

DISTRIBUTION CAPITAL INVESTMENTS – AMI AND FAN

METER REPLACEMENT PROJECT

The core of the Company’s multi-year Meter Replacement project is to replace the meters located at our customers’ premises that are currently at end of life, and make supporting and related investments in the systems we use to manage and communicate with the equipment on our distribution grid. We have used the existing meters for more than 20 years, and the time has come to replace them with more up-to-date technology that will continue to serve as the foundation of basic utility service while enabling new benefits.

Our present automated meter reading (AMR) technology is at the end of its life, and our meter reading services vendor, Landis+Gyr (Cellnet), is no longer manufacturing replacement parts for this system. Further, our current contract with Cellnet for meter reading services expires at the end of 2025. We have obtained good value from the AMR technology over a long period of time – it has worked efficiently for more than 20 years – but we must now move to a new solution. Notably, our peer utilities are also either in the process of transitioning to smart meters or have already done so.

In light of the need to transition away from our AMR meters, we surveyed the available options and determined that more advanced technology has reached a point where it is sufficiently mature to be in our customers’ best interests. The meters we will be deploying have advanced capabilities that include the ability for them to interact with related communication and control technologies. While the timing of the project is driven by the need to replace the AMR meters, the investments included in the Meter Replacement project will also support our broader infrastructure needs.

The Company has chosen modern Advanced Metering Infrastructure (AMI) meters with embedded Distributed Intelligence (DI) functionality, and we are making related improvements to our distribution communications and control systems. The AMI meter we selected is the Riva 4.2 meter manufactured by Itron Inc. These meters will enable the Company to provide customers with granular information about their energy usage that they can use to help lower their monthly bills, and enhance other aspects of our service to customers by automatically reporting power outages, for example. It is the right time to replace the current meters.

The components of the Meter Replacement project are: (1) the Field Area Network (FAN) and (2) AMI, and (3) the software development necessary to enable customer

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rates from the new AMI data and integrations with other Xcel Energy Systems. These investments will extend our visibility of the distribution system all the way to our customers' premises.

The Meter Replacement project will deploy: (1) new meters to all of our South Dakota customers, and (2) a two-way communications network across our South Dakota service area. The primary components of the Itron Riva 4.2 meters are its energy measurement capabilities; an embedded two-way radio frequency communication module; embedded Distributed Intelligence capabilities; and an internal service switch for residential type meters. AMI meters have an expected 20-year service life, compared to the 15-year service life of the AMR meters we will be replacing.

FAN is a secure two-way communication network that provides wireless communications across Xcel Energy's service area – to, from, and among, field devices and our information systems. In support of cost recovery for these initiatives, below we discuss the need for AMI and FAN, the process for selecting the technologies and vendors, the customer benefits, and other information that supports these initiatives. Like AMI meters, FAN equipment has an average service life of 20 years.

In summary, AMI and FAN are critical foundational elements of our grid modernization strategy. AMI is the Company's new metering solution – replacing our legacy AMR system, which is being discontinued by our service provider – and provides a crucial foundation for other planned and future grid modernization components. FAN is the communication network that will enable secure and efficient two-way communication of information and data between the new AMI meters at customers' homes and businesses and other future field devices and the Company's back-office systems. The system visibility and data delivered by AMI and FAN will provide customer benefits in reliability, as well as the ability for remote disconnection and connection – which reduces costs – and greater customer offerings for rates, programs, and services in the future. AMI and FAN will also enhance the Company's planning and operational capabilities by giving us access to timely, accurate, and consistent data. From this data, we can provide enhanced information directly to customers, allowing them to make better informed decisions about their energy usage. The volume and scope of data from the AMI meters delivered over the FAN is several orders of magnitude greater than our legacy metering infrastructure, allowing many business processes and services supporting our customers to be more timely, accurate, and consistent. We are excited to begin this step change in advanced technology and the benefits it will bring our customers and our operations.

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In the following sections, we discuss:

- The need for AMI and FAN,
- Customer benefits,
- Actions we have taken to minimize costs for customers, including the expected life of the meters,
- Customer data security and privacy, and
- Project implementation plans.

NEED FOR AMI AND FAN

In this Section, we discuss the Company's need for investments in AMI and FAN. This is driven in the immediate term by the Company's current AMR meters reaching the end of their lives. But, as discussed below, the decision to transition to AMI as a replacement is based on the value this technology will provide to our customers.

Over the last several years, we have experienced a variety of converging needs and opportunities related to distribution grid modernization – some driven by internal system needs, others by industry direction, and others by customers and other stakeholder considerations. Now is the right time to begin a more significant advancement of the grid with AMI and FAN.

Each of the core elements (AMI, FAN, and DI) adds to the customer experience in a specific way, but each is also interdependent upon the others to ensure that maximum benefits can be realized. While DI capabilities are embedded in the AMI meters and will provide important value to our customers and our grid operations, we are not seeking cost recovery of DI in this filing. The initial DI capabilities are expected to go into service in late 2024, which will better align with a future recovery proceeding.

