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**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF NORTH DAKOTA**

NORTHERN STATES POWER COMPANY
ADVANCE DETERMINATION OF PRUDENCE –
460 MW SHERCO SOLAR FACILITY

CASE No. PU-21-_____

**APPLICATION FOR
ADVANCE DETERMINATION OF PRUDENCE**

I. INTRODUCTION

Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy (NSP or Xcel Energy or the Company), submits to the North Dakota Public Service Commission (Commission) this Application for an Advance Determination of Prudence (ADP) for 460 MW of grid-scale solar photovoltaic (PV) capacity at the Company's Sherburne County (Sherco) Generating Station site (Sherco Solar or Project). The Project is composed of a solar site under development by National Grid Renewables (NG Renewables, f/k/a Geronimo Energy), combined with a site of similar size under development by the Company adjoining the existing Sherco Generating Station to the west and east, respectively.

The Company is proposing to add the Sherco Solar resource to fill a capacity need on the NSP System that is expected to arise in 2026 and grow thereafter. The Company has had an identified capacity need in the mid-2020s dating back to our 2011-2025 Resource Plan (filed in Case No. PU-10-589), and this need has remained through our two more recent Integrated Resource Plans (IRP), which have been filed with the Commission in Case Nos. PU-15-019 and PU-19-220. Sherco Solar also presents an opportunity to replace a portion of the generation capacity of Sherco Unit 2, which is currently planned for retirement in 2023, and to reutilize the Company's valuable existing interconnection rights associated with that retiring facility.

The Company is pursuing Sherco Solar to fill this capacity need consistent with the selection of solar resources pursuant to our most recent IRP Preferred Plan, which is a Minnesota-based resource planning analysis. Further, development of solar resources

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at the Sherco site in Becker, Minnesota advances Minnesota state clean energy policy goals by meeting the state’s preference for renewable energy resources,¹ and helping meet the state’s greenhouse gas emissions targets,² Renewable Energy Standard (RES),³ and Solar Energy Standard (SES).⁴ Additionally, the Sherco Solar Project was initially proposed in response to the Minnesota Public Utilities Commission’s (MPUC) investigation to identify investments that utilities could undertake to support economic relief and recovery in the wake of the COVID-19 pandemic. Xcel Energy thus fully acknowledges that this resource addition is driven by Minnesota policy priorities.

The Company further recognizes that the selection of a solar resource to meet this capacity need is not consistent with North Dakota planning priorities. Specifically, when externality values are excluded from the modeling, as required under North Dakota law,⁵ Sherco Solar is not the least cost option for filling the identified capacity need in 2026. Rather, the “North Dakota Plan” resource planning analysis in our most recent IRP selected a dispatchable resource, modeled as a greenfield combustion turbine (CT), to meet the identified capacity need.

Nonetheless, the Project will provide needed capacity and emissions-free energy to the integrated NSP System that will benefit all of our customers, including those in North Dakota. For this reason, and in the interest of maintaining the integration of the NSP System for the benefit of all our customers, the Company is proposing a cost assignment methodology be applied to the Sherco Solar project that would reconcile the different planning priorities of Minnesota and North Dakota. To do so, the Company is requesting an ADP for the Sherco Solar project that would institute a cost assignment methodology to ensure North Dakota customers pay for costs consistent with North Dakota planning priorities – namely costs that are representative of a dispatchable resource such as a CT – while allowing Minnesota customers to take advantage of the policy attributes of a solar resource. To that end, instead of applying the traditional interjurisdictional demand and energy allocators to the full cost of the Project, the Company proposes to assign a smaller share of the costs of the Project to North Dakota via market-based proxy prices for both the capacity of and energy from the Sherco Solar project.

¹ Minn. Stat. § 216B.2422, subd. 4.

² Minn. Stat. Ch. 216H.

³ Minn. Stat. § 216B.1691, subd. 2a.

⁴ Minn. Stat. § 216B.1691, subd. 2f.

⁵ N.D.C.C. § 49-02-23.

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As a result, while the Company is requesting an ADP for the Sherco Solar resource addition in this Application, we are not requesting a determination that the entire Project and all associated costs are prudent under North Dakota planning principles. Rather, as discussed below, the Company proposes to recover from North Dakota customers costs based on a generic new resource addition and market prices for the energy generated by the Project.

In the Company's Preferred Plan in our most recent IRP, the planning model selected a 500 MW solar resource as the optimal resource to add in 2025 to fill a capacity need in 2026. However, under North Dakota planning assumptions which prohibit consideration of externality values, the model selected 374 MW of firm dispatchable capacity as the optimal resource to fill this identified need. To reflect the costs of this North Dakota modeled resource and maintain the NSP System structure, the Company proposes to use a proxy pricing mechanism to ensure North Dakota rates are not adversely impacted by the energy preferences of another state but rather reflect North Dakota law and policy priorities.

Specifically, the Company proposes to assign to the North Dakota jurisdiction only the North Dakota share of the costs of a generic, new, and firm dispatchable resource (*i.e.*, a greenfield CT) in the year before the capacity need arises, consistent with the IRP. To establish a proxy capacity price for a generic CT, the Company proposes to use the Midcontinent Independent System Operator's (MISO) Cost of New Entry (CONE) value. The CONE is an industry-standard, all-in estimate of the cost of constructing a new power plant, represented as a cost per MW-year installed. The CONE is locationally specific based on each zone within MISO and is updated annually. We propose to use CONE as a proxy price for the capacity provided by Sherco Solar, and to allocate the North Dakota share of those repriced capacity costs using the Company's jurisdictional demand allocator in effect at the time.

