Grid Resiliency-Grid Transformation Ep12_1

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Hello, I'm Nadia Ely and thanks for joining me.

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As we discuss some of the grid transformation plans, milestones and the progress its programs and initiatives have been making as we work to transform the grid to meet the changing landscape of the energy industry while providing the safe and reliable service our customers expect.

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Joining me to discuss this are Vice President of Grid and Technical Solutions, Robbie Wright and Director of Grid Resiliency, Steve Eisenbrock.

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Thanks for being with me.

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Robbie, I'm going to start with you today.

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Both the strategic underground program and the main feeder hardening initiative celebrated major milestones recently.

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Can you highlight those and the specific benefits these programs continue to offer the communities we serve?

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Sure.

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Nadia, thanks for the opportunity to join you today.

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I'll start with you know a lot of great work occurring over many years and both of these programs and so is exciting to be able to celebrate those milestones, not only the work that's been accomplished but also the the benefits that are being delivered to our customers.

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I'll start with strategic undergrounding.

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You know, we started this program in 2014 working to convert the the worst performing overhead tap lines moving those underground to eliminate outages for for customers.

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We have a total target for the program of about 4000 miles and through the end of 2023 we reached the 2000 mile mark.

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So we've got 2000 miles of those overhead tap lines have been converted to underground.

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A lot of great benefits here.

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The customers that are directly connected to those TAP lines are seeing significant reductions and and outages.

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So as an example, those customers directly connected to the TAP lines have seen their total TAP line outage time go from over 600 minutes a year to under 3 minutes a year.

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So that's a direct benefit to those, those customers.

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If you think about the idea that we are eliminating outage events all together, so those customers are benefiting directly, but then all of our customers are also benefiting because our crews can get to other outages more quickly.

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So it really delivers benefits for all customers and that's especially important when we get into severe weather events.

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And I'll give you just one example.

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Back in January of 2022, we had a major snowstorm impact.

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Our customers, our service territory.

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We did some calculations and with the work that we've done already converting those tap lines to underground, we estimate that that total storm restoration time was 13 hours shorter than it would have been prior to any of this work occurring.

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If you even take that further and project out for when we we would have the entire 4000 miles that we

are targeting when we have those all those miles converted, that same storm we estimate would have been shortened by about 24 hours.

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A lot of great work and strategic undergrounding and a lot of very real benefits being delivered to our customers.

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I'll turn to Mainfeet of hardening, a similar story here.

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We we've started Mainfeet of hardening in 2020.

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We identified customers that were experiencing more than twice the average outage time as the average customer and identified feeders serving those customers and it's about 1000 miles of main feeder line that we're targeting with this program.

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Most of the work involves rebuilding the lines to stronger standards or relocating the lines into better areas with with less tree exposure or or putting them underground.

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And then in some instances we're also adding in new feeders and new capacity to give us more back feed options.

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So through the end of 2023, we've hardened about 275 miles of those main feeders.

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So that's about 25% complete.

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And in the four years that we've been working on the program, So in 2023, the customers that were on those circuits that have been hardened so far for at least one year, so that we've got at least one year of data.

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Those customers in 2023 saw a 133 minute improvement in their total outage time compared to a previous five year average.

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And and then if you drill down all those feeders, if you drill down to just the customers that have the worst performance that I mentioned earlier, we're targeting those customers twice.

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The average outage time on on those feeders, those specific customers saw a 49% improvement in their overall outage time.

5:04
So again, a lot of great work has been accomplished and a lot of great benefits have been delivered to our customers.

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Very impressive, Ravi.

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Congratulations to those teams.

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Thank you, Steve.

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Grid resiliency programs such as voltage optimization, enablement and intelligent grid devices play big roles in the GTP.

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How do we measure the success of these and other GTP programs while enhancing grid resiliency and service reliability?

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Well, Nadia, we measure the success of these programs in two main ways with the first being the progress that we're making in doing the actual work, both from a construction and financial perspective as it's outlined in the the grid transformation plan of the GTP.

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And second being how our customer service is improved as a result of the work we've done.

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Here are just a few stats that I'll go through to show the progress we're making on several of the programs.

6:02
As at the end of 2023.

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For voltage optimization enablement, we have improved over 2600m points with intelligent grid devices.

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We have installed nearly 200 smart line devices.

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We've hardened 275 miles of line as part of the main feet of hardening program.

