable-growth-coalition/>.

The Project is also designed to be socioeconomically beneficial to landowners, local governments, and communities. Landowner compensation is established by a combination of voluntary lease agreements and purchase options between landowners and Louise Solar. Louise Solar has entered into leases or purchase options with the landowners that own the land on which the Project would be constructed. While several acres are under option to support the Project substation, the majority of the land for the Project will be leased beginning after the Site Permit is issued and prior to the start of construction.

The Project will also create new local job opportunities for various trade professionals that live and work in the area as it is typical to advertise locally to fill required construction positions. Opportunity exists for sub-contracting to local contractors for gravel, fill, and civil work. Additional personal income will also be generated by circulation and recirculation of dollars paid out by the Project as business expenditures and state and local taxes. Louise Solar will issue a Request for Proposal (RFP) to Balance of Plant (BOP) contractors to construct the Project. Louise Solar will include preferences for contractor bids that utilize local, union construction craft employees to the greatest extent feasible in accordance with the Project's budget, timeline, industry standards and requirements, and corporate safety policies. The BOP contractor selected will be required to work with labor unions, local subcontractors, and other vendors to implement a Project construction staffing model that maximizes local hiring and local economic benefits for the Project, while ensuring the Project is safely built on time and on budget. Typical onsite construction staff levels will depend on the number of concurrent tasks being performed and the phasing of the Project. The Project will create approximately 350-400 jobs during the construction and installation phases, and up to 21 indirect and 2 full time permanent jobs during the operations phase.

The Project offers an opportunity to maximize the economic attributes that benefit the local community and deliver an overall cost-competitive energy project. The Project's strong solar resource, proximity to existing electrical and transportation infrastructure, and ability to create a construction-efficient layout are some of the major benefits of the Project.

3.2.2 Promotional Activities Giving Rise to Demand

Louise Solar was granted an exemption from Minn. R. 7849.0240, subp. 2(B), which requires that each large electric generating facility (LEGF) CN application contain "an explanation of the relationship of the proposed facility to promotional activities that may have given rise to the demand for the facility." Louise Solar has not engaged in promotional activities which could have given rise to the need for the Project's anticipated generated electricity. Thus, consistent with its determinations in past CN proceedings, the Commission granted an exemption to Louise Solar.

3.2.3 Effects of Facility in Inducing Future Development

The Project is not expected to directly affect development in Mower County or hinder future development that can otherwise occur in surrounding agricultural areas.

The Project is designed to be socioeconomically beneficial to landowners, local governments, and communities. Landowner compensation is established by voluntary leases or purchase agreements between the landowner and Louise Solar for Louise Solar's lease or purchase

of the land. Solar energy infrastructure will also provide an additional source of revenue to the townships and county in which the Project is sited. For instance, the Project is estimated to provide annual production tax revenues to Mower County of approximately \$105,000-\$115,000 annually over 35 years or longer. Additionally, Lodi and Adams Townships will receive approximately \$25,000-\$30,000 annually over 35 years. In addition, lease and purchase payments paid to the landowners will offset potential financial losses associated with removing a portion of their land from agricultural production.

As discussed in Section 3.2.1, the Project will create new local job opportunities for various trade professionals that live and work in the area and it is typical to advertise locally to fill required construction positions. The Project will create approximately 350-400 jobs during the construction and installation phases, and up to 21 indirect and 2 full time permanent jobs during the operations phase. Temporary construction jobs within Mower County will generate indirect economic benefits as employees spend their income on local goods and services and pay local sales tax. As an operating facility, Louise Solar will annually generate \$2.7 million in economic output by supporting approximately 21 indirect jobs and distributing nearly \$2 million in direct earnings.

General skilled labor is expected to be available in Mower County or Minnesota to serve the Project's basic infrastructure and site development needs. Specialized labor will be required for certain aspects of the Project. It may be necessary to import specialized labor from other areas of Minnesota or neighboring states because the relatively short construction duration often precludes special training of local or regional labor. Because most of the assembly and wiring work for solar installations is considered electrical work under the Minnesota State Electrical Code, much of the workforce needed to construct a solar facility must be comprised of Minnesota-licensed electricians.

Construction of the Project would provide temporary increases to the revenue of the area through increased demand for housing, lodging, food services, fuel, transportation, and general supplies. Additional personal income will also be generated by circulation and recirculation of dollars paid out by the Project as business expenditures and state and local taxes. At the same time the Project is providing income to residents, increase in renewable energy will also help to lessen wholesale energy market volatility.³⁶ The development of solar energy technology now makes solar power's relative price competitive with other generators, including natural gas and coal.

4.0 COMPLIANCE WITH CERTIFICATE OF NEED CRITERIA (MINN. R. 7849.0120)

The Commission has established criteria to assess the need for an LEGF in Minn. R. 7849.0120. The Commission must grant a CN to an applicant upon determining that:

- A. (T)he probable result of denial would be an adverse effect upon the future adequacy, reliability, or efficiency of energy supply

³⁶ U.S. Dep't of Energy, *The Use of Solar and Wind as a Physical Hedge against Price Variability within a Generation Portfolio*, at 35 (August 2013) (stating that "Solar and wind generation significantly reduces the exposure of electricity costs to natural gas price uncertainty in fossil-based generation portfolios on a multi-year to multi-decade time horizon.")

to the applicant, to the applicant's customers, or to the people of Minnesota and neighboring states;

B. (A) more reasonable and prudent alternative to the proposed facility has not been demonstrated by a preponderance of the evidence on the record;

C. (B)y a preponderance of the evidence on the record, the proposed facility, or a suitable modification of the facility, will provide benefits to society in a manner compatible with protecting the natural and socioeconomic environments, including human health; and

D. (T)he record does not demonstrate that the design, construction, or operation of the proposed facility, or a suitable modification of the facility, will fail to comply with relevant policies, rules, and regulations of other state and federal agencies and local governments.³⁷

As discussed further below, the Project satisfies all four of the Commission's criteria for granting a CN for the Project.

4.1 THE PROBABLE RESULT OF DENIAL OF LOUISE SOLAR'S APPLICATION WOULD BE AN ADVERSE EFFECT ON THE ADEQUACY, RELIABILITY, AND EFFICIENCY OF THE REGIONAL ENERGY SUPPLY (MINN. R. 7849.0120(A)).

The Project will provide 50 MW of nameplate capacity to meet the electricity needs of Minnesota and the region. Louise Solar plans to negotiate one or more power purchase agreements, or the sale of the Project, with utilities that have a need to purchase or produce renewable energy to serve their customers. Applicant may also offer the Project's output for sale on the wholesale market or to a corporate purchaser. Denying the application would result in the loss of a significant amount of electricity needed to satisfy state and regional demand and would deny utilities and other purchasers the opportunity to purchase clean, low-cost energy that will count toward satisfying applicable renewable energy standards and goals.

As discussed in Section 3.1, there is a significant body of state legislative policy requiring utilities to obtain a certain percentage of their total energy resources from renewable energy, which supports the need for reliable, efficient renewable resources, like the solar energy produced by the Project.

The Project has no air emissions and extremely low environmental impacts. It will displace pollutants emitted by fossil fuel-fired generating resources, including carbon dioxide, which is considered a significant contributor to climate change.

³⁷ Minn. R. 7849.0120.A–D.

In addition, many other states in the region have similar renewable energy requirements. For example, Illinois requires certain utilities to obtain 25 percent of eligible sales from renewables by 2025.³⁸ Similarly, North Dakota has adopted the national “25 by ’25” initiative, which establishes a goal of having not less than 25 percent total energy consumed within the United States come from renewable resources by January 1, 2025.³⁹ Under current state standards, total United States renewable portfolio standard demand will increase from 290 TWh in 2018 to 540 TWh in 2030.⁴⁰ Given existing renewable energy capacity, an additional 180 TWh increase in renewable resources will be required to meet demand through 2030.⁴¹ In addition, the regional transmission grid is being expanded to deliver renewable energy generation in a cost-effective manner.⁴² Further, Minnesota’s SES requires utilities to provide 1.5 percent of their total retail electrical sales from electricity generated by solar energy by the end of 2020 and 10 percent by 2030.⁴³ Based on this data, there is a need for more solar power to adequately, reliably, and efficiently meet the region’s need for renewable energy than is currently available.

In 2014 and 2015, EDF conducted a detailed analysis to identify the current point of interconnect (POI) and solar site location for development. EDF’s search was limited to the southern half of the state due to the good solar resource and relatively open farmland in the region. Within the southern portion of the state, EDF screened for substations and transmission lines with available capacity, which revealed a relatively narrow subset of possible POIs. Based on internal modeling, these sites were also anticipated to have low or no network upgrade requirements. EDF then screened available land within approximately 3 miles of the identified POIs due to the financial limitations of constructing a longer transmission line (construction cost, easement acquisition cost, and electrical losses). Lands within the 3-mile radius of the POI were determined potentially suitable if they were: cleared and otherwise undeveloped, not currently encumbered by other easements (wind farms, etc.), contained minimal wetlands, streams, transmission lines, pipelines, roads, or other obstacles that would limit the buildable land or lead to irregularly shaped development areas. EDF also screened the areas for geotechnical risks, habitat for endangered species, proximity to culturally sensitive areas, other potential environmental risks such as pollutants, steep slopes, flood zones, current land use conflicts, and a clear and uncontested title. Once the potential Project areas passed the above constraints tests, EDF approached landowners to negotiate voluntary leases and easements.

EDF identified the Adams substation as having available capacity and low interconnection costs. The Project site was chosen over others for its proximity to the POI, supportive landowners, and no competition with other potential renewable energy projects (i.e., available land not

³⁸ 20 Ill. Comp. Stat. sec. 2855/1-75(c)(1).

³⁹ See N.D.C.C. § 17-01-01.

⁴⁰ LAWRENCE BERKELEY NAT’L LAB., U.S. RENEWABLES PORTFOLIO STANDARDS at 24 (July 2019).

⁴¹ *Id.* at 21.

⁴² *MTEP18 MISO Transmission Enhancement Plan*, at 42.

⁴³ Minn. Stat. § 216B.1691, subd. 2f(a).

currently participating in one of the several adjacent wind projects). There has been considerable wind development in this area of Minnesota historically, which limits the ability to site the proposed solar Project at another location while remaining close enough to the Adams Substation. Accordingly, Louise Solar makes efficient use of the regional transmission system by developing a no-emissions solar energy project at a location with low-cost interconnection and few required upgrades.

4.2 NO MORE REASONABLE AND PRUDENT ALTERNATIVE TO THE LOUISE SOLAR PROJECT HAS BEEN DEMONSTRATED (MINN. R. 7849.0120(B)).

Minn. R. 7849.0120(B) requires a CN applicant to examine possible project alternatives so that the Commission can determine whether a more reasonable and prudent alternative exists. Applying the factors set forth in Minn. R. 7849.0120(B), the Project has many advantages when compared to other renewable alternatives.

4.2.1 Size, Type, and Timing

When evaluating alternatives, the Commission examines whether the project is the appropriate size, whether it is the right type, and whether the timing is appropriate. With respect to renewable energy projects, the Commission has concluded that the proper inquiry in evaluating the size of the project is the appropriateness of the size of the project to the overall state and regional need for renewable energy. As demonstrated in Section 3.1, the need for renewable energy in the coming years far exceeds the amount of energy to be supplied by the Project.

Regarding the type of facility, the Commission granted Louise Solar an exemption from Minn. R. 7849.0250(B) with respect to evaluating non-renewable alternatives because such alternatives do not meet the Project's objective of providing energy that will satisfy renewable energy and other clean energy standards and goals.

With respect to timing, the Project is expected to be on-line and operational by the end of 2022 or 2023, depending on completion of regulatory approvals and the MISO interconnection process. This will help Minnesota and other electric utilities achieve the necessary renewable energy levels required to meet pending clean energy standards milestones.⁴⁴

4.2.2 Cost Analysis

The Project will also generate electricity at a lower cost per kilowatt hour than would other possible fossil fuel and renewable energy options, such as coal and biomass.⁴⁵ Even though the Solar Investment Tax Credits (ITC) phases down over the next several years, solar generation growth is anticipated to continue because the costs for solar continue to fall faster than for other sources.⁴⁶ In addition, although the Project has yet to secure arrangements for the sale of energy

⁴⁴ *Id.*

⁴⁵ See EIA, LEVELIZED COST AND LEVELIZED AVOIDED COST OF NEW GENERATION RESOURCES IN THE ANNUAL ENERGY OUTLOOK 2020 (2020), https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf.

⁴⁶ See EIA, ANNUAL ENERGY OUTLOOK 2020 at 72 (Jan. 2020), <https://www.eia.gov/outlooks/aeo/pdf/aeo2019.pdf>.

it will produce, Louise Solar is confident it will be able to secure long-term purchasers at attractive prices and terms. Importantly, as an independent power producer, Louise Solar, rather than the State or its ratepayers, bears the risk of not securing a PPA or otherwise not selling the Project's output.