Similar to the capacity costs, the Company proposes to use a proxy price for the energy that Sherco Solar provides to North Dakota customers. Specifically, the Company proposes to charge the North Dakota jurisdiction for its share of the energy produced by the Project using the day-ahead locational marginal price (LMP) at the Sherco Solar site. Thus, even if the levelized cost of the Sherco Solar Project is above the market price of energy, North Dakota customers will only pay LMP for the energy that is produced. These energy costs will be passed to North Dakota customers through the Fuel Cost Rider (FCR). This is the same methodology the Company uses today for the energy produced by Minnesota-based Community Solar Gardens.

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The end result of this proposal is that North Dakota customers will pay for only the North Dakota share of the capacity costs from what would be a least-cost resource addition to meet an identified capacity need in the mid-2020s, and market prices for its share of energy produced by the Project. Because the incremental costs associated with the Project being a solar facility to meet Minnesota policy preferences are borne by Minnesota customers, all non-capacity and energy related attributes of Sherco Solar will be for the benefit of Minnesota customers. The Company's analysis indicates that North Dakota customers could save nearly \$7 million over the life of the Sherco Solar project compared to being allocated the North Dakota portion of the full value of the Project. We believe this is a prudent, fair, and efficient way to ensure that both North Dakota and Minnesota policy preferences are acknowledged and that the NSP System remains intact. As a result, the Company's addition of Sherco Solar, subject to these pricing conditions, is a prudent resource addition to meet an identified capacity need.

In support of the Company's Application, Xcel Energy provides the following Direct Testimony:

- Policy Testimony – Mr. Greg P. Chamberlain
- Resource Planning Testimony – Ms. Farah L. Mandich

The remainder of this Application addresses the following:

- Description of Applicant;
- Communication and Service;
- Standard of Review;
- Authority for Relief Requested;
- Project Background, Need, and Selection Process
- Cost Assignment Proposal;
- Economic Analysis;
- Prudence of the Sherco Solar Project; and
- Conclusion.

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II. COMPLIANCE MATTERS

A. Description of Applicant

Xcel Energy is a Minnesota corporation duly authorized to conduct business in the State of North Dakota as a foreign corporation. The Company conducts business in the State of North Dakota as a public utility subject to the jurisdiction and regulation of the Commission pursuant to Title 49 of the North Dakota Century Code (N.D.C.C.). The name and address of Xcel Energy is:

Northern States Power Company, a Minnesota corporation
414 Nicollet Mall
Minneapolis, Minnesota 55401

Xcel Energy also operates in North Dakota from the following address:

Northern States Power Company
2302 Great Northern Drive
Fargo, North Dakota 58102

The Company's Certificate of Incorporation with amendments and Certificate of Authority were filed with the Commission on September 30, 2009, and October 12, 2009, respectively, in Case No. PU-09-664. Current Certificates of Good Standing issued by the North Dakota and Minnesota Secretaries of State were filed in the same case on January 8, 2021, and are incorporated herein by reference.

Xcel Energy has service territory in five upper Midwest states including North Dakota. The Company presently serves approximately 95,000 retail electric customers in and around Fargo, Grand Forks, and Minot, North Dakota, and owns approximately 1,450 conductor miles of transmission and 3,810 conductor miles of electric distribution lines in North Dakota.

B. Communication and Service

The Company respectfully requests that the following persons be placed on the Commission's official service list for all official communications in this case:

David H. Sederquist	Regulatory Records
Senior Consultant, Regulation and Finance	Records Specialist

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C. Standard of Review

North Dakota Century Code section 49-05-16(1)(d) authorizes the Commission to issue an ADP if it “determines that the resource addition is prudent.” This standard is similar to the “honestly and prudently invested” standard that the Commission uses for ratemaking.⁶ The general prudence standard calls for determining whether the utility action was reasonable at the time it was taken under all relevant circumstances.⁷ Under Section 49-05-16(1), the Commission may issue an order approving the prudence of a proposed project if four conditions are met:

- a. The public utility files with its application a projection of costs to the date of the anticipated commercial operation of the resource addition;
- b. The public utility files with its application a fee in the amount of one hundred seventy-five thousand dollars;
- c. The commission provides notice and holds a hearing, if appropriate, in accordance with section 49-02-02; and
- d. The commission determines that the resource addition is prudent. For facilities located or to be located in this state the commission, in determining whether the resource addition is prudent, shall consider the benefits of having the resource addition located in this state.

D. Authority for Relief Requested

North Dakota Century Code section 49-05-16 allows a public utility to seek an ADP from the Commission at the utility’s discretion. Pursuant to the Settlement Agreement in Case No. PU-07-776, the Company is obligated to file an application for an ADP for any proposed new construction or acquisition of a generating resource above 50 MW

⁶ See N.D.C.C. § 49-06-02.

⁷ See Charles F. Philips, Jr., *The Regulation of Public Utilities – Theory and Practice* at 292 (Public Utility Reports 1988); see also David J. Muchow & William A. Mogel, *Energy Law and Transactions* at § 4.02[3][b] (2009).

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where the Company proposes to assign all or part of the costs to the North Dakota jurisdiction.⁸ In Case No. PU-12-59, Xcel Energy committed to filing its ADP applications within fourteen days of seeking similar approvals from the MPUC.⁹

With this Application, the Company has met its filing obligations. This Application complies with the requirements of N.D.C.C. § 49-05-16 and the Settlement Agreement in Case No. PU-07-776. Additionally, the Company is submitting this Application within fourteen days of the April 12, 2021 filing of a similar application with the MPUC.

