Speaker 1 (00:07):

[inaudible]

Rachel Johnson (00:08):

I'm Rachel Johnson, the member relations manager here at Cherryland electric cooperative. Oh boy. Do I have a good one for you guys today? We're going to talk about grid capacity and utility peaking. I know two of your favorite topics, certainly very timely as we continue to enjoy a very warm sun summer. So one of the things that we monitor as a utility is when we peak and what we mean by that is when we sell the highest amount of electricity and we monitor monthly peaks, yearly peaks, all time peaks, um, just kind of, it's a part of our planning process to make sure that we have enough electricity available to meet the demand. Um, and also allows us to recognize any trends in the amount of demand for electricity. Recently in July, we set an all time high peak for our system four times in a row.

Rachel Johnson (00:56):

So what, what that means is four days in a row, we kept beating our all time peak, which is crazy. It was just super hot, uh, with the current situation with the COVID crisis, a lot of people are still working from home or have more people from home. So we had more people at home running air conditioning, and the demand for electricity was really high. When we start to see high demand for electricity, us industry, folks start paying really close attention to how much supply we have available to meet that demand because we know that our members are counting on us to help keep the lights on during those situations. And that's the subject of a recent chat I had with Zach Anderson from Wolverine power cooperative. Zach is the chief financial officer at Wolverine. And many of you who listen frequently are familiar with Wolverine.

Rachel Johnson (01:44):

Wolverine is our power provider. They provide power generation and transmit transmission services for us. And for four other distribution cooperatives in Michigan, Wolverine is also a cooperative. It is governed by a board of directors who are we that is comprised of directors from each of the distribution. Co-op so ch Cherryland has two people who you vote for to represent you on the Cherryland board, who are then appointed to also represent your interest on the Wolverine board. So before I kick it over to my conversation with Zach, um, just a little groundwork, so it's easier for you to follow along. You will hear us refer several times to miso. Miso is an acronym for Mid-Continent independent system operator, which is really just a very long way of saying the grid operator. When we talk about my soul, we're talking about the grid and my soul manages the electric grid for our region.

Rachel Johnson (02:37):

And Zach will explain a little bit more about what that means. We also dig into what we referred to as max gen events or maximum generation events. And this happens, it's essentially a procedure that's implemented by miso to help stabilize the grid during times when demand for electricity is particularly high, or if supply for electricity is particularly low. So I'm kind of, uh, two really technical terms, but they really help us to understand all the work that's going on behind the scenes to help keep the lights on during these, uh, high demand times or these really hot times. And also kind of think about the impact that this, some of the trends we're seeing might have for our future power supply planning. If you have any questions after the podcast, don't hesitate to reach out to me by leaving a comment on the blog or by emailing me at R Johnson at Cherryland electric dot co-op.

Rachel Johnson (03:34):

Again, that's rJohnson@cherrylandelectric.co op, and now I'm going to kick it over to my conversation with sex. We can talk a little bit more about the state of the grid and our ability to meet the demand for electricity, Zach, thanks for joining us today. Uh, you know, I was just thinking about this. I think you may in fact, be one of our most prolific guests. I feel like you've been on the podcast more than we've had almost anyone else on the podcast. So thank you for, thank you for always taking the time. And I know our members really appreciate getting to hear Wolverine's perspective on some of the issues impacting them.

Zach Anderson (04:05):

Oh, thanks for having me. Certainly my first podcast experience via zoom. So see how this

Rachel Johnson (04:12):

We're, we're super modern here. So for the listeners at home, I've been saying this for months now. I am in fact still recording from my house. Although, uh, I, I moved my studio out of the basement, so I have sunlight. So it does feel a little bit like a, uh, an improvement, but hoping to be back in the, in the room together soon. But the, the thing that brought Zach and I together for our conversation today is as we go through the hot summer season, one of the things we're watching is the, the grid's capacity to serve the energy demand as we see increased air conditioning load and things like that. And so I just invited Zach on to kind of help talk through how the grid operates and how some of those, um, those pressures on our supplier handled. So, uh, to kind of start us off SAC, can you explain what the regional grid is and kind of how it works?