4.2.3 Potential Environmental and Socioeconomic Impacts

The purpose of this analysis is to compare the potential impacts of various renewable generation options. As demonstrated in Sections 10 and 11 of this Application, the environmental impacts of the Project will be minimal and significantly less than a fossil-fuel based facility. One of the greatest attributes of solar energy is its minimal impact on the environment. The Project will not release carbon dioxide, sulfur dioxide, nitrogen oxides, mercury, or particulate matter. It will not require water for power generation and will not discharge wastewater containing any heat or chemicals during operation. It will produce energy without the extraction, processing, transportation, or combustion of fossil fuels. The Project will be sited to minimize environmental impacts. Additionally, recent research on the environmental impacts of solar farms indicates that there could be some net benefits to soil resources over the lifecycle of the Project.⁴⁷

4.2.4 Reliability

The Project will have an average expected annual net capacity factor of 25-28 percent.

4.3 THE LOUISE SOLAR PROJECT WILL BENEFIT SOCIETY IN A MANNER COMPATIBLE WITH THE NATURAL AND SOCIOECONOMIC ENVIRONMENTS (MINN. R. 7849.0120(C)).

Minn. R. 7849.0120(C) requires a CN applicant to address whether the proposed project will benefit society in a manner that is compatible with protecting natural and socioeconomic environments, including human health. Applying the factors set forth in Minn. R. 7849.0120(C), the energy produced by the Project will provide significant, numerous, and various societal benefits, with minimal negative impacts.

4.3.1 Overall State Energy Needs

As discussed in Section 3.1 above, utilities continue to require renewable energy to meet the Minnesota SES, and other clean energy and greenhouse gas reduction standards and goals, as well as to meet consumers' energy demands. Thus, the Project is not only compatible with Minnesota's energy needs, but it is wholly consistent with it.

4.3.2 Potential Environmental and Socioeconomic Impacts Compared to No-Build Alternative

In general, the socioeconomic impacts associated with the Project will be positive. Wages will be paid and expenditures will be made to local businesses and landowners during the Project's

⁴⁷ See Jeffrey S. Briberg, *Utility and Community Solar Should Use Native Landscaping* CLEANTECHNICA (Mar. 15, 2016), <https://cleantechnica.com/2016/03/15/utility-and-community-solar-should-use-native-landscaping/>.

construction and operation. The construction and operation of the Project will increase Mower County's tax base. In addition, purchase payments to landowners will offset potential financial losses associated with removing a portion of their land from agricultural production. The Project will impact up to 325 acres of agricultural land within the Preliminary Development Area by taking land out of row-crop production but will not result in a significant impact to land-based economies in the Project vicinity. Of the 455,680 acres in Mower County, the majority (approximately 447,193 acres) are cropland. Impacts to 325 acres of agricultural land within the solar facility would temporarily reduce the amount of agricultural land in the County by approximately 0.0008 percent.

Agricultural production would be allowed to continue in the area within the Project Area but outside the fence of the Preliminary Development Area during construction and operation of the Project. Similarly, if haying or grazing vegetation management strategies are used, some agricultural activities would continue within the Preliminary Development Area. In addition, taking land that has been farmed for more than 100 years temporarily out of production results in benefits to the soil at the end of the Project's useful life. According to the United States Department of Agriculture (USDA), establishing and maintaining permanent cover of either introduced or native grasses, legumes and forbs for nesting cover, winter cover, brood cover, pollinator habitat, and food for wildlife can reduce soil erosion, improve water and air quality, enhance plant diversity, and increase soil organic matter and overall soil health.⁴⁸

One of the greatest attributes of solar energy is its minimal impact to the environment. The Project will not release carbon dioxide, sulfur dioxide, nitrogen oxides, mercury, or particulate matter. It will not require water for power generation and will not discharge wastewater containing any heat or chemicals during operation. It will produce energy without the extraction, processing, transportation, or combustion of fossil fuels. The Project will be sited in a way that minimizes environmental impacts.

The development of solar energy has recently become and will continue to be important in diversifying and strengthening the economic base of Minnesota. As discussed in Section 3.2.1, Louise Solar will issue a RFP to BOP contractors to construct the Project. Louise Solar will include preferences for contractor bids that utilize local, union construction craft employees to the greatest extent feasible in accordance with the Project's budget, timeline, industry standards and requirements, and corporate safety policies. The BOP contractor selected will be required to work with labor unions, local subcontractors, and other vendors to implement a Project construction staffing model that maximizes local hiring and local economic benefits for the Project, while ensuring the Project is safely built on time and on budget. Additionally, much of the workforce needed to construct a solar facility must be comprised of Minnesota licensed electricians because most of the assembly and wiring work for solar installations is considered electrical work under the Minnesota State Electrical Code, which in turn requires that Minnesota licensed electricians complete that work. Wages and salaries paid to contractors and workers in Mower County will contribute to the total personal income of the region. At least part of the wages paid to temporary and permanent Project workers will be circulated and recirculated within the county and the state.

⁴⁸ United States Department of Agriculture, Natural Resources Conservation Service, *Conservation Choices: Conservation Cover*, <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcseprd413671>.

Expenditures made by the Applicant for equipment, fuel, operating supplies, and other products and services will benefit businesses in the county and the state. In addition, lease and purchase payments paid to the landowners will more than compensate for potential financial losses associated with removing a portion of their land from agricultural production, and these payments will diversify and strengthen the local economy.

Long-term benefits to the county's tax base as a result of the construction and operation of the Project will contribute to improving the local economy. For example, the Project will pay a Production Tax to the local units of government of \$1.20 per MWh of electricity produced, resulting in an annual Production Tax to of approximately \$105,000-\$115,000 annually to Mower County and approximately \$25,000-\$30,000 annually to Adams and Lodi Townships over 35 years.

Not building an electrical generation facility would result in no physical impact to the environment in Mower County. However, not building the Project would also not provide an additional source of tax revenues to the county, an increase in the income stream to residents and businesses, or an increase in the amount of low-cost, clean, reliable renewable energy available to state or regional utilities and their customers. The Project will have a minimal impact on the physical environment, while simultaneously providing significant benefits.

4.3.3 Inducing Future Development

Although the Project is not expected to directly affect development in Mower County, the Project will provide significant benefits to the local economy and local landowners. Landowners in the Project area will benefit from the purchase and lease payments, and installation of solar energy infrastructure will increase the local tax base in the townships and county in which the Project is sited. The Project will also provide significant income opportunities for local residents through the creation of temporary construction and permanent O&M positions.

4.3.4 Socially Beneficial Uses of Output

The Project will produce affordable, clean, renewable energy that will help meet energy demands and the RES, the SES and other clean energy and carbon reduction standards. According to the EPA's Greenhouse Gas Equivalencies Calculator, the Project will offset approximately 78,618 metric tons of CO₂, the equivalent of 9,187 homes' energy consumption for one year. In addition, the local economy will benefit from the landowner purchase payment for the Project, production taxes, income from jobs created, and local spending. It will also provide carbon-free energy that will assist in meeting carbon and greenhouse gas reduction goals.

4.4 THE LOUISE SOLAR PROJECT IS CONSISTENT WITH FEDERAL, STATE, AND LOCAL RULES AND POLICIES (MINN. R. 7849.0120(D))

4.4.1 The Project is Consistent with Minnesota Energy Policy

The Project will provide a significant amount of renewable energy, which is consistent with Minnesota's policy to increase renewable energy use. Solar, as renewable energy, is a favored

energy resource under Minnesota law.⁴⁹ In addition, as discussed previously, the SES mandates increased electric generation from solar resources.⁵⁰ The state has also set a goal to reduce statewide greenhouse gas emissions across all sectors producing those emissions to a level at least 80 percent below 2005 levels by 2050.⁵¹ Governor Walz recently announced a set of policy proposals that are designed to lead Minnesota to 100 percent clean energy in Minnesota's electricity sector by 2040.⁵² Just over 25 percent of Minnesota's electric generation came from clean energy at the time of Governor Walz's announcement.⁵³ Adding new sources of electric energy with no emissions, like solar energy, is essential to meeting these goals.

Further support for the conclusion that the Project is consistent with state energy policy can be found in the favorable tax treatment that solar energy facilities receive. The state legislature has exempted all real and personal property of solar energy conversion systems from property taxes.⁵⁴ Solar energy conversion systems are also exempt from state sales tax.⁵⁵

4.4.2 The Project is Consistent with Applicable Minnesota Statutory Provisions

In addition to the criteria set forth in Minn. R. Ch. 7849, there are several statutory provisions that may apply to a CN application. As discussed below, the Project is consistent with these statutory requirements.

4.4.2.1 Renewable Preference

Minn. Stat. § 216B.243, subd. 3a provides a preference for renewable resources:

The commission may not issue a certificate of need under this section for a large energy facility that generates electric power by means of a nonrenewable energy source, or that transmits electric

⁴⁹ See Minn. Stat. § 216B.243, subd. 3a (“The commission may not issue a certificate of need under this section for a large energy facility that generates electric power by means of a nonrenewable energy source, or that transmits electric power generated by means of a nonrenewable energy source, unless the applicant for the certificate has demonstrated to the commission's satisfaction that it has explored the possibility of generating power by means of renewable energy sources and has demonstrated that the alternative selected is less expensive (including environmental costs) than power generated by a renewable energy source. For purposes of this subdivision, “renewable energy source” includes hydro, wind, solar, and geothermal energy and the use of trees or other vegetation as fuel.”)

⁵⁰ Minn. Stat. § 216B.1691, subd. 2f.

⁵¹ Minn. Stat. § 216H.02, subd. 1.

⁵² Office of Governor Tim Walz, *Governor Walz, Lieutenant Governor Flanagan, House and Senate DFL Energy Leads Announce Plan to Achieve 100 Percent Clean Energy in Minnesota by 2040* (Jan. 21, 2021), available at <https://mn.gov/governor/news/?id=1055-463873>.

⁵³ *Id.*

⁵⁴ Minn. Stat. § 272.02, subd. 24.

⁵⁵ Minn. Stat. § 297A.67, subd. 29.

power generated by means of a nonrenewable energy source, unless the applicant for the certificate has demonstrated to the commission's satisfaction that it has explored the possibility of generating power by means of renewable energy sources and has demonstrated that the alternative selected is less expensive (including environmental costs) than power generated by a renewable energy source. For purposes of this subdivision, "renewable energy source" includes hydro, wind, solar, and geothermal energy and the use of trees or other vegetation as fuel.

Minn. Stat. § 216B.2422, subd. 4, is also applicable:

The commission shall not approve a new or refurbished nonrenewable energy facility in an integrated resource plan or a certificate of need, pursuant to section 216B.243, nor shall the commission allow rate recovery pursuant to section 216B.16 for such a nonrenewable energy facility, unless the utility has demonstrated that a renewable energy facility is not in the public interest.

The Project is consistent with Minnesota's preference for renewable energy and satisfies these statutory criteria by furthering available resources to meet this renewable energy preference.

4.4.2.2 *Distributed Generation*

Minn. Stat. § 216B.2426 states that:

The commission shall ensure that opportunities for the installation of distributed generation, as that term is defined in section 216B.169, subdivision 1, paragraph (c), are considered in any proceeding under section 216B.2422, 216B.2425, or 216B.243.

Pursuant to Minn. Stat. § 216B.169, subd. 1(c), "distributed generation" refers to projects of no more than 10 MW. The Project is a utility-scale Project and will not provide distributed energy to the system as defined by Minnesota Law. However, Louise Solar believes that the need for new energy resources is so great that it also will not displace any opportunities for installation of renewable energy. Additionally, the Project's transmission opportunities and economies of scale make it an exceptional electrical resource that will provide great benefits to the state and the local economy.

4.4.2.3 *Innovative Energy Preference*

Minnesota also requires the Commission to consider an innovative energy project⁵⁶ before authorizing construction or expansion of a fossil-fueled generation facility.⁵⁷ Because the Project is not a fossil-fuel facility, this requirement is not applicable.

4.4.2.4 *RES and SES Compliance*

Minn. Stat. § 216B.243, subd. 3(10) requires the Commission to evaluate whether a CN applicant is in compliance with Minnesota's RES and SES. Louise Solar, however, is not subject to the RES or SES because it has no retail sales of electricity in Minnesota. Therefore, this requirement does not apply to the Project.

4.4.2.5 *Environmental Cost Planning*

Minn. Stat. § 216B.243, subd. 3(12) requires the Commission to evaluate the extent to which an applicant has considered the risk of environmental costs and regulation. As the Commission and the Department of Commerce have determined, this statute does not apply to renewable generation facilities such as the Project.⁵⁸

4.4.2.6 *Transmission Planning Compliance*

Minn. Stat. § 216B.243, subd. 3(10) requires the Commission to consider whether a utility seeking a CN complies with certain transmission planning requirements. As an independent power producer, this statute does not apply to Louise Solar.

4.4.3 The Project is Consistent with Federal Energy Policy

The Project will provide a significant amount of renewable energy, which is consistent with Federal energy policy favoring renewable projects. Federal energy policy provides significant U.S.

⁵⁶ An "innovative energy project" is:

a proposed energy-generation facility or group of facilities which may be located on up to three sites: (1) that makes use of an innovative generation technology utilizing coal as a primary fuel in a highly efficient combined-cycle configuration with significantly reduced sulfur dioxide, nitrogen oxide, particulate, and mercury emissions from those of traditional technologies; (2) that the project developer or owner certifies is a project capable of offering a long-term supply contract at a hedged, predictable cost; and (3) that is designated by the commissioner of Iron Range resources and rehabilitation as a project that is located in the taconite tax relief area on a site that has substantial real property with adequate infrastructure to support new or expanded development and that has received prior financial and other support from the board.