Xcel Energy is requesting an ADP for the Sherco Solar project with costs and benefits assigned as proposed by the Company in this Application and supporting testimony.

III. DESCRIPTION AND PURPOSE OF FILING

A. Project Background

Sherco Solar is a joint development between NG Renewables and Xcel Energy that will be located adjacent to the Company's Sherco Generating Station in Becker, Minnesota. As part of the Project, the Company is acquiring a 230 MW site west of the existing Sherco Generating Station from NG Renewables (West Block), and combining it with a project developed on land to the east for which Xcel Energy holds leases (East Block), bringing the overall Project to 460 MW. The proposed solar generation site boundary encompasses approximately 3,480 acres of land which is predominantly used for agriculture, with a mix of hay/pasture, row crops, and irrigated farmland.

The Project will include two collector substations, one for each block of land that will be developed, and two 345 kV generation-tie (gen-tie) lines which will connect the collector substations to the point of interconnection at the existing Sherburne County Substation. NG Renewables will continue to develop the Project and secure, on Xcel Energy's behalf, Minnesota permits for the Project site and routes for the high voltage transmission lines connecting the Project to the Sherburne County Substation. A key factor in the selection process was the Project's proximity to existing electrical and transportation infrastructure, including the Sherco Generating Station, existing

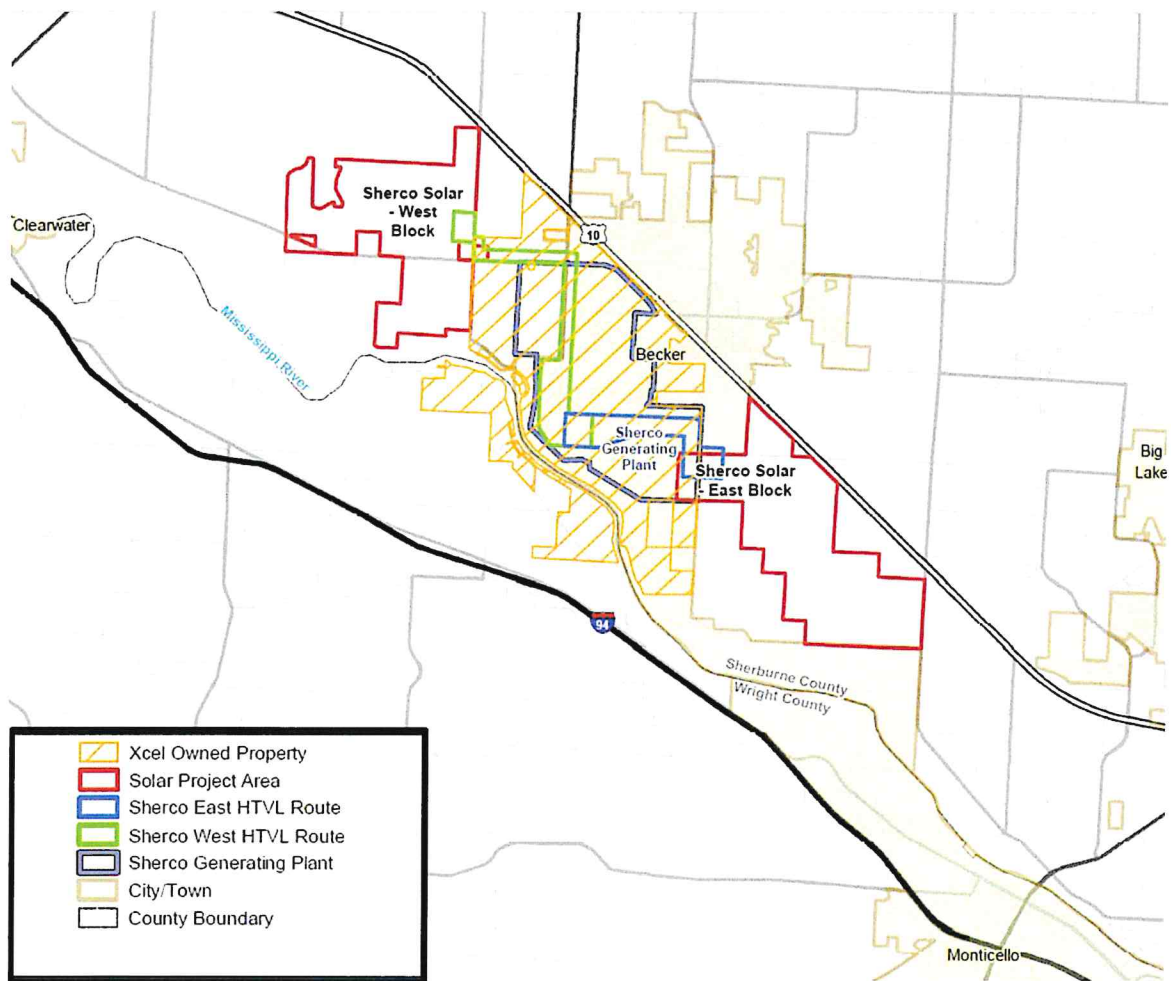
⁸ *N. States Power Co. Elec. Rate Increase Application*, Case No. PU-07-776, ORDER ADOPTING SETTLEMENT AGREEMENT at 6 of attached Settlement Agreement (Dec. 31, 2008).

⁹ *N. States Power Co. Advance Prudence – Geronimo Wind Application*, Case No. PU-12-59, LETTER OF COMMITMENT (Nov. 5, 2012).

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transmission lines, and the Sherburne County Substation, which will soon have available capacity due to the retirement of Sherco Unit 2. Figure 1 below shows the Sherco Solar Project site boundary, including the East and West Blocks outlined in red.