Zach Anderson (05:00):

Yeah, yeah. So this is, this can be a very complex thing. There's, there's a lot that goes on in the broader quote unquote grid as we call it. So the U S has really broken up into four major power grids. There's everything essentially East of the Mississippi. Then there's a West of the Mississippi sands, California, and some of that area is broken up. And then there's Texas, like Texas is just their own thing. It's called ERCOT, they're Texas. They know how to do it better than anybody else. So we are in Michigan interconnected to really the broader and the largest, one of the largest grids in the world and where we sit for the most part with our load here in Michigan is within a subset of that grid, which is called the Mid-Continent independent system operator. So as its name implies, it spans the mid continent within North America.

Zach Anderson (06:00):

In fact, that covers not only the U S portion of the grid, but it covers parts of Ontario and Manitoba as well. So, um, spanning from Canada all the way down to the Gulf of Mexico miso is watching managing generation and transmission on the quote unquote grid throughout the mid continent. As the name implies, the independent is important in the, in the name because they are looking out for supply and demand balance within all of the market participants. So Wolverine being a market participant, large investor owned utilities like DTE and consumers energy here in the state of Michigan are, um, market participants. And we look out for our generation and our transmission within that broader market. But what we're really looking at for, for miso is to bring that independence, to take all of the available supply and match it as best they can to the demand throughout every single minute, every single second, all year long.

Rachel Johnson (07:09):

So I just want to make sure that I'm following. So basically what miso is doing is not necessarily their job. They're not picking winners and losers. Their job is to look at the grid and say, here's everything we know we have available to sell here's everything we know people want to buy. How do we best match those things up and keep the, keep the grid balanced and things, the lights on basically, right? So then what happens or does it ever happen that they have times when those two things don't match up? How do they handle that? If they start to see some sort of imbalance where maybe we're have we had, they're seeing higher demand than what we have supply for something like that.

Zach Anderson (07:44):

So this is going on every single day, they're looking at supply and demand. So we can quite literally see, um, supply issues, generation issues. When we save supply, what we're meaning here is having enough generation to meet the, meet the demand. And so that's something that's happening every single day. And if they miso becomes concerned that there isn't enough supply to meet demand or demand is outpacing supply. On a particular day, they have a multitude of steps they can work through. So really there, there are about eight steps that, that they take from telling people to prepare. So think of, uh, like when you're watching the weather and you see a weather alert comes out and it says, we're, we've got a severe weather watch going on right now. So that's, that's what my, so does. They'll tell us it's time for conservative operation. So be prepared, get your transmission system or your generation that may not have been available.

Zach Anderson (08:48):

If it can be available, get it ready, get it prepared because we're seeing a condition that may warrant that, that coming on to run. And so continuing the weather analogy. At some point, you moved from a watch, Hey, let's, let's be prepared and ready to a warning. This is we're now in a condition that says, Hey, those generators and those transmission lines that we said, we need those things in service. Those need to be in service now. So turn that generator on and get it running. So you really move from a preparation to an operational phase. And, and then from there, if they continue to see issues, there are multitude of steps, which are, let's borrow a cup of sugar from our neighbor, if you will. So, Hey, we don't have enough generation within miso to meet this demand. We need to look to a neighbor.

Zach Anderson (09:43):

Like I said, the grid is as we're participating East of the Mississippi, there's generators in different markets, other markets, other than miso, that may be able to come to the aid of the Mid-Continent independent system operator. There might be a generator in Ohio, that's in a different market that can help out miso in Michigan. So you start looking to your neighbors to say, do you have available supply to be able to help you out from there? If you've exhausted everything within your market, if you've, um, knocked on your neighbor's door to say, Hey, what do you have available to help me out? Then you start looking to, let's ask the demand side. So let's ask Rachel at her house to turn her thermostat up to 78 or 80 degrees and turn off any unnecessary lights in the house, turn off that the extra TV, if you can, whatever you can do to conserve, spend the rest of your afternoon on your smartphone.

