HAYWARD SOLAR PROJECT

Application to the Minnesota Public Utilities Commission for a Certificate of Need for a Large Electric Generating Facility

MPUC Docket No. IP-7053/CN-21-112
May 5, 2021

Application to the Minnesota Public Utilities Commission for a Certificate of Need for the up to 150 MW Hayward Solar Large Electric Generating Facility

Hayward Solar Project

Freeborn County, Minnesota

MPUC Docket Number: IP-7053/CN-21-112

Prepared for:

Hayward Solar LLC
8800 N. Gainey Center Dr., Suite 250
Scottsdale, AZ 85258

Prepared by:

Fredrikson & Byron, P.A.
200 South Sixth Street, Suite 4000
Minneapolis, MN 55402

May 5, 2021

Project Name:	Hayward Solar Project
Project Location:	Freeborn County, MN
Applicant:	Hayward Solar LLC

Authorized Representative:	Mike Roth, Director, Strategic Development & Acquisitions
Signature:	
Company:	Tenaska, Inc.
Address:	14302 FNB Parkway, Omaha, NE 68154-5212
Phone:	(402) 938-1634
Fax:	(402) 691-9530
Email:	mroth@tenaska.com

Authorized Representative:	Aron Branam, Vice President of Development & Construction
Signature:	Aron Branam Aron Branam (May 4, 2021 14:15 PDT)
Company:	Arevon Energy, Inc.
Address:	8800 N. Gainey Center Drive, Ste 250, Scottsdale, AZ 85258
Phone:	(480) 389-0785
Email:	abranam@arevonenergy.com

Preparer of Application:	Jeremy P. Duehr
Signature:	***/s/ Jeremy P. Duehr***
Company:	Fredrikson & Byron, P.A.
Address:	200 South Sixth Street, Suite 4000, Minneapolis, MN 55402
Phone:	(612) 492-7413
Fax:	(612) 492-7077
Email:	jduehr@fredlaw.com

TABLE OF CONTENTS

Images:

Tables:

List of Appendices:

List of Figures:

ACRONYMS

AADT	Annual Average Daily Traffic
AC	Alternating current
ACE	Affordable Clean Energy
AIMP	Agricultural Impact Mitigation Plan
Applicant or Hayward Solar	Hayward Solar LLC
Arevon	Arevon Energy Management
BMPs	Best Management Practices
BOP	Balance of Plant
C&I	Commercial and Industrial
CD Fund VII	CD Clean Energy and Infrastructure VII JV, LLC
CN	Certificate of Need
CN Application	Hayward Solar Project CN Application
Commission	Minnesota Public Utilities Commission
CO_2	Carbon Dioxide
CPP	Clean Power Plan
CR	County Road
dBA	The dBA scale is A-weighted decibels
DC	Direct current
DOC-EERA	Department of Commerce, Energy Environmental Review and Analysis
EIA	U.S. Energy Information Administration
EPA	U.S. Environmental Protection Agency
EPC	Engineering, Procurement and Construction
Exemption Request	Hayward Solar's Request for Exemption from Certain Certificate of Need Application Content Requirements
FAA	Federal Aviation Administration
GHG	Greenhouse gas
GIA	Generator Interconnection Agreement
Hayward Solar Project or Project	Hayward Solar Farm
HVTL	High Voltage Transmission Line
IRPs	Integrated Resource Plans
IPaC	Information for Planning and Conservation
IPP	Independent power producer
ITC	Investment Tax Credit

JEDI	Jobs and Economic Development Impacts
kV	Kilovolt
kVA	Kilovolt-ampere
kW	Kilowatt
kWh	Kilowatt hour
Land Control Area	The land under a purchase option between the landowner and Hayward Solar
LEGF	Large Electric Generating Facility
LEPGP	Large Electric Power Generating Plant
LHVTL	Large High Voltage Transmission Line
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
Minn. R.	Minnesota Rules
Minn. Stat.	Minnesota Statutes
MISO	Midcontinent Independent System Operator
MNDNR	Minnesota Department of Natural Resources
MNDOT	Minnesota Department of Transportation's
MPCA	Minnesota Pollution Control Agency
MTO	Minnesota Transmission Owners
MW	Megawatt
MWh	Megawatt hour
NHIS	Natural Heritage Information System
NLEB	Northern Long-eared Bat
NPDES	National Pollutant Discharge Elimination System
NREL	National Renewable Energy Laboratory
O&M	Operations and Maintenance
POI	Point of interconnection
PPA	Power Purchase Agreement
Preliminary Development Area	That portion of the Land Control Area currently anticipated to be occupied by the Project
Project Area	Approximate 1,958-acre area containing the Project, including the transmission line and interconnection facilities
Project Gen-Tie Line	The short 200-300-foot-long 161 kV overhead electrical transmission line that will connect the Project Substation to the SMMPA Switchyard
Project Substation	The new substation constructed to facilitate all power generated from the Project.
PV	Photovoltaic

RECs	Renewable Energy Credits
RES	Renewable Energy Standards
RFP	Request for Proposal
SCADA	Supervisory Control and Data Acquisition
SES	Solar Energy Standards
SHPO	Minnesota State Historic Preservation Office
S-RECs	Solar Renewable Energy Credits
SMMPA	Southern Minnesota Municipal Power Agency
SMMPA Line Tap	The 750 – 900 foot long 161 kV overhead electrical transmission line that will connect the SMMPA Switchyard to the SMMPA Hayward-Murphy Creek 161 kV HVTL.
SMMPA Switchyard	The new switchyard to be permitted, constructed, owned and operated by SMMPA.
SP	Site Permit
SP Application	Hayward Solar Project's Site Permit Application
SWPPP	Storm Water Pollution Prevention Plan
TWh	Terawatt hours
U.S.	United States
USACE	U.S. Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
VMP	Vegetation Management Plan
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	Yes
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	Yes
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	Yes-partial[1]
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

[1] The Commission granted a partial exemption to limit its discussion to only renewable alternatives.

Minnesota Rule	Required Information	Application Section(s)	Exemption Granted
Subp. 2(B)	Additional Considerations – Promotional activities that may have given rise to the demand for the facility	3.2.2	Yes
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[2]
B(2)	Discussion of Alternatives – Increased efficiency of existing facilities	5.2.1.2	Yes[2]
B(3)	Discussion of Alternatives – New transmission lines	5.2.1.3	Yes[2]
B(4)	Discussion of Alternatives – New generating facilities of a different size and energy resource	5.2.1.4-10	Yes – partial[3]
B(5)	Discussion of Alternatives – Reasonable combination of alternatives	5.2.1.10	Yes[2]
C	Proposed Facility and Alternatives	5.3	
C(1)	Capacity cost in current dollars per kilowatt	5.3.1	Yes – partial[1]
C(2)	Service life	5.3.2	Yes – partial[1]
C(3)	Estimated average annual availability	5.3.3	Yes – partial[1]
C(4)	Fuel costs in current dollars per kilowatt hour	5.3.4	Yes – partial[1]
C(5)	Variable operating and maintenance costs in current dollars per kilowatt hour	5.3.5	Yes – partial[1]
C(6)	Total cost in current dollars of a kilowatt hour provided by it	5.3.6, Appendix A	Yes – partial[1]

[2] However, if a PPA is executed prior to CN Application submittal or during the pendency of the CN proceeding, the exemption is conditioned upon Hayward providing equivalent data from any purchaser(s) of the output.

[3] The Commission granted a partial exemption, exempting Hayward from discussing any alternative generating facilities of a different size or using an energy source other than renewable alternatives. However, if a PPA is executed prior to application submittal or during the pendency of the CN proceeding, the exemption is conditioned upon Hayward providing equivalent data from any purchaser(s) of the output.

Minnesota Rule	Required Information	Application Section(s)	Exemption Granted
C(7)	Estimate of its effect on rates system-wide and in Minnesota	5.3.7	Yes[4]
C(8)	Efficiency, expressed for a generating facility as the estimated heat rate	5.3.8	Yes – partial[1]
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[1]
D	System Map	5.4	Yes[5]
E	Other relevant information about the facility and alternatives that may be relevant to a determination of need	-	No
7849.0270	**Peak Demand and Annual Consumption Forecast**		Yes[3]
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
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[3]
7849.0290	**Conservation Programs**	8.0	Yes
7849.0300	**Consequences of Delay**	9.0	Yes[6]
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**	10-11	
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

[4] However, if a PPA is executed prior to CN Application submittal or during the pendency of the CN proceeding, the exemption is conditioned upon Hayward providing equivalent data from any purchaser(s) of the output if the purchaser has a system as defined by Minn. R. part 7849.0010, subp. 29.

[5] The Commission granted an exemption and instead required Hayward to provide a map showing the site of the Project and its location relative to the power grid. However, if a PPA is executed prior to CN Application submittal or during the pendency of the CN proceeding, the exemption is conditioned upon Hayward providing equivalent data from any purchaser(s) of the output if the purchaser has a system as defined by Minn. R. part 7849.0010, subp. 29.

[6] The Commission granted an exemption and instead required Hayward to provide data regarding the consequences of delay on its potential customers and the region.

Minnesota Rule	Required Information	Application Section(s)	Exemption Granted
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[3]

HAYWARD SOLAR PROJECT

1.0 EXECUTIVE SUMMARY

Hayward Solar LLC (Hayward Solar or Applicant), a Delaware limited liability company and a wholly owned indirect subsidiary of CD Clean Energy and Infrastructure VII JV, LLC (CD Fund VII), submits this Certificate of Need (CN) Application (CN Application) to the Minnesota Public Utilities Commission (Commission), pursuant to and in accordance with Minn. Stat. § 216B.243 and Minn. R. Ch. 7849. Hayward Solar respectfully requests that the Commission issue a CN for the Hayward Solar Project (Hayward Solar Project or Project), a solar energy generating facility and associated systems with an up to 150-megawatt (MW) alternating current (AC) nameplate capacity, planned to be located in Hayward Township, Freeborn County, Minnesota (**Figure 1**). The overall Project, including transmission line interconnection facilities, are proposed within an approximate 1,958-acre area (Project Area) and the Project would connect to the existing Southern Minnesota Municipal Power Agency (SMMPA) Hayward-Murphy Creek 161 kilovolt (kV) high voltage transmission line (HVTL) that transects the Project boundary (see **Figures 1 & 2**).

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. Hayward Solar is also applying for a Site Permit (SP Application) pursuant to the Minnesota Power Plant Siting Act (Minn. Stat. § 216E) and Minn. R. Ch. 7850 (MPUC Docket No. IP-7053/GS-21-113).

2.0 INTRODUCTION

2.1 THE HAYWARD SOLAR PROJECT

Hayward Solar is an independent power producer (IPP) that proposes to construct and operate the Project at a site within Hayward Township, Freeborn County, Minnesota (**Figure 1**). Hayward Solar has secured site control for the entire proposed Project via lease option agreements and a purchase agreement (for the proposed new switchyard site). The final Project design is expected to occupy approximately 1,272 acres (**Preliminary Development Area – Figure 2**), within the overall 1,958-acre Project Area (**Figure 1**). As design and engineering is not yet completed for the Project, the excess acreage between the Preliminary Development Area and Project Area allows for planned buffers and flexibility in overall final Project design. The total nameplate capacity for the proposed Project is up to 150 MW AC.

The Project will be comprised of photovoltaic (PV) solar panels/arrays, linear axis tracking rack system, inverters, fencing (around Project facilities), step-up transformers, power transformers, electrical wiring, access roads, Project substation, Operations and Maintenance (O&M) building, switchyard, below-ground or above-ground electrical collection and communication lines, parking areas, up to ten weather stations, 161-kV overhead gen-tie transmission line, a Supervisory Control and Data Acquisition (SCADA) systems, switchgear,

metering equipment, stormwater collection ponds, temporary laydown areas (*see* **Figure 3**), and other ancillary equipment or buildings typical of a utility-scale solar facility.

The current Project design proposes connecting the proposed Project to the electrical grid on the existing SMMPA Hayward-Murphy Creek 161 kV HVTL. All electricity generated by the Project will be routed to a new Project substation (Project Substation) via underground collector cables. The Project Substation will be connected to SMMPA's new switchyard (SMMPA Switchyard) using a short 200-300-foot-long 161 kV overhead electrical transmission line (Project Gen-Tie Line) (Figures 3 & 4). The new SMMPA Switchyard will contain switching gear/meter (which will be the point of interconnection [POI]) and connect to the existing SMMPA Hayward-Murphy Creek 161 kV HVTL via a 750 – 900 foot long 161 kV overhead electrical transmission line (SMMPA Line Tap). The Project Substation and Project Gen-Tie Line will be permitted by Hayward Solar via the site permit to be issued by the Commission and constructed, owned and operated by Hayward Solar. The SMMPA Switchyard and SMMPA Line Tap will be permitted, constructed, owned and operated by SMMPA. No transmission infrastructure exceeding the voltage and length requirements of a "large energy facility" under Minnesota Statutes §216B.2421, Subd. 1, are proposed for the Project. Therefore, the proposed Project will not trigger the need for a separate Route Permit or CN from the Commission for planned Project interconnection facilities. As such, the Project also does not require a separate notice plan as defined in Minn. R. 7829.2550, which is required for a HVTL that requires a CN. Hayward Solar plans to construct the Project on a schedule that facilitates an in-service date in 2023.