Minn. Stat. § 216B.1694, subd. 1.

⁵⁷ Minn. Stat. § 216B.1694, subd. 2(a)(4).

⁵⁸ *In the Matter of the Application of Elm Creek Wind, LLC for a Certificate of Need for a Large Energy Facility, the Elm Creek Wind Project in Jackson and Martin Counties*, Order Granting Certificate of Need at 12, Docket No. IP6631/CN-07-789 (Jan. 15, 2008).

federal tax incentives to attract investment in renewable energy projects, including solar projects like the Project. For example, the solar ITC provided by Section 48 of the Internal Revenue Code permits qualifying entities to elect to claim a credit of 30 percent of qualifying costs for a project that has “begun construction” for federal income tax purposes through 2019. As modified by the Consolidated Appropriations Act, 2021 that was signed into law on December 27, 2020, the amount of the ITC steps down to 26 percent for projects that begin construction in 2020, 2021 or 2022, and to 22 percent for projects that begin construction in 2023 (in each case, as long as the project is placed in service prior to January 1, 2026). Solar projects that begin construction in 2024 or later are eligible for a 10 percent ITC. Louise Solar expects to utilize the ITC as part of the Project’s long-term financing structure.

4.4.4 The Project Complies with Federal, State, and Local Environmental Regulation.

The Project will meet or exceed the requirements of all applicable federal, state, and local environmental laws and regulations. **Table 11** in Section 12.3 provides a list of approvals the Project may need to obtain from governmental entities to demonstrate full compliance. Louise Solar is committed to obtaining all necessary environmental and other approvals required under federal, state, and local requirements.

The Project will comply with all relevant requirements and will fulfill important state energy policies with respect to renewable energy and environmental protection. In particular, the facility meets the requirements of Minnesota Statutes §§ 216B.2422, subd. 4 and 216B.243, subd. 3a, which state that the Commission may not approve a nonrenewable energy facility unless it determines that a renewable facility is not in the public interest, or more expensive than the nonrenewable facility including consideration of environmental costs. It is further consistent with state policies relating to the reduction of greenhouse gasses.

The Project offers a cost-competitive and environmentally superior alternative to fossil fuel generators that is clearly in the public interest and can reliably deliver accredited capacity, energy, Renewable Energy Credits (RECs) and other environmental attributes. Approval of the Project is in the public interest because it meets all of Minnesota’s laws supporting acquisition of clean, renewable energy and provides an opportunity for utilities and other customers seeking to diversify and build their energy generation portfolios.

5.0 DESCRIPTION OF PROJECT AND ALTERNATIVES (MINN. R. 7849.0250)

5.1 PROPOSED PROJECT

Louise Solar is proposing to construct a 50 MW AC solar PV facility located in Lodi and Adams Townships, Mower County, Minnesota. The Applicant has secured site control for 613 acres of agricultural land that will host the proposed Project. The final Project design is expected to occupy approximately 325 acres or less. The excess acreage allows for planned buffers and flexibility in overall design. Site control for the Project resides adjacent to ITC Midwest’s existing Adams Substation, which will provide a relatively short approximate 700-1,000-foot length 161 kV transmission connection between the proposed solar facility and existing substation.

The Project’s primary components include PV panels mounted on a linear axis tracking system (Figure 1), centralized inverters, and a Project substation. For descriptive purposes, an individual tracker row is used as a basic unit of the Project. A tracker row is made up of panels mounted on a flat beam oriented north-south, with a break in the middle where the gear box is located. The tracker rows, which tilt east to west to follow the sun throughout the day, are connected together in groups and, depending on the manufacturer, served by a single motor. The racking system consists of all the components involved in fastening the panels to the tracker rows, plus the tracker beams, gearboxes, motors, and pier foundations.

Associated facilities include electrical cables and accessories, conduit, switchgears, step up transformers, SCADA systems, and metering equipment. The Project will include an O&M facility, temporary laydown yards/staging areas, and internal Project access roads. The Project will include a perimeter fence and will be gated at access points which will include security locks. The Project will be re-vegetated with low-growing seed mixes (e.g., short grasses or low-growing forbs, low-growing wetland seed mixes (where appropriate) or some other low-growing perennial cover) and described in the AIMP (see Site Permit Application, Appendix B).



Figure 1: Typical solar tracker row design.

The solar array at the Project will consist of PV solar panels, a racking system, inverter skids, security fencing, and up to four weather stations.

The Applicant proposes to use panels affixed to tracking mechanisms that would allow the panels to “track” the sun from east to west on a daily basis. The panels and tracking rack system are generally aligned in rows north and south with the PV panels facing east toward the rising sun in the morning, parallel to the ground during mid-day, and then west toward the setting sun in the afternoon. The panels are rotated by a small motor connected to the tracking rack system to slowly track with the sun throughout the day. The tracking rack system allows the Project to optimize the angle of the panels in relation to the sun throughout the day, thereby maximizing production of electricity and the capacity value of the Project.

When the sun is directly overhead, the PV panels will be at a zero-degree angle (level to the ground) and four to six feet off the ground. The tracker rows will follow the sun from approximately 60 degrees east to 60 degrees west through the course of the day. At 60 degrees (tilted to the highest position), the edge of the panels will be a maximum of 15 feet off the ground. The design will involve no spinning machinery, no thermal cycle, and no water use (except for infrequent module washing). The Project will require approximately 146,692 PV panels to make up the 50 MW-AC solar facility.

To the extent practical, the racking system foundations will be a driven pier and will not require concrete, although some concrete foundations may be required depending upon site specific soil conditions and geotechnical analysis.

A specific solar module has not yet been selected for the Project. Several are under consideration, including panels manufactured by Canadian Solar, First Solar, Hanwha, JA Solar, Jinko, LONGi, Risen, Seraphim, Talesun, and Trina. All panels under consideration are mono- or poly-crystalline models. The Applicant will consider the costs and performance of each technology option as well as environmental and safety standards when making its final selection. This process has been included in the proposed Project timeline and the final selection should not alter the Project scope, time frame, or budget. Several racking and trackers are under consideration, including: the ATI DuraTrack, GameChange Solar’s Genius Tracker, NEXTracker’s NX Horizon, PV Hardware’s Axone/Monoline, and Soltect’s SF7/SF7 Bifacial model (Figure 2). Racking infrastructure and trackers will be selected closer to the procurement stage to ensure performance standards are met.

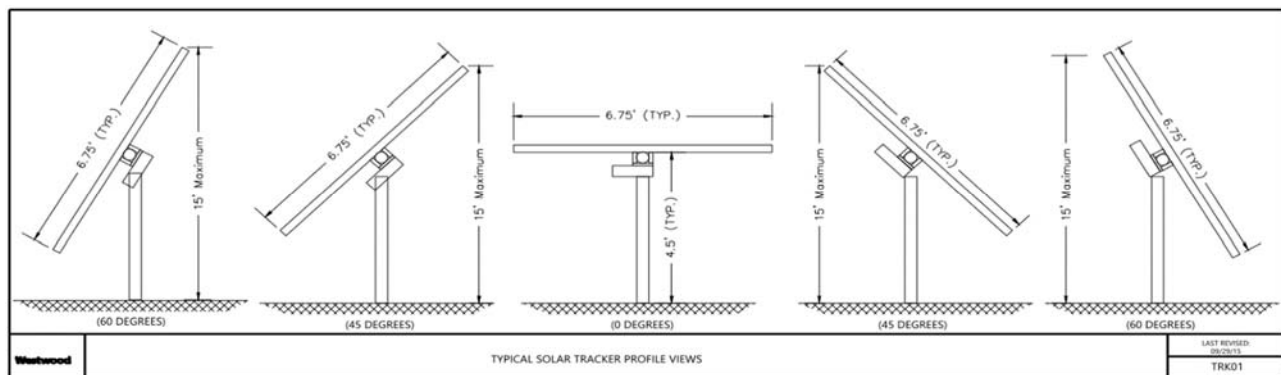


Figure 2: Typical solar tracker profile.

The Project’s main components include PV panels mounted on a single axis tracking system, solar inverters, and a Project transmission line. The racking system foundations will use driven piers or posts and are not anticipated to require concrete; however, some concrete foundations may be needed depending on location and specific soil conditions. The associated facilities include electrical cables, conduit, switchgear, step up transformers, supervisory control and data acquisition (SCADA) system, and metering equipment. The solar facility will be fenced and gated for security. After construction is complete, disturbed areas will be seeded with a beneficial seed mix to enhance soil and water retention and reduce stormwater runoff and erosion throughout the Project Area. The Applicant will work collaboratively with the Minnesota

Department of Natural Resources (MNDNR) to select and design the vegetation to maximize soil health and co-benefits like pollinator habitat.

At approximately 700-1,000 feet long, the proposed 161 kV transmission line will provide the physical interconnection between the Project substation and the 161 kV bus at the existing ITC Midwest Adams Substation. The step-up substation includes a 161-kV circuit breaker, 34.5-kV/161-kV generator step-up transformer, relay and protective equipment, supervisory control and data acquisition equipment, telecommunication equipment and metering equipment. There will be a single dead-end structure within the Project substation and several additional pole structures to enter the Adams Substation. The transmission line will include several wood or steel direct embedded posts approximately 70-100 feet in height. The post structures are anticipated to consist of a standard horizontal braced-post design. The type of conductor will be determined following the completion of detailed electrical design. The exact length and position of the line and poles will be determined by on-going engineering. The final placement and design of the transmission line will incorporate feedback from ITC Midwest and the owners of several transmission lines which currently enter the Adams substation from the south and that Louise Solar's gen-tie may need to cross before entering the Adams substation.

The Applicant believes that the selected Project location in Mower County is advantageous for solar development based upon a good solar resource, willing landowner participants, consistency with local land use designations and zoning, the excellent proximity to existing electric transmission infrastructure, and minimal impact to natural and cultural resources.

5.1.1 Nominal Generating Capability and Effect of Economies of Scale

The total nameplate capacity for the proposed Project facilities is 50 MW AC. The facility will be designed utilizing a DC to AC ratio that optimizes the accredited capacity of the array according to MISO guidelines, the site-specific interconnection capacity and the losses associated with cable losses, thermal losses, and other associated derates. The Project will generate 50 MW, enough energy to provide electricity for approximately 9,187 homes annually and avoid the emission of approximately 78,618 metric tons of carbon annually.⁵⁹ Larger solar projects, such as the Project, can realize some economies of scale by spreading out the relatively fixed transaction, operation, and maintenance costs over the entire Project, resulting in decreased costs per kWh of electricity produced.

Generally, economies of scale (system size) do not affect the generation characteristics of the proposed facilities since the efficiency of a photovoltaic system depends primarily on the characteristics of the individual panels and the inverter. This allows excellent flexibility to adjust system size for the site-specific constraints without impacting the facilities' overall efficiencies.

The total installed capital costs for the Project are estimated to be approximately \$62.05 million, with Project cost depending on variables including, but not limited to, construction costs, taxes, tariffs, and panel selection, along with associated electrical and communication systems,

⁵⁹ Based on EPA Greenhouse Gas Equivalencies Calculator and 112,500,000 kWh annual production PVSYST model.

and access roads. Operating costs for the Project are estimated to be approximately \$1.2 million dollars on an annual basis, including labor, materials, and property taxes.

5.1.2 Annual Capacity Factor

The Project is anticipated to have a net capacity factor of between approximately 25 percent and 28 percent, with projected average output of approximately 112,593 MWh annually of reliable, deliverable on-peak energy.

5.1.3 Fuel

The Project will generate electricity from sunlight; therefore, no fuel is required.

5.1.4 Anticipated Heat Rate

The conversion of solar to electricity does not generate heat as combustion or nuclear electricity generation facilities would when generating electricity. Therefore, heat rates are not applicable to a solar project.

5.1.5 Facility Location

The Project will be located within Lodi and Adams Townships in Mower County, Section 12, Township 101N, Range 16W in Mower County and Section 7 and 18, Township 101N, Range 15W in Mower County. The closest city to the Project Area is Adams, Minnesota. Louise Solar has negotiated a mix of lease agreements and purchase agreements/options with landowners of the Project site that includes approximately 613 acres of private land under lease from six landowners. While several acres are under option to support the Project substation, the majority of the land for the Project will be leased.

Included as Maps 3 and 4a-d is a preliminary layout of the Project. The Project's facilities will include solar panels and racking, inverters, security fencing, access roads as required, an operations & maintenance building, laydown areas, substation, transformer, electrical collection and communication lines, up to four weather stations, and ancillary equipment or buildings as necessary. This preliminary layout reflects Louise Solar's effort to maximize the Project's energy production, follow applicable setbacks, and minimize impacts to the land, environment, and surrounding community. Although Louise Solar expects the final layout to remain similar to the preliminary layout, changes may occur as a result of ongoing site evaluation, permitting processes, landowner preferences, and engineering activities.

