MINNESOTA
PUBLIC UTILITIES COMMISSION

Staff Briefing Papers

Meeting Date	May 29, 2020		Agenda Item 1**(1)
Company	Xcel Energy **E002/M-19-666**		
Docket No.	**In the Matter of Xcel Energy's Integrated Distribution Plan and Advanced Grid Intelligence and Security Certification Request**		
Issues	1. Should the Commission accept or reject Xcel Energy's 2019 Integrated Distribution Plan (IDP)? 2. Should the Commission modify Xcel Energy's IDP filing requirements; including moving from annual to biennial IDP filings?		
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Relevant Documents	**Date**
Xcel Energy, Initial Filing – 2019 IDP Report; Att. A1-C (Public)	Nov. 1, 2020
Xcel Energy, Att. D1 – M2 (Public)	Nov. 1, 2020
Xcel Energy, Att. M3- O4 (Public)	Nov. 1, 2020

Initial Comments	
Department of Commerce–Div. of Energy Resources	Mar. 17, 2020
Environmental Law & Policy Center and Vote Solar	Mar. 17, 2020
Clean Energy Economy Minnesota	Mar. 17, 2020
Innovative Power Systems Solar	Mar. 17, 2020
City of Minneapolis	Mar. 17, 2020
Interstate Renewable Energy Council	Mar. 17, 2020
Fresh Energy	Mar. 17, 2020
Fresh Energy, Xcel IR Responses 1-45 (in 3 Public filings)	Mar. 17, 2020
Fresh Energy, Xcel IR Responses 46-50 (Public)	Mar.18, 2020

Reply Comments

Xcel Energy	Apr. 10, 2020
Department of Commerce-Div. of Energy Resources	Apr. 10, 2020
Environmental Law & Policy Center and Vote Solar	Apr. 10, 2020
Institute for Local Self Reliance	Apr. 10, 2020

Supplemental Comments

Department of Commerce-Div. of Energy Resources	Apr. 22, 2020
Environmental Law & Policy Center and Vote Solar	Apr. 22, 2020
Innovative Power Systems Solar	Apr. 22, 2020
Fresh Energy	Apr. 22, 2020
Xcel Energy	Apr. 22, 2020
City of Minneapolis	Apr. 22, 2020

Table of Contents

I. Statement of the Issues

1. Should the Commission accept or reject Xcel Energy's 2019 Integrated Distribution Plan (IDP)?
2. Should the Commission modify Xcel Energy's IDP filing requirements; including moving from annual to biennial IDP filings?

II. Background

On November 1, 2019, Xcel Energy filed the Company's 2019 Integrated Distribution Plan (2019 IDP)[1] in response to the amended IDP filing requirements in the Commission's July 16, 2019 Order in Docket No. E002/M-18-251. The purpose of the Commission's IDP filing requirements is to facilitate a utility's IDP filing that will meet the following planning objectives[2]:

- Maintain and enhance the safety, security, reliability, and resilience of the electricity grid, at fair and reasonable costs, consistent with the state's energy policies;
- Enable greater customer engagement, empowerment, and options for energy services;
- Move toward the creation of efficient, cost-effective, accessible grid platforms for new products, new services, and opportunities for adoption of new distributed technologies;
- Ensure optimized utilization of electricity grid assets and resources to minimize total system costs; and
- Provide the Commission with the information necessary to understand the utility's short-term and long-term distribution-system plans, the costs and benefits of specific investments, and a comprehensive analysis of ratepayer cost and value.

On March 17, 2020, the Department of Commerce-Division of Energy Resources (Department), Environmental Law & Policy Center and Vote Solar (ELPC/VS), Clean Energy Economy Minnesota (CEEM), Innovative Power Systems Solar (IPS Solar), City of Minneapolis (Minneapolis), and Interstate Renewable Energy Council, LLC (IREC) submitted initial comments addressing elements of the IDP beyond solely the AGIS certification request.

On April 10, 2020, the Department, ELPC/VS, Xcel Energy submitted reply addressing elements of the IDP beyond the AGIS certification request. Institute for Local Self-Reliance (ILSR) also submitted such a reply.

[1] The IDP filing included a certification request of the Company's Advanced Grid Intelligence and Security (AGIS) Initiative discussed in a separate set of briefing papers. Similarly, some party comments addressed both the IDP report and AGIS certification request, but for readability staff separate the topics into separate briefing papers. If party comments only addressed the AGIS certification request, they are not cited as relevant documents in these briefing papers.

[2] MN PUC, ORDER ADOPTING INTEGRATED DISTRIBUTION PLAN FILING REQUIREMENTS (February 20, 2019), Docket No. E015/CI-18-254, p. 2

On April 22, 2020, the Department, ELPC/VS, IPS Solar, Fresh Energy, Minneapolis and Xcel Energy submitted supplemental reply addressing elements of the IDP beyond the AGIS certification request.

III. Staff Overview of the Issues

Xcel Energy makes four requests with the 2019 IDP Report filing:

1. Accept the 2019 IDP (**Decision Option 1**).
2. Allow the Company to file IDP Reports biennially instead of annually. (**Decision Option 2**).
3. Certify the Advanced Grid Intelligence and Security Initiative and Advanced Planning Tool.
4. Set January 25th as the annual deadline for the ADMS compliance report required to be cross-filed in both the Transmission Cost Recovery Rider and IDP dockets.

These briefing papers cover the first two requests. The companion briefing papers on the Certification Request addresses the third request; including the related party comments and recommendations. The fourth request was addressed by the Commission's May 19, 2020 Notice.

Section IV is a Staff summary of Xcel Energy's 2019 IDP highlighting topics where parties' comments focus. **Section V** summarizes parties' comments and recommendations; including the Company's responses. **Section VI** offers Staff analysis and recommendations. **Section VII** captures the decision options before the Commission.

No party objects to the Commission accepting Xcel Energy's 2019 IDP or allowing for biennial IDP filings going forward; however, parties offer a number of recommendations for future IDPs and/or other proceedings and filings summarized in **Section V** and the decision options in **Section VII**.

Regarding acceptance of an IDP, the Commission's filing requirements[3] state:

> Commission review of annual distribution system plans are not meant to preclude flexibility for Xcel to respond to dynamic changes and on-going necessary system improvements to the distribution system; nor is it a prudency determination of any proposed system modifications or investments.
>
> …
>
> The Commission will either accept or reject a distribution system plan by June 1 (to the extent practicable) of the following year based upon the plan content and conformance with the filing requirements and Planning Objectives listed above. The plan will be

[3] See **Attachment A** to these briefing papers for staff updated Xcel Energy's IDP Filing Requirements capturing the changes approved by the Commission's July 16, 2019 Order in Docket No. E002/M-18-251. ELPC/VS requested this update at Initial, p. 2.

reviewed and may be combined with the Biennial Distribution System Plan required by Minn. Stat. 216B.2425 and associated certification requests…

IV. Staff Summary of Xcel Energy's 2019 IDP

A. Baseline Data (System, Financial and Distributed Energy Resources)

System Overview

Xcel Energy serves about 1.3 million customers in Minnesota with 1,177 feeders - a network of over 26,000 miles of distribution lines.[4] Residential is 88% of customers and 12% of electricity sales; whereas, commercial and industrial is 12% of customers and 71% of electricity sales.[5] Approximately 1,300 employees serve the Company's Minnesota distribution system. Xcel Energy outlines their Strategic Priorities in Figure 1.[6]

Figure 1: Xcel Energy Strategic Priorities – Applied to Distribution

Financial

Xcel Energy provides 5-year historical and proposed Capital and Operating & Maintenance (O&M) expenditures.[7] From 2014-2018, Xcel Energy spent $950.2 million on Distribution capital in Minnesota. For 2019-2024, the Company proposes more than doubling that capital spending in Minnesota to over $2.28 billion. From 2014-2018, Xcel Energy spent $639.3 million on Distribution O&M for the NSPM operating company (not only Minnesota). For 2019-2024, the Company proposes an approximately 9% increase to $705.7 million. **Section IV.B** discuss the Company's proposed distribution budgets (2019-2024) in more detail. Staff Analysis in **Section**

[4] Xcel Energy, IDP, Initial Filing, p. 37: 58% (15,000 mi) is overhead; 42% (11,000 mi) is underground.
[5] *Id.,* p. 37 reporting for NSPM operating company footprint (Dakotas, MN, WI, MI)
[6] *Id.*, p. 2
[7] *Id.,* pp. 16 (Capital), 20-21 (O&M)

VII compare the Company's distribution budgets over time and as filed between the 2018 and 2019 IDPs.

Distributed Energy Resources

Xcel Energy provides an inventory of distribution-connected DER as of July 2019 summarized below in Table 1.[8]

Table 1: Xcel Distribution Connected DERs (July 2019)

	Completed Projects		**Queued Projects**	
	MW	# of Project	MW	# of Project
Rooftop Solar	67_{dc}	4,391	61_{dc}	1,101
RDF Projects	19_{dc}	25	1_{dc}	2
Wind	16_{dc}	61	$<1_{dc}$	8
Storage/Batteries	N/A	35	N/A	20
Community Solar	585_{ac}	208	313_{ac}	286
Grid Scale (Aurora)	100_{ac}	16	0	0
Energy Efficiency	1,120	N/A	N/A	N/A
Demand Response	824	413,783	N/A	N/A
Electric Vehicles	N/A	7,081-8,500	N/A	N/A

Xcel Energy notes the 824 MW of demand response equates to about 12% of the Company's Minnesota system peak (6,800 MW.)[9] The Company does not provide the distribution system location of current energy efficiency and demand response– either because they are not tracked or because the business systems are separate.[10] Further, the Company is not able to forecast DER in terms of expected geography because the tools and services for such forecasting are very limited at this time. Xcel Energy describes the priority put on enhancing forecasting capability – noting DER is now included in bulk system forecasts and the Company requests certification of an Advanced Planning Tool to allow more granular inputs and feeder-level load forecasts.[11]

[8] *Id.*, Tables 49 and 50, p. 187. Staff note: With the 2019 Annual DER Reports (filed March 2020 in Docket No. E999/PR-19-10), the Company now reports all DER in AC (alternating current). This inventory includes both AC and DC (direct current.)

[9] Staff Note: This appears to be a Minnesota-only look at demand response and system peak. In the Company's Upper Midwest Integrated Resource Plan: 2020-2034 (July 1, 2019) at Ch. 3, p. 58, Table 3-2, existing Load Management in the reference case for 2020 is 924 MW and peak load varies between about 9,100 MW for NSPM.

[10] *Id.*, pp. 189-190

[11] *Id.*, p. 193. Staff Note: The Advanced Planning Tool certification request is included in the Certification Request briefing papers.

