

AEP OHIO EXHIBIT NO. _____

BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of)	
Ohio Power Company for Authority to)	Case No. 23-23-EL-SSO
Establish a Standard Service Offer)	
Pursuant to §4928.143, Ohio Rev. Code,)	
in the Form of an Electric Security Plan.)	

In the Matter of the Application of)	
Ohio Power Company for Approval of)	Case No. 23-24-EL-AAM
Certain Accounting Authority)	

DIRECT TESTIMONY OF
MARK A. BERNDT
IN SUPPORT OF AEP OHIO'S
ELECTRIC SECURITY PLAN

Filed: January 6, 2023

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MARK A. BERNDT

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BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO
DIRECT TESTIMONY OF
MARK A. BERNDT
ON BEHALF OF
OHIO POWER COMPANY

1 **I. PERSONAL BACKGROUND**

2 **Q1. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3 A. My name is Mark A. Berndt and my business address is 700 Morrison Road, Gahanna,
4 Ohio 43230.

5 **Q2. BY WHOM ARE YOU EMPLOYED AND WHAT IS YOUR POSITION?**

6 A. I am employed by Ohio Power Company (“AEP Ohio” or the “Company”) as Director –
7 Projects.

8 **Q3. WOULD YOU PLEASE DESCRIBE YOUR EDUCATIONAL AND**
9 **PROFESSIONAL BACKGROUND?**

10 A. I graduated with a Bachelor of Arts in Psychology from The University of Notre Dame in
11 2001. From 2001 through 2006, I served in the United States Navy as a commissioned
12 Surface Warfare Officer. During that time, I served tours on two ships, and I graduated
13 from the Naval Nuclear Power School in 2004. I joined American Electric Power (“AEP”) in
14 2007 as an analyst in Commercial Operations. From 2010 to 2019, I progressed through
15 positions in the Strategic Initiatives group within AEP Service Corporation (“AEPSC”),
16 from analyst ultimately to Director in 2019. In 2016, I received my Masters of Business
17 Administration through the Executive Program at The Ohio State University. In 2019, I
18 joined AEP Ohio and have held positions as Director – Business Development, Director –
19 Business Operations Support, and now Director – Projects.

1 **Q4. WHAT ARE YOUR RESPONSIBILITIES AS DIRECTOR OF PROJECTS?**

2 A. I am responsible for leading the project management and business partner oversight
3 functions for AEP Ohio. Our Project Management Organization (“PMO”) coordinates the
4 planning and execution of the distribution capital work plan for all six districts within AEP
5 Ohio’s service territory, including overhead line and station projects, underground and
6 network projects, as well as smart grid deployment. The PMO also includes our
7 performance monitoring/controls and continuous improvement groups. Additionally, I am
8 responsible for our Region Support group, which manages the contractual relationship with
9 all our third-party business partners, including our vegetation management partners, that
10 work on behalf of AEP Ohio.

11 **Q5. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY IN ANY REGULATORY**
12 **PROCEEDINGS?**

13 A. Yes. I previously submitted testimony in proceedings before the Public Utilities
14 Commission of Ohio (the “Commission”) in Case No. 21-0541-EL-UNC.

15 **Q6. ARE YOU SPONSORING ANY EXHIBITS IN THIS PROCEEDING?**

16 A. Yes, I am sponsoring the following exhibit:

- 17 • Exhibit MAB-1 – Classification of Trees Outside the Rights of Way (“ROW”)

18 Caused Outages (2020-2022)

19 **II. PURPOSE OF TESTIMONY**

20 **Q7. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

21 A. The purpose of my testimony is to provide an overview of the Company’s proposed update
22 to its existing Enhanced Service Reliability Rider (“ESRR”). Specifically, I will explain
23 the need to continue and modify the ESRR as a component of AEP Ohio’s reliability

1 strategy. The proposed update to the ESRR will allow the Company to continue its four-
2 year trim cycle for trees inside the right-of-way (“TIR”). The Company continues to be
3 successful in limiting outages related to TIR, in large part due to the four-year trim cycle,
4 as evidenced by TIR being a very minimal contributor to System Average Interruption
5 Duration Index (“SAIDI”), System Average Interruption Frequency Index (“SAIFI”) and
6 Customer Minutes of Interruption (“CMI”) in 2021. In addition, the updated ESRR is
7 designed to reduce outages caused by trees outside the right-of-way (“TOR”), which in
8 2021 was the leading contributor to SAIDI and CMI, and was the second leading
9 contributor to SAIFI. The proposed scope of the vegetation management program going
10 forward, and thus the estimated costs of executing that scope, is at a level that has proven
11 to be successful improving customer reliability related to both TIR- and TOR-related
12 outages.