5.2 AVAILABILITY OF ALTERNATIVES (MINN. R. 7849.0250(B))

Minn. R. 7849.0250(B)(4) requires an applicant to discuss the availability of new generating facilities of a different size or using a different energy source as an alternative to the proposed facility. The objective of this alternatives analysis is to determine whether there are other energy sources that can better satisfy the need identified for the Project. The Commission granted Louise Solar a partial exemption from this data requirement, and Louise Solar will discuss only renewable alternatives as outlined in that exemption.

Developing and operating generating sources that are cost-effective and use proven technology is particularly important to an independent power producer like Louise Solar. Louise Solar does not have access to ratepayer funds that could provide a resource for retirement of capital investments. In addition, Louise Solar must keep its prices—and thus, its costs—low enough to remain competitive. For these reasons, Louise Solar must exercise diligence in deciding where and when to pursue opportunities for capital investment in new power-generating facilities. As indicated in this Application, the current pricing for solar energy is cost effective when compared to other renewable and non-renewable sources of electricity.

Commercial feasibility and reliability with respect to the generation output needed are important considerations in selling the power generated, and solar is a reliable resource. However, with respect to the alternatives discussed below, without a guarantee of long-term reliability and cost-effectiveness, it is difficult or impossible to convince customers that an unproven technology should be selected for purchase.

5.2.1 Alternatives Considered

5.2.1.1 Purchased Power

Louise Solar is an independent power producer and does not purchase power. Instead, Louise Solar will sell power to utilities or other potential customers. As such, this data requirement is not applicable, and the Commission granted Louise Solar an exemption.

5.2.1.2 Upgrades to Existing Resources

Louise Solar has no existing facility in Minnesota for which it might seek improved operating efficiency. As such, this data requirement is not applicable, and the Commission granted Louise Solar an exemption.

5.2.1.3 New Transmission

Louise Solar has no plans to become involved in owning or operating transmission lines beyond the collection and feeder lines that will be needed for interconnection of the Project. The development, construction, and operation of transmission and distribution lines designed to deliver power to end use customers will be left to utilities with defined service area obligations to retail customers. As such, this data requirement is not applicable, and the Commission granted Louise Solar an exemption.

5.2.1.4 Wind Power

Minnesota has a significant and important wind resource that can and is being used for energy and capacity services within the State's generating portfolio. Although wind is a good energy resource, solar is a good capacity resource. As a result, these two technologies complement each other and are not true substitutes. There is need for both wind and solar energy in Minnesota's renewable portfolio, and Louise Solar will be increasing the state's solar generation as part of an effort to increase solar energy's contribution to that portfolio.

Furthermore, this area of Mower County has already seen a significant build-out of wind projects; therefore, additional wind development would not be a viable alternative. In fact, the Project location was originally explored for siting a 50 MW wind project, which was submitted into the MISO interconnection queue. The study results for that wind project showed modest upgrade costs. EDFR did not continue developing that wind site due to a lack of land and waking from nearby existing facilities. Instead, the site was recognized as being more favorable to a solar project due to the identified transmission capacity and ability to site a project close to the POI, and without the need for lengthy overhead transmission.

5.2.1.5 *Hydroelectric Power*

Hydropower is also not an alternative to the Project. In 2015, hydropower in Minnesota produced 849,054 MWh of power, up slightly from 840,410 MWh in 2010, and compared to 774,729 MWh in 2005.⁶⁰ According to the 2016 Quad Report, issues with hydropower relate to “[c]osts of maintaining and operating dams compared to other sources of energy . . . as well as increased concern about the potential negative effect dams can have on Minnesota’s river ecosystems.”⁶¹ There is not sufficient new hydro resources in Minnesota to replace the output of the Project.

5.2.1.6 *Biomass*

Minnesota communities do have accessible and low-value biomass feedstocks. However, the costs of these feedstocks vary widely, and the supply of biomass feedstock is limited.⁶² Further, the environmental impacts of a biomass facility may be greater than those of the Project, due to both the facility itself and the machinery and equipment needed to gather and transport the biomass fuel. For these reasons, a biomass plant is not a good alternative to the Project.

5.2.1.7 *Emerging Technologies*

New renewable emerging power generation technologies are being developed, and Louise Solar believes that the current approaches are not sufficiently mature to provide the output needed to match the nameplate capacity of the Project or to be cost-effective and reliable.

5.2.1.7.1 *Pumped Storage*

The proposed site is not suited to a pumped storage application because the topography of the site is relatively flat with slopes ranging from 1 to 5 percent, and pumped storage requires the storage of large amounts of water in an elevated reservoir. Therefore, pumped storage is only commercially and technically viable in locations with certain existing geology for water storage

⁶⁰ Quad Report at 28.

⁶¹ *Id.*

⁶² *Id.* at 27.

and large (*i.e.*, steep) elevation changes. In addition, there is currently no net new generation from pumped storage in Minnesota.⁶³ This technology is therefore not an alternative to the Project.

5.2.1.7.2 Compressed Air

Highly specialized geological sites are needed to make use of compressed air technology. Such sites are scarce in Minnesota. This technology has been implemented on a limited basis and creates no net new energy generation. Compressed air is therefore not an alternative to the Project.

5.2.1.7.3 Thermal Storage

This technology, which makes use of accumulated heat transferred to insulated repositories, is not yet commercially proven. Moreover, the Project is intended to generate electricity, not store energy. The storage of energy is not being considered as a part of the Project. Accordingly, this is not an alternative to the Project.

5.2.1.7.4 Hydrogen and Fuel Cells

Hydrogen, and its use in fuel cells, has received a lot of attention for its potential to impact energy production and use. Fuel cells can be used to produce energy in the form of electricity and heat. This energy can be applied to power vehicles and buildings. Fuel cells use a chemical reaction rather than a combustion reaction. Fuel cells have a similar level of efficiency as natural gas combustion sources and, when using hydrogen as fuel, have nearly no pollution. Hydrogen, however, is expensive, as it requires substantial amounts of energy to produce. While much research is being done regarding hydrogen and fuel cells, the technology is not yet available on a commercial scale.

5.2.1.7.5 Non-CN Facilities (Minn. R. 7849.0120(A)(4))

Under Minn. Stat. §§ 216B.2421 and 216B.243, subd. 2, and Minn. R. Ch. 7849, a CN is required for the Project because it is a “large energy facility,” *i.e.*, larger than 50 MW. As an independent power producer, Louise Solar must compete with other available technologies to sell power on the wholesale market, if necessary. Due to the size of the Project, Louise Solar has the advantage of additional economies-of-scale not available to smaller, non-CN facilities.

5.2.1.8 *No Facility Alternative (Minn. R. 7849.0340)*

The Commission granted Louise Solar an exemption from Minn. R. 7849.0340, which requires an applicant to submit data for the alternative of “no facility,” including a discussion of the impact of this alternative on the applicant’s generation and transmission facilities, system, and operations. The Rule also requires an analysis of “equipment and measures that may be used to reduce the environmental impact of the alternative of no facility.”⁶⁴

⁶³ EIA, ELECTRIC POWER MONTHLY: HYDROELECTRIC (PUMPED STORAGE) POWER BY STATE BY SECTOR (Aug. 25, 2020), https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=table_1_12_a.

⁶⁴ Minn. R. 7849.0340(C).

Louise Solar does not have a “system,” nor does it have other generation and transmission facilities in Minnesota. As such, the requirements of Minn. R. 7849.0340 are not applicable to the Project and are not necessary to determine need for the facility. Instead, Louise Solar will provide data regarding the impact of the “no facility” alternative on its potential customers and the region.

Given that the Project is designed to increase the amount of energy available for purchase on the wholesale market that will satisfy clean energy standards, not building the facility is not an alternative. Not building the facility would result in no increase in renewable energy and, in turn, no opportunity for utilities to purchase the Project’s output to satisfy clean energy standards. Such an outcome is contrary to Louise Solar’s objective for the Project and will not satisfy the state and regional need for renewable energy.

5.2.1.9 *Facility Information for Alternatives Involving Construction of a LHVTL*

The Commission granted Louise Solar an exemption from Minn. R. 7849.0330, which requires the applicant to provide certain data for each alternative that would involve construction of a large high voltage transmission line (LHVTL). Transmission facilities are not true alternatives to the Project, since the purpose of the Project is to increase the supply of available renewable energy. Louise Solar does not currently plan on installing any facilities that would be defined as an LHVTL. Thus, it is anticipated that the electricity generated will be transmitted via facilities owned or operated by others. For these reasons, Minn. R. 7849.0330 is not applicable, and the Commission granted Louise Solar an exemption from this data request.

5.2.1.10 *Combinations*

No combination of the aforementioned alternatives would be appropriate because, as compared to the Project, they would not enable Louise Solar to more efficiently or cost-effectively produce electric output to be purchased by utilities or private corporations to provide needed energy and satisfy the RES and other clean energy and carbon reduction standards. The Commission granted Louise Solar an exemption from this data request.

5.2.2 **Economic Comparison**

Table 3 below, taken from the EIA, demonstrates that solar energy generated by a PV tracking facility has a competitive capital cost and a lower operating cost than other types of renewable resources. The Project will generate electricity at a lower cost per kilowatt hour than would other possible fossil fuel and renewable energy options, such as coal and biomass.⁶⁵ As discussed in Sections 4.2.2 and 4.4.3, even though the ITC will phase down over the next several

⁶⁵ See EIA, ANNUAL ENERGY OUTLOOK 2021, Narrative at 19 (2021), https://www.eia.gov/outlooks/aeo/pdf/AEO_Narrative_2021.pdf.

years, solar generation growth is anticipated to continue because the costs for solar continue to fall faster than for other sources.⁶⁶

Table 3: Renewable Technology Costs⁶⁷

Technology	Size (MW)	Total Overnight Cost (2020\$/kW)	Variable O&M (2020\$/MWh)	Fixed O&M (2020\$/kW-yr)
Fuel Cells	10	6,866	0.59	30.94
Biomass	50	4,078	4.85	126.36
Conventional Hydropower	100	2,769	1.40	42.01
Wind	200	1,846	0.00	26.47
Solar PV – tracking	150	1,248	0.00	15.33
Solar Thermal	115	7,116	0.00	85.82

5.2.3 Alternatives Summary

The Project is the best alternative for meeting the capacity and renewable energy needs in Minnesota and the region in the near term. All other potential alternatives reviewed by Louise Solar fall short in one or more categories. Louise Solar’s analysis demonstrates that the Project is a cost-effective energy resource; the Project uses commercially proven and reliable generating technology for the electrical generation output needed. Moreover, the Project is the energy source appropriate for the site selected for the Project.

5.3 DISCUSSION OF PROPOSED FACILITY AND ALTERNATIVES (MINN. R. 7849.0250(C)).

The Commission granted Louise Solar a partial exemption from Minn. R. 7849.0250(C)(1)–(9), which requires a discussion of various details regarding both the proposed facility and each of the alternatives discussed in response to Minn. R. 7849.0250(B). Consistent with the Commission granting Louise Solar a partial exemption from the data requirements in Minn. R. 7849.0250(B), thereby limiting the discussion required to only renewable alternatives, the Commission also limited the information required under this data requirement to only those renewable alternatives discussed in response to Minn. R. 7849.0250(B)(4). As discussed above, no good alternatives exist. Therefore, only information regarding the Project is applicable.

⁶⁶ EIA, ANNUAL ENERGY OUTLOOK 2021, Narrative at 7, 16 (2021), https://www.eia.gov/outlooks/aeo/pdf/AEO_Narrative_2021.pdf.

⁶⁷ The figures in Table 3 are taken from EIA’s Assumptions to AEO2021: Electricity Market Module at 6 (Feb. 2021), <https://www.eia.gov/outlooks/aeo/assumptions/pdf/electricity.pdf>.

5.3.1 Capacity Cost

Solar energy projects are accredited by MISO at a medium to high percentage of nameplate capacity. MISO provides accreditation of 50% of its Network Resource Interconnection Service (NRIS) value for projects with no operating history. Because the Project has a 60% NRIS, it will be assigned 15 MW of accredited capacity in its first year. Once operating data is obtained, the Project receives capacity credit based on its output in the peak months of June, July and August. We anticipated Louise Solar may provide 30 MW or more of accredited capacity in subsequent years. Nevertheless, costs for renewable energy facilities are typically not expressed in terms of capacity costs. The Project will likely deliver energy and accredited capacity to the off-taker on an as-generated basis and will receive payment for both in the form of a single \$/MWh payment. Louise Solar's estimated total cost for the Project per kW is provided in Appendix A, Section 5.3.1, which has been designated trade secret. The largest components in the total cost of the Project will be the solar panels, tracking rack system, and installation labor; however, infrastructure costs for access roads and electrical collection systems also are factors.

5.3.2 Service Life

With proper maintenance, service, and replacement of parts, the expected life of the Project is 35 years or longer. Louise Solar is confident that its maintenance program will result in excellent longevity for the Project.

5.3.3 Estimated Average Annual Availability

Louise Solar estimates that the Project facilities will be available approximately 99 percent of the year, which is consistent with industry standards.

5.3.4 Fuel Costs

There are no fuel costs associated with the Project. Rights to the land on which the Project will be located will require annual lease payments. Nominal purchases of electricity will be necessary to run the Project, and that power will be acquired from local electricity utility, similarly to any other commercial or industrial business, or supplied by the Project's own generation equipment.

