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Performance Metrics for Xcel Energy's Electric Utility Operations

**2019 Stakeholder Engagement Process
Meeting 1 Summary Report**

MN PUC Docket No. E-002/CI-17-401

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Facilitated by the Great Plains Institute

About this Report

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ATTRIBUTION OF STAKEHOLDER COMMENTS

The stakeholder comments summarized in this report represent the collective insights shared by participants at the March 20, 2019 meeting for MN PUC Docket No. E-002/CI-17-401.

Summarized comments should not be attributed to any particular individual or organization.

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ABOUT THE GREAT PLAINS INSTITUTE (GPI)

A nonpartisan, national, nonprofit organization, the Great Plains Institute (GPI) is transforming the energy system to benefit the economy and environment. We combine a unique consensus-building approach, expert knowledge, research and analysis, and local action to find and implement lasting solutions. Our work strengthens communities and provides greater economic opportunity through creation of higher paying jobs, expansion of the nation's industrial base, and greater domestic energy independence while eliminating carbon emissions.

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Executive Summary

Around the country, utility commissioners and other policy makers are taking a fresh look at the traditional cost-of-service utility business model, which was designed to promote the expansion of electric service throughout the country. Compensation was based on making the utility whole for their cost of delivering electricity service, plus a return on equity to pay back utility shareholders for their investment into the system. This regulatory framework worked, but included a bias toward capital expenditures.

A number of changes, including technology advances, flat or declining load, customer desires to know more and have more of a decision-making role in their electric service, and distributed generation that feeds power back to the grid, are all forcing a reevaluation of the traditional cost-of-service utility business model. The question being explored in multiple states is whether a system of performance-based incentives could better align utility compensation to societal goals for the electric system, including greater customer choice, lower or more stable costs, and reduced environmental impacts.

In Minnesota, the Public Utilities Commission is currently looking into this through Docket E-002/CI-17-401, which seeks to establish performance metrics and, potentially, incentives for Xcel Energy's electric operations. Following a hearing in November 2018 and subsequent order where the commission established the goals and desired outcome of electric utility regulation in Minnesota, the Great Plains Institute convened over thirty energy system stakeholders on March 20, 2019 to discuss their perspectives on suitable performance metrics for Xcel Energy that align with the commission's desired outcomes.

The meeting was the first step in a stakeholder engagement process that will take place throughout the 2019 calendar year, seeking to culminate in the establishment of performance metrics for Xcel Energy's electric utility operations in Minnesota, as well as procedures for calculating, reporting, and verifying those metrics.

This report summarizes the perspectives that were collectively shared by participants at that meeting as a starting point for a comment and reply period that will soon be issued by the commission. In total, stakeholders discussed roughly one hundred different performance metric topics under the commission-established outcomes of affordability, reliability, customer service quality, environmental performance, and cost-effective alignment of generation and load. A summary of discussion on each of the metrics is listed in this report alphabetically, by outcome.

Over the course of discussion, the following themes emerged that may be worth considering as parties develop their comments to the commission:

- Many stakeholders felt that metrics should measure desired outcomes, not deployment of specific technologies or approaches that can, but aren't guaranteed to, deliver those outcomes.
- Some metrics run the risk of bias towards specific technologies or approaches. Stakeholders generally felt that metrics should be agnostic to specific technologies or approaches.

- There are multiple perspectives about the extent to which utilities can be expected to exert influence over certain metrics.
- While some states are exploring both performance metrics and associated regulatory reforms, Minnesota is at this time only looking to establish metrics for the purpose of collecting information. However, some participants felt that metrics should still be crafted with potential reforms in mind.
- With over 100 metrics discussed, some stakeholders questioned whether the commission should initially limit itself to a specific number of metrics, while others thought that it was better to start with a longer list to be refined over time.
- While discussions at the meeting were structured around the commission's five established outcomes, stakeholders found that some metrics touch on multiple outcomes, which was seen as beneficial for prioritizing and consolidating metrics.
- In order to provide a level playing field, metrics presented for discussion during this meeting were not labeled as existing or new, but as the process moves forward stakeholders and the commission may need to evaluate whether existing metrics should be tweaked to be brought into alignment with the commission's outcomes.

Overall, the structure of the five commission-established outcomes seemed to provide a useful foundation for discussing a comprehensive set of electric utility performance metrics for Xcel Energy. While the meeting included a presentation on seven metric design principles that the commission had previously established, facilitators did not ask participants to strictly adhere to the design principles during discussions. The formal comment and reply periods that will soon be noticed in Docket 17-401 will be important to further evaluate metrics that are necessary under each outcome, and that comply with the design principles established by the commission.

Importantly, the overall process for evaluating metrics has been split into two phases that will occur in the 2019 calendar year and that each end with a commission hearing—the first phase aims to identify an initial list of metrics that are suitable to the five commission-established outcomes; the second aims to develop concrete procedures for calculating, verifying, and reporting on those metrics. At this current stage in the process, the key goal is to identify a list of metrics that are necessary to measure utility performance on the five outcomes.

The next stakeholder meeting will take place after the conclusion of the initial comment period that will be opened following publication of this report. That second meeting will provide an opportunity for parties to clarify their initial comments in-person and to identify key areas of agreement and disagreement in advance of their reply comments to the commission.

Background

Introduction

BACKGROUND ON PERFORMANCE-BASED REGULATION

Performance-based regulation (PBR) in the utility sector is not a new concept, but is now being looked at by regulators and utilities in different ways—as a means to achieve myriad goals and even as a new compensation structure.

Traditionally, PBR has been utilized for reliability measures, such as the number and/or frequency of service interruptions. In some cases, regulators establish performance targets and adjust a utility's authorized return based on performance against the established targets. In other cases, utilities are asked to measure certain performance measures without tying performance to a monetary incentive. Even these measures that are unattached to monetary incentives can provide helpful information to regulators.

Today, PBR is being explored for additional purposes. Instead of customers paying only for the delivery of electricity through the system, PBR can enable a regulatory framework and utility business model that encourages desired outcomes by aligning compensation to achieving goals, not necessarily just electricity consumption.

Around the country, utility commissioners and other policy makers are taking a fresh look at the traditional cost-of-service utility business model, which was designed to promote the expansion of electric service throughout the country. Compensation was based on making the utility whole for their cost of delivering the service, plus a return on equity to pay back utility shareholders for their investment into the system. This regulatory framework worked, but included a bias toward capital expenditures.

A number of changes, including technology advances, flat or declining load, customer desires to know more and have more of a decision-making role in their electric service, and distributed generation that feeds power back to the grid, are all forcing a reevaluation of the traditional cost-of-service utility business model. The question being explored in multiple states is whether a system of performance-based incentives could better align utility compensation to societal goals for the electric system, including greater customer choice, lower or more stable costs, and reduced environmental impacts.

PBR has been analyzed and implemented in a number of states and in Australia, Canada, and Europe. How much of a utility's compensation is subject to performance differs everywhere. PBR may only be for measurement purposes in some jurisdictions; in others, utilities may be incentivized to meet goals or improve performance in certain areas, such as decreased service interruptions or increased customer satisfaction. In these cases, a limited amount of utility compensation may be subject to PBR.

Other jurisdictions have fully implemented the performance-based compensation framework, with a reduction in the utility's authorized return on equity, coupled with a series of performance measures that would allow the utility to earn back that revenue reduction or earn over the original return on equity if they exceed the established targets. And there are jurisdictions in the

US that are now looking at a system in which compensation is wholly based on performance by the utility, as assessed through a series of established metrics and associated targets.

PERFORMANCE-BASED REGULATION IN MINNESOTA

In Minnesota, the Public Utilities Commission (PUC) is currently looking into PBR in Docket E-002/CI-17-401 (“Docket 17-401”), which seeks to establish performance metrics and, potentially, incentives for Xcel Energy’s electric operations. Docket 17-401 officially opened for comment on September 22, 2017 and was formally discussed by the PUC at a hearing on November 1, 2018. Following that hearing, the PUC issued an order on January 8, 2019 setting forth a process to explore and establish performance metrics for Xcel Energy’s electric operations by October 2019.

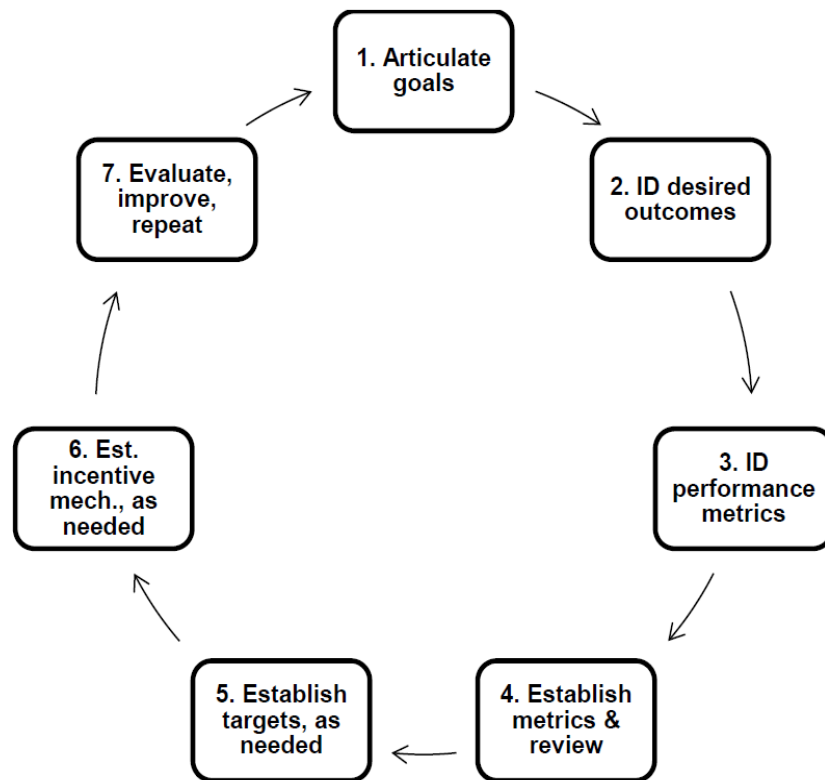
Part of the discussion leading up to the January 8, 2019 order focused on whether such a process is needed if Xcel Energy is providing what customers and regulators want, including affordable rates, a strong track record of service quality, a commitment to significant carbon reductions, and several renewable energy options for customers. Ultimately, all parties supported measuring Xcel Energy’s performance to ensure that the utility is indeed delivering what customers and regulators want. In its order, the commission adopted the seven-step Performance Incentive Mechanism or “PIM” Process that was proposed by the Minnesota Office of the Attorney General (OAG), which would first establish metrics only for the purpose of collecting information, and then use that information to determine if regulatory reforms are warranted.¹

The OAG’s PIM Process, which is based on a series of implementation steps for performance incentive mechanisms that were developed by Synapse Energy Economics (“Synapse”), begins by establishing the goals and desired outcomes of utility regulation.² Those outcomes then inform the development of metrics by which utility performance can be evaluated. Targets are then established to inform the expected performance on each metric. Eventually, the metrics and targets are reviewed and used to identify any areas of misalignment between the utility business model and public interest outcomes. At this point in the process, regulators could consider regulatory reforms to address those misalignments, including the establishment of rewards or penalties tied to achieving the desired targets.