Zach Anderson (10:41):

That's not plugged in, knock yourself out, but turn off your TV and your cable box and whatever else you have running. That's where we would reach out to Cherryland from Wolverine. Wolverine would get a directive from miso and they would say, Hey, we're doing everything that we can. On the supply side,

we have all the generators running that are available. We have all the transmission in service that can be put into service right now. So we need you to reach out to anyone that you can and make what's called a public appeal. So for someone like Rachel, she's going to reach out via the local airwaves on radio, social media posts and say, Hey members, would you please conserve generation or excuse me, your load, where you can, because we're starting to exhaust our supply. So we need to see reduction to be able to help keep the lights on.

Rachel Johnson (11:36):

And I don't think I'm sorry. I just, I know there's some more steps, but I, I do think it's important that we acknowledge that has not happened, uh, for us with electric supply very frequently that we get to the point where we actually have to start asking the public to, to curb their demand. So I do think it's like really important to acknowledge that a lot of the time, even as we do have these kind of weird potential warnings or, you know, watches into warnings type of a thing, a lot of the time we are able to handle that without the general public ever, even being, having any awareness of it. And then, um, for our listeners, I'll, I'll reiterate that if we were to get to the point where we had to do a public call, we would utilize all of our normal channels that you're used to hearing from us.

Rachel Johnson (12:22):

And so we would utilize our, probably our text alert system. We would also utilize our emails and utilize our social media. So as long as we have up to date information from you, you would always be able to get a heads up that either we, you know, we maybe needed you to, to, to your point plug less things in, or maybe even further steps where things start to get a little more mandatory. Can we talk through what happens next? So everyone's done what they can, but for whatever reason, we still just have a demand that's outstripping supply. What ha what happens with miso at that point?

Zach Anderson (12:55):

So at that point, there's unlike a lot of this leading up to public appeals. There are things that continue to go on behind the scenes that are, are, um, emergency action plans that some utilities can take into account. There are certain exceptions to environmental regulation. So before we will get to the absolute last step, uh, we've had this call come in before from the state of Michigan and the, um, at that time it was, uh, the DEQ. Now it's, uh, energy, great lakes or Eagle. The Eagle can allow for exceptions to operating air permits, that you could run a diesel plant or essentially get to a point where run absolutely everything we've got for the short duration, because we know it will cool off. Eventually night's going to fall. People will go to sleep and then we'll get past it. That's a long way of saying once we've exhausted, all reasonable efforts, we get to what are referred to in the industry as rolling blackouts.

Zach Anderson (14:05):

And so everybody that's on the grid regardless of if your generation supply matches your demand. So one of the things that Wolverine is really proud of is that we've invested in enough generation to meet our members demand, and then some to do everything we can to keep our members lights on. But ultimately when it comes down to shedding load, everybody that's connected to the grid has to do their part to support that. So Wolverine, as part of this, if we're talking about Michigan, it's about a 20,000 megawatt system, Wolverine would have to shed its share of that, that 20 megawatts amongst all of its members. So we have a specific plan that we, as, as part of the grid, as a good neighbor, if you will, that will open up certain breakers within substations. And so certain Cherryland members will be offline and certain, um, great lakes, energy members, all, all of the load that we serve throughout the state has to

make that sacrifice, to keep as much of the lights on as we can. And if it needs to continue, it rotates around.

Rachel Johnson (15:18):

Yeah. And I think you said something in there that's really important, important that I'd like to reiterate. Cause we've talked a lot about how good of a job Wolverine has done in investing in new generation. On behalf of our members, we're obviously all really proud of the Alpine plant, but also some of the new renewables in our portfolio. And I think that one risk we would have is that our members hear that message, which is absolutely true and then think, Oh, well then they're good. I don't ever have to worry about this, but we're still all kind of, if you think of the grid is a bath tub, we're all still in the same bathtub. And when the water's running out of the bathtub, we're all in it together. And that, and that's ultimately what you're saying is that even though we've made these investments and these investments all are benefiting everyone across Michigan and miso, but once you get to that point where we would have to start shedding load, we're also all still, still kind of in it together. So the load shedding thing I think is probably the piece that would be most concerning to our members because obviously that's the point where they could potentially lose power. How much warning would we get or how, what kind of walk me through what we would be able to do to help prepare people in that scenario?