5.3.5 Variable Operating and Maintenance Costs

Most solar operating costs are fixed. Louise Solar expects that operation and maintenance costs will average \$5-8 per kW-year over the life of the Project. The expected variable operations and maintenance costs per kWh are provided in Appendix A, Section 5.3.5. An advantage of solar energy facilities is that they typically are not required to go completely offline for maintenance. Small sections of the solar array can be serviced while the rest of the facility continues to deliver energy.

5.3.6 Total Cost

Louise Solar's estimated total capital cost per kWh for the Project is provided in Appendix A, Section 5.3.6, which has been designated trade secret. This estimate assumes typical

solar farm design, construction, and operational data for a 35-year estimated service life. The price for which Louise Solar will sell the energy will be determined as a result of negotiations with purchaser(s).

5.3.7 Estimate of Facility's Effect on Rates

Minn. R. 7849.0250(C)(7) requires an applicant to estimate its proposed project's "effect on rates system-wide and in Minnesota, assuming a test year beginning with the proposed in-service date." The Commission granted Louise Solar a partial exemption from this requirement because it does not have a "system" as defined by the Rules, and it is not a utility with retail rates for the power it plans to generate. As such, the data are neither available to Louise Solar nor necessary to determine the need for the Project. Instead, Louise Solar proposes to submit data on the Project's impact on state or regional wholesale prices.

The Project's energy production will be modest in comparison to the annual energy consumption of Minnesota and the region and will likely not have a measurable effect on rates. However, the Project could ultimately play a role in stabilizing or even lowering rates by offering an alternative to conventional generation sources.⁶⁸ For instance, utilities could purchase output from the Project to partially replace energy from generation sources with higher or more volatile pricing, such as natural gas plants. In addition, the Project will not face the same cost-increasing hurdles to construction (*e.g.*, potential carbon regulation and higher permitting costs due to increased regulatory scrutiny) faced by conventional fossil-fuel generation sources. For example, the Project is consistent with the State of Minnesota's goal of reducing carbon emissions. Minnesota and other states are moving forward with implementing clean energy policies, and it is anticipated that existing coal plants will be retired in an effort to comply with the state's clean energy policies.⁶⁹

5.3.8 Efficiency

Because no fuel is burned in the production of energy at the Project, this information is not available.

⁶⁸ See *e.g.*, Christian Roselund, *Renewables reduced wholesale power costs by \$5.7 billion in Texas*, pv magazine (Nov. 6, 2018) (reporting that wind, and to a lesser degree solar, "are bringing down wholesale power prices and making them more stable"); Union of Concerned Scientists, *Benefits of Renewable Energy Use* (Updated Dec. 2017); Good Energy, *Wind and solar reducing consumer bills*, (Oct. 2015) (analyzing impact of renewable energy usage on electric rates in the United Kingdom).

⁶⁹ See, *e.g.*, NRDC Issue Paper, *Clean Energy and Efficiency Can Replace Coal For a Reliable, Modern Electricity Grid* (Mar. 2017) (available at <https://www.nrdc.org/sites/default/files/clean-energy-replace-coal-modern-electricity-grid-ip.pdf>); Xcel Energy, Upper Midwest Resource Plan 2020-2034, at 5, 2020-2034 Upper Midwest Integrated Resource Plan Docket No. E002 /RP-19-368 (planning for Minnesota-based retirements); EIA, *Nuclear and coal will account for majority of U.S. generating capacity retirements in 2021* (Jan. 12, 2021) (available at <https://www.eia.gov/todayinenergy/detail.php?id=46436>).

5.4 MAP OF SYSTEM (MINN. R. 7849.0250(D))

The Commission granted Louise Solar an exemption from Minn. R. 7849.0250(D), which requires an applicant to include a map showing the applicant's system. As an independent power producer, Louise Solar does not have a "system." The information requested is thus not available to Louise Solar nor relevant to the determination of need for the Project. Instead, maps showing the proposed site of the Project and its location relative to the power grid are included as Map 5.

6.0 PEAK DEMAND AND ANNUAL CONSUMPTION FORECAST (MINN. R. 7849.0270).

The Commission granted Louise Solar an exemption from Minn. R. 7849.0270, subs. 1–6, which require the applicant to provide "data concerning peak demand and annual electrical consumption within the applicant's service area and system." Louise Solar does not have a "service area" or "system" and, as such, the requested data are inapplicable.

As an alternative to the requested data, Louise Solar provides the following data regarding the regional demand, consumption, and capacity data from credible sources to demonstrate the need for the independently produced renewable energy that will be generated by the Project. If a PPA is executed for the Project's output, Louise Solar will also provide the Commission with additional system-specific information.

A review of utilities' integrated resource plans (IRPs), requests for proposals, and similar documents demonstrates that utilities will seek additional renewable generation resources in the next several years.⁷⁰ Xcel Energy has announced plans to reduce carbon emissions 80 percent Company-wide by 2030, and to provide 100 percent carbon-free electricity across its service territory by 2050.⁷¹ To reach this goal, Xcel plans to eliminate all coal generation on its system by 2030, and to add 3,500 MW cumulative utility scale solar resources, in addition to approximately 2,250 MW of cumulative wind by 2034 to replace wind that is set to retire. Similarly, in an August 14, 2020, compliance filing, the Minnesota Transmission Owners' summarized their publicly-stated clean energy goals, which generally included increasing carbon-free energy and a discussion of the transmission system that will be needed to do so.⁷²

More broadly, retirements of coal-based generating units are expected across the MISO region, and renewable generation resources are expected to fill the resulting capacity needs.⁷³

⁷⁰ Xcel Energy, Upper Midwest Resource Plan 2020-2034, at 5, 2020-2034 Upper Midwest Integrated Resource Plan Docket No. E002 /RP-19-368. *See also* Minnesota Power, 2015 Integrated Resource Plan (available at <http://www.mnpower.com/Content/documents/Environment/2015-ResourcePlan.pdf>) (approved by the Minnesota Public Utilities Commission on June 10, 2015); Otter Tail Power Company, Application for Resource Plan Approval 2017-2031 (available at <https://www.otpc.com/media/838904/resource-plan.pdf>).

⁷¹ Xcel Energy, Upper Midwest Resource Plan 2020-2034, at 5.

⁷² Compliance Filing, *In the Matter of the Minnesota Transmission Owners' 2019 Biennial Transmission Projects Report*, Docket No. E002/M-19-205 (Aug. 14, 2020).

⁷³ U.S. Energy Information Administration, *Annual Energy Outlook 2017*, at 22 (available at [https://www.eia.gov/outlooks/aeo/pdf/0383\(2017\).pdf](https://www.eia.gov/outlooks/aeo/pdf/0383(2017).pdf)); NRDC Issue Paper, *Clean Energy and Efficiency Can*

Additional demand is being drive by corporate and industrial consumers, who are increasingly entering into longer power purchase agreements for renewable energy.⁷⁴

7.0 SYSTEM CAPACITY (MINN. R. 7849.0280).

Minn. R. 7849.0280 requires a CN applicant to provide information on the ability of its existing system to meet the forecasted demand. As an independent power producer, Louise Solar does not have a “system” as defined by the Rules. Accordingly, the Commission granted Louise Solar an exemption from this requirement and permitted Louise Solar to instead provide regional demand, consumption, and capacity data from credible sources to demonstrate the need for the independently produced renewable energy that will be provided by the Project. This information is provided in Section 3.0.

8.0 CONSERVATION PROGRAMS (MINN. R. 7849.0290)

The Commission granted Louise Solar an exemption from Minn. R. 7849.0290, which requires an applicant to describe its energy and conservation plans, including load management, and the effect of conservation in reducing the applicant’s need for new generation and transmission facilities.

9.0 CONSEQUENCES OF DELAY–SYSTEM (MINN. R. 7849.0300)

The Commission granted Louise Solar an exemption from Minn. R. 7849.0300, which requires the applicant to “submit data on the consequences of delay on the potential customers and the region.” Louise Solar is not a utility and has no “system” as defined by the Rules. Thus, this data requirement is inapplicable to Louise Solar and is unnecessary to determine the need for the Project. Instead, Louise Solar provides the following data on the consequences of delay to Minnesota and the region.

The primary consequences of delaying construction of the Project would be the failure to capture the investment tax credit, which allows the Project to offer even more competitive rates for its likely utility customer, which helps keep a utility’s rates low to its end use customers. As set forth in Section 4.4.3, the investment tax credit is phasing down to 26 percent for projects that begin construction in 2020, 2021 or 2022, and to 22 percent for projects that begin construction in 2023. EDFR has safe harbored equipment that will allow the Project to capture the full 30 percent investment tax credit as long as the Project is commercially operational before the end of 2023. In addition, delay negatively impacts the State’s interest in achieving its renewable energy and climate change goals as quickly as possible.

Replace Coal For a Reliable, Modern Electricity Grid (Mar. 2017) (available at <https://www.nrdc.org/sites/default/files/clean-energy-replace-coal-modern-electricity-grid-ip.pdf>).

⁷⁴ American Wind Energy Association, *Consumer demand drives record year for wind energy purchases* (Jan. 30, 2019) (available at: <https://www.awea.org/resources/news/2019/consumer-demand-drives-record-year-for-wind-energy>); *see also* Business Renewables Center, *Corporate Renewable Deals 2014-2018* (available at <https://businessrenewables.org/corporate-transactions/#wpcf7-f942-p471-o1>).

10.0 ENVIRONMENTAL INFORMATION FOR PROPOSED PROJECT AND ALTERNATIVES (MINN. R. 7849.0310)

10.1 VISUAL IMPACTS

Siting utility-scale solar projects in rural environments can change the overall aesthetics of the landscape by introducing a commercial-like facility into an otherwise agricultural setting. Similar to wind farms, solar arrays may be viewed by some as a disruption to the existing agricultural landscape, and by others as a welcomed complimentary use to farming practices (harvesting solar energy, soil resting and pollinator-friendly habitats). Consequently, aesthetics related to utility-scale solar is largely one of personal perspective and preference.

Land use in the Project Area is characterized as agricultural with more than 96% converted to row crop agriculture. Aside from agricultural fields, the landscape also supports a patchwork of woodlands, wetlands and drainages. The topography of the Project Area is generally flat with slopes ranging from 1 to 5 percent. The Project Area is surrounded by farmsteads with residences and outbuildings. Most of these farmsteads are at least partially surrounded by woodlands or shelterbelts, which fractionally prevents uninterrupted views of the surrounding landscape.

The Adams Substation is located immediately adjacent to the Project Area to the east and is not surrounded by woodlands or otherwise obstructed by vegetation or trees. Additionally, there are multiple transmission lines within or adjacent to the Project Area that interrupt natural agricultural views. At least six transmission lines extend south of the Adams Substation and even more to the north. Additional transmission lines run east and west just south of the Project area, with other lines transecting the northern portion of the Project Area. Views in the area are also naturally interrupted by Trunk Highway 56 located between the northern and southern portions of the Project, and other county and township roadways. The transmission lines, substation and surrounding roadways are the current man-made focal points, along with multiple wind turbines at several operating wind farms. Wind farms in close proximity to the Project include the Mower County Wind Energy Center directly east (~0.3-mile), the G. McNeilus Wind Farm immediately southwest (~1 mile), and Prairie Star to the north (~3.3 miles).

There are no residences or businesses within the Project Area; however, there are eleven residences and several agricultural buildings on parcels adjacent to the Project Area (see Figure 1). **Table 4** provides distances to the nearest residences to the Project, including approximate distance to the Preliminary Development Area boundary and approximate distance to the edge of preliminary solar array locations.

Table 4 Proximity of Residences to Louise Solar Facility

Residence	Distance to Development Boundary (feet)	Distance to Solar Arrays (feet) 1	Distance to Nearest Inverter (feet) 1
A	242	346	515
B	764	954	1,107

Table 4 Proximity of Residences to Louise Solar Facility

Residence	Distance to Development Boundary (feet)	Distance to Solar Arrays (feet) ¹	Distance to Nearest Inverter (feet) ¹
C	118	206	604
D	225	413	1,245
E	834	888	1,547
F	510	1,169	1,721
G	754	977	1,687
H	101	447	634
I	818	440	977
J	150	1,144	2,156
K	815	1,624	2,033
¹ Based on preliminary Project layout.			

Residence A is located adjacent to the west-central portion of the Project Area north of County Highway 56. This residence has existing vegetative screening around two sides of the farmstead, including the north and east sides adjacent to the Project.

Residence B is located adjacent to the northwestern portion of the Project Area. The residence faces east and has existing vegetative screening along the north and east sides of the property.

Residence C is located adjacent to the central portion of the Project Area. The residence is surrounded by existing vegetative screening along the sides of the farmstead.

Residence D is located adjacent to the northwest portion of the Project Area south of 150th Street. The residence is surrounded by existing vegetative screening along the sides of the farmstead.

Residence E is located adjacent to the northern portion of the Project Area north of 150th Street. The residence faces south and has existing vegetative screening along the north side of the property.

Residence F is located adjacent to the north-eastern portion of the Project Area southwest of 150th Street and 690th Avenue. The residence faces south and has existing vegetative screening along the north side of the property.