The Midcontinent Independent System Operator (MISO) interconnection request for the Project is in the 2019 queue. Hayward Solar anticipates executing a Generator Interconnection Agreement (GIA) with MISO in the 1st quarter 2022. This interconnection will provide sufficient outlet to accommodate all of the solar energy generation from the Project.

The Project falls within the definition of a Large Electric Power Generating Plant (LEPGP) in the Power Plant Siting Act and, thus, requires a Site Permit (SP) from the Commission prior to construction. Hayward Solar submitted a request to the Minnesota Department of Commerce, Environmental Review Analysis (DOC-EERA) for a size determination on December 7, 2020 in accordance with Minn. Stat. § 216E.021. The size determination response from DOC-EERA was issued on December 29, 2020. Hayward Solar plans to file a large electric power generating plant SP application for the Project in Docket No. IP-7053/GS-21-113. Minn. R. Ch. 7850 provides for three different procedures for obtaining a SP: full review, alternative review, and local review. In accordance with Minnesota Statute 216E.04, Subd. 2(8), Hayward Solar is seeking approval of its SP application under the alternative review process provided for under Minn. Stat. §216E.04, Subd. 2(8) and Minn. R. 7850.2800-7850.3900. Hayward Solar filed a Notice of Intent to Submit a Site Permit Application under the Alternative Permitting Process to the Commission on April 13, 2021.[7] The SP is the only site approval needed for construction of the Project (Minn. Stat. § 216E.10, subd. 1.). The SP supersedes and preempts all zoning, building, or land use rules, regulations, or ordinances promulgated by regional, county, local and special purpose government.

[7] *See* Notice of Intent to Submit a Site Permit Application under the Alternative Permitting Process (April 13, 2021), MPUC Docket No. IP-7053/GS-21-113 (eDocket ID. No. 20214-172854-01).

2.2 APPLICANT INFORMATION

Hayward Solar is an independent power producer; it is a Delaware limited liability company and a wholly owned indirect subsidiary of CD Fund VII, a clean energy infrastructure fund.

Arevon Energy Management (Arevon) is an affiliate of CD Fund VII with the mandate to oversee the development and energy products marketing while Arevon Asset Management is another affiliate of CD Fund VII that oversees financial and operational asset management; both are focused on providing highly specialized services to ensure portfolio growth.

Tenaska, an energy development company with headquarters in Omaha, Nebraska is providing development services to Arevon for the Project. Tenaska is one of the leading independent power producers in the United States (U.S.) and has developed approximately 10,000 megawatts of natural gas-fueled and renewable power generation with its affiliates. Tenaska, alongside Arevon, will be overseeing development of the Project.

2.3 PROJECT CONTACTS

Aron Branam, Vice President of Development & Construction
Arevon Energy, Inc.
8800 N. Gainey Center Drive, Ste 250,
Scottsdale, AZ 85258
(480) 389-0785
abranam@arevonenergy.com

Mike Roth, Director, Strategic Development & Acquisitions
Tenaska, Inc.
14302 FNB Parkway, Omaha, NE 68154-5212
(402) 938-1634
mroth@tenaska.com

Jeremy P. Duehr (#0391808)
Fredrikson & Byron, P.A.
200 South Sixth Street, Suite 4000
Minneapolis, Minnesota 55402-1425
(612) 492-7413
jduehr@fredlaw.com

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 an up to 150 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[8]
Due with CN Application	$4,375.00
Due 45 days after CN Application submittal date	$4,375.00
Due 90 days after CN Application submittal date	$4,375.00
Due 135 days after CN Application submittal date	$4,375.00
Total Calculated Fee	$17,500.00

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 February 5, 2021 Hayward Solar submitted a Request for Exemption from Certain Certificate of Need Application Content Requirements (Exemption Request)[9]. In its Exemption Request, Hayward Solar requested that the Commission grant its exemptions for an up to 150 MW project, 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 Renewable Energy Standard (RES) or the Solar Energy Standards (SES) requirements set forth in Minn. Stat. § 216B.1691, or other clean energy standards.

On March 24, 2021, the Commission issued an order granting Hayward Solar the exemptions it requested in its Exemption Request, consistent with the recommendations filed by the Department of Commerce, Division of Energy Resources.[10] Where appropriate in this CN Application, Hayward 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

Hayward Solar is proposing to construct this facility to generate and sell energy, capacity and renewable energy credits, either bundled or unbundled, to one or more electric utilities and/or commercial customers. Hayward Solar is working towards securing a Power Purchase Agreement

[8] The Fee is calculated to be $10,000.00 + ($50.00 * 150 MW) = $17,500

[9] Request for Exemption from Certain Certificate of Need Application Content Requirements (February 5, 2021), MPUC Docket No. IP-7053/CN-21-112 (eDocket ID No. 20212-170740-01).

[10] Order (March 24, 2021), MPUC Docket No. IP-7053/CN-21-112 (eDocket ID No. 20213-172146-01).

(PPA) or other enforceable mechanism to sell the electricity generated by the Project. The power generated by the Project will be offered for sale to wholesale customers, including Minnesota utilities and cooperatives that have identified a need for additional renewable energy and capacity, and commercial and industrial (C&I) customers that have set clean energy goals; or the Project could be owned directly by a utility. As an independent power producer, Hayward Solar is not limited to the needs of one region and is able to bid into multiple wholesale markets across the country. 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 up to 150 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 solar PV in Minnesota has increased rapidly in recent years.[11] According to the Minnesota Department of Commerce's most recent Energy Policy and Conservation Quadrennial Report, Minnesota solar capacity grew rapidly in 2017, adding 403 MW AC of capacity compared to 170 MW AC in 2016, and increased by 287 MW AC in 2018 and 152 MW AC in 2019.[12] According to the 2020 Quad Report, preliminary data from Xcel Energy shows that developers added 140 MW AC of community solar gardens for a total of more than 1,200 MW AC as of December 2020 (based on preliminary estimates).[13] Solar electricity accounted for nearly 3% of electricity generated within Minnesota in 2020.[14] As Minnesota's utilities strive to achieve ambitious renewable energy targets, "aggressive renewable additions"[15] 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 reduction goals of any utility in the U.S."[16] 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.[17]

---

[11] Minnesota Department of Commerce, Energy Policy and Conservation Quadrennial Report 2020 at 9 (March 1, 2021), https://mn.gov/commerce-stat/pdfs/20210301_quad_report.pdf (hereinafter, the "2020 Quad Report").

[12] 2020 Quad Report at 133-134.

[13] 2020 Quad Report at 134.

[14] 2020 Quad Report at 133.

[15] Xcel Energy, Upper Midwest Integrated Resource Plan 2020-2034 (July 1, 2019), available at https://www.xcelenergy.com/staticfiles/xe-responsive/Company/Rates%20&%20Regulations/The-Resource-PlanNo-Appendices.pdf.

[16] *Id.*

[17] Xcel Energy, 2020-2034 Upper Midwest Integrated Resource Plan Supplement (June 30, 2020), Docket No. E002/RP-19-368, available at https://www.xcelenergy.com/staticfiles/xe-responsive/Company/Rates%20&%20Regulations/Resource%20Plans/Upper-Midwest-Energy-Plan-Supplement-063020.PDF.

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.[18] Likewise, SMMPA announced its plan for a 90 percent reduction in carbon dioxide (CO_2) emissions from 2005 levels and 80 percent carbon-free energy on an annual basis in 2030.[19] Additionally, the Minnesota Transmission Owners' Biennial Transmission Report's compliance filing outlines gaps between existing and planned transmission lines and the transmission system that will be required to meet the companies' publicly stated clean energy goals, which include the following:

- Dairyland Power Cooperative is transitioning to a more diverse generation portfolio, with carbon reduction and system reliability 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.[20]

Hayward Solar is well-positioned to help meet the renewable resource needs of Minnesota's electric utilities.

Beyond aiding with utility compliance towards voluntary renewable commitments and Minnesota's existing renewable energy standards, Hayward Solar can also help meet other state policies and goals. For example, Minn. Stat. § 216C.05 identifies energy planning and policy goals that include "the development and use of renewable energy resources wherever possible."[21] In addition, Minn. Stat. § 216H.02 sets forth greenhouse gas (GHG) emissions reduction goals and planning requirements. Minnesota has thus far fallen short of reaching these goals, and in the Minnesota Pollution Control Agency's (MPCA) 2019 Greenhouse Gas Legislative Report, the MPCA details that Minnesota's GHG reductions thus far have declined 12% versus 2005 levels. This is notably below "goal of a 15% emissions reduction by 2015,"[22] and suggests that Minnesota will risk missing its goal of 30 percent reduction by 2025 without significant additional progress. By providing additional, carbon-free energy generation, Hayward Solar can help further eliminate

[18] Minnesota Power (ALLETE), EnergyForward, https://www.mnpower.com/Environment/EnergyForward.

[19] 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-in2030#:~:text=The%20plan%20would%20result%20in,an%20annual%20basis%20in%202030.

[20] Compliance Filing, *In the Matter of the Minnesota Transmission Owners' 2019 Biennial Transmission Projects Report*, Docket No. E002/M-19-205 (Aug. 14, 2020) (eDocket ID No. 20208-165906-02).

[21] Minn. Stat. § 216C.05, subd. 1.

[22] 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 .

CO_2 and other GHG emissions from Minnesota's power sector, where significant emissions continue to originate. Similarly, the Governor issued Executive Order 19-37 establishing a Climate Change Subcabinet to "[i]dentify policies and strategies that will put Minnesota back on track to meet or exceed" those goals.[23]

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.[24] Given that just over 25 percent of Minnesota's electric generation came from clean energy at the time of Governor Walz's announcement,[25] Minnesota will need additional renewable generation like that provided by the Project to meet this goal. Similarly, President Biden recently issued Executive Order 14008 ("Tackling the Climate Crisis at Home and Abroad") promoting renewable energy development – in addition to directing the U.S. 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."[26]

Clean energy requirements in Minnesota and neighboring states further demonstrate the need for the Project. Thirty-seven U.S. states, eleven of which are MISO states, currently have either mandated or suggested voluntary renewable portfolio standards or policies.[27] 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 sources by 2025. Utilities[28] 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.[29] 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.[30] Renewable resources, such as the Project, are needed to meet these clean energy requirements in both Minnesota and neighboring states.

---

[23] Executive Order 19-37 (Dec. 2, 2019).

[24] 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.

[25] *Id.*

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

[27] 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.

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

[29] Minn. Stat. § 216B.1691, subd. 2f(a).

[30] Minn. Stat. § 216B.1691, subd. 2f(e).

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 percent[31] or establish a 100 percent carbon free standard by 2050.[32] 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.[33]

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 in the United States[.]"[34] Additional renewable resources will be needed to meet the 25 by '25 initiative in North Dakota and similarly situated states.

Under current state renewable energy policies, the total United States renewable portfolio standard demand will increase from 310 terawatt hours (TWh) in 2019 to 600 TWh by 2030.[35] Given existing renewable energy capacity, an additional 270 TWh increase in renewable energy generation resources will be required to meet demand through 2030.[36] In addition, the regional transmission grid is being expanded to deliver renewable energy generation in a cost-effective manner.[37] Although the current Production Tax Credit and Investment Tax Credit (ITC) 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.[38]

---

[31] H.F. No. 1772, 90th Legis. (Feb. 27, 2017).

[32] 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.

[33] *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).

[34] NDCC § 17-01-01.

[35] Lawrence Berkeley Nat'l Lab., U.S. Renewables Portfolio Standards at 24 (July 2019).

[36] *Id.* at 25.

[37] MTEP 18 MISO Transmission Enhancement Plan at 42.

[38] MTEP 18 MISO Transmission Enhancement Plan at 144.

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.[39]

Further, 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 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 corporations' 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.[40] 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 has already seen 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 capacity, which highlights the broader trend of increased demand for renewables across the United States.[41] Similarly, according to a 2019 research report, corporate contracts accounted for 22 percent of 2018 PPAs for renewables in the United States.[42] Further, the buyers are not just large corporations; smaller companies are entering into aggregated purchasing models and further driving additional market expansion.[43]

Additionally, many of Minnesota's largest companies 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 GHG emissions targets of 30 percent reduction by 2025 and

[39] Lazard's Levelized Cost of Energy Analysis 13.0, 2019.

[40] 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.-windand-solar-growth/.

[41] Id.

[42] 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-ppa2018.

[43] 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-energycontracts#gs.nxat51.

80 percent reduction by 2050."[44] 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 GHG emissions.

Given the demand for renewable energy, a market exists for independently produced electricity generated from solar and other renewables, including the up to 150 MW to be generated by the Project. As a non-wind variable generation resource utilizing linear axis solar tracking systems to follow the path of the sun throughout each day, the Project will have a nameplate capacity of up to 150 MW AC, enough energy to provide electricity for approximately 28,000 homes annually and avoid the emission of approximately 261,871,072 pounds (118,783 metric tons) of CO_2 equivalent annually.[45] In sum, Minnesota has a wide array of needs that Hayward Solar can help address. The clean, renewable power that Hayward Solarthe Project 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, environmental benefits as well as avoided environmental costs, as discussed in **Sections 10 and 11** in this CN 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 this Project. The Project could also assist an off-taker in either replacing older coal plants with renewable energy or avoiding construction of a new natural gas peaking plant, thereby reducing CO_2 emissions.[46]

The Project is also designed to be socioeconomically beneficial to landowners, local governments, and communities. Landowner compensation is established by voluntary option leases or purchase agreements between the applicable landowner and Hayward Solar. Hayward Solar has secured all necessary land rights (lease option agreements for the solar facility and a purchase agreement for the new SMMPA Switchyard) for construction and operation of the proposed Project. While several acres are also under lease option to support the Project Substation and O&M building, all of the land required for the Project except for the SMMPA Switchyard will

[44] Minnesota Sustainable Growth Coalition. "Clean Energy Vision". Accessible at: https://environmental-initiative.org/work/minnesota-sustainable-growth-coalition/.

