

Founded in 1852
by Sidney Davy Miller

MILLER CANFIELD

Sherri A. Wellman
TEL +1.517.483.4954
FAX +1.517.374.6304
E-MAIL Wellmans@MillerCanfield.com

Miller, Canfield, Paddock and Stone, P.L.C.
120 N. Washington Square, Suite 900
One Michigan Avenue Building
Lansing, Michigan 48933
TEL (517) 487-2070
FAX (517) 374-6304
millercanfield.com

MICHIGAN
ILLINOIS
NEW YORK
OHIO
WASHINGTON, D.C.
CALIFORNIA
CANADA
MEXICO
POLAND
UKRAINE
QATAR

September 30, 2024

Ms. Lisa Felice
Executive Secretary
Michigan Public Service Commission
7109 West Saginaw Highway
Lansing, MI 48917

Re: Northern States Power Company - Wisconsin
Case No. U-20147

Dear Ms. Felice:

Attached for electronic filing in the above-referenced case is Northern States Power Company-Wisconsin's Distribution Plan (2025-2029), which includes Appendixes A-D.

Please be advised that Appendix C (Distribution System Maps) and Appendix D (Distribution Asset List) are confidential and will be submitted in the future subject to protection.

Should you have any questions or concerns, please advise.

Sincerely,

Miller, Canfield, Paddock and Stone, P.L.C.

By: _____
Sherri A. Wellman

SAW/ehk
Enclosures

cc w/enc: Amit T. Singh (singha9@michigan.gov)
Julie A. McRea (Julie.A.McRea@xcelenergy.com)



**NORTHERN STATES POWER COMPANY -
WISCONSIN**
MICHIGAN DISTRIBUTION PLAN
(2025-2029)

September 30, 2024

TABLE OF CONTENTS

- I. EXECUTIVE SUMMARY..... 2
- II. COMPANY OVERVIEW..... 4
 - A. NSP-W Michigan Jurisdiction..... 5
 - B. Xcel Energy Holding Company..... 8
 - 1. *Clean and Reliable Energy Sources*..... 9
- III. DISTRIBUTION OPERATIONS OVERVIEW..... 12
 - A. NSP-W Michigan Electric Distribution System..... 12
 - B. NSP-W Distribution Organization..... 14
- IV. DISTRIBUTION PRIORITIES..... 15
 - A. Reliability..... 16
 - B. Safety and Customer Focus..... 23
- V. DISTRIBUTION STRATEGY AND PLAN..... 24
 - A. Long-Term Overview..... 24
 - 1. *Preparing for New and Increased Loads*..... 26
 - 2. *Enabling the Clean Energy Transition* 27
 - 3. *Maintaining and Enhancing Reliability and Resilience*..... 28
 - 4. *Modernizing the Grid*..... 30
- VI. DISTRIBUTION CAPITAL INVESTMENTS..... 32
 - A. Historical Michigan Distribution Capital Investments 34
 - B. Supply Chain Issues..... 35
 - C. Planned Michigan Distribution Capital Investments 37
- VII. ADVANCED GRID INTELLIGENCE AND SECURITY (AGIS) OVERVIEW..... 44
- VIII. O&M FORECAST AND RATE CASES..... 48
 - A. O&M Forecast 48
 - B. Forecast vs. Rate Case Development..... 49
- IX. COST-BENEFIT ANALYSIS FEASIBILITY..... 50
- X. CONCLUSION..... 52

MICHIGAN DISTRIBUTION PLAN

I. EXECUTIVE SUMMARY

NSP-W Michigan Distribution Plan for 2025 through 2029 outlines the company's strategy to improve the distribution system's reliability, safety, and customer focus through various initiatives and investments.

Northern States Power Company-Wisconsin (NSP-W) serves approximately 9,000 retail electric customers in Michigan's Upper Peninsula and 267,000 in Wisconsin. NSP-W is a subsidiary of Xcel Energy and operates with a focus on providing clean, reliable energy services. In 2018, Xcel Energy was the first major U.S. energy provider to announce a vision to provide 100 percent carbon-free electricity by 2050. From a 2005 benchmark, in 2023 the NSP System reduced total carbon emissions by 57 percent, provided 41 percent renewable electricity, and total carbon-free resources supplied 64 percent of the energy used by NSP System customers.

NSP-W's Michigan service area is the smallest investor-owned electric utility in the state, covering two counties and seven communities in the Upper Peninsula. The majority of customers are residential, with a significant portion located in Gogebic County. The Michigan service territory faces unique challenges, including sparse population density, non-contiguous service areas, seasonal customers, and heavily forested regions with lake effect weather, which complicate distribution operations and maintenance. NSP-W's Michigan distribution system is also smaller than other Michigan investor-owned utilities, comprising approximately 470 circuit miles of line and 28 feeders served from 22 substations. The system is primarily operated at 12.5 kV, with ongoing projects to phase out older 4 kV operations.

Our investments in our distribution system are focused on achieving four primary objectives: (1) preparing for new and increased loads; (2) enabling the clean energy transition; (3)

maintaining and enhancing reliability and resilience; and (4) modernizing the grid. The company plans significant capital investments in asset health, new business, and capacity projects from 2025 to 2029. These investments focus on replacing aging assets through grid hardening to address reliability and safety for our customers in our Michigan service territory. These investments also aim to enhance the distribution system's resilience, and readiness for future customer needs and technological advancements.

Historically, NSP-W Michigan service territory has had less than desirable reliability performance due to its aging system and grid hardening that is necessary. Starting in 2018, NSP-W began to invest additional capital related to asset health improvements in the Michigan jurisdiction. To improve reliability, NSP-W has focused on grid hardening, including upgrading infrastructure, installing protection devices, and enhancing vegetation management. These efforts aim to reduce the frequency and duration of outages, particularly those caused by storms and vegetation. Not proceeding with future planned investments would be a continued reliability concern for NSP-W's Michigan service territory as these distribution assets are aging and can be prone to more frequent outages. Continuing to make distribution capital investments in our Michigan service territory and receive recovery is necessary and important to provide safe and reliable service to our customers while replacing infrastructure that has reached the end of its useful life.

Additionally, NSP-W is implementing AGIS to modernize the distribution system, including Advanced Metering Infrastructure (AMI), Advanced Distribution Management System (ADMS), and other technologies to improve grid efficiency and customer service. NSP-W plans to deploy AMI technology starting in 2025 to improve outage management, system efficiency, and customer service. AMI will enable automatic outage notifications and provide detailed usage information to customers.

NSP-W's long-term strategy includes preparing for increased loads, enabling the clean energy transition, maintaining reliability and resilience, and modernizing the grid. The company aims to balance cost-effectiveness with the evolving needs of its customers. Preparing the distribution system for the future requires a fundamental and proactive shift in the planning and budgeting framework which has been able to meet the needs of our customers over the last century. Now, our budget framework incorporates not only the necessary work to maintain existing infrastructure, but also the investments needed in new and expanded infrastructure, technology, and workforce to prepare for the future and achieve the strategic outcomes of enabling the clean energy transition, maintaining and enhancing reliability and resilience, and modernizing our customers' interactions with the distribution grid. The health of our distribution system is critical to ensuring we are able to continue to provide reliable electric service today and in the future.

The plan emphasizes grid hardening, vegetation management, replacing aging infrastructure, deploying AMI, and meeting customer expectations to ensure a reliable and resilient distribution system in Michigan along planning the distribution system for the future needs of our customers.

II. COMPANY OVERVIEW

Northern States Power Company, Wisconsin (NSP-W or Company), headquartered in Eau Claire, Wisconsin, is a fully integrated investor-owned utility that generates, transmits, distributes, and sells electricity to approximately 9,000 retail customers in the western tip of the Upper Peninsula of Michigan and 267,000 retail customers in northwestern Wisconsin. In 2023, only 2 percent of NSP-W's retail electric operating revenues were derived from operations in Michigan. NSP-W owns approximately 550 megawatts (MW) of generation (net dependable summer capacity) and over 2,700 miles of transmission facilities, and in August 2023 served a coincident

peak load of approximately 1,425 MW. In August 2023, NSP-W's coincident peak load in Michigan was 23 MW¹. The non-coincident peak of all Michigan distribution feeders is 31.2 MW². NSP-W is also engaged in the retail distribution and sale of natural gas to approximately 117,000 customers in Wisconsin and Michigan.

A. NSP-W Michigan Jurisdiction

NSP-W's total company electric operating revenues in 2023 were approximately \$813.5 million, with Michigan retail electric operating revenues comprising approximately \$16.9 million or approximately 2.1 percent of total NSP-W electric operations. NSP-W's Michigan operations, based on total Michigan sales, make it the smallest investor-owned electric utility in the state of Michigan. NSP-W's Michigan service territory encompasses only two counties (Gogebic and Ontonagon) and seven communities on the western side of the Upper Peninsula directly bordering Wisconsin. See Figure 1 and 2. Communities served in Gogebic County includes Ironwood, Bessemer, Wakefield, Marenisco and Erwin. Communities served in Ontonagon County include Berglund and McMillan. Over 75 percent of our 9,000 electric customers are served in three communities, Ironwood, Bessemer and Wakefield, all located in Gogebic County (See Figure 3).

¹ NSP-W peak load in the state of Michigan occurred in January 2019 and was 27 MW.

² There are some very small feeders that are not included and do not significantly impact this non-coincident peak..

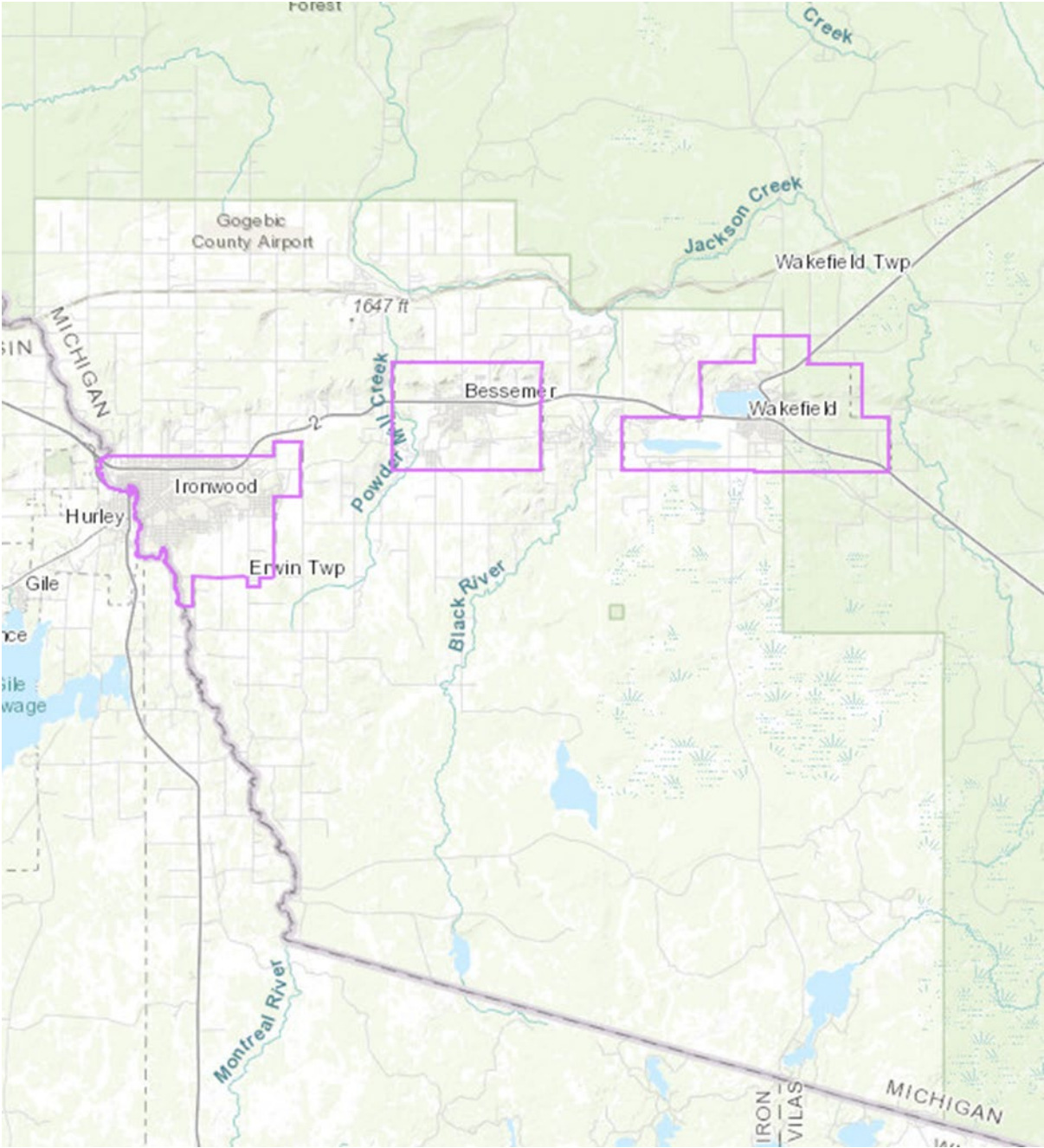
Figure 1 – NSP-W Michigan Service Territory in the Upper Peninsula



Figure 2 – NSP-W Michigan Service Territory – Gogebic and Ontonagon Counties



Figure 3 – NSP-W Michigan Service Territory – Ironwood, Bessemer & Wakefield



As of March 2024, NSP-W’s electric residential rates for a customer using 500 kWh per month are the lowest of the seven MPSC-regulated electric utilities in Michigan. NSP-W only operates one generating plant in Michigan, the Superior Falls hydroelectric plant, a 1.6 MW unit located on the Montreal River in Ironwood.

