

STATE OF MINNESOTA  
BEFORE THE  
MINNESOTA PUBLIC UTILITIES COMMISSION

Beverly Jones Heydinger	Chair
Nancy Lange	Commissioner
Dan Lipschultz	Commissioner
John Tuma	Commissioner
Betsy Wergin	Commissioner

IN THE MATTER OF XCEL ENERGY'S  
2016-2030 UPPER MIDWEST RESOURCE  
PLAN

DOCKET NO. E002/RP-15-21

**REPLY COMMENTS**

**INTRODUCTION**

Northern States Power Company, doing business as Xcel Energy, submits to the Minnesota Public Utilities Commission this Reply to the July 2, 2015 Comments received on its 2016-2030 Upper Midwest Resource Plan in the above-referenced docket. In this Reply, we share a bold energy vision that transitions our system from coal generation, advances the acquisition of significant levels of renewable generation, recognizes nuclear energy as a critical carbon-free baseload resource, and confirms our commitment to energy efficiency efforts.

In our initial Resource Plan, we shared a vision of a 40 percent reduction of carbon dioxide emissions from 2005 levels by 2030. Since that time, other parties filed comments recommending different approaches, and the Environmental Protection Agency has issued its final Clean Power Plan (CPP). We have reviewed and analyzed the comments filed by our stakeholders. We have also conducted a preliminary analysis of the CPP, though we recognize much more will develop around this rule. In these Reply Comments, we present our analysis to-date, outline our proposed actions, and suggest a procedural framework that allows us to continue to move forward quickly, work collaboratively with other parties, and at the same time recognize the many other cases before the Commission.

In these Reply Comments, we outline our vision of the energy future for our customers, communities, and states. We believe our proposal benefits our customers by supporting a cost-effective transition to the future, allowing adequate time to transition our workforce, creating new jobs and investments for our communities in the states we serve, and continuing our renewable and carbon-free energy leadership. Our proposal would result in a 60 percent reduction of carbon emissions from 2005 levels by 2030. We recognize many pieces of a complex effort need to come together

to achieve these benefits. We outline this proposal to begin the necessary discussions and actions and to allow parties to consider how we may work together to achieve this outcome while weighing it against other alternatives. We look forward to a robust discussion around our proposal and welcome procedural guidance and input from the Commission and the Minnesota Pollution Control Agency (MPCA) on how best to coordinate between the agencies to further this important work.

Our proposal has four primary elements:

1. *Accelerate the transition from coal energy to renewables.* Our proposal includes:
  - Achieving 60 percent carbon emission reductions by 2030,
  - Ceasing coal generation at Sherco Unit 2 in 2023,
  - Ceasing coal generation at Sherco Unit 1 in 2026, and
  - Advancing the addition of substantial renewable generation (1,200 MW by 2020).
2. *Preserve regional system reliability.* We propose to continue operation of our nuclear units during the current resource planning period and construct sufficient gas fired generation and infrastructure to maintain reliability with an appreciation of regional, state, and local community economic and policy considerations. To that end, we envision:
  - Reaffirming our commitment to nuclear energy through the current licenses of our existing units,
  - Adding a combustion turbine in North Dakota by 2025,
  - Studying a Sherco Unit 2 boiler conversion or combustion turbine alternative,
  - Studying gas infrastructure and transmission expansion, and
  - Replacing Sherco generation with a combined cycle no later than 2026.
3. *Pursue energy efficiency gains and grid modernization.* We propose to continue our commitment to energy efficiency and new technologies, and we look to capitalize on these efforts rather than seeking to replace coal capacity megawatt for megawatt. We believe that modernizing the grid will further enable customer-driven solutions.
4. *Ensure customer benefits.* We propose to work with the Commission, the MPCA, and our stakeholders to ensure our customers get the full benefit of our proposal by:
  - Working with the MPCA, along with its counterpart environmental agencies in our other states, on the CPP State Plans to maximize the benefits of compliance for our customers and communities, and

- Pursuing rate plans and cost recovery mechanisms that smooth costs for our customers.

Our Preferred Plan in our initial filing achieved substantial progress toward federal and state energy goals at a reasonable cost. During the course of this proceeding, however, parties have asked us to consider alternative proposals. In evaluating those alternatives, we have concluded that we can propose a plan that achieves even greater carbon reductions, invests in our communities, and maintains the affordability of our rates while assuring reliable service. Three key factors drive our decision to advance this proposal now and underscore why we believe it the best course of action for our customers, communities, and company.

First, we believe there is great benefit to the certainty our proposal provides. While additional studies, rule analysis, and CPP State Plan development will be necessary, there is significant value for the Company and our customers if we shift our focus to the future. This forward-focus allows for the following to begin now:

- We will have a full ten years to transition our workforce to support our future generation resources.
- We can begin planning the redevelopment of the Sherco site to accommodate a combined cycle unit and solar energy, extend sufficient gas infrastructure to the site, finalize transmission studies, and fully understand the operational issues presented by the new infrastructure in conjunction with Sherco Unit 3 and Monticello.
- We can begin work on our North Dakota-sited combustion turbine, which will require building out sufficient natural gas and transmission infrastructure to support that generation.
- We can begin readying Request For Proposal (RFP) processes for additional wind and solar generation that we expect to be located throughout our service territories – and, with that, start identifying ways to maximize our CapX 2020 investments.
- We can work with the MPCA, along with its counterparts in our other states, to create a straw proposal for the CPP State Plans and explore a trading system that benefits all of the customers and states we serve.

We believe there are tangible benefits to moving now. For instance, we will have the opportunity to maximize the anticipated Production Tax Credit extensions in the acquisition of renewable energy. Additionally, addressing the future of Sherco Units 1 and 2 now helps us avoid the situation where we are replacing all of our baseload energy generation in the early 2030s.