Zach Anderson (16:25):

Yeah. So this is probably the, the biggest challenge that I think is, is not necessarily always well understood. And that's, we have a step wise process to get us to the absolute last resort to shed load. And so, excuse me, in most cases, we're going to have some time to plan over a series of hours and think about, okay, we've now moved from the watch into the warning and that warnings becoming more severe, et cetera. That being said, if it is so severe. So if there were a failure of a major generator or a failure of a major station or a line that impacts everybody within the state, the grid would jump automatically to that last step. And it would say right now, Wolverine, we need you to do your part. And we would have, we would have very little to no warning to do that.

Zach Anderson (17:25):

It might be in the next 20 minutes, we need, we need 20 megawatts from Wolverine and its members and your lights would, would go out. We would do everything we could to communicate that as quickly as we could. And we would follow up to provide details on that. Why did this happen? What was, what was the issue as much as we can, some of these things are confidential, but we would give as much information as we could, but I want to make very clear that just because there's a step wise process and this is the last resort, it can happen as quickly as we could get a call today and say, 20 minutes from now, we need you to shed load. And we wouldn't really know why we would just have to take that action.

Rachel Johnson (18:09):

Yeah. And I think that, um, you know, it's easy to think through the scenario kind of escalating gradually on a hot summer day that keeps getting hotter and hotter and hotter. But that in those situations we probably would be in a decent position with the ability to warn people. It won't change the fact that they're going to be mandatorily blacked out, but we would have the opportunity to get ahead of it and say, Hey, here's, you know, here's something that's going to happen, but that doesn't account for, to your point, some random catastrophic event that just somehow has a big, an unexpected impact on either the supply or the demand in, in the, in the grid. So that's a, that's a really good point to make. Um,

and I will just, I don't want to keep hammering this, but I will say in all of those scenarios, if we have contact information for you, we are going to reach out to you, even if it's after the fact.

Rachel Johnson (18:57):

So I think that's where it's just really important to kind of make sure that you keep your information up to date and sign up for our outage text alerts, because they're the best way to know what's going on. So then tell me what, okay. So we get through an event who knows why, what happened? Like how did bring everybody back on, you know, I, I think back to like some of these, you know, going back 15 years ago, or so these catastrophic grid events where you couldn't just turn everybody back on at once, but I, if I'm understanding the way the max gen procedures work they're designed so that we don't get into that type of a situation. Right?

Zach Anderson (19:31):

Right. So if you go back to the 2003 blackout, that impacted impacted parts of Southern Michigan, but mainly went out from, uh, Northern Ohio to the Eastern seaboard, that was an uncontrolled major blackout. So loss of generation in that particular situation and the outage cascaded and became uncontrollable by the system operators, there were unforeseen things that after the fact, they said, here's how we can do, here's what we can do to prevent events like this from happening in the future. But as it was happening, it was an unknown event, which then leads to a systematic reenergize station of the grid. Whereas when we're talking about quote unquote, rolling blackouts, there's, there's a focus on what breakers are we going to open? What, um, not to get too deep in the technical weeds, how are we going to maintain balance within the grid? So you're always trying to balance supply and demand.

Zach Anderson (20:40):

Going through a rolling blackout process is designed that you keep your system in a pretty healthy condition, so that as you're going through this, you can quickly restore that power. As soon as the, the need to curtail that load is dissipates with either the increase of supply, the improvement in system conditions. If there was a transmission line issue that was repaired, whatever the case may be to get that power back on as quickly as possible versus an unplanned outage, which may take hours. And in some cases up to days, depending on how catastrophic that that situation could be to bring it to a really tangible example right now, and it's happening for the first time, since 2001, California is going through rolling blackouts with, with a heat wave that they're experiencing right at this moment. So they are utility by utility shutting customers off and sort of rolling that around. That's why they're called rolling, moving who's out of power for particular periods so that your house doesn't get too warm and dangerous. You don't lose all your food in your refrigerator. It's a much more deliberate process. It's never where you want to be, but this, this does happen. And it, as I said, is going on in California right now, as we speak.