Approximately 85 percent of our Michigan electric customers are residential, with commercial and industrial customers comprising most of the remaining 15 percent. The distribution of electricity sales by type of customer, however, is significantly different. Residential customers comprise approximately 49 percent of electricity sales, with commercial and industrial customers making up most of the remaining 51 percent. In Table 1 below, additional details on our service territory demographics by census tract are provided.

**Table 1: Service Territory Socioeconomic Data
(NSP-W Michigan Jurisdiction)
Data from Climate and Economic Justice Screening Tool**

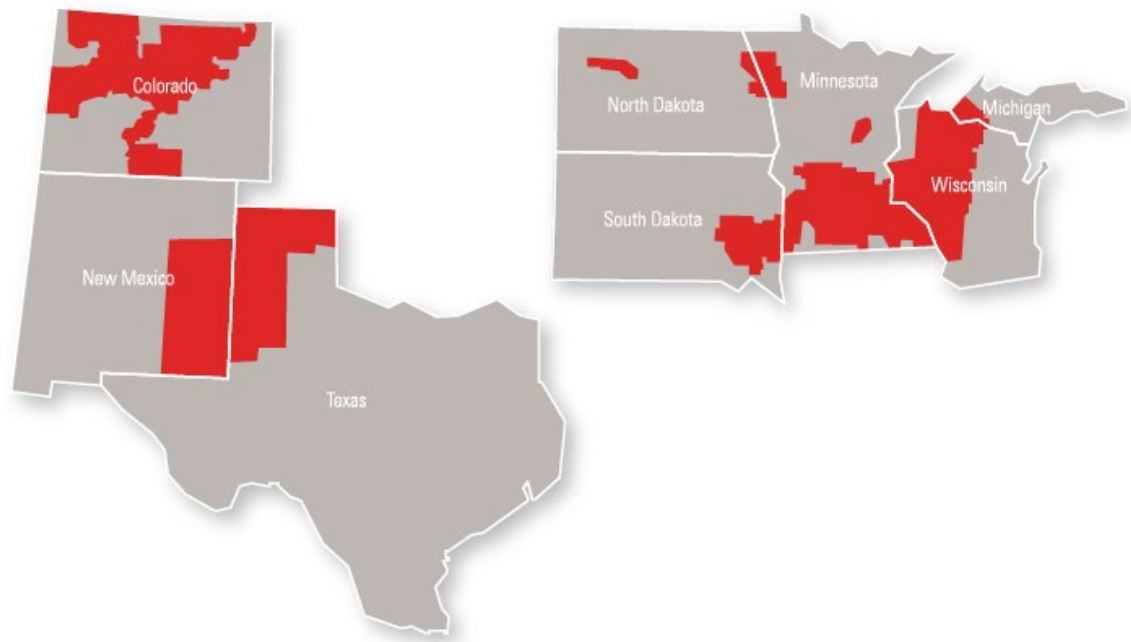
Census Tract	County	Community	Disadvantaged Community	Indicator Percentiles					Natural Hazards Risk Index
				Low Income	Energy Burden	Unemployment	Housing Burden	Low Life Expectancy	
26053950100	Gogebic County	Marenisco	Yes	82	98	21	21	85	61
26053950200	Gogebic County	Wakefield	Yes	74	87	33	53	19	56
26053950300	Gogebic County	Bessemer	No	73	84	60	29	63	58
26053950400	Gogebic County	Marenisco	No	54	91	61	22	52	58
26053950600	Gogebic County	Ironwood	Yes	71	72	48	67	85	57
26053950500	Gogebic County	Ironwood	Yes	89	41	75	62	59	53
26053950700	Gogebic County	Ironwood	No	44	84	52	29	45	61
26131970300	Ontonagon County	Bergland	No	62	94	47	23	9	61

B. Xcel Energy Holding Company

NSP-W is a wholly owned subsidiary of Xcel Energy, a utility holding company headquartered in Minneapolis, Minnesota. Xcel Energy directly owns four utility subsidiaries that operate in portions of eight states. In addition to NSP-W, the other three utility subsidiaries are: (i) Northern States Power Company, a Minnesota corporation (“NSP-M”), (ii) Public Service Company of Colorado, a Colorado corporation, and (iii) Southwestern Public Service Company, a New Mexico corporation. The service territories of these four Xcel Energy subsidiaries include portions of Michigan, Colorado, Minnesota, New Mexico, North Dakota, South Dakota, Texas,

and Wisconsin. See Figure 4. Xcel Energy also operates Xcel Energy Services, Inc (“XES”). XES provides services, at cost, to the four utility operating companies. The services provided by XES to NSP-W include, but are not limited to, executive management, finance, accounting, human resources, information technology, environmental, engineering, legal, and customer service.

Figure 4: Xcel Energy Service Areas



Xcel Energy is focused almost exclusively on its core business of providing regulated electric and natural gas service to its customers through its four traditional, vertically integrated utilities. Xcel Energy’s mission is to provide customers the safe, clean, reliable energy services they want and value at a competitive price.

1. Clean and Reliable Energy Sources

Our customers want clean, reliable energy sources at reasonable prices, and the Company’s strategic priorities reflect those preferences. Xcel Energy has a long-term commitment to diversify the Company’s generation portfolio by reducing reliance on coal, maintaining nuclear generation, and incrementally adding new, cleaner resources such as wind and solar energy. In 2018, Xcel

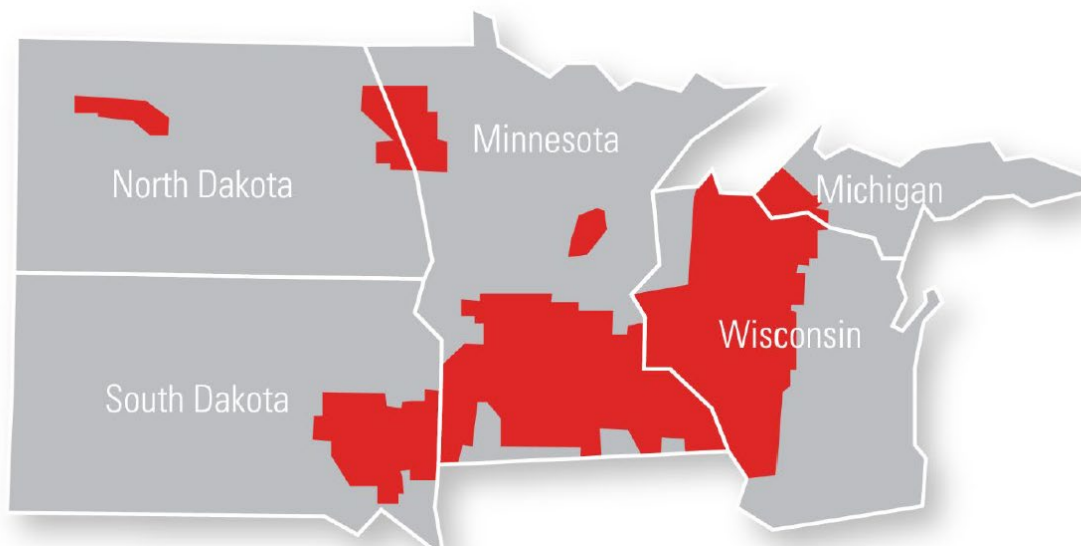
Energy was the first major U.S. energy provider to announce a vision to provide 100 percent carbon-free electricity by 2050. A diverse fuel mix benefits customers by providing increasingly cleaner energy from resources that act as a hedge against future fuel price increases and volatility; it also reduces the cost risk associated with future energy regulations. By taking a proactive approach, Xcel Energy can improve planning certainty, allowing the Company to more effectively manage costs and keep customers' rates competitive over the long term.

NSP-W and NSP-M (collectively the NSP Companies) plan, build, and operate a single integrated electric production and transmission system (the NSP System)³. See Figure 5. Each resource in the NSP System - whether generation or transmission - was developed in consideration of the needs of the entire five-state⁴ NSP System as a whole. This integrated resource planning approach supports the system-wide achievement of economies of scale, allows the operating companies in all five states to share the costs of the resources, and provides resource diversity that would not otherwise be economically feasible for a utility the size of NSP-W. This diversity acts as a hedge for customers against fuel cost variability, concentrated geographic changes to the system, and supply constraints. It also provides value in the form of assurance that the energy supply will be adequate and reliable regardless of changes in market conditions or changes in public policy.

³ The NSP Companies rely on the NSP System to meet the electric needs of their customers, and customers of both companies pay a pro rata share of NSP System capital and operating costs under an agreement approved by FERC. This agreement is referred to as the Interchange Agreement ("I/A")

⁴ The five states included in the NSP System are Wisconsin, Michigan, Minnesota, North Dakota, and South Dakota.

Figure 5 – NSP System



From a 2005 benchmark, in 2023 the NSP System reduced total carbon emissions by 57 percent, provided 41 percent renewable electricity, and total carbon-free resources supplied 64 percent of the energy used by NSP System customers. This has been achieved through retiring coal-fired plants and replacing or refurbishing the highly efficient natural gas plants along with re-licensing and upgrading NSP-M’s baseload nuclear power plants. The NSP system has also invested in wind and solar energy to be combined with our hydroelectric and biomass facilities to expand our renewable energy generation. Ongoing investments in the transmission system have expanded and strengthened the electric grid, enabling increased access to low-cost power supply and continuing excellent service reliability for our customers.

The NSP System is also well positioned to meet Michigan’s clean energy legislation enacted in 2023. The Integrated Resource Plan (“IRP”) for the NSP System, which is filed in Minnesota,⁵ and will be filed in Michigan in the near future, meets Michigan’s clean energy goals when considering the NSP System as a whole. The NSP Companies’ preferred plan provides for

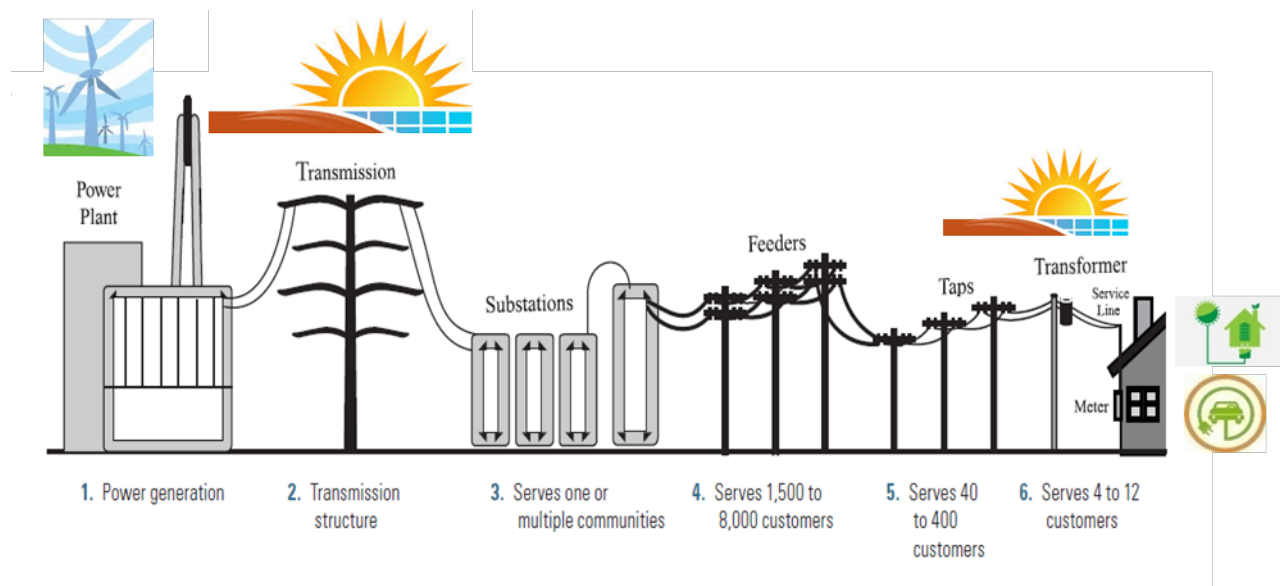
⁵ Minnesota Public Utilities Commission Docket No. E002/RP-24-67

up to 88 percent carbon free electricity by 2030, with 56 percent coming from renewable resources, increasing to 60 percent by 2035.