Staff does not summarize the other electric vehicle and charging station detail in the IDP[12] and refers readers to the Transportation Electrification Plan filings due in June 2020 for updated information.[13]

B. Long-Term Distribution System Modernization and Infrastructure Investment Plans

The Company describes the planning process that informs its IDP and investment plans.[14] Table 2 provides an overview of the Company's 5-year Capital Expenditures for Minnesota using the IDP categories.[15]

Table 2: Distribution Capital Expenditures Budget – State of Minnesota Electric (Millions)

	Bridge Year	Budget					Budget Ave
IDP Category	2019	2020	2021	2022	2023	2024	2020-2024
Age-Related Replacement & Asset Renewal	$72.50	$87.20	$79.50	$78.30	$79.70	$81.00	$81.10
New Customer Projects and New Revenue	$34.80	$35.60	$39.30	$39.30	$39.40	$39.40	$38.60
System Expansion or Upgrades for Capacity	$19.50	$44.40	$40.10	$32.30	$32.90	$37.90	$37.50
Projects related to Local (or other) Gov't-Req.	$31.30	$28.90	$29.40	$28.50	$29.00	$29.20	$29.00
System Expansion or Upgrades for Reliability and Power Quality	$19.80	$21.50	$114.70	$117.40	$117.30	$117.30	$97.60
Other	$26.70	$38.30	$39.70	$43.20	$35.40	$35.10	$38.30
Metering	$6.70	$5.50	$4.30	$3.50	$2.30	$2.30	$3.60
Grid Mod. & Pilot Projects	$4.60	$19.90	$49.30	$141.70	$152.40	$76.70	$88.00
Non-Investment	$(4.90)	$(3.70)	$(3.70)	$(3.80)	$(3.80)	$(3.80)	($3.80)
TOTAL	$210.90	$277.50	$392.60	$480.30	$484.60	$415.20	$410.00

Notes: Excludes Grid Modernization –Other includes Fleet, Tools, Communication Equipment, Locating, Transformer Purchases and the Advanced Planning Tool; Reliability includes placeholder investments for a new reliability program (Incremental System Investment); and Non-investment includes Contributions In Aid of Construction (CIAC), which partially offset total project costs and 3rd party reimbursements for system upgrades due to interconnections and Solar, which is 100% reimbursable by the developers, annual totals will vary based on payment and project timing.

Xcel Energy explains O&M cannot be manually distributed in the IDP categories like capital expenditures, and notes on average capital projects have 2-7% of associated Distribution

[12] *Id*., pp. 190-191
[13] MN PUC Docket No. E99/M-17-879
[14] Xcel Energy, IDP, Initial Filing, pp. 27-37. Att. E (Public and Trade Secret) is the Risk Scoring Methodology. Att. F1 (Public) is the NSPM Distribution Capital Projects List. Att. F2 (Public and Trade Secret) is the NSPM Risk Scored Project Details.
[15] *Id*., p. 17, Table 7

O&M.[16] Table 3 provides the Company's 5 year O&M Budget for NSPM operating company (not only Minnesota).[17]

Table 3: Distribution O&M Expenditures Budget – NSPM Electric Jurisdiction

	Bridge	**Budget**					**Budget Avg.**
Expenditure Category	2019	2020	2021	2022	2023	2024	2020-2024
Labor	$53.80	$58.30	$59.80	$60.50	$61.60	$63.60	$60.80
Cont. Outside Vendor/Contract Labor	$17.10	$8.90	$12.90	$9.70	$8.70	$8.60	$9.80
Damage Prevention Locates	$8.30	$8.50	$8.60	$8.60	$8.60	$8.60	$8.60
Vegetation Management	$29.00	$28.20	$28.90	$28.40	$30.20	$30.10	$29.20
Materials	$5.90	$6.90	$6.80	$6.80	$6.80	$6.80	$6.80
Transportation Costs	$7.40	$6.90	$6.80	$6.80	$6.80	$6.80	$6.80
AGIS	$0.60	$2.80	$4.50	$6.80	$8.80	$6.50	$5.90
Misc. Other	$(0.20)	$(3.90)	$(3.60)	$(3.60)	$(3.40)	$(3.50)	$(3.60)
TOTAL	$121.90	$116.60	$124.70	$124.00	$128.10	$127.50	$124.20

Capital and O&M expenditures associated with the advanced grid initiative are presented separately as a holistic initiative; Misc Other includes bad debt, First Set Credits, use costs, office supplies, janitorial, dues, donations, permits, etc.

Incremental System Investment

Under System Expansion or Upgrades for Reliability and Power Quality, Xcel Energy outlines an Incremental System Investment (ISI) Initiative with four main programs: substation, underground, overhead tap, and overhead mainline.[18] Xcel Energy describes the ISI as:[19]

> Shift[ing] funding closer to those portions of the system that directly connect to customers with the goal of enhancing the safety, reliability, and resiliency of the system while also enabling customer choice and the adoption of DER, such as EVs. This initiative will both expand two of Xcel Energy's existing programs, one that replaces underground cables that are at risk of failure and another that identifies and replaces substation transformers that are nearing the end of their useful life… [and]… creates new programs that focus directly on our customers' reliability and DER adoption needs by expanding investments on portions of our system closer to the customer. Typically, these elements are the taps (radial extensions from our feeders) and secondary voltage systems.

[16] *Id*., p. 19
[17] *Id*., p. 22, Table 9
[18] *Id*. pp. 107-124. Staff note: Xcel described a similar Incremental Customer Investment Initiative in the 2018 IDP at pp. 92-95 and budgeted annual capital expenditures between 2021-2023 of $85 million, $88 million and $40 million respectively. (source: 2018 IDP, Att. B, p. 5)
[19] *Id*. pp. 107-108

The Company summarizes the annual capital expenditures for ISI for the 2019 IDP's projected 5-year planned capital investments, replicated in Table 4.[20]

Table 4: ISI Capital Expenditures

Distribution State of MN Electric (Millions) **ISI Programs**		**2020**	**2021**	**2022**	**2023**	**2024**
Overhead Tap Programs	Targeted Undergrounding		$18.2	$27.0	$27.0	$27.0
	Low Cost Reclosers		$2.7	$2.4	$2.4	$2.4
	Pole Top Reinforcements		$2.7	$2.4	$2.4	$2.4
	Transformer and Secondary Replacements		$2.5	$2.4	$2.4	$2.4
	High Customer Count Taps		$3.0	$3.0	$3.0	$3.0
	Community Resiliency		$2.0	$3.0	$3.0	$3.0
Underground Programs	Mainline Cable Replacement		$7.0	$7.8	$7.8	$7.8
	Underground Residential Distribution (URD) Cable Replacement		$5.0	$2.5	$2.5	$2.5
	Cable Assessment		$7.0	$6.0	$6.0	$6.0
	Network Monitoring		$2.0	$2.3	$2.3	$2.3
	St. Paul Tunnel Rehabilitation		$5.0	$5.0	$5.0	$5.0
	Feeder Exit Capacity		$3.8	$3.0	$3.0	$3.0
	Purchases / Tooling		$4.5	$0.2	$0.2	$0.2
Substation Programs	Substation Asset Renewal		$5.0	$5.0	$5.0	$5.0
	Transformer Replacement		$7.0	$13.0	$13.0	$13.0
Overhead Mainline Programs	Lightning Protection Replacement		$1.0	$1.0	$1.0	$1.0
	Pole Fire Mitigation		$2.5	$2.0	$2.0	$2.0
TOTAL		**0.0**	**$81.0**	**$88.0**	**$88.0**	**$88.0**

In addition, Xcel Energy's ISI O&M accounts for $1.5 million of the annual Distribution O&M budget for 2021-2024 primarily in "Contract Outside Vendor."[21]

Grid Modernization and Pilot Projects

New in the 2019 IDP is a Grid Modernization and Pilot Programs category in the 5-year budget with an average annual capital expenditure of $88 million. Xcel Energy notes over $25 million of this category relates to approved or pending electric vehicle pilot programs.[22] This category also captures the Distribution-only AGIS capital expenditures both already certified and

[20] *Id.,* p. 108, Table 25
[21] *Id*., pp. 108-109. Staff Note: The 2019 IDP (Att. G2) also notes the average budgeted "Contract Outside Vendor" annual O&M expense related to AGIS is $5.9 million.
[22] *Id*, p. 17. Staff Note: Electric Vehicle Programs account for over $54 million total in this category between 2020-2024, and about $27-28 million between 2020-2022 based on Att. F1, p. 4 and Att. M2, p. 194

proposed for certification in this docket; whereas, the AGIS Certification Request encompasses capital expenditures for both Distribution and Business Systems not previously certified.[23]

C. Hosting Capacity and DER Interconnection

Xcel Energy summarizes how the Company's hosting capacity analysis has evolved and fits with the interconnection process today and over time; including highlighting how the annual HCA studies "serve three purposes: 1) provide an indication of distribution feeder capacity for DER; 2) streamline interconnection studies; and 3) inform annual long-term distribution planning."[24]

With the implementation of the Minnesota Distributed Energy Resource Interconnection Process (MN DIP) in June 2019, Xcel Energy began to track distribution system upgrade costs paid for by all DER customers, and will report this in future years. For Community Solar Gardens in 2018, the Company reports the amount was $44.5 million dollars.[25] The Company also reports on fees collected for DER application review, engineering studies, program participation; as well as, metering charges and deposits.[26]

Xcel Energy describes a stepped approach to updating interconnection technical requirements with IEEE 1547-2018 beginning with managing inverters to a fixed power factor. The Company highlights an EPRI study conclusion that fixed power factor control resolves almost all voltage violations and that "modest control of reactive power can significantly reduce voltage rise from the generator." Xcel Energy notes the Company's modeling and simulation capabilities must evolve to incorporate more advanced functions.[27]

D. DER Scenario Analysis

Xcel Energy cautions DER penetration analysis and forecasting at a granular feeder level is much more complex and likely less accurate than doing so at a system level. The Company notes EPRI has identified shortcomings with existing models that use policy outcomes, macro-economic factors, or rooftop potential to predict DER adoption. Further, the Company flags a lack of good historical, predictable data inherent in the emerging DER markets in Minnesota; exacerbating predictability at smaller geographic levels. With those caveats, Xcel Energy provides 10-year reference, medium, and high scenario DER forecasts for distributed solar PV, storage energy efficiency, demand response and electric vehicles.[28]

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[23] 2019 IDP, Att. F1, p. 4. Staff Note: Using 2022, Staff was unable to reconcile about $19 million from the Grid Modernization and Pilot Projects capital budget overview with the line items for the Capital Budgeting Groups: Electric Vehicle Program, AGIS, and Solar in the 2019 IDP Att. M2, pp. 190 – 195, Exhibit KAB-1, Schedule 2, pp. 1-6.
[24] Xcel Energy 2019 IDP, Att. A, pp. 226 – 229 citing Integrated Distribution Planning Report Prepared for the Minnesota Public Utilities Commission, ICF International (August 2016). Staff Note: Docket No. E002/M-19-685 is the pending docket on Xcel Energy's 2019 HCA Report.
[25] *Id*., p. 230
[26] *Id.*, pp. 230-231
[27] *Id*., pp. 236-239
[28] *Id*., pp. 192-208. Staff Note: The scenario analysis for demand response and energy efficiency use the Upper Midwest (NSPM) forecast in the Company's current IRP; whereas, the other DER reference cases are for