Residence G is located adjacent to the south-eastern portion of the Project Area northwest of County Highway 56 and 690th Avenue. The residence is surrounded by existing vegetative screening along the sides of the farmstead.

Residence H is located adjacent to the south-western portion of the Project Area southeast of 140th Street and 680th Avenue. The residence is surrounded by existing vegetative screening along the sides of the farmstead.

Residence I is located adjacent to the south-western portion of the Project Area south of 140th Avenue. The residence faces east and has existing vegetative screening along the west side of the property.

Residence J is located adjacent to the south-western portion of the Project Area south of 140th Avenue. The residence faces east and has existing vegetative screening along the west side of the property.

Residence K is located directly north and east of the Adams Substation, immediately south of County Highway 56, and south of the Project Area boundary. The main access to the residences faces north and is surrounded on all sides by existing vegetative screening. Aesthetics and views in and near the Project Area will be modified, however aesthetics related to utility-scale solar tends to be one of personal preference and perspective. Approximately 325 acres of agricultural land will be converted to solar panels, inverters, access roads, a Project substation, security fencing and a short 161 kV transmission line. The facilities will look somewhat different from the existing landscape. However, some of these features such as gravel roads, electric transmission and distribution lines and substations already exist on the landscape. A portion of the Preliminary Development Area will be covered with rows of solar panels as shown in Figure 1. The panels are constructed of dark, light-absorbing materials and covered with an anti-reflective coating to reduce reflection. Glint and glare from the panels are reduced by using dark colors to absorb rather than reflect light. During manufacturing, panels are coated to reduce light reflection. Typically, solar panels only reflect 2 percent of light.

It is expected that there will be minimal visual impacts from the Project and associated facilities. Locations where visual impacts may potentially be the greatest are adjacent to residences and along public roadways and trails. The solar arrays will be visible from adjacent roadways, parcels, and state trails, but given their relative low profile, and the fact they will be fenced for security, they will not be visible from significant distances. The short, 700-1,000-foot transmission line will be visible from a greater distance than the panels, but the change is likely to be barely perceptible given its short length and proximity to the Adams Substation and other existing transmission lines. Tree clearing will be avoided with equipment installation which will maintain natural visual barriers from surrounding parcels and homes. The average distance from nearby homes to sited solar **panels** based on the preliminary layout is nearly 700 feet. All of the nearest 11 residences are at least partially surrounded by natural vegetation screening, which should help block direct views of the solar facility. Louise Solar has coordinated with adjacent landowners,

and they have not expressed concerns regarding aesthetic aspects of the Project. Visual renderings showing current conditions and an additional rendering showing how the facility is anticipated to look from three separate vantage points around the Project Area are included below.

Operational lighting will be required at gates and perimeter areas as necessary for safety and security. If practicable, lighting will be motion-activated and down lit to minimize impacts and effects. Impacts to light-sensitive land uses are not anticipated given the rural Project location coupled with minimal required lighting for operations.

View 1: Existing condition looking south from State Highway 56.



View 1: Proposed condition looking south from State Highway 56.



View 2: Existing condition looking southwest from 680th Avenue.



View 2: Proposed condition looking southwest from 680th Avenue.



View 3: Existing condition looking northwest from 690th Avenue.



View 3: Proposed condition looking northwest from 690th Avenue.



10.2 WILDLIFE

Impacts to wildlife are expected to be minimal. The proposed establishment of stable, year-round herbaceous cover post-construction will likely benefit many wildlife species (e.g., ground-nesting birds, pollinators). Common species of wildlife adapted to agricultural land use may be present in the Project Area such as white-tailed deer, red fox, striped skunk, wild turkey, ring-necked pheasant, and an array of passerines, rodents, and insects. During Project construction, wildlife within the Project Area are likely to be temporarily displaced; however, as the current land use is predominately agricultural, these species would be impacted by human activity regularly. Overall, construction of the Project is expected to minimally impact wildlife or their populations. During operations, any potential impacts to wildlife are also expected to be minimal (e.g., excluding large mammals from site access from fencing). As the potential impacts to wildlife are anticipated to be minimal or temporary, no species-specific mitigation is proposed.

10.2.1 Federal and State Listed Species

Louise Solar reviewed the United States Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) database was reviewed for the potential occurrence of federally-listed species, candidate species, or designated critical habitat that may occur within or near the Project Area. Also, the MNDNR's Natural Heritage Information System was reviewed for documented occurrences of federally- or state-listed species, state Species of Concern, and rare habitats within the Project Area and within one mile of the Project Area. Although these reviews

do not represent a comprehensive survey, they provide information on the potential presence of protected species and habitat within and adjacent to the Project Area (refer to **Table 5** below).

Table 5 Federal- or state-listed species identified as potentially occurring within the Project Area, or surrounding region.

Common Name	Scientific Name	Habitat	Within 1-Mile	Within Project Area	State	Federal
Mammals						
Northern long-eared bat (NLEB)	<i>Myotis septentrionalis</i>	In winter, hibernates in caves and mines. In fall, swarms in forested areas surrounding hibernation sites. During late spring and summer, forages and roosts in upland forests (USFWS 2018b)	No	No	SC	T
Plants						
Prairie bush-clover	<i>Lespedeza leptostachya</i>	Dry to mesic tallgrass prairies with gravelly soils (USFWS 2009)	No	No	T	T
Wild Quinine	<i>Parthenium integrifolium</i>	Prairies, fields, open wooded areas, rocky woods and hillsides with dry soils (USDA 2001)	Yes	No	E	N/A

E = Endangered, T = Threatened, SC = Species of Concern

According to Louise Solar’s review of USFWS (2020) IPaC, two species that are listed as threatened or endangered under the federal Endangered Species Act (ESA) may occur within or near the Project Area: the federally-threatened northern long-eared bat (NLEB) and prairie bush clover.

10.2.1.1 Northern Long-eared Bat

The NLEB is listed as threatened under the federal ESA, due to population-level declines primarily due to a fungal infection that manifests as white-nose syndrome (WNS).

The USFWS published a final 4(d) rule for NLEB on January 14, 2016. In the Final 4(d) rule, the agency limited prohibitions for the species to those that would protect the bat in WNS-affected geographic areas during the most vulnerable stages in the species’ life history—specifically, during hibernation, spring staging, fall swarming, and pup rearing. The Project Area is located within

the USFWS- designated WNS Zone.⁷⁵ Per the USFWS' (2016a) Final 4(d) rule for NLEB, within the WNS Zone, incidental take due to tree removal is prohibited as follows:

- If it occurs within 0.25-mile (0.4 kilometer) of a documented hibernaculum. or
- If it involves a documented maternity roost tree or other trees within 150 feet (47 meters) of the documented maternity roost tree during June or July.
- In addition, all take within known hibernacula is prohibited.

The Project Area is primarily agricultural lands with only a small area of forested habitat (<1 percent); the landscape surrounding the Project Area is also dominated by agriculture. During their active season (April 1 through October 31), NLEB may roost in the trees within the Project Area.

Overall, Louise Solar does not anticipate that the Project will impact NLEB during construction or operations. There are no known hibernacula or roost trees in Mower County. Under Section 7(a)2 of the ESA, federal action agencies may rely upon the Programmatic Biological Opinion for the Final 4(d) Rule to meet Section 7 consultation responsibilities for NLEB.⁷⁶ Under the Programmatic Biological Opinion and per the guidance of the USFWS on October 8, 2020, Project proponents may use a streamlined approach involving an online NLEB 4(d) rule determination key and consultation form. The USFWS stated that if the determination was a no effect determination, that no further coordination is needed. The Louise Solar determination⁷⁷ indicated that the Project will not affect NLEB, and the Project layout has been designed to avoid the removal of trees during Project construction.

It is unlikely that the Project will impact NLEB during construction or operations. Tree clearing is not anticipated for Project construction; therefore no removal of potential roost trees is anticipated. If NLEB occur near the Project Area, they may be temporarily disturbed during construction activities that occur during the species active season (April 1 to October 31) due to human activity or noise. However, these potential impacts are likely minimal and similar to human activity that currently occurs within and near the Project Area (i.e., highway traffic and farming equipment).

10.2.1.2 Prairie Bush-Clover

The federally threatened prairie bush-clover is a tallgrass prairie endemic native to the upper Mississippi River Valley. Its current range is limited to discrete locations in Minnesota, Illinois, Iowa, and Wisconsin. Prairie bush clover occurs on dry mesic prairies with gravelly soils on north-, northeast- or northwest-facing slopes in southwestern Minnesota. Remaining occurrences of the

⁷⁵ U.S. FISH AND WILDLIFE SERV., 2018C: NORTHERN LONG-EARED BAT FINAL 4(D) RULE: WHITE-NOISE SYNDROME ZONE AROUND WNS/PD POSITIVE COUNTIES/DISTRICTS (Oct. 1, 2018), <https://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf>.

⁷⁶ U.S. FISH AND WILDLIFE SERV., PRAIRIE BUSH CLOVER (LESPEDEZA LEPTOSTACHYA) FACT SHEET (2009), <https://www.fws.gov/midwest/endangered/plants/prairiebushclover/prairieb.html>.

⁷⁷ U.S. FISH AND WILDLIFE SERV., INFORMATION FOR PLANNING AND CONSULTATION REPORT FOR LOUISE SOLAR (2020).

species are generally restricted to remnant prairies; in Minnesota, most populations occur in prairies that were formerly or are currently pasture. The primary threat to the species is habitat loss and destruction (MNDNR, 2019f; USFWS, 2009).

The Project Area is dominated by agriculture (96 percent), with some small amounts of developed areas (2.2 percent), herbaceous/hay/pasture (1.4 percent), and less than one percent of deciduous forest, barren land, and emergent herbaceous wetland. The Project footprint is designed to be sited on land currently used for agricultural purposes, (i.e., areas not suitable for prairie bush clover). Thus, prairie bush clover is not expected to be impacted by Project construction or operation. Additionally, the species was not observed during field studies conducted the week of November 2, 2020. The Native Plant Community (NPC) identified as a southern mesic prairie that is located adjacent to the Project area is not anticipated to be disturbed during Project construction or operation. There is no online determination tool for prairie bush-clover impacts.

10.2.2 State Listed Species

Based on the MNDNR Environmental Review (ER) response (#ERBD 20190287), a state-endangered plant species was documented within the southern mesic prairie NPC (determined to be a degraded prairie remnant during the November 2, 2020 site visit) that is adjacent to the Project Area. However, Project construction should not impact the NPC. Suitable habitat for the state-endangered plant species includes prairies, fields, open wooded areas, rocky forests, or hillsides, with dry, well-drained soils. Land cover within the Project Area is predominately disturbed (96 percent), with limited amounts of herbaceous (<2 percent) and forest (<1 percent) available. As the adjacent NPC is not expected to be impacted during Project construction or operation, or potentially suitable habitat within the Project Area impacted, the state-endangered plant species are not anticipated to be affected.

Louise Solar submitted a Project introduction letter to MNDNR staff in August 2020. On September 11, 2020, the MNDNR responded to Louise Solar with the following recommendations. Louise Solar's intentions regarding these comments follow in italics.

- Review the MNDNR's Commercial Solar Siting Guidance (MNDNR, 2016a) and Prairie Establishment and Maintenance Technical Guidance for Solar Project. *Louise Solar reviewed the MNDNR (2016) Commercial Solar Guidance for the Louise Solar Project.*
- MNDNR requests that infrastructure be placed sufficiently away from the Shooting Star State Trail so that it does not impact trail maintenance, typically the 10-foot paved trail and about 5 feet on either side of the trail. MNDNR prefers that crossings be directionally bored or placed overhead to avoid damage to the paved trail. *Louise Solar has designed the project to avoid placing infrastructure on or near the state trail. Any collection lines that need to cross the trail will be directionally bored, and licenses pursued from the Division of Lands and Minerals.*
- The Minnesota Biological Survey (MBS) site/remnant prairie adjacent to the Project boundary should be avoided and contains a documented state-endangered plant. If the native plant community will be disturbed, a botanical survey for the state-endangered plant

will be required. *Louise Solar is aware of this native plant community and has designed the project to avoid the resource.*

- Live mussels have been documented upstream and downstream of the proposed Project and could occur within the Project Area. None of the mussels are state- or federally-listed; however, mussels are generally uncommon and sensitive to disturbances. As such, the MNDNR recommends: Using effective erosion and sediment control. Avoid or minimize stream crossings and work instream. Use environmentally sensitive construction techniques such as directional boring or overhead lines. If boring is planned, bore pits should be placed away from the water's edge and erosion control methods should be employed to prevent excavation material from entering the water. Upon completion, pits should be filled, graded to preconstruction contours, and re-vegetated with native plant species. *As recommended by the DNR, Louise Solar intends to use effective erosion and sediment control in accordance with the Stormwater Pollution Prevention Plan (SWPPP) that will be prepared for the project and reviewed by the MPCA prior to start of construction. Bore pits will be placed away from the water's edge, and work within streams will be minimized or avoided altogether.*
- The northwest portion of the Project Area overlaps an unnamed stream (a public water) and its associated floodplain. Any work within the ordinary high water level will require a public waters work permit. It is recommended to avoid placing infrastructure in the flood zone. If work is intended to occur in this location, ensure all local floodplain requirements are met. *Louise Solar is not planning work within the unnamed Public Watercourse, and it is the intent to keep all project infrastructure outside of the floodplain.*
- A few areas within the Project Area are identified as National Wetlands Inventory (NWI) wetlands. The MNDNR recommends avoiding NWI wetlands to avoid installation and operational problems and to minimize environmental impacts. Ensure all wetland and WCA requirements are fulfilled by contacting the appropriate Wetland Conservation Act (WCA) authority. *Louise Solar intends to avoid or minimize impacts to NWI wetlands. Unavoidable impacts will be properly permitted.*
- The MNDNR recommends avoiding installing infrastructure in mapped flow paths. *Louise Solar intends to avoid installing infrastructure within mapped flow paths.*
- The MNDNR recommends using wildlife friendly fencing and erosion control, and invasive species best management practices (BMPs) due to the proximity to natural areas. *Additionally, Louise Solar will implement MNDNR guidance of wildlife-friendly fencing by installing either a 6-foot chain-link fence with top guard angled out and upward at 45 degrees with 3-4 strands of smooth wire (no barbs), or 8' chain link for security and safety purposes. At the request of MNDNR, barbed wire will not be used around the perimeter of the Project.*

10.2.3 MNDNR High Value Habitats

The MNDNR High Value Habitats (i.e., MBS sites of biodiversity significance, NPCs, et cetera.) identified within the Project Area were limited to 11 field-delineated wetlands and portions of three watercourses. The Project will use BMPs to minimize impacts to the wetlands and watercourses. No other MNDNR High Value Habitats were identified within the Project Area. The degraded prairie remnant that is located adjacent to the northern boundary of the southern portion of the Project Area will not be impacted during Project construction. As such,

permanent impacts to MNDNR High Value Habitats will be avoided and no mitigation measures are proposed.