III. DISTRIBUTION OPERATIONS OVERVIEW

NSP-W’s distribution system is the portion of the electric system that delivers energy from the transmission system to the Company’s electric customers. The electrical grid is composed of generating resources, high voltage transmission lines, and the distribution system, which is the vital final link that facilitates the safe and reliable flow of electricity from substations to our customers as shown in Figure 6 below.

Figure 6: Illustrative Electric Grid



A. NSP-W Michigan Electric Distribution System

The Michigan portion of the electric distribution system has approximately 470 circuit miles of line (as shown in Table 1) and 28 feeders with approximately 12,200 poles served from 19 substations. The majority of the system is operated at 12.5 kV. Approximately 40 circuit miles are still being operated at 4 kV which will be eliminated as a result of an in-progress substation

and feeder project. Approximately 94 circuit miles of the system is underground, and the remaining portion is overhead construction.

**Table 2: Circuit Miles
(NSP-W Michigan Jurisdiction)
Length in Miles**

	Single-Phase	Multi-Phase
12470 Volts	237	98
720 Volts	78	0
4160 Volts	36	16
2400 Volts	5	0
Total	356	114

In addition to the demographics regarding our Michigan service territory provided earlier, there is additional uniqueness associated with our service territory in the Upper Peninsula that make distribution operations and serving our customers unique.

- The population density of our two-county service territory is sparse. We serve two counties in Michigan (Gogebic and Ontonagon). The population density in Gogebic County is 5.2 people per square mile. In Ontonagon County, the population density is 3.3 people per square mile.
- Our Michigan service territory is segmented and interwoven with rural electric co-ops, municipalities, and neighboring utilities. The resulting non-contiguous nature of the territory, along with lower customer density, presents unique challenges in managing and maintaining the distribution system.
- NSP-W’s service territory includes seasonal customers, which presents unique challenges. As seasonal customers are often not present, an absent customer is likely unaware of an outage event and therefore will not notify us. The deployment of Advanced Metering Infrastructure (AMI) (discussed later in this document) will alleviate some these challenges because AMI technology will automatically notify NSP-W when an outage occurs.

- Geographically, NSP-W's Michigan service territory features areas that are heavily forested and experience lake effect weather (e.g., strong wind gusts and snow) caused by Lake Superior. These terrain characteristics present unique accessibility and operational challenges that must be taken into consideration when planning distribution system maintenance.
- Regarding tree density, given that our service territory is densely forested, in this case the tree canopy density is over 64% in the majority of our service territory. This makes vegetation management and continued grid hardening important.

Over the last 6 years, the Company has proactively been investing in replacing aging assets in the Company's Michigan service territory so there are a number of newer distribution assets in place in our Michigan service territory. However, there still exists a portion of the Michigan distribution system that was built in the 1930's and 1940's.

B. NSP-W Distribution Organization

The Distribution organization is responsible for constructing, operating, and maintaining the poles, wires, and cables that connect individual residences and businesses to the larger electrical grid to ensure the delivery of power to the Company's customers is safe and reliable. These facilities are often those most visible to customers. The services provided to customers include operating the distribution system, restoring service to customers after outages, performing routine maintenance, constructing new infrastructure to serve new customers, and making upgrades necessary to improve the performance and reliability of the distribution system. To provide these key services, Distribution manages five functional areas: (i) Operations, (ii) Engineering, (iii) Business Operations, (iv) Planning and Performance and (v) System Planning. The key responsibilities of these areas include:

- ***Operations*** - Responsible for the design, construction, and maintenance of the distribution system, as well as monitoring and operating the system from the Electric Control Center, responding to electric distribution trouble calls, and coordinating emergency response.
- ***Engineering*** - Provides technical support, including addressing distribution-related customer service issues.
- ***Business Operations*** - Responsible for several areas, including vegetation management, outdoor lighting, metering systems and support, facility attachments, and the builders call-line.
- ***Planning and Performance*** - Provides business planning, consulting, analytical services and performance governance and management.
- ***System Planning*** - Provides analysis of the electric distribution system's ability to serve existing and future electricity loads by evaluating the historical and forecasted load levels and utilization rates of major system components such as substations and feeders. We see this changing as our planning processes evolve, to analyze all future electricity connections, rather than just loads.

IV. DISTRIBUTION PRIORITIES

Distribution is the frontline group in the field, implementing the key Company priorities that drive NSP-W's operations on a daily basis; namely, reliability, safety, and customer focus.

A. Reliability

To address reliability, Distribution regularly measures reliability performance and evaluates the overall health of the distribution system to determine investments needed to maintain and reinforce the system. An analysis is periodically conducted to evaluate the overall performance of key components of the distribution system such as poles and wires. NSP-W's capital investment budget has increased to reflect the additional and necessary work to maintain and improve reliability.

Utilities typically measure reliability performance based on System Average Interruption Duration Index ("SAIDI"), System Average Interruption Frequency Index ("SAIFI"), and Customer Average Interruption Duration Index ("CAIDI"). SAIDI measures how long on average a customer does not have power over a set period of time. SAIFI measures how many outages the average customer experiences over a set period of time. SAIDI and SAIFI are average service performance metrics for the entire customer population including customers that have not experienced interruptions. CAIDI measures average length of sustained interruption events for only customers that have experienced interruptions.

Table 3 below presents annual SAIDI, SAIFI, and CAIDI results for NSP-W's Michigan operations, NSP-W overall, as well as the average of utilities reporting through the Institute of Electrical and Electronics Engineers ("IEEE") Distribution Reliability Working Group Benchmarking Study ("DRWG") for the last 5 years, excluding major events based on the IEEE-1366-2012 methodology.⁶

⁶ The IEEE methodology is an industry standard for calculation of reliability performance indices. The methodology includes a process for identification of major event days to allow a separation of analysis for performance on outlier days versus days more representative typical stresses on the power delivery system. This facilitates performance trending to identify changes and assess impacts of system improvement and to facilitate benchmarking with the industry on a more common base.

Table 3: Annual SAIDI, SAIFI, & CAIDI - Excluding Major Events Days

	SAIDI (minutes)			SAIFI			CAIDI (minutes)		
	NSP-W		IEEE	NSP-W		IEEE	NSP-W		IEEE
	Michigan	NSP-W	DRWG*	Michigan	NSP-W	DRWG	Michigan	NSP-W	DRWG*
2018	130	91	98	0.71	0.67	1.14	183	136	85
2019	100	112	103	0.66	0.86	1.32	152	130	71
2020	244	102	187	2.26	0.83	1.42	108	122	119
2021	177	86	201	1.43	0.79	1.46	123	109	89
2022	209	116	193	1.44	0.86	1.39	145	134	125
Avg	172	101	156	1.30	0.80	1.35	142	126	98
2023**	163	85		1.49	0.73		110	117	

* IEEE Distribution Reliability Working Group Benchmarking Survey Median values for the Small Utilities (<100,000 customers) comparison group.

**2023 IEEE data not available at time of filing.

Although Distribution uses the data in the above table to compare performance from year to year and to other utilities, Table 4 below shows the true customer experience by including outages on all days.

Table 4: Annual SAIDI, SAIFI, & CAIDI – All Outages

	SAIDI (minutes)			SAIFI			CAIDI (minutes)		
	NSP-W		IEEE	NSP-W		IEEE	NSP-W		IEEE
	Michigan	NSP-W	DRWG*	Michigan	NSP-W	DRWG	Michigan	NSP-W	DRWG*
2018	222	125	113	1.09	0.80	1.26	204	157	94
2019	106	214	169	0.68	1.03	1.68	156	208	99
2020	346	134	296	2.41	0.91	1.68	144	147	134
2021	562	253	212	2.11	1.13	1.46	266	225	106
2022	391	414	593	1.97	1.41	1.95	198	294	301
Avg	325	228	277	1.65	1.06	1.61	194	206	147
2023**	245	176		1.59	0.95		154	186	

* IEEE Distribution Reliability Working Group Benchmarking Survey Median values for the Small Utilities (<100,000 customers) comparison group.

**2023 IEEE data not available at time of filing.

Though the data in both Tables 3 and 4 above indicate an improvement in reliability results for NSP-W Michigan customers during 2023, performance for both SAIDI and SAIFI show our system is still historically prone to poor results relative to the average NSP-W Wisconsin customer and the average utility customer. The comparative data in Table 4 specifically shows over the last

five years (2018-2022), the average NSP-W Michigan customer experienced over 5 hours (325 minutes/60 minutes = 5.4 hours) without power, while the average NSP-W Wisconsin customer experienced closer to 4 hours (228/60 = 3.8) without power. The average utility customer, as reported through the IEEE DRWG, experienced almost 5 hours (277/60 = 4.6) without power.

Of the large impact events that contributed to the poor performance in 2021 and 2022, over half of those events were storm related. Reliability performance metrics improved in 2023 in large part due to a decrease in storm impacts. Given the inconsistencies shown in the reliability tables, the Michigan reliability performance results are not acceptable to the Company, and assumingly are also not acceptable to the Company's Michigan customers or to the Commission. The distribution capital investments we are focused on directly address this reliability performance.

Customers also expect reliable and uninterrupted power. In today's digital landscape, the rise of social media has empowered customers with multiple channels to express their insights and frustrations during a service outage. In addition, customers are becoming less accepting of outages caused by storms. In response, the electric utility industry, including NSP-W, has worked to develop grid hardening guidelines, which lead to greater resilience of the distribution system.

Grid hardening creates a system that can better withstand storms and other major events through changes to various areas including design standards, siting, construction, maintenance, inspection, and plans for alternate configuration. Grid hardening also includes finding ways to prevent outages in areas susceptible to storm events. Further, the purpose of grid hardening is to ensure that if the system were to fail, it will fail in a manner that minimizes damage to the system, leading to reduced outage times and fewer impacted customers.

Even with the Company's grid hardening efforts, intense weather conditions will always have some level of impact on customers and the system. This is especially true in areas with older facilities and large quantities of trees, such as in the areas of Michigan where the Company serves.

When service to customers is disrupted, the Company uses an industry-leading response protocol to preserve public safety and restore the greatest number of customers as quickly as possible.

Vegetation impacts contribute to 55 percent of SAIDI and 41 percent of SAIFI in Michigan. NSP-W's Michigan system is located in a heavily forested area and consists of smaller conductors (i.e., wires) that have weakened over time due to repeated damage from vegetation landing on them. Because of this deterioration, the conductors have a higher susceptibility to breakage. Older, smaller poles are also more likely to fail when a tree lands on the line. Other primary contributing causes are broken insulators and lightning. In addition, the majority of outages occur on the distribution taps versus the mainline feeder. The taps, or branches, off of the mainline feeder are the lateral lines that accommodate the majority of customers. Taps typically have protective fuses to separate them from the mainline feeder if the taps are faulted. Since the majority of storm-related outages occur beyond the distribution taps, focusing efforts only on substation and feeder improvements will not resolve all of the reliability issues. As such, in order to more fully grid harden the distribution system against storm-related outages, it is necessary to focus efforts on distribution taps in addition to the other capital investments needed. All of these types of capital investment projects, including a pole replacement program, are a focus of the Company.