Table 5: DER Scenarios

	Reference	Medium	High
Solar PV	1,102 MW*ac*	1,261 MW*ac*	1,481 MW*ac*
Storage	< 3 MW	< 6 MW	< 12 MW
Energy Efficiency *(% of energy sales*)	1.5%	2.8%	3.8%
Demand Response	~950 MW	~1,400 MW	~ 1,600 MW
Electric Vehicles (*cumulative #, annual GWh sales*)	~25,000 90 GWh	~110,000 500 GWh	~475,000 2,150 GWh

For the reference case, the Company forecasts 340 MW*ac* of additional solar PV between 2020 and 2029, with nearly half of the addition occurring by 2022.[29] For energy storage, the Company forecasts number of projects (rather than MW or MWh) by extrapolating from a quarterly report by Wood Mackenzie for "High" and a growth rate of 21.9% from Navigant Research's Global DER Overview for "Mid". Based on the storage DER scenarios and assuming an estimated average MW, the Company does not expect distributed energy storage to exceed 12 MW by 2029.[30] For both energy efficiency and demand response, the Company notes the reference case is what is included in the current Xcel Energy Integrated Resource Plan.[31] Xcel's EV forecast uses a high, medium, and low, with the medium forecast of 110,000 electric vehicles on the road by 2029 functioning as the reference case. Xcel is working to improve its EV forecast in its next Transportation Electrification Plan.[32]

Xcel Energy describes a "takes a village" approach to DER integration at higher penetrations; specifically, identifying improvements to interconnection review, hosting capacity analysis, and planning tools. Further, Xcel Energy sees greater monitoring and control as increasingly essential in the future, and describes how with the procured Advanced Distribution Management System (ADMS), continued deployment of SCADA to more substations, and a future Distributed Energy Resource Management System (DERMS). Lastly, the Company describes how the AGIS investments (IVVO, AMI, and FAN) will assist with DER integration.[33]

E. Non-Wires (Non-Traditional) Alternatives Analysis

Att. H includes the results NWA Analysis for the 2019 IDP.[34] Xcel Energy describes a manually intensive effort to pull peak load curves for feeders and substation transformers from historical monitoring data and advance that to the forecasted year of interest (2022 peak load curve in the 2019 NWA.) After blending for contingency situations as appropriate, the Company tailors and adds in demand response and existing generation curves to determine final energy and

Minnesota.

[29] *Id*., Table 51, p. 196

[30] *Id*., pp. 199-200

[31] Xcel Energy, 2019-2034 IRP, Docket No E002/RP-19-368, Initial Filing, Table 3-2, p. 58

[32] Xcel Energy, IDP, Initial Filing, pp. 205-206

[33] *Id.*, pp. 210-211

[34] Xcel Energy, 2019 IDP, Att. D1-M2, Att. H, pp. 1-37

demand values.[35] New this year, Xcel Energy applied focused demand response for N-0 risks (normal operations) to reduce load before evaluating solar and storage to make up the rest of the deficiency. Xcel Energy also reduced the storage cost assumption from $600,000/MWh to $400,000/MWh between the 2018 and 2019 IDPs.

Xcel Energy's screening criteria (project type, cost, and timing) identified nine projects for further evaluation.[36] Xcel Energy provided forecasted hourly load curves (including with N-1 contingency when applicable) compared to modeled hourly load curves with the NWA solution reviewed for each of the projects. None of the NWA cost less than a traditional project on an installed cost basis.[37]

Xcel Energy is working with EPRI and others in the industry to improve NWA analysis. The Company currently finds comparing NWA to traditional projects difficult because the NWA may not fully solve allow of the risks (especially, in contingency situations) and the NWA does not build in spare capacity like traditional solutions.

F. Stakeholder Engagement

Xcel Energy summarizes four stakeholder workshops on the 2019 IDP, and offers highlights of the stakeholder input received.[38] The Company's first and last stakeholder workshops were broadly open and focused on feedback on the 2018 IDP and a preview of the 2019 IDP filing and discussion about how distribution planning is evolving respectively. The middle stakeholder workshops focused on the NWA analysis and cost benefit frameworks, and were invite-only for those who submitted comments in the 2018 IDP proceeding.

V. Parties' Comments

A. Baseline Data (System, Financial and Distributed Energy Resources)

Parties primarily addressed two issues related to the baseline data in the 2019 IDP: 1) locational reliability and equity and 2) inclusion of community energy and climate plans.

<u>Locational Reliability and Equity</u>

ELPC/VS recommend the Commission adopt a new IDP filing requirement for Xcel Energy to provide maps illustrating the reliability of the Company's distribution system at a feeder-level, and explain how reliability investments will improve equity and prioritize poor-performing portions of the distribution system (**Decision Option 3**). ELPC/VS suggest inclusion in the IDP strengthens the link between the Company's service quality report dockets (which *report* on reliability performance) and the Company's IDP (which explains plans to *improve* reliability

[35] Xcel Energy, 2019 IDP, p. 98
[36] Staff Note: In response to Minneapolis, the Company clarified that a 10th project "Louise LOU TR2 & Feeders" ($3.5 million) was not included because it is located in South Dakota. See Xcel Reply, Att. A at p. 34.
[37] Xcel Energy, Att. H, Table 2, p. 2
[38] *Id*., pp. 260-264.

performance.) ELPC/VS proffers the IDP – not the service quality report docket– is the appropriate forum for the Company to explain how planned investments will not only improve system-wide reliability but also address specific poor-performing areas.[39] The Department supports ELPC/VS in concept, but not a change to the IDP filing requirements now; rather, expects locational reliability and equity included in the Company's annual service quality reports and ISI in the scope of the contested case.[40]

ELPC/VS agree with the Department that a rate case is the appropriate venue for the traditional prudence review of costs. ELPC/VS suggest the IDP provides a valuable opportunity for stakeholders to provide input on the Company's strategy for addressing reliability. Lastly, ELPC/VS note equity consideration is important at every stage of the investment planning process and should be integrated into the IDP, even if equity impacts are measured and evaluated in the context of the service quality report dockets too.[41]

Community Energy and Climate Plans

The City of Minneapolis again raises concern with Xcel Energy's description of continued low penetration of DERs, and highlights four urban and suburban communities that have local solar energy generation and equity goals. Minneapolis suggests Xcel Energy is a critical partner for these communities, and could more cost-effectively support the community goals if included in the IDP planning process. The City of Minneapolis recommends requiring Xcel Energy to consider the energy and climate goals of the Minnesota communities the Company serves, along with customer preference trends, when addressing existing or enhanced forecasting of DER deployment in future IDPs.[42] (**Decision Option 4**)

The Department seems to disagree, but also is not clear what specific change in Xcel's planning process Minneapolis suggests. The Department suggests including individual community energy and climate plans in the IDP would burden all of Xcel's ratepayers with incremental costs incurred in support of the goals of a single ratepayer, or subset of ratepayers, without a showing of benefits to all of Xcel's ratepayers. Further, the Department highlights interconnection costs are borne by the DER customers, and forecasting tools that enable geographic-specific forecasting are very limited at this time.[43] In Supplemental, Minneapolis highlights Xcel Energy is responsible for managing billions of dollars of critical infrastructure with an expected life measured in decades, and clarifies the City's goal is deploy infrastructure investments in an efficient matter consistent with public policy goals to save money for all customers.[44]

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[39] ELPC/VS Supplemental, pp. 1-2
[40] Department Reply, pp. 7-8. Department Supplemental, pp. 7-8 Staff Note: this decision option is included in the Certification Request Briefing Papers.
[41] ELPC/VS Supplemental, p. 2
[42] Minneapolis Initial, pp. 7-8. Specifically, Minneapolis mentions IDP filing requirement 3.A.32 and Order Point 7 from the Commission's July 2019 Order on Xcel Energy's 2018 IDP in Docket No. E002/CI-18-251, p.
[43] Department Reply, pp. 11-12
[44] Minneapolis Supplemental, pp. 2-3 and cites Vibrant Clean Energy, LLC, "Minnesota's Smarter Gird: Pathways

Xcel Energy responds that the Company works with 450 communities in Minnesota with different goals, and sees no need to change the IDP requirements. The Company highlights the Minneapolis Clean Energy Partnership, Partners in Energy, Certified Renewable Percentage, Solar Rewards, Community Solar Gardens and the Community Relations and Account Managers who work with community leaders on a variety of distribution-related issues. The Company says planning already factors in these public policies and goals.[45] Minneapolis appreciates the Company's response and looks forward to continued collaboration.[46]

B. Long-Term Distribution System Modernization and Infrastructure Investment Plans

City of Minneapolis appreciates the 2019 IDP outlining Xcel Energy's proposed distribution system budget, which exceeds $2.5 billion in capital expenditures over the next 5 years. Minneapolis suggests the 5-year Action Plan should include a detailed discussion of the underlying assumptions, including load growth, and more granularity into the costs of investments planned.[47]

Incremental System Investment (ISI) Initiative

In addition to the AGIS certification request, party comments on the Company's investment plan focus on the Incremental System Investment (ISI).[48] Fresh Energy highlights Xcel Energy proposes to spend $81-88 million of capital per year beginning in 2021 on various equipment replacement and upgrades – representing a 400% increase in spending for the System Expansion or Upgrades for Reliability and Power Quality category compared to 2019 levels.

ELPC/VS offer another summary of the ISI as $345 million in capital spending between 2021 and 2024 (roughly 40% of the overall planned Asset Health and Reliability capital spending.) ELPC/VS recognize the Company's focus for ISI on portions of the distribution system that "directly connect to customers" with sub-programs targeted to proactively address portions of the distribution system with poor reliability performance. To this end, ELPC/VS see potential merit and an opportunity to advance equity by targeting investments to particularly vulnerable customers. Xcel acknowledges the Company does not currently offer details on where these investments will occur. ELPC/VS recommend Xcel provide in future IDP filings maps illustrating feeder-level reliability of the Company's distribution system, and explain how ISI or other targeted reliability spending will prioritize areas with poor reliability performance and advance equity across the service territory.[49] (**Decision Option 3**)

Toward a Clean, Reliable and Affordable Transportation and Energy System", MNPUC Special Planning Meeting (Oct. 30, 2018), Slides 20 and 38

[45] Xcel Energy Reply, Att. A, pp. 11-12

[46] Minneapolis Supplemental, p. 2

[47] Minneapolis Initial, pp. 6-7.

[48] Staff Note: The 2018 IDP referred to the ISI as the Incremental Customer Investment Initiative, Staff Briefing Papers (May 30, 2019) at pp. 25-27 in Docket No. E002/M-18-251 summarize.