13 **III. STATUS OF CURRENT ENHANCED SERVICE RELIABILITY RIDER**

14 **Q8. PLEASE PROVIDE A DESCRIPTION OF THE COMPANY’S VEGETATION**
15 **MANAGEMENT ACTIVITIES AND THEIR IMPACT ON CUSTOMER**
16 **OUTAGES.**

17 A. The ESRR, which was initially approved by the Commission in 2009, facilitated the
18 establishment and continuation of a cycle-based vegetation management program.
19 Increased vegetation management activity since initiation of the ESRR has led to the
20 reduction in outages caused by TIR, resulting in improved reliability for our customers.
21 Additionally, as the Company has invested to remove danger trees, it has seen the reduction
22 in outages caused by TOR. Danger trees are trees that are structurally unsound (e.g., has
23 signs of disease, extreme leaning, or other defects such as splits, etc.) and could strike the

1 power lines when they fall. Removal of danger trees has been specifically done through
2 the Company's standalone Danger Tree Program established in 2018, funded by the
3 Company's Distribution Investment Rider, and then continued as a component of the ESRR
4 in late 2021. As part of this proceeding, the Company has included both TIR and TOR
5 vegetation management activities in its proposed ESRR.

6 **Q9. PLEASE SUMMARIZE THE COMPANY'S VEGETATION MANAGEMENT**
7 **PROGRAM.**

8 A. Systematic, whole system vegetation management programs are widely utilized by the
9 utility industry as an effective way to reduce the frequency and duration of vegetation-
10 related outages. AEP Ohio's vegetation management program includes two major
11 components: (1) for TIR, a cycle-based program, and (2) for TOR, identifying and
12 removing danger trees. AEP Ohio currently collects \$35M in vegetation management
13 expense through its base rates set in 20-585-EL-AIR; the Company also collects
14 incremental vegetation management expenses through the ESRR. The Company's
15 experience shows that TIR-related outages start to increase after four years without
16 performing vegetation management on a cleared circuit, due to the inability to maintain
17 sufficient clearance of trees. For this reason, AEP Ohio's cycle-based vegetation
18 management program is specifically designed to be on a four-year trim cycle. The
19 Company began its four-year trim cycle program for TIR in 2009, with the establishment
20 of the ESRR, and has completed three full cycles since implementation.

21 With the reduction of TIR-related outages over time, TOR became a leading cause
22 of reliability issues. In response, the Company established a stand-alone Danger Tree
23 Program in 2018. The Danger Tree Program initially targeted hot spot areas based on

visual inspections; however, AEP Ohio began a clearance schedule in 2019, initially working through the circuits with the highest CMI caused by TOR. Removing danger trees continues to be a priority in AEP Ohio's annual work plan, and by the end of 2022 the Company plans to have targeted every circuit that has CMI attributed to TOR. Beginning in 2023, the vegetation management program will also incorporate a systematic approach for danger trees, more closely aligned with the TIR four-year trim cycle. As the Company works through its TIR circuits, it intends to also remove danger trees along those same circuits, providing better cost and schedule efficiencies. As such, the Company is proposing to recover incremental costs for vegetation management above what the Company collects in base rates through the ESRR as set forth in Figure MAB-5.

Q10. HAVE AEP OHIO AND ITS CUSTOMERS EXPERIENCED BENEFITS FROM AEP OHIO'S INCREASED VEGETATION MANAGEMENT ACTIVITY?

A. Yes. Increased vegetation management activity since initiation of the ESRR in 2009 has led to reductions in TIR-caused outages, resulting in improved reliability and service to customers. Specifically, AEP Ohio's vegetation management program has reduced outages caused by TIR by 80 percent since 2010:

- During 2010 – 2,700 outages caused by TIR.
- During 2021 – 536 outages caused by TIR.

Additionally, upon the initiation of the Danger Tree Program in 2018, the Company began making significant investments in the removal of danger trees. Figure MAB-1 shows the level of TIR spend, TOR spend, and associated danger trees removed. Spend on TIR and TOR was not tracked separately until 2018.