[45] This is based upon the U.S. Environmental Protection Agency (EPA) Greenhouse Gas Equivalencies Calculator and 168,000,000 kWh (168,000 MWhs) annual production PVSYST model. See Greenhouse Gas Equivalencies Calculator | Energy and the Environment | US EPA.

[46] NREL (August 2007), Energy, Economic and Environmental benefits of the Solar America Initiative, at 4 (stating that PV installations can help provide electricity during peak demand periods, thereby decreasing the need for constructing new natural gas peaking plants) and at 21 (stating that electricity generation (in 2007) was the largest industrial source of air emissions in the United States and the emissions from solar energy generation, that replaces fossil fuel sources of energy, are negligible).

be leased. Prior to commencement of construction the lease options and switchyard purchase option will be exercised and converted into leases and owned property, respectively. Under the leases, land used for the Project would be returned to the underlying landowners upon completion of the 30-year term of the Project.

The Project will also create new local job opportunities for various construction 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 construction 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. Hayward Solar will issue a Request for Proposals (RFP) to contractors to construct the Project. Hayward 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 contractor selected will be required to work with labor unions, local subcontractors, and other vendors to implement a 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. During construction, the Project is expected to create approximately 204 direct, on-site jobs and support an additional 115 jobs across all industries in Freeborn County. As an operating facility, the Project will support up to 14 jobs, including 4 on-site and 10 in other industries across the county.[47]

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, minimal environmental impact 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

The Commission granted Hayward Solar 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." Hayward Solar is not a utility and has not engaged in promotional activities which could have given rise to the need for the electricity to be generated by the Project. Thus, consistent with its determinations in past CN proceedings, the Commission granted an exemption to Hayward Solar.

3.2.3 Effects of Facility in Inducing Future Development

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

[47] *Economic Impact of a Proposed Solar Energy Project in Freeborn County, Minnesota*, A Report of the Economic Impact Analysis Project, University of Minnesota Extension, at 8 (April 2021).

The Project is located within the political boundaries of Hayward Township in Freeborn County, Minnesota (**Figure 1**)**.** Based on Freeborn County zoning information, the Project Area is zoned agricultural.[48] The Project is located in a rural area approximately two miles east of the City of Hayward. The Project is in a rural area within Hayward Township and no incorporated communities are located within the Project Area. The incorporated communities that are geographically closest to the Project Area are Hayward (1.6 miles west), Albert Lea (6.5 miles west), and Austin (8 miles east). Albert Lea is also the nearest larger city to the Project Area. Based on the 2010 U.S. Census, the population of Freeborn County is 31,255 persons, which represents less than 1 percent of the total population of Minnesota. According to the 2010 U.S. Census Bureau, approximately 1,054 vacant housing units exist in Freeborn County. In the Austin metropolitan area there are approximately 527 vacant housing units (U.S. Census Bureau, 2010). In addition, according to the City of Austin's website (https://www.austinmn.com) numerous hotels, guest houses, and campgrounds are available in the greater Austin area. These residences and temporary housing statistics suggest the local area would support an influx of construction workers if needed.

The Project is designed to be socioeconomically beneficial to landowners, local governments, and communities. Landowner compensation is established by voluntary option leases or purchase agreements between the landowner and Hayward Solar for Hayward Solar's lease or purchase of the land. Lease and purchase payments paid to the landowners will more than offset potential financial losses associated with removing a portion of their land from agricultural production. In fact, based upon an analysis completed by Strategic Economic Research, the land use value of leasing the land for solar far exceeds the value for agricultural use when considering the development of the land for the Project.[49] For example, the price of corn would need to rise to $12.72 per bushel from current pricing of $3.26 per bushel or yields for corn would need to rise to approximately 410 bushels per acre by the year 2052 from the current approximate yields of 187 bushels per acre to generate more income for the landowner and the local community than the solar lease.

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. Opportunity exists for sub-contracting to local contractors for gravel, fill, and civil work. During construction, direct spending in Minnesota is estimated to be $33.8 million, including an estimated $15.6 million in direct spending in Freeborn County. During the construction phase, the Project plans to directly hire 204 employees and pay $7.9 million in wages, salaries, and benefits to complete the work. The Project is anticipated to generate an estimated $30.9 million in economic activity during construction. This includes $13.6 million in labor income impacts. In addition to the 204 onsite direct jobs, the Project will support an additional 115 jobs across all industries in Freeborn County. The Project will support jobs in industries such as real estate, health care, and

[48] Land parcels are shown as agricultural on the 1990 Land Use Map, although zoning is not indicated on this map. https://www.mngeo.state.mn.us/maps/LandUse/lu_free.pdf.

[49] Land Use Analysis of the Hayward Solar Project (January 2021), Strategic Economic Research.

professional services.[50] Temporary construction jobs within Freeborn County will generate indirect economic benefits as employees spend their income on local goods and services and pay local sales tax. Solar energy infrastructure will also provide an additional source of revenue to Freeborn County and Hayward Township in which the Project is sited. For instance, businesses and households affected by construction of the Project in Freeborn County are expected to generate an estimated $461,870 in state and local taxes between 2022 and 2023.[51] When expanded to include all Minnesota businesses affected by the construction spending, the amount of state and local taxes generated from the Project increase to an estimated $2.3 million.[52]

As an operating facility, the Project is expected to generate an estimated $3.3 million in economic activity in Freeborn County per year. This includes $703,530 in labor income. The Project will support 14 jobs, including 4 direct, on-site jobs and 10 indirect jobs in other industries across Freeborn County.[53] Businesses and households affected in Freeborn County by operations and maintenance of the Project will generate an estimated $99,040 in state and local tax revenues.[54]

General skilled labor is expected to be available in Freeborn 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, fuel, transportation, and general supplies and related services. 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 local residents, it will also help make the energy those residents may rely upon less susceptible to volatility.[55] The development of solar

[50] *Economic Impact of a Proposed Solar Energy Project in Freeborn County, Minnesota,* A Report of the Economic Impact Analysis Project, University of Minnesota, at 4-5 (April 2021).

[51] *Id.* at 7.

[52] *Id.*

[53] *Id.* at 8.

[54] *Id.* at 9.

[55] U.S. Dept. 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.").

energy technology now makes solar power's relative price competitive with other generators, including natural gas and coal.[56]

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 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.

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 HAYWARD SOLAR'S CN 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 up to 150 MW of nameplate capacity to meet the electricity needs of Minnesota and the region. Hayward Solar plans to negotiate one or more PPAs with utilities or other power users with a need to purchase additional renewable energy or, if necessary, to offer the Project's output for sale on the wholesale market. Denying the CN Application would result in the loss of a significant amount of electricity needed to satisfy state and regional demand, and

[56] NREL, *2017 Standard Scenarios Report: A U.S. Electricity Sector Outlook*, at 19 (October 2017); U.S. Energy Information Administration, *Levelized Cost and Levelized Avoided Cost of New Generation Resources in the Annual Energy Outlook 2016*, at Tables 1a, 1b, (August 2016) available at http://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf.

would deny utilities and others the opportunity to purchase clean, renewable, low-cost energy that will count toward satisfying the RES, SES and/or other clean energy standards and objectives.

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 with some environmental benefits. It will displace pollutants emitted by fossil fuel-fired generating resources, including CO_2, which is considered a significant contributor to climate change and GHG emissions. It will meet the needs of many of the state's electric consumers at a competitive cost and assist the off-taker in meeting its renewable energy standards while enhancing the economic base and energy security in Freeborn County.

In addition to the specific need for renewable energy to serve Minnesota utilities, 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.[57] Similarly, North Dakota has adopted the national "25 by '25" initiative, which establishes a goal of having not less than 25 percent of total energy consumed within the United States come from renewable resources by January 1, 2025.[58] Under current state standards, total United States renewable portfolio standard demand will increase from 290 TWh in 2018 to 540 TWh in 2030.[59] Given existing renewable energy capacity, an additional 180 TWh increase in renewable resources will be required to meet demand through 2030.[60] In addition, the regional transmission grid is being expanded to deliver renewable energy generation in a cost-effective manner.[61] 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.[62] 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.

While coal generation made up 73 percent of total generation in the MISO region in 2009, due to retirements, coal facilities are expected to supply only 36 percent of MISO demand by 2030.[63] The generation fleet in the MISO region is in transition, and MISO is engaged in active

[57] 20 Ill. Comp. Stat. sec. 2855/1-75(c)(1).

[58] *See* N.D. Cent. Code. § 17-01-01.

[59] Lawrence Berkeley Nat'l Lab., U.S. Renewables Portfolio Standards at 24 (July 2019).

[60] *Id.* at 21.

[61] *MTEP18 MISO Transmission Enhancement Plan*, at 42.

[62] Minn. Stat. § 216B.1691, subd. 2f(a).

[63] 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-

analysis and planning to enable the transition to lower carbon resources.[64] The Project is only one part of the transition to less carbon intensive energy generation, and this shift to new generation technology will continue, even absent the Project. MISO can deploy both generation and capacity resources to support reliability, and the Project will be able to function as a generation resource to load-serving entities in Minnesota, in addition to MISO Planning Resource Zone 1.

4.2 NO MORE REASONABLE AND PRUDENT ALTERNATIVE TO THE HAYWARD 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. Minnesota and regional utilities have a need for renewable energy beyond what is currently under contract in order to meet RES and SES milestones as well as to meet carbon reduction goals. Moreover, C&I companies are procuring renewable energy to meet their current energy needs and, in some cases, to secure up to 100 percent of their energy needs from renewable sources.

Regarding the type of facility, the Commission granted Hayward 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 the RES and other clean energy standards.

With respect to timing, the Project is expected to be on-line and operational by the end of 2023, depending on completion of regulatory approvals, securing a power purchaser, and the MISO interconnection process. This will help Minnesota, other electric utilities, consumers and the region achieve the necessary renewable energy levels required to meet current and pending clean energy standards milestones.[65]

4.2.2 Cost Analysis.

---

ip.pdf). *See also* 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).

[64] *See* MISO, *Aligning Resource Availability and Need: Changing Reliability Requirements for an Evolving Fleet* (Aug. 2020).

[65] Minn. Stat. § 216B.1691, subd. 2f(a).

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.[66] Even though the Solar ITC phase 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.[67] In addition, although Hayward Solar has not yet secured offtake for the energy to be produced by the Project, it is confident that it will be able to secure long-term purchases at attractive prices and terms. Importantly, as an IPP, Hayward Solar, rather that the State or its ratepayers, bears the risk of not securing PPAs 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 CN Application, the environmental impacts of the Project will be minimal and significantly less than a fossil-fuel based facility. In fact, there are likely to be environmental benefits from the Project. One of the greatest attributes of solar energy is its minimal impact on the environment. During the planned 30 year operational period, the Project will not release CO_2, 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 is being sited and designed to minimize environmental impacts and, to the extent practicable, enhance and improve environmental conditions. Additionally, recent research on the environmental impacts of solar farms indicates that there may be net benefits to soil resources over the lifecycle of the Project.[68] At the same time, the socioeconomic benefits of a utility-scale solar power project are considerable, as described in Section 4.3 below.

4.2.4 Reliability.

The Project will provide up to 150 MW AC of capacity and approximately 168,000 megawatt hours (MWh) annually of reliable, deliverable on-peak energy. The Project will have an average expected annual net capacity factor of between approximately 23 and 27 percent.

4.3 THE HAYWARD 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),

---

[66] *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.

[67] *See* EIA, ANNUAL ENERGY OUTLOOK 2020 at 72 (Jan. 2020), https://www.eia.gov/outlooks/aeo/pdf/aeo2019.pdf.

[68] *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/.

the energy produced by the Project will provide significant, numerous, and varied societal benefits, with minimal negative impacts as discussed below.

4.3.1 Overall State Energy Needs

As discussed in Section 3.1 above, utilities continue to require renewable energy to meet the RES, SES and other clean energy and GHG reduction standards, 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 and directly addresses those needs.

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 construction and operation. The construction and operation of the Project will increase Freeborn County's tax base. In addition, land lease payments and the land purchase payment to landowners will offset potential financial losses associated with removing a portion of their land from agricultural production. The final Project design is expected to occupy the approximately 1,272 acre Preliminary Development Area, within the overall 1,958-acre Project Area (**Figures 2 & 4**). The Project will temporarily change the land use from agricultural to solar energy generation use within the Preliminary Development Area during the life of the Project and will not result in a significant impact to land-based economies in the Project vicinity. Of the 462,416 acres in Freeborn County, the majority (approximately 394,024 acres) are cropland. Impacts to 1,272 acres or less of agricultural land within the planned Project facility would reduce the amount of agricultural land in the County by much less than 1% (i.e., 0.3%) . Upon decommissioning of the Project, the Preliminary Development Area will be allowed to return to agricultural or other preferred land uses as determined by the underlying landowners.

Agricultural production would be allowed to continue in certain areas within the Project Area but outside of the fence of the Preliminary Development Area during construction and operation of the Project. Similarly, if mowing 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.[69] These benefits are only enhanced by a Project design that further takes into account avoidance and/or minimization of environmental impacts.