¹ *In the Matter of a Commission Investigation To Identify and Develop Performance Metrics and, Potentially, Incentives for Xcel Energy’s Electric Utility Operations*, Docket No. E-002/CI-17-401, Comments of the Office of the Attorney General (Dec. 21, 2017).

² Melissa Whited, Tim Woolf, & Alice Napoleon, Synapse Energy Economics, Inc., *Utility Performance Incentive Mechanisms: A Handbook for Regulators* (2015), 52.

Figure 1: PIM Process proposed by the Minnesota Office of the Attorney General



In its January 8, 2019 order, the commission established Steps 1 and 2 of that process. It stated that, “The goals in overseeing the rates, investments, and returns made by the investor-owned utilities in Minnesota are to promote the public interest by ensuring adequate, efficient, and reasonable service, reasonable rates, the opportunity for regulated entities to receive a fair and reasonable return on their investments, and environmental protection.” The commission further established the following desired outcomes of utility regulation in Minnesota:

1. Affordability
2. Reliability, including both customer and system-wide perspectives
3. Customer service quality, including satisfaction, engagement and empowerment
4. Environmental performance, including carbon reductions and beneficial electrification
5. Cost effective alignment of generation and load, including demand response

Having established the goals and desired outcomes of regulation, the commission is now seeking to accomplish Steps 3 and 4 of the Minnesota Office of the Attorney General’s PIM process—identifying possible performance metrics and establishing those metrics along with reporting requirements. To aid in the metric development process, the commission established the following seven design principles to define what constitutes a quality metric for the purpose of measuring utility performance. These design principles also came from Synapse’s report on PBR:

1. Tied to the policy goal. A metric should clearly reflect whether or not the underlying policy goal is being met. That is, it should seek and evaluate data that is specifically tied to the particular policy goal underlying the metric.
2. Clearly defined. The method of calculating a metric should be precise and unambiguous in order to enable meaningful comparisons and to reduce potential disputes.
3. Able to be quantified using reasonably available data. Using already reported data or data that is readily available will reduce administrative burden and the costs associated with implementing the metric.
4. Sufficiently objective and free from external influences. Metrics should seek to measure behaviors that are within a utility's control and free from exogenous influences, such as weather or market forces.
5. Easily interpreted. Metrics should exclude the effects of factors outside a utility's control so they provide a better understanding of utility performance and should use measurement units that facilitate comparisons across time and utilities (i.e., "per KWh" or "per customer")
6. Easily verified. Straight-forward data collection and analysis techniques should be used, and independent third-party evaluators can further ensure accurate verification with respect to performance metrics.
7. Should complement and inform evaluation of utility performance. Performance metric systems should be designed to complement—not replace—other parts of a utility's regulatory system such as MYRPs (multi-year rate plans) and cost trackers.

Importantly, Docket 17-401 is one of several exploratory and decisional processes in Minnesota that are seeking to modernize both utility regulation and the utility business model, including the establishment of grid modernization and distribution planning processes, updating Minnesota's distribution interconnection standards, the development of advanced rate designs, and a commission investigation into electrifying transportation. Docket 17-401 touches on and relates to all of these and other topics in front of the commission, emphasizing the need for a holistic and thoughtful approach to establishing metrics.

Stakeholder Engagement Process

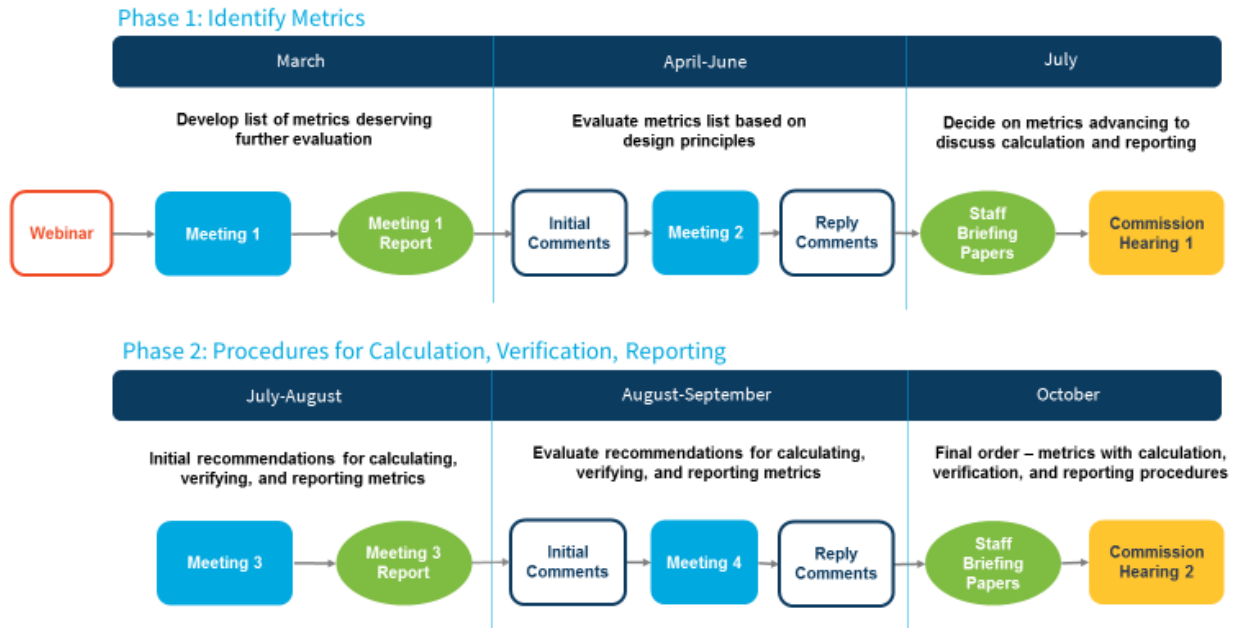
OVERALL PROCESS DESIGN

In its January 8, 2019 order, the commission selected GPI as the facilitator for stakeholder engagement on Docket 17-401 and stated that its "priority at this juncture is to facilitate a broad and robust discussion, using a process that is sufficiently structured but necessarily flexible." The commission further declared that, "Encouraging parties to openly exchange ideas at this early stage of the process is integral to generating useful and measurable outcomes, while avoiding an overly prescriptive framework that could hinder the development of meaningful performance metrics."

In consideration of this guidance, GPI developed a stakeholder engagement process that covers Steps 3 and 4 of the Minnesota Office of the Attorney General's PIM Process within the nine-month period set forth by the commission. The stakeholder engagement process seeks to first accomplish Step 3—identifying performance metrics—by developing stakeholder perspectives on an initial list of metrics that fit under each of the five outcomes and have the

potential to align to the seven metric design principles. Those metrics will be discussed both in stakeholder meetings and through formal comment and reply periods set by the commission, and then brought to the commission for consideration.

Figure 2: 2019 Stakeholder Engagement Process for Docket 17-401



The resulting initial list of metrics will then advance to Step 4—establishing calculation, verification, and reporting requirements in alignment with the seven metric design principles. Again, the process will use a combination of stakeholder meetings and formal comment and reply periods before going to the commission for consideration.

MEETING 1 DETAILS

Following the commission's request to encourage an open exchange of ideas among parties, GPI convened an educational webinar on February 5, 2019 featuring a presentation from Tim Woolf of Synapse, followed by an all-day meeting in Minneapolis on March 20, 2019 that sought to provide a collaborative forum for exploring stakeholder perspectives around metrics under each of the five commission-established outcomes. The meeting was open to any interested party and was advertised broadly to the public, both through official notice in Docket 17-401 and through outreach by GPI to a list of 200 stakeholders. This document summarizes the perspectives on performance metrics shared by participants during the all-day meeting, as a starting point for a formal comment and reply period to be issued by the commission.

ATTENDEES

The following individuals attended the March 20, 2019 meeting, including 36 participants, 2 observers from commission, and 11 GPI facilitators, staff, and notetakers.

Participants:

- Hamdia Abdo, Ever-Green Energy
- Nina Axelson, Ever-Green Energy
- Daniel Beckett, Minnesota Department of Commerce
- Sara Bergan, Stoel Rives
- Carolyn Berninger, Minnesota Center for Environmental Advocacy
- Patrick Boland, Xcel Energy
- RaeAnna Buchholz, Minnesota Chamber of Commerce
- Jessica Burdette, Minnesota Department of Commerce
- Joseph Dammel, Minnesota Attorney General's Office
- Bridget Dockter, Xcel Energy
- Michelle Edwards, Xcel Energy
- Amy Fredregill, Sustainable Growth Coalition
- Laura Hannah, Fresh Energy
- Ralph Jacobson, IPS Solar, Inc.
- Rolf Jacobson, Center for Sustainable Building Research
- Anna Johnson, Fresh Energy
- Erick Karlen, Greenlots
- Will Kenworthy, Vote Solar
- Jody Londo, Xcel Energy
- Stacy Miller, City of Minneapolis
- Marcus Mills, Community Power
- Timothy Nolan, Gichi Ka
- Michael O'Boyle, Energy Innovation
- Audrey Partridge, Center for Energy and Environment
- Gurkan Peksoz, Mortenson
- Joe Pereira, Citizen's Utility Board
- Jessica Peterson, Xcel Energy
- Marcia Podratz, Minnesota Power
- Paul Schroeder, HOURCAR
- Bria Shea, Xcel Energy
- Pat Smith, CSBR - UMN
- Jim Strommen, Suburban Rate Authority
- Chris Villarreal, Plugged In Strategies
- Jordan Wentz, State of Minnesota, Office of Enterprise Sustainability
- LeAnne Widen, Xcel Energy
- Donald Wynia, CenterPoint Energy

MN PUC Observers:

- Kelly Martone
- Michelle Rebholz

GPI Facilitators and Notetakers:

- Kris Acuna
- Katelyn Bocklund
- Quinn Carr
- Trevor Drake
- Jenna Greene
- Jess Jellings
- Rolf Nordstrom
- Jordana Palmer
- Brian Ross
- Lola Schoenrich
- Doug Scott

AGENDA

The March 20, 2019 meeting had three main components:

1. Grounding presentations: Melissa Whited from Synapse presented on Synapse's work that provided the foundation for the PIM Process that Minnesota is now following in Docket 17-401, including the rationale behind each metric design principle and examples of applying (or not adequately applying) those principles in other jurisdictions. GPI staff also presented on the overall stakeholder engagement process design.
2. Small group discussions: Stakeholders were invited to attend five half-hour breakouts to discuss roughly 20 metric topics under each of the commission-established performance outcomes. Each breakout had its own GPI facilitator and notetaker (the notes of which are summarized later in this report) and a visual board that was used to indicate various stages of stakeholder agreement. As noted later in this report, stakeholders had the opportunity to add new metrics as well.
3. Plenary Discussion: The meeting ended with a plenary discussion in which GPI facilitators briefly reviewed the top themes that emerged during small group discussions under of the five outcomes, and stakeholders were asked for additional feedback, questions, and clarifications. Stakeholders were also asked to provide feedback on the overall process of establishing performance metrics.

RESULTS

The remainder of this document summarizes the perspectives shared by meeting participants around performance metrics for Xcel Energy's electric utility operations, using the commission's five established performance outcomes as a structure for discussing the metrics. Rather than being a comprehensive evaluation of metrics, the summaries of stakeholder perspectives in this document are intended to provide a starting point for further evaluation by parties in the formal comment and reply periods for Docket 17-401. Ideally, the summaries will help parties to effectively craft their comments to the commission.