Table 5: NSP-W-Michigan Primary Outage Causes – All Outages

NSP-W-Michigan Primary Outage Causes - System / All Days						
Primary Cause	5 Year Average (2019-2023)					
	Customers Interrupted (CI)	Customer Minutes Out (CMO)	Outage Count	% SCI	% CMO	% Count
Veg Tree	6,611	1,551,503	86	42%	53%	27%
Unknown	908	291,093	24	6%	10%	8%
Arrester	1,740	223,798	5	11%	8%	1%
Lightning	251	161,685	12	2%	6%	4%
Environment	320	155,327	4	2%	5%	1%
Animal	838	129,174	41	5%	4%	13%
Insulator	247	73,416	1	2%	2%	0%
Intentional	715	69,618	86	5%	2%	27%
Public Damage	989	67,571	5	6%	2%	2%
Accidental	1,610	65,999	4	10%	2%	1%
Conduct Fatigue	489	46,479	1	3%	2%	0%
Connector	143	34,574	6	1%	1%	2%
Voltage Regulator	266	17,027	0	2%	1%	0%
Fused Cutout	75	11,733	14	0%	0%	4%
Overload	72	11,710	3	0%	0%	1%
Cable	25	9,141	7	0%	0%	2%
Pole	202	5,744	1	1%	0%	0%
Conduct Contact	33	5,554	4	0%	0%	1%
Transformer	27	4,495	5	0%	0%	2%
Fuse Link	12	948	4	0%	0%	1%
Bushing	1	332	0	0%	0%	0%
Debris In Line	3	302	0	0%	0%	0%
Rd Spray	0	12	0	0%	0%	0%
Breaker	0	0	0	0%	0%	0%
Terminator	0	0	0	0%	0%	0%

Reliability can be improved through three methods: reducing the number of customers impacted by an outage event, shortening an outage event, or eliminating an outage event.

Minimizing the number of customers impacted by an event can be accomplished through installation of a series of protection devices along the line, including the installation of reclosers and fuses at tap positions, as explained above.

Shortening of an event can occur by building a hardened system that will resist failures and mechanically coordinate the failures when they occur. NSP-W, in conjunction with the Electric Power Research Institute (“EPRI”)⁷, identified grid hardening opportunities by completing engineering studies, full-scale experiments, and simulated tree contact on a de-energized older line. Today, NSP-W incorporates grid hardening by increasing pole size and moving to composite cross-arm materials, along with grade B construction for guying on any new construction or rebuild. By strengthening the system, the number of outages can be reduced. When a tree lands on the line, a hardened system tends to resist asset breakage and may only require clearing the obstruction. Looping the system backbone so power can be rerouted through switching prior to fixing the problem can shorten an outage. In a hardened system, when a failure occurs, the portion of the system most likely to break should also be the easiest to repair (e.g., the wire versus a pole or cross-arm). Alternatively, relocating a line to an area that is more easily accessible by repair crews can also shorten an outage.

Eliminating an outage event can be accomplished through installation of equipment such as animal protection on pole mounted transformers. Outages can also be eliminated by relocating lines from an area with high exposure to vegetation. Removing an antiquated substation can prevent an outage from occurring and, if an outage were to occur, reduce repair time because spare parts are more readily available.

In addition, to ensure we are prepared, we maintain a high level of storm response readiness that guides our planning, execution, and communications – and we regularly assess and drill our readiness and response. Our planning and preparations start well in advance of an actual weather event with foundational elements such as agreements with contractors to supplement our field

⁷ The document Distribution Grid Resiliency: Overhead Structures can be located on EPRI’s website at www.epri.com.

forces when needed – and mutual aid agreements with other utilities for the same purpose. As soon as the Company knows there is an outage, a crew is dispatched to investigate. When the crew arrives on the scene, it assesses the problem and proceeds with the repair. Due to the complexity of the Company’s electric system and the variety of potential causes of an outage, this process can take several minutes or, in extreme circumstances, hours. Time estimates can vary based on the extent of the outage, public safety issues that take priority, etc. The Company’s restoration process gives top priority to situations that threaten public safety, such as live, downed wires. Repairs are then prioritized based on what will restore power to the largest number of customers most quickly. Crews work safely around the clock until power is restored to all customers.

The Company regularly conducts maintenance on the NSP-W Michigan system, including maintaining a four-year vegetation maintenance cycle. The overall goal of the Company’s vegetation management program is to develop site-specific, environmentally sensitive, cost-effective, and socially responsible solutions to vegetation control near electric facilities. We do this through risk-based scheduling of our distribution maps considering in past outages, customer counts, and other risk factors, which allows us to best manage potential SAIDI impact. So, while we measure our cyclical interval using four-years as a base, some maps get scheduled after only 3-4 years, while others may not be scheduled for 6-7 years based on the results of risk scoring. Vegetation work includes trimming trees, so they do not grow into the lines and identifying and mitigating branches and trees inside and beyond the right-of-way that are considered a hazard. The vegetation maintenance group tracks and investigates vegetation caused events. Of the approximately 75,000 NSP-W Sustained Customer Interruptions (“SCI”) investigated in 2023, it was determined that 92 percent of the vegetation events were not preventable. That is, if tree trimming were performed the day before, the event still would have occurred. Damage from trees is one of the leading contributors to long outages and with additional tree failures due to the

ongoing impact of emerald ash borer, the Company expects to see longer outages. To make a marked improvement in the Company's reliability performance, and because of the high density of trees and the impacts of emerald ash borer in NSP-W's Michigan service area, it is essential to rebuild areas of its system to address reliability issues. Meeting today's grid hardening standards and relocating lines to avoid vegetation damage are important strategies to consider in conjunction with rebuilding.

B. Safety and Customer Focus

Safety remains a top priority for NSP-W. Distribution takes actions to support the safety of the Company's workforce and customers in a variety of ways, including:

- Capital investments in fleet, tools, and equipment that ensures workers have the necessary provisions and support to do their job safely and efficiently.
- Vegetation management program that helps reduce preventable tree-related service interruptions and addresses public and employee safety.
- Damage prevention program that helps the public identify and avoid underground electric infrastructure.
- Pole replacement program that ensures lines and equipment are supported by quality wood poles.

Customer Focus is reflected by providing NSP-W's customers with more choices related to their energy use. This is demonstrated through the Company's support of new technologies and distributed generation. NSP-W has also worked to improve its ability to determine an Estimated Restoration Time ("ERT") and provide customers with updates to ERT. The Company also flags customers that experience four or more events in a twelve-month period. This allows NSP-W's engineers to track and address reliability issues. In addition, the Company is introducing a

corporate Advanced Grid Intelligence and Security (“AGIS”) initiative, which allows for increased transparency for customers regarding the services they receive. The corporate AGIS initiative enhances the Company’s ability to more quickly identify and dispatch crews for system issues that are detected and is discussed in more detail in the Company’s strategy and plan below.

Community input is essential to the success of these grid resiliency projects. During planning, construction, and operation, the Company identifies key personnel to remain connected and continue listening to community perspectives on the project. The community relationship manager and operations & maintenance site manager will monitor and respond to community feedback during site planning, installation, and operation, respectively. Community grievances will be handled on an individual basis. If common issues are reported by multiple community members, we evaluate and provide an appropriate response.

V. DISTRIBUTION STRATEGY AND PLAN

A. Long-Term Overview

Distribution makes capital investments to improve the safety and reliability of the system, to improve system functionality, and to modernize the distribution system. Distribution also maintains safe and reliable service by making significant investments to support capacity needs due to increased loads from existing or new customers and to relocate existing facilities in response to road construction projects. As Distribution makes these investments, it does so with an eye to the future to ensure that the investments it makes not only support the customer’s need for safe and reliable service today, but also lays the groundwork for the grid of the future. We expect the technology, policy interests, and customer expectations to continue to inform our strategy in significant ways in the next five to 30 years.

The essential role that electricity plays in our customer’s lives is ever-changing. While the power system is the lifeblood of our economy, we are anticipating that as customers continue to electrify additional areas of their lives, such as transportation and space heating, there will be additional service expectations placed on our system. Notably, Electric Vehicles (“EV”), heating load and Distributed Energy Resources (“DER”) could grow to increase the electric demand seen today in the long-term outlook. Through continuous improvement and step changes in our planning approach and standards, we are committed to meeting these challenges and maximizing opportunity over the long-term as these new demands become more prevalent with our Michigan jurisdiction customers.

Currently, the Company has seen very small amounts of EV or DER interest in our Michigan service territory given the small communities and population in which we serve. Based on EV registrations, as of April 2024, there are 14 registered electric vehicles in the Company’s Michigan service territory. Additionally, as of August 2024, the Company has 10 DER customers. Given these figures the Company does not expect significant growth in EV or DER loads in the 5-year plan, and these issues are not discussed extensively in this current distribution plan related to our Michigan service territory or customers. Given the small amount of DER and EVs in our Michigan service territory and that the Company does not expect that to grow significantly in the next 5 years, the Company has not modeled hosting capacity for our Michigan service territory at this time. However, the impacts of DER in the planning process used by Xcel Energy across the eight-state system will be explained at a high level.

Customer expectations continue to increase, as will their reliance on the electric system to support everyday activities. Moreover, the distribution system will continue to add new types of loads and resources – with unique and different profiles compared to historical distribution system operation. Simply put, “normal” distribution planning will evolve over the long range to capture

new opportunities for system reliability and resiliency. In an increasingly power-dependent world, maximizing power quality and minimizing the number and length of power outages experienced by customers is key to customer satisfaction.

Within this rapidly shifting planning landscape, the evolution of the Company's distribution strategy and planning process is ongoing. Our strategy incorporates not only the necessary work to maintain existing infrastructure, but also proactively identifying and investing in the necessary additional infrastructure, capabilities, and workforce needed to prepare for the future. The combination of these two approaches will allow us to facilitate the clean energy transition, maintain and enhance reliability and resilience, and modernize our customers' interactions with the distribution grid. The health of our distribution system is critical to ensuring that we are able to continue to provide reliable electric service today and in the future. In short, our distribution strategy is to:

Proactively invest in our distribution system so that capacity is available before our customers need it as well as prepare our system to accommodate increasing penetration of distributed generation resources. We plan to do this by making investments in baseline capacity, improving asset health thereby decreasing reliability risk, and deploying industry leading technology solutions, both hardware and software, to maximize grid value while maintaining affordable rates for customers.

Our investments in our distribution system are focused on achieving four primary objectives: (1) preparing for new and increased loads; (2) enabling the clean energy transition; (3) maintaining and enhancing reliability and resilience; and (4) modernizing the grid. We discuss each of these strategic objectives and our plans to achieve them below.

1. Preparing for New and Increased Loads

Since Xcel Energy serves eight states and millions of customers, Xcel Energy is preparing for a future with increasing loads and DER. Planning for these new expectations begins with evolving our forecasting capabilities to better anticipate these impacts on our system. Where cost-

effective, it will also be important to consider non infrastructure alternatives such as non-wires alternatives and demand response. The combination of these strategies will allow us to meet the evolving expectations of our customers while also remaining focused on prudence and cost-effectiveness. We are taking a strategic and balanced approach to our system planning that will maintain or enhance levels of service for all customers while enabling future load growth and DER. Increasing our investment in the system is necessary, and keeping bills low remains a priority for the Company. The Company's ability to recover those investments in cost recovery proceedings is vital not only to providing basic utility service but also to comply with new laws and Commission requirements. As always, we will continue to weigh and prioritize competing objectives to manage costs.

In addition, we are building new capabilities and ways of working that will be crucial to the long-term health of the system. Just as the grid is evolving, so must the personnel who engineer, design, operate, and maintain it. As initiatives continue to grow, such as DER interconnections, we need to add additional resources to existing teams. As load growth increases, DER strategies change and emerge, technologies continue to evolve, our personnel must do the same. We anticipate our resources to grow as our load curve grows, however, at an earlier and proactive pace. We need more engineering employees to design the uptick in capital projects. Along with our existing skillsets, we will ramp up our resources with data analytics, project management and emerging technologies.