Second, environmental regulations will continue to place pressure on the operations

of Sherco Units 1 and 2. The possibility that NO<sub>x</sub> reductions would require installation of Selective Catalytic Reduction (SCRs) at the Sherco Units in the mid-2020s was a factor that advanced this proposal. We do not believe committing significant amounts of capital to these Units represents a realistic view of our energy future. We have successfully operated Sherco Units 1 and 2 to produce cost-effective energy while exceeding environmental regulations; however, the environmental pressures on these Units will continue to build. Our vision for the future is cleaner, cost-effective energy, so – for us – moving forward now is the best choice and focus for our resources. We recognize that others in the region may not be able to make changes now due to recent investments in plants (for instance in South Dakota), higher percentages of coal energy (for instance in North Dakota), or the desire to see how various litigated issues are resolved. We believe our action here can help our region successfully make this transition, encourage the development of renewable energy in our states, and provide jobs and investments for our communities. Our plan will also help identify energy solutions and embrace new technologies, providing clear benefits for our customers from our energy leadership.

Third, our customers increasingly want cleaner energy. More of our customers are asking us to provide options for all renewable energy or are making individual or corporate commitments to sustainability and the environment. Likewise, our cities are making commitments to sustainability. Potential new customers deciding whether to locate their businesses in our states have asked for clean energy options. We believe the action we are taking here will position us well to serve customers into the future. At the same time, we are sensitive to the cost concerns of all our customers, and are aware that some of our customers compete in regional, state, national, and increasingly international markets. We believe we can deliver this proposal at a reasonable cost and do not believe cost concerns warrant delaying action. We prefer to implement a plan that provides cleaner energy and at the same time aggressively pursue actions to lower costs. For example, we will be ready to launch an RFP if the Production Tax Credit for wind generation is extended. In addition, we can focus on lowering costs of this plan through the development of a regional approach to the CPP and potential trading options. Finally, we believe longer-term rate plans are important as they can moderate any necessary rate increases over five-year periods and benefit customers by providing greater predictability. A longer-term rate compact has other benefits as it can free-up state regulatory, Company, and stakeholder resources to focus on issues other than ratemaking, such as the CPP State Plans and grid modernization. We have successfully entered into these longer-term compacts in North Dakota and South Dakota, and look forward to advancing proposals to do so in Minnesota based on legislation passed in the last legislative session.

With these factors in mind, over the past two months we developed alternative approaches to our Preferred Plan. The result is the proposal outlined in these Reply

Comments. While we have done the preliminary analysis to validate the plan, significant work is necessary to make it a reality. We recognize customers, communities in all of our states, and parties will want to react to this proposal and will want more details. We look forward to that exchange of information and further discussion. We intend to encourage additional public comment, but at the same time want to continue to work constructively and collaboratively with the parties to do the work that is necessary to move the plan forward. We want to move quickly, but deliberately, recognizing the need for input on the significant decisions that will be necessary. We believe that with the input and support of our stakeholders, we can begin the task of transitioning our fleet from baseload coal to cleaner energy resources.

For our part, a fleet transformation of this magnitude requires a diligent and thoughtful process to ensure our system remains safe, reliable, and cost-effective. We are at the beginning of the process to determine the best way to accomplish this transition, but much remains to be done. Among other things, we are currently studying how Sherco unit closures impact system reliability, how to efficiently deliver gas supply to a repowered Sherco site as well as a site in North Dakota, and how we can successfully transition our workforce and minimize the impacts on our current employees at the Sherco plant. These items and others need to be resolved to make the plan viable. If we are unable to reach resolution on these items, we would recommend the Department's proposed plan as an achievable fallback position. In that plan, we would convert one Sherco Unit to a gas boiler in 2025, and submit our next resource plan in January 2017 with additional detail on the impact of further actions at Sherco.

The last time we significantly transformed our fleet was in the early 2000s when we worked with the Commission and our stakeholders to repower Riverside and High Bridge plants, and make environmental improvements to our King plant. The Metro Emissions Reduction Project (MERP) construct effectively vetted generation alternatives and provided the Commission an opportunity to evaluate the costs and terms of the proposal.<sup>1</sup> We think the same approach could work here. A MERP-type construct would provide a forum for the Company to bring forward a definitive, thorough proposal for the Commission to consider and analyze. Prior to bringing the proposal forward, we would welcome the opportunity to work with parties to try and find areas of agreement and resolution, including working to align our proposal with the MPCA process.

In the balance of our Reply, we provide additional detail on our proposal, outline next steps, provide an initial analysis of the CPP, and respond to specific stakeholder

---

<sup>1</sup> Docket No. E002/M-02-633.

Comments.

Section I – *Our Proposal*

Section II – *Next Steps*

Attachment A – *Updated Load and Resources Information*

Attachment B – *Initial Analysis of the Clean Power Plan*

Attachment C – *Response to July 2, 2015 Comments*

## **I. OUR PROPOSAL**

In our Resource Plan, we initially proposed to operate Sherco Units 1 and 2 to 2030 and to add a total of 1,800 MW of wind and 1,700 MW of large solar resources over the planning period. With our revised proposal, we can achieve a 60 percent carbon emissions reduction by 2030 (from 2005 levels). To achieve that goal, we propose three actions:

*First*, establish retirement dates for Sherco Units 1 and 2 that are technically feasible, allow for an orderly workforce transition, and align with our resource needs. To that end, we propose to cease coal operations at Sherco Unit 2 in 2023 and Sherco Unit 1 in 2026.

*Second*, accelerate the addition of wind and solar resources – a total of 800 MW of wind and 400 MW of solar in the pre-2020 timeframe. Advancing renewables benefits our customers in that we can capitalize on favorable market pricing and anticipated tax credits. The acceleration also brings replacement generation online to ensure reliable service for our customers during the Sherco transition.