Figure MAB-1

	A=B+C+D	B	C	D=E+F	E	F	
(\$ M)	Total Spend \$	TIR O&M \$	Initial TIR Clearing Capital \$	TOR Total \$	TOR O&M \$	TOR Capital \$	Danger Trees Removed
2018	\$66.3	\$49.0	\$3.2	\$14.1	\$0.0	\$14.1	45,418
2019	\$99.3	\$49.1	\$2.1	\$48.1	\$0.0	\$48.1	152,308
2020	\$92.5	\$46.4	\$2.0	\$44.1	\$0.0	\$44.1	128,035
2021	\$82.4	\$62.2	\$1.0	\$19.2	\$0.6	\$18.6	44,752

Figures MAB-2 and MAB-3 show the decline in the CMI and SAIDI from tree-related outages. CMI and SAIDI from TIR-related outages have decreased since the inception of the ESRR in 2009.

Regarding TOR, the Company initially experienced an issue with dead ash trees due to the outbreak of the Emerald Ash Borer (“EAB”). This insect has been directly attributed with the physical demise and eventual death of ash trees, and therefore responsible for an increase of danger trees. The EAB began to proliferate throughout the Company’s service territory in 2013; however, since a tree infested by the EAB can take between 3-5 years to die, it wasn’t until the 2017 timeframe that the Company truly began to experience outages related to the danger trees created by the EAB. Over recent years, as the Company has removed many ash trees, the percentage of danger trees that are ash trees has decreased. Danger trees include trees of many species throughout the Company’s service territory. Exhibit MAB-1 shows the classification of TOR-caused outages by tree species (as well as by tree diameter, distance from ROW and type of tree failure) since 2020.

CMI and SAIDI from TOR-related outages began to decrease upon the inception of the Danger Tree Program in 2018. The contribution to SAIDI from TOR began to decrease almost immediately from a peak of 65.8 minutes in March 2019 to 39.0 minutes

by the end of 2020. In 2021, the Company curtailed spending in anticipation of lower funding levels for the Danger Tree Program. The majority of the \$19.2M spent in 2021 was spent in the first half of the year. With lower spend levels later in the 2021 year (and continuing in 2022), the contribution to SAIDI from TOR is again increasing, as reflected in Figure MAB-4.