[49] ELPC/VS Initial, pp. 13-15

Fresh Energy also points out the Company provides no evidence to support this incremental spending. If the Commission wants to proceed with the ISI, Fresh Energy recommends requiring Xcel Energy to develop a formal ISI plan based on demonstrated needs and a clear articulation of expected reliability improvements to be filed with any future requests for cost recover, certification request or the next IDP whichever comes first (**Decision Option 4**).[50] Xcel Energy clarifies the Company is not seeking action on the ISI in the IDP, but offers to prepare and initiate the ISI if the Commission agrees and wants to separately pursue or otherwise take up the matter.[51] Fresh Energy remains concerned by the lack of detail or demonstration of need, and does not support separate consideration of the ISI Initiative at this time.[52]

The Department concludes increased transparency and analysis is necessary for the $2.5 billion in investments associated with the ISI Initiative and increased distribution system spending beyond the AGIS certification request. The Department requests this topic be included in a Contested Case referral.[53]

C. Hosting Capacity and DER Interconnection

Hosting Capacity

IREC agrees with Xcel Energy that hosting capacity analysis (HCA) is a "key element in the future of distribution system planning" and "will have the potential to further enable [DER] integration by guiding future installations and identifying areas of constraint."[54] To this end, IREC asks the Commission to adopt a goal of replacing the MN DIP Initial Review screens with more precise HCA results, and establish a pathway toward using the HCA in the interconnection process.[55] IREC further explains this requires Xcel Energy's HCA to be updated frequently, thoroughly vetted, and validated (**Decision Option 6**).[56] ILSR and Minneapolis agree.[57] IREC suggests this will reduce customers' cost of DER interconnection and reduce the workload of utility engineers performing interconnection review. The Department suggests either the Company's annual Hosting Capacity Analysis Report docket or the statewide interconnection docket is more appropriate to address this suggestion.[58] IREC suggests the IDP is the right docket because "one purpose of IDP is to set the trajectory for long-term distribution system investments."[59]

[50] Fresh Energy Initial, pp. 3-4
[51] Xcel Reply, Att. A, p. 13
[52] Fresh Energy Supplemental, p. 1
[53] Department Reply, p. 22. This recommendation is included as a decision option in the AGIS briefing papers.
[54] IREC Initial, p. 2 citing Xcel 2019 IDP at p. 226.
[55] IREC Initial, p. 3
[56] IREC Initial, pp. 3-4. Staff Note: Xcel Energy's annual HCA Report is under consideration in Docket No. E002/M-19-685.
[57] ILSR Reply, p. 2; Minneapolis Supplemental, p. 5
[58] Department Reply, p. 13 referring to Docket No. E002/M-19-685 and E999/CI-16-521 respectively.
[59] IREC Initial, pp. 3-4

D. DER Scenario Analysis

Similar to the discussion of locational reliability and equity, CEEM suggests hosting capacity analysis and DER forecasts (scenarios) should identify potential deployment scenarios that deliver benefit to disadvantaged, vulnerable and low-income communities.[60]

Advanced Inverters and DER Interconnection

ELPC/VS asks for more information on how the Company plans to engage the interoperability capabilities of IEEE 1547-2018 certified advanced inverters. ELPC/VS question whether external control and monitoring with systems like a Distributed Energy Resource Management System (DERMS) is necessary or cost-effective until far higher levels of DER penetration than the Company currently projects for 2025. ELPC/VS recommends modifying the IDP filing requirement on DER Scenarios to require Xcel to explain when and why the Company expects to need remote control over DERs (**Decision Option 7**). Xcel Energy agrees changing the settings of advanced inverters in a more dynamic fashion via sophisticated communication may not be necessary or cost-effective, and suggest the Distributed Generation Workgroup's Technical Subgroup is the place for this discussion. For additional context, Xcel Energy discusses future options for autonomous and seasonal settings, including Volt-Var considerations.[61] The Company is happy to provide an overview of inverter development and role in DER integration, but does not see a change to the IDP filing requirements as necessary.[62]

E. Non-Wires (Non-Traditional) Alternatives Analysis

NWA Screening Criteria: Cost, Project Type, and Timing

Minneapolis and IPS Solar suggest reducing the NWA Analysis threshold from $2 million to $1 million to qualify more projects for review (**Decision Option 8**). Minneapolis identifies four projects within the 2022-2024 timeframe exceeding $1 million that the City argues demonstrates a range of costs may be more appropriate to identify NWA candidate projects.[63]

Additionally, Minneapolis suggest Xcel Energy include Asset Health project, not only Capacity projects, as candidates for NWA Analysis. Minneapolis says omission of "Asset Health" projects could result in the exclusion of viable investments and disadvantage cities with older infrastructure, such as urban areas, unintentionally creating inequities in NWA opportunities. Minneapolis highlights New York, California and Vermont include analysis of such projects.

Finally, Minneapolis argues Xcel Energy's proposed 3-year lead time criteria could miss opportunities for rapid NWA deployment citing examples of rapid storage deployment in South

[60] CEEM Initial, p. 7
[61] Xcel Energy Reply, Att. A, p. 39
[62] Xcel Reply, Att. A, pp. 4-5
[63] Minneapolis Initial, p. 4

Australia and California's Aliso Canyon. Thus, Minneapolis suggests including Capacity projects in the first two years of the planning cycle in the NWA screening criteria.

ELPC/VS recognize the limitations of using a cost threshold, but also the current challenge of cost-effective NWA solutions below $2 million. Xcel Energy highlights how engineering labor-intensive NWA analysis is currently in support of maintaining all three screening criteria; including the $2 million threshold.[64] The Department does not support changes to the IDP filing requirement's cost threshold or the Company's criteria for filtering project to evaluate.[65] ELPC/VS suggest these issues be addressed through an ongoing stakeholder advisory group. In Supplemental, Minneapolis highlights that Xcel Energy acknowledges additional work is needed to identify the best range of project costs, and modifies the City's recommendation to direct Xcel Energy to work with stakeholder to identify improved screening criteria for potential NWA projects.[66] (**Decision Option 11 or 13**)

NWA Request for Proposal (RFP)

City of Minneapolis supports a RFP for a NWA pilot to allow market innovation, improve cost estimate accuracy, and solicit feedback from the market and stakeholders.[67] ELPC/VS propose modifications to the IDP filing requirement on NWA Analysis that includes: 1) more granular load shape information for a NWA; 2) inclusion of all revenue streams of the DER for cost evaluation; and 3) a RFP for projects that involve N-0 risks. (**Decision Option 9**)

The Department agrees that the additional information requested by ELPC/VS would be helpful to evaluate Xcel Energy's NWA proposals and that an RFP process increases transparency of costs, benefits and opportunity for third-party developers to propose cost-competitive solutions. However, the Department does not support a new filing requirement suggesting the existing IDP filing requirements could be interpreted as requiring such information.[68] ELPC/VS suggest such interpretation would lead to the conclusion that Xcel's IDP is incomplete, and continues to support the new filing requirement.[69]

Xcel Energy cites the state of the industry and resource intensity as reasons to wait on requiring NWA RFPs.[70]

Avoided Costs and Value of DER

CEEM highlights how a comparison of costs of NWA investments compared to traditional investments (e.g. net cost differences) fail to show an overarching evaluation philosophy. CEEM suggests future IDP should provide more explicit cost-benefit information.[71] CEEM questions

[64] Xcel Energy Reply, Att. A., p. 34
[65] Department Reply, p. 9, 12
[66] Minneapolis Supplemental, p. 2 Citing 2019 IDP at pp. 97-98.
[67] Minneapolis Initial, pp. 4-5
[68] Department Reply, p. 5
[69] ELPC/VS Supplemental, p. 2
[70] Xcel Energy Reply, Att. A, p. 35
[71] CEEM Initial, p. 5

whether the Commission or Xcel Energy should revisit policy related to NWAs prior to the next IDP related to the filing requirement versus a planning approach and the role of third parties.

The Department believes it is reasonable for a utility to establish an internal plan or framework for review of NWAs, and suggests this will develop through future iterations of IDPs, as Xcel installs and utilizes advanced system technologies, making NWA analysis a less manual process.[72]

More broadly, CEEM suggests the DER discussion needs to evolve to encompass valuation of and compensation for DER attributes that may vary by technology, desired system performance, and other policy priorities.[73] City of Minneapolis makes recommendations on Xcel Energy's Kasson NWA analysis to adjust the DER (solar and storage) costs, use DER value stacking to reduce utility costs below assumed DER install costs, and consider a portfolio approach that includes demand response and energy efficiency.[74] ELPC/VS also recommends the Company consider all revenue streams available when developing NWA cost estimates, and that the Commission modify the Company's IDP filing requirements accordingly. (**Decision Option 9**)

IPS Solar appreciates the NWA calculations Xcel Energy provided in the IDP, highlighting that Attachment H includes traditional and NWA (solar and storage) cost comparisons for a substation capacity upgrade, and the Company's further clarification on how energy efficiency and demand response are used in the NWA analysis. IPS Solar also focuses on the need to identify a value stack for the DERs in a NWA, and suggests the process used to establish the Value of Solar methodology be a guide to establish a broader Value of DER. IPS Solar also outlines some categories of avoided cost values the Commission should consider. IPS Solar recommends Xcel develop a Value of DER in the next IDP as part of a Commission-convened process to develop the value of DER for Minnesota.[75] (**Decision Option 10**)

On potential additional DER value, Xcel Energy agrees in principle, but not practicality. The Company notes the Advanced Planning Tool will help identify value, and is under Commission certification review in this docket. However, the Company argues additional stacked benefits are difficult to quantify for specific applications – and in some cases, lack the means of monetary compensation for assumed benefits.[76]

<u>NWA Stakeholder Advisory Group</u>

ELPC/VS recommend the Commission initiate a separate docket, like the Hosting Capacity Analysis dockets, to address Xcel Energy's NWA analysis, and direct the Company to form a separate NWA Stakeholder Advisory Group to inform and advance the Company's NWA

[72] Department Reply, p. 13
[73] CEEM Initial, pp. 7-9
[74] Minneapolis Initial, p. 6
[75] ISP Solar Supplemental, pp. 1-2
[76] Xcel Energy Reply, Att. A, p. 37

analysis.[77] (**Decision Option 11**) ELPC/VS suggest this newly formed NWA Stakeholder Advisory Group could explore (or litigate) opportunities to expand NWA screening criteria, identify specific grid needs, propose pilots, and result in the annual NWA updates recommended by the Department.[78] The Department supports the concept of a NWA stakeholder advisory group and a deeper dive on NWA Analysis *within* the IDP dockets. The Department not support a separate docket because such an approach does not keep the administrative record intact in the IDP and adds regulatory burden.[79]

F. Stakeholder Engagement

IREC asks the Commission to require Xcel Energy to allow any interested person to participate in stakeholder meetings to ensure the Company gets the best possible feedback.[80] Great Plains Institute and Xcel Energy excluded IREC from two of three stakeholder meetings for the 2019 IDP by restricting participation to those that commented on the 2018 IDP. The Department agrees with IREC encouraging Xcel Energy to "make a good faith effort to be as inclusive and open in its stakeholder process as possible."[81] Minneapolis agrees.[82]

Xcel Energy does not believe Commission needs to take action on IREC's suggestion. The Company says a lesson learned from the 2018 IDP process was hosting only large, open-to-the-public meetings did not allow commenting parties an opportunity to fully flesh out feedback in meetings – limiting the effectiveness in terms of refining the filing and party comments. Xcel Energy notes IREC had the opportunity and chose not to participate in the 2018 IDP. Xcel Energy claims the Company's choice to go beyond the Commission's required level of stakeholder engagement to more deeply engage some stakeholders on certain aspects of the 2019 IDP did not limit IREC in any way.[83]

G. IDP Filing Requirements

Accept or Reject IDP

The Department recommends acceptance of Xcel Energy's 2019 IDP[84], so does Xcel Energy[85], ELPC/VS[86], CEEM[87], and Fresh Energy (**Decision Option 1**).[88] City of Minneapolis and CUB supports acceptance with modifications and enhancements described above. The remaining

[77] ELPC/VS Initial, p. 2, 12
[78] ELPC/VS Reply, pp. 6-7
[79] Department Supplemental, p. 5
[80] IREC Initial, p. 3
[81] Department Reply, p. 13
[82] Minneapolis Supplemental, p. 5
[83] Xcel Energy Reply, Att. A, pp. 5-6
[84] Department Initial, p. 10; Reply, p. 1
[85] Xcel Energy Reply, p. 4
[86] ELPC/VS Initial, p. 1
[87] CEEM Initial, p. 3
[88] Fresh Energy Initial, pp. 1-2; Supplemental, p. 1

parties did not address the question directly, but many did address the certification request filed with the IDP as discussed in the accompanying staff briefing papers.