Outcome and Metric Summaries

How to Read the Outcome and Metric Summaries

QUICK GUIDE TO READING THE SUMMARIES

1. **Table of Contents.** All of the metrics that were discussed are listed alphabetically *by outcome*. The best way to navigate the metrics is by using the table of contents at the beginning of this report. NOTE: several metrics appear under multiple outcomes.
2. **Outcome summaries.** Each of the five commission-established outcomes is listed below, followed by a short summary of key discussion themes under that outcome.
3. **Metric summaries.** The outcome summaries are followed by summaries of metric topics that were discussed under that outcome, including the following:
 - a. The metric topic.
 - b. “Possible metrics” that were listed to provide examples of how the topic could be measured. In some cases, a known data source for the metric is listed in parentheses (e.g., FERC or EIA).
 - c. “Final status” to indicate whether there was broad agreement that the metric topic was necessary to measure utility performance on that outcome, and whether it was acceptable as-is or needed revision.
 - d. “Notes” which summarize the discussion for each metric topic, including how its “final status” came about.

HOW METRICS WERE DISCUSSED AT THE MEETING

Stakeholders were invited to attend five half-hour small group breakout sessions (with roughly eight attendees per group) to discuss metric topics under each of the commission-established performance outcomes. Each breakout had its own GPI facilitator and notetaker (the notes of which were used to generate the metric summaries in this report) and a visual board with a list of metric “cards” that could be placed into four buckets representing different stages of agreement among the group (shown in the figure below). Each card listed a topic and one or more “possible metrics” to measure performance on that topic that had been proposed by parties in Docket 17-401. Facilitators used the boards to track stakeholder consensus on the metrics in four categories:

Figure 3: Visual board categories for tracking stakeholder consensus

<p style="text-align: center;">AGREE Necessary and acceptable as-is</p>	<p style="text-align: center;">AGREE Unnecessary</p>	<p style="text-align: center;">AGREE Necessary but needs revision</p>	<p style="text-align: center;">DISAGREE</p>
<p>All group members agree that metrics in this bucket are necessary to measure performance on this outcome <i>and</i> the formulas for measurement look generally acceptable.</p>	<p>All group members agree that metrics in this bucket are <i>not</i> necessary to measure performance on this outcome. However, they may still be necessary for other outcomes.</p>	<p>All group members agree that metrics in this bucket are necessary to measure performance on this outcome, but need review or revision to make them acceptable.</p>	<p>All group members were not in agreement enough to place these metrics in one of the other three buckets (could be based on necessity, formulas, or something else).</p>

All metric topics on the board began in the first category, “AGREE-Necessary and acceptable as-is” and could be pulled for discussion and moved to another category based on consensus of the group. However, metrics were only allowed to move consecutively through the categories; they could not be moved backward. In other words, if a metric was moved to “AGREE— Necessary but needs review/revision,” it could be moved to “DISAGREE,” but it could not be moved back to the other two previous categories. Moreover, the cards were not reset between rounds.

These rules were put in place so that at the end of the five rounds, it would be clear which metric topics had earned broad stakeholder agreement to be kept as-is, discarded, or revised, and also which metric topics had resulted in disagreement among participants. Additionally, stakeholders were allowed to add new metrics, aided by GPI facilitators to ensure there was adequate discussion in the process of proposing and adding new cards.

Using these boards, facilitators encouraged discussion around the following questions:

1. Are these metric topics necessary to measure utility performance on this outcome?
2. Are there any necessary metric topics that are missing?
3. For metrics deemed necessary, are they generally acceptable as written (including the possible metrics listed)? If not, what revisions would be needed?
4. For metrics in the “DISAGREE” column, what are the varying perspectives that should be considered?

Importantly, 30 minutes was a short timeframe for small groups to discuss 15-20 metrics under each of the five outcomes. These discussions were meant to draw out different stakeholder perspectives, which are summarized in this report, but were not meant to comprehensively

evaluate all metrics. The formal comment and reply periods will allow a more thorough evaluation.

ORIGIN OF THE METRICS

In the first comment and reply period for Docket 17-401, which began in September 2017, the commission asked stakeholders to broadly suggest what metrics should be considered to measure Xcel Energy's performance. In response, several parties submitted comprehensive lists of both existing and new metrics for consideration. In total, there were nearly 180 different metrics submitted to the commission. Some of these metrics were sourced from specific statutes or commission dockets in Minnesota, while others were suggested based on reports and activities from other states.

Given the breadth of metrics that had already been submitted to the docket, GPI decided to use these suggested metrics for the purpose of discussion at the March 20, 2019 stakeholder meeting. While stakeholders were allowed to modify metrics and propose new ones, the original list was based off of metrics that had been entered into the formal record through party comments.

TOPICS VERSUS METRICS

In order to make it possible to discuss a list of 180 metrics with a large group of stakeholders, GPI staff consolidated the suggested metrics into "metric topics" that included one or multiple "possible metrics" for consideration. For example, "demand response" was a metric topic that included the following possible metrics: megawatt-hours of demand response provided per year; percent of customers participating in demand response programs per year; number of customers enrolled in demand response programs; potential and actual peak demand savings from demand response.

This structure, using higher-level metric topics, allowed a discussion of about 85 topics (which grew to 100 topics as a result of new additions) rather than 180 metrics and seemed to work well for the purpose of initial stakeholder discussion. However, as the process moves forward, the specific metrics will need to be refined.

EXISTING VERSUS NEW METRICS

While the possible metrics being considered contained both existing and new metrics, GPI intentionally did not label them as existing or new to allow a fair evaluation of all suggested metrics and avoid biasing stakeholder opinions. As the process moves forward, it will be important to identify which metrics are existing and new, and to consider updates to the existing metrics if and when doing so is deemed beneficial.

Affordability

It became clear through stakeholder discussions that affordability as a utility performance outcome had varying interpretations. Ultimately, stakeholders seemed to be defining affordability under three general sub-topics: customer costs and impacts; system costs and impacts; and projected costs and decisions as a result of resource planning.

Accordingly, deciding which metric topics should be used to assess a utility's performance on affordability was tied to these sub-topics. As with the other outcomes, most of the metric topics discussed under affordability was deemed necessary by all stakeholders, but needed revision or additional work to make them acceptable.

The utility's role in influencing affordability, versus that of the economy in general, was a theme of discussion across multiple metrics under this outcome. This may be something worth considering as it pertains to the design principle that metrics should be "within a utility's control and free from exogenous influences, such as weather or market forces."

AVERAGE BILLS

Possible metrics:

- Average bills by customer class

Final status: Necessary but needs revision

Notes: All stakeholders ultimately found it necessary to measure average bills to assess utility performance on affordability. However, some initially felt that it may be difficult or misleading for average bills to indicate performance on affordability given many differences within customer classes. For example, even in the residential class, varying housing types would impact the average. Bills can also vary at the city-level due to local taxes or franchise agreements. Some customer segments also have subsidies to bring down their overall bills, which would need to be considered. Importantly, participants noted that bills provide a different measurement than rates—a customer's electricity bill can go down, even while rates go up, if that customer implements energy efficiency.

CAPACITY COSTS

Possible metrics:

- Cost per kW of installed capacity (Federal Energy Regulatory Commission)

Final status: Necessary but needs revision

Notes: Stakeholders felt that it was necessary to measure capacity costs as a component of performance on Affordability, but they pointed out that the specific metric(s) should be considered carefully. For example, solar may have a lower cost per kW of installed capacity, but may not be available when needed, while nuclear and fossil plants are likely to be available when needed but are more expensive per kW installed capacity. It was suggested that capacity at peak usage times may be a more useful metric.

COST-EFFECTIVE ALTERNATIVE RESOURCES

Possible metrics:

- \$/MW cost of alternative portfolio vs. traditional investment
- # of non-wires alternatives
- Savings from non-wires alternatives

Final status: Necessary but needs revision

Notes: Participants felt that this metric indicates quality in a utility's resource investment choices, the impacts of which could ultimately affect affordability. Some stakeholders thought that this metric would provide transparency for customers. It was noted that this topic is still evolving.

CUSTOMER COSTS

Possible metrics:

- Total cost per customer
- Total cost per kWh per customer

Final status: Necessary but needs revision

Notes: Participants felt that this metric was necessary to indicate performance on affordability, but that the exact formula or data sources needed further consideration. It was noted that costs could be subdivided by customer types to make this more informative. This metric could also help to indicate progress on system efficiency—if the system is becoming more efficient, then costs per customer should decrease overall.

DELINQUENCY

Possible metrics:

- # of delinquencies occurring over time in a customer service program

Final status: Necessary but needs revision

Notes: Stakeholders discussed that delinquency can be an indicator of affordability. For example, decreasing delinquency rates could indicate that energy bills are becoming more affordable. Other factors like the economy could also impact delinquency and would need to be considered.

DEPOSITS

Possible metrics:

- # customers required to make deposits as a condition of service

Final status: Unnecessary

Notes: Participants questioned whether the number of customers required to make deposits actually indicate affordability. This may be a better measure under the customer service quality outcome.

DISCONNECTIONS

Possible metrics:

- Total disconnections
- # avoided disconnections due to affordability/assistance programs

Final status: DISAGREE

Notes: Some stakeholders felt that it would be useful to know if disconnections are increasing year-by-year, which could indicate an affordability issue. Others felt that disconnections may not be a good indicator of overall affordability because disconnection only applies to a small number of customers and may be limited by the “cold-weather rule,” which prevents customers from being disconnected during the heating season. It was noted that Xcel Energy already reports this metric on a monthly basis.

ENERGY COSTS

Possible metrics:

- Costs per net kWh (FERC)

Final status: Necessary but needs revision

Notes: Stakeholders thought it was necessary to measure energy costs in order to assess utility performance on affordability, but they were confused by the specific metric—costs per net kWh—listed. This metric might benefit from additional explanation or consideration with regard to the design principle that metrics should be easily interpreted.

ENERGY POVERTY HEAT MAP

Possible metrics: Census tract with income/race, site energy use intensity, and conservation improvement program investment

Final status: Necessary but needs revision

Notes: This metric was suggested by a stakeholder via survey before the meeting. Participants liked the overall idea of measuring energy poverty, but thought that it needed revision and refinement. It was noted in discussions that this metric could be used to target utility programming and resources towards energy-impovertised areas, as measured by census tract income distribution, utility energy intensity, and geographic allocation of Conservation Improvement Program dollars.

FUEL COSTS

Possible metrics:

- Average cost of fuel per net kWh
- Fuel price volatility

Final status: Necessary but needs revision

Notes: As with energy costs and capacity costs, stakeholders thought it was necessary to measure fuel costs, but felt that the exact metric(s) would benefit from additional consideration. In particular, some stakeholders thought this metric should measure fuel costs as they pertain to Xcel Energy's fuel clause rider. Additionally, fuel price volatility started as its own metric topic, but was combined with fuel costs over the course of stakeholder discussion.