6:21
Work associated with the targeted corridor improvement program has removed nearly 30,000 ash trees from our system.

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For voltage island mitigation, we've provided redundancy for seven substation Transformers.

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Substation technology deployment has yielded 2 substations fully completed with several under construction others under construction.

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We have provided 8 substations with vastly enhanced protection in the substation physical security program.

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And for the software applications associated with the GTP, such as the outage Management System, distributed energy resource management System, Flister and Enterprise Asset Management System, we're measuring milestones to ensure the projects are implemented on schedule and on budget.

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Now if we turn to how we measure the success for our customers, I would focus first on the program that's probably made the biggest impact very early on in in the GTP and that's mean fee to hardening.

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And while Robbie covered some of the customer benefits, I think it's worth repeating some of these stats for 2023.

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Once again for the circuits that had been hardened for at least a year, all customers on those circuits saw on average and over 2 hour reduction in their outage minutes and then once again drilling down to level on those same circuits.

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Basically the customers who were experiencing the worst service which was at least twice the system Sadie average.

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Those customers saw 49% improvement in their individual Sadie.

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Now looking at the two programs you asked about voltage optimization, enablement and intelligent grid devices.

8:02
These programs that are programs that prepare the grid for other impending improvements.

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These programs both require other software applications to be in place and operating to truly measure their success From a customer's perspective.

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For voltage optimization enablement, the true value to our customers that they'll see is when we actually lower the voltage at the substation transformer, which will yield savings on their electric bills.

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At the start of this year, we successfully piloted 4 substation Transformers by manually lowering the set point voltage at each.

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In order to accomplish widespread voltage reductions at the target 1000 substation Transformers across their system, we're implementing the Edge software application.

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Edge will actively monitor near real time AMI voltage information and adjust the substation transformer voltages to provide savings to our customers.

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And I'm happy to say that the EDGE software application is on track to be installed and operational this summer.

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As circuits become ready through the multi year enablement project, they will be added to the Edge software for voltage optimizations with savings being tracked along the way.

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And then if we move to intelligent grid devices, our customers will see the value as the Flister software application is installed and functioning.

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Flister software application will utilize fault location information from the intelligent grid devices to very quickly develop the optimal switching arrangements and utilize the same intelligent grid devices to remotely isolate the fault and to restore the maximum number of customers as quickly as possible.

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Flisters are scheduled to be in place and functional in Q3 of this year.

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And once it's in place and utilizing the intelligent grid devices, we can calculate the reduction and restoration time.

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Our customers see.

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Clearly a lot of great work being done.

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Thank you, Steve.

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Robbie, coming back to you, can you elaborate on how Dominion Energy's other GTP programs also work to strengthen infrastructure to improve service reliability and mitigate outage risks?

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Sure.

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So we've talked about main Feeder hardening and that that's a big part of our grid transformation plan.

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And there are several other programs that we have in, in GTP that provide similar reliability benefits for our customers.

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You know Steve touched on intelligent grid devices and flisser and how they work together, automate restoration.

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The end result there is we'll have fewer customers waiting for restoration or repairs.

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We'll also have smaller line segments that we have to patrol when we're trying to find and fix issues.

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Steve also touched on the work we're doing to remove ash trees proactively.

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And again that's eliminating a risk to our overhead lines in that just like Flister and intelligent grid devices will provide a big benefits to our customers in terms of improving reliability by way of of reducing risk, eliminating outages.

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I'd like to maybe touch on a couple of other programs we've not, we've not talked much about yet and and these are more focused on reducing risk than necessarily eliminating regular and clear regularly occurring or blue sky outages.

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So when you think about risk, think about the potential for long duration outages or outages affecting entire communities and and large numbers of customers or outages that might occur on the coldest or the hottest days of the year.

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So Voltage Island mitigation, this program adds redundancy to parts of our grid where we have large segments of customers and and entire communities that are at risk for an extended outage, which could be up to 24 hours if we have an issue that occurs at a this particular substation feeding that area.

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So what we're doing with voltage Island mitigation, we typically are going in and adding another transformer in the substation and in creating new feeder ties so that we have more restoration options to get the lights back on should an outage occur.

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We're also focusing on improving security at certain substations.

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So substations that have large numbers of customers or maybe serve critical load areas, we are improving the physical security at those stations to protect, protect against different types of threats.

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A lot of this work involves upgrading the perimeter fencing, installing cameras or installing other monitoring capabilities.