The Department interprets the question of whether to accept a utility's IDP as a question of whether the utility's IDP contains the information and data required by the Commission's IDP filing requirements and in light of the Commission's previous order(s). The Department's review of Xcel Energy's 2019 IDP concludes Xcel Energy provided information relevant to the IDP filing requirements and the 2019 Order.[89] Further, the Department finds Xcel Energy addresses how the IDP met each of the Planning Objectives in Att. B to the 2019 IDP. The Department claims not to be in a position currently to evaluate whether Xcel's IDP is optimally utilizing assets to minimize costs (Planning Objective #4). The Department expects over time Xcel's effort to analyze NWAs, provide more detailed alternative analysis for distribution system investments including cost-benefit analysis will further actualize this Planning Objective.[90]

Biennial IDPs

Xcel Energy requests modifying the Company's IDP filing requirements to require biennial IDPs (**Decision Option 2**). Xcel Energy describes this as the single most impactful change the Commission could make by allowing more time for the Company to reflect on feedback and make meaningful progress on the IDP Planning Objectives.[91]

The Department views a biennial filing cadence with annual updates of financial and NWA analysis information as a potentially optimal path forward (**Decision Option 2.a**). The Department views the IDP requirements related to financial data and NWA analysis as helpful in understanding how ratepayer funds are spent on the distribution system and due to the potential to defer utility investments in capital assets.[92] Xcel Energy requests that if the Commission require annual distribution budget and NWA analysis per the Department's recommendation, the Commission also authorize the Company to submit advanced grid certification requests in non-IDP (even-numbered) years (**Decision Option 2.b**).[93]

Fresh Energy believes a biennial IDP filing is sufficient because much of the information does not change significantly from year to year.[94] Fresh Energy suggests the Commission establish a performance-reporting framework for tracking AGIS progress and benefit realization to monitor accomplishments between future biennial IDP filings.[95]

Minneapolis recommends that if Xcel Energy does not file the next IDP until 2021, the Company should propose a NWA pilot by November 1, 2020 (**Decision Option 2.c**).[96] The Department and

[89] Department Initial, p. 10
[90] *Id.,* p. 11
[91] Xcel Energy Reply, Att. A, pp. 7-8
[92] Department Initial, p. 14
[93] Xcel Energy Supplemental, pp. 6-7
[94] Fresh Energy Initial, p. 2
[95] Fresh Energy Initial, p. 3. Staff Note: This decision option is included in the Certification Request briefing papers.
[96] Minneapolis Initial, p. 6

Xcel Energy agree proposing a NWA pilot may be premature and not achieve the outcomes Minneapolis desires. The Company notes it continues to work with Minneapolis to understand the objective of this proposal.[97]

ELPC/VS is the only other party to comment on the biennial request and does not object.[98]

Advanced Rate Design Road Map – overlaps with AGIS Certification Request

ELPC/VS, Fresh Energy, and CUB recommend the Commission require a new IDP filing requirement for Xcel Energy to develop an advanced rate design roadmap for the next IDP (**Decision Option 14**).[99] These parties agree Xcel Energy has not provided a coherent rate design strategy, and describe a complete roadmap as a forward-looking plan for how rate design will leverage grid modernization investments. Fresh Energy also recommends Xcel Energy engage stakeholders in at least two stakeholder meetings by May 2021 to inform the roadmap (**Decision Option 15**).[100]

Xcel Energy believes rate design is best addressed in a general rate case or dedicated rate design proceeding, and out of the scope of the IDP. The Company describes several advanced rate design offerings approved or under consideration: residential "Flex Pricing" TOU pilot, EV off peak rates, and General TOU Service for the commercial and industrial class. The Company does not see a benefit in pausing the Demand Response action plan proposed in the IRP, CIP or other filings for an advanced rate design roadmap. If the Commission wishes to direct the Company to produce such a roadmap, Xcel Energy suggests the Commission's recently established rate-design proceeding[101] is the appropriate forum. Lastly, Xcel Energy agrees with the importance of addressing low-income customer protections and enrollment mechanisms in program or pilot design, but disagrees with addressing these issues in a roadmap. Xcel Energy describes an alternative decision option the Company would not oppose in Reply at 25.[102]

The Department recommends further record development of such a roadmap as part of a contested case on the AGIS Certification Request.[103]

Other Filing Requirement Changes

As discussed above, ELPC/VS propose two modifications to existing Xcel Energy's filing requirements (**Decision Options 3 and 9**). The Department analysis of proposed changes to filing requirements "… considers whether recommended modifications: (1) are reasonably likely to result in a benefit for ratepayers and the public interest; and (2) can be reasonably

[97] Department Reply, p. 9. Xcel Energy Supplemental, p. 8
[98] ELPC/VS Reply, p. 10
[99] ELPC/VS Reply, pp. 3-5; CUB Supplemental, pp. 8-9; Fresh Energy Supplemental, p. 3
[100] Fresh Energy Initial, p. 8
[101] Docket No. E002/M-20-86
[102] Xcel Energy Reply, pp. 22-25
[103] Department Supplemental, p. 20. Staff Note: This decision option is included in the Certification Request briefing papers.

incorporated into other utilities' IDP requirements."[104] The Department concludes both modifications to existing IDP filing requirements are unnecessary at this time, and highlights the information requested could be provided under the filing requirements today.[105]

The Department notes "some elements of the IDP may become superfluous" if Xcel Energy continues to submit significant, identical passages from past IDPs, and identifies an overview and explanation from the Company of what has changed as helpful.[106] The Company does not believe it is reasonable to require a narrative to explain all that might be different from the last IDP, notes the executive summary and compliance matrix as resources, and suggests parties should communicate to the Commission a narrower set of information to require in IDPs if the document is too long.[107]

Role of the IDP in Context of Other Proceedings

Parties highlight a lack of clarity in how the IDP, integrated resource plan (IRP), rate cases (especially multi-year rate plans (MYRP)) and performance metrics inform each other and harmonize. CUB suggests the MYRP, IDP and IRP cycles should be aligned, such that an approved or accepted IRP or IDP action plan informs the setting of base rates or target revenues for the subsequent MYRP control period, which should improve regulatory efficiency and preserve the cost containment integrity of the MYRP framework.[108] CUB continues that the Commission could ensure key benefits articulated in the respective plans are realized at the same time as costs for the investments are recovered through the MYRP rather than riders to protect customers from cost overruns. CUB concludes such a holistic approach is consistent with the Legislature's guidance governing MYRPs quoting parts of Minn. Stat. §216B.16; Subd. 19:[109]

> … a MYRP's "forecasted base rate must include the utility's planned capital investments and investment-related costs" and the Commission is required to "ensure that rates remain just and reasonable during the course of the plan, including terms and conditions for rate adjustment."

ELPC/VS agrees and includes transmission planning in this alignment.[110] OAG focuses on aligning cost recovery proposals with detailed metrics and historical baseline data in the ongoing performance metrics docket to ensure benefits are realized and not paid for twice by customers.[111]

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[104] Department Reply, p. 4
[105] Department Reply, pp. 5-7
[106] Department Initial, p. 14
[107] Xcel Energy Reply, Att. A, pp. 2-3
[108] CUB Initial, Analysis, p. 10
[109] *IBID.* Cites Minn. Stat. §216B.16, Subd. 19(a)(1) and (e).
[110] ELPC/VS Reply, p. 2
[111] OAG Initial.

The Department is not recommending specific action at this time; however, notes this issue will continue to arise and would benefit from setting frameworks and expectations that would inform future MYRPs and possible performance incentive mechanisms. Further, the Department suggests timing of individual proceedings should occur in a way that does not preclude the Commission's ability to harmonize the results of each proceeding.[112]

VI. Staff Analysis

Staff supports accepting Xcel Energy's 2019 IDP with the caveat language from past years about what acceptance means, and adjusting the filing cadence from annual to biennial for Xcel Energy (**Decision Option 1 & 2**)**.** The other rate-regulated utilities file biennial IDPs. The timeframe for Xcel Energy from Commission acceptance (by June 1) to the annual filing date (by November 1) provides very limited time to reflect and advance the substance of the IDP between filings.

Staff agrees with the Department that going forward the Company should focus on highlighting and explaining what is changing with the Company's IDP. Staff also agrees with the Company that it is not reasonable for the Company to add more summary to an already voluminous IDP. Staff suggests the evaluation of how the IDP achieves the planning objectives or references, within subsections of the IDP that are repetitive, to past filings could accomplish the Department's suggestion with minimal effort by the Company. Staff read the entire IDP, including all of the attachments, and note at times dozens of pages are verbatim repeat from the 2018 IDP. This repeat may be accurate because the planning process or reported information remains the same; however, for the avid IDP reader and the IDP writer it is more efficient and useful to reference a past IDP's summary and focus on what is changing or new with an explanation of why.[113] Where there was not an acknowledgement of what, if anything, in sections had changed, staff used a PDF comparison of the 2018 and 2019 IDPs to increase our understanding of how the Company's distribution system and planning has evolved in the past year.

A. Baseline Data (System, Financial, DER)

Locational Reliability

Staff notes the Commission currently has an open comment period on locational reliability in Xcel Energy's annual Service Quality, Safety, and Reliability (SQSR) docket.[114] This Notice stems from the Commission's adoption of a locational reliability and service quality metrics (including

[112] Department Reply, p. 8

[113] Staff Note: Repeating simple details like the mile of distribution lines in each IDP is not the issue; rather, when ten or more pages repeat because a planning process either remains the same or has small adjustments buried within repeated text the writer and reader unnecessarily work harder to understand what is changing with the Company's IDP.

[114] Docket No. E002/M-20-406. Initial Comments are due August 12, 2020, and Reply Comments on August 26, 2020.

a focus on equity) from its investigation into performance metrics for Xcel Energy.[115] Part of the Commission's Notice for Comment includes feedback on whether maps displaying reliability at a more granular level should be included with the annual report.

Additionally, Xcel Energy's annual SQSR reports include a description of the Company's Feeder Performance Improvement Program (FPIP) that focuses on the worst performing feeders for each year. Attachment E of Xcel's 2019 Service Quality report contains information by work center on the worst performing feeders, and improvements made to correct issues.[116]

Staff recommends the Commission continue to develop a better understanding of locational reliability in the existing SQSR annual reports and docket. Duplicating the already ongoing process could be difficult for parties to track and consume limited resources. If the Commission moves to a biennial IDP cadence, it may be appropriate to revisit how locational reliability and equity fit into the 2021 IDP filing, after metrics have been developed in the Company's SQSR docket.