11.0 FACILITY INFORMATION FOR PROPOSED PROJECT AND ALTERNATIVES INVOLVING CONSTRUCTION OF A LEGF (MINN. R. 7849.0320)

11.1 LAND USE AND REQUIREMENTS (MINN. R. 7849.0320(A))

The Project is located within a rural landscape, and therefore the primary land use in the Project Area is agricultural at 96.2 percent (refer to **Table 6**).⁷⁸ The remainder of the Project Area consists of developed land (2.2 percent) and a small amount of herbaceous or hay/pasture land (1.4 percent). The remaining identified land uses include deciduous forest, emergent herbaceous wetlands, barren land, and open water. In total, the remaining land uses comprise a minor 0.2% of the Project Area. Most of the agricultural land in the Project Area is subject to row-crop agriculture, such as corn and soybeans. Developed land within the Project Area generally consists of public roads, namely 680th Avenue, 690th Avenue, 140th Street and 150th Street. The small area (8.3 acres) of herbaceous/hay/pasture lands within the Project Area is associated with roadside ditches and unnamed streams. The minor amount of open water identified in the Project Area is associated with a wetland that is predominantly located outside of the Project Area.

Table 6 Land Use Within the Project Area

Land Use Type	Acres in Project Area	Percent of Total Acreage
Agricultural	590.1	96.2%
Developed	14.3	2.3%
Herbaceous/Hay/Pasture	7.2	1.2%
All other land uses	1.7	0.3%
Total	613.3	100.0%

Farmsteads are sparsely scattered outside of the Project Area, generally situated near public roads. Based on review of available aerial photography, there are 11 residences (A-K) located on parcels adjacent to the Project Area as highlighted in **Table 4**.

The Project will change the land use from agricultural to solar energy use within the Preliminary Development Area. The conversion of agricultural land to the solar facility will have a relatively minimal impact on the rural character of the surrounding area or Mower County. As discussed further in Section 4.3, Land-based Economies, of the 455,680 acres in Mower County the majority is classified as agricultural land. Impacts to 325 or less acres of agricultural land

⁷⁸ U.S. Geological Survey, National Land Cover Database (2011).

within the solar facility and transmission line footprint would reduce the amount of agricultural land in the county by less than one percent. Expected land use impacts within the Preliminary Development Area are provided in **Table 7**.

Table 7 Expected Land Use Impacts – Preliminary Development Area

Land Use Type	Acres in Project Area	Percent of Total Acreage
Agricultural	320.7	98.79%
Developed	1.8	0.55%
Herbaceous/Hay/Pasture	2.1	0.65%
All other land uses	0	0%
Total	324.6	100.0%

Normal agricultural activities can continue within portions of the Project Area not converted to solar panels, access roads, transmission and fencing. After the useful life of the Project, the current agricultural land use could be restored by removing the solar panels, short transmission line, and associated facilities.

While there is no land in the Project Area currently used as residential or commercial, land use may also be restored to these uses after the useful life of the Project. The Project is not anticipated to preclude current or planned land use on adjacent parcels; and upon decommissioning and removal of the Project, the affected parcels may be returned to the existing agricultural use or transitioned to other planned land uses.

The Project has been designed in compliance with the Mower County Comprehensive Plan (2002) and does not propose infrastructure or other construction activities in areas noted as Urban Service Management Areas or other future development areas specified in the Future Land Use Plan. Components of the Project may be located in areas where there is a planned extension of water, sewer, or other services. Construction of the Project would not preclude the future orderly extension of these services across property under Louise Solar’s control as these extensions would likely be accomplished by utilizing existing public rights-of-way which will not be impacted by the Project.

Because the Site Permit supersedes local permits, no zoning or land use permits are required for construction of the Project from Mower County or associated townships. According to Mower County zoning map data (Mower County, 2019), lands within the Project Area are zoned Agricultural. Mower County Zoning Ordinance Section 14-18.7 states that solar farms (exceeding 1 MW nameplate capacity) are allowed in the Agricultural district upon approval of a conditional use permit (CUP). Mower County Zoning Ordinance Section 14-51 states that transmission lines exceeding 35 kV must acquire a CUP prior to construction. Louise Solar will pursue a CUP from Mower County for the short transmission line prior to construction. Per the Mower County

Ordinance, the Project uses are compatible with local land use regulations for solar energy facilities and transmission lines. The County has determined that these types of land uses are acceptable in the Agricultural Zoning District upon approval of a CUP. See Sections 1.4.4.1 and 4.2.10 regarding the Site Permit and preemption of local permits and zoning.

Because no permanent land use or zoning impacts are anticipated, no additional mitigation measures are proposed beyond those described in the prepared AIMP.

11.2 TRAFFIC (MINN. R. 7849.0320(B))

The Project is located in a rural area approximately one mile east of Adams and 1.3 miles west of Taopi, Minnesota. Residences are scattered throughout the rural area where the land use is dominated by agricultural fields, predominately corn and soy. With the exception of Minnesota State Highway 56, the State Highway which bisects the northern and southern sections, roads that surround the Project Area are local county or township roads. The Project Area is bordered on the north by 150th Street, on the southwest by 680th street and 140th street, and the east by 690th street. Similarly, the Project Area is not bordered by a street on the southern edge, but the Project is bisected by 680th Street. ITC Midwest's Adams Substation, where the Project will tie into the grid, is situated immediately adjacent to the southern portion of the Project Area, with numerous existing overhead power lines terminating at the substation and partially intersecting portions of the Louise Project Area boundary. The Project and interconnection location are located on relatively flat terrain conducive to solar development.

Construction traffic will use the existing state and county roadway system to access the Project facilities and deliver construction materials and personnel. Traffic during construction is estimated to be approximately on average 50-100 pickup trucks, cars, and/or other types of employee vehicles onsite for the majority of construction. It is estimated that approximately 10-20 semi-trucks per day will be used for delivery of facility components. Semi-truck delivery will vary per day depending on time of construction and delivery timeline of equipment. For purposes of comparison, the functional capacity of a two-lane paved rural highway is in excess of 5,000 vehicles per day (AADT). Since the area roadways have AADTs that are well below capacity, this increased traffic may be perceptible to area residents, but the slight increase in volume is not expected to affect traffic function. Slow-moving construction vehicles may also cause delays on smaller roads, similar to the impact of farm equipment during planting or harvest. However, these delays should be minimal for the relatively short construction delivery period. Overweight or oversized loads are unlikely. If they are required, Louise Solar will obtain the appropriate approvals prior to construction.

After construction is complete, traffic impacts during the operations phase of the Project will be negligible. A small maintenance crew driving through the area in pickup trucks on a regular basis will monitor and maintain the facilities as needed, but traffic function will not be impacted as a result.

11.3 INFORMATION PERTAINING TO FOSSIL-FUELED ACTIVITIES (MINN. R. 7849.0320(C)–(D))

11.3.1 Fuel

The Project is not a fossil-fueled facility. The Project will be fueled by the sun.

11.3.2 Emissions

The Project is not a fossil-fueled facility and will not release any emissions from the power generation process.

Minor temporary effects on air quality are anticipated during construction of the proposed Project and associated transmission line as a result of exhaust emissions from construction equipment and other vehicles, and from fugitive dust that becomes airborne during dry periods of construction activity.

The magnitude of air emissions during construction is influenced by weather conditions and the type of construction activity. Exhaust emissions, primarily from diesel equipment, will vary with the phase of construction. Emissions from construction vehicles will be minimized by using modern equipment with lower emissions ratings. Adverse effects on the surrounding environment are expected to be negligible because of the short and intermittent nature of the emission and dust-producing construction phases.

When necessary, dust from construction traffic will be controlled using standard construction practices such as watering of exposed surfaces, covering of disturbed areas, and reduced speed limits. Emissions from construction vehicles will be minimized by keeping construction equipment in good working order. Overall, dust emissions currently experienced annually in the area through farming activities will be reduced for the life of the Project through the establishment of perennial vegetative cover.

BMPs will be used during construction and operation of the Project to minimize dust emissions if wind erosion becomes an issue. Practices may include sprinkling haul and access roads and other exposed dust producing areas, containment of excavated material, protection of exposed soil, soil stabilization, reducing speed limits within construction zones, and treating stockpiles to control fugitive dust. A SWPPP will be developed prior to construction that will include BMPs to minimize the potential for fugitive dust. Overall, dust emissions currently experienced annually in the area through farming practices are likely to be reduced through the establishment of perennial vegetative cover.

The Project will have no air emissions and will avoid emissions associated with fossil generation facilities. Louise Solar undertook analysis using U.S. Environmental Protection Agency (EPA) data for emissions and generation data for the MISO-Minnesota Zone to calculate avoided emissions related to the Project. **Table 8** provides a summary of the estimated reduction

in pollutants from the Project based on the EPA’s avoided emissions and generation tool calculator.⁷⁹

Table 8 Estimated Avoided Pollutants

Pollutant	Tons or Pounds/Year
CO ₂ E	79,608 metric tons
NOX	90,000lbs
PM2.5	Can’t find data to support
SO ₂	67,500lbs

11.4 WATER USAGE FOR ALTERNATE COOLING SYSTEMS (MINN. R. 7849.0320(E))

The Project will not use any water for alternate cooling systems. Minimal to no washing is anticipated to be needed at Project facilities due to the naturally occurring and frequent precipitation.

11.5 WATER DISCHARGES (MINN. R. 7849.0320(F))

No wastewater discharges will occur as a result of the construction or operation of the Project except for domestic-type sewage discharges of Project personnel. Temporary sanitary facilities will be provided during construction, which will be installed in accordance with applicable regulations.

Temporary dewatering may be required during construction for electrical trenches. Water may be used during construction to provide dust control and water for concrete mixes, if applicable, and other construction purposes. If temporary dewatering is required during construction activities, discharge of dewatering fluid will be conducted under the National Pollutant Discharge Elimination System (NPDES) permit program and addressed by the Project’s SWPPP as required.

11.6 RADIOACTIVE RELEASES AND WASTE (MINN. R. 7849.0320(G))

The Project will not generate any radioactive or solid waste under normal operating procedures. No parts require greasing or oiling on a regular basis.

11.7 SOLID WASTE (MINN. R. 7849.0320(H))

The Project is not expected to generate significant quantities of solid waste during operation. The Project may require use of certain petroleum products such as gear box oil, hydraulic fluid, and gear grease. These materials will be recycled or otherwise stored and disposed of in accordance with applicable State and Federal regulations. These materials will also be stored, recycled, and/or disposed of in accordance with applicable local, State, and Federal regulations.

⁷⁹ Located at <https://www.epa.gov/statelocalenergy/avoided-emissions-and-generation-tool-avert>.

11.8 NOISE (MINN. R. 7849.0320(I))

Noise is defined as unwanted sound. It may be made up of a variety of sounds of different intensities, across the entire frequency spectrum. Noise is measured in units of decibels (dB) on a logarithmic scale. Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies are given more “weight.” The A-weighted scale (dB(A)) is used to reflect the selective sensitivity of human hearing. This scale puts more weight on the range of frequencies that the average human ear perceives, and less weight on those that we do not hear as well, such as very high and very low frequencies.

Common sound sources within an agricultural and/or rural environment include, but are not limited to, sound from farm equipment such as tractors and combines, sound generated from traffic on roadways, sounds from birds, and wind rustling through the vegetation. Typically, the ambient acoustic environment of a rural or agriculturally-oriented community has equivalent continuous sound levels (Leq, which is an energy-based time-averaged noise level) ranging from 30 dB(A) to 60 dB(A).