Rachel Johnson (22:03):

And I think that's something that it's easy to lose sight of that this is better than the alternative. So even though it's certainly not what anyone wants to happen, if we were to get to that situation, helping people to really understand, well, the alternative was we had something we no longer had control over potentially having a more significant impact on the overall health of the grid. And I think, you know, certainly from a technical perspective, you can dig into this better than I can, but the way the, all the, the system is so interconnected, you can't just turn it on and off with a switch, right? And there's certain generators that need to have access to electricity to turn on and run. And so to the extent that we can

control it while it may, it may potentially impact more people, but it's going to have a lesser impact on everyone who had impacts and allow us to, um, to get us get back on track as fast as possible.

Rachel Johnson (22:51):

Um, so I do want to, um, in our last couple minutes here, just, just shift into, uh, the conversation, not into kind of how the grid operates, but talking through what you see right now in terms of grid, supply and demand. I mean, I've been with Cherryland for eight years, and even I feel like I've seen a difference from when I first started. I didn't see as many max gen alerts coming across my desk. I feel like we're seeing more. Is that just in my head or can you talk through kind of what you're seeing in terms of trends?

Zach Anderson (23:21):

We're seeing a lot more, so we have in the last four years really coming up on five years now, I'm seeing more max generation alerts, these warnings that we're talking about. So if I keep referring back to that weather analogy, we're seeing more warnings or have seen more in the last five years than we had seen in the previous 15. Um, we've, I believe the number is now 16 or 18 max generation events in the last four years. And prior to that, I think we had eight to 10. So, um, obviously a significant increase in the recent experience what's going on is we're seeing, um, retirement of traditional generation. So there's a pretty clear break point, especially as we talk specifically about the lower peninsula of Michigan, uh, consumers, energy retired, a number of their, what they called their classic seven coal plants in 2016, that was almost 2000 megawatts of, of generation that had been running 24, seven, three 65.

Zach Anderson (24:37):

And from a technical perspective, provides a lot of flexibility from a supply standpoint to the grid. And so, so when those units went away, we've started to see an increased need for, um, generation like Wolverine operates, which are behind the meter or in now in today's case, in front of the meter, natural gas peaking plants running more often to make up for traditional base load plants that are no longer there, because really the only thing we've seen come on the grid has been 400 megawatts of, of Alpine that Wolverine built and then renewables that in some cases, 150 megawatts that Wolverine's been a part of. And then another about 1500 megawatts of wind have come on the grid in the last five years or so we have about 2000 megawatts of wind in Michigan now. And most of that is pretty new, but replacing traditional 24 seven base load generation with intermittent generation presents a challenge it's intermittent by its nature.

Zach Anderson (25:45):

Sometimes it's there and it's producing a hundred percent of what it's capable of, typically on the hottest days of the year. We don't see there still. So we don't see a lot of production from the wind to give you an example. This year, Wolverine was producing about 850 megawatts from its natural gas power plants. We have 210 megawatts of available wind and renewables, and we were getting two megawatts from, from those resources. So I don't say that to scare anybody about renewables. They're, they're very cost competitive. They're a huge part of our portfolio. We have almost 20% of our annual energy coming from renewables, but when we're talking about reliability and grid support in moments, you need everything you can get. And there's only so much you can get from an intermittent resource at that particular point in time. So that's the challenge. You lose base load generation, you bring on more and more renewables.

Zach Anderson (26:44):

You need something to be able to back that up and to balance that. And that's where natural gas peaking comes in. But if we don't build more traditional resources and or storage, doesn't become more and more of a thing, it, it can cause reliability issues. And that's what we're seeing to a degree is that we have a little less generation than we need to match the demand in the lower peninsula of Michigan. Now, that's, that's a fact when we plan for capacity, we're planning for our supply in the lower peninsula to match our demand in the lower peninsula. And it's a fact that right now we're a little bit short on matching those two things, which means anytime you have generator maintenance or transmission lines out of service, if the system's not in its optimal condition and generators need to be worked on from time to time, we're at a greater risk for these watches warnings and events on the grid, that's what's going on.