Community Clean Energy and Climate Plans

See DER Scenarios section below.

B. Long-Term Distribution System Modernization and Infrastructure Investment Plans

The IDP is not a prudence review; however, some parties envision a future where IDP investment plans inform base rates or target revenues. In the IDP, the Company provides significant detail of what the money will be spent on (e.g. undergrounding lines, replacing poles, etc.) and generally, how the Company identifies these priorities. The IDP has little discussion of why budgets change between filings beyond the overarching recognition that the distribution system in dynamic and must respond to customers and communities. Perhaps more challenging, given what some parties envision as harmony between proceedings, the IDP does not tie investments in the 5-year investment plan to metrics like savings or benefits unless the Company is also requesting certification – and even then, parties do not think what is offered is sufficient. Prior to the IDP, the Commission only received and reviewed distribution budgets as part of a much larger rate case. The Commission created the IDP recognizing an industry trend toward increased distribution spending due to aging infrastructure and grid modernization. The Commission also recognized distribution budgets will continue to be reviewed, likely with more scrutiny going forward, in rate case proceedings.

[115] Docket No. E002/CI-17-401. Staff Note: The Commission's April 16, 2020 Order in Docket No. E002/CI-17-401 at p. 2 acknowledges the locational reliability and equity metrics will be addressed in the annual Service Quality, Safety and Reliability docket.

[116] Xcel Energy, 2019 Service Quality, Safety, and Reliability Report, Docket E002/M-20-406, Attachment E

Staff provides a side-by-side of the 2018 IDP and 2019 IDP 5-year Action Plan Budget and the overall % change for the annual capital budgets provided in the 2018 and 2019 IDPs by year and an annual average by category:

Figure 2: Comparison of 2018 and 2019 IDP Budgets for 2019-2023, $Millions
(includes some AGIS Investments)

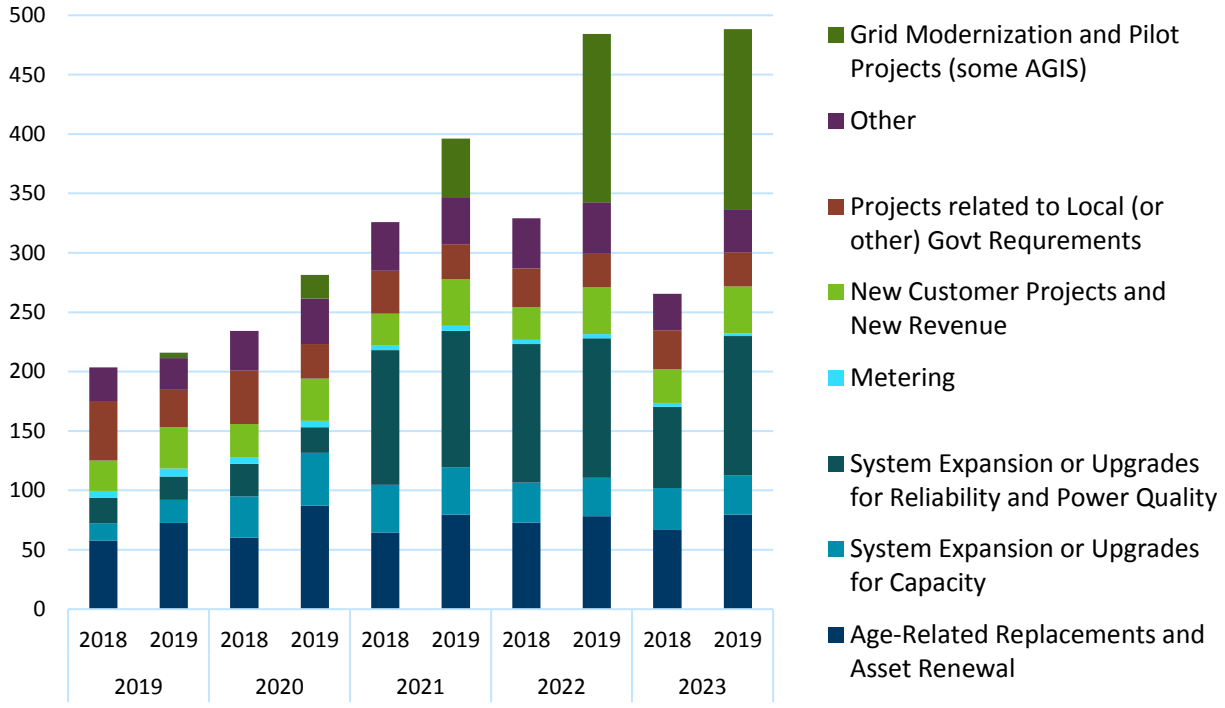


Figure 3: % Change in 2018 and 2019 IDP Total Annual Capital Budget
(Includes some AGIS Investments)

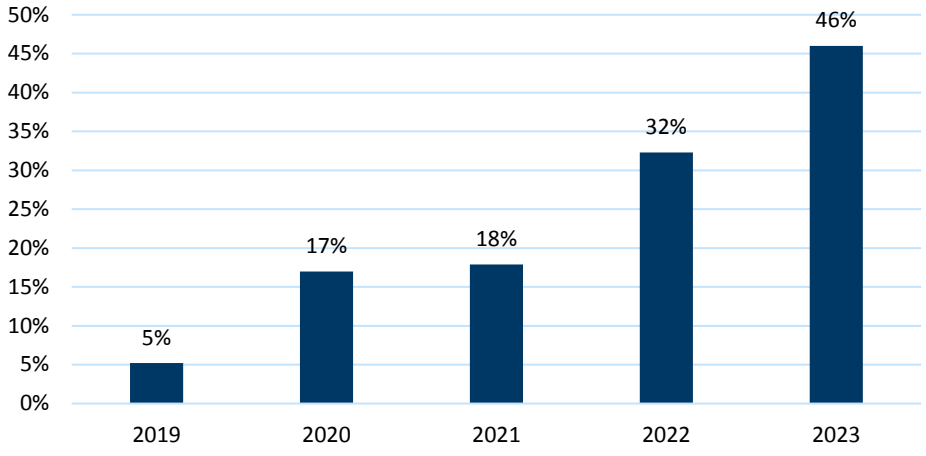
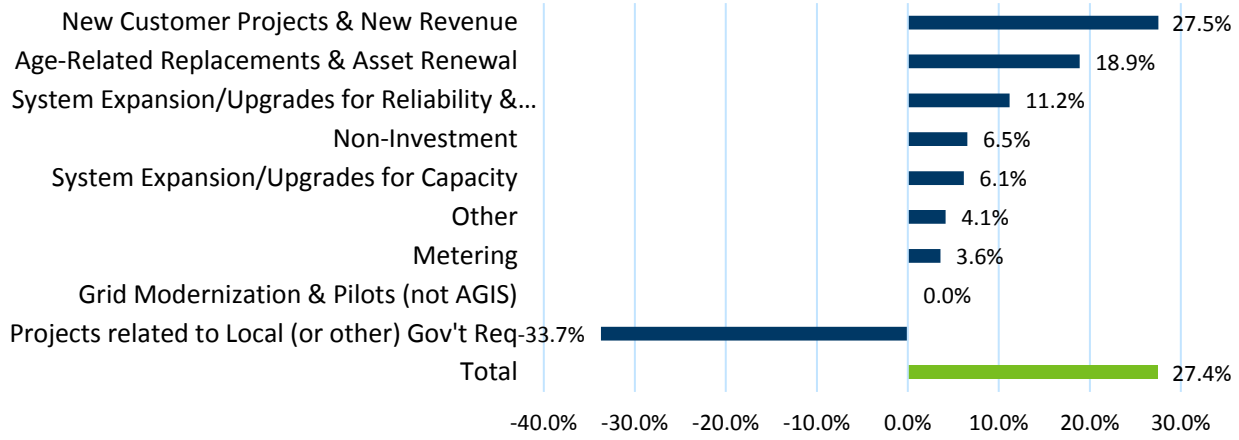


Figure 4: % Change between 2018 and 2019 IDP Capital Budget Categories
(Average for 2019-2023, includes some AGIS Investment)



C. Hosting Capacity and DER Interconnection

Staff defers to the Commission on which proceeding is more appropriate to address Commission guidance on the role of hosting capacity analysis in interconnection review (**Decision Option 6**). The Commission will consider Xcel Energy's 2019 HCA Report in early June, and in 3Q 2020 is anticipated to host a Distributed Generation Workgroup meeting evaluating the first year rollout of the MN DIP, which includes the Initial Review screens contemplated to be replaced by the HCA in comments in this docket. Staff agrees with the parties, including Xcel Energy, that in its present state the Company's HCA cannot adequately replace the MN DIP Initial Review Screens. Staff further notes to improve the HCA to do so likely requires investments in an advanced planning tool and advanced grid technologies under consideration in the accompanying Certification Request to this IDP.

Regarding advanced inverters and interoperability with the utility, Staff appreciates the discussion by the Company and parties, and agrees the Distributed Generation Workgroup is the relevant place to address the issue in more detail. That said, the Company's commitment to include updates and address how advanced inverter capabilities may fit or be utilized by proposed grid investments in future IDPs and Certification Requests is critical. Staff does not think a change to IDP filing requirement 3.C.3 is required at this time (**Decision Option 7**).

D. DER Scenarios

Staff appreciates the City of Minneapolis raising the issue of how the IDP addresses community planning related to local generation and beneficial electrification efforts (**Decision Option 4**). Xcel Energy summarizes how the Company currently engages with communities, and notes that effort is incorporated in the IDP. Staff is not convinced looking at the DER scenarios that the Company is including community clean energy and beneficial electrification policies communities within its service territory plan to implement. Minneapolis and Saint Paul both have local solar generation goals along with overall renewable goals that alone would seem to affect the DER scenarios; let alone the other communities' unique goals. Staff agrees with the

Department that inclusion in the IDP's DER Scenarios or baseline data should not change established cost causation principles and that inclusion may need to be captured at the system-wide level given current planning tools.

E. Non-Wires Alternatives Analysis

The Commission and ratepayers are fortunate to have the Company and stakeholders' active engagement in developing NWA analysis, which is still emerging in the industry. Parties capture the near-term priorities (e.g. screening criteria, NWA analysis methodology and assumptions, NWA evaluation parameters) and present the Commission and Company with two options: 1) establish a separate docket and NWA Stakeholder Advisory Group (**Decision Option 11**) or 2) continue to engage stakeholders in IDP dockets (**Decision Option 13**.) As Xcel highlights without planning tools that allow the Company to develop more granular (time and location specific) load shapes (such as the APT), NWA Analysis will continue to be labor intensive and of limited value. Staff defer to the Commission on the level of priority and investment the Company should give NWA Analysis.