The background noise in the vicinity of the Project facilities is typically a result of farming equipment/operations, wind, and vehicles. A comparison of typical noise-generating sources is outlined in **Table 9**.

Table 9 Common Noise Sources

Sound Pressure Level (dBA)	Common Noise Source
140	Jet Engine (at 25 meters)
130	Jet Aircraft (at 100 meters)
120	Rock and Roll Concert
110	Pneumatic Chipper
100	Jointer/Planer
90	Chainsaw
80	Heavy Truck Traffic
70	Business Office
60	Conversational Speech
50	Library
40	Bedroom
30	Secluded Woods
20	Whisper

Source: MPCA, 2008

The MPCA has the authority to adopt noise standards pursuant to Minnesota Statutes §116.07, subd. 2. The adopted standards are set forth in Minnesota Rules Chapter 7030. The MPCA standards require A-weighted noise measurements. Different standards are specified for daytime (7:00 AM to 10:00 PM) and nighttime (10:00 PM to 7:00 AM) hours. The noise standards specify the maximum allowable noise volumes that may not be exceeded for more than 10 percent

of any hour (L10) and 50 percent of any hour (L50). The Project Area is considered a Noise Classification Area 1 (NAC 1) with daytime noise allowances of 60 decibels (dBA) and nighttime noise allowances of 50 dBA according to the Minnesota Statutes §116.07 and Minnesota Rules Chapter 7030 noise ordinance. **Table 10** indicates the MPCA state noise standards.

Table 10 MPCA State Noise Standards - Hourly A-Weighted Decibels

Noise Area Classification	Daytime (7:00 a.m. – 10:00 p.m.)		Nighttime (10:00 p.m. – 10:00 a.m.)	
	L10	L50	L10	L50
1 – Residential	65	60	55	50
2 – Commercial	70	65	70	65
3 – Industrial	80	75	80	75

Source: Minn. R. §7030.0040

During construction, noise will be emitted by the construction vehicles and equipment, including pile drivers for installation of piers. The amount of noise will vary based on what type of construction is occurring at the Project on a given day. These noise impacts will be temporary and limited to daytime hours. Construction associated noise will likely be perceptible at adjacent residences although none are located within the Project Area. Noise will be generated from construction equipment such as bulldozers, bobcats, and scrapers.

Table 1: Typical Sound Levels from Construction Equipment

Equipment	Max Sound Pressure Level at 25 meters (82 feet) dBA	Max Sound Pressure Level at 15 meters (50 feet) dBA
Excavator	76	85
Dozer	76	85
Grade	76	85
Roller	76	85
Dump Truck	75	84
Concrete Mixing Truck	76	85
Concrete Pumper Truck	73	82
Man-lift	76	85
Flatbed Truck	75	84
Large Crane	76	85
Small Crane	74	83
Trencher	72	83
Compactor	69	80
Forklift	75	85
Boom Truck	75	84
Small Pile Driver	73	84

Source: Federal Highway Administration Construction Handbook, 2017.

According to the Federal Highway Administration Construction Handbook, 2017, the majority of the construction equipment that could be used on the site is anticipated to generate noise between 72-85 dBA. (See **Table 11.**) Sound levels from grading equipment are not dissimilar from the typical tractors and larger trucks used in agricultural communities during harvest. The Applicant anticipates impact driving of the pilings to be the most significant source of construction

noise at roughly 101 dBA at 50 feet.⁸⁰ The noise from construction activities would dissipate with distance and be audible at varying decibels, depending on the locations of the equipment and receptor. The average distance from area homes to the proposed Project solar arrays is roughly 700 feet. Construction activities will likely be sequenced across the Project, with site preparation occurring at some array locations and pile driving at others. Additionally, construction and staging activities are scheduled to occur during daytime hours.

The main sources of noise from the Project during operation will be from the inverters and the Project substation transformer, although some minor noise may be generated from the short transmission line in the form of corona (crackling) or from wind blowing through the conductors and structures. All electrical equipment will be designed to National Electrical Manufacturer Association Standards. The Applicant plans to use SMA Solar Technology, or equivalent, inverters, which were modeled for the Project.

The Applicant conducted a noise propagation and modeling assessment for the proposed inverters and proposed Project substation transformer (Refer to Site Permit Application, Appendix G). Predicted noise levels were determined using Cadna-A noise propagation and modeling software. The Applicant modeled the distance from the noise generation sources until rural background noise levels of 40 dBA were reestablished. Rural background noise levels are congruent with the ANSI S12.9-13/Part 3 Category 6: Very Quiet Rural Residential with a typical daytime ambient noise level of approximately 40.0 dBA.

According to provided SMA Solar Technology inverter specifications, the step up location inverters are expected to produce approximately 67 dBA at 1 meter from the noise source during peak production. The main power transformer located at the proposed Project substation is expected to produce approximately 95 dBA at 1 meter from the power source.

Predicted noise levels were determined using an aggregate of output levels from the inverter skid transformers and inverters. Based on the modeling, the inverter skid locations throughout the Project Area reestablished typical rural background sound levels of 40.0 dBA on an average of 9.08 meters (29.8 feet) from the location centers.

The transformer within the Project substation located on the southeast portion of the Project Area reestablished rural background sound levels of 40.0 dBA on an average of 86.8 meters (284.85 ft) from the transformer center. The modeled noise impacts on the eastern transformer boundary are 40.4 dBA and are not expected to impact the surrounding area.

Construction noise will be temporary in duration, limited to daytime hours and relatively minimal, and will return to background levels of 40 dBA during the day and 34 dBA at night once construction is finalized. The nearest noise receptor is Residence C, situated approximately 206 feet from the nearest solar array. Noise levels modeled at the receptors were at or below the ANSI s12.3/Part 3 Category 6: Very Quiet Rural Residential with a typical daytime ambient noise level of approximately 40.0 dBA. Receptors G, H, and I, were modeled with impacts above the

⁸⁰ U.S. DEP'T OF TRANSP., FEDERAL HIGHWAY ADMINISTRATION CONSTRUCTION NOISE HANDBOOK (2017), https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm.

established ambient levels of 1.5 dBA, 8.5 dBA, and 0.5 dBA, respectively. However, these levels were not significant enough to create a noise environment over 40 dBA during the day and 34 dBA at night, well within the state's noise standards of 60 and 50 dBA. On average, homes are more than 700 feet away from the proposed arrays. During construction, the Applicant plans to limit construction to daylight hours. Equipment used for construction will be in good working condition and properly muffled to reduce sound generation to the greatest extent practicable.

The main source of noise from the Project during operation will be from the inverters, which includes the air conditioners housed in each, and to a lesser extent from the transformers and rotation of the tracking system. All electrical equipment will be designed to National Electrical Manufacturer Association Standards. Project noise modeling of proposed Project inverter and substation equipment determined that ambient levels were generally reestablished within the Project boundary, and therefore no increased sound levels are expected outside the Project Area or at nearby occupied dwellings. Additionally, any minor corona or wind-related noise from the short transmission line is not expected to be heard at nearby residences given the closest is well over 1,000 feet away and separated from the transmission line by a row of mature trees. Because no noise impacts from operation of the solar Project are expected, no additional mitigation is proposed.

During construction, Louise Solar plans to limit construction to daylight hours. No noise impacts are anticipated during operation; therefore, no mitigation measures are proposed.

11.9 CONSTRUCTION AND OPERATION WORK FORCE (MINN. R. 7849.0320(J))

The Project will create approximately 350-400 jobs during the construction and installation phases, and up to 21 indirect and 2 full time permanent jobs during the operations phase. Additionally, non-construction jobs such as engineering and surveying will be needed prior to and during construction. Louise Solar used the National Renewable Energy Laboratory's Jobs and Economic Development Impacts PV tool⁸¹ to calculate jobs associated with the design construction and installation of the Project.

11.10 LOUISE SOLAR WILL MANAGE THE OVERALL OPERATIONS AND MAINTENANCE OF THE PROJECT.

Louise Solar anticipates having an operations agreement with another entity for performance of BOP O&M. The BOP O&M provider will be an experienced third party. Louise Solar and its O&M contractors will hire employees or other appropriate contractors to complete operations and maintenance tasks.

11.11 NUMBER AND SIZE OF TRANSMISSION FACILITIES (MINN. R. 7849.0320(K))

Electrical wiring will connect the panels to inverters, inverters will transform the power from DC to AC current. Underground 34.5 kV collector lines from the Project will deliver solar generated energy to the Project substation. The collector system voltage will then be stepped up

⁸¹ <https://jedi.nrel.gov/>.

from 34.5 kV to 161 kV and transmitted to the Adams Substation via a short (approximate 700-1,000-foot) Project transmission line.

The interconnection details will be determined as a result of studies, discussions, and agreements with MISO. Access to transmission facilities beyond interconnection will be arranged by the entity or entities purchasing the Project’s energy output and will depend on the buyer and the ultimate destination for the energy output.

12.0 OTHER FILINGS AND PERMITS

12.1 ENVIRONMENTAL REPORT

Pursuant to Minn. R. 7849.1000–.2100, the Department of Commerce is required to prepare an Environmental Report for any large energy facility for which a CN must be obtained.

12.2 SITE PERMIT

Louise Solar will also submit to the Commission a Site Permit application pursuant to the Minnesota Power Plant Siting Act (Minnesota Statutes Chapter 216E) and Minnesota Administrative Rules Chapter 7850.

12.3 OTHER PROJECT PERMITS

Project permits and approvals that may be necessary to complete the Project are listed in **Table 12**. Louise Solar will obtain these approvals, as necessary, prior to Project construction.

Table 12: Project Permits and Approvals

Agency	Permit	Applicability	Permit Status and Timing
Federal			
US Army Corp of Engineers	Section 404 Permit for wetland impacts.	Dredging or filling jurisdictional waters of the United States (wetlands/waterways)	To be obtained prior to construction, as needed
U.S. Environmental Protection Agency	Spill Prevention, Control, and Countermeasures Plan	Required if any facility associated with the Project (O&M or substation) has oil storage of more than 1,320 gallons	To be obtained prior to construction, as needed
State			

Agency	Permit	Applicability	Permit Status and Timing
Minnesota Public Utilities Commission	Certificate of Need	Required for LEGFs (electric power generating plant or combination of plants at a single site with combined capacity of 50 MWs or more and transmission lines directly associated with the plant that are necessary to interconnect the plant to the transmission system).	To be obtained prior to construction and filed concurrent with Site Permit Application.
	Site Permit	Construction of energy conversion facility	To be obtained prior to construction
Minnesota Pollution Control Agency	Section 401 Certification	Required for filling in jurisdictional waters of the United States and if a Section 404 permit is required from the U.S. Army Corps of Engineers	To be obtained prior to construction, as needed
	NPDES General Permit (includes SWPPP)	For stormwater discharges from construction activities with disturbances greater than one acre	To be obtained prior to construction
Minnesota Department of Health	Well construction permit	Required for installation of a well	To be obtained prior to construction of low-volume well at O&M facility, as needed
Minnesota Department of Labor and Industry	Request for Electrical Inspection	Required to comply with the state electrical code	Inspection to be conducted during construction and prior to operation.
Minnesota Department of Transportation (MnDOT)	Application for Utility Accommodation on Trunk Highway Right-of-Way	Installing utilities along, across or within trunk highway right-of-way.	To be obtained prior to construction, as needed.
	Access (Driveway) Permit	Required for construction of a driveway/access road utilizing MnDOT rights-of-way.	To be obtained prior to construction, as needed.
	Oversize/Overweight Permit	Vehicles delivering equipment, materials and supplies that exceed applicable MnDOT height/length limits and weight limits.	To be obtained prior to equipment deliveries, as needed.

Agency	Permit	Applicability	Permit Status and Timing
Minnesota Department of Natural Resources	Water Appropriation/Dewatering Permit	Required for all users withdrawing more than 10,000 gallons of water per day or 1 million gallons per year (dewatering)	To be obtained prior to construction, if necessary.
MNDNR Division of Lands & Minerals	Utility Crossing License	Required to cross state land with utility infrastructure	To be obtained prior to construction, as needed
Minnesota State Historic Preservation Office	Cultural and Historic Resources Review; State and National Register of Historic Sites Review	Projects that require State permits of affect State register properties, or require Section 106 compliance.	Obtain concurrence on Phase I inventory prior to construction.
County/Local			
Mower County	Conditional Use Permit	Required for construction of solar energy facility or transmission line (greater than 35 kV) in Mower County	A state site permit for “large energy facilities,” including transmission lines, preempts local zoning, building codes and land use rules put forth by counties, townships, and other special purpose governments.
	Septic System Permit	Required prior to installation of any septic system in Mower County	To be obtained prior to construction, as needed.
	Moving Permit	Required for transporting oversized and overweight loads on County roadways.	To be obtained prior to construction, as needed
	Application for Driveway/Entrance	Required to work and place facilities within public road right-of-way	To be obtained prior to construction, as needed.
	Excavation and/or obstruction permit	Required to work and place facilities within public road right-of-way	To be obtained prior to construction, as needed.
Mower County Soil and Water Conservation District	Minnesota Wetland Construction Act Approval	Activities affecting water resources	To be obtained prior to construction, as needed