Rachel Johnson (27:44):

Yeah. You know, this is not the first time we've had this conversation even on this podcast and shared our concerns. And I think, I think that the interesting thing is so far, we've still been able to manage all those challenges without the end consumer necessarily feeling it. I do think it's important though, that we continue to communicate it to the end consumer because there may be a day when they feel it. I mean, I just think we have to start to grapple with that M and a, and then I, and I also, I thank you for explaining all that. Cause I think it's important. We continue to reiterate to our listeners the difference between power that is dispatchable versus power that is or sorry, generation that is dispatchable versus generation that is intermittent. And we have no control over when it's available. So that, that wind is a perfect example.

Rachel Johnson (28:29):

We're sitting here with this generating resource, but because we don't control when it produces electricity, we can't necessarily at our will match that supply up to demand. And so things like, I think, um, storage are going to be really interesting to watch because without the addition of storage in a meaningful way, then we have to continue to either, I mean, correct me if I'm wrong, build natural gas, keep old coal plants on. Like there, something has to, something has to become the, you know, the thing that keeps the base, the baseline in the bathtub, if you will.

Zach Anderson (29:03):

Yeah. Yep, yep. Or it has to be some type of load reduction. So, you know, there's growing thoughts around, you know, smart homes and balancing how much energy homes use and storage and things like that coming from not the outside in I'll call it from generation and transmission to the home, but from the home back to the grid. So we're constantly trying to evolve and think about how we use all available resources, but it really intrusively is. And all of the above approach you have to, when you get in these critical situations, it's not, I think I can get a megawatt from over there. You need the megawatt or the lights go out. And that's just a technical fact. So it can't be well. I think if, if we control all these water heaters right now, we're going to be able to keep the grid on no, you need to be able to do that and be able to demonstrate and prove that you can do that.

Zach Anderson (30:04):

If you can. Fantastic. It's another resource for us to utilize and it's generation, you know, traditional generation that you may not have to invest in, but it needs to be able to perform the same way traditional generation can perform in order for it to be effective. And I, I think California is seeing that

right now. They've they moved away intentionally from a lot of traditional resources, which I'm not making a judgment on that, but trying to balance the grid when you're reliant on residential and large scale solar, they may not have a challenge in the middle of the afternoon, like they may have had in the past, because if it's really hot, it's likely sunny and that's great. But what they're having to scramble for is the sun goes down at some point. And so how do you have generation that can pick up when the load is still high and you need that supply to match it.

Zach Anderson (31:02):

And your supply is diving down and your loads not diving down to match with it. That's a balance that they're having, having to try to work through. And that it's a challenge. I think we'll figure it out. We've, we've been very successful adapting to keep the lights on and not having people notice. I mean, that's, that's the ideal, right? When you work in this industry, if nobody feels like, Hey, my lights just went out and I don't know why it's a perfect day. I don't expect anything to be going on. You know, there's not storms taking down power lines, what's happening. We've been able to manage through that with, with this hot weather. But I think it's important for the listeners to know that we're closer than we've been in, in a really long time. So it's really about that same time that California was having issues at the turn of the century and in the year 2000, 2001, we're about at that same place or headed there. Um, again here in here in Michigan.

Rachel Johnson (32:03):

Well, the exciting thing is, and I think, you know this, and I know this there's so many amazing technologies available today and being developed today and, and, and I'm, and I'm glad that you pointed this out. We will figure it out. And I think, and I, cause I, sometimes we do podcasts like this. I worry that people will leave with like a dire. The sky is falling type of a thing. And I don't think that's the message. The message though, is to your point, it, the margins are tight and it's something we need to, to be investing in and paying attention to as a, as a state, certainly as a regional grid. Um, and I think when you, some of the technologies that are to be a part of the solution are going to require consumers to have an even stronger relationship with their utility in order for it to all work well.

Rachel Johnson (32:46):

And so I think that's a place where the co-ops are particularly well positioned to be successful. And it, and I, and I think our members will be glad to be a part of a co op as we, as we try some of those things out. Um, so we're, we're coming right up on time. I just want to take a thank you again for coming on and explaining this. I know it's a really technical topic and there's a lot of different moving parts in it, but I, it's a really important topic and we appreciate you taking the time,

Speaker 1 (33:13):

Educate our listeners on it. [inaudible].