Figure 1: Sherco Solar Project Site Boundary



B. Project Need

The 460 MW Sherco Solar Project will partially fill a capacity need on the NSP System that the Company’s most recent 2020-2034 IRP forecasts for 2026. The Company has been forecasting a large capacity need arising in the mid-2020s for over a decade, due to an evolving set of factors. Indeed, this capacity shortage was initially forecasted by

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the Company in our 2011-2025 Resource Plan.¹⁰ At that time, we estimated that 2,003 MW of additional capacity would be needed in 2025, primarily due to the expiration of large hydroelectric contracts in that year.¹¹ In our following resource planning cycle (2016-2030), the Company similarly identified a capacity shortage on the NSP System in the mid-2020s, noting deficits of 1,341 MW in 2025 and 1,936 MW in 2026.¹² In the Supplement to our 2016-2030 IRP, we noted that this capacity need arising in 2024 and expanding significantly in 2025 and 2026 was caused primarily by the Company's plan to cease coal operations at Sherco Units 1 and 2 in 2026 and 2023, respectively, along with other changes to our generating resources.¹³ In our most recent 2020-2034 Upper Midwest IRP Supplement, filed with the Commission on June 30, 2020, we forecasted a 92 MW net capacity deficit on the system arising in 2026 and growing to 1,016 MW by 2030, caused in part by unit retirements.¹⁴

To partially fill this identified capacity need in the mid-2020s, the Company's preferred generation expansion plan in our most recent IRP Supplement (Preferred Plan) selected 500 MW of large scale solar to be added to the NSP System in 2025.¹⁵ The Preferred Plan factors in the externality values of various generation types, carbon-reduction goals set by the Company, and other Minnesota policy priorities, and in our view best positions the Company to achieve our carbon goals while maintaining a reliable system and keeping our customers' bills low. As the Commission is aware, however, the Settlement in Case No. PU-07-776 requires the Company to include in its Resource Plans an analysis of a Resource Plan scenario compliant with Federal and North Dakota laws only (North Dakota Plan). Under the North Dakota Plan in the most recent IRP Supplement, the model selected 374 MW of Firm Dispatchable capacity to fill the

¹⁰ Filed with the Commission in Case No. PU-10-580 (Aug. 3, 2010).

¹¹ *N. States Power Co. Integrated Resource Plan*, Case No. PU-10-589, 2011-2025 RESOURCE PLAN at p. 3-21 (Aug. 3, 2010). As discussed further in the testimony of Company Witness Ms. Farah Mandich, the capacity need in the 2011-2025 Resource Plan was calculated slightly differently than in the subsequent plans, due to MISO guidance in place at the time.

¹² *N. States Power Co. Integrated Resource Plan*, Case No. PU-15-019, 2016-2030 UPPER MIDWEST INTEGRATED RESOURCE Plan at p. 55 (Jan. 1, 2015).

¹³ *N. States Power Co. Integrated Resource Plan*, Case No. PU-15-019, 2016-2030 UPPER MIDWEST INTEGRATED RESOURCE Plan at p. 11-12 (Jan. 1, 2015).

¹⁴ *N. States Power Co. Integrated Resource Plan*, Case No. 19-220, 2020-2034 UPPER MIDWEST INTEGRATED RESOURCE PLAN SUPPLEMENT at Att. A, p. 15-16 (June 30, 2020). In our currently-pending 2021 Electric Rate Case (Case No. PU-20-441), the Company has requested the Commission adjust the remaining lives of Sherco Units 1 and 2 to reflect these revised retirement dates.

¹⁵ *N. States Power Co. Integrated Resource Plan*, Case No. 19-220, 2020-2034 UPPER MIDWEST INTEGRATED RESOURCE PLAN SUPPLEMENT, Table 3-1 (June 30, 2020).

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capacity need in 2025.¹⁶ Regardless of how this capacity need is filled, in both scenarios the Company has a significant capacity need beginning in 2026.

C. Project Selection Process

In light of this identified capacity need, and in response to the MPUC's request that the Company explore projects which might provide economic stimulus in light of current recessionary conditions resulting from the COVID-19 pandemic,¹⁷ the Company issued a Request for Proposals (RFP) and conducted a competitive solicitation for solar projects at the Sherco site. There was substantial interest in the RFP, generating many questions, and it ultimately resulted in three bid submissions that we reviewed under the oversight of our independent auditor (IA). Our IA, Guidehouse, validated our process, certifying that it believes the goals of our RFP were achieved, that project assessments were performed in a fair and consistent manner, and that there is no evidence that we unfairly advantaged any interested party or respondent to the RFP. The RFP process used for the Sherco Solar Project, consistent with prior MPUC orders and under the supervision of the IA, included protections to ensure that the Company's self-build proposals were not unfairly advantaged or given preferential consideration.

The RFP was specific to the Sherco site to ensure that the Company's existing interconnection rights at the Sherco site are reused by the new project. As noted in our ADP Application for the Heartland Divide II wind project (Case No. PU 20-433), greenfield renewable projects in the MISO West region currently face substantial cost uncertainty due to uncertainty surrounding MISO-assigned transmission upgrades, and many proposed projects have withdrawn from the queue as a result. As discussed in more detail below, the expected retirement of Sherco Unit 2 in 2023 will free up substantial interconnection capacity at the Sherco site that, under MISO rules, must be reused by the Company within three years, otherwise the Company will lose this valuable asset. Due to the current state of the MISO West queue, in order to develop new generation resources, it is essential that the Company make efficient use of its existing interconnection rights.