One of the greatest attributes of solar energy is its minimal impact on the environment. The Project will not release CO_2, sulfur dioxide, nitrogen oxides, mercury, or particulate matter.

[69] 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.

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.

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 above, Hayward Solar will issue an RFP to contractors to construct the Project. Hayward 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 selected contractor 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 requires Minnesota licensed electricians to complete. Wages and salaries paid to contractors and workers in Freeborn 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 Freeborn County and the state. Expenditures made by the Applicant for equipment, fuel, operating supplies, and other products and services will benefit businesses in Freeborn County and the state. In addition, lease options and purchase payments paid to the landowners will offset 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 Freeborn 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 of approximately $305,000.00 for Freeborn County and approximately $76,000.00 for Hayward Township.

Not building an electrical generation facility would result in no physical impact to the environment in Freeborn County. However, not building the Project would also not provide an additional source of tax revenues to Freeborn County or Hayward Township, an increase in the income stream to residences 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 Freeborn County, the Project will provide significant benefits to the local economy and local landowners. Landowners in the Project area will benefit from the lease options and purchase payments, and installation of solar energy infrastructure will increase the local tax base in the county and township

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. It will produce enough energy to meet the energy needs for approximately 28,000 homes annually and prevent emission of approximately 261,871,072 pounds (118,783 metric tons) of CO_2 equivalent annually.[70] In addition, the local economy will benefit from the landowner lease options and purchase payments for the Project, production taxes, income from jobs created, and local spending. It will also provide carbon-free energy that will assist in meeting Minnesota's carbon and GHG reduction goals.

4.4 THE HAYWARD 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.[71] In addition, as discussed previously, the SES mandates increased electric generation from solar resources.[72] Minnesota has also set a goal to reduce statewide GHG emissions across all sectors producing those emissions to a level at least 80 percent below 2005 levels by 2050.[73] 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.[74] Just over 25 percent of Minnesota's electric generation came from clean energy at the

[70] This is based upon the U.S. Environmental Protection Agency (EPA) Greenhouse Gas Equivalencies Calculator and 168,000,000 kWh (168,000 MWhs) annual production PVSYST model. See Greenhouse Gas Equivalencies Calculator | Energy and the Environment | US EPA.

[71] *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.")

[72] Minn. Stat. § 216B.1691, sub. 2f.

[73] Minn. Stat. § 216H.02, subd. 1.

[74] 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.

time of Governor Walz's announcement.[75] 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.[76] Solar energy conversion systems are also exempt from state sales tax.[77]

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 a number of 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 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.

[75] *Id.*

[76] Minn. Stat. § 272.02, subd. 24.

[77] Minn. Stat. § 297A.67, subd. 29.

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" references projects of no more than 10 MW. Hayward Solar is a utility-scale Project and will not provide distributed energy to the system as defined in Minnesota Law. However, Hayward 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 electric 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 project[78] before authorizing construction or expansion of a fossil-fueled generation facility.[79] 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. Hayward 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. The Project will, however, serve as a resource for utilities that must meet the RES and SES requirements.

---

[78] 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.

[79] Minn. Stat. § 216B.1694, subd. 2(a)(4).

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.[80]

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 is in compliance with certain transmission planning requirements. As an independent power producer, this statute does not apply to Hayward 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. 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. Although no final decisions have been made, Hayward 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 12** in Section 12.3 provides a list of approvals the Project may need to obtain from governmental entities to demonstrate full compliance. Hayward Solar is committed to obtaining all necessary environmental and other approvals required under federal, state, and local requirements.

The Project will comply will all relevant requirements and in addition 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

[80] *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).

nonrenewable facility including consideration of environmental costs. It is further consistent with state policies relating to the reduction of GHG.

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, RECS and other environmental attributes to meet utilities' and consumers' needs for generation. 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

The Project is an up to 150 MW AC solar PV facility located within the approximate 1,958 acres Project Area (**Figures 1 & 2)** in Hayward Township, Freeborn County, Minnesota. The Project location is indicated in **Table 2** and shown on **Figure 1**.

Table 2: Project Location

Township	Range	Section
102N	20W	1
102N	20W	2
102N	20W	3
102N	20W	11
102N	20W	12
102N	20W	13
102N	20W	14
102N	20W	15

Hayward Solar has secured site control for the entire proposed Project via lease option agreements and a purchase agreement (for the proposed SMMPA Switchyard site). The final Project design is expected to occupy the approximately 1,272 acre Preliminary Development Area, within the overall 1,958-acre Project Area. As design and engineering is not yet completed for the Project, the excess acreage between the Preliminary Development Area and Project Area allows for planned buffers and flexibility in overall final Project design. Site control for the Project includes the crossing area of SMMPA's existing 161 kV HVTL. The Project will connect to the grid via the SMMPA Line Tap an approximately 750-900-foot long 161 kV transmission line from the new SMMPA Switchyard to the existing SMMPA Hayward-Murphy Creek 161 kV HVTL. The Project Gen-Tie Line (a 200-300 foot long 161 kV transmission line) will likely exit from the northwestern portion of the Project Substation and connects to the new SMMPA Switchyard.

The Project's primary components include solar panel modules mounted on a linear axis tracking rack system (**Image 1)**, a mixture of 18 3150 kilovolt-ampere (kVA) and 30 3600 kVA central inverters, a Project substation, and an O&M building. The current design includes use of NexTrackers which has one motor per tracker row. The final selection of equipment will be

dependent upon equipment that is available at the time of construction. For descriptive purposes, an individual tracker row is used as a basic unit of the Project. A tracker row is made up of modules mounted on a flat beam oriented north-south, with a break in the middle where the gear box is located. The tracker rows tilt east-west to follow the sun throughout the day, are connected together in rows and are served by one motor. The racking system consists of all the components involved in fastening the modules to the tracker rows, plus the tracker beams, gearboxes, motors, and pier foundations.

Image 1: Typical Solar Tracker Row Design

The solar array at the Project will consist of PV solar panel modules, a racking system, inverter skids, security fencing, and up to ten weather stations. Hayward Solar proposes to use modules affixed to tracking mechanisms that would allow the modules to "track" the sun from east to west on a daily basis. The modules and tracking rack system are generally aligned in rows oriented north and south with the PV modules 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 modules 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 modules 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 modules 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 a maximum of 60 degrees east to 60 degrees west through the course of the day (the design tilt may vary). At the maximum 60 degrees (tilted to the highest position), the edge of the modules 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).

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 pending geotechnical analysis. Driven pier foundations are typically driven 8-15 feet into the ground depending on site specific soils. The depth pier foundations will be installed for the Project will be determined in final design.

A specific solar module has not yet been selected for the Project. Several Tier 1 manufacturers are under consideration, including modules manufactured by Jinko, Canadian Solar, First Solar, Hanwha, JA Solar, LONGi, Risen, Seraphim, Talesun, and Trina. All modules under consideration are mono- or poly-crystalline models. Hayward Solar 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, timeframe or budget. Several racking and tracker vendors 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. Racking infrastructure and trackers will be selected closer to the procurement stage to ensure performance standards are met.

New solar modules are being introduced to the market regularly (e.g., higher efficiency or higher wattage per module options). As such, it is important to maintain as much flexibility in the individual supplier and technology choice as possible until just before procurement. Selection of newer, higher wattage equipment that may become available before the Project goes to construction could potentially reduce the overall footprint of the Project.

Associated facilities include electrical cables and accessories, conduit, inverter pads, switchgears, step up transformers, SCADA system, and metering equipment (**Figures 2-4**). The Project will include 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. Electrical wiring will connect the PV panels to inverters which will convert solar energy generated power from DC to AC. Power inverters convert approximately 1,500 volts of DC power output from the PV solar panels to between 600-690 volts of AC power depending on the inverter selected. A step-up transformer then converts the AC voltage to an intermediate voltage of 34.5 kV. Collection cables then carry the 34.5 kV power the Project substation (see next section). Step-up transformers are located with each of the inverters. The total length of the electrical collection system is approximately 85,000 linear feet.

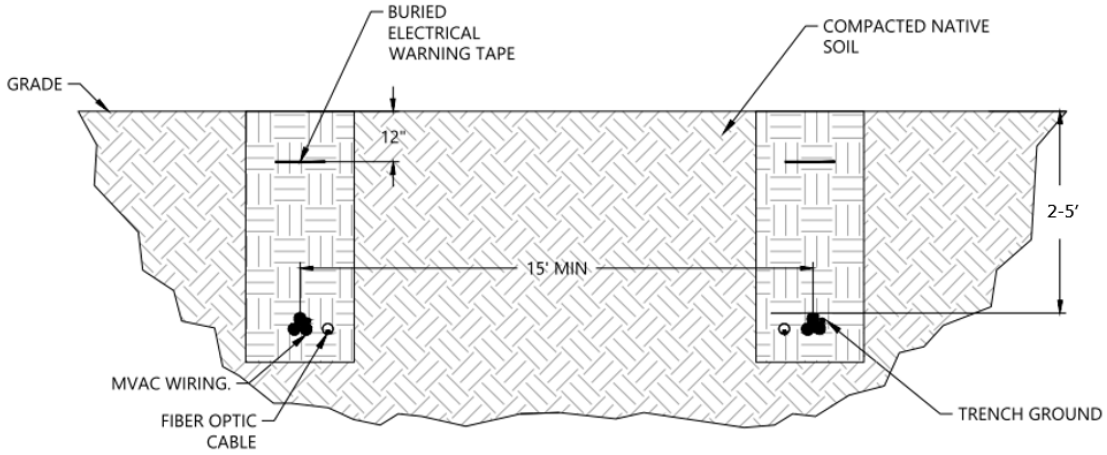

Image 2: Typical Solar Collection Trenches for Cables

Hayward Solar will install the DC electrical collection cabling either below-ground, underhung beneath the PV panels and racking (i.e., CAB system), or suspended above ground via the CAB system.[81] The CAB system is a cable management system that delivers a safe, strong and durable support for utility-scale wiring for ground-mount solar power generation facilities. CAB systems are quick and easy to install and provide potential labor and material cost benefits on solar projects. If buried, the underground trench will be approximately 2-5 feet deep below ground and one to two feet wide (**Image 2**). Excavation and refilling the trench will be conducted in accordance with the Agricultural Impact Mitigation Plan (AIMP).

Inverter skids will be installed at locations throughout the Preliminary Development Area. Each skid includes a DC to AC inverter and a step-up transformer to which the inverters will feed electricity (**Figure 3**). The final number of inverters for the Project will depend on the inverter size, as well as inverter and panel availability. The Project's preliminary design proposes 48 central inverter skids.

Skids provide the steel foundation for the enclosed inverter, step-up transformer, and SCADA system. The height of a skid is approximately 8-12 feet above grade. The skids will be placed atop a poured reinforced concrete slab or pier foundations and will typically measure 10 feet wide by 25 feet long. Concrete foundations will be poured onsite or precast and assembled off-site. The inverters skids are located within the interior fenced portion of the Project along access roads.

[81] In this option some Project construction locations may install the CAB system on pile foundations (without racking on it) to connect the DC cables to the inverter/equipment pad.

A specific solar inverter has not yet been selected for the Project. Several are under consideration, including units manufactured by FIMER, Power Electronics, SMA, Sungrow, and TMEIC. Hayward Solar will consider the costs and performance of each option as well as environmental and safety standards when making its final selection.

Each inverter pad will also include one or more transformers to which the inverters will feed electricity (**Image 3** which shows the DC cables buried option). Inverters convert the DC output of the PV modules to AC, which is required for delivery to the electrical grid. After the inverter has converted the electricity it is stepped-up via a transformer from low-voltage to medium or intermediate voltage (stepped up to 34.5 kV). The final number of inverters for the Project will depend on the inverter size, inverter and module availability, as well as the final array configuration. For the purposes of generation estimates, Hayward Solar has modeled the SMA Solar Technology 4200 UP-US inverter.