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And the whole goal here is to deter the threats from occurring in the first place and then also improve our situational awareness so that we can respond more quickly if something does occur.

13:03
Finally, I'll talk about two new pilot programs that that we have in the works related to tree trimming.

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And these both were approved by the State Cooperation Commission last fall.

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First one, we're testing out the use of satellite imagery and computer analytics to identify dead or dying trees, So hazard trees that pose a risk to our overhead power lines.

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That allows us to proactively remove those trees much like we're doing with the ash tree program and to reduce the risk of outages and reduce the risk of significant damage to our lines.

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And that's especially beneficial during severe weather events, anything involving wind, heavy rain, ice, things like that.

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And then the second pilot program we are, we are piloting the removal of tree canopy on some of our worst performing feeders.

14:02
And so this program really is about working with customers that the the land owners to remove large mature tree limbs that overhang our power lines and and wires those pose a risk again especially during severe weather.

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And so if we can work proactively with with homeowners, land owners, property owners to remove the that tree canopy, we're eliminating risk and improving our our ability to recover after severe weather events.

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And so both of these programs we're just getting started on but certainly looking forward to seeing in progress and and seeing the benefits that that we achieve with them.

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Thank you, Robbie.

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Very exciting news.

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Steven, what ways do Dominion Energy's grid resiliency efforts align with the increasing demands and expectations for safe, reliable electric service?

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So we all know Dominion has always had a very strong safety culture and it's one of our core values.

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All of us pride ourselves on our personal focus on safety, working safely as part of a team and providing safe service to our customers.

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We have also realized that our customers recent expectations have increased for reliable power whether it's working at home or taking classes from home, utilizing telehealth services or depending on increasing number of Internet connected devices.

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Our customers way of life has changed in recent years and they expect us to deliver nearly uninterrupted power.

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A few of the great transformation programs that come to mind that help us accomplish these efforts would be main feat of hardening that utilizes new construction standards with strengthen watch which strengthen our poles and provide new cross arms to reduce broken poles during storm events allowing for quicker restoration.

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Intelligent grid devices paired with the Felicer system that better isolates faults and restores power quick more quickly to our customers.

16:04
Voltage Island mitigation that installs redundancy, eliminating extended outages due to substation transformer failures.

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Substation technology deployment that replaces aged equipment by rebuilding substations and substation physical security that further prevents vandalism and related outages at our substation.

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The grid transformation plan truly has given us yet another vehicle to raise our already high safety standards and to continue to improve service reliability for our customers.

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Thank you, Steve.

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This last question is for both of you.

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What does the future hold for our grid strengthening and resiliency programs that you both outline in such detail?

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And are there any new initiatives currently in the works?

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Robbie, I know you talked about a couple a few minutes ago.

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Steve, I'll start with you.

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Sure, Nadia.

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We're always looking for ways to systematically improve the grade.

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We're planning for the current grid transformation plan to have at least one future phase, continuing the work of many of these programs for several years to come.

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We've started conversations about the grid transformation plan version two point O and we're trying to take a look at what will that look like.

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And you know this could include versions of existing programs that reach down another level to capture the next set of high value projects.

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We've also talks tossed around a few new ideas on potential programs.

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So I would encourage everyone for their input to this process.

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If you have an idea or concept that you believe would increase reliability and resiliency on a systematic basis, let us know.

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I don't know that I could could add a whole lot more to that.

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I think Steve really hit the nail on the head.

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We know our customer expectations around reliability and resiliency are only going up and we know that these programs provide significant benefits to our customers and we need to keep as a top priority a focus on executing this important work and doing that that work safely and efficiently.

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That's got to stay as a top priority.

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But but as Steve said, we also need to keep looking for new programs that can help us on this journey.

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We've got to continue to find new ways to meet customer expectations around reliability and and resiliency.

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I would say All in all, it's an exciting time to be in the electric distribution of business.

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Definitely appreciate the work by all of our colleagues here in the grid and technical solutions team, but also across the rest of Dominion Energy.

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A lot of different parts of our overall company and different organizations have been key to getting the programs where they are today and and helping us achieve the milestones that we talked about.

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I'd like to thank Robbie Wright and Steve Eisenrod for their expertise and participation.

18:51
Learn more about grid resiliency at dominionenergy.com/grid improvement projects.

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Thanks for listening and be on the lookout for future episodes.

19:00
I'm Nadia Ely.