GEOGRAPHIC DISTRIBUTION OF RESOURCES

Possible metrics:

- # of EV charging stations in low-income neighborhoods
- Utility and municipal partnership projects in places like Minneapolis Green Zones

Final status: DISAGREE

Notes: Stakeholders discussed the geographic distribution of electric vehicle charging stations as an example under this topic, though it was noted that Xcel may not have enough control over charging station locations to make this an acceptable metric. Ultimately, stakeholders disagreed about whether this metric is necessary to indicate utility performance on affordability.

INTEGRATED RESOURCE PLAN/INTEGRATED DISTRIBUTION PLAN FORECAST ACCURACY

Possible metrics:

- Integrated resource plan and rate case forecast load vs. actual sales and peak demand
- Savings vs. spending forecasts in \$ or %

Final status: Necessary but needs revision

Notes: Stakeholders agreed that this metric would be beneficial to track under the outcome of affordability because forecasts impact how the utility makes investments—the costs of which will ultimately be borne by customers. Participants noted that electrification (e.g., due to increasing adoption of electric vehicles) can make accurate forecasting more difficult.

LINE COSTS

Possible metrics:

- Total cost per mile of line

Final status: Necessary but needs revision

Notes: Stakeholders agreed that line costs would be useful to know as a general component of rates; however some participants felt that it may be difficult to hold Xcel Energy accountable for line costs. It was also noted that the costs of transmission versus distribution system lines vary significantly, which would need to be considered when establishing a metric for line costs.

PARTICIPATION IN AFFORDABILITY PROGRAMS

Possible metrics:

- # customers signed up for affordability/assistance programs
- % of eligible customers participating in affordability/assistance programs

Final status: Necessary but needs revision

Notes: Stakeholders agreed that there should be one or more metrics to indicate participation in affordability programs and they had a significant discussion about how to craft those metrics. Importantly, stakeholders noted that Xcel Energy already reports on affordability program participation, as required by statute.

Some stakeholders questioned whether utilities have adequate control over eligibility for and participation in affordability programs since some programs require customers to go through a federal process to be eligible and those federal programs determine participation limits. Others felt that despite those constraints, if the utility operates an efficient system that results in customer bill amounts decreasing, then participation in affordability programs would also decrease.

Meeting participants also discussed that general economic conditions would impact this metric, making it difficult to determine the extent of utility influence versus that of the economy. Some stakeholders noted that “eligibility” could be a useful point of comparison against participation to help understand the utility’s actions in the context of economic conditions.

Lastly, some stakeholders felt that it would be important to understand the frequency or duration of participation in affordability programs for individual customers, arguing that effective affordability programs should ultimately help customers be able to afford their electric bills without support.

PARTICIPATION IN EFFICIENCY PROGRAMS (OF CUSTOMERS ELIGIBLE FOR AFFORDABILITY PROGRAMS)

Possible metrics:

- # or % of customers eligible for affordability programs that are participating in efficiency programs
- Participation by geographic location

Final status: Necessary but needs revision

Notes: This metric was added by stakeholders in the third round of small group discussions. It was suggested to capture the notion that participation in energy efficiency programs can reduce energy bills, making them more affordable. However, some stakeholders raised the concern that if customers are already facing affordability as a challenge, then their ability to participate in some efficiency programs may be limited due to the need for capital investment and other resources to implement efficiency improvements.

QUALITY OF CONSIDERATIONS IN INTEGRATED RESOURCE PLANNING

Possible metrics:

- Consideration of long-term costs in integrated resource plans
- # scenarios considered
- # of scenarios based on stakeholder recommendations
- Consideration of alternative resources

Final status: DISAGREE

Notes: There was disagreement on whether this is a necessary measurement to assess utility performance on affordability and how it should be measured. Some participants liked that this sought to track stakeholder input in resource planning and suggested that transparency might be added as a useful component. Others felt that it may be difficult to quantify what constitutes a “quality” consideration. Ultimately, this metric would benefit from additional discussion and refinement.

RATE BY CLASS

Possible metrics:

- Rates broken down by types of customers, compared to state and national averages

Final status: Necessary but needs revision

Notes: Stakeholders thought this was worth measuring to assess utility performance on affordability, but there were concerns about designing an appropriate metric. The idea is that this would help to indicate what typical bills look like across different customer classes, especially in comparison to other utility territories. However, some participations raised the concern that those comparisons may not be apples-to-apples. It was noted that Edison Electric Institute tracks this, on average, at the state and national level, and that these metrics are generally reported on a per kWh basis.

SOCIETAL EXTERNALITIES

Possible metrics:

- Health costs, environmental degradation costs

Final status: DISAGREE

Notes: This metric was added during the first round of small group discussions. Ultimately, participants disagreed whether this was a necessary measurement to assess performance on affordability. The idea seemed to be that the external impacts of the power system, including health and environmental impacts, could cause additional costs to customers that would impact affordability. Some participants felt that, while this may be important to society, it wasn't relevant to the utility's performance on the outcome of affordability. It was suggested that this might fit better belong under the environmental performance outcome and, if included, would need to be well-defined to be useful.

Reliability, including Customer and System-Wide Perspectives

As noted in the Introduction section of this report, regulators have been using agreed-upon standards to measure reliability for decades. Accordingly, those well-established reliability measures had broad stakeholder agreement to be kept as-is; however there were several additional reliability-related topics that had been proposed in Docket 17-401 and that stakeholders discussed during this meeting.

One key consideration across multiple topics under Reliability was that it's important to measure the extent to which different technologies and approaches are delivering desired reliability services and benefits, rather than simply measuring the deployment of those technologies and approaches. In other words, some stakeholders felt that just because things like demand response, distributed energy resources, and distribution line controls can deliver desired reliability benefits doesn't mean that they will. Additionally, there was concern that some metrics may not be technology-agnostic, such that asking the utility to improve its performance on the metric result might lead to unfairly favoring one technology over another.

Another theme that arose in discussion on reliability was the balance between reliability and affordability. Some stakeholders noted that high levels of reliability and power quality are possible, but can also be expensive, and concluded that reliability metrics by themselves are less useful than reliability metrics paired with affordability metrics. In the plenary discussion, it was noted that this concept can be applied more broadly, such that all of the metrics should inform one another to create balance.

ADVANCED METERING

Possible metrics:

- # or % of customers with advanced metering infrastructure (AMI) and automated meter reading (AMR) meters (US Energy Information Administration (EIA))
- Quantity of energy served through AMI (EIA)

Final status: Necessary but needs revision

Notes: There was broad agreement to have a metric on advanced metering, but also a significant amount of discussion about how to appropriately craft the metric. Some stakeholders saw a connection with “participation in load shape programs,” another proposed metric under reliability. Group members also noted that two are related but not the same—advanced metering is farther-reaching than participation in load shape programs, as utilities could have AMI meters in service that aren't actively being used with load shape programs.

With that difference in mind, some participants suggested that the formulas or data sources for an advanced metering metric should consider not just deployment but also functionality or benefits of advanced meters (e.g., are they actually being used to yield their intended benefits?). It was noted that there are different strategies around deploying advanced metering—some utilities are seeking to deploy meters first and

develop programs to utilize them second, while others are seeking to deploy meters at the pace of customer participation in programs to utilize them.

AGGREGATE POWER PLANT EFFICIENCY

Possible metrics:

- EFOR--Equivalent Forced Outage Rate (North American Electric Reliability Corporation)
- Weighted equivalent availability factor (North American Electric Reliability Corporation)

Final status: Necessary but needs revision

Notes: Participants agreed that this metric would be useful to assess reliability because it indicates both system efficiency and generator availability. However, most of the discussion was focused on clarifying the meaning of this metric, including how “aggregate” is defined. Future revisions to this metric should consider making it as clear as possible.

CAPACITY FACTOR

Possible metrics:

- Average energy generation for a period / energy that could be generated at full nameplate capacity (Federal Energy Regulatory Commission)

Final status: DISAGREE

Notes: This metric ultimately ended up in the “disagree” pile because some stakeholders thought it provided significant value to measure a utility’s performance on reliability, while others thought it was unnecessary or even misleading. Supporters felt that this is a simple way to measure reliability because a high capacity factor indicates a risk of outages in an emergency event. Opponents pointed out that this metric favors large power plants rather than renewable resources like wind and solar, which have very low capacity factors by comparison.

CYBER SECURITY

Possible metrics: None provided

Final status: Necessary but needs revision

Notes: This metric was added during small group discussions. Stakeholders proposed to add a metric on cyber security to assess performance on reliability. However, participants discussed whether posting about cyber security threats on a data dashboard might make the system less secure. Ultimately, there was agreement that a cyber security metric could be useful to support preventing a security breach.

DEMAND RESPONSE

Possible metrics:

- MW of demand response capacity available

- MWh called upon over time

Final status: Necessary but needs revision

Notes: While there was broad agreement to have one or more metrics on demand response, there was also discussion about whether this metric is appropriate to include under reliability (versus cost-effective alignment of generation and load) and whether it should be combined with participation in load shape programs (another metric under reliability). Some stakeholders noted that demand response can be used for different purposes and that those purposes might usefully determine how it's measured under specific outcomes. For example, some demand response programs are targeted at improving reliability, others offer solely economic benefits, and some programs seek to elicit both benefits. Therefore, this metric might be improved by considering the specific reliability benefits that demand response is intended to deliver.

DISTRIBUTED ENERGY RESOURCES

Possible metrics:

- MW installed by type (EIA)
- # installations per year by type

Final status: Necessary but needs revision

Notes: While there was agreement to keep a DER metric under reliability, it was clear that there are varying perspectives on the extent to which DERs influence reliability. Some participants pointed out that DERs don't inherently make the grid more stable and could ultimately decrease reliability. Others noted that DERs, if paired with the right technologies and management approaches could increase reliability (examples included smart inverters and using storage for "black start" services).

In particular, there seemed to be agreement that simply knowing the capacity or number of DERs installed doesn't say anything useful about the impact of those DERs on reliability. Rather, what matters is how DERs are used. Suggested metrics included DER utilization, energy produced, and quantifying the reliability benefits they provide (or are capable of providing).

DISTRIBUTION LINE CONTROLS

Possible metrics:

- # or % of lines with voltage and volt-ampere reactive controls

Final status: Necessary but needs revision

Notes: Stakeholders broadly agreed both that this metric was useful for judging utility performance on reliability and that the formula or data sources need significant revision or reconsideration. This metric could be improved by thinking about the specific controls that influence reliability, including smart inverters.

FLEXIBLE RESOURCES

Possible metrics:

- MW of fast ramping capacity

Final status: Necessary but needs revision

Notes: Stakeholders agreed that measuring flexible resources for the purpose of reliability was worthwhile. However, there were several considerations raised about how best to measure this: the definition should be technology-neutral; we should not only think about flexibility but also environmental impacts; and if considering DER's, then the location of those resources should be considered to provide flexibility as needed. Ultimately, thinking about the locational component of flexible resources (as opposed to total quantities of flexible resources on the system) is what pushed this metric into the "necessary but needs revision" bucket.

GRID MODERNIZATION

Possible metrics: None provided

Final status: DISAGREE

Notes: This metric was added during small group discussions. One participant proposed to add a metric on grid modernization, including calculations on the degree to which the grid has been modernized, the degree to which various forms of reliability issues have been avoided based off historical comparisons because of modernization, etc. There was disagreement from stakeholders about whether this metric would be a good measure of reliability.