The general timing rules for generator interconnection replacement set forth in Attachment X of the MISO Tariff require that: (1) a request for generator interconnection replacement be submitted *at least one year prior* to the date that an existing

¹⁶ *N. States Power Co. Integrated Resource Plan*, Case No. 19-220, 2020-2034 UPPER MIDWEST INTEGRATED RESOURCE PLAN SUPPLEMENT, Table 3-1 (June 30, 2020).

¹⁷ See MPUC Docket No. E,G999/CI-20-492.

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generation facility will cease operation,¹⁸ and (2) the expected commercial operation date for a replacement facility must be *within three years* of the date that the existing facility ceases operation.¹⁹ The rules allow *the owner* of an existing facility to request *itself* replace the facility with another facility. The rules do not allow the owner of an existing facility to submit a request for a third party to build a replacement facility that will use the owner's existing interconnection rights. This is why the Company needed to purchase the West Block of the Project from NG Renewables and why we only solicited Build-Transfer proposals (not PPAs) in our RFP.

The planned retirement of Sherco Unit 2 in 2023 will free up nearly 700 MW of interconnection capacity to be reused at the Sherco site. However, under the MISO rules described above, if a replacement resource is not put in service within three years of Sherco Unit 2's retirement the Company will lose these valuable interconnection rights forever. Based on current constraints in the MISO interconnection queue and the Company's observation of recent planning study cycles and assigned interconnection upgrade costs, we estimate that the potential opportunity cost of foregoing full reutilization of the interconnection rights associated with Sherco Unit 2 is approximately \$140 million to \$350 million.²⁰

After conducting the thorough and competitive RFP process described above, the Company's combined bid with NG Renewables offered the most beneficial project to meet our solar needs under Minnesota law and the Company's own goals. Sherco Solar as proposed was the cheapest project bid and will be the cheapest utility scale solar on the NSP System. By leveraging the expertise of both companies, we will be able to ensure the project maximizes benefits to customers. In addition to the RFP, which offered valuable insight to alternative project pricing, we compared the Project to other solar resources on our system and in the region. This evaluation found that the proposed Sherco Solar project would provide lower cost energy than any solar facility currently operating on the NSP system and is less than half the price of the average Community Solar Garden project.

¹⁸ MISO Tariff Attach. X § 3.7.1(ii).

¹⁹ MISO Tariff Attach. X § 3.3.1. Additionally, § 3.3.1 states that "For Existing Generating Facility that is in suspension pursuant to Section 38.2.7 of the Tariff or in Forced Outage, the start date of suspension or outage shall be considered the date of cessation of operation of the Existing Generating Facility for purposes of calculating the three (3) year limit."

²⁰ Our IRP assumes that greenfield solar or combustion turbine interconnection costs (*i.e.* projects that go through the MISO queue) will be approximately \$200/kW over the planning period and wind or combined cycle interconnection costs are \$500/kW. As noted above, there are approximately 700 MW coming available when Sherco Unit 2 ceases operation in 2023.

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Company Witness Mr. Greg Chamberlain discuss the resource solicitation and selection process further in his Direct Testimony.

IV. PROJECT COSTS, OUTPUT, AND SCHEDULE

1. Project Costs

The total installed capital costs for the Project are estimated to be approximately [TRADE SECRET BEGINS

TRADE SECRET ENDS]. Importantly, the Project is positioned to take advantage of the recent solar investment tax credit (ITC) extension, and we expect the Project to qualify for [TRADE SECRET BEGINS

TRADE SECRET ENDS].

Table 1 below presents a breakdown of project costs by category and block:

Table 1: Sherco Solar Project Costs

Category	East Block	West Block	Total
	[TRADE SECRET BEGINS		
Capital			
Transmission			
Interconnection Substation			
AFUDC			
Total			TRADE SECRET ENDS]

The Company has made every effort to ensure that our estimated project costs are reasonable and justified. However, as with other projects, the final project costs can vary from our estimates as they are dependent on several different variables, including

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equipment costs and/or supply chain issues (for panels, inverters, trackers and racking systems), changes in taxes, incentives or tariffs (*i.e.* steel or equipment tariffs), and timing of the site permit review and final regulatory approval. The Company will continue to make every effort to ensure that project costs remain as close to these estimates as possible.

2. Project Output

As noted earlier, the Sherco Solar project will have a total installed capacity of 460 MW. The Company estimates that the net annual delivered energy will be **[TRADE SECRET BEGINS** **TRADE SECRET ENDS]** after both the West and East Blocks are placed in-service.

Furthermore, the net capacity factor (NCF) is expected to be within the range of **[TRADE SECRET BEGINS** **TRADE SECRET ENDS]**. This range in the NCF was calculated by using manufacturer's supplied equipment performance data modeled using the PVSyst tool with third-party commercial meteorological data projections for the site. The Company believes this range is reasonable. The approximate midpoint of this range, **[TRADE SECRET BEGINS** **TRADE SECRET ENDS]**, was used for the purposes of calculating project performance and costs.

Based on the project lifetime costs and expected production, the Company has calculated the levelized cost of energy (LCOE) to be **[TRADE SECRET BEGINS** **TRADE SECRET ENDS]**. As with other cost components, the actual LCOE can shift depending on any changes in final project costs, tax benefits, and actual project production

3. Project Schedule

We currently expect primary construction activities for the Sherco Solar project will occur in **[TRADE SECRET BEGINS** **TRADE SECRET ENDS]**. However, other engineering and procurement activities **[TRADE SECRET BEGINS** **TRADE SECRET ENDS]**.