A number of parties suggest DER value stacking or DER valuation as a key consideration in improving NWA analysis; including IPS Solar's Value of DER recommendation (**Decision Option 10**). The Commission has further proceedings in the statewide DER interconnection docket to review DER Rate Guidance that was established by the Commission in 2004. This review is queued to take place after Phase II in that docket (July 2020.) Staff is also monitoring FERC's PURPA reform docket[117], which includes proposed changes to avoided cost valuation and compensation rates for DER qualifying facilities. Additionally, FERC Order 841 proposes to allow certain distribution-connected DER with storage to participate in the wholesale market (MISO.) The Value of Solar methodology that IPS Solar proposes as a model has undergone further examination in informing the compensation rates for Community Solar Gardens.[118]

F. IDP Filing Requirements

Staff agrees with the Department that no changes to the IDP filing requirements are necessary at this time (**Decision Options 3, 7, 8, 9, 14**). Staff also supports the parties and Department's suggestion that the Company enhance the next IDP by addressing the suggestions provided; especially, with regard to NWA Analysis. Staff includes the Rate Design Roadmap as an IDP filing requirement change because of ELPC/VS recommendation (**Decision Option 14**); however, other regulatory process for such a roadmap is discussed in the associated briefing papers.

VII. Decision Options

1. Accept Xcel Energy's 2019 IDP Report as in compliance with IDP reporting requirements. Acceptance of the 2019 IDP has no bearing on prudency or certification. (*Xcel, Department, ELPC/VS, CEEM, Fresh Energy)*

[117] FERC Noticed of Proposed Rulemaking on Qualifying Facility Rates and Requirements Implementation Issues Under the Public Utility Regulatory Policies Act of 1978 (Sept. 19, 2019), FERC Docket No. RM19-15-000
[118] Docket No. E002/M-13-867

2. Require Xcel Energy to file Integrated Distribution Plans biennially going forward. The Company's next IDP no later than November 1, 2021. *(Xcel, Department, Fresh Energy)*
    a. Require the Company to continue to file annually the following IDP requirements: (*Department)*
        i. Baseline Financial Data, IDP Requirements 3.A.26-30; and
        ii. Non-Wires (Non-Traditional) Alternatives Analysis, IDP Requirements E.1-2.
    b. Require the Company to propose a Non-Wires Alternative Pilot by November 1, 2020 (*City of Minneapolis)*

3. Establish a new Xcel Energy IDP filing requirement as follows (*ELPC/VS, Minneapolis)*: 3F. Locational Reliability and Equity.
    a. Xcel shall provide a map that illustrates the reliability of the Company's distribution system at a feeder-level.
    b. Xcel shall describe how its proposed reliability investments will prioritize those portions of its system with poor reliability performance.
    c. Xcel shall explain how its proposed reliability investments will advance equity across its service territory.

4. Require Xcel Energy to provide detail on how the energy and climate goals of the Minnesota communities it serves, along with customer preference trends in the DER Scenario Analysis of future IDPs. In particular, distribution generation planning should include consideration of local community goals, such as local and beneficial electrification. (*Minneapolis*)

Long Range Investment Plan

5. Company shall develop a formal ISI Plan based on specific demonstrated needs and a clear articulation of expected reliability improvements. The ISI Plan should be filed with any future request for cost recovery or certification, or with Xcel's next IDP, whichever comes first. (*Fresh Energy, Minneapolis*)

Hosting Capacity, Interconnection, and Scenario Analysis

6. Establish a pathway towards use of the Hosting Capacity Analysis in interconnection review by adopting a goal of replacing the MN DIP's fast track screens with the HCA and requiring frequent updates, vetting of technical assumptions, and validation of results. *(IREC, ILSR, Minneapolis)*

7. Modify Xcel Energy's IDP Filing requirement at 3.C.3 as follows: (*ELPC/VS*)

    3.C.3. Distributed Energy Resource Scenario Analysis. Provide a discussion of the processes and tools that would be necessary to accommodate the specified levels of DER integration, including whether existing processes and tools would be sufficient. Provide a discussion of the system impacts and benefits that may

arise from increased DER adoption, potential barriers to DER integration, and the types of system upgrades that may be necessary to accommodate the DER at the listed penetration levels. Provide a discussion of whether external control through utility communication with smart inverters, above and beyond the autonomous functions associated with smart inverters, would be necessary to ensure the safe and reliable operation of the grid at the listed penetration levels.

Non-Wires Alternatives Analysis

8. Modify Xcel Energy's IDP filing requirement at 3.E.1 to reduce the cost threshold from two million to one million dollars. (*IPS Solar*)

9. Modify Xcel Energy's IDP Filing requirement at 3.E.1 as follows: (*ELPC/VS*)

   3.E.1 Non-Wires (Non-Traditional) Alternatives Analysis. Xcel shall provide a detailed discussion of all distribution system projects in the filing year and the subsequent 5 years that are anticipated to have a total cost of greater than two million dollars. For each distribution system project satisfying those criteria, Xcel shall explain the hour(s) and day(s) during which an NWA would be called upon to deliver energy and demand, if an NWA were to defer or avoid the project. For any forthcoming project or project in the filing year, which cost two million dollars or more, provide an analysis on how non-wires alternatives compare in terms of viability, price, and long-term value. In determining how non-wires alternatives compare to forthcoming projects or projects in the filing year in terms of price, Xcel shall consider all revenue streams available to the non-wires alternative project. For projects that involve N-0 risks, Xcel shall issue a request for proposals soliciting NWA solutions addressing those risks.

10. Require Xcel to develop a Value of DER in the next IDP as part of a Commission-convened process to develop the value of DER for Minnesota (*IPS Solar)*

11. The Commission initiates a separate docket to address Xcel's Non-Wires Alternatives (NWA) analysis, and direct the Company to form a separate NWA Stakeholder Advisory Group that can inform and advance the Company's NWA analysis moving forward, including the Company's NWA screening criteria and investment deferral opportunity assessment. (*ELPC/VS, Minneapolis)*
    a. Direct Xcel Energy to work with stakeholders to identify improved screening criteria for potential NWA projects. Modifications may include consideration of: (*Minneapolis)*
        i. Project types: Such as including both capacity and health asset categories;
        ii. Project timing: Following the Commission order more closely by including years 2 – 5 of the plan timeframe so as not to miss opportunities for

energy storage and other distributed energy resources, which can be deployed quickly;

iii. Technology options and associated cost assumptions;
iv. $2 million minimum cost threshold;
v. The NWA methodology and analytical assumptions;
vi. Issue an RFP for third-parties to identify NWA solutions and propose market-based project costs;
vii. Evaluation parameters:
    1. Expand the solutions evaluated to include additional NWA technologies using a portfolio approach, including energy efficiency, solar, energy storage, and demand side management deployed in combination with each other;
    2. In addition to competitive procurements, Xcel should consider opportunities to source NWAs through customer program offerings (for example, overlaying a geo-targeted incentive onto an existing customer demand response program);
    3. In future IDPs, Xcel should explore the opportunity to combine NWAs and wires solutions so that the latter can be right-sized and complemented by NWAs in instances where an NWA alone may be unable to meet the full need.

Stakeholder Meetings

12. Require Xcel Energy to allow any interested person to participate in stakeholder engagement meetings regarding its IDP and HCA *(IREC, Department, Minneapolis)*

13. Require Xcel Energy to engage stakeholders in further advancing the Company's NWA Analysis; including, but not limited to, screening criteria, analysis methodology and assumptions, NWA evaluation parameters. (*Staff interpretation of Department*)

AGIS-Related Filing Requirement Modifications

14. Establish a new Xcel Energy IDP filing requirement as follows: (*ELPC/VS, Fresh Energy, CUB*)

> 3.D.4. Rate Design Roadmap
> Xcel shall provide a rate design roadmap that includes the following components:
>
> a. A summary of the Company's current advanced rate designs and demand management programs, advanced rate designs in development, and relevant industry best practices.
> b. A timeline for offering updated dynamic rates and/or demand management programs for all customer classes.

c. Potential rate and program design strategies to support low-income participation in these offerings.
d. A discussion of opportunities for utilizing distributed energy resources and/or beneficial electrification technologies in conjunction with planned dynamic rates and/or demand management programs.
e. Enrollment mechanisms for convenient customer participation in the advanced rate offerings.
f. Implementation plans for offering advanced rates, including education and outreach to customers.
g. Evaluation plans for monitoring, verifying, and improving the effectiveness of advanced rate designs.
h. A discussion of supportive programs (such as customer education) and enabling technologies (such as smart thermostats) that are associated with the Company's rate design strategy.

15. Require Xcel Energy engage stakeholders in at least two stakeholder meetings by May 2021 to inform a rate design roadmap. (*Fresh Energy)*

Staff recommends: **1, 2.a, 13**. Staff does not recommend: **3**. Staff takes no position on the other decision options.

Attachment A: Staff Updated reflecting July 2019 Order

MINNESOTA INTEGRATED DISTRIBUTION PLANNING REQUIREMENTS

For Xcel Energy

Docket E002/CI-18-251

Planning Objectives: The Commission is facilitating comprehensive, coordinated, transparent, integrated distribution plans to:

- Maintain and enhance the safety, security, reliability, and resilience of the electricity grid, at fair and reasonable costs, consistent with the state's energy policies;
- Enable greater customer engagement, empowerment, and options for energy services;
- Move toward the creation of efficient, cost-effective, accessible grid platforms for new products, new services, and opportunities for adoption of new distributed technologies; and,
- Ensure optimized utilization of electricity grid assets and resources to minimize total system costs.
- Provide the Commission with the information necessary to understand Xcel's short-term and long-term distribution system plans, the costs and benefits of specific investments, and a comprehensive analysis of ratepayer cost and value.

Commission review of annual distribution system plans are not meant to preclude flexibility for Xcel to respond to dynamic changes and on-going necessary system improvements to the distribution system; nor is it a prudency determination of any proposed system modifications or investments.

For filing requirements which Xcel claims is not yet practicable or is currently cost-prohibitive to provide, Xcel shall indicate for each requirement:

1. Why the Company has claimed the information is not yet practicable or is currently cost-prohibitive;

2. How the information could be obtained, at what estimated cost, and timeframe;

3. What the benefits or limitations of filing the data in future reports as related to achieving the planning objectives;

4. If the information cannot be provided in future reports, what information in the alternative could be provided and how it would achieve the planning objectives.

Distribution System Plan Process

1. Filing Date: Require Xcel to file annually with the Commission beginning on November 1, 2018 an Integrated Distribution Plan (MN-IDP or IDP) for the 10-year period following the

submittal. The Commission will either accept or reject a distribution system plan by June 1 (to the extent practicable) of the following year based upon the plan content and conformance with the filing requirements and Planning Objectives listed above. The plan will be reviewed and may be combined with the Biennial Distribution System Plan required by Minn. Stat. 216B.2425 and associated certification requests, as authorized in that docket (E002/M-17-776).

2. Stakeholder Meeting(s): Xcel should hold at least one stakeholder meeting prior to the November 1 filing of the Company's MN-IDP to obtain input from the public. The stakeholder meeting should occur in a manner timely enough to ensure input can be incorporated into the November 1 MN-IDP filing as deemed appropriate by the utility.