GENERATOR AVAILABILITY

Possible metrics:

- Units of time that a generator produces at its nameplate capacity

Final status: Unnecessary

Notes: This metric was added during small group discussions. There was discussion to add availability as a metric, measured as units of time that a generator produces at its nameplate capacity. After discussion, stakeholders agreed that this metric was ultimately unnecessary, as it is included in "Aggregate Power Plant Efficiency" metric.

INTERRUPTIONS

Possible metrics:

- MAIFI, SAIDI, SAIFI, CAIDI, CELID, CEMI, ASAI

Final status: Necessary and acceptable as-is

Notes: There was broad agreement that measuring interruptions is necessary to assess reliability, especially from an end-user standpoint. Even interruptions under five minutes can be problematic for some customers, especially if they don't know how long the

interruption will last. Some stakeholders felt that among all the metrics under this outcome, this is the most important one.

METER READING PERFORMANCE

Possible metrics: None provided

Final status: Unnecessary

Notes: Stakeholders broadly agreed that it's unnecessary to measure meter reading performance as component of utility performance on reliability. In particular, participants thought that this metric was outdated and would become increasingly less important as utilities transition to AMI. Some stakeholders thought it might make sense to continue to report on this in other dockets or to consider as a metric under Customer Service Quality.

NET METERING

Possible metrics:

- Net metering total installed capacity (EIA)
- MWh sold back to utility via net energy metering (EIA)
- # of customers on net energy metering rates (EIA)
- # net energy metering installations per year

Final status: Unnecessary

Notes: Stakeholders broadly agreed that it's unnecessary to measure net metering in order to assess utility performance on reliability, though some participants thought it might be considered under Environmental Performance as a measure of DER deployment, or under Customer Service Quality as a measure of providing services that customers want.

PARTICIPATION IN LOAD SHAPE PROGRAMS

Possible metrics:

- # customers participating by program – time of use, demand response, energy efficiency, etc.

Final status: Necessary but needs revision

Notes: There was extensive discussion about this metric, most of it focused on determining whether participation in load shape programs has any impact on reliability. Several participants noted that this might better fit under cost effective alignment of generation and load. Ultimately, stakeholders seemed to agree that a form of this metric could usefully help to indicate utility performance on reliability, and that if kept, should measure the specific load shape programs that actually influence reliability. Accordingly, some participants thought that this metric could be improved by removing the "participation" component and just calling this "load shape programs."

POWER QUALITY

Possible metrics:

- Measured changes in voltage
- # of validated power quality or voltage complaints to the commission
- Transient change, sag, surge, undervoltage, harmonic distortion, noise, stability, and flicker

Final status: Necessary and acceptable as-is

Notes: Stakeholders broadly agreed that power quality is necessary to measure since the commission defined Reliability as “including both customer and system-wide perspectives.” There was some discussion about whether the responsibility for power quality lies with the utility or with customers, since customer-owned equipment may cause power quality issues that affect reliability on the system. In response, it was noted that the utility could, hypothetically, offer a program or incentive to increase power quality to mitigate reliability related issues. Ultimately stakeholders were comfortable with this as written, including the possible metrics listed.

LOCATIONAL RELIABILITY

Possible metrics:

- Hosting capacity
- Worst performing feeders

Final status: Necessary but needs revision

Notes: This metric was added during small group discussions. Stakeholders felt that the proposed metrics did not adequately capture the locational elements of reliability, but rather system averages. Reliability metrics must capture locational information to most effectively utilize resources across the system.

PREVENTATIVE MAINTENANCE

Possible metrics: None provided

Final status: Necessary but needs revision

Notes: This metric was added during small group discussions. Stakeholders agreed that performing preventative maintenance on equipment to address system vulnerabilities is an important metric for ensuring reliability. Stakeholders discussed areas such as poles, bush maintenance, protecting physical assets, etc.

RESILIENCE

Possible metrics: None provided

Final status: Necessary but needs revision

Notes: This metric was added during small group discussions. Stakeholders broadly agreed that resiliency is an important aspect of reliability, although there was some disagreement about whether other metrics sufficiently do, or could, capture resiliency

(such as flexible resources). Resiliency might cover the ability to recover from a large event (such as an extreme weather event) and/or the physical security of the electricity system (preventative measures). Finding calculations to measure resiliency is complicated and a question that many entities are wrestling with, but there was broad agreement that resiliency is an important aspect of reliability.

STORAGE

Possible metrics:

- Installations per year
- MW installed
- % of storage customers enrolled in load management programs

Final status: Necessary but needs revision

Notes: Stakeholders broadly agreed that there should be a storage-specific metric under the outcome of Reliability, but didn't come to consensus on exactly how the metric should be crafted. At least one participant was interested in measuring curtailment of renewables to identify where (and when) storage might be paired with renewables to support reliability. There was a suggestion that one way to accomplish this, with an eye towards the utility's responsibility, would be to measure success in deploying storage to enhance reliability.

SYSTEM LOSSES

Possible metrics:

- Total losses/MWh generation

Final status: Necessary but needs revision

Notes: Stakeholders agreed that system losses are important to measure and ultimately can impact reliability, especially if unpredictable losses occur. However, some participants thought this metric might also belong under "cost effective alignment of generation load," as misalignment can cause losses. This metric could be improved by thinking about how to measure the specific impacts of system losses on reliability.

Customer Service Quality, including Satisfaction, Engagement, and Empowerment

Throughout discussions on customer service quality, it became clear that the terms “satisfaction, engagement, and empowerment” were important to determine what metrics should fit under this outcome. These terms provided for a discussion that extended beyond the traditional customer service quality metrics that utilities are already required to report.

Stakeholders seemed to broadly agree that customer service quality metrics should seek to identify what customers need and want from their electric utility, and then measure how well the utility is providing those things. In general, participants took issue with any metric that sought to measure the number of customer products or services, arguing that customer service quality metrics should instead focus on quality provision.

The role of third parties in this outcome was of particular interest. Over the course of discussion, it became clear that some stakeholders saw a clear division between third parties that are under contract with the utility and those that are not, arguing that a utility cannot be expected to have influence over those non-contracted third parties, such as the ones that operate within Xcel Energy’s community solar garden program. Third parties also came up in discussion about customer energy usage data access, with some participants finding that data should only be accessible to individual customers, while others thought that data should be accessible to third parties to allow them to provide beneficial services to the utility’s customers. This topic would warrant further discussion in the formal comment and reply period.

Finally, many of the metrics discussed under customer service quality came from a list of existing metrics that were submitted into Docket 17-401 based on state requirements for electric utilities in Minnesota. Several of these existing metrics remained in the “AGREE—Necessary and acceptable as-is” category, including billing accuracy, call center quality, customer complaints, order fulfillment, outage communications, and service appointment quality. However, in the last round of stakeholder discussions, there was a question raised about whether these standard customer service quality metrics are truly needed to measure utility performance on this outcome. The group was interested in discussing this, but ran out of time. Therefore, these standard customer service quality metrics may be worth considering in the formal comment and reply periods.

BILLING/INVOICE ACCURACY

Possible metrics:

- % of accurate bills
- % bills produced by actual meter reads
- # months to adjust invoices

Final status: Necessary and acceptable as-is

Notes: This metric was seen as necessary and acceptable as-is to all stakeholders and was not flagged for discussion.

BILL-PAYING CONVENIENCE/CHOICE

Possible metrics:

- # of bill-paying options
- Satisfaction with bill-paying options

Final status: Necessary but needs revision

Notes: Some stakeholders saw this metric as unnecessary to measure utility performance on customer service quality, while others thought it was useful. Ultimately all participants were comfortable with saying that it was necessary but needed revision.

CALL CENTER QUALITY

Possible metrics:

- % of calls answered
- Average response time (to answer calls)
- % inquiries resolved on the first call
- Customer satisfaction with call center interactions

Final status: Necessary and acceptable as-is

Notes: This metric was seen as necessary and acceptable as-is to all stakeholders and was not flagged for discussion.

CUSTOMER COMPLAINTS

Possible metrics:

- # received over time
- # formal complaints to regulatory agencies (per 1,000 customers)

Final status: Necessary and acceptable as-is

Notes: This metric was seen as necessary and acceptable as-is to all stakeholders and was not flagged for discussion.

CUSTOMER PRODUCTS/SERVICES

Possible metrics:

- Total # available
- # new
- Satisfaction measured by survey
- Adoption rate by offering

Final status: Necessary but needs revision

Notes: Stakeholders broadly supported measuring customer products and services as a component of customer service quality, but there was significant discussion about how to craft the specific metric(s). Some participants thought it would be helpful to define what qualifies as a “customer product or service.” As with other metrics, stakeholders seemed to coalesce around the idea that the number of products and services is less

important than their quality and that it's especially important whether the utility is delivering products and services that customers need and want. It was also suggested that awareness of products and services should be measured to provide useful context to customer adoption (i.e., adoption by itself doesn't provide the full picture).

CUSTOMER SATISFICATION WITH THIRD PARTIES -- NOT UNDER CONTRACT

Possible metrics:

- Customer satisfaction with third parties (survey)

Final status: DISAGREE

Notes: Customer satisfaction with third parties started as a single metric, but was split into two metrics based on stakeholder discussion that indicated that it mattered whether the third parties were under contract with the utilities or not. Ultimately, there was disagreement about whether it's necessary to measure customer satisfaction with third parties *not under contract with the utility* in order to assess utility performance on customer service quality. The difference in opinion came to down to whether participants felt that utilities should be responsible for third parties that they can't oversee through contracts.

CUSTOMER SATISFACTION WITH THIRD PARTIES -- UNDER CONTRACT

Possible metrics:

- Customer satisfaction with third parties (survey)

Final status: Necessary but needs revision

Notes: Customer satisfaction with third parties started as a single metric, but was split into two metrics based on stakeholder discussion that indicated that it mattered whether the third parties were under contract with the utility or not. Stakeholders broadly agreed that for third parties *who are under contract with the utility* it is necessary to measure customer satisfaction to assess utility performance on customer service quality. Agreement was based on the notion that contracts allow utility oversight of third parties. While this metric seemed to have broad support, it was placed under "needs revision" since it saw significant discussion from multiple small groups.

CUSTOMER SATISFACTION WITH UTILITY

Possible metrics:

- J.D. Power Electric Utility Business Customer Satisfaction Index
- J.D. Power Electric Utility Residential Customer Satisfaction Index
- % of customers satisfied with recent transaction (survey)

Final status: Necessary but needs revision

Notes: Participants broadly supported measuring customer satisfaction with their utility in order to assess performance on customer service quality, but didn't think the possible metrics listed were adequate. In particular, multiple participants thought that J.D. Power surveys don't adequately measure customer satisfaction, and that measurement could

be improved upon. Moreover, stakeholders discussed that in relation to customer products and services, it would be especially important to measure what customers want from their utility, and whether they feel like they're getting that satisfactorily or not. Importantly, it was noted that a utility in California was caught manipulating a customer satisfaction metric, so metrics under this topic should be considered carefully.