*Third*, commit to the continued utilization of our carbon-free nuclear baseload resources through the existing plant licenses – and engage the Commission and our stakeholders in a multi-year study to better understand the evolving nuclear landscape, the expected costs to operate our units through their current licenses, and what the industry is considering for additional life extensions.

We outline below the four primary elements of our proposal.

### **A. Accelerate the Transition from Coal Energy to Renewables**

#### *1. Sherco Units 1 and 2*

The first step in achieving a 60 percent reduction in our carbon emissions is to chart a certain path for Sherco Units 1 and 2. We considered the Clean Energy Organizations’

(CEO) recommendation to close the first Unit in 2021 and the second Unit in 2024, but moved those dates out to adjust for construction timelines, system reliability, workforce transition – and allow time for CPP State Plan development. We also considered the Department’s recommendation to convert one Sherco Unit to a natural gas boiler in 2025. While the Department’s recommendation sets forth a practical alternative, we believe that beginning a two-Unit transition effort now best positions our customers to benefit from favorable market pricing and a construction schedule for replacement generation in the early 2020s. This timing also demonstrates leadership on implementation of the CPP, provides an adequate planning horizon for our employees, and positions us for an orderly transition to the future.

In order to deliver an orderly transition, we will need to work aggressively to complete technical studies, create workforce transition plans, draft detailed construction plans, coordinate with the MPCA and other states on the CPP, and develop a thorough MERP-type proposal. Important to the success of our proposal will be the availability of tax credits, community and state outreach and support for generation and infrastructure investments, and longer-term cost recovery mechanisms to help smooth rates and facilitate the transition for customers.

## 2. *Technical Feasibility*

The technical feasibility of our proposal is still under study. In our March 16, 2015 Supplement, we noted that Sherco Units 1 and 2 are key components of our system, that the grid has grown up around them for nearly 40 years, and that the Units’ size, location, and operating characteristics require detailed technical study to confirm that we fully understand the implications of their removal from the NSP and Midcontinent Independent System Operator (MISO) Systems.

To that end, we described the MISO Attachment Y2 and Xcel Energy Transmission Reliability studies we were initiating to examine the effects of phased retirement scenarios of one or both Sherco Units. We also explained that we would need to revisit our Black Start plan that currently relies on these Units to restore the system in the case of a catastrophic event. While we still need to complete our Transmission Study and Black Start analysis, we have received the MISO Y2 study results.

The MISO Y2 Study found that ceasing operations of one Sherco Unit will likely require some mitigation for expected reliability impacts. Ceasing operation of both Units, however, creates a significant voltage issue in the Monticello area. Importantly, MISO also declared Sherco Units 1 and 2 as System Stability Resources (SSR), which means that before we can cease operations of those Units, MISO must approve our plans to ensure we have sufficiently mitigated any anticipated impacts on the transmission system. The preliminary results from our Transmission Reliability Study

are consistent with the MISO Y2 findings with respect to system impacts of a one versus two Unit closure.

The most significant reliability issues that require additional study include: (1) ensuring the Monticello Nuclear Plant meets Nuclear Regulatory Commission (NRC) requirements related to voltage during all system conditions; and (2) ensuring we can reliably serve Twin Cities area load by providing sufficient generation and voltage support. In January 2016, we anticipate receiving the results of our Transmission Reliability Study that will provide further insight into system stability and reliability under various Sherco retirement scenarios; this study is also likely to identify topic areas for additional study.

An important consideration in assessing the technical feasibility of retiring generating units is the replacement plan. We believe the replacement generation we are proposing at Sherco and in North Dakota will fulfill our expected energy and capacity needs and provide critical reliability solutions in their respective locations. We discuss our proposed replacement generation more fully in Section B.

### *3. Policy Considerations*

We share the same goal as many of our stakeholders – delivering clean, reliable, and affordable energy to our customers while supporting our service territory communities. We have helped to lead the way to this objective through our early action to:

- Add significant and competitively-priced amounts of wind to our system,
- Develop sophisticated wind forecasting systems that facilitate our ability to reliably integrate significant amounts of wind onto our system,
- Avoid building approximately 3,100 MW of generation capacity by helping our customers achieve energy efficiency through our programs,
- Initiate one of the largest solar programs in the country, and
- Achieve significant carbon emissions reductions in a cost-effective manner while preserving jobs and maintaining our commitment to our communities through our MERP.

Once again, early action will help deliver value to our customers. With respect to the impact of environmental regulations, however, we are dealing in the unknown. We recognize there are many details to work through with the CPP, and that the State Plan will need to align well with our proposal in order to ensure benefits for all of our customers. We look forward to working with the MPCA, and expect to offer ideas to support regional solutions and a surplus compliance market to motivate utilities to go beyond compliance, providing substantial benefits to our customers and offering



solutions to our neighboring states.

a. Evolving Environmental Regulations

In August 2015, the EPA issued its final CPP rules, which may prove to be the most significant environmental regulation affecting the electric power sector to-date. Our early efforts and environmental leadership will ease the remaining work we have to do to achieve our share of CPP compliance. However, we are just at the beginning of a significant effort that will require coordination and collaboration across many different stakeholder groups in Minnesota and across our Upper Midwest region.

Obtaining clarity on CPP State Plan requirements will take time. However, our preliminary understanding of the final rule is that this proposal will very likely exceed our requirements in the case of either a rate- or mass-based approach.

In the case of a mass-based CPP approach, we reasonably believe our proposal will generate a significant quantity of surplus allowances to facilitate interstate CPP solutions that would benefit our customers. Getting appropriate credit for our customers for the surplus compliance our plan generates is an essential part of this plan, and will help defray the costs our customers will incur as we transform our generation portfolio.