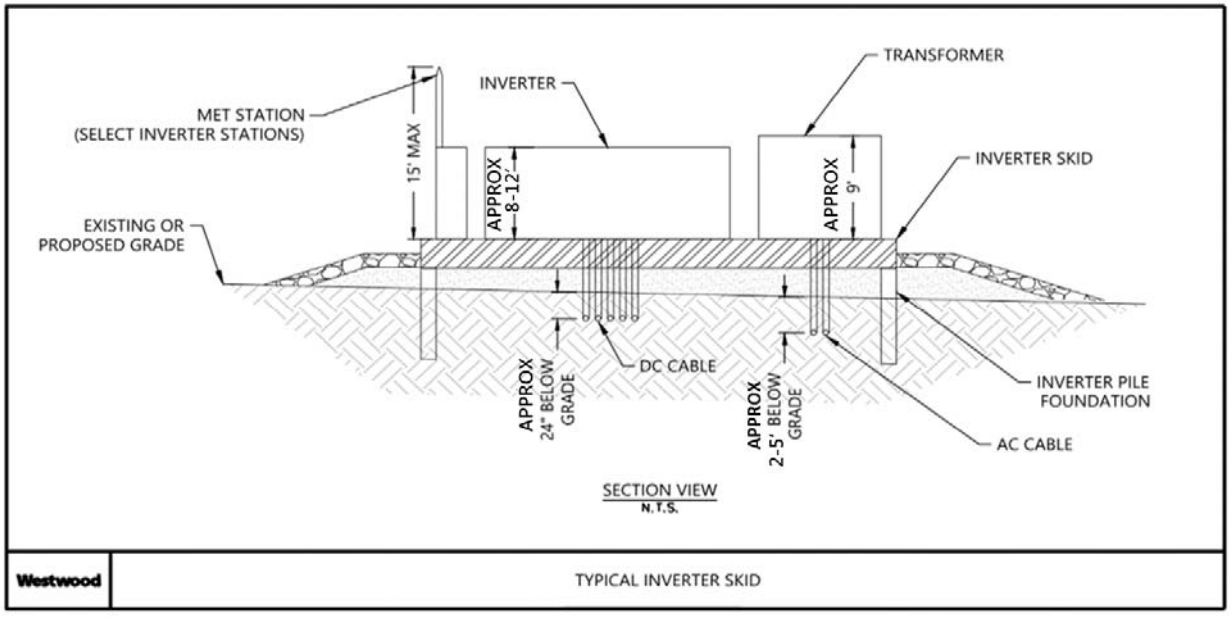

Image 3: Typical Solar Inverter Skid (DC Cables Buried Option)

The AC electrical collection system from the inverters/step-up transformer to the Project Substation will be buried between 2 to 5 feet below ground. The final type of electrical system will be determined prior to construction based on technology, availability of materials, and costs. Below-ground AC electric conductor collection lines will transfer the converted 34.5 kV AC electricity from the inverter equipment (which is assembled on skids and delivered to the Project as a package) to the Project Substation. During trench excavations, the topsoil and subsoil will be removed and stockpiled separately in accordance with the AIMP. Once the electric conductor collection lines are laid in the trench, the trench will be backfilled with subsoil followed by segregated topsoil. Electrical collection technology is changing and will be site-specific depending on geotechnical analysis, constructability, and availability of materials. Final engineering and procurement recommendations will help determine the construction method for the electrical collection system.

The depth to cables may be deeper for installation under existing utilities or other features requiring avoidance. The specific electrical collection technology used will be site-specific depending on geotechnical analysis, constructability, and availability of materials. Final engineering and procurement will help determine the construction method for the electrical collection system. Underground cabling will be installed in accordance with the AIMP.

At approximately 200-300 feet long, the proposed Project Gen-Tie Line will connect the Project substation to the SMMPA Switchyard,which facilitates the interconnection of the Project to the existing SMMPA Hayward-Murphy Creek 161 kV HVTL via the 750-900 foot long SMMPA Line Tap. The Project Substation is proposed in the northwestern part of the Project Area. The Project Substation will consist of high voltage electrical structures (i.e., poles), breakers, a 34.5 to 161 kV step-up transformer, metering and related equipment for connecting to the transmission grid, lightning protection, and control equipment according to the specifications of the GIA with MISO and SMMPA. The Project Substation and SMMPA Switchyard will contain transmission pole A-frame deadend structures that will support above ground conductors. The current design includes a set of A-frame deadend structures (up to 100 feet in height) located within the Project Substation and in the SMMPA Switchyard which will be connected via conductors in a single short span. Final layout and design of these facilities may require use of intermediate tangent structures if the span length is increased from what is expected at this time. In that case, a single dead-end structure will be located within the Project Substation and additional tangent pole structures will carry the Project Gen-Tie Line from the Project Substation to the SMMPA Switchyard. The number of poles and length of the Project Gen-Tie Line are pending final engineering and design. The tangent structures will likely be made of wood or metal and will be 60-90 feet tall.

The proposed SMMPA Switchyard will be used to interconnect the Project to the existing SMMPA Hayward-Murphy Creek 161 kV HVTL, which crosses through the northern portion of the Project Area. SMMPA will modify the existing Hayward-Murphy Creek 161 kV HVTL by installing new deadend structures within the existing HVTL right-of-way to re-direct the circuit in/out of the SMMPA Switchyard via the SMMPA Line Tap. SMMPA will also design, engineer, permit and construct the SMMPA Switchyard, including the SMMPA Line Tap, which is necessary to connect the SMMPA Switchyard to the Hayward-Murphy Creek 161 kV HVTL. Hayward Solar will convey the real property for the SMMPA Switchyard to SMMPA. The SMMPA Switchyard and SMMPA Line Tap will be network facilities permitted, constructed, owned and operated by SMMPA.

The Applicant believes that the selected Project location in Freeborn 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

Hayward Solar is planning to use PV solar panels with a total equivalent PV generating capacity of 156.6 MW and a mixture of 18 3150 kilovolt-ampere (kVA) and 30 3600 kVA central inverters. This preliminary design and Project layout takes into account applicable energy loss (approximately 2% AC losses) and would allow for a maximum of 150 MW AC of solar energy

generation and transmission onto the grid (which is capped at 150 MW AC as part of the interconnection request and generator interconnection agreement with MISO that will be signed prior to construction of the Project). The Project will generate up to 150 MW AC of capacity, enough energy to provide electricity for approximately 28,000 homes annually and avoid the emission of approximately 261,871,072 pounds (118,783 metric tons) of carbon annually.[82] 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 due to the fact that the efficiency of a PV system depends primarily on the characteristics of the individual modules and the inverter. This allows excellent flexibility to adjust system size for site specific constraints without impacting the facilities' overall efficiencies.

The total installed capital costs for the Project are estimated to be approximately $130 million, with Project cost depending on variables including, but not limited to, construction costs, taxes, tariffs, panel selection, electrical and communication systems, and final design considerations (e.g., access roads, O&M building, etc.), as well as potential ongoing impacts from COVID-19. Economies of scale do affect the capital cost of the Project. Should a smaller Project be more advantageous to an off-taker, Hayward Solar reserves the right to adjust its capital costs per MW to reflect the revised Project size. Operating costs are estimated at approximately $2.2 million per year, which includes payments to landowners, site maintenance, and equipment repairs and parts.[83]

5.1.2 Annual Capacity Factor

The Project is anticipated to have a net capacity factor of between approximately 23 percent and 27 percent, with projected average annual output of between approximately 300,000 and 362,000 MWhs.

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.

---

[82] This is based upon the U.S. Environmental Protection Agency (EPA) Greenhouse Gas Equivalencies Calculator and 168,000,000 kWh (168,000 MWhs) annual production PVSYST model. See Greenhouse Gas Equivalencies Calculator | Energy and the Environment | US EPA.

[83] *Economic Impact of a Proposed Solar Energy Project in Freeborn County, Minnesota*, A Report of the Economic Impact Analysis Project, University of Minnesota Extension, at 7 (April 2021).

5.1.5 Facility Location

Hayward Solar is proposing to build its solar facility in within the approximate 1,958 acres Project Area (**Figures 1 & 2)** in Hayward Township, Freeborn County, Minnesota. The Project is located within the political boundaries of Hayward Township in Freeborn County, Minnesota (**Figure 1**)**.** The Project is located in a rural area approximately two miles east of the City of Hayward. The Project location is indicated in **Table 3** and shown on **Figure 1**.

Table 3: Project Location

Township	Range	Section
102N	20W	1
102N	20W	2
102N	20W	3
102N	20W	11
102N	20W	12
102N	20W	13
102N	20W	14
102N	20W	15

Hayward Solar has secured site control for the entire proposed Project via lease option agreements and a purchase agreement (for the proposed new switchyard site). The lease option agreements are in place with seven private landowners of the Project Area. All current landowners actively work their land or another participating landowner as agricultural use. One of the landowners maintains approximately 900 acres of the Project Area. The final Project design is expected to occupy approximately 1,272 acres (Preliminary Development Area – **Figure 2**), within the overall 1,958-acre Project Area (**Figure 1**). As design and engineering is not yet completed for the Project, the excess acreage between the Preliminary Development Area and Project Area allows for planned buffers and flexibility in overall final Project design.

Figures 3 & 4 depict the Project interconnection facilities, preliminary Project layout and associated infrastructure of the proposed Project. The Project's facilities will include solar panels/arrays, linear axis tracking rack system, inverters, step-up transformers, power transformer, electrical wiring, access roads, Project substation, O&M building, switchyard, security fencing, below-ground or above-ground electrical collection and communication lines, parking areas, up to ten weather stations, an 161-kV overhead gen-tie transmission line, a SCADA system, switchgear, metering equipment, stormwater collection ponds, temporary laydown areas (*see* **Figure 3**) and ancillary equipment or buildings as necessary. The preliminary Project layout within the Preliminary Development Area reflects Hayward Solar's effort to maximize the energy production of the Project, follow applicable setbacks, and minimize impacts to the land, environment, and surrounding community. While Hayward Solar expects the final layout to remain similar the preliminary layout presented in **Figures 3 and 4**, changes may occur as a result of ongoing site evaluation, permitting process, landowner preferences, and micro-siting 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 Hayward Solar a partial exemption from this data requirement, and Hayward Solar will discuss only renewable alternatives.

Developing and operating generating sources that are cost-effective and use proven technology is particularly important to an IPP like Hayward Solar. Hayward Solar does not have access to ratepayer funds that could provide a resource for retirement of capital investments. In addition, Hayward Solar must keep its prices – and, thus, its costs – low enough to remain competitive. For these reasons, Hayward Solar must exercise diligence in deciding where and when to pursue opportunities for capital investment in new power-generating facilities. As indicated in this CN 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 guaranty 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

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

5.2.1.2 Upgrades to Existing Resources

Hayward 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 Hayward Solar an exemption.

5.2.1.3 New Transmission

Hayward 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 Hayward 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 Hayward Solar will be increasing the state's solar generation as part of an effort to increase solar's contribution to that portfolio.

5.2.1.5 Hydroelectric Power

Hydropower is also not an alternative to the Project. Changes in Minnesota's renewable electricity generation from 2000 through 2020 show rapid growth in wind power generation starting in about 2005, and solar generation starting in 2016, while biomass and hydro sources remained relatively flat during most of the period.[84] 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."[85] There is not sufficient new hydro resources in Minnesota to replace the output of Hayward Solar.

5.2.1.6 Biomass

Minnesota communities do have accessible and low-value biomass feedstocks. However, the cost of these feedstocks vary widely, and the supply of biomass feedstock is limited.[86] 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 Hayward 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 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 and large (i.e., steep) elevation changes.

---

[84] 2020 Quad Report at 124.

[85] Minnesota Department of Commerce, Energy Policy and Conservation Quadrennial Report 2016 at 28, https://mn.gov/commerce-stat/pdfs/quad-report-2016.pdf.

[86] *Id.* at 27.

In addition, there is currently no net new generation from pumped storage in Minnesota.[87] Accordingly, this technology is 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, and those that do exist are not located in the vicinity of the site. This technology has been implemented on a limited basis and as with all storage technologies, it creates no net new energy generation. Accordingly, it is not an alternative to the Project.[88]

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, it 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 IPP, Hayward Solar must compete with other available technologies to sell power on the wholesale market, if necessary. Due to the size of the Project, Hayward 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 Hayward 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 Commission instead allowed Hayward Solar to provide data regarding the impact on the wholesale market of the "no facility" alternative. The Rule also requires an analysis of

[87] 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.

[88] *See e.g.*, http://energystoragehub.org/technologies/mechanical/compressed-air-energy-storage-caes/caes-an-introduction/ (accessed November 2, 2020).

"equipment and measures that may be used to reduce the environmental impact of the alternative of no facility."[89]

Hayward 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, Hayward 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 and non-utility customers to purchase the Project's output to satisfy clean energy standards. Such an outcome is contrary to Hayward 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 (Minn. R. 7849.0330)

The Commission granted Hayward 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. Hayward 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 Hayward 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 Hayward 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 Hayward Solar an exemption from this data request.

5.2.2 Economic Comparison

Table 4 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.[90] As discussed in Section 4.2.2., even though the ITC will phase down over the next several years, solar

[89] Minn. R. 7849.0340(C).

[90] *See* EIA, Annual Energy Outlook 2021, Narrative at 19 (2021), https://www.eia.gov/outlooks/aeo/pdf/AEO_Narrative_2021.pdf.

generation growth is anticipated to continue because the costs for solar continue to fall faster than for other sources.[91]

Table 4: Renewable Technology Costs[92]

Technology	Size (MW)	Total Overnight Capital 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 – with 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 Hayward Solar, including the use of alternative renewable resources or emerging technologies, non-CN facilities, or the no-build alternative, fall short in one or more categories. Hayward Solar's analysis demonstrates that the Project is a cost-effective energy resource and 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 Hayward 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 Hayward 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) that could provide electric power at the asserted level of need. As discussed above, no good alternatives exist. Therefore, only information regarding the Project is applicable.

[91] *See* EIA, Annual Energy Outlook 2021, Narrative at 7, 16 (2021), https://www.eia.gov/outlooks/aeo/pdf/AEO_Narrative_2021.pdf.

[92] 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 value for projects with no operating history. Once operating data is obtained, the Project receives capacity credit based on its output in the peak months of June, July and August. 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. Hayward 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 component in the total cost of the Project will be the solar panels and tracking rack system; 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 30-35 years or longer based on the useful commercial lifespan of modules. Hayward Solar is confident that its maintenance program will result in excellent longevity for the Project.

5.3.3 Estimated Average Annual Availability

Hayward 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. 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.

5.3.5 Variable Operating and Maintenance Costs

Most solar operating costs are fixed. Hayward Solar expects that operation and maintenance costs will average $5.00 per kW-year over the life of the Project (excluding vegetation management, a detailed O&M plan and costs have not been developed). Hayward Solar's estimated variable operating and maintenance costs per kWh are provided in Appendix A, Section 5.3.5, which has been designated trade secret. 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

Hayward 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 Hayward Solar will sell the energy was determined as a result of Hayward Solar's internal modelling.