CUSTOMER USAGE DATA ACCESS

Possible metrics:

- # customers able to access daily usage data
- % customers who have authorized third party access
- Customer satisfaction with data access
- Third party data vendor satisfaction with utility interaction

Final status: DISAGREE

Notes: Access to customer energy usage data as a measure of utility performance on customer service quality was a key topic of discussion across multiple breakout groups, ultimately resulting in disagreement rather than consensus. However, there seemed to be consensus that it would help to split this into two separate topics: customer satisfaction with the ability to access their own data; and third-party satisfaction with the ability to access aggregate customer energy usage data. One participant posed the question of what level of usage data frequency is appropriate, whether it be daily, 15-minute periods, or by the minute. Another participant noted that access to usage data is the foundation of customer "empowerment," which is part of this outcome. Ultimately, this topic was of significant interest and should be discussed in the comment and reply periods to the extent parties are interested in including it as one or more metrics under customer service quality.

CYBER SECURITY

Possible metrics: N/A

Final status: DISAGREE

Notes: This metric was proposed and added as a result of discussions about customer energy usage data access, related to concern about the risk of a security breach that could put sensitive customer data at risk. Ultimately, stakeholders disagreed that this is necessary to measure utility performance on customer service quality. Notably, this metric also shows up under the outcome of reliability.

DELINQUENCY

Possible metrics:

- Delinquency charges
- # or % of delinquent customers

Final status: Unnecessary

Notes: All stakeholders agreed that measuring customer delinquency is unnecessary to assess utility performance on customer service quality, though it may be important for affordability. However, it was noted that Xcel Energy is currently required to report this metric to regulators.

DISCONNECTIONS

Possible metrics:

- Total disconnections
- # avoided disconnections due to affordability/assistance programs

Final status: Necessary but needs revision

Notes: There was consensus that disconnections should be measured to assess utility performance on customer service quality, but participants thought that the specific metric(s) needed additional consideration to be most useful. In particular, avoided disconnections seemed like the most useful metric, but also the most difficult to quantify, especially since utility are forbidden from disconnecting customers during the heating season in Minnesota from a safety standpoint.

INTERCONNECTION SUPPORT

Possible metrics:

- Average days for interconnection
- Satisfaction with interconnection process (survey)

Final status: Necessary but needs revision

Notes: Stakeholders broadly agreed that interconnection support should be measured under customer service quality, but felt that the specific metric(s) needed additional consideration. Some participants felt that interconnection speed was especially important, and that the traditional utility business model is not incentivized to deliver quick interconnection. It was noted that there's another docket at the MN PUC, Docket No. 16-521, that recently established new interconnection metrics, and those should be review and considered for this topic.

LOW-INCOME PRODUCTS/SERVICES

Possible metrics:

- Total # available
- # new products and services
- Satisfaction measured by survey
- Adoption rate by offering

Final status: Necessary but needs revision

Notes: Some stakeholders felt strongly, and ultimately all agreed, that low-income specific products and services should be measured as a component of customer service quality. However, as with several other metrics, participants felt that the total number of products and services is not important, and that what matters is generating products and

services that meet customers' needs. Therefore, this topic was deemed necessary but needs additional review.

ORDER FULFILLMENT

Possible metrics:

- Response time to fulfill requests including service installation/extension/termination, outage responses, and meter re-reading

Final status: Necessary and acceptable as-is

Notes: This metric was seen as necessary and acceptable as-is to all stakeholders and was not flagged for discussion.

OUTAGE COMMUNICATIONS

Possible metrics:

- Average time between outage and public notice
- # of ways to obtain outage information

Final status: Necessary and acceptable as-is

Notes: This metric was ultimately seen as necessary and acceptable as-is to all stakeholders. While some participants questioned the usefulness of this metric, others felt that this is something customers care about. It was noted that advanced metering infrastructure will make it easier to detect and notify customers of outages. Stakeholders also discussed that this might be worth measuring in relation to customer satisfaction with the utility.

OUTAGE REFUNDS

Possible metrics:

- Total refunds for outages related to storms/major events that exceed performance standards

Final status: DISAGREE

Notes: Stakeholders disagreed whether outage refunds are a necessary measurement to assess utility performance on customer service quality. Some participants felt that this metric was unnecessary and might be better suited to affordability or reliability. Others had an entirely opposite opinion, stating that this topic is a core component of customer service quality. Therefore, parties interested in this metric should provide additional evaluation in their written comments to the commission.

PARTICIPATION IN AFFORDABILITY PROGRAMS

Possible metrics:

- # customers signed up for affordability/assistance programs
- % of eligible customers signed up for affordability/assistance programs

Final status: Necessary and acceptable as-is

Notes: This metric was seen as necessary and acceptable as-is to all stakeholders and was not flagged for discussion.

RATE OPTIONS

Possible metrics:

- # of total rate options
- # of new rate options
- Customer participation in specific rate options

Final status: Necessary but needs revision

Notes: This metric topic was initially listed as “rate options to affect load shape,” but participants agreed that customers don’t care about load shape; they care about finding rate that works well for their needs. Therefore, the topic was relabeled “rate options.” Like several other metrics, stakeholders thought it was more important to ensure that there are rate options to meet customers’ needs than that there are a given number of options.

SERVICE APPOINTMENT QUALITY

Possible metrics:

- # appointments made, fulfilled, and missed (due to customer not present)

Final status: Necessary and acceptable as-is

Notes: This metric was seen as necessary and acceptable as-is to all stakeholders and was not flagged for discussion.

THIRD PARTY SATISFACTION WITH UTILITY

Possible metrics: N/A

Final status: DISAGREE

Notes: This metric was proposed and added during stakeholder discussions about customer satisfaction with third parties. Some participants felt that it was also important to measure whether those third parties (such as solar developers) were satisfied with their interactions with the utility, while others felt that the utility and regulators should not be concerned with the satisfaction of third parties. For parties that cared about this metric, it would be worth providing additional details in formal comments to support commission consideration.

Environmental Performance, including Carbon Reductions and Beneficial Electrification

Throughout stakeholder discussions, environmental performance metrics saw a remarkable amount of consensus from stakeholders, with no metrics ending up in the “DISAGREE” category, and seven metrics that stakeholders thought were generally acceptable as written.

As with the other outcomes, many of the metrics that had been proposed relating to environmental performance needed to be reviewed and revised to measure their specific contributions to the particular outcome—in this case, the question was whether metric topics had an environmental component, and if so, how best to measure it. This was a point of discussion for electric vehicles, distributed energy resources, and green pricing programs, all of which can, but don’t necessarily always, provide environmental performance benefits.

Stakeholders also discussed the boundaries of environmental performance as it pertains to electric utilities, including whether there should be metrics to measure water usage for electric utility operations and whether environmental performance should be measured geographically in addition to system-wide performance.

ALIGNMENT OF WATER AND ENERGY SYSTEMS

Possible metrics:

- Gallons of water saved by residential customers, water/wastewater companies

Final status: Necessary but needs revision

Notes: This metric was proposed and added during the fourth round of small group discussions. Participants discussed whether this falls within Xcel Energy’s control or not. One stakeholder felt that water consumption from power generation is within their control. Ultimately, all participants felt that this was worth measuring as a component of environmental performance, but it could benefit from additional consideration and refinement.

BENEFICIAL ELECTRIFICATION

Possible metrics: None provided (but noted that it might be covered by individual EV/fuel switching metrics under this same outcome).

Final status: Necessary but needs revision

Notes: While stakeholders thought it was necessary to measure beneficial electrification as a component of Environmental Performance, they felt that any resulting metrics would need to be made more specific (e.g., targeted at specific types of electrification like transportation and space heating) to be useful.

CARBON EMISSIONS

Possible metrics:

- Tons CO₂ emitted per year (US Environmental Protection Agency)

- Tons CO₂ reduced compared to a baseline

Final status: Necessary and acceptable as-is

Notes: Stakeholders broadly agreed that carbon emissions should be measured to assess a utility's environmental performance. It was noted that this is similar to, but not the same as, carbon intensity. Ultimately, participants felt that both were important to measure.

CARBON INTENSITY

Possible metrics:

- CO₂ emissions per customer
- CO₂ emissions per MWh sold
- CO₂ emissions per MWh generated

Final status: Necessary and acceptable as-is

Notes: Stakeholders agreed that carbon intensity is necessary to measure a utility's environmental performance and that the specific metrics listed looked acceptable. There was some discussion about whether the utility's control over this metric extends beyond carbon emissions from power plants to emissions due to customer behavior (e.g., as a result of utility programs to incentivize customer behavior changes that would reduce carbon intensity). Accordingly, there was a suggestion that this metric is related to measuring the effectiveness of load shape programs, which can also influence carbon intensity, as well as costs.

CARBON REDUCTION COSTS

Possible metrics:

- Cost per additional unit of CO₂ emissions reduction beyond existing requirements

Final status: Necessary but needs revision

Notes: Stakeholders thought that carbon reduction costs were a necessary component of measuring a utility's environmental performance, but noted that eligible "costs" would need to be defined in order to make this metric comply with the design principles. There was also a question about how revenue generation for dealing with carbon should be addressed.

COMMUNITY SOLAR

Possible metrics:

- Overall participation rate
- Low and moderate income (LMI) participation rate
- LMI energy burden reduction

Final status: Necessary and acceptable as-is

Notes: This metric was not pulled for discussion. Therefore, its status remained "necessary and acceptable as-is," but it may benefit from additional consideration.

CUMULATIVE DISTRIBUTED ENERGY RESOURCE EFFECTS

Possible metrics:

- Cumulative effect of all DER's on peak load or load shape

Final status: Necessary but needs revision

Notes: While there was broad agreement that this should be measured, stakeholders noted that DERs include customer-owned generators (i.e., diesel backup), which are a concern for environmental performance. A suggested improvement was to measure the carbon intensity of DERs in coordination with load shape. On this point, participants noted that the effect of DERs on peak load doesn't always have an impact on environmental performance. Accordingly, stakeholders suggested that this metric should be considered along with metrics around demand management and demand response as there is likely some overlap. Another suggestion for improvement was to measure utility incentives to support DERs that increase environmental performance.

ECONOMY-WIDE CARBON REDUCTIONS

Possible metrics:

- Economy-wide (possibly cost-effective) CO₂ emissions reductions due to utility actions, such as electrification of transportation

Final status: Unnecessary

Notes: Stakeholders felt that this metric was duplicative of other carbon emissions metrics that were discussed and therefore unnecessary.

ELECTRIC SPACE/WATER HEATING

Possible metrics:

- MWh or % of load attributable to off-peak space/water heating
- % of total usage due to space/water heating
- # or % of customers enrolled in time of use rates for space/water heating

Final status: Necessary but needs revision

Notes: Stakeholders felt that it was necessary to measure the environmental impacts of electric space and water heating, but they didn't think possible metrics listed were adequate as they don't specifically measure those impacts. One suggested revision was to measure avoided carbon emissions as a result of fuel switching.

ELECTRIC VEHICLES

Possible metrics:

- # or % of customers on EV-specific rates and programs
- # EV's added to the grid annually
- MWh or % of EV charging load that is utility-controlled
- MWh or % of EV charging load that occurs off-peak

Final status: Necessary but needs revision

Notes: Participants felt that electric vehicles should be measured to assess a utility's environmental performance, but that the specific metrics could be improved. As with other metrics under Environmental Performance, stakeholders noted that the possible metrics listed don't measure environmental impacts, such as air quality. Rather, it's assumed that more electric vehicles equate to improved air quality. It was noted that this assumption is only true if customers are switching to electric vehicles from gasoline- or diesel-fueled vehicles.