In Attachment B to this Reply, we provide a more detailed discussion of our initial analysis of the CPP. Additionally, in Attachment C, we address the National Ambient Air Quality Standards (NAAQS) and Regional Haze and Visibility regulations.

b. Socioeconomic Impacts

Charting a path certain for Sherco Units 1 and 2 is important for our employees, the City of Becker and surrounding area, and Liberty Paper, who relies on steam from the Units for its operations. With these stakeholders in mind, our proposal provides an eight to ten year transition period and proposes to replace generation onsite, which will preserve jobs, grow tax base, and reaffirm our commitment to Central Minnesota.

We have a successful history with transitions like this. Since 2007, we have closed six coal-fired generating units, including our High Bridge and Riverside plants, which we repowered on natural gas as part of our MERP. In terms of our employees, by working closely within the Company and our International Brotherhood of Electrical Workers union locals, we have successfully managed these transitions.

#### 4. *Renewable Generation*

The second step in achieving our carbon emissions goal is advancing the addition of renewable resources. Technology is enabling a quicker and more cost-effective move toward a clean energy future. Solar costs have decreased by more than 60 percent in the last five years. The cost of wind generation energy is now on par with new natural gas combined cycle – and offers a great fuel hedge. We are also seeing storage technologies begin to come on the market and believe batteries will increasingly come down in cost, offering both new potential in transportation and also in providing reliability and support to renewable and Distributed Energy Resources (DER).

In recognition of these advancements, we believe we can add more renewable generation to our system earlier. Our proposal maintains the same total levels of renewable additions as our Preferred Plan proposed – 1,700 MW of large solar generation and 1,800 MW of wind generation – but proposes to add a total of 1,200 MW of renewable generation in the 2016-2020 timeframe. In advancing these additions, we are seeking to benefit our customers by capitalizing on favorable pricing and available tax incentives. Accordingly, our ability to advance the addition of early wind generation is dependent on an extension of the production tax credit.

We also see an opportunity to further our compliance with the CPP to obtain tradable surplus compliance credits that could serve to offset some of the costs of this plan for our customers. As the percentage of generation coming from renewables and DER continues to grow, it is important to understand how that growth impacts our grid. We recognize the Commission is already pursuing this knowledge with the Grid Modernization effort.

#### **B. Preserve Regional System Reliability**

The second element to our proposal is to preserve regional system reliability by constructing sufficient gas-fired generation infrastructure and committing to the continued utilization of our carbon-free nuclear baseload resources through the existing unit licenses.

##### 1. *Natural Gas Generation*

The size, type, and timing of additional thermal generation involves multiple considerations, including system stability needs, resource needs, and regional, state, and local economic and policy considerations. While we do not propose to replace Sherco Unit 1 and 2 capacity megawatt for megawatt due to higher energy efficiency and the addition of renewable energy resources, we propose to add natural gas generation at both the Sherco site and in North Dakota to support system reliability.

With respect to Sherco, we are continuing to study the potential to convert one of the boilers to gas, as suggested by the Department; however, preliminary assessments suggest that refueling with natural gas poses significant operational challenges. Further study of this option, as well as combustion turbine alternatives is necessary.

When Sherco Units 1 and 2 are retired, we believe that a combined cycle generating unit at the Sherco location provides many needed benefits to the transmission system, including needed reactive power for voltage support and dynamic response for system stability. Replacing Sherco Units 1 and 2 with a combined cycle unit facility also reinforces our commitment to Central Minnesota generally, and Becker specifically. This would provide continued commitment through jobs, property taxes, and presence in the communities of Central Minnesota. We also believe the development of solar energy on the Sherco site further demonstrates our continued commitment to the community. Our customers will also benefit from replacement because the Company can capitalize on the existing infrastructure at the site, including transmission, land, water, and site services.

Replacing Sherco Units 1 and 2 with a combined cycle facility also benefits Liberty Paper, who relies on the steam output of Sherco Units 1 and 2 for their operations. A combined cycle onsite would enhance natural gas supply and provide options for continuing support of steam supply to Liberty Paper. Liberty Paper is a valued customer, an important employer in the Becker area, and a critical part of Minnesota's recycling industry.

We also propose to add a combustion turbine unit in North Dakota by 2025. Adding North Dakota-based generation is important from both a policy and reliability perspective. North Dakota is a growing part of our integrated system – and nearly all of the generation serving North Dakota customers is in Minnesota. Given that, North Dakota has requested that the Company commit to build generation resources in the state—and we agreed. From a reliability perspective, siting generation in North Dakota is preferable given its proximity to the growing load centers.<sup>2</sup> This proximity promotes system reliability and allows for a rapid and effective response in the event of a power outage due to an adverse weather event.

## 2. *Our Nuclear Fleet*

The second step to ensuring system stability – and achieving a 60 percent reduction in

---

<sup>2</sup> We have previously discussed the differing policy views between Minnesota and North Dakota with respect to the make-up of our generation portfolio, and note that the Agreement we filed with the North Dakota Commission on September 30, 2015 commits to site thermal generation in North Dakota before 2025.

carbon emissions – is committing to utilize our carbon-free nuclear baseload through the existing plant licenses. The nuclear industry is facing significant pressure and some companies are considering closing nuclear units. Our proposal calls for the continued operation of our nuclear units through the 2020s. The rationale to support our position is three-fold. First, our nuclear units are a critical baseload resource that ensures system reliability and stability—particularly as large coal units come off line. Second, in order to maintain system stability, promote an orderly workforce transition, and maintain affordable energy for our customers, we need to transition away from coal before taking on the issue of a nuclear transition. Third, our nuclear fleet is critical to meeting carbon emissions targets and provides a hedge against high gas prices.

As we prepare our system for the transition, we need to do so in light of what other resources will be on our system to assure we can provide reliable and affordable energy to our customers. Retaining nuclear generation provides our system with a baseload energy resource that helps ensure system stability. Although renewable technology has made significant strides, it is not yet capable of replacing baseload generation. Accordingly, one view of our system is that our nuclear units can act as a bridge—ensuring system reliability while allowing time for the development of storage technologies like batteries. This staged transition also provides time to understand and respond to system impacts as baseload generation shifts, allows for an orderly workforce transition, and spreads customer rate impacts over time. Another view is that nuclear should continue to be a resource beyond the current licenses of the units. To that end, the nuclear industry and the NRC are actively discussing the potential for additional license renewals (known as “life after 60”).