2. *Enabling the Clean Energy Transition*

The electric sector is already moving quickly to decarbonize power generation and is uniquely positioned not only to lead the decarbonization of the sector itself but also to contribute significantly to a net-zero economy. Our Upper Midwest Xcel Energy System is already over 40 percent renewables and 60 percent carbon free. Supply resources are becoming less carbon-

intensive and more diverse; decentralization of generation is accelerating – driven by advances in technology and new business models, as well as new and expanded policy priorities focused on increasing distributed solar and other DER as well as broad electrification of transportation and other end-uses.

Indeed, federal incentives for decarbonization in both utility generation as well as residential and DER investments are driving an enormous increase in the renewable market. The Inflation Reduction Act (IRA) – the largest climate investment ever by the US government – is expected to more than triple US clean energy production in less than 10 years, which would result in about 40 percent of the country’s energy coming from renewable sources such as wind, solar and energy storage by 2030.

3. Maintaining and Enhancing Reliability and Resilience

Our customers expect high quality, uninterrupted power. We will continue to focus on reliability (the day-to-day performance of the grid); as well as resilience (the ability of the grid to withstand and recover from significant events). This plan evaluates the health of our existing system and identifies areas where we need to make investments to continue to serve our customers reliably.

Reliability and resilience are often overlapping, but different concepts that can require different or complementary grid tools and investments. Reliability improvement opportunities focus on the day-to-day performance of the grid by reducing both the number and duration of outage events on the system. Resilience, on the other hand, focuses on improving the distribution system’s ability to withstand, endure and recover from significant events that can create widespread outages and result in long-duration restoration times.

Climate change increases the volume and intensity of storms. It also creates more extreme temperatures. Increased system resilience will be a crucial component of maintaining day-to-day

reliability. To that end, we regularly evaluate the overall health of our system on an ongoing basis and make investments where needed to reinforce our system. This evaluation includes an asset health analysis of the overall performance of key components of the distribution system such as poles and underground cables. Based on this analysis, we develop programs and implement replacement and maintenance work plans to both support our customers' needs for reliable service today, and to lay the groundwork for the grid of tomorrow. While we have been making ongoing investments to maintain the reliability of the system by replacing assets on an as-needed basis, we will increase the level of these investments to address the growing number of assets that have reached or are approaching their estimated service life. The next section of the plan document details the asset investment needs and programs employed to address them. Without these needed asset replacements, the system will be at greater risk of outage events and slower restoration due to equipment failures. This equipment remains the backbone of our operations and we will need these assets to operate smoothly so we can see the efficiency gains expected from our grid modernization investments. Our approach to capital investments needs to balance a variety of considerations including risk, cost, service, and customer demands.

At the same time, both reliability and resiliency are dependent on system security – both physical and cyber. The Company has a dedicated Enterprise Security and Emergency Management (ESEM) business unit that encompasses both cyber and physical security, security governance and risk management, and enterprise resilience and continuity services. This combination of services is designed to cover analysis of vendor risks, alignment of the technology with security standards, secure solution design and deployment, integration with Company solutions including user access management and system monitoring and incident response, as well as threat analysis and planning for continuity of business operations in the event of a disruption. The Company's security risk management program provides Company leaders with information

about threats and the level of security risks, so that mitigations and responses can be planned that are proportional to the risk.

Finally, we will continue to implement physical security measures to ensure the safety of our assets. We have focused strategic physical security efforts on assets based on their criticality to the stability of the electric grid. Recent physical security events throughout the nation have highlighted the need to address the security of assets beyond the traditional bulk electric system substations. The Company is currently working to expand physical security efforts and is evaluating substation facilities to not only address their criticality to the stability of the electric grid, but their importance to our customers and communities.

4. *Modernizing the Grid*

The fourth area of focus for distribution is on the implementation of a variety of grid modernization investments. We have implemented foundational modernization efforts on the distribution system over many years, maintaining a grid that is reliable and as efficient as it could be with the technology it currently employs. We are now modernizing the grid in an increasingly impactful way in response to the changing landscape of customer usage patterns, policies, and technical developments. These are through our AGIS investments which include:

- An Advanced Distribution Management System (ADMS) that provides grid operators important and necessary visibility and control of increasingly complex distribution grid operations,
- Advanced Metering Infrastructure (AMI) that provides customers with detailed usage information to understand and modify their usage to save energy and money – and foundational capabilities for the Company to improve its operations, lower costs, and more efficiently implement advanced rates and load flexibility programs,

- A Field Area Network (FAN), which brings value to customers by facilitating two-way communications between AMI meters and other smart devices on the distribution grid and the Company's back-office systems, and
- Fault Location, Isolation, and Service Restoration (FLISR), which will significantly improve reliability for customers by automating actions on the grid to isolate faults and providing insights to operators that improve outage response efficiency.

We are also moving forward with Distributed Intelligence (DI), leveraging the on-meter computing capabilities of AMI meters. The analytics made possible through DI can provide additional insights to help customers make more informed decisions about their energy usage, increase the ability to connect customers to demand-side management programs, and increase the efficacy of time-differentiated rates. In addition, DI allows the Company to create new, innovative demand side management and demand response offerings. As we take an enterprise-wide approach to our DI plans, Michigan customers will be able to access and benefit from new apps and tools that become available. AGIS will be discussed in-depth in the capital investment section of this plan.

Future grid modernization investments will be necessary to integrate more DERs, keep pace with load growth, and ensure efficient and sound operations in an increasingly complex environment. We envision a highly integrated technology environment playing a key role in overcoming challenges such as fluctuations in the grid's frequency and voltage, reduced inertia, and bi-directional power flows. An integrated environment will allow operators to further collaborate to maintain safety and reliability of grid operations through evolving conditions. The deployment of Distributed Energy Resources Management System (DERMS) is an emerging approach to connect and manage DER on the utility system. As penetration levels of DER increase, there is an increasing need to have more visibility and active management and coordination with

DER to maintain a secure, reliable, and resilient distribution system. Currently, Xcel Energy is examining DERMS capabilities in the market and will explore vendor capabilities in more detail through 2024 for our larger jurisdictions like Minnesota and Colorado. Given our small customer base in our Michigan service territory, DER customers are limited, and the Company does not expect DERMS to be necessary for our Michigan customers in the next 5 years.

VI. DISTRIBUTION CAPITAL INVESTMENTS

Electric and gas utilities are long-term, capital-intensive businesses. Every year, we prepare a five-year financial forecast that is used to anticipate the financial needs of each Xcel Energy operating utility company, including NSP-W. This forecast includes a budget for both Capital and O&M spend. The majority of the distribution budgets have been dedicated to immediate customer reliability needs and other shorter-term investments impacted by the dynamic nature of the distribution system. This includes building and maintaining feeders, substations, transformers, service lines, and other equipment – as well as restoring customers and our system in the wake of severe weather and responding to local and other government requirements to relocate our facilities.

Preparing the distribution system for the future requires a fundamental and proactive shift in the planning and budgeting framework which has been able to meet the needs of our customers over the last century. Now, our budget framework incorporates not only the necessary work to maintain existing infrastructure, but also the investments needed in new and expanded infrastructure, technology, and workforce to prepare for the future and achieve the strategic outcomes of enabling the clean energy transition, maintaining and enhancing reliability and resilience, and modernizing our customers' interactions with the distribution grid. The health of our distribution system is critical to ensuring we are able to continue to provide reliable electric

service today and in the future.

Each year when a five-year budget is created and approved, however, as we get closer to when spending will occur, our forecasts become more refined, based on more relevant information for the upcoming period. Distribution budgets must maintain flexibility to adjust to emergent circumstances and weather.

Distribution's capital projects fall primarily into three capital investment groupings depending on the primary purpose of the project. These groupings are: (i) Asset Health, (ii) Capacity, and (iii) New Business.

Asset Health projects are related to replacing infrastructure that is experiencing high failure rates and frequent outages, and as a result, negatively impacts the reliability of service and increases operating and maintenance expenditures needed to repair this equipment. When poor performing assets are identified, projects that will improve asset performance are included in the budget. Projects in this category include replacement of wood poles, overhead lines, cable, and substation equipment that have reached the end of their useful life. This category also captures replacements due to storms and public damage. Additionally, this category covers projects to relocate utility infrastructure in public rights-of-way when mandated to do so to accommodate public projects such as road widening or realignment. These public projects, often referred to as "mandates," generally follow municipal and state funding availability. These mandate projects often result in updated distribution infrastructure.

Capacity investments include all distribution system projects associated with upgrading or increasing capacity to handle load growth on the system and to serve load when other elements of the distribution system are out of service. This includes installing new or upgraded substation transformers and distribution feeders. Capacity projects often span multiple years and are necessitated by increased load from either existing or new customers.

New Business includes new overhead and underground extensions and services associated with extending service to new customers. Capital projects required to provide service to new customers include the installation or expansion of feeders, primary and secondary extensions, and service laterals.

A. Historical Michigan Distribution Capital Investments

The Company’s historical actual distribution capital investments, by category, for 2019 through 2023 along with forecasted spend for 2024 are set forth in Table 6 below. The values in Table 6 represent capital expenditures for distribution.

Table 6 – Distribution Non-AGIS Capital Investment 2019-2024 (in Millions)

Major Category	2019 Act	2020 Act	2021 Act	2022 Act	2023 Act	2024 Fcst
ASSET HEALTH & RELIABILITY	\$1.9	\$3.0	\$2.0	\$3.7	\$4.7	\$3.5
NEW BUSINESS	\$0.3	\$0.4	\$0.6	\$0.4	\$0.7	\$0.6
CAPACITY	\$0.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.7
OTHER	\$0.1	\$0.1	\$0.0	\$0.0	\$0.0	\$0.0
Total	\$2.5	\$3.5	\$2.6	\$4.1	\$5.4	\$4.8

Starting with the Company’s 2018 rate case proceeding and continuing with the 2022 rate case, the Company presented plans to begin to increase distribution investment through an Asset Health initiative to ensure greater reliability. This plan included continued replacement of aging distribution infrastructure related to reliability. In addition, the plan included increasing the Company’s investments for rebuilding and relocating overhead lines during this time period.

In 2022 and 2023, the Company completed a significant portion (approximately 73 percent) of the Penokee substation conversion project consisting of 4 feeders being converted from 4kV to 12.5kV. Due to supply chain constraints the remaining portion of this project will be completed in 2025. The Penokee project will be discussed in more detail later in the plan.

The Township Feeder Rebuild was also completed in 2023 which relocated portions of the feeder line that runs east of the Township substation from a heavily vegetated right-of-way to a road right-of-way and also upgraded the conductor size. The benefits are increased reliability and capacity, in addition to reducing the risk from severely degraded wires and poles that are susceptible to vegetation related outages. The Township feeder has historically been one of the top five worst performing feeders in our Michigan service territory.

Additionally, approximately 15 percent of the Bessemer Feeder Extension project was constructed in 2023 with the remaining portion scheduled to be completed in 2024 and early 2025, as discussed later in the plan. The majority of the asset health category spend for 2024 is related to the Bessemer Feeder. The Bessemer feeder has been one of the top three worst performing feeders in our Michigan service territory, including in 2023 as reported in the Company's Service Quality and Reliability Standards annual report in Case No. U-12270.

During 2022 and 2023, the Company replaced 155 tested poles, reducing risk of broken poles from wind, ice, or vegetation. In 2024, the Company will address the remaining replacement and reinforcement poles identified in the last several years.

B. Supply Chain Issues

Since 2020, we are experiencing cost increases due to inflation in materials and labor rates. Supply chain issues have affected the economy since the start of the COVID-19 pandemic and these issues continue to impact distribution planning. Although many types of equipment are affected by supply chain challenges, the most significant impact is in transformer supplies. Disruptions in overseas and domestic manufacturing have caused significant delays and shortages of critical materials such as steel and components required in the manufacturing of transformers. Further, labor disruptions have become a factor in supply chain and inflation and other factors

have driven costs up at least 50 percent over 2020 averages. Given these challenges, in order to invest in our system to address issues with reliability and aging infrastructure, the Company needs to increase the level of capital spend in the near term as shown by the increase in Table 7.