Stakeholders also discussed the extent to which electric vehicles are within the utility's control. It was noted that Xcel Energy doesn't know when a customer purchases an electric vehicle, but they do know when customers sign up for an electric vehicle-specific rate. Accordingly, participants suggested removing the metric, "# of EV's [electric vehicles] added to the grid annually," but keeping the other three metrics. There was also a suggestion to add a metric around equitable access to electric vehicle infrastructure.

ENERGY EFFICIENCY

Possible metrics:

- Annual and lifecycle energy savings (EIA)
- Annual and lifecycle peak demand savings (EIA)
- Program costs per unit energy saved (EIA)

Final status: Necessary and acceptable as-is

Notes: This metric was not pulled for discussion. Therefore, its status remained "necessary and acceptable as-is," but it may benefit from additional consideration. Notably, this metric shows up under other performance outcomes.

FOSSIL CARBON EMISSIONS RATE

Possible metrics:

- Tons of CO₂ per MWh fossil generation (US Environmental Protection Agency)

Final status: Unnecessary

Notes: Stakeholders felt that this metric was duplicative of other carbon emissions metrics under the Environmental Performance outcome.

FUEL SWITCHING

Possible metrics:

- MMBtu avoided fuel for transportation or space/water heating

Final status: Necessary but needs revision

Notes: Stakeholders felt that it was necessary to measure fuel switching to assess a utility's environmental performance, but that the specific metrics needed additional consideration. In particular, a general fuel-switching metric may be duplicative of more

specific metrics that capture fuel switching, like electric vehicles and electric space and water heating. Additionally, it was suggested that measuring fuel switching should also include commercial and industrial applications like combined heat and power, as well as switching from gas to induction ranges.

GEOGRAPHIC PLACEMENT OF RESOURCES

Possible metrics:

- Impacts/benefits due to targeted geographic placement compared to other options

Final status: Necessary and acceptable as-is

Notes: Stakeholders felt that measuring the geographic placement of resources was necessary to assess a utility's environmental performance and that the possible metric listed was generally acceptable. Participants suggested that this could be improved by specifying "environmental impacts" (rather than simply "impacts") in the metric. It was also noted that the equity components of resource placement were discussed as a metric under the outcome of Affordability.

GREEN PRICING

Possible metrics:

- # customers participating in green pricing programs such as Renewable*Connect

Final status: Necessary and acceptable as-is

Notes: Stakeholders felt that participation in green pricing programs was important to measure. Some participants thought that additionality—the notion that green pricing programs result in more renewable energy on the system than would otherwise be the case—was important to consider. It was also suggested that this metric could be improved by focusing on the environmental impacts of green pricing programs.

OTHER ENVIRONMENTAL BENEFITS

Possible metrics:

- Concentration of particulate matter, NO_x, SO₂
- Geographic/equity component

Final status: Necessary and acceptable as-is

Notes: This metric was added during discussion to address environmental impacts that weren't captured in the list of possible metrics under environmental performance. Stakeholders noted that this may be related to "geographic placement of resources," another metric under this outcome.

RENEWABLE ENERGY

Possible metrics:

- Renewable percent of total generation (US Environmental Protection Agency)

- Total amount of renewable energy capacity
- Annual and lifecycle peak demand reductions due to renewable energy

Final status: Necessary but needs revision

Notes: Stakeholders were supportive of a renewable energy metric, but saw several opportunities for improvement. Some participants thought that there should be technology-specific metrics, including solar, wind, and biomass. There was also a suggestion that metrics should consider the lifecycle environmental impacts of renewable energy technologies (e.g., not just electricity production, but also manufacturing and disposal of materials).

SOLAR ENERGY

Possible metrics:

- MW installed, total and annually
- MW installed by type

Final status: Unnecessary

Notes: Stakeholders felt that solar energy metrics should be captured under the broader “renewable energy” metrics, so a separate topic for solar specifically was deemed unnecessary.

Cost Effective Alignment of Generation and Load, including Demand Response

At the November 1, 2018 commission hearing for Docket 17-401, this outcome was initially phrased as “peak load reduction,” but was modified by the commission during the hearing based on stakeholder consensus that peak reduction by itself is too narrow a focus. The idea was that the ultimate goal is to cost-effectively align both generation and demand-side resources, which could include not just reducing peak, but also shifting or increasing loads during certain time periods to optimize the system, which would have both efficiency and cost benefits.

Despite this revision in phrasing, participants spent significantly more time trying to interpret the meaning of this outcome than they did for the other four outcomes. Ultimately, there seemed to be agreement that the highest-level intent of this outcome was system optimization, though some participants noted that it’s important to not lose the focus on load management that the current phrasing provides. While this wasn’t resolved at the meeting, it may be worth considering whether and how to clarify the intent of this outcome as the process moves forward so that everyone is clear what specific end-results utilities are being asked to deliver, and thus which metrics make the most sense.

One key theme of discussion on this outcome was that it seemed to participants to be especially interrelated with the other outcomes. For example, the “cost effective” component of this outcome relates to the affordability performance outcome, and several stakeholders pointed out that the net impact on carbon emissions should also be considered in aligning generation and load. Moreover, most forms of load management require customer participation, which touches on the “satisfaction, engagement, and empowerment” components of the customer service quality outcome.

ADVANCED (INNOVATIVE) GENERATION TECHNOLOGIES

Possible metrics:

- mWh capacity (new)
- improved generation efficiency

Final status: Necessary but needs revision

Notes: This metric was proposed and added in the third round of small group discussions. The intention was to measure technologies that can contribute to cost effective alignment of generation and load, but that are not already addressed in the other metrics under this outcome.

ADVANCED METERING

Possible metrics:

- # or % of customers with advanced metering infrastructure (AMI) and automated meter reading (AMR) meters (EIA).

- Quantity of energy served through AMI (EIA)

Final status: Necessary but needs revision

Notes: Stakeholders supported the idea of measuring AMI as it pertains to load management, but they felt that the possible metrics listed were inadequate. In particular, they thought it would be better to measure how the data collected from AMI is being used to support the cost-effective alignment of generation and load (e.g., through the design of new rates or programs that utilize that data). Notably, this metric was proposed under other outcomes and received similar feedback.

AVOIDED OR DEFERRED INVESTMENTS

Possible metrics:

- # of instances where a distribution system upgrade is avoided/deferred due to load management or DERs

Final status: Necessary but needs revision

Notes: Stakeholders felt that avoided or deferred investments were necessary to measure utility performance on cost-effective alignment of generation and load, but that the specific metrics deserve additional consideration. One participant was concerned that calculating the necessary counterfactuals (i.e., the cost of investments that were avoided or deferred) would be contentious. It was also noted that the possible metric listed only includes avoided or deferred distribution investments, but should be revised to include system investments more broadly.

COMBINED HEAT AND POWER CAPACITY

Possible metrics:

- MW Combined Heat and Power (CHP) installed
- # CHP installations

Final status: Unnecessary

Notes: Over the course of discussion, stakeholders decided that CHP should fall under one or the other of two new metrics proposed under this outcome: either “distributed energy resources” or “advanced (innovative) generation technologies.” The rationale behind this suggestion was that CHP is just one of many DERs that could contribute to alignment of generation and load and it seemed oddly specific to have a metric just on CHP (though there was broad agreement that CHP is important and under-utilized). Therefore, this CHP-specific metric was deemed unnecessary. However, stakeholders did point out a number of considerations for a CHP metric.

As noted above, many participants felt that the proposed CHP capacity metric was too narrow and not well tied to the performance outcome. Just knowing the megawatts and number of CHP installations wouldn’t say anything useful about utility performance on cost-effectively aligning generation and load. Some participants felt it would be better to measure something more outcome-focused, like the load shape or load factor impacts of CHP. Others felt that there *should* be some kind of CHP-specific metric to provide

visibility into the quantity and location of CHP systems, but acknowledged that such a metric may not fit under this specific performance outcome.

DEMAND RESPONSE

Possible metrics:

- MWh of demand response provided over past year (EIA)
- % of customers participating in demand response programs per year (EIA, FERC)
- # customers enrolled in demand response programs (EIC)
- Potential and actual peak demand savings from demand response (EIA)

Final status: Necessary but needs revision

Notes: Participants broadly supported a demand response metric under this outcome, but felt that the specific metrics listed needed additional consideration. Group members suggested that a more appropriate metric might focus on how well demand response is being used to accomplish cost-effective alignment of generation and load.

DISTRIBUTED ENERGY RESOURCES

Possible metrics:

- Capacity and energy from DERs (mW and mWh)
- Number of installations
- Utilization of DERs to optimize loads

Final status: DISAGREE

Notes: There was disagreement whether a DER metric is necessary under this outcome. Some participants felt that DERs are simply tools to achieve a desired outcome and that the outcome should be measured rather than the tools. Others felt that they might be worth measuring since DERs can facilitate the cost-effective alignment of generation and load. If a DER metric is further developed, some of these concerns might be addressed by focusing the metric on the desired outcome rather than simply accounting for their deployment.

ELECTRIC VEHICLE MANAGED CHARGING

Possible metrics: N/A

Final status: N/A

Notes: This metric was suggested to facilitators at the end of stakeholder discussions. GPI staff decided to include it for consideration, but have not given it a “final status” since it was not discussed.

ENERGY EFFICIENCY

Possible metrics:

- Annual and lifecycle energy savings (EIA)
- Annual and lifecycle peak demand savings (EIA)

- Program costs per unit energy saved (EIA)

Final status: Necessary but needs revision

Notes: Stakeholders ultimately felt that energy efficiency is important for cost-effectively aligning generation and load, but that the specific metrics listed weren't acceptable. Some participants thought that energy efficiency should be a component of other metrics, including demand response and DERs. Some stakeholders felt that there should be metrics to measure different types of energy efficiency, including the cost-effectiveness of efficiency programs, end-use efficiency, and system efficiency.

ESTIMATED CURTAILMENT

Possible metrics:

- Estimated curtailed energy as a percentage of available curtailable energy
- Put into three categories (oversupply, system constraint, facility requesting)

Final status: Necessary but needs revision

Notes: This metric was proposed and added during the fourth round of small group discussions and derived from a similar metric in Hawaii. The idea was that tracking curtailments might add useful information to other load management metrics being tracked under this outcome. It was noted that this metric might be useful in the next five years, but less useful beyond that particularly given that the cost of curtailment must be measured against the cost of other alternatives, such as energy storage, whose costs will change over time. One participant questioned whether it would make more sense to include this as a sub-metric with other existing load management metrics. Ultimately, this topic would benefit from additional consideration.

GEOGRAPHIC PLACEMENT OF DISTRIBUTED ENERGY RESOURCES

Possible metrics:

- Targeted locations of DERs with the aim of aligning generation and load
- Hosting capacity of solar gardens

Final status: Necessary but needs revision

Notes: This topic was originally listed as “geographic placement of resources,” and was edited during discussion to specify distributed energy resources (DERs), as stakeholders felt it was important to call out the specific resources being targeted. The possible metrics listed were developed and added during discussion. Group members felt that this was important, but that they needed more time to refine exactly how to phrase the metrics for the purpose of cost-effectively aligning generation and load. One participant felt that in order for DERs to have a role in aligning loads, the utility would need to have some control over them. Another participant felt that metrics should shed light on whether or not geographic placement is minimizing net new costs to the system and maximizing system benefits.