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 Hayward 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 Hayward Solar nor necessary to determine the need for the Project. Instead, Hayward 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.[93] For instance, a utility can 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.[94]

5.3.8 Efficiency

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

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

The Commission granted Hayward Solar an exemption from Minn. R. 7849.0250(D), which requires an applicant to include a map showing the applicant's system. As an IPP, Hayward Solar does not have a "system." The information requested is not available to Hayward Solar or 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 **Figure 2**.

---

[93] *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).

[94] *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-electricitygrid-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.).

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

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

As an alternative to the requested data, Hayward 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, Hayward 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.[95] 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.[96] 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' (MTO) 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.[97]

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.[98] Additional demand is being drive by C&I consumers, who are increasingly entering into longer PPAs for renewable energy.[99]

---

[95] 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 https://www.mnpower.com/Content/Documents/Environment/2015-resource-plan.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.otpco.com/media/838904/resource-plan.pdf).

[96] Xcel Energy, Upper Midwest Resource Plan 2020-2034, at 5.

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

[98] U.S. Energy Information Administration, Annual Energy Outlook 2017, at 22 (available at https://www.eia.gov/outlooks/aeo/pdf/0383(2017).pdf); 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).

[99] 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-

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 IPP, Hayward Solar does not have a "system" as defined by the Rules. Accordingly, the Commission granted Hayward Solar an exemption from this requirement and permitted Hayward 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)

Because Hayward Solar is not a regulated utility, has no retail customers, and plans to sell the Project's output on the wholesale market, the Commission granted Hayward 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 (Minn. R. 7849.0300)

The Commission granted Hayward 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." Hayward Solar is not a utility and has no "system" as defined by the Rules. Thus, this data requirement is inapplicable to Hayward Solar and is unnecessary to determine the need for the Project. Instead, Hayward Solar provides the following data on the consequences of delay to the region.

The primary consequences of delaying construction of the Project would be the failure to capture the ITC, 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 4.2.2, the ITC 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. In addition, delay negatively impacts the State's interest in achieving its renewable energy and climate change goals as quickly as possible.

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

windenergy); see also Business Renewables Center, Corporate Renewable Deals 2014-2018 (available at https://businessrenewables.org/corporate-transactions/#wpcf7-f942-p471-o1).

(harvesting solar energy, soil resting, improved water quality and pollinator-friendly habitats). Consequently, aesthetics related to utility-scale solar is largely one of personal perspective and preference.

The Project Area is located in a rural, flat, agricultural setting (**Figures 1 & 2**). The topography of the Project Area is generally flat with elevations ranging from 1,245 to 1,280 feet above sea level. Land use within the Project Area is predominantly agricultural, with corn and beans being the most common crops. Farmsteads in the area (often containing a farm house with barns, machine sheds and grain storage) are sprinkled across the landscape approximately ¼ to one mile apart. Most farms have planted windbreaks consisting of trees and shrubs around them. Untilled lines of trees and shrubs can be seen along fence rows. Paved and gravel roads form grids around farm fields separated by ½ to one mile with Interstate-90 along the north edge of the Project. Few remaining surface water features exist as the area now has numerous drain tiles and ditches to remove water from agricultural fields.

The Project will convert predominately agricultural land to a solar facility characterized by complex geometric forms, lines, and surfaces that may be divergent from the surrounding rural landscape. Construction activities will occur during daylight hours, limiting impacts of lighting on light-sensitive land uses. Solar PV employs glass panels that are designed to maximize absorption and minimize reflection to increase electricity production efficiency.

To limit reflection, solar PV panels are constructed of dark, light-absorbing materials and covered with an anti-reflective coating. Today's panels reflect as little as two percent of the incoming sunlight depending on the angle of the sun and assuming use of anti-reflective coatings.

The solar arrays will occupy most of the disturbed area for the solar facilities (**Figure 4**). Electrical transformers and inverters, the Project Substation, a POI/SMMPA Switchyard, an O&M building, and access roads will utilize the rest of the disturbed area. Most of the facility, including the solar arrays, will be low-profile, typically less than 12 feet tall. Electricity generated by the Project will travel on underground 34.5 kV AC collector lines from the Project inverters to the Project substation. The Project Gen-Tie Line will extend between the Project Substation and SMMPA Switchyard. The SMMPA Line Tap will be installed by SMMPA between the SMMPA Switchyard and the existing SMMPA 161 kV Hayward-Murphy Creek HVTL. The Project Substation and SMMPA Switchyard will contain transmission pole A-frame deadend structures that will support above ground conductors. The deadend structures will be 90-100 feet in height. These transmission facilities will be grouped together and will allow the Project to connect to the existing SMMPA 161 kV HVTL that crosses through the northern portion of the Project Area approximately 750-900 feet north/northeast of the planned SMMPA Switchyard site north of County Road (CR) 46. They will be visible from the local roadways and about 1,200 feet from the nearest residence (Residences 1-5 and 11; see **Figures 3 & 4**). From outside the facility these structures would be most visible from I-90 and CR 46. Other power poles with heights up to 100 feet are located in the vicinity of the Project and adjacent to roadways and the rail line. The addition of Project transmission facilities are not expected to significantly alter the viewshed or increase visual impacts. Per Minn. Stat. 216E.01 subd. 4, neither the Project Gen-Tie Line nor the SMMPA Line Tap meet the high voltage transmission line definition because they are both less than 1,500 feet long. As such, a separate route permit from the

Commission will not be required for the 161 kV transmission facilities being constructed as part of the Project.

Approximate dimensions of proposed facilities are provided below:

Solar Field

a. *Solar field*: The Project solar array panels will be no more than 15 feet in height. Height may vary due to manufacturer, topography and vegetation constraints. A typical solar tracking rack with panels and approximate dimensions are provided as (**Image 4**).

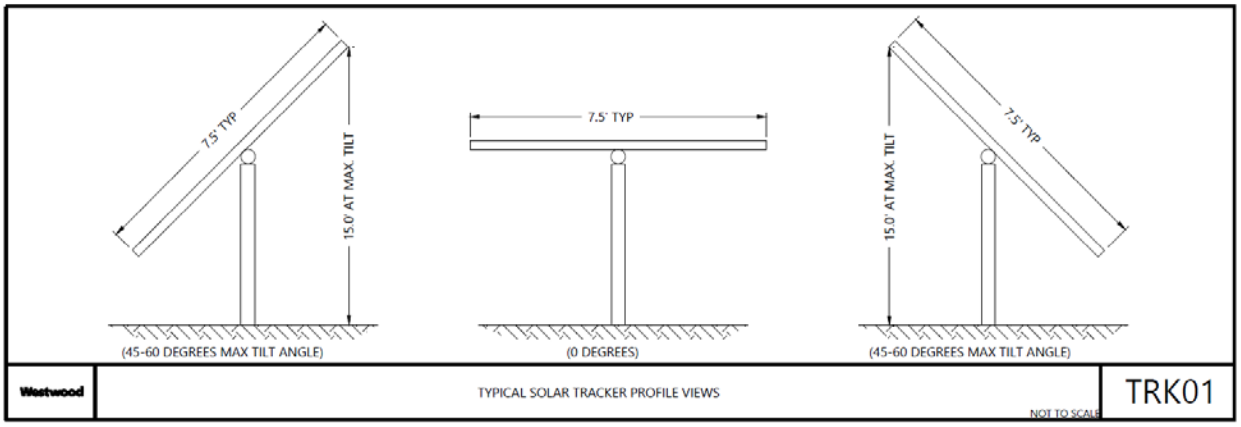

Image 4: Typical Solar Tracker Profile

b. *Solar inverter skids*: The height of a skid is approximately 8-12 feet above grade. The skids will be placed atop a poured reinforced concrete slab or pier foundations and will typically measure 10 feet wide by 25 feet long. Concrete foundations will be poured onsite or precast and assembled off-site. A typical inverter skid is provided as **Image 5**.

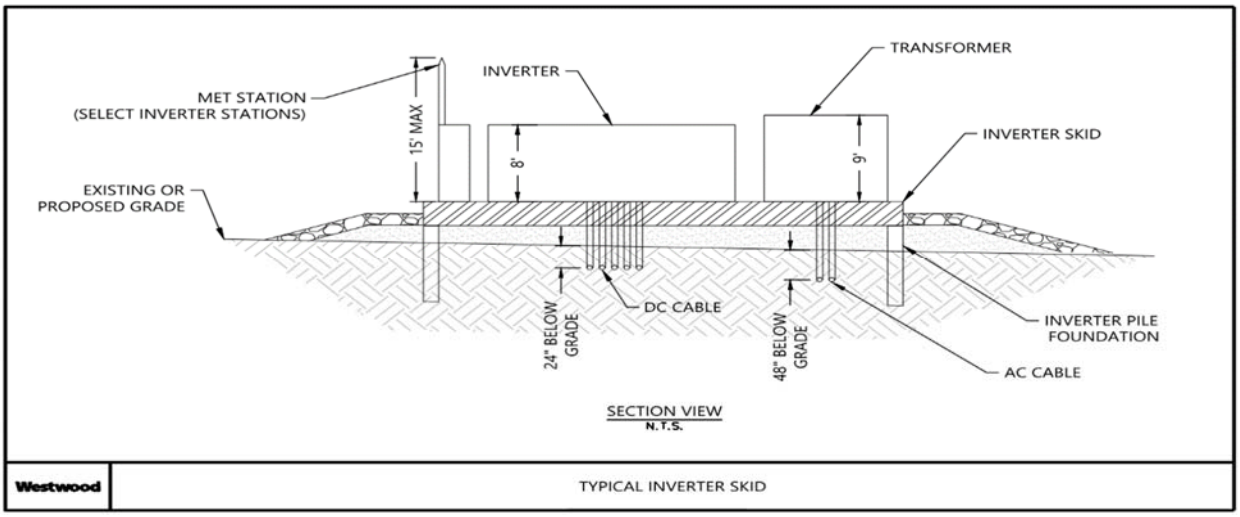

Image 5: Typical Inverter Skid

c. *Weather station*: Up to ten weather stations up to approximately 15 feet tall.

Interconnection facilities

a. Substation: The Project Substation is proposed in the northwestern part of the Project boundary (**Figures 2 & 3**). The Project Substation is estimated to occupy approximately 0.7 acres of land. The Project Substation will consist of high voltage electrical structures (i.e., poles), breakers, a 34.5/161 kV step-up transformer, metering and related equipment for connecting to the transmission grid, lightning protection, and control equipment according to the specifications of the GIA with MISO and SMMPA. The Project Substation location will be graded and the ground surface dressed with crushed rock, and secondary containment areas for the transformer will be installed as necessary. The fenced area of the Project Substation footprint will be approximately 150' x 200' in size (subject to final substation design and layout) and be surrounded by a minimum 30-foot buffer. The area within the Project Substation fence will be graveled to minimize vegetation growth and reduce fire risk. The Project Substation will be fenced with a 6-foot chain-link fence topped with one foot of barbed wire in accordance with North American Electric Reliability Corporation (NERC) requirements for security and safety purposes. The Project Substation will include a parking area, secured with a lockable gate, and will be accessible to qualified, trained Project operational personnel or those escorted by such personnel at all times using the Project's access roads.

b. Switchyard: The proposed SMMPA Switchyard will be used to interconnect the Project to the existing SMMPA transmission line. The existing SMMPA HVTL crosses through the northern portion of the Project Area (**Figures 2 & 3**). Soil corrections, if determined to be necessary by SMMPA, will be made as part of site clearing and preparation prior to construction of SMMPA Switchyard facilities. Foundations will then be installed and the switchyard area will be graded with the ground surface dressed with crushed rock. The new SMMPA Switchyard will be fenced with a 6-foot chain-link fence topped with one foot of barbed wire in accordance with NERC requirements for security and safety purposes.

The SMMPA Line Tap (i.e., the in/out connection transmission lines will be installed in a new easement area from existing SMMPA Hayward-Murphy Creek 161 kV HVTL to the SMMPA Switchyard to interconnect the Project to the grid. The length of these lines is approximately 750-900 feet and will include installation of either two deadend pole structures (for single deadends) or six deadends (for 3-pole deadends), depending on SMMPA's selected design, and required electric conductors (**Figure 3**). Hayward Solar will obtain an easement for the SMMPA Line Tap and acquire land (via a purchase option agreement) needed for the SMMPA Switchyard. SMMPA will design/engineer the SMMPA Switchyard and SMMPA Line Tap following SMMPA requirements and standards, permit, and construct the SMMPA Switchyard and SMMPA Line Tap. Hayward Solar will transfer the land interests associated with the SMMPA Switchyard and SMMPA Line Tap to SMMPA who will then own and operate the SMMPA Switchyard and SMMPA Line Tap.

c. Distribution Line. Underground 34.5 kV collector lines from the Project inverters will deliver solar generated energy to the Project substation. The 34.5 kV collector system voltage will then be stepped up to the interconnection voltage of 161 kV by the transformer located at the Project Substation and transmitted to the SMMPA Switchyard via the Project Gen-Tie Line in a single span between deadend structures (**Image 6**).