Figure MAB-2

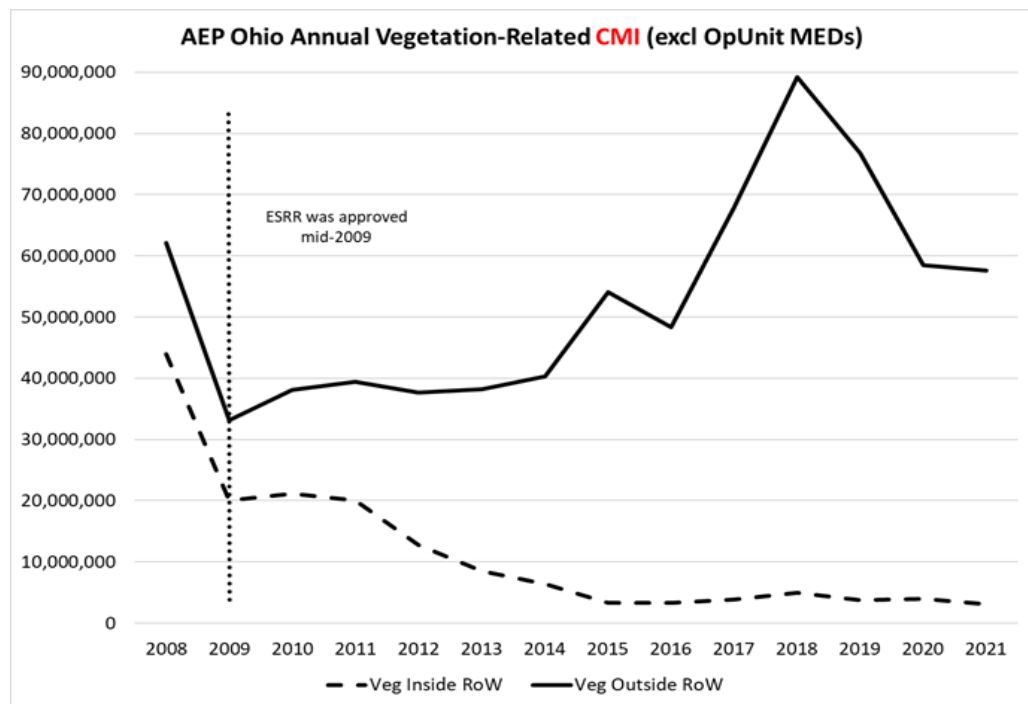


Figure MAB-3

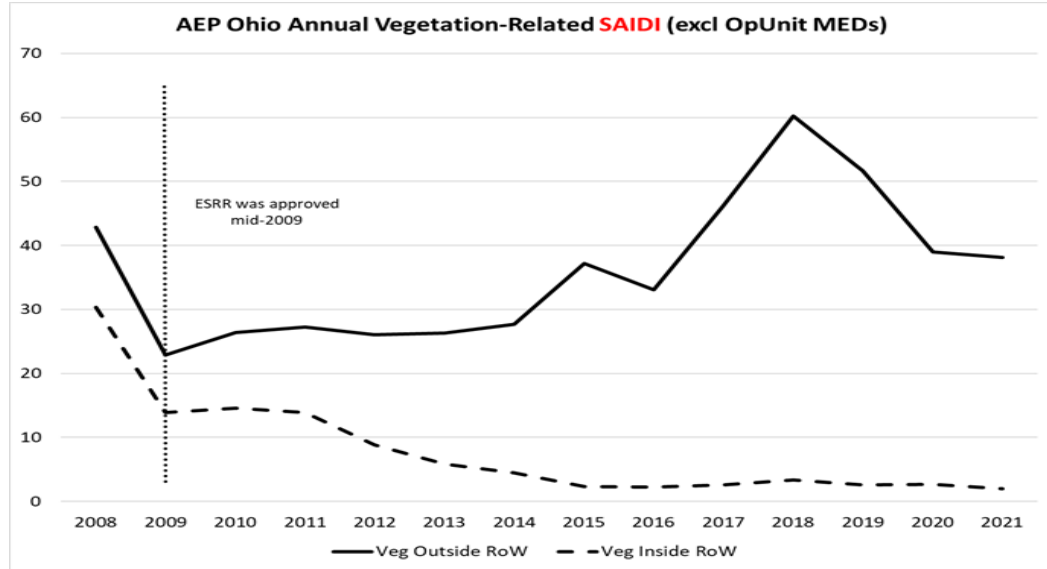
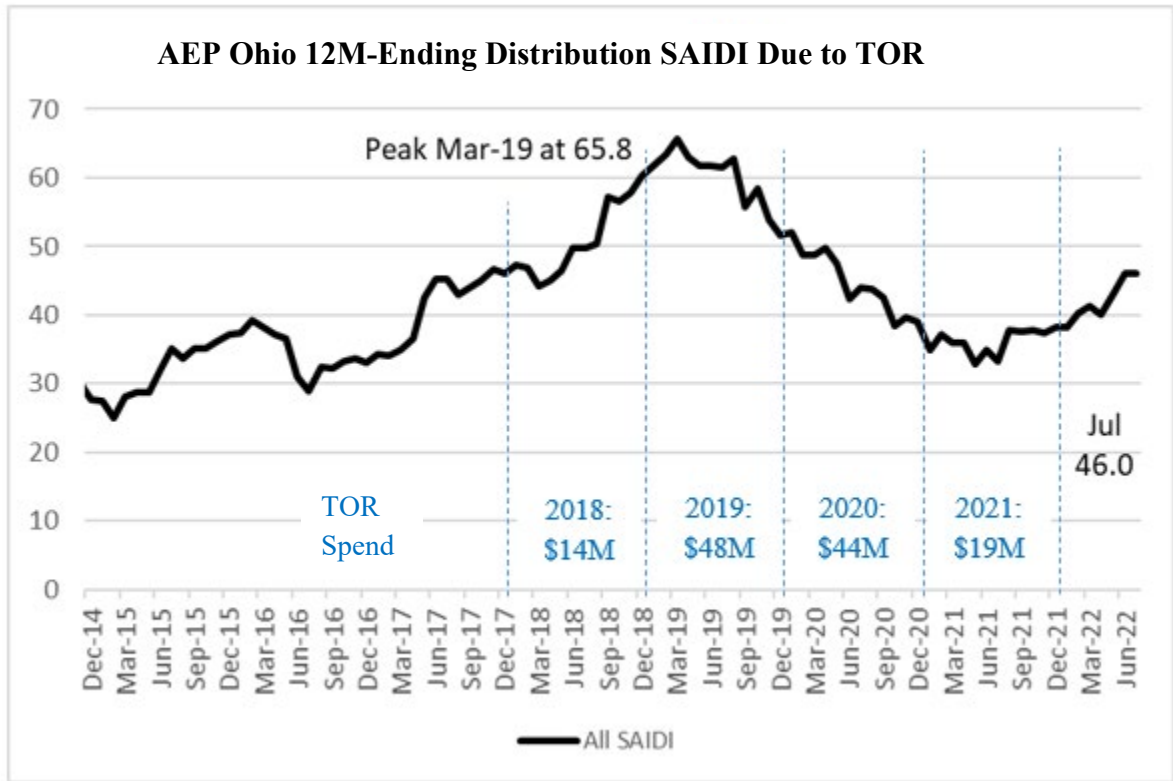