GRID OPTIMIZATION

Possible metrics:

- Quantity of microgrid deployment
- Smart grid deployment
- Amount of line loss decrease
- Degree of (gen/load) alignment optimization achieved

Final status: Necessary but needs revision

Notes: This topic and its associated possible metrics were added during the fourth round of small group discussions. The idea was to track the degree of investment into modernizing the grid through actions like burying lines, deploying smart grid technologies, and enabling microgrids. Another perspective was that this metric could be used to optimize overall service capacity. One participant raised the concern that having a microgrid metric could drive creation of unnecessary microgrids. Another stakeholder felt that the intent was simply to track the information—not to require action on it.

INTEGRATION OF NEW LOADS

Possible metrics:

- MWh or % of new loads occurring in low-usage or low-cost periods versus high-usage or high-cost periods

Final status: Necessary but needs revision

Notes: Stakeholders felt that it was necessary to measure the integration of new loads, but there was some confusion and discussion about how best to craft the specific metric(s). EV charging was discussed as a working example, as charging during certain times could make it more difficult to cost-effectively align generation and load. There was a suggestion that “new” should be removed from the title, so that this could apply to integration of all loads. It was noted that this topic overlaps with other topics under this outcome, including load shifting and load shape.

LOAD FACTOR

Possible metrics:

- System average load / system peak load
- Sector average load / sector peak load

Final status: Necessary but needs revision

Notes: Stakeholders ultimately agreed that load factor is necessary to measure under this outcome, but that the specific metrics deserve additional consideration. There were also varying perspectives on the usefulness of this metric. Some participants felt that load factor used to be a good measure of overall system efficiency, but that it's less important with increasing amounts of variable renewables on the system. Others felt that load factor is still useful as a measure of whether the system for which customers are paying is being used efficiently. Additionally, some stakeholders thought that other

metrics around load shape could provide a more useful and more granular measurement of ensuring that resources are being used efficiently.

LOAD SHAPE INVESTMENT

Possible metrics:

- \$ per kW peak reduced annually or seasonally
- Impact of investments on load shape compared to other options

Final status: Necessary but needs revision

Notes: There was broad support for measuring load shape investment, but also concern that the specific metric(s) should focus on whether investments are cost-effectively (or cost-efficiently) aligning generation and load. It was suggested that this metric should be relabeled as “cost-efficient load shape investment.”

LOAD SHAPE

Possible metrics:

- Ratio of electricity usage in the lowest-usage or lowest-cost hours to the electricity usage in the highest-usage or highest-cost hours over a given time period

Final status: Necessary but needs revision

Notes: Stakeholders broadly agreed that load shape was a necessary component of utility performance on cost-effectively aligning generation and load, but there were several suggestions for improving the specific metric(s). In particular, some suggested the need to consider environmental impacts, and specifically carbon emissions, in addition to costs when identifying load shape improvements so that generation and load aren't aligned at the expense of higher carbon emissions. One participant questioned whether load shape should be measured system-wide or for individual technologies or programs, or both.

LOAD SHIFTING

Possible metrics:

- % load shifted to off peak
- kW shifted to off peak

Final status: Necessary but needs revision

Notes: There was broad support for measuring load shifting under this outcome, but some participant also remarked that this metric may not be necessary if the metrics developed under “load shape” would capture load shifting adequately. Like load shape, there was interest in considering both costs and environmental impacts in measuring load shifting.

PARTICIPATION IN LOAD SHAPE PROGRAMS

Possible metrics:

- # customers participating by program—time of use, demand response, energy efficiency, etc.

Final status: Necessary and acceptable as-is

Notes: Stakeholders broadly supported measuring participation in load shape programs and unanimously agreed that the specific metrics should focus on the effectiveness of certain programs in affecting load shape (e.g., net effect on load shape for different program groupings/offerings). The concern was that participation by itself doesn't indicate how effective those programs are at achieving cost-effective alignment of generation and load.

PEAK LOAD REDUCTION

Possible metrics:

- kW peak reductions weather-normalized from a baseline (could also adjust for beneficial electrification)

Final status: Necessary and acceptable as-is

Notes: Participants broadly agreed that peak load reduction should be measured under this outcome, and that the possible metric listed looked acceptable. There was some discussion about the longevity of this metric, but ultimately participants agreed it's useful for now. There was also a discussion about whether this might be consolidated with other load shape metrics, but no specific actions were proposed.

RATE OPTIONS TO AFFECT LOAD SHAPE

Possible metrics:

- # of total rate options
- # of new rate options

Final status: Unnecessary

Notes: Stakeholders agreed that measuring the number of rate options available to affect load shape doesn't provide useful information for judging utility performance on cost-effectively aligning generation and load. It was noted that the goal is to get customers to adopt rates with the biggest desired impact, not just to adopt any rate.

REALTIME GENERATION AND LOAD SYNCHRONIZATION

Possible metrics:

- Carbon reduced
- Cost savings

Final status: Necessary but needs revision

Notes: This topic was proposed and added in the fifth and final round of stakeholder discussions. It was automatically placed in the “necessary but needs revision” bucket as there wasn’t immediate disagreement. It would be helpful to collect additional perspectives on the usefulness of this topic as it pertains to cost-effectively aligning generation and load. The idea was that measuring real-time generation and load synchronization would allow insight into how well programs are effectively managing load to match variable renewable energy generation in real time, leading to system optimization and cost savings.

REDUCTION IN LINE LOSSES

Possible metrics:

- Quantity losses reduced over time

Final status: Necessary but needs revision

Notes: Several participants questioned whether this is necessary to measure, but ultimately were comfortable keeping in the “necessary but needs revision” pile. Some stakeholders felt that line losses are important to measure, but don’t fit well with this particular outcome. Others felt that line losses aren’t worth measuring given other, more important metrics. One participant suggested that line losses can’t easily be measured.

Overall Feedback and Next Steps

Overall Stakeholder Feedback

The following overall themes arose during the stakeholder discussions that may be worth additional consideration as this process moves forward:

MEASURING OUTCOMES, NOT DEPLOYMENT

Many of the metrics that stakeholders discussed during the meeting were oriented towards measuring deployment or quantities of a specific technology or approach, such as the total number of distributed energy resource installations or the total megawatts of demand response capacity. In almost all of these cases, stakeholders took issue with measuring deployment or quantities and instead preferred that the desired outcome, benefit, or service was measured.

The general argument was that while many technologies and approaches can deliver desired benefits, it shouldn't be assumed that they will do so. Moreover, in many cases there are multiple technologies or approaches that can deliver the same benefits, so focusing on measuring the desired outcome allows flexibility in choosing how that outcome is best achieved. This notion of measuring outcomes as opposed to deployment fits well with the first metric design principle, which states that metrics should be "tied to the policy goal."

TECHNOLOGY NEUTRALITY AS A CONSIDERATION

There were several metrics that stakeholders felt were not adequately technology-agnostic, such that asking the utility to improve performance on the metric would equate to asking them to favor one technology over another, without regard to how that technology might provide benefits that would be measured under other outcomes.

For example, capacity factor, which measures average energy generated over a period of time as a percentage of nameplate capacity, makes sense for an electric system that's mostly powered by large power plants that run consistently and have significant operations and maintenance costs. However, capacity factor may not be suitable for a system that operates with large amounts of variable renewable power generation such as wind and solar, which may only generate electricity during certain times, resulting in a lower capacity factor, but don't require the same level of initial investment and operations and maintenance.

As noted above, there was a desire among some stakeholders that metrics should measure performance on the desired outcomes, not deployment of specific technologies that are assumed to benefit those outcomes. However, even outcome-oriented metrics can be designed to favor certain technologies. Therefore, technology neutrality (or perhaps inclusivity) may be important to consider in metric development.

UTILITY INFLUENCE AND CONTROL

Across several of the outcomes, there were discussions and ultimately many varying opinions about the extent of the utility's control over influencing certain metrics. These discussions were about interpreting the fourth design principle, which states that metrics should be "sufficiently objective and free from external influences," such that they are clearly within the utility's control. Differing perspectives about the extent of utility control and influence will likely continue to be a key point of discussion for some metrics. It may be helpful for parties to consider this as they draft their comments for the formal comment and reply periods.

CONSIDERATION OF POSSIBLE REGULATORY REFORMS

While the focus of Docket 17-401 is currently on establishing metrics, which can then be used to determine whether regulatory reforms are needed to achieve desired utility performance, some stakeholders were concerned that the metrics should be designed now with the possibility in mind that they may later have incentives tied to them that would seek to adjust the traditional cost of service model. The metric design principles, which were developed by Synapse and established by the commission, are intended to accomplish this, though it may still be worth keeping this in mind as the process moves forward.

LIMITING THE NUMBER OF METRICS

Throughout the March 20 meeting, there were multiple points where stakeholders asked whether there should be a limit to the number of metrics established in this process. A limit may be useful in helping to focus the conversation on the most important metrics, but it may also inadvertently eliminate metrics that don't seem like a priority today, but could provide information that would be useful to have collected several years down the road. This discussion wasn't resolved at the meeting and may be helpful to address during the comment and reply periods.

OVERLAP AMONG THE FIVE OUTCOMES

Stakeholders noted that some metrics have a clear overlap across multiple outcomes, which could be desirable for helping to consolidate and prioritize the most important metrics. While this meeting was structured to identify metrics that fit discretely under each outcome, it may be worth considering if there are metrics that usefully apply to multiple outcomes.

EXISTING VERSUS NEW METRICS

In order to enable a fair and comprehensive evaluation of which metrics are necessary to indicate performance on the commission-established outcomes, GPI did not label metrics as existing or new for the purpose of stakeholder discussion. However, the list of metrics considered did include a mix of both. Since the commission stated that one of its goals is to streamline and consolidate metric reporting, it will be important as this process moves forward to identify whether metrics are existing, and if so, whether they need to be modified to align to the five outcomes.

Next Steps

Overall, the structure of the five commission-established outcomes seemed to provide a useful foundation for discussing a comprehensive set of electric utility performance metrics for Xcel Energy. While Meeting 1 included a presentation on the metric design principles, facilitators did not ask participants to strictly adhere to the design principles during discussions. Therefore, the formal comment and reply periods in Docket 17-401 following this meeting will be important to further evaluate metrics that are necessary under each outcome and that comply with the design principles established by the commission.

Importantly, not all of the metric design principles need to be completely resolved at this stage of the process. The overall process for evaluating metrics has intentionally been split into two phases—the first aims to identify an *initial* list of metrics that are suitable to the five outcomes; the second aims to develop concrete procedures for calculating, verifying, and reporting those metrics. Some of the design principles are most applicable to the first phase, while others are more applicable to the second phase. For design principles that pertain to calculation, verification, and reporting, the key question at this stage in the process is whether a given metric *could possibly* be designed to comply with those principles. The second phase of the process will then seek to refine metrics accordingly.

In order to facilitate ongoing stakeholder dialogue, GPI will convene stakeholders after the conclusion of the initial comment period, but before the due date for reply comments, with the intention of allowing parties to clarify their initial comments in-person and to identify key areas of agreement and disagreement in advance of an anticipated commission hearing to consider an initial list of performance metrics for Xcel Energy's electric utility operations.