The project will be placed in service on a rolling basis, with full Project operation by the fourth quarter of 2024. The Company anticipates beginning commercial operations

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for portions of the Project via a phased approach beginning in 2023 to accommodate the planned in-service date for the entire Project.

V. COST ASSIGNMENT PROPOSAL

While the Sherco Solar Project is the least-cost resource under a Minnesota view including externality costs and comports with Minnesota state policy priorities in filling the established capacity need, we recognize that it is not the least-cost resource to fill this need under North Dakota law.²¹ For this reason, and because the Project was developed in response to the MPUC's request for utility proposals to support economic recovery during the global pandemic, the Company is proposing to recover in North Dakota only the traditionally allocated costs that are representative of a similarly sized least-cost resource under North Dakota law, with the difference being offset by additional recovery in the policy-setting state, Minnesota.

While we recognize this ADP request is unique, the use of proxy costs/pricing is not unprecedented. In fact, assigning project costs to Minnesota customers due to the direct link to Minnesota policy goals is how Community Solar Garden (CSG) costs are currently handled. That is, we recover all CSG costs from our Minnesota customers because cost-causation for CSG resources is firmly tied to Minnesota policy goals. Here, as noted above, the Sherco Solar Project advances clean energy policy goals in Minnesota by meeting the state's preference for renewable energy resources²² and progressing toward compliance with the state's greenhouse gas emissions targets,²³ RES,²⁴ and SES.²⁵

In exchange for recovering a higher proportion of the Project's capacity and energy costs in Minnesota, the Company will assign all of the corresponding attributes from the Project to Minnesota, including all Renewable Energy Certificates (RECs), ancillary services, and any other renewable attributes of the energy generated by the Project. Included in these benefits would be any cost reductions that would accrue to the project from changes in tax law currently under consideration by the United States Congress.

²¹ *See, e.g.*, N.D.C.C. § 49-02-23 ("The commission may not use, require the use of, or allow electric utilities to use environmental externality values in the planning, selection, or acquisition of electric resources or the setting of rates for providing electric service.").

²² Minn. Stat. § 216B.2422, subd. 4.

²³ Minn. Stat. Ch. 216H.

²⁴ Minn. Stat. § 216B.1691, subd. 2a.

²⁵ Minn. Stat. § 216B.1691, subd. 2f.

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The remainder of this Section discusses how the Company proposes to assign the costs of the capacity and energy of the Project to North Dakota customers.

A. Capacity Costs

As noted above, the Sherco Solar Project will help fill an identified capacity need on the Company's system beginning in the 2025 timeframe. To ensure equitable contribution to the capacity costs and value of the Project consistent with state policy priorities, the Company proposes to recover from North Dakota customers only the costs of what would be a least-cost resource under North Dakota law. As specified in the most recent IRP Supplement, under North Dakota planning requirements Firm Dispatchable capacity (modeled using generic greenfield CT costs) is selected as the least-cost resource to fill the 2025 capacity need. As a result, for North Dakota ratemaking and as a means to maintain the NSP System, the Company proposes to develop a capacity charge to North Dakota based on greenfield firm dispatchable capacity that would be applied to the Sherco Solar capacity value. In other words, the Company proposes to recover from the North Dakota customers only the North Dakota jurisdictional share of the cost of a generic greenfield CT – beginning at the time of the capacity need in 2026 – rather than the full cost of the Sherco Solar project.

The Company proposes that the cost of a generic new CT will be determined using MISO's planning year 2024-2025 CONE price. The MISO CONE is an industry-standard, all-in estimate of the cost of constructing a new CT. MISO determines an appropriate CONE value for each of its Local Resource Zones (LRZ) on an annual basis, using, among other things, the most recent Energy Information Administration (EIA) report on Capital Cost Estimates for Utility Scale Electricity Generation Plant (EIA Report). The EIA Report contains detailed specifications for a hypothetical advanced CT, including information regarding the differences in project costs for an advanced CT with a nominal capacity of 237 MW, based upon the state where the facility is constructed. We believe the MISO CONE price provides an appropriate, third-party developed basis for identifying the capacity cost of adding a new, generic, and least-cost resource under North Dakota policy principles. The MISO CONE price, which is provided in terms of \$/MW-year, will be multiplied by the MISO accredited capacity value of the Sherco Solar plant and then allocated to North Dakota based on the traditional 12 coincident peak (12CP) jurisdictional allocator in place in 2025.

To accomplish this proposal from a ratemaking perspective, the Company proposes to calculate the capacity charge amounts and make the corresponding line item

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adjustments in future North Dakota rate case Test Years. The expected life of the Sherco Solar Project is 35 years, which is comparable to the 40-year book life of a generic CT. The Company's proposed ratemaking treatment for the Sherco Solar Project is discussed further in the Direct Testimony of Company witness Mr. Greg Chamberlain.

B. Energy Costs

For energy produced by the Project, the Company proposes to charge North Dakota customers a proxy price using the day-ahead LMP at the Project site. The energy generated by the Project will be priced on an hourly basis using the day-ahead LMP at the Sherco Solar site and these costs will be assigned to the North Dakota jurisdiction and recovered through the FCR. Because the Project is being developed in part to meet Minnesota policy objectives and all renewable attributes of the Project will flow to Minnesota customers, North Dakota customers should pay no more than market rates for the energy that is generated by the Project, and our proposed structure would accomplish this aim. This is the same structure we have used for the energy provided by the Minnesota-based Community Solar Gardens program resources.