Figure MAB-4 shows a more granular monthly contribution to SAIDI specifically from TOR, aligned with the associated TOR spend, in recent years. As such, the Company's experience and data supports the conclusion that as spending on danger tree removal is reduced, SAIDI related to TOR increases. The Company is thus proposing additional funding in this ESRR to remove danger trees in order to continue providing reliable service to its customers, as further explained below.

Figure MAB-4



Q11. HAS THE COMMISSION PREVIOUSLY ADDRESSED THE BENEFITS OF THE COMPANY'S VEGETATION MANAGEMENT PROGRAMS?

A. Yes, the PUCO provided the following comment in the PUCO Order for Case Nos. 16-1852-EL-SSO and 16-1853-EL-AAM (ESP IV).

“The Commission is persuaded that the vegetation management program contributed to the reduction in the number of interruptions, customer interruptions, and customer outage minutes since 2009 and to AEP Ohio's ability to meet its reliability performance standards. Reliable service is a benefit to customers and the public interest. The Commission finds the cost to customers, given the ongoing nature of the program, to be reasonable. The Commission continues to find significant benefit in proactive, cycle-based, end-to-end vegetation management

1 along the Company's circuits and rights of way as an effective means of reducing
2 and preventing outages and service interruptions caused by vegetation. Vegetation
3 management is by its very nature an ongoing process.

4 Accordingly, the Commission finds that the ESRR benefits electric consumers
5 and the public interest, as the program enhances service reliability, particularly the
6 electric system's ability to withstand weather-related events. Accordingly, the
7 Commission finds that the ESRR provision of the Stipulation is beneficial to
8 consumers and the public interest.”

9 **IV. PROPOSED MODIFICATIONS TO ENHANCED SERVICE RELIABILITY**
10 **RIDER**

11 **Q12. IS AEP OHIO PROPOSING THAT THE ENHANCED SERVICE RELIABILITY**
12 **RIDER BE CONTINUED IN THIS ESP FILING?**

13 A. Yes. In order to manage vegetation growth on the distribution system, AEP Ohio proposes
14 to continue the existing ESRR, with modifications. In particular, the Company proposes
15 that the funding level be increased to reflect the Company’s anticipated costs going
16 forward. To optimally manage TIR, the Company’s costs reflect the continuation of the
17 systematic four-year trim cycle including new practices, plus cost inflation. To better
18 manage TOR, the Company’s costs reflect the continuation of activity designed to remove
19 danger trees, the scope of which is more closely aligned with the more proactive scope the
20 Company implemented in 2019-2020, plus cost inflation. Company witness Mayhan
21 discusses the modifications to the ESRR further in her testimony.

22 **Q13. WHAT NEW PRACTICES DOES AEP OHIO INTEND TO EMPLOY TO**
23 **MANAGE TIR?**

24 A. As the Company continues with its four-year trim cycle, the Company will also proactively

1 remove more branches that overhang the primary overhead wires. Currently, the
2 Company's four-year trim cycle efforts focus on clearing the formal ROW, defined as the
3 established, maintained area beneath and adjacent to overhead facilities. On many ROWs,
4 the trees have not been trimmed "ground-to-sky." The Company has determined that
5 branch failures outside of the formal ROW have caused 30% of all tree-caused outages
6 since 2020. Although not all branch failures are overhanging branches, the Company
7 intends to proactively pursue more overhang removal, where possible, to reduce the
8 number of outages caused by limb failure.