Image 6: Typical A-Frame Deadend Structures

The current design includes a set of A-frame deadend structures (up to 100 feet in height) located within the Project Substation site and in the SMMPA Switchyard which will be connected via the Project Gen-Tie Line in a single short span. Final layout and design of these facilities may require use of intermediate tangent structures if the span length is increased from what is expected at this time. In that case, a single dead-end structure will be located within the Project Substation and additional tangent pole structures will carry the Project Gen-Tie Line from the Project Substation to the SMMPA Switchyard. The number of poles and length of Project Gen-Tie Line are pending final engineering and design. The tangent structures will likely be made of wood or metal and will be 60-90 feet tall (**Image 7**).

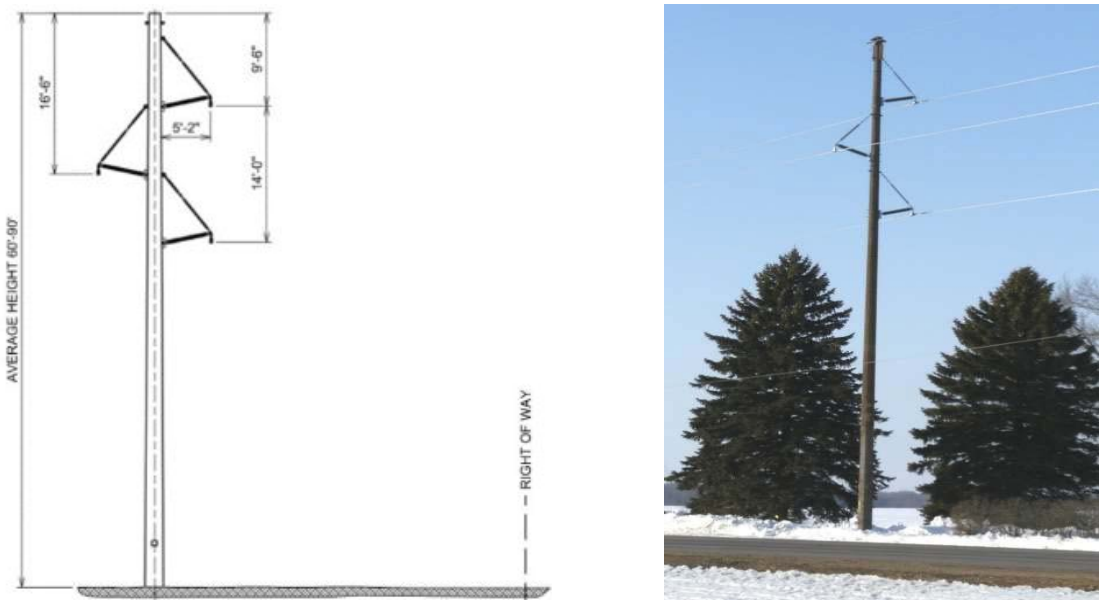

Image 7: Typical Overhead Transmission Line Structure

The type of conductor will be determined following the completion of detailed electrical design. The SMMPA Switchyard will be connected to the existing Hayward-Murphy Creek 161

kV HVTL via the SMMPA Line Tap. As discussed above, Hayward Solar will acquire land rights for these facilities, and SMMPA will design, permit, construct, own and operate the SMMPA Switchyard and SMMPA Line Tap.

Operations and Maintenance Area

a. *Operations and Maintenance Building*: The O&M building will be located near the Project Substation and SMMPA Switchyard with access from County Road 46. The location of the O&M building is currently planned on 0.23-acres in the northwest portion of the Project Area, north of the Project Substation location. The buildings typically used for this purpose are approximately 2,000 to 4,000 square feet. Final design of the O&M building will be completed prior to construction.

b. *Lighting*: Exterior security lighting will be installed at the O&M building and Project substation; as needed by maintenance personnel, lights will be used if work or maintenance is required after dark. A motion sensing, down casting security light will be installed at the locked entrance of the Project. Switch activated lights will be placed at each inverter for repair purposes. Impacts to light-sensitive land uses are not anticipated given the rural Project location coupled with minimal required lighting for operations of the Project.

There is one farmstead within the southwest corner of the Project Area north of the intersection of 190th Street and 840th Avenue; there are 11 residences on parcels and two observation points within the Albert Lea/Austin KOA Campground adjacent to the Project Area (see **Figures 2 and 6**). **Table 5** 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 solar arrays and nearest inverters based upon the current preliminary design.

Table 5: Proximity of Residences to the Project

Residence	Distance to Development Boundary (feet)	Distance to Solar Arrays (feet) [1]
1	1,491	1,236
2	337	867
3	184	789
4	188	766
5	184	780
6	1,328	1,783
7	387	803
8	1,219	1,673

Residence	Distance to Development Boundary (feet)	Distance to Solar Arrays (feet) [1]
9	109	738
10	795	1,382
11	1,183	1,265
12 Albert Lea/Austin KOA Campground – Pool	653	737
13 Albert Lea/Austin KOA Campground – Campsite	910	1,004

Residence 1 is located adjacent to the northwest portion of the Project Area west of 830th Avenue. This residence has existing buildings and vegetative screening around four sides of the residence, including east side adjacent to the Project.

Residences 2-5 are located within 250 feet of each other adjacent to the west portion of the Project Area. Residence 2 has existing vegetative screening along the south and buildings to the east and north sides. Residence 3 is located south of Residence 2. It has existing vegetative screening along the north, south and east sides. Residence 4 is located west of Residence 3. It has existing vegetative screening along the north and east side. Residence 5 is located west of Residence 4. It has existing vegetative screening along the south, north and east sides.

Residence 6 is located adjacent to the southwest portion of the Project Area southwest of the intersection of 190th and 840th Avenues. This residence has existing buildings and vegetative screening around three sides of the residence, including north and west and south.

Residence 7 is located 2,100 feet north of Residence 6 and northwest of the intersection of 190th and 840th Avenues. This residence has existing buildings and vegetative screening around four sides of the residence.

Residence 8 is located southeast of the intersection of CR 30 and 190th Street along the southeast portion of the Project Area. This residence has existing buildings on the north and west and vegetative screening around four sides of the residence.

Residence 9 is located southwest of the intersection of CR 30 and 200th Street along the east portion of the Project Area. This residence has existing buildings on the south and west and vegetative screening around west and north sides of the residence.

Residence 10 is located west-northwest of the intersection of CR 30 and 200th Street along the east portion of the Project Area. This residence has existing buildings on the north and vegetative screening primarily around west and north sides of the residence.

Residence 11 is located north of the intersection of CR 46 and I-90 along the north portion of the Project Area. This residence has existing buildings on the south and vegetative screening primarily around north and southwest sides of the residence.

Observation Point 12 is at the swimming pool and 13 is at the camping area in the Albert Lea/Austin KOA Campground located north of I-90 along the northeast portion of the Project Area, which is south of I-90. These features have sparse plantings of trees and shrubs to the south between the campground and the interstate and proposed Project. Five additional trees are within I-90's south right-of-way.

It is expected that there will be minimal visual impacts from the Project and associated facilities. The Project transmission facilities will be visible from the local roadways and about 1,200 feet from the nearest residence. Other power poles with heights up to 100 feet are located in the vicinity of the Project and adjacent to roadways and the rail line. The addition of Project transmission facilities is not expected to significantly alter the viewshed or increase visual impacts.

The Project solar arrays (surrounded by security fence) will be visible from adjacent roadways and parcels up to approximately ½ mile given their relative low profile and color. Project fencing will look similar to existing agricultural field fencing. While relatively few trees exist within the Project Area, Hayward Solar has designed the Project to avoid tree clearing which will somewhat break up the view of the arrays in some areas.

Exterior security lighting will be installed at the O&M building and Project substation; as needed by maintenance personnel, lights will be used if work or maintenance is required after dark. A motion sensing, down casting security light will be installed at the locked entrance of the Project. Switch activated lights will be placed at each inverter for repair purposes. Impacts to light-sensitive land uses are not anticipated given the rural Project location coupled with minimal required lighting for operation of the Project.

10.2 WILDLIFE

Given that the Project is comprised primarily of agricultural lands, occurrence of wildlife within the Project Area is limited. As a result, impacts on wildlife are expected to be minor. Common species of wildlife adapted to agricultural land use may be present in the Project such as white-tailed deer, raccoon, striped skunk, woodchuck, ring-necked pheasant, Canada geese, mallards, red-winged blackbird and other small perching birds, common raptors such as red-tail hawk, common garter snakes, northern leopard frogs and American toad, rodents, snakes, 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 have minimal impacts on wildlife or their populations. During operations, any potential impacts on wildlife are also expected to be minimal. As the potential impacts to wildlife are anticipated to be minimal or temporary, no species-specific mitigation is proposed.

Tetra Tech submitted a formal MNDNR Natural Heritage Information System (NHIS) Data request for the Project Area on January 4, 2021. In response, the MNDNR reviewed the proposed Project and stated the Project will not negatively affect any known occurrences of rare features. USFWS Information for Planning and Consultation (IpaC), data received on April 2, 2021 identified one federally threatened species (the northern long-eared bat [*Myotis septentrionalis*; NLEB]) within or near the Project Area. Suitable NLEB habitat consists of a variety of forested habitat near water sources (MNDNR 2018). According to MNDNR and USFWS (2020), there are no known NLEB maternity roost trees or hibernaculum in Freeborn County. There are very few trees and water sources within the Project Area, so impacts to northern long-eared bat and their habitat is not expected. Additionally, few trees are expected to be removed for construction of the Project.

The USFWS (2018) adapted a habitat connectivity model for the federally endangered rusty-patched bumble bee (*Bombus affinis*; RPBB), to identify the zones around current (2007-2017) RPBB records where there is a high potential for the species to occur. The model produces discrete zones where there is a potential for the species to be present. The zones are referred to as High Potential Zones or Low Potential Zones. High Potential Zones contain extant sites and the surrounding area and are considered to have the greatest potential for species presence. RPBB presence is assumed within High Potential Zones where suitable habitat is present. Low Potential Zones include Primary Dispersal Zones, which models the maximum dispersal potential of the species from sites with recent records surrounding High Potential Zones; and Uncertain Zones, which contain the maximum dispersal potential from historic records of the species observed between 2000 and 2006. According to this model, there is approximately 352 acres of RPBB Low Potential Zone within the one-mile Project buffer. Nesting sites include underground and abandoned rodent cavities or clumps of grass (i.e., bunchgrasses), and overwintering sites include patches of undisturbed soil along woodland edges (USFWS 2017). o negative impacts on rusty patched bumble bees are expected because the RPBB Low Potential Zone does not fall within the Project Area, and with the establishment of native perennials, negative impacts to Rusty patched bumble bee is not expected.

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 (96.6%; U.S. Geological Survey [USGS], 2011); see **Table 7** and **Figure 7**. The remainder of the Project Area consists of developed land (3.2%) and a small amount of herbaceous or hay/pasture land (0.1%). The remaining identified land use is a minor area (less than 0.1%) of mixed forest.

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 CR 46, CR 30, CR 102, 200th Street, and T-236 (**Figure 5**). The small area (2.6 acre) of herbaceous lands within the Project Area is associated with roadside ditches. The small amount of mixed forest surrounds the rural residence located in the southwestern portion of the Project Area.

Table 6: Land Use Within the Project Area

Land Use Type	Acres in Project Area	Percent of Total Acreage
Cultivated Crops	**1,892.61**	**96.64%**
Developed, Low Intensity	**16.93**	**0.86%**
Developed, Medium Intensity	**2.38**	**0.12%**
Developed, High Intensity	**0.000058**	**0.000003%**
Developed, Open Space	**43.75**	**2.23%**
Hay/Pasture	**0.31**	**0.02%**
Herbaceous	**2.27**	**0.12%**
Mixed Forest	**0.13**	**0.01%**
Total	**1,958.4**	**100.0%**

Farmsteads are sparsely scattered outside of the Project Area generally situated near public roads. One farmstead is located in the Project Area; however, proposed Project facilities have been sited around the residence and setbacks implemented. Based on review of available aerial photography, there are seven residences located on parcels adjacent to the Project Area as highlighted on **Figures 1, 2 & 4**.

Hayward Solar reviewed Freeborn County's *Land Use Policy Plan* (1982) during preparation of the Project design. As feasible, the Project has been designed in compliance with the goals and policies of the *Land Use Policy Plan*. The *Land Use Policy Plan* acts as a basis for the Freeborn County Zoning Ordinance and as a guideline to be used to make adjustments to the land use system of the County. Policies of the Agricultural District are to preserve and conserve protect agricultural areas for agricultural purposes. The *Land Use Policy Plan* states that non-farm uses should not be allowed to locate on agricultural land unless a need for the use is demonstrated and other suitable locations are not available.

Hayward Solar has demonstrated a need for the use of a solar energy facility in this location in the SP Application and throughout this CN Application being submitted to the Commission for approval. Hayward Solar has demonstrated the lack of other suitable locations in its SP Application. Since Project land will be temporarily leased from participating landowners and land will be returned to agricultural land uses upon decommissioning of the Project, the Project will further the County's goals of providing long-term agricultural opportunities.

The Project will temporarily change the land use from agricultural to solar energy generation use within the Preliminary Development Area (**Figures 2-4**). The temporary conversion of agricultural land to the solar facility will have a relatively minimal impact on the rural character of the surrounding area or Freeborn County. As discussed further in **Section 4.3**, Land-based Economies, of the 462,416 acres in Freeborn County the majority is classified as agricultural land. Impacts to 1,272 or less acres of agricultural land within the planned Project facility would reduce the amount of agricultural land in the County by less than 1%. Expected land use impacts within the Preliminary Development Area are provided in **Table 8**.