Continuing to operate our nuclear fleet is also essential to achieving the emissions reductions contemplated by state and federal policies. Our nuclear units comprise more than half of the Company’s carbon-free generation. Given the current limits of battery storage, nuclear units retired today would likely be replaced primarily by natural gas, which exposes our customers to gas price volatility and a significant increase in carbon emissions. For context, through 2030, our nuclear fleet is projected to generate about 14,000 GWh/year of clean energy. If all of that baseload generation were replaced with natural gas combined cycle generation emitting at 900 lbs CO<sub>2</sub>/MWh, the resulting increase in carbon emissions would be 6.3 million short tons per year—equivalent to adding 1.2 million cars to the road.

Our proposal outlines a continued commitment to nuclear generation; however given the pressures in the nuclear industry and the higher costs many projects have encountered, we believe it is important to provide the Commission with a thorough assessment of what this commitment to nuclear could cost, what pressures the industry is facing and what alternatives could reasonably be explored.

Our most recent five-year capital forecast shows increased capital costs for Prairie Island over those used in our Changed Circumstances filing in 2012. As a result, we have undertaken a further review of life cycle costs for our Prairie Island Units. Unlike Monticello where most major equipment has been replaced, the Prairie Island life cycle management (LCM) program was scaled back to address immediate areas of concern; in particular, the electric generator and the generator step up transformer when the decision not to proceed with the Electric Power Uprate (EPU) was made. We have undertaken additional review of the likely costs we expect we would need to incur to run the Prairie Island nuclear units through their current life, and are continuing to assess and validate that information. We plan to undertake a similar review at Monticello, and would like to formalize a process to share and update our expectations about these expected costs and risks that those costs could be higher (for instance if the industry were to experience another significant rule change such as fire protection or cybersecurity.) To that end, we propose to engage the Commission and our stakeholders in a multi-year study to better understand the evolving nuclear landscape, including the expected costs to operate through the current life and beyond.

With respect to increased capital costs, at a high level, what we are seeing as the plant ages and we work to comply with regulatory requirements is that our projected capital spend at Prairie Island is outpacing some of the estimates included in the Changed Circumstance filing. That said, our fixed operating and maintenance (Fixed O&M) costs are lower than we modeled such that the increase in capital spend is offset by the Fixed O&M savings. While our costs from 2011-2015 tracked amounts anticipated in that filing, our review of future operations at Prairie Island indicates the need for substantially more capital. Our five-year capital expenditure forecast from 2016 to 2020 has increased by roughly \$175 million above what was anticipated in 2012.

As a result, we also reviewed the capital that had been projected for the latter period of Prairie Island's license. We determined that operating the plant to the end of its current license would require substantial increases in capital for the period 2021 through 2034, primarily due to the reliability risks of aging equipment and anticipated costs for compliance with additional NRC requirements. While it is difficult to predict the specific investments that may be required in this timeframe, we believe that capital expenditures would likely need to increase by roughly \$600 to \$900 million over this fifteen-year period. Without a comprehensive LCM project as we completed for Monticello, we have increased the cost of planned equipment reliability investments to reflect that Prairie Island will continue to require more regular replacements on the non-reactor side of the plant. We have also created a larger contingency for anticipated capital expenditures for NRC-mandated compliance programs in the future.

Our capital expenditure forecast for 2011 to 2034 has increased between \$650 and \$950 million since our Changed Circumstance filing. Over the same period, however, we have not experienced the level of escalation that was modeled, and do not anticipate cost growth at the level we were previously modeling, so our Fixed O&M estimates have decreased by approximately \$1 billion over the same period.

Operations through the end of Prairie Island's licensed life compared to a natural gas combined cycle unit using the high end capital assumptions continues to produce Present Value of Societal Costs (PVSC) benefits in the neighborhood of approximately \$500 to \$1 billion. Notably, these results do not consider additional replacement variables, including transmission system costs, the timing and ability to deliver the significant amount of incremental natural gas to our system, the costs of accelerating funding of our decommissioning and associated worker retention costs.

For all of these reasons, we believe continuing to operate our nuclear Units makes sense for our customers. We also realize, however, that the costs of our nuclear fleet can change rapidly and are influenced by other events in the industry. As such, we believe this discussion would benefit from a formal review that could occur through a multi-year study to better understand the evolving nuclear landscape. In that process, we would propose to conduct a similar exercise on the costs of continued operations at Monticello. Such timing would allow the immediate actions related to Sherco to proceed, but position the Commission with substantially more information about nuclear in advance of our next Resource Plan.

### **C. Pursue Energy Efficiency Gains and Grid Modernization**

The third element in our plan commits to pursue energy efficiency gains at the level recommended by the Department. We have seen tremendous advances in energy efficiency, and have discussed the challenges associated with our ability to continue to achieve significant levels of energy efficiency with our customers under the current regulatory construct, due largely to increasing codes and standards. Indeed, our position in this docket has been that we could not continue to achieve energy efficiency gains at the 1.5 percent level. However, we believe technology advancements may alter that future, and by leveraging technology to take advantage of the increasingly "smart" appliances and electronic devices, we may be able to unlock greater potential savings. Accordingly, we commit to maintain a goal of 1.5 percent Demand Side Management (DSM) through the planning period, and to find ways to stimulate greater demand response with our customers. Additionally, we are open to continued collaboration and discussion on the conservation incentive. We understand that the Department and stakeholders will be working through this issue in 2016, toward a goal of implementing solutions in 2017.