VI. ECONOMIC ANALYSIS

Because the Company is not requesting that the full costs of Sherco Solar be deemed prudent in this ADP and the Project is proposed to fulfill capacity additions already indicated in our IRP Preferred Plan, we did not conduct additional capacity expansion and production cost modeling for the project using the EnCompass tool. However, under North Dakota planning principles, a 374 MW firm dispatchable unit (represented by a greenfield CT) was selected as the least-cost resource to fill the identified capacity need. Because we are choosing to fill our capacity need with the Sherco Solar project, rather than firm dispatchable capacity, we are proposing to "price" a firm dispatchable resource to determine the amount that North Dakota rates should reflect to meet the overall system need.

Typically, the Company acquires resources by examining the result of the IRP and subsequently seeking to either self-build or acquire the least cost resource available to fulfill that need, according to the size, type, and timing of the resources in the IRP. To acquire those resources, the Company surveys the market – including opportunities for expansion at Company owned resources – and determines the least-cost option for

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moving forward. The Company used that process to acquire Sherco Solar as well; however, the resource identified to fill our capacity need per the North Dakota Plan is a greenfield CT, whereas in the IRP Preferred Plan, it is a solar resource. In order to execute on our Preferred Plan while also respecting the policy preferences of North Dakota, we are proposing to “price” a firm dispatchable resource to determine the amount that North Dakota rates should reflect to meet the overall system need. We performed this valuation with a model that analyzes several potential proxy resources, in order to determine which would best represent the cost of a generic dispatchable resource to be recovered from North Dakota.

In this instance, the Company would need to determine a reasonable proxy for the cost of capacity that it would otherwise have incurred but for meeting its need with the Sherco Solar Project. To develop this pricing, we analyzed several potential proxy resources in order to determine which would best represent the cost of a generic dispatchable resource to be recovered from North Dakota. Ultimately, we determined that MISO CONE is the most appropriate proxy value.

A. Methodology

The Company used a cost assignment valuation model to analyze several different potential proxy pricing options and determine which would best represent a “least cost” resource under North Dakota law and policies. The Company sometimes uses bespoke models to analyze alternative resource selection opportunities in light of different options available. The cost assignment model developed here assesses resource alternatives in light of the Company’s costs to procure similar capacity and energy options; specifically, we compared the costs of several different potential proxy options over the expected life of the Sherco Solar facility.

The first step to be able to compare potential capacity price proxies to Sherco Solar’s actual costs was to determine how best to normalize the different types of values and units across the different options. This was necessary because Sherco Solar’s marginal energy costs are zero, and therefore the cost of energy is a function of the revenue requirement calculation for the capital placed in rate base for the Project, ongoing O&M and tax treatment, and other ancillary costs. To that end, the Company set all pricing based on the energy and capacity proxy to create two outputs: (1) the Levelized Cost of Energy, which priced each resource on a \$/MWh basis; and (2) a notional value which is the present value of the total cost of the resource to North Dakota customers over

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its life. These values allow us to compare the different resources notwithstanding their different cost structures.

The Company analyzed four different options to use as a proxy price for Sherco Solar:

1. MISO CONE;
2. A generic brownfield combustion turbine (CT);
3. The Mankato Energy Center II PPA (MEC II PPA); and
4. A combination of maintaining Sherco Unit 2 in service through 2034—its current remaining depreciable life in North Dakota—and replacing it with a generic CT thereafter.

MISO CONE

MISO CONE is an independent, third-party generated value of the cost of installing new capacity in MISO Load Zone 1. MISO CONE is developed using information from the EIA. Ultimately, MISO CONE is a valuable, independent, proxy for the actual cost of installing new greenfield CT capacity in the Company's service territory (*i.e.*, in MISO Load Zone 1). MISO calculates a CONE value for each LRZ for each Planning Year according to the formula provided in MISO Business Practice Manual No. 11, Resource Adequacy. The CONE value used for our analysis here is for the 2020-2021 Planning Year, but ultimately the Company proposes to use the 2024-2025 Planning Year CONE value as a proxy because the Sherco Solar project will be placed fully into service by the end of 2024, and our IRP indicates capacity additions in 2025 in order to meet our impending capacity needs. The 2020-2021 CONE value is consistent with recent years and it is reasonable to assume that the 2024-2025 value will be similar to this value.

Generic Brownfield CT

The forecasted capacity costs of a generic brownfield CT are set forth in our most recent IRP Supplement. While the firm dispatchable resource selected in the North Dakota Plan is representative of a greenfield CT, the generic brownfield CT represents an appropriate proxy if the Company were to be able to repower an existing site. Consequently, the brownfield generic CT represents a helpful additional comparison point for the pricing proposal presented here.

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MEC II PPA

The MEC II PPA represents the most recent increment of large-scale firm dispatchable installed capacity on the NSP System and therefore is indicative of the cost of firm dispatchable capacity to the Company. Further, because the MEC II project consisted of the installation of an additional CT at an existing combined cycle facility, MEC II also provides a useful benchmark to represent approximate pricing for a combustion turbine at a brownfield site. Consequently, the MEC II PPA provides a reasonable baseline for actual capacity costs to the Company.

Sherco Unit 2 + Generic CT

The Company analyzed a proxy resource of keeping Sherco Unit 2 operational through 2034 and replacing it with a generic CT because, pursuant to the Settlement in Case No. PU-07-776, the remaining life for Sherco Unit 2 is currently set at 2034 in North Dakota. Thus this proxy option reflects North Dakota policy as it stands today. The Company has asked the Commission to revise the remaining life of Sherco Unit 2 to its currently-scheduled retirement date in 2023 in our 2021 Electric Rate Case (Case No. PU-20-441). At the request of Commission staff in the 2021 Electric Rate Case, the Company prepared estimates of the costs of keeping Sherco Unit 2 operational through 2034. To price this proxy resource here, we used those estimates combined with the forecasted cost of a generic CT from our most recent IRP.