We are also taking steps to make our supply chain more redundant and resilient to mitigate the impact of the industry-wide transformer shortage. These steps include:

- Increasing our inventory of transformers and other equipment and working with vendors to ensure that they are expanding their own inventories wherever possible.
- Placing long-term purchase orders for new equipment
- Seeking to diversify our suppliers where possible. While we are focused on domestic equipment sources, we are also seeking additional transformer and conductor suppliers outside the US for the first time. We have entered into new contracts with two manufacturers in South Korea for regular shipments of distribution transformers. Currently, these suppliers offer shorter lead times than the domestic transformer sources.
- Exploring the use of alternate materials, designs, and parts where appropriate.
- Establishing a dedicated market intelligence and business analytics team to evaluate supply chains and plans for critical materials, including transformers, cable and wire, wood poles, and other equipment.
- Expanding our transformer rebuild and refurbishment program to its maximum capacity.
- Increasing spare quantity levels to support planned and emergent projects.
- Leveraging alliance agreements, which can help improve lead times.

Despite these efforts, these supply chain issues are not expected to abate in the near term, which presents a national security challenge requiring a federal response. To that end, we are working with industry partners, the US Department of Energy, transformer manufacturers, and other critical infrastructure partners to encourage federal action on this issue. The federal

government could support efforts to improve the availability of labor and use the Defense Production Act to reconfigure other US manufacturing facilities to produce distribution transformers and seek federal funding for expanded production. We continue to communicate with builders and developers about transformer supply for their projects as we navigate ongoing challenges with long lead times for equipment for new projects, which further necessitates important prioritization and thoughtful planning approaches.

C. Planned Michigan Distribution Capital Investments

Over the last three years, the Company has averaged approximately \$4.0 million per year in capital investments related to Asset Health projects as shown in Table 6. This historical level of capital investment will not meet the requirements to improve our system integrity, ensure employee and public safety, and to fulfill customers' reliability expectations. As shown in Table 7 below, the majority of the capital investments in 2025 through 2029 are in the Asset Health category associated with specific projects or initiatives. Distribution has identified multiple Asset Health projects to address key aging infrastructure components, including rebuilding and relocating overhead lines. Not proceeding with these investments would be a reliability concern for NSP-W's Michigan service territory as these distribution assets are aging and can be prone to more frequent outages. Continuing to make distribution capital investments in our Michigan service territory is necessary and important to provide safe and reliable service to our customers while replacing infrastructure that has reached the end of its useful life. The Company is also prioritizing distribution capital investment to address storm hardening and reliability—areas on which the Commission is focused. While some of these projects will be initiated and completed by 2025 through 2029, others may extend beyond the 2029 timeframe.

Table 7 – Distribution Non-AGIS Capital Investment 2025-2029 (in Millions)

Major Category	2025 Fcst	2026 Fcst	2027 Fcst	2028 Fcst	2029 Fcst	Total 5-year
ASSET HEALTH & RELIABILITY	\$6.2	\$7.0	\$3.2	\$5.4	\$2.2	\$24.0
NEW BUSINESS	\$0.6	\$0.6	\$0.7	\$0.6	\$0.6	\$3.2
CAPACITY	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
OTHER	\$0.0	\$0.0	\$0.0	\$0.1	\$0.0	\$0.1
Total	\$6.8	\$7.6	\$3.9	\$6.1	\$2.8	\$27.3

Table 8 below details the projects that the Company is prioritizing for 2025 through 2029. As detailed, these projects span multiple years and phases. The projects over this timeframe primarily focus on reducing the length of an outage, preventing an outage from occurring, rebuilding or upgrading older lines and substation equipment, and relocating lines away from heavily vegetated areas. In addition, although no specific undergrounding projects are provided in the 5-year plan, we have contemplated targeted undergrounding for some specific projects. However, targeted undergrounding is only one component of resiliency planning for the broader distribution system. The capital investments included in Table 8 are estimated based on previous and similar projects, and on unit-based costs that are built into our estimating tools.

Table 8– Distribution Asset Health Investments (in Millions)

Asset Health Project	2025 Fcst	2026 Fcst	2027 Fcst	2028 Fcst	2029 Fcst	Total Fcst
Penokee Range Substation Conversion	\$3.4	\$1.8				\$5.2
Bessemer Feeder Extension	\$0.6					\$0.6
Indianhead Substation Rebuild	\$0.8	\$3.8	\$1.6			\$6.2
Bergland Substation Rebuild			\$0.2	\$2.4		\$2.6
Bergland Feeder Cable Replacement				\$0.9		\$0.9
Pole Replacement Program	\$0.4	\$0.4	\$0.4	\$0.7	\$0.7	\$2.6
Other Routine Replacement/Programs	\$1.0	\$1.0	\$1.0	\$1.4	\$1.5	\$5.9
Total	\$6.2	\$7.0	\$3.2	\$5.4	\$2.2	\$24.0

Penokee Range Substation Conversion

This project was started in 2021 and continues through 2026 with the voltage conversion of the Ironwood area from 4 kV distribution to 12.5 kV. With the completion of the new Penokee Range Substation in 2020, feeders can now be designed, and construction can be executed to convert feeders from the old 4 kV Ironwood Substation to 12.5 kV. The conversions of the four feeders from the old Ironwood Substation to the new Penokee Range Substation started in 2021 and will continue into 2025. The project was targeted to be completed in 2023, however, transformer supply chain constraints have extended the project into 2025. Rebuilding and relocating these overhead lines will complete the conversion of the distribution from the old Ironwood Substations to the new Penokee Range Substation. The benefits of this project include improved capacity and reliability with a new substation, 12.5 kV distribution, improved feeder ties with adjacent substations, and retirement of the 4 kV substations at Ironwood and Northside. Some of these feeders being converted are some of the worst performing feeders in our Michigan service territory based on historical outage data.

Bessemer Feeder Extension

This project was also discussed in the 2022 Rate Case due to expected expenditures in 2023 at that time. This project was slightly delayed due to supply chain constraints and acquiring land easements. This project extends the Bessemer feeder 5 miles to connect with the Great Lakes feeder and rebuilds the Great Lakes feeder from single-phase to three-phase. The Bessemer feeder project was started in 2023, continues in 2024 and will be finalized in 2025. Additionally, the Bessemer feeder is one of the top three worst performing feeders in our Michigan service territory. This project resolves the risk of an extended outage of the Great Lakes distribution system if the Great Lakes Substation transformer were to fail.

The Great Lakes Substation is at end of life and is in poor condition. Another alternative for the Great Lakes Substation that was considered but rejected included buying spare transformers to install beside the existing, in-service transformers. That option was rejected due to inadequate working clearances in the Great Lakes Substation and the poor condition of the entire facility. In addition, rebuilding the Great Lakes Substation in the same location is not an option because NSP-W has no way to off-load the Substation during construction. The Company also lacks adequate property for the rebuild. Lastly, building a new substation nearby was also rejected because of higher costs and the need for transmission conversion. We therefore think of the available options, our current plan best achieves our reliability goals.

Indianhead Substation Rebuild

This project is to rebuild the Indianhead substation in Wakefield, Michigan which is 53 years old. The existing substation is considered to be at end of life and is in poor condition. Due to the age of this substation, the substation is experiencing deteriorating asset health and the associated reliability issues. In rebuilding the substation, the existing 34.5kV - 12.5kV, 3.5 Mega Volt Amp (“MVA”) transformer will be replaced with a 34.5kV - 12.5kV 7 MVA transformer in order to accommodate any load growth in the area. The new substation will improve distribution reliability in the Wakefield area. This project is planned to start in 2026 and continue through 2027.

Bergland Substation Rebuild and Feeder Cable Replacement

This project is to rebuild the Bergland substation in Bergland, Michigan which is 51 years old. This project is very similar to the Indianhead Substation rebuild. The existing substation is considered to be at end of life and is in poor condition. Due to the age of this substation, it is experiencing deteriorating asset health and the associated reliability issues. In rebuilding the substation, the existing 34.5kV-12.5kV, 3MVA transformer will be replaced with a 34.5kV -

12.5kV 7MVA transformer to accommodate any load growth in the area. The new substation will improve distribution reliability for the Bergland township. This project is planned to start in 2027 and be completed in 2028.

The feeder conductor replacement portion of the project is to rebuild aging overhead infrastructure on the Bergland feeder, in coordination with the substation rebuild. The existing overhead is end of life and is in poor condition. The rebuild includes approximately two miles of three-phase overhead line and three miles of single-phase overhead line. An overhead capacitor and several protective devices will also be replaced. This work will be completed in 2028 in conjunction with the substation rebuild.

Pole Replacement Program

The Company is increasing the routine replacement of poles that have been identified in need of replacement or reinforcement to further improve reliability and storm-harden the system given the aging pole infrastructure. The estimated investment of \$0.4 million each year will replace or reinforce approximately 80 poles per year.

By way of background, the Company has an assess-and-treat wood pole program that ensures wood poles have adequate strength to support their load. Assessment procedures include visual inspection, sounding and boring of the poles, and excavation of the base of the poles to determine the presence of damage or decay that may impact groundline strength. Remaining strength is modeled in the field at the time of assessment using specialized software and inputting dimensions of any damage or decay contributing to section loss and/or reduction of circumference. Poles determined as having less than the necessary strength based on National Electric Safety Code (“NESC”) standards are classified as priority replacement or are reinforced through trussing. Poles determined to be NESC compliant are remedially treated to prevent or arrest wood decay. Distribution has a goal of achieving a 12-year assessment cycle on wood pole assets (the actual

poles inspected each year can vary depending on the cycle for operating company and overall budget). As mentioned above, NSP-W has approximately 12,200 poles in its Michigan service territory. Since the start of the NSP-W pole assessment program in 2013, all of the poles in the Michigan service territory have been assessed at least once. The 12-year assessment cycle will start again in 2025. Annually, the expected overall average of approximately 8 percent of poles were identified each year will as needing replacement or reinforcement. Assessment results are delivered to the Company's engineering department and designed for replacement or reinforcement as identified through the wood pole assess-and-treat program. If a considerable number of poles are identified as needing replacement in a concentrated area, rebuilding that section of the line will be considered, and this investment would be classified as a discrete rebuild project.

Other Routine Replacements

Distribution taps drive the majority of outages related to vegetation issues. Without the distribution tap work, the Company will not be able to fully storm-harden the system with feeder and substation investments alone. As the feeders and substation equipment detailed above are upgraded or rebuilt, the Company will also be focused on the related distribution tap rebuilds due to aging infrastructure, high levels of outages, and extended outages. The benefits of these distribution tap rebuild are minimized outages. The Company is estimating that the capital investment related to distribution taps will occur over the next 5 years. The amount included in the 2025-2029 amount in Table 8 is \$1.0 million per year for such routine replacements.

Areas with reliability issues are studied and O&M maintenance work is completed when that is the best option. The installation of squirrel guards or a replacement cross-arm on a newer pole are good examples. In cases with an older line that has experienced numerous vegetation-related outages, rebuilding to a more robust system and relocating when feasible will offer future

benefits through improved reliability of the system. As described above, our projects are focused on aging assets that routinely affect the reliability of our system. Regarding pole replacement, very few poles are viable after 100 years in service and with many aging poles, along with the associated wire, replacing poles and wire on a case-by-case basis may only delay the ultimate solution of rebuilding a line while also incurring increasing reliability issues and maintenance costs in the interim.

Infrastructure Investment and Jobs Act (IIJA) Grants

Additionally, the Company is also working on distribution projects related to Infrastructure Investment and Jobs Act (IIJA) grant dollars awarded by the State of Michigan. NSP-W is awaiting final grant award negotiation with the U.S. Department of Energy (DOE) for a Grid Resilience and Innovation Partnerships (GRIP) application submitted through the Michigan Department of Environment, Great Lakes, and Energy (EGLE) in November 2023. The GRIP funding (if awarded pending negotiations with DOE) is over and above the proposed distribution budget and would simply result in incremental work beyond what is proposed by the Company. The Company's proposal for this GRIP funding is to expand current planned resiliency projects in Michigan, including vegetation management on distribution lines. Specifically, the Company has requested dollars that will enable the rebuild of roughly 1.5 miles of the Bessemer feeder three phase overhead line and reroute certain portions of the line to improve accessibility on the western portion of the Bessemer feeder. Additionally, the Company has requested matching funds for vegetation management that would allow the Company to clear an additional 51.6 miles on the Bessemer feeder. This feeder has a high proportion of tree caused outages and the customers served by this feeder would see a direct reliability benefit.