We believe that modernization of the distribution system will be an important step in

our ability to unlock greater DSM gains by enabling customer choice, savings, and control by creating a safe and efficient platform for new products, new services, and opportunities for accelerated adoption of new technologies. We know that some of our customers want more control of their energy choices and believe advancements in technology will help us deliver those consumer options.

For example, the Clean Energy Partnership with the City of Minneapolis represents our commitment to collaborate on innovative approaches and enhanced outcomes in energy efficiency and the use of renewable energy to help the city achieve its Climate Action Plan goals. We supported the approval of the Partnership's 2015-2016 work plan, incorporating a broad spectrum of concepts and ideas that have yet to be fully fleshed out to determine the level of impact this may have on a community focused concept such as the Clean Energy Partnership. Similarly, but on a smaller scale through our Partners in Energy program, we work with local stakeholders to develop custom action plans and provide implementation support services to help meet community energy objectives for delivering clean, affordable energy and achievement of their sustainability goals.

We are committed to be the preferred and trusted provider of the energy services our customers' need, which will require that we remain connected to our customers, think creatively to deliver solutions, and leverage the advancing technology. Our proposal sets us on a sustainable path to this future by committing to continue our strong achievement of DSM and Demand Response results.

#### **D. Ensure Customer Benefits**

We plan to work with the Commission, the MPCA, and our stakeholders to ensure our customers get the full benefit of our proposal. By working with the MPCA on the CPP State Plan, along with its counterpart environmental agencies in our other states, we hope to encourage adoption of a regional approach with trading options to maximize the benefits of compliance for our customers and communities. We also intend to work with the Commission and the Department to pursue longer-term rate compacts which will provide the runway we need to manage our business while smoothing the costs for our customers of this transition. Additionally, a longer-term rate compact will free-up Commission, stakeholder, and Company resources to focus on this proceeding, the State Plan, and other issues like Grid Modernization. We have successfully entered into these longer-term regulatory compacts in North Dakota and South Dakota, and look forward to advancing proposals to do so in Minnesota based on legislation passed in the last legislative session. Finally, we plan to develop a MERP-type proposal to provide predictable cost recovery and ensure an orderly transition to a cleaner energy future.

## **E. Customer Impacts**

We have completed a preliminary analysis of our proposal and believe that we can begin the transformation of our generation fleet at a reasonable cost for our customers. We will complete a detailed customer impact analysis that will be filed with the Commission no later than January 29, 2016, but our initial analysis suggests that the plan can be implemented while keeping the overall cost impact through the planning period within an incremental two to three percent rate increase above our Reference Case. When we complete and submit our full resource planning analysis, it will include the same level of detail on estimated rate impacts that we submitted in our April 17, 2015 Reply Comments in this docket. In the interim, we provide a high level summary of expected cost impacts of our revised proposal as compared to our Preferred Plan:

- Our Preferred Plan identified a one to two percent incremental rate impact above the Reference Plan for the period of 2016 to 2030; our revised proposal likely raises the incremental rate impact to two to three percent above the Reference Plan.
- Monetizing the value of the additional carbon emissions reduction of our revised proposal at the midpoint (\$21.50) of the range of the Commission's regulatory cost of carbon, we show the incremental rate impact at the low-end of this range, and approximately two percent over the planning period.

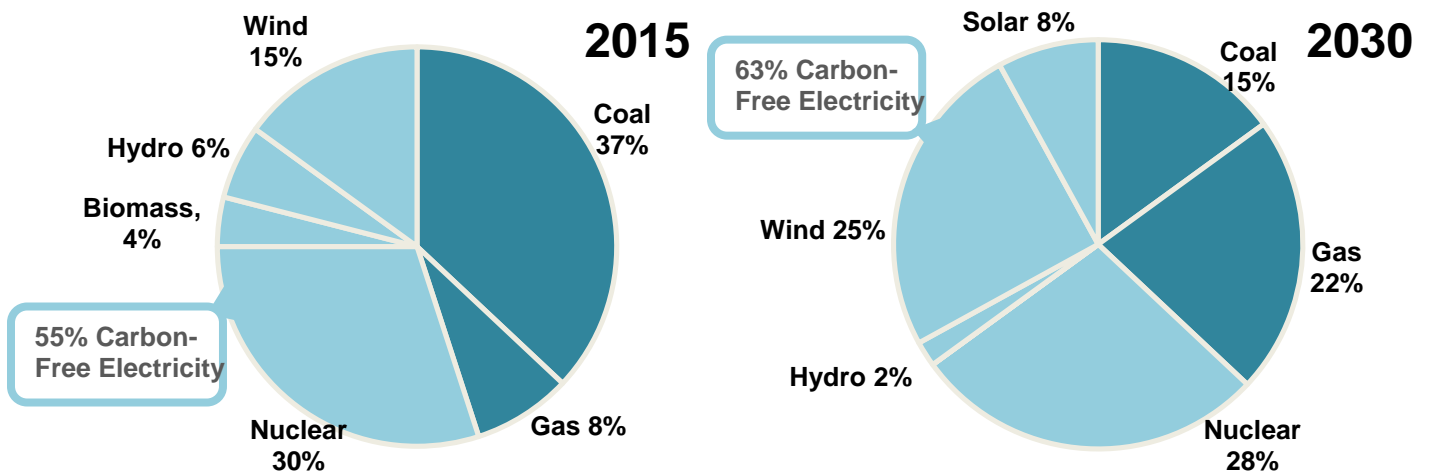
We believe that there are opportunities to further offset the rate impact of our proposal by working with the MPCA and its counterparts in other states to develop a regional carbon market. We also believe there are regulatory tools, such as multi-year rate plans and the Emissions Reduction Rider statute (Minn. Stat. § 216B.1692) that can provide predictable cost recovery and help to smooth cost impacts for our customers.