For all of these proxy options, the model begins charging for capacity in 2026, the first year of the capacity need.

B. Results of Analysis

Table 2 below shows the results of our analysis of these potential proxy price options. From left to right, the columns in Table 2 show the levelized energy costs, levelized capacity costs, LCOE, and net present value of the total costs of each potential proxy option, as compared to Sherco Solar.

The levelized energy costs are based on forecasted LMPs and are the same for all proposed proxy options because the Company has proposed to charge North Dakota customers the day-ahead LMP at the Project site. The levelized capacity costs have some variation based on the expected cost to add each resource in 2026. The levelized energy and capacity cost values are added together to form the LCOE for each option.

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The LCOE is an important metric for providing an apples-to-apples comparison of the proxy options to Sherco Solar because it normalizes the different capacity factors of the resources against Sherco Solar and better indicates the true cost to North Dakota customers since the energy proxy would be paid for each MWh produced by Sherco Solar. Additionally, the LCOE provides a means to compare various capacity types to Sherco Solar because solar generation effectively does not have any marginal energy costs.

The last column shows the net present value of the total costs (capacity and energy) of each resource. This is an important metric because it shows the net present value savings that could flow to North Dakota customers by using each proxy price, in lieu of direct cost recovery for Sherco Solar.

Table 2: Comparison of Potential Capacity Proxy Options

[TRADE SECRET BEGINS...

...TRADE SECRET ENDS]

As discussed above, the Company believes CONE is the most appropriate proxy to use for determining recovery in North Dakota for several reasons. The CONE value represents an unbiased calculation of the true cost of a greenfield CT in each MISO LRZ, based on EIA data, and it is updated annually by a third party. Because it is issued annually, there will be an updated CONE value available for the 2024-2025 Planning Year, when the capacity need that we are filling with Sherco Solar arises. Further,

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CONE is an appropriate proxy for the greenfield CT selected in the North Dakota Plan in the IRP. For these reasons and others, the South Dakota Public Utilities Commission has previously approved the Company's use of MISO CONE as a proxy price for the Marshall Solar and North Star Solar projects.

The other proxy options that we analyzed are less appropriate to stand in for the firm dispatchable energy that the North Dakota Plan calls for in 2025. For example, the levelized cost of a generic brownfield CT as provided in the IRP likely understates the actual cost of constructing new greenfield firm dispatchable capacity in 2025, as indicated in the North Dakota Plan, and it is not certain that the Company could construct a brownfield CT on that timeframe. Similarly, the MEC II PPA represents the pricing of the second unit that was added at the MEC facility, meaning it was able to realize efficiencies and reduce costs by taking advantage of existing infrastructure on site.

The Company's analysis as shown in Table 2 indicates that the MISO CONE is virtually identical to our estimated cost of keeping Sherco Unit 2 operational and replacing it with a generic CT thereafter. This is important because it reflects North Dakota policy as it stands today—Sherco Unit 2 has a remaining life through 2034. The fact that MISO CONE closely reflects these costs provides further confidence that it accurately represents the costs of filling this capacity need under North Dakota policy principles.

As shown in Table 2, using the CONE proxy for capacity costs and LMP for energy costs, we estimate that North Dakota customers could save nearly \$7 million on a NPV basis as compared to Sherco Solar. These savings are heavily dependent on the relationship between LMP and Sherco Solar and the assumptions around Sherco Solar's capacity accreditation. If Sherco Solar is well above LMP, the savings of the proposed proxy pricing mechanism will increase. If the capacity value assigned to Sherco Solar once constructed varies from the values used in our analysis, the proxy price mechanism would also change to reflect that value. Ultimately, this analysis demonstrates that CONE is an appropriate proxy to use for determining North Dakota's share of the costs of the Sherco Solar project.

VII. PRUDENCE OF THE SHERCO SOLAR PROJECT AS PROPOSED

The Sherco Solar Project helps the Company address a significant capacity need on our system in the mid-2020s, as identified in our most recent Resource Plan. While it is not

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the optimal resource to fill this capacity need according to the IRP's North Dakota Plan, the Company's proposed cost assignment mechanism would ensure that North Dakota customers only pay the costs of an equivalent least-cost resource as defined by North Dakota law – in this case a generic greenfield natural gas CT.

The proxy price for the generic CT will be determined using the widely-accepted MISO CONE value for the 2024-2025 planning year. Additionally, North Dakota customers would only be responsible for paying the market price for the energy generated by the Project, even if the levelized cost of the Project is above market. As with any Company resource, the North Dakota jurisdiction's share of the Project's proxy demand and energy costs will be determined according to the applicable jurisdictional allocator in effect at the time the Project commences operations. Under this proposed cost assignment and ratemaking structure, the share of the Sherco Solar project that North Dakota customers are responsible for is equivalent to a least-cost resource, thus the resource addition is prudent and the ADP should be approved.

VIII. CONCLUSION

For all the reasons set forth above, Xcel Energy respectfully requests the Commission grant an ADP for the proposed 460 MW Sherco Solar Project, subject to the cost assignment conditions discussed above.

Dated: April 26, 2021

Northern States Power Company

Respectfully submitted,

/s/ Greg P. Chamberlain

GREG P. CHAMBERLAIN

REGIONAL VICE PRESIDENT, REGULATORY & GOVERNMENT AFFAIRS