AMI will provide customers and the Company more granular and useful data that will enable an improved customer experience. Customers will be able to access timely and detailed energy usage data through web and mobile applications. Customers will be able to better manage their energy use and will be empowered to control costs.

AMI also facilitates timely and automatic reporting of power outages. Each meter will send a "last gasp" message when an outage occurs. These messages are reported by the FAN and supporting systems to the Company's outage management system, which uses the information to predict for our operators the scale and location of the

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outage(s); this helps to improve our response to outages. Then, when power is restored, the meters can verify the customer is back in service, which allows us to send accurate and timely notifications to customers about the resolution of an outage, and makes the Company's outage management more efficient.

The FAN is a wireless communications network whose function is to enable secure and efficient two-way communication of information and data between the AMI meters to Xcel Energy's systems that enable functions such as billing and outage management.

Influenced by other services, customers have come to expect more from their energy providers than in the past, including greater choices and levels of service, as well as greater information about and control over their energy use. Customers also expect greater functionality and interaction in how those services are delivered. They expect a smarter, simpler, and more seamless experience. Our grid modernization efforts and specifically our Meter Replacement project are intended to create better interfaces with customers, provide them with better information and more choices in the future, and thus improve their overall experience. Enhancing the customer experience is critically important and continually enhancing our customers' reliability experience is at the core of quality electric service.

We plan to integrate modern customer experience strategies with advanced grid platforms and technologies to transform the customer experience. These foundational and core investments will allow us to advance our technical capabilities to deliver reliable, safe, and resilient energy that customers value. The cost of this initiative will be spread over the implementation period, which reasonably manages the cost impact for our customers.

With the AMI meters and the other components, the Company will be able to provide data and information that is simply not broadly available with our current system and AMR technology. This is not just an incremental improvement compared to the data provided by our current metering technologies; rather, the Meter Replacement project will allow the Company to provide customers with information at a very granular level that can impact their energy usage decisions, as well as improve reliability, and improve the safety and security of the grid.

Not only is AMI the right technology for the future, but it is also the right replacement for our legacy system that is at the end of its life. In addition to opening opportunities to provide increased and enhanced customer capabilities, we will gain

valuable data enabled by the AMI meters and the two-way FAN that will help us improve our operations, costs, and the service we provide to customers.

CUSTOMER BENEFITS

The AMI and FAN technologies combine to transform the customer experience to provide greater visibility and insight. Right away, customers will be able to access new information that can help them save energy and money. After a customer receives their new AMI meter, they can access granular energy usage data from their AMI meter through an online customer portal, which will also provide helpful tips on how to save energy and money. This access to more granular usage information, paired with energy savings tips, can help customers make more informed decisions on their energy use and help them save on their bills.

AMI enables potential future offerings as well that could give customers greater convenience and control to save money, provide access to rates and billing options – such as time of use rates – that suit their budgets and lifestyles, and provide more personalized and actionable communications.

On a system level, we have been improving our reliability metrics in South Dakota. However, there are limitations. Although we have been able to successfully operate the system for many years, advancements in technology can now support communications between intelligent devices across the distribution system—up to and including meters at customers' homes and businesses. The Meter Replacement Project is the first and necessary step to modernize the grid.

Similarly, the Company has traditionally had little insight into the customer experience – the voltage that the customer is receiving, whether the power is out or has been restored, or any abnormality that might be detectable and potentially lead to larger reliability issues. Since we have not had visibility into the system beyond the substation level, we have traditionally relied on customers notifying us of outages via phone, website, or smartphone app. Our Outage Management System then aggregates the outage reports and predicts the portion(s) of the distribution system that lost power. Once we know the portion of the system that is out, we must patrol the lines to find the source of the problem. This increases the time and expense associated with responding to outages and leaves our customers without power for longer periods of time. The Company can use the information from the advanced meters to better pinpoint the location of the outages and deploy our teams to those specific portions of the distribution system.

MINIMIZING COSTS FOR CUSTOMERS

We have taken a number of actions to minimize costs and maximize value for our customers. With AMI and FAN we have taken affirmative steps to also get the maximum value from our selected AMI meters and FAN equipment. We used competitive sourcing processes and selected metering technology that is open standards-based. AMI meters have an expected 20-year service life, compared to the 15-year service life of the AMR meters we will be replacing, and FAN investments also have an anticipated life of 20 years.

In addition, the use of industry standard, non-proprietary protocols and technologies lessens the risk of premature obsolescence. Technologies and components with which we may wish to connect in the future are more likely to be interoperable with commonly deployed standards and technologies. The ability to use our modems to connect with other cellular networks, public or private, or other communications technologies likewise gives us flexibility to adapt our FAN backhaul in response to future developments, and reduces the risk that equipment will need to be prematurely replaced or physically modified.

We also employed standardized processes and procedures for selecting technologies to be deployed in the Company's environment as well as the execution of large capital projects. These processes are designed to ensure that the Company is both containing costs appropriately and spending money on the items necessary to achieve the desired outcomes and overall reasonable costs.