## **F. Updated Metrics**

Our proposal seeks to transform the energy supply for our Upper Midwest customers. Figure 1 below provides a side-by-side comparison of our energy mix today and how that energy mix changes as a result of our revised proposal. Overall, our carbon-free energy component increases to 63 percent.



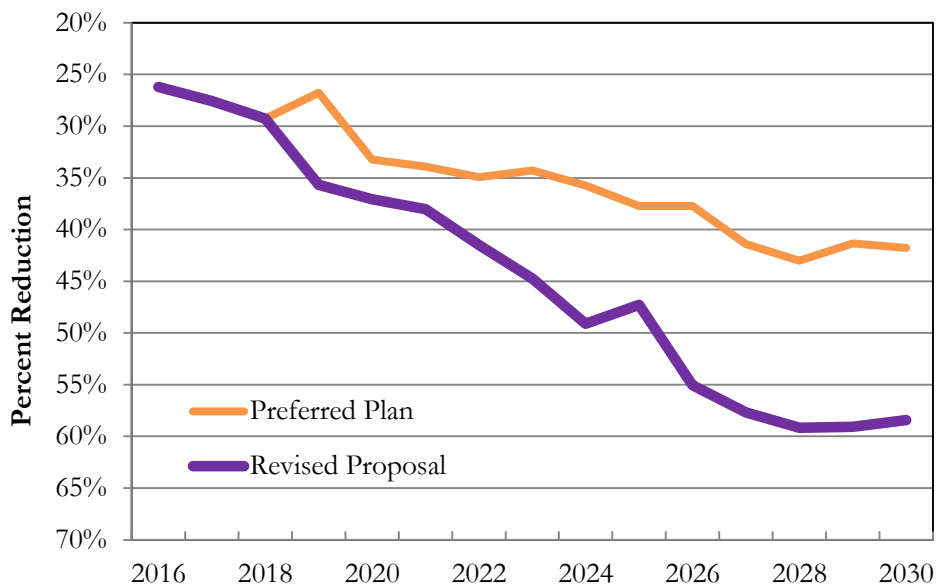
**Figure 1: 2015 Energy Mix Compared to Revised Proposal in 2030**



Key changes in our energy mix include a reduction to 15 percent for coal, and an increase in natural gas to 22 percent. With respect to renewables, solar increases to 8 percent, wind increases to 25 percent and—due to contract expirations—biomass and hydro drop to zero and two percent, respectively.

Figure 2 below demonstrates the projected carbon reduction of the revised proposal compared to the Preferred Plan. As shown, our revised proposal accelerates our reduction of carbon emissions and increases the level of reduction significantly – achieving nearly a 60 percent reduction from 2005 levels by 2030.

**Figure 2: Projected Carbon Reduction from 2005 Revised Proposal Compared to Preferred Plan**



As Attachment A to this Reply, we also provide an updated Load and Resources analysis that summarizes our capacity position through the planning period, and an Expansion Plan that outlines the generation additions we are considering to address the resource needs of our customers.

## II. NEXT STEPS

We have outlined the Company’s proposal for an energy future that is reliable, cost-effective, and cleaner. Our proposal optimizes the resource investments our customers have already made; provides the sustainability choices our customers want; creates the runway we need to successfully transition our workforce; creates the opportunity to reinvest in our communities; and motivates the Company to go beyond CPP compliance and generate valuable surplus allowances to the benefit of our customers.

We believe the level of collaboration that has ensued in this Resource Plan docket to-date has greatly improved stakeholder understanding of the evolving planning landscape and proposals that have been made. We have continued our outreach as we prepared these Comments and believe additional collaborative discussions will be beneficial. So that we can take advantage of the momentum of the current proceeding and continue our work with stakeholders to assemble the necessary support for and protections around our revised plan, we respectfully propose the following next steps:

- We propose to work with Commission Staff on a procedural schedule that continues to build the record for our revised proposal in this proceeding. With that in mind, we are open to supplementing the record incrementally as we complete various analyses and studies. We commit to supplement our revised proposal with a more detailed analysis and the results of our Transmission Reliability Study no later than January 29, 2016.
- Between now and January 2016, we propose to collaborate with parties to share our work, obtain valuable feedback (including in the form of filed Comments, if the Commission so orders), and identify areas of concern.
- Between now and January 2016, we propose to schedule additional stakeholder outreach meetings.
- We propose to immediately begin working with the Department and the MPCA on a schedule to accommodate the CPP State Plan, as well as collaborate regarding the scope of our nuclear study outlined above. Further, we look forward to similar collaboration with the Department and stakeholders regarding conservation potential and the associated financial incentives.
- We propose to develop a MERP-type proposal that we will be prepared to bring forward in the spring of 2016.

## CONCLUSION

In these Reply Comments, we have outlined our vision for a cleaner energy future. We believe our proposal benefits our customers by supporting a cost-effective transition to a cleaner generation fleet, allows adequate time to transition our workforce, creates new jobs and investments for our communities, and continues our renewable and carbon-free energy leadership. There is much work to do be done, but we look forward working with the Commission, the Department, the MPCA, and our other stakeholders to bring our proposal forward.

Dated: October 2, 2015

Northern States Power Company

**UPDATED LOAD AND RESOURCES INFORMATION**

We provide below, an updated Load and Resources (L&R) analysis that summarizes our capacity position through the planning period, and an Expansion Plan that outlines the generation additions we are considering to address the resource needs of our customers. For clarity, we provide this resource summary in a format that builds on the L&R information included in our March 16, 2015 Supplement.

The final row of Table 1 below provides our updated capacity position before adding any of the new resources proposed in our revised proposal. More specifically, it shows we expect to have sufficient capacity to meet our customers' needs through 2023. However, starting in 2024 we have a capacity deficit that grows from 177 MW to over 3,500 MW by 2030.