VII. ADVANCED GRID INTELLIGENCE AND SECURITY (AGIS) OVERVIEW

In addition to the investments in poles and wires in Michigan, Xcel Energy is also making investments to modernize the distribution system in all the states we serve through the AGIS initiative. The AGIS initiative is a long-term strategic plan to transform our electric distribution system to meet multiple goals, including the promotion of efficiency and reliability and the safe integration of more distributed resources into our system. This initiative will build an advanced electric grid that is more resilient and provides more tools and options for customers. Implementing AGIS requires, among other things, replacing customers' electric meters, and we will start the effort to replace our Michigan customers' electric meters in 2025 through our AMI initiative. During this transition, we will put more technology in place for the long-term benefit of our customers and our overall system.

NSP-W currently has limited visibility into the distribution grid and relies on customers to notify it of operational incidents such as outages. When responding to incidents, NSP-W currently must send workers out into the field to locate the source of the problem. Of course, this effort takes time and expense that in many cases can be improved and even avoided with the implementation of AMI and the other components of AGIS. AMI meters will notify the Company when a sustained power outage occurs⁸, and through an integration with its Outage Management System ("OMS"), improve the efficiency of NSP-W's response and thus the customer experience. AMI will benefit the operation of the grid and customers in this and other ways with improved system efficiency, reliability, and operations, and will include improved distribution system management efficiency, improved outage management efficiency, improved outage management during storms, reduction

⁸ As noted on Page 8 of Chad Nickell's testimony in Case No. U-21565-004, AMI meters will aid in the calculation and reporting of momentary interruption "events" but will have limitations for reporting of all momentary interruptions.

in field and meter services, and improved efficiency in distribution maintenance. In addition, the Company will maintain AMI data so in the future, the data can be used to design rates and other customer offerings.

NSP-W's vision for the future distribution grid is one that utilizes advances in technology to improve monitoring and operation of the grid for the benefit of customers. The implementation of AGIS and DI will provide NSP-W with timely and accurate information about what is happening on all portions of the grid, from substations down to each individual customer's meter. These investments will also provide the necessary information, automation, and intelligence to help NSP-W address problems more efficiently. In some cases, these insights will alert NSP-W to situations likely to result in an outage (such as overloaded equipment) before an outage even occurs. The increased number of field sensors and devices will also provide NSP-W with the necessary information to continually monitor and adjust the system to support any increases in DERs and other technologies such as EVs.

There are several components of the AGIS initiative in Michigan including ADMS, AMI, FAN and DI.

ADMS is an integrated operating and decision software and hardware support system to assist control room, field personnel, and engineers with monitoring, controlling, and optimizing the electric distribution system. As further technology is rolled out, ADMS will support the management and complex interaction of operations across the grid, from DERs to outage events, feeder switching, operations, and advanced applications utilizing intelligent field devices. ADMS gives the Company access to real-time and near-real-time data to provide information to operator console(s) at the distribution control center on a single integrated platform, which means the different technologies will communicate with and update each other in the ADMS platform. ADMS is also the fundamental platform that will utilize the enhanced asset data that is being

gathered as part of the ADMS project and updated in the Company's Geospatial Information System ("GIS"). Implementation of AGIS and DI has been and will be occurring over several years. ADMS is a necessary foundation for other components and is therefore already operational. The Company is continuing to invest in ADMS in 2024, as part of enhancing the Company's asset records in its GIS and will be complete before the start of 2025.

AMI is an integrated system of AMI meters, communications networks, and software systems that together enable secure two-way communication between customer meters and utilities' business and operational systems. AMI meters can measure and transmit voltage, current, and power quality data and can act as a sensor, providing timely monitoring at the customer's point of service, which has a variety of uses for customers and business operations. AMI is a key element of grid modernization because it provides a central source of information that interacts with many of the other components. AMI has the potential to benefit customers in many ways, including enhancing NSP-W's ability to operate the distribution system, providing new information and insights to customers, enabling new rate options, and facilitating new capabilities to further enhance the customer experience. AMI will be deployed to Michigan electric customers in 2025.

FAN will be a resilient wireless communications network. It will provide connectivity and enable two-way communications between the existing infrastructure and new and planned field devices, including the AMI meters at customer premises. The FAN will be a single, general-purpose, wireless networking resource capable of simultaneously accessing diverse types of endpoints, each with its own performance requirements on NSP-W's electric system. These endpoints will include a variety of field devices, including reclosers, electric meters, capacitor banks, and essentially any other field device capable of communication. These endpoint devices also participate in the FAN mesh network by providing connectivity and act as repeaters. Going forward, FAN will be able to communicate with other endpoints as new devices are installed or

existing devices are upgraded with communications modules. The installation of the FAN includes the network design, deployment, and commissioning of new communication devices that are installed throughout the same geographic areas in which the Company is installing AMI meters. New communication devices are primarily installed on distribution poles owned by the Company. The FAN implementation activity for Michigan began in 2024 and will continue into 2025. FAN is built out approximately six months in advance of the deployment of AMI meters.

DI refers to data processing capabilities within the AMI meters the Company will be deploying. DI is related to the AGIS initiative but is considered separate from it because it relates to the additional hardware and software necessary to store data and host certain processes that interact with the meters. The AMI meters include a DI platform, which is the equivalent of a small computer within the AMI meters that can process data in real time. This provides the Company with powerful capabilities that we will use to help customers better understand and reduce energy usage, and help the Company detect and respond to issues on the distribution system. Without DI, the Company and customers would not have the same access to this information. Enabling the DI data processing capabilities includes deploying applications that will run on the meter and the development of information technology ("IT"). Namely, in this context IT refers to the infrastructure and architecture work involved in the creation of the software to integrate the DI effectively, reliably, and securely with Xcel Energy's back-office systems. This includes integration with meter data and customer information systems, as well as development of the core load analytics capability which unlocks much of the potential for future applications. Infrastructure development also consists of data center infrastructure (including servers, storage, and network infrastructure) and other hardware to support DI implementation. The Company is making additional investments under the DI project to enable both customer-facing and grid facing capabilities that enhance the value of the Company's meter investment. This includes additional

insight and information regarding energy usage for customers, which will allow customers to reduce bills, and additional insight and information for the Company’s employees, which will improve the Company’s ability to enhance service quality for customers. Capital spend related to DI has already begun and is planned to continue over the 5-year period and beyond. Table 9 below shows the Company’s capital spend related to AGIS. Capital spend becomes less after 2025 when the AMI replacements are completed.

**Table 9: Grid Modernization - Capital Expenditures
(NSP-W Michigan Jurisdiction)
(Dollars in Thousands)**

Component	2024	2025	2026	2027
AMI – MI*	\$95	\$1,786	\$0	\$0
AGIS- Other	\$130	\$47	\$40	\$40
FAN	\$166	\$14	\$0	\$0
ADMS	\$26	\$0	\$0	\$0
DI	\$9	\$4	\$0	\$0
Total	\$426	\$1,851	\$40	\$40

VIII. O&M FORECAST AND RATE CASES

A. O&M Forecast

The distribution O&M budget is associated with maintaining, inspecting, installing, and constructing distribution facilities such as poles, wires, transformers, and underground electric facilities. It also includes labor costs related to vegetation management, which includes the work required to ensure that proper line clearances are maintained, maintain distribution pole right-of-way, and address vegetation-caused outages, and damage prevention, which includes costs associated with the location of underground electric facilities and performing other damage prevention activities. This includes our costs associated with the statewide “Call 811” or “Call Before You Dig” requirements, which helps excavators and customers locate underground electric infrastructure to avoid accidental damage and safety incidents. Finally, it includes the fleet

(vehicles, trucks, trailers, etc.) and miscellaneous materials and minor tools necessary to build out, operate, and maintain our electric distribution system. The 5-year O&M budget for the distribution business unit is provided in Table 10 below showing that the Company’s Michigan distribution O&M averages approximately \$1.0 million per year.

**Table 10: Distribution O&M Budget
(NSP-W Michigan Jurisdiction)
(Dollars in Thousands)**

Category	2025	2026	2027	2028	2029	Avg.
Labor	\$526	\$629	\$609	\$605	\$605	\$595
Contract Labor/Outside Vendor	\$503	\$592	\$623	\$578	\$616	\$583
Materials	\$61	\$67	\$67	\$65	\$67	\$65
Transportation	\$84	\$91	\$87	\$84	\$82	\$86
First Set Credits & Other	(\$271)	(\$304)	(\$336)	(\$216)	(\$262)	(\$278)
Total	\$903	\$1,075	\$1,050	\$1,116	\$1,109	\$1,050

Finally, we emphasize that the distribution budget is an ongoing and iterative process that is largely driven by the immediacy of reliability and other emergent circumstances that are the practical reality of the distribution business. Notably, our capital and O&M storm restoration spend is uneven year-to-year due to the unpredictable nature of storms. Over the 5-year period of 2019-2023 Michigan total storm spend has averaged approximately \$180,000 with about 75% of that amount O&M expense with the remaining 25% capital-related. However, the storm O&M spend was much more significant in 2022 and 2023 and averaging \$210,000 each year for O&M alone.

B. Forecast vs. Rate Case Development

This Distribution Plan presents a long-term plan and vision for the distribution grid, and a five-year year action plan that aligns with our internal forecasts and budgets. By contrast, a rate case requests cost recovery of near-term investments – most recently filed for the years 2025-2027 in Case No. U-21565 and still pending – and includes information inherent in the ratemaking process like cost of service, capital additions, and revenue requirements, which are not reflected

in the IDP. The timing of rate case filings is determined based on internal analyses of our financial position and other factors; there is typically no predetermined or set schedule for rate case filings.

For distribution, we revisit our five-year budget each year, and the outer years of the five-year forecast are particularly subject to change as we gain more information on system needs. Maintaining this flexibility in the budget (and in actual spending) is critical because it recognizes the dynamic nature of the distribution system and the practical realities of maintaining it. For example, as noted above, the number and strength of storms varies year to year, which is reflected in the variation in actual year to year spending on storm restoration. For these reasons, the five-year budget we present in this Distribution Plan will not be identical to the costs for which we seek recovery in a past or future rate case.

IX. COST-BENEFIT ANALYSIS FEASIBILITY

The Company does not believe that conducting a cost-benefit analysis (CBA) for all discretionary projects (at the work order level) is feasible or prudent given (a) the sheer volume of projects, (b) the lack of clarity around what would be considered a “discretionary” project, and (c) the divergent priorities/values that stakeholders place on projects that would need to be reduced to a monetary value for purposes of a CBA.

As an initial matter, there is no single universally accepted method of performing a cost benefit analysis. However, every process has some variation of the following five steps:

1. Identify Project Scope
2. Determine Costs
3. Determine Benefits
4. Compute Analysis Calculations
5. Make Recommendation and Implement

Based on this definition, the Company conducts CBAs for a variety of projects in the distribution budget. For example, the Company conducts a robust CBA/risk analysis for capacity projects. This risk scoring methodology helps the Company prioritize capacity projects based on the reliability and financial benefits of the projects compared to the costs. While we have called it a risk analysis, it is a CBA.

It is not efficient to conduct a CBA for all discretionary work, and we are concerned that this will impede developing the necessary investments to meet our customer's needs. First, the volume of projects in the distribution five-year budget makes CBAs for each project impracticable and costly. There is a cost to these analyses, and customers ultimately pay for those prudently incurred costs. It is important that we not only ensure thoughtful prioritization of our distribution system investments appropriately, but that we, consistent with regulatory requirements, thoughtfully strive to maximize benefits and minimize costs to customers. Moreover, we are concerned that there is not yet sufficient stakeholder consensus on which specific projects are indeed "discretionary" to be able to narrow the list of those projects that could be subjected to a CBA. Finally, a CBA requires project benefits to be identifiable and capable of reduction to a monetary value, and we understand that stakeholders have varying priorities for distribution system investments, which could lead to disagreement on CBA methodologies and assumptions, which could in turn delay important projects.

All that said, we do conduct, CBAs for Michigan investments when necessary such as the AMI investments. This CBA is confidential in nature and was shared as part of recovery in the last Michigan electric rate case (Case No. U-21097) and in the pending rate case (Case No. U-21565).

X. CONCLUSION

This NSP-W Michigan distribution plan for 2025 through 2029 focuses on several key areas to improve the distribution system and ensure safe and reliable service for customers:

1. **Grid Hardening:** Implementing grid hardening measures to create a system that can better withstand storms and other major events. This includes changes to design standards, siting, construction, maintenance, inspection, and plans for alternate configuration.