Table 7: Expected Land Use Impacts – Preliminary Development Area

Land Use Type	Acres in Preliminary Development Area	Percent of Total Acreage
Agricultural	1,265.7	99.48%
Developed	5.8	0.45%
Herbaceous/Hay/Pasture	0.8	0.06%
All other land uses	0	0%
Total	**1,272.3**	**100.0%**

Normal agricultural activities can continue within some portions of the Project Area not converted to solar modules, access roads, O&M building, transmission facilities, and fencing. After the useful life of the Project, the current agricultural land use would be restored by removing the Project.

The Project is not anticipated to preclude current or planned land use on adjacent parcels. 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 Freeborn County *Land Use Policy Plan*. Agricultural activities will be resumed upon decommissioning of the Project. 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 Hayward 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.

As the Project is subject to siting and oversight by the State of Minnesota under the Minnesota Power Plant Siting Act, the CN and SP to be issued by the MPUC will serve as approval of the Project. Hayward Solar will continue to coordinate with Freeborn County on other potential permits for the Project (e.g., road use agreement, driveway permits, etc.).

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))

Access to the Project will be via existing County and Township roads as shown of **Figures 2-4.** The major roadway in the area is Interstate 90 located immediately north of the proposed Project. Other roads that surround the Project Area are local County or Township roads. The Project Area is bordered by CR 46 in the northern portion and bound by CR 30 to the east. Annual Average Daily Traffic (AADT) counts based on Minnesota Department of Transportation's (MNDOT's) 2017 Publication of traffic volumes for Freeborn County are provided in **Table 9** and displayed on **Figure 5** (MNDOT, 2017).

Table 8: Annual Average Daily Traffic in the Project Vicinity

Roadway	Year	AADT Traffic Volume Total
Interstate 90 (north of Project Area to Hayward, MN)	2017	11,900-12,000
CR 46 (crosses Project Area to Hayward, MN)	2017	1,950
CR 30 (850th Ave. eastern boundary of Project Area)	2017	470

Source: MNDOT, 2017

There will be several access points to the Project. The northern portion of the Project will be accessed from CR 46 (East Main Street), 200th Street (T-121) and T-236. The southern portion of the Project will be accessed from CR 30 (850th Avenue), 200th Street, and T-236. Access from Interstate 90 is not currently being contemplated for the Project.

One railway crosses the northwestern portion of Project Area (**Figures 1 & 6**). SMMPA will construct its 161 kV line from its switchyard across the railway to SMMPA's existing 161 kV transmission line. SMMPA will be responsible for securing any necessary encroachment agreements with the railway owner prior to construction to minimize impacts to rail traffic.

According to the Federal Aviation Administration (FAA), there are no FAA-registered airports located within three nautical miles of the Project Area.

Access to the Project will be via existing Township and County roads. With the limited possible exception of minor field access or driveway changes depending on final design, no changes to existing roadways will occur. Hayward Solar will work with Freeborn County staff on a road use agreement to address road use and related concerns. This agreement will be completed prior to start of construction.

Overall construction traffic will use the existing State and County roadway system to access the Project site and facilities to deliver construction materials and personnel. Traffic during construction is estimated to be approximately on average 150-200 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. Overweight or oversized loads are unlikely. If they are required, Hayward Solar will obtain the appropriate approvals prior to construction. 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 given the type of construction and materials required for the Project. If they are required, Hayward Solar will obtain the appropriate approvals prior to construction

After construction is complete, traffic impacts during the operational phase of the Project are expected to 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; traffic function in the Project Area 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 as a result of exhaust emissions from construction equipment and other vehicles, and from fugitive dust from wind erosion of agricultural land 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 and other carbon-based fueled equipment, will vary with the phase of construction. Emissions from construction vehicles will be minimized by using modern equipment with lower emissions ratings and properly functioning exhaust systems. 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. These effects will most likely be less than the historic emissions from farm machinery and fugitive dust produced during normal farming operation that would otherwise typically occur within and near the Project site.

Applicable BMPs will be used during construction and operation of the Project to minimize dust emissions. Additional BMPs will be implemented as part of the VMP and AIMP which will also address emissions (e.g., mulching exposed soils, installing and maintaining vegetative cover, engineering controls, such as reducing vehicle and equipment speed, maintaining equipment and exhaust/mufflers, etc.). Additional practices may include watering or treating haul and access roads and other exposed dust producing areas, containment of excavated material, protection of exposed soil, soil stabilization, and treating stockpiles to control fugitive dust. As part of the required construction stormwater permit that will be obtained for the Project, a National Pollutant Discharge Elimination System (NPDES) construction stormwater permit and associated Stormwater Pollution Prevention Plan (SWPPP) will be developed prior to construction and implemented during construction that will include BMPs to minimize to potential for fugitive dust.

The Project will have no air emissions and will avoid emissions associated with fossil generation facilities. Hayward Solar undertook analysis using EPA data for emissions and generation data for the MISO-Minnesota Zone to calculate avoided emissions related to the

Project. **Table 10** provides a summary of the estimated reduction in pollutants from the Project based on the EPAs avoided emissions and generation tool calculator.[100]

Table 9 Estimated Avoided Pollutants

Pollutant	Tons or Pounds/Year
CO_2	-18,870 tons
NOX	-22,217 lbs
PM2.5	-1,641 lbs
SO2	13,371 lbs

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 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 NPDES permit program and addressed by the Project's SWPPP, as required. Temporary sanitary facilities will be provided during construction, and the O&M building may require a septic system, which will be installed in accordance with applicable regulations.

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 will 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. In addition, some waste streams will be generated at the O&M building. These materials will also be stored, recycled, and/or disposed of in accordance with applicable local, State, and Federal regulations.

[100] Located at https://www.epa.gov/statelocalenergy/avoided-emissions-and-generation-tool-avert.

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

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 step-up transformers and rotation of the tracking systems. All electrical equipment will be designed to National Electrical Manufacturer Association Standards. **Table 11** summarizes the anticipated distance to reach the most stringent MPCA noise standard (50 dBA) from the inverters, trackers and the Project Substation 34.5 to 161 kV power transformer modeled for use at the Project.

Table 10: Noise Model Results for the Project

Decibel Levels	Inverter Distance to dB(A) Levels (feet)	Project Substation Transformer Distance to dB(A) Levels (feet)
50	66	56
45	129	97
40	250	173
35	450	304

Results of noise modeling indicate that the Project will not exceed applicable noise levels during operation of the Project. Hayward Solar plans to use Sungrow, or equivalent, inverters. These inverters produce 67 dBA at their source. Because the inverters are located within the solar arrays, the noise levels from the Project equipment are not expected to be discernible from background noise levels at homes in the vicinity. Sungrow indicates that its inverters will produce a maximum noise level of 79 dBA at 1 meter. As indicated in **Table 11** above, the distance the noise level would decrease to 50 dBA is 66 feet (for the inverters) and 56 feet (for the transformer); no noise impacts are anticipated. Accordingly, the Project will not cause or contribute to an exceedance of Minnesota's noise standards. The distance of the nearest inverter to a residence is approximately 1,050 feet, which is the farmstead residence located within the southern end of the Project Area and whose landowner is participating in the Project (**Figure 6**). Based upon the noise model results included in **Table 11**, no impacts to this residence is not anticipated.

During construction Hayward Solar will mitigate potential noise impacts by limiting construction to daylight hours and use of construction equipment and vehicles with properly functioning mufflers and noise-control devices. No noise impacts are anticipated during Project operation; therefore, no mitigation measures are proposed. Hayward Solar will confirm during final Project design that MPCA noise limits will be met.

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

During construction, the Project is expected to create approximately 204 direct, on-site jobs and support an additional 115 jobs across all industries in the county. As an operating facility, the Project will support 14 jobs, 4 on-site and 10 in other industries across the county.[101] Additionally, non-construction jobs such as engineering and surveying will be needed prior to and during

[101] *Economic Impact of a Proposed Solar Energy Project in Freeborn County, Minnesota*, A Report of the Economic Impact Analysis Project, University of Minnesota Extension, at 5 (April 2021).

construction. Hayward Solar used the National Renewable Energy Laboratory's (NREL) Jobs and Economic Development Impacts (JEDI) PV tool[102] to calculate jobs associated with the design construction and installation of the Project.

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

Hayward Solar anticipates having an operations agreement with another entity for performance of Balance of Plant (BOP) O&M. The BOP O&M provider will be an experienced third party. Hayward 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. The AC current will be stepped up through transformer to 34.5 kV and brought via underground 34.5 kV AC collection cables to the Project Substation. The 34.5 kV collector system voltage will then be stepped up to the interconnection voltage of 161 kV by the transformer located at the Project Substation. The power will then be transmitted to the switchyard via the Project Gen-Tie Line.

The SMMPA Switchyard will be used to interconnect the Project to the existing SMMPA transmission line. The existing SMMPA HVTL crosses through the northern portion of the Project Area (**Figures 2 & 3**). Hayward Solar will acquire the land underlying the new SMMPA Switchyard (via a purchase option agreement) and secure any other land rights that are necessary to facilitate the SMMPA Line Tap. SMMPA will design, engineer, permit and construct the new SMMPA Switchyard and SMMPA Line Tap. Hayward Solar will secure and convey the real property for the SMMPA Switchyard and SMMPA Line Tap to SMMPA. These facilities will be network facilities owned and operated by SMMPA.

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 utility or utilities 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 DOC-EERA is required to prepare an Environmental Report for any large energy facility for which a CN must be obtained.

12.2 SITE PERMIT

[102] https://jedi.nrel.gov/.

Hayward Solar will also submit to the Commission a SP Application pursuant to the Minnesota Power Plant Siting Act (Minnesota Statutes Chapter 216E) and Minnesota Administrative Rules Chapter 7850 (MPUC Docket No. IP-7053/GS-21-113).

12.3 OTHER PROJECT PERMITS

Hayward Solar will obtain all permits and licenses that are required for the Project, following issuance of the SP. The permits or approvals that Hayward Solar has identified as potentially being required for the construction and operation of the Project are shown in **Table 12**.

Table 11: Potential Permits/Approvals

Table 12 Potential Permits/Approvals			
Agency	**Permit**	**Applicability**	**Permit Status and Timing**
Federal			
U.S. Army Corps of Engineers (USACE)	Section 404 Permit	Dredging or filling jurisdictional Waters of the United States (wetlands/waterways)	To be obtained prior to construction in jurisdictional waters, as needed
U.S. Environmental Protection Agency	Spill Prevention, Control, and Countermeasures Plan	Project facilities with oil storage of more than 1,320 gallons	To be prepared prior to construction, as needed
State			
Minnesota Public Utilities Commission	Certificate of Need	Required for LEGFs (electric power generating plant or combination of plants at a single site with a 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, application filed concurrent with the SP Application
	Site Permit	Construction of energy conversion facility	To be obtained prior to construction, application filed concurrent with the CN Application
Minnesota Pollution Control Agency (MPCA)	Section 401 Water Quality Certification	Required for Section 404 Individual and Nationwide Permits.	To be obtained prior to construction, if necessary

Table 12 Potential Permits/Approvals			
Agency	**Permit**	**Applicability**	**Permit Status and Timing**
	National Pollutant Discharge Elimination System (NPDES) General Permit and Stormwater Pollution Prevention Plan (SWPPP)	Construction activity that disturbs one or more acre of land.	To be obtained/prepared prior to construction
Minnesota Department of Health (MDH)	Well construction permit	Installation of a water supply well.	To be obtained prior to construction of a well (for O&M building), as needed
Minnesota Department of Labor and Industry (MDLI)	Electrical inspection of installed equipment	Necessary to comply with state electrical codes.	Inspection to be conducted during construction and prior to operation
Minnesota Department of Natural Resources (MNDNR)	Water Appropriation 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 dewatering activities, as needed
MNDNR, Division of Lands & Minerals	Utility Crossing License	Required to cross state land with utility infrastructure.	To be obtained prior to crossing state land with utility infrastructure, as needed
Minnesota State Historic Preservation Office (SHPO)	Cultural and Historic Resources Review; State and National Register of Historic Sites Review	Projects that require State permits or affect State register properties, or require Section 106 compliance.	Obtain concurrence on Phase I inventory prior to construction
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 installation of utilities within MNDOT right-of-way, as needed
	Access (Driveway) Permit	Required for construction of a driveway/access road utilizing MNDOT rights-of-way.	To be obtained prior to construction of driveway on MNDOT right-of-way, as needed

Table 12 Potential Permits/Approvals			
Agency	**Permit**	**Applicability**	**Permit Status and Timing**
	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
County/Local			
	Building Permit	Required for new construction in Freeborn County.	To be obtained prior to construction, as needed
	Minnesota Wetland Conservation Act (WCA) Approval (in conjunction with Freeborn County Soil and Water Conservation District)	Activities affecting water resources.	To be obtained prior to construction in jurisdictional waters, as needed
	Septic Permit Application	Required prior to installation of any septic system in Freeborn County.	To be obtained prior to construction of septic system, as needed
	Access Permit	Required for moving, widening or creation a new driveway access to County roads.	To be obtained prior to construction of new driveway access, as needed
	Utility Permit	Required for installation of utility infrastructure in a County road right-of-way.	To be obtained prior to installation , as needed
	Right-of-Way Permit	Required to work within public road right-of-way.	To be obtained prior to work within right-of-way, as needed
	Oversize/Overweight Permit	Use of overweight or oversized vehicles on County roadways.	To be obtained prior to equipment deliveries, as needed