**Table 1: Updated Load and Resources (MW)**

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Forecasted Load</b>	9,442	9,525	9,597	9,649	9,674	9,694	9,754	9,748	9,766	9,798	9,868	9,962	10,136	10,151	10,251
MISO System Coincident	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
Coincident Load	8,970	9,048	9,117	9,167	9,190	9,209	9,266	9,261	9,278	9,308	9,375	9,464	9,629	9,644	9,739
MISO Planning Reserve	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%
Obligation	9,607	9,691	9,764	9,818	9,843	9,863	9,924	9,919	9,937	9,969	10,041	10,136	10,313	10,328	10,430
<b>Existing Resources</b>	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Load Management	1,009	1,021	1,033	1,044	1,056	1,067	1,078	1,090	1,101	1,103	1,098	1,094	1,089	1,085	1,080
Coal	2,372	2,395	2,395	2,395	2,395	2,395	2,395	2,395	2,395	2,395	2,395	2,395	2,395	2,395	2,395
Nuclear	1,648	1,643	1,643	1,643	1,643	1,643	1,643	1,643	1,643	1,643	1,643	1,643	1,643	1,643	1,643
Natural Gas	3,451	3,476	3,476	3,465	3,465	3,465	3,465	3,465	3,137	2,824	2,298	2,047	1,812	1,812	1,812
Biomass/RDF/Hydro/Wind	1,341	1,339	1,316	1,279	1,205	1,437	1,430	1,383	1,310	461	451	407	318	300	299
Solar*	25	33	137	143	149	156	164	174	187	202	220	242	268	300	338
Existing Resources	9,846	9,906	9,999	9,970	9,913	10,163	10,176	10,150	9,772	8,627	8,105	7,827	7,525	7,535	7,568
<b>Position Jan 2, 2015 RP</b>															
Initial Filing	239	216	235	152	70	300	251	231	-165	-1,341	-1,936	-2,309	-2,788	-2,794	-2,862
<i>* Solar includes 2014 Solar RFP (Docket No. E002/M-14-162)</i>															
<b>Planned Resource Additions</b>	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Black Dog 6	0	0	0	208	208	208	208	208	208	208	208	208	208	208	208
Calpine MEC2	0	0	0	278	278	278	278	278	278	278	278	278	278	278	278
Geronimo	0	0	70	69	69	69	68	68	68	67	67	67	66	66	66
Community Solar Garden - Additions**	20	36	53	72	94	103	103	102	102	101	101	100	100	99	98
Additional Approved Resources	20	36	123	628	649	658	657	656	655	654	654	653	652	651	650
<b>Position Mar 16, 2015 RP</b>															
Supplement Filing	260	251	358	779	719	958	909	887	490	-687	-1,282	-1,657	-2,136	-2,143	-2,212
<i>** Solar Additions represent the revised solar implementation due to Community Solar Gardens.</i>															
<b>Proposal</b>	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Sherco 2 Cease Coal Operation	0	0	0	0	0	0	0	-667	-667	-667	-667	-667	-667	-667	-667
Sherco 1 Cease Coal Operation	0	0	0	0	0	0	0	0	0	0	-694	-694	-694	-694	-694
<b>Proposed Coal Reductions</b>	0	0	0	0	0	0	0	-667	-667	-667	-1,361	-1,361	-1,361	-1,361	-1,361
<b>Position Oct 2, 2015 RP</b>															
Reply Comments Filing	260	251	358	779	719	958	909	220	-177	-1,354	-2,643	-3,017	-3,497	-3,503	-3,573

As shown in Table 2 below, our proposal adds thermal and renewable resources in an incremental manner to limit customer rate impacts while also supporting a smooth transition of our generation fleet through 2030.

**Table 2: Revised Proposal Expansion Plan<sup>1</sup>**  
**(MW Additions, Nameplate Ratings)**  
**(Accredited capacity is less - see Table 3)**

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Large Solar	-	-	-	200	-	200	100	100	100	100	100	100	-	400	-	-	1,400
Wind	-	-	-	-	800	-	-	200	200	-	400	200	-	-	-	-	1,800
North Dakota CT	-	-	-	-	-	-	-	-	232	-	-	-	-	-	-	-	232
Sherco Gas Conversion/CT	-	-	-	-	-	-	-	-	-	-	562	-	-	-	-	-	562
Sherco CC	-	-	-	-	-	-	-	-	-	-	-	778	-	-	-	-	778
CT	-	-	-	-	-	-	-	-	-	-	-	464	-	-	-	-	464
CC	-	-	-	-	-	-	-	-	-	-	-	-	778	-	-	-	778

*Note: The North Dakota CT is reflected in 2023 for planning purposes.*

Relative to the Expansion Plan in our March 16 Supplement, we are proposing to accelerate the acquisition of 400 MW of large solar and an additional 200 MW of wind for a total acquisition of 800 MW of wind and 400 MW of large solar in the 2018 to 2020 timeframe. This timing will allow the opportunity to take advantage of possible cost-reducing incentives, while at the same time adding the energy resources necessary to allow Sherco Unit 2 to cease operations. Thermal resource additions, including a combined cycle at Sherco needed for system stability, a possible conversion of a Sherco Unit to use natural gas, and a combustion turbine in North Dakota are also staggered throughout the planning period to help manage costs and facilitate a smooth fleet transition.

To demonstrate how these proposed resources will meet the capacity needs of our customers through 2030, we provide a view of our net capacity position after these resources are added to the system as Table 3 below. Table 3 begins with the net capacity position from the final row of the L&R Table 1 above, and adds the MISO accredited capacity value of each of the proposed new resources. Table 3 concludes with our net capacity position.

<sup>1</sup> We clarify that with respect to Solar resource additions, we no longer show the expected 697 MW of Small Solar additions through 2030 or the 287 MW of Large Solar in 2017 already approved by the Minnesota Commission in the Expansion Plan. These resources are integrated into the L&R. Therefore, the total renewables additions we propose in this Reply are consistent with the total levels we proposed in our March 16 Supplement.