2. **Vegetation Management:** Addressing vegetation impacts, which contribute significantly to outages. This involves managing tree density and ensuring continued grid hardening to prevent outages caused by vegetation.

3. **Aging Infrastructure:** Replacing aging assets in the Michigan service territory, including overhead conductors and poles that were built in the 1930s and 1940s.

4. **Advanced Metering Infrastructure (AMI):** Deploying AMI technology to automatically notify the company when an outage occurs, especially in areas with seasonal customers.

5. **Reliability Performance:** Regularly measuring reliability performance and evaluating the overall health of the distribution system to determine necessary investments. This includes analyzing key components such as poles and wires.

6. **Customer Expectations:** Ensuring reliable and uninterrupted power for customers, especially in today's digital landscape where customers have multiple channels to express their insights and frustrations during service outages.

These recommendations aim to enhance the reliability, safety, and customer focus of the distribution system, addressing the unique challenges of the Michigan service territory.

Additionally, the backbone of distribution planning is ensuring we have the right infrastructure in place to keep the lights on for our customers and to be ready to accommodate new

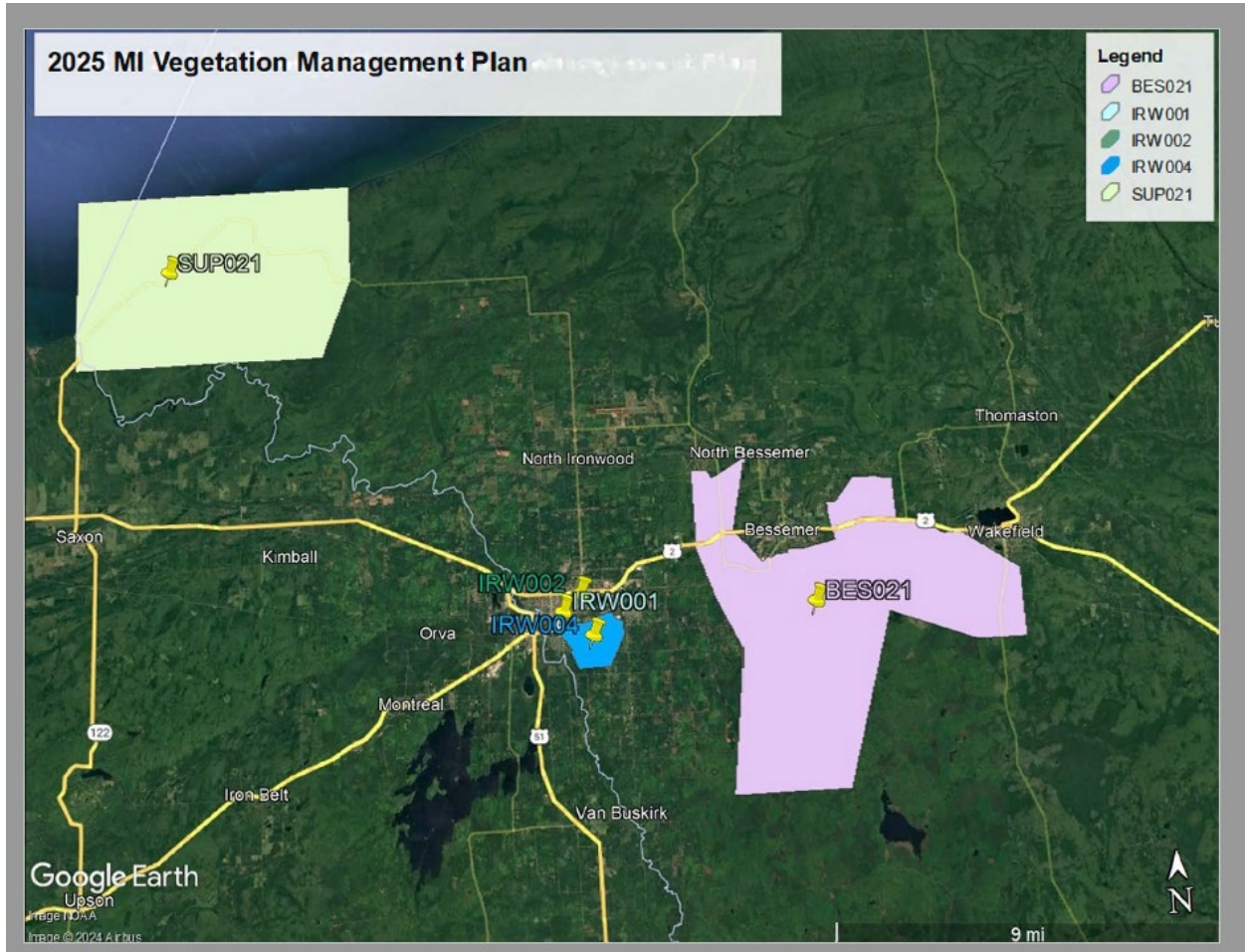
customer load and DER growth in a timely fashion. We continue to take measured and thoughtful action to balance these key factors and ensure our customers receive the greatest value both now and over time, and that the fundamentals of our distribution business remain sound. We take a long-term view of system planning to ensure that we can continue to maintain a safe, reliable system today while building the grid of the future.

As we continue to maintain a safe, reliable, resilient, and affordable distribution system over the next five years, the new planning landscape, as discussed above, has the potential to challenge the current capabilities and resource requirements; we must ensure that our teams continue to have the appropriate skillsets, knowledge, and experience that will be necessary as the grid of the future takes shape. With the tools and strategies discussed in this plan, we are taking a measured and thoughtful approach to ensure our customers receive the greatest value and that the fundamentals of our distribution business remain sound.

As we prepare for the future, the evolving technology, policy interests, and customer expectations will continue to inform our strategy and may require changes in the way we plan for and operate our grid. We are at a transformational time for the distribution system, and we appreciate the opportunity to share our plans with the Commission.

APPENDIX A

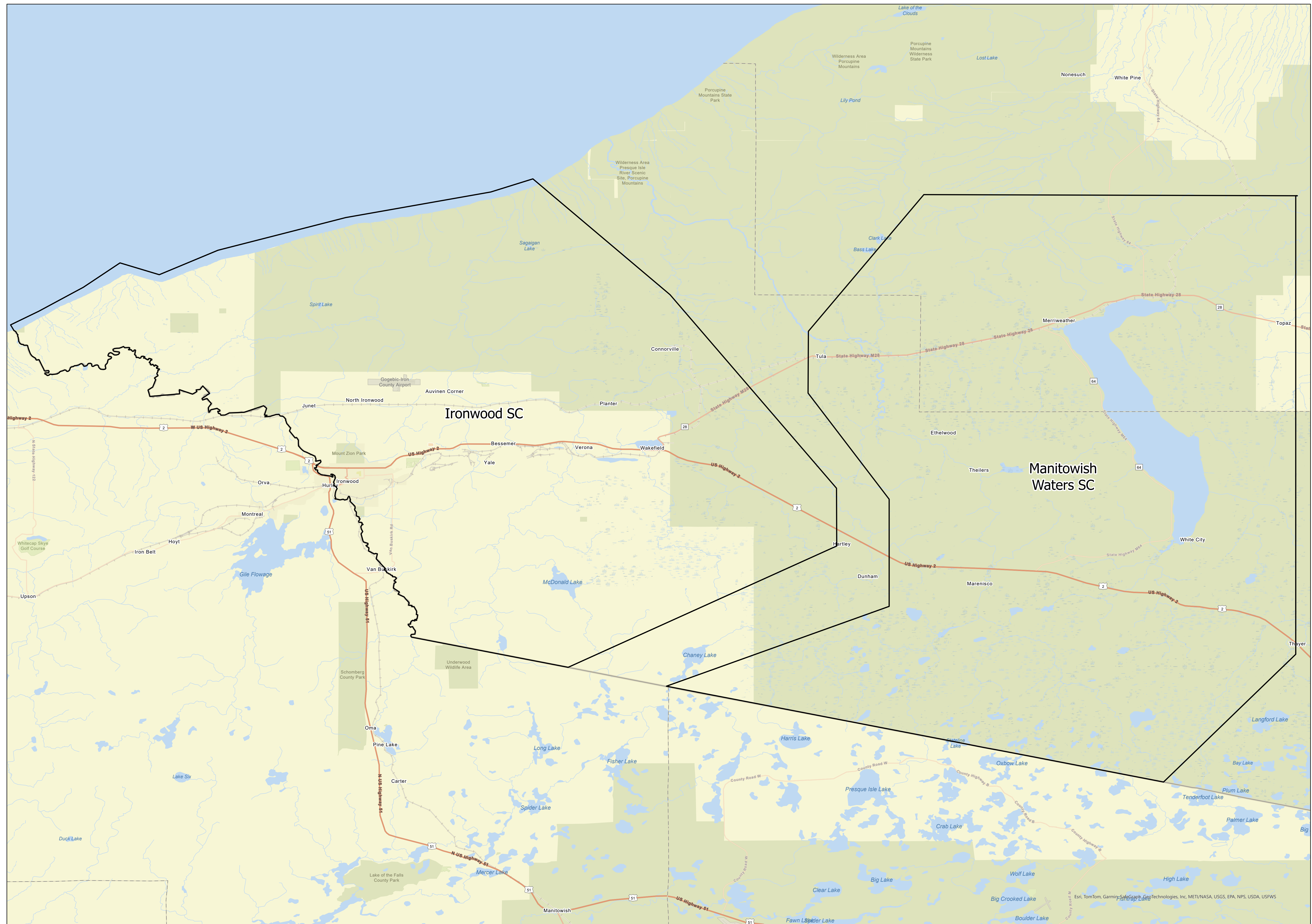
2025 Vegetation Management Plan



APPENDIX B

Service Territory Map

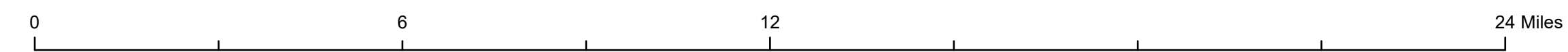
UP-MICHIGAN SERVICE CENTER BOUNDARIES



DISCLAIMER: THERE ARE NO REPRESENTATIONS OR WARRANTIES (EXPRESS OR IMPLIED) ABOUT THE ACCURACY OF THIS PRINT. THIS PRINT IS PROVIDED WITH NO CLAIM AS TO PRINT COMPLETENESS, TIMELINESS, ACCURACY OF CONTENT OR USEFULNESS. STATE LAW REQUIRES ANYONE DIGGING, GRADING OR EXCAVATING TO OBTAIN A PRIOR FIELD LOCATE OF ALL UTILITIES; THIS PRINT DOES NOT DISCHARGE THIS REQUIREMENT OR ANY OTHER REQUIREMENT. THE COMPANY AND ITS AFFILIATES ASSUME NO LEGAL RESPONSIBILITY OR LIABILITY FOR THE RECIPIENT'S USE (OR ANY OTHER PARTIES' USE) OF THE PRINT, INCLUDING THE RECIPIENT'S INTENDED PURPOSE IN USING THE PRINT. NO COMPANY EMPLOYEE OR OTHER PARTY HAS BEEN AUTHORIZED TO PROVIDE THIS PRINT FOR PLANNING OR ESTIMATING PURPOSES; RELY ON THIS PRINT AT YOUR OWN RISK. BY ACCEPTING THIS PRINT, THE RECIPIENT & ANY OTHER PARTY RECEIVING A COPY OF THE PRINT ACKNOWLEDGES AND AGREES TO THIS DISCLAIMER. For All Field Locates Call 811

THIS DOCUMENT IS XCEL ENERGY CONFIDENTIALS AND PROPRIETARY INFORMATION AND MAY NOT BE REPRODUCED IN WHOLE, OR IN PART, NOR MAY ANY OF THE INFORMATION CONTAINED HEREIN BE DISCLOSED WITHOUT THE CONSENT OF XCEL ENERGY. CONFIDENTIALS AND PROPRIETARY INFORMATION © 2019 XCEL ENERGY INC. | XCEL ENERGY IS REGISTERED TRADEMARK OF XCEL ENERGY INC

Legend
 — Service Center Boundary



APPENDIX C

NSP-W Michigan Service Territory Distribution System Maps

CONFIDENTIAL

APPENDIX D

NSP-W Distribution Asset List

CONFIDENTIAL