At a minimum, Xcel should seek to solicit input from stakeholders on the following MN-IDP topics: (1) the load and distributed energy resources (DER) forecasts; (2) proposed 5-year distribution system investments, (3) anticipated capabilities of system investments and customer benefits derived from proposed actions in the next 5-years; including, consistency with the Commission's Planning Objectives (see above), and (4) any other relevant areas proposed in the MN-IDP.

Following the November 1 filing, the Commission will issue a notice of comment period. If deemed appropriate by staff, an additional stakeholder meeting may be held in combination with the comment period to solicit input.

3. Filing Requirements: For purposes of these requirements, DER is defined as "supply and demand side resources that can be used throughout an electric distribution system to meet energy and reliability needs of customers; can be installed on either the customer or utility side of the electric meter."[119] This definition for this filing may include, but is not limited to: distributed generation, energy storage, electric vehicles, demand side management, and energy efficiency.[120]

A. Baseline Distribution System and Financial Data:

System Data

1. Modeling software currently used and planned software deployments

2. Percentage of substations and feeders with monitoring and control capabilities, planned additions

3. A summary of existing system visibility and measurement (feeder-level and time interval) and planned visibility improvements; include information on percentage of

[119] See *Minnesota Staff Grid Modernization Report, March 2016*.
[120] ICF Report, Integrated Distribution Planning, August 2016, prepared for Minnesota Public Utilities Commission, Docket No. E999/CI-15-556, available online: See eDockets ID: 20169-124836-01.

system with each level of visibility (ex. max/min, daytime/nighttime, monthly/daily reads, automated/manual)

4. Number of customer meters with AMI/smart meters and those without, planned AMI-investments, and overview of functionality available

5. Discussion of how the distribution system planning is coordinated with the integrated resource plan (including how it informs and is informed by the IRP), and planned modifications or planned changes to the existing process to improve coordination and integration between the two plans

6. Discussion of how DER is considered in load forecasting and any expected changes in load forecasting methodology

7. Discussion if and how IEEE Std. 1547-2018[121] impacts distribution system planning considerations (e.g. opportunities and constraints related to interoperability and advanced inverter functionality)

8. Estimated distribution system annual loss percentage for the prior year

9. For the portions of the system with SCADA capabilities, the maximum hourly coincident load (kW) for the distribution system as measured at the interface between the transmission and distribution system

10. Total distribution substation capacity in kVA

11. Total distribution transformer capacity in kVA

12. Total miles of overhead distribution wire

13. Total miles of underground distribution wire

14. Total number of distribution premises

15. Total costs spent on DER generation installation in the prior year. These costs should be broken down by category in which they were incurred (including application review, responding to inquiries, metering, testing, make ready, etc).

16. Total charges to customers/member installers for DER generation installations, in the prior year. These charges should be broken down by category in which they were incurred (including application, fees, metering, make ready, etc.)

[121] IEEE Standard 1547-2018, published April 6, 2018.

17. Total nameplate kW of DER generation system which completed interconnection to the system in the prior year, broken down by DER technology type (e.g. solar, combined solar/storage, storage, etc.)

18. Total number of DER generation systems which completed interconnection to the system in the prior year, broken down by DER technology type (e.g. solar, combined solar/storage, storage, etc.)

19. Total number and nameplate kW of existing DER systems interconnected to the distribution grid as of time of filing, broken down by DER technology type (e.g. solar, combined solar/storage, storage, etc.)

20. Total number and nameplate kW of queued DER systems as of time of filing, broken down by DER technology type (e.g. solar, combined solar/storage, storage, etc.)

21. Total number of electric vehicles in service territory

22. Total number and capacity of public electric vehicle charging stations

23. Number of units and MW/MWh ratings of battery storage

24. MWh saving and peak demand reductions from EE program spending in previous year

25. Amount of controllable demand (in both MW and as a percentage of system peak)

Financial Data

26. Historical distribution system spending for the past 5-years, in each category:

a. Age-Related Replacements and Asset Renewal
b. System Expansion or Upgrades for Capacity
c. System Expansion or Upgrades for Reliability and Power Quality
d. New Customer Projects and New Revenue
e. Grid Modernization and Pilot Projects
f. Projects related to local (or other) government-requirements
g. Metering
h. Other

The Company may provide in the IDP any 2018 or earlier data in the following rate case categories:

a. Asset Health
b. New Business
c. Capacity
d. Fleet, Tools, and Equipment
e. Grid Modernization

For each category, provide a description of what items and investments are included.

27. All non-Xcel investments in distribution system upgrades (e.g. those required as a condition of interconnection) by subset (e.g. CSG, customer-sited, PPA and other) and location (i.e. feeder or substation).

28. Projected distribution system spending for 5-years into the future for the categories listed above, itemizing any non-traditional distribution projects

29. Planned distribution capital projects, including drivers for the project, timeline for improvement, and summary of anticipated changes in historic spending. Driver categories should include:

a. Age-Related Replacements and Asset Renewal
b. System Expansion or Upgrades for Capacity
c. System Expansion or Upgrades for Reliability and Power Quality
d. New Customer Projects and New Revenue
e. Grid Modernization and Pilot Projects
f. Projects related to local (or other) government-requirements
g. Metering
h. Other

30. Provide any available cost benefit analysis in which the company evaluated a non-traditional distribution system solution to either a capital or operating upgrade or replacement

DER Deployment

31. Current DER deployment by type, size, and geographic dispersion (as useful for planning purposes; such as, by planning areas, service/work center areas, cities, etc.)

32. Information on areas of existing or forecasted high DER penetration. Include definition and rationale for what the Company considers “high” DER penetration.

33. Information on areas with existing or forecasted abnormal voltage or frequency issues that may benefit from the utilization of advanced inverter technology.

B. Hosting Capacity and Interconnection Requirements

1. Provide a narrative discussion on how the hosting capacity analysis filed annually on November 1 currently advances customer-sited DER (in particular PV and electric storage systems), how the Company anticipates the hosting capacity analysis (HCA) identifying interconnection points on the distribution system and necessary distribution

upgrades to support the continued development of distributed generation resources[122], and any other method in which Xcel anticipates customer benefit stemming from the annual HCA.

2. Describe the data sources and methodology used to complete the initial review screens outlined in the Minnesota DER Interconnection Process.[123]

C. Distributed Energy Resource Scenario Analysis

1. In order to understand the potential impacts of faster-than-anticipated DER adoption, define and develop conceptual base-case, medium, and high scenarios regarding increased DER deployment on Xcel's system. Scenarios should reflect a reasonable mix of individual DER adoption and aggregated or bundled DER service types, dispersed geographically across the Xcel distribution system in the locations Xcel would reasonably anticipate seeing DER growth take place first.

2. Include information on methodologies used to develop the low, medium, and high scenarios, including the DER adoption rates (if different from the minimum 10% and 25% levels), geographic deployment assumptions, expected DER load profiles (for both individual and bundled installations), and any other relevant assumptions factored into the scenario discussion. Indicate whether or not these methodologies and inputs are consistent with Integrated Resource Plan inputs.

3. Provide a discussion of the processes and tools that would be necessary to accommodate the specified levels of DER integration, including whether existing processes and tools would be sufficient. Provide a discussion of the system impacts and benefits that may arise from increased DER adoption, potential barriers to DER integration, and the types of system upgrades that may be necessary to accommodate the DER at the listed penetration levels.

4. Include information on anticipated impacts from FERC Order 841[124] (Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators) and a discussion of potential impacts from the related FERC Docket RM-18-9-000 (Participation of Distributed Energy Resource Aggregations in Markets Operated by Regional Transmission Organizations and Independent System Operators)

D. Long-Term Distribution System Modernization and Infrastructure Investment Plan

[122] Minn. Stat. 216B.2425, Subd. 8
[123] Forthcoming Order, E999/CI-16-521, MN DIP 3.2 Initial Review
[124] *Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators,* 162 FERC ¶61,127 (February 28, 2018)

1. Xcel shall provide a 5-year Action Plan as part of a 10-year long-term plan for distribution system developments and investments in grid modernization based on internal business plans and the DER future scenarios.

2. Xcel shall provide a 5-year Action Plan as part of a 10-year long-term plan for distribution system developments and investments in grid modernization based on internal business plans and considering the insights gained from the DER futures analysis, hosting capacity analysis, and non-wires alternatives analysis. The 5-year Action Plan should include a detailed discussion of the underlying assumptions (including load growth assumptions) and the costs of distribution system investments planned for the next 5-years (expanding on topics and categories listed above). Xcel should include specifics of the 5-year Action Plan investments. Topics that should be discussed, as appropriate, include at a minimum:

- Overview of investment plan: scope, timing, and cost recovery mechanism
- Grid Architecture: Description of steps planned to modernize the utility's grid and tools to help understand the complex interactions that exist in the present and possible future grid scenarios and what utility and customer benefits that could or will arise.[125]
- Alternatives analysis of investment proposal: objectives intended with a project, general grid modernization investments considered, alternative cost and functionality analysis (both for the utility and the customer), implementation order options, and considerations made in pursuit of short-term investments. The analysis should be sufficient enough to justify and explain the investment.
- System interoperability and communications strategy
- Costs and plans associated with obtaining system data (EE load shapes, PV output profiles with and without battery storage, capacity impacts of DR combined with EE, EV charging profiles, etc.)
- Interplay of investment with other utility programs (effects on existing utility programs such as demand response, efficiency projects, etc.)
- Customer anticipated benefit and cost
- Customer data and grid data management plan (how it is planned to be used and/or shared with customers and/or third parties)
- Plans to manage rate or bill impacts, if any
- Impacts to net present value of system costs (in NPV RR/MWh or MW)
- For each grid modernization project in its 5-year Action Plan, Xcel should provide a cost-benefit analysis based on the best information it has at the time and include a discussion of non-quantifiable benefits. Xcel shall provide all information used to support its analysis.
- Status of any existing pilots or potential for new opportunities for grid modernization pilots

[125] https://gridarchitecture.pnnl.gov/

3. In addition to the 5-year Action Plan, Xcel shall provide a discussion of its vision for the planning, development, and use of the distribution system over the next 10 years. The 10- year Long-Term Plan discussion should address long-term assumptions (including load growth assumptions), the long-term impact of the 5-year Action Plan investments, what changes are necessary to incorporate DER into future planning processes based on the DER futures analysis, and any other types of changes that may need to take place in the tools and processes Xcel is currently using.

E. Non-Wires (Non-Traditional) Alternatives Analysis

1. Xcel shall provide a detailed discussion of all distribution system projects in the filing year and the subsequent 5 years that are anticipated to have a total cost of greater than two million dollars. For any forthcoming project or project in the filing year, which cost two million dollars or more, provide an analysis on how non-wires alternatives compare in terms of viability, price, and long-term value.

2. Xcel shall provide information on the following:

- Project types that would lend themselves to non-traditional solutions (i.e. load relief or reliability)
- A timeline that is needed to consider alternatives to any project types that would lend themselves to non-traditional solutions (allowing time for potential request for proposal, response, review, contracting and implementation)
- Cost threshold of any project type that would need to be met to have a non-traditional solution reviewed
- A discussion of a proposed screening process to be used internally to determine that non-traditional alternatives are considered prior to distribution system investments are made.