We are taking a measured and thoughtful approach to advancing the grid to ensure our customers receive the greatest value, the fundamentals of our distribution business remain sound, and we maintain the flexibility needed as technology and our customers' expectations continue to evolve.

CUSTOMER INFORMATION DATA SECURITY AND PRIVACY

Our Company and Meter Replacement Project security approach is one of "defense-in-depth." The advanced meters will be physically sealed and monitored to detect tampering. Customer usage data are well protected on the meter. Attempts to physically open or otherwise access a meter will trigger tamper alarms. No customer-identifying data are held in the meter.

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Advanced meters and other networked devices have network interface capabilities that enable them to connect to the FAN. We leverage both physical and cyber security controls to protect these network interfaces from unauthorized access.

Meter communications will be encrypted to protect the privacy of our customers, as will the other communications that travel on the FAN from and between the authorized devices that have been registered onto the network. Firewalls control the information that travels in and out of the corporate network. The AMI head-end will validate the integrity of the data received. We will actively monitor the communications path between the meters and the Company data centers to promptly detect and respond to any anomalous activity. Additional monitoring of the head-end system will trigger alerts for investigation.

We take our responsibility to protect the privacy and security of our customers, grid, and information systems seriously. We have based our controls on a security controls governance framework, which leverages industry best practices. Our defense-in-depth approach will apply controls at many levels to identify and protect all components of the grid and help ensure the reliable and safe delivery of energy to our customers, while protecting customer data.

ROLLOUT AND IMPLEMENTATION







The Company plans to deploy approximately 103,000 AMI meters in South Dakota beginning in the first half of 2024. We anticipate deployment will be complete in mid-to late-2025. FAN deployment precedes AMI meter deployment by approximately 3-6 months, to ensure that there is a fully operational network for the meters to communicate with when they are installed. To support this, we began FAN installation in April 2023.

Customers will be notified of their meter replacement starting approximately 90 days before they receive their AMI meter. A phased customer notification schedule will include detailed information explaining AMI meters and benefits, how meters will be deployed and installed, and what to expect during the installation process. Customers will receive at least four notifications through multiple communication channels prior to the planned AMI meter installation date at their premises. These communications will be applicable to small business customers as well as residential customers. Xcel Energy account managers dedicated to large C&I customers will help ensure a smooth experience before, during, and after meter installation.

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Figure 1 shows the notifications that will occur prior to meter installation and the materials customers will receive during and after meter installation or attempt.

Figure 1: Meter Installation Communications Schedule

| ~90 days before installation | ~60 days before installation | ~30 days before installation | ~7 days before installation | Day of meter installation | After five attempts at installation (if necessary) |
|---|---|---|---|---|---|
|  |  |  |  |  |  |
| Bill onsert: introduction | Postcard: a new meter is coming soon | Letter or email: what to expect during installation | Phone call: your electric meter will be replaced soon | Door hanger: installation success or attempt | Letter: please contact us |

During deployment, we expect we will find that a limited number of customer meter sockets are defective and do not comply with Xcel Energy’s standards and criteria applicable to meter sockets as set forth in Section 4.11 of Xcel Energy’s Standard for Electric Installation and Use (Xcel Energy Standards). Section 4.11 of the Xcel Energy Standards designates meter sockets as customer-owned equipment, which means that customers are responsible for its maintenance and repair. However, to ensure a timely and efficient roll-out of the Company’s new AMI meters, we plan to facilitate any necessary minor repairs on the customer’s behalf and at the Company’s expense. We will coordinate with the customers to complete these repairs at a mutually agreeable time, and require each customer to sign a consent and release form. We will not, however, perform work beyond the meter housing and socket; should that work be necessary, the customer will need to hire and pay for a qualified electrician to perform that work. If a customer refuses to sign the consent and release for the Company to facilitate the necessary repairs, the customer will need to hire a qualified electrician to complete the necessary repairs at their own cost – and will not receive an AMI meter until that work is complete.

As noted above, while the initial software development is currently underway and some capabilities will be immediately available to customers upon receiving an AMI

meter, DI is not expected to be in service until late 2024.¹ Our DI implementation will be discussed in a future recovery proceeding.

CONCLUSION

In summary, AMI and FAN are critical foundational elements of a modern grid— and now is the appropriate time to implement for our customers and for our operations. These technologies will work together to address system and customer needs, enhance our service to customers, and open up new opportunities for future products and services. The data delivered by AMI and FAN will provide customer benefits in terms of reliability and information, as well as the ability for remote connection and disconnection of residential type meters. AMI and FAN and the supporting software development will also provide enhanced information directly to customers, allowing them to make better informed decisions about their energy usage.

¹ Like AMI, the in-servicing of the DI assets are tied to the level of AMI meter penetration in the NSP-Minnesota Operating Company and is also triggered by NSPM reaching 80 percent AMI deployment.