9 **Q14. WHAT IS THE PROPOSED SCOPE OF THE DANGER TREE ACTIVITY**
10 **GOING FORWARD?**

11 A. The Company proposes to increase funding to levels that have proven to improve customer
12 reliability, allowing the Company to more proactively remove more danger trees that pose
13 a reliability risk. Additionally, the Company plans to incorporate a systematic, cycle-based
14 approach for danger trees that more closely aligns with the TIR four-year trim cycle.

15 The identification and removal of danger trees has become more difficult in recent
16 years. The removal of danger trees involves evaluating factors such as (but not limited to)
17 the size and type of the tree, condition of the tree, and soil condition at the base. Before
18 2020, 75% of the TOR-related outages were caused by danger trees that were dead. As
19 those dead trees have been systematically cleared, since 2020 approximately 74% of TOR-
20 related outages have been caused by danger trees that were alive, which are more difficult
21 to evaluate from a risk perspective than dead trees. Additionally, 36% of all TOR-related
22 outages since 2020 were due to tree trunk failure, and 32% were caused by up-rooted trees.
23 Again, identifying and removing trees with the potential to be up-rooted is more difficult

and expensive than solely removing dead and/or dying trees with a visible potential for trunk failure. Exhibit MAB-1 provides further information on the classification of TOR-caused outages. The ESRR improvements will help ensure the Company can identify and remove these danger trees which, in turn, will reduce outages caused by TOR.

Q15. WHAT ARE AEP OHIO'S PLANNED VEGETATION MANAGEMENT COSTS REFLECTED IN THIS PROCEEDING?

A. The cost to operate the vegetation management program shown in Figure MAB-5 is required to maintain the four-year TIR trim cycle and integrate a cycle-based approach to remove danger trees outside the ROW.

Based on the Company's 2020-2021 average cost-per-mile applied to the total miles for the annual component of the four-year TIR trim cycle, the total cost is expected to be approximately \$57M in 2022. Additionally, the danger tree activity to remove TOR in conjunction with the four-year trim cycle, comparable to the proposed plan going forward, would have cost an estimated \$40M in 2022. The Company also anticipates a 5% average annual cost increase as a result of labor rate, fuel, inflation, materials, etc. for both TIR and TOR work. Figure MAB-5 shows the total ESRR costs anticipated for 2024-2030.

Figure MAB-5 – Enhanced Service Reliability Plan (\$M in O&M)

(\$ M)	June-Dec 2024	2025	2026	2027	2028	2029	Jan-May 2030	Total
TIR activities	\$39	\$66	\$69	\$73	\$77	\$80	\$35	\$439
TOR activities	\$27	\$47	\$49	\$51	\$54	\$57	\$25	\$310
Total Vegetation Cost	\$66	\$113	\$118	\$124	\$131	\$137	\$60	\$749
Less: Base Rate recoverable amount	(\$20)	(\$35)	(\$35)	(\$35)	(\$35)	(\$35)	(\$15)	(\$210)
Total ESRR Expense	\$46	\$78	\$83	\$89	\$96	\$102	\$45	\$539

The Company is proposing the ESRR be set to recover the costs incurred from June 2024 through May 2030 above the \$35M of annual vegetation costs currently recovered

1 through base rates. Company witness Mayhan further discusses the proposed recovery
2 mechanism for the ESRR in her testimony.

3 **Q16. IS THIS INCREASED FUNDING NECESSARY TO ENSURE CUSTOMER**
4 **RELIABILITY?**

5 A. Yes. These funds will be used to supplement the base case funding to enable continuation
6 of the critically-important four-year trim cycle and also restore the danger tree activity to
7 the level that resulted in the customer reliability benefits seen in the 2019-2020 timeframe.

8 **Q17. ARE THE COMPANY'S FORECASTED VEGETATION EXPENSES**
9 **REASONABLE?**

10 A. Yes. These expenses are reasonable and reflect the proven amounts necessary to
11 accomplish the program's goals to enhance reliability for our customers, especially given
12 the cost inflation and constrained labor market that the Company faces. Continuation of
13 the ESRR is expected to maintain the improvement in reliability due to reduced TIR-related
14 interruptions. Additionally, with the increased scope of the Company's danger tree
15 activity, decreased outages due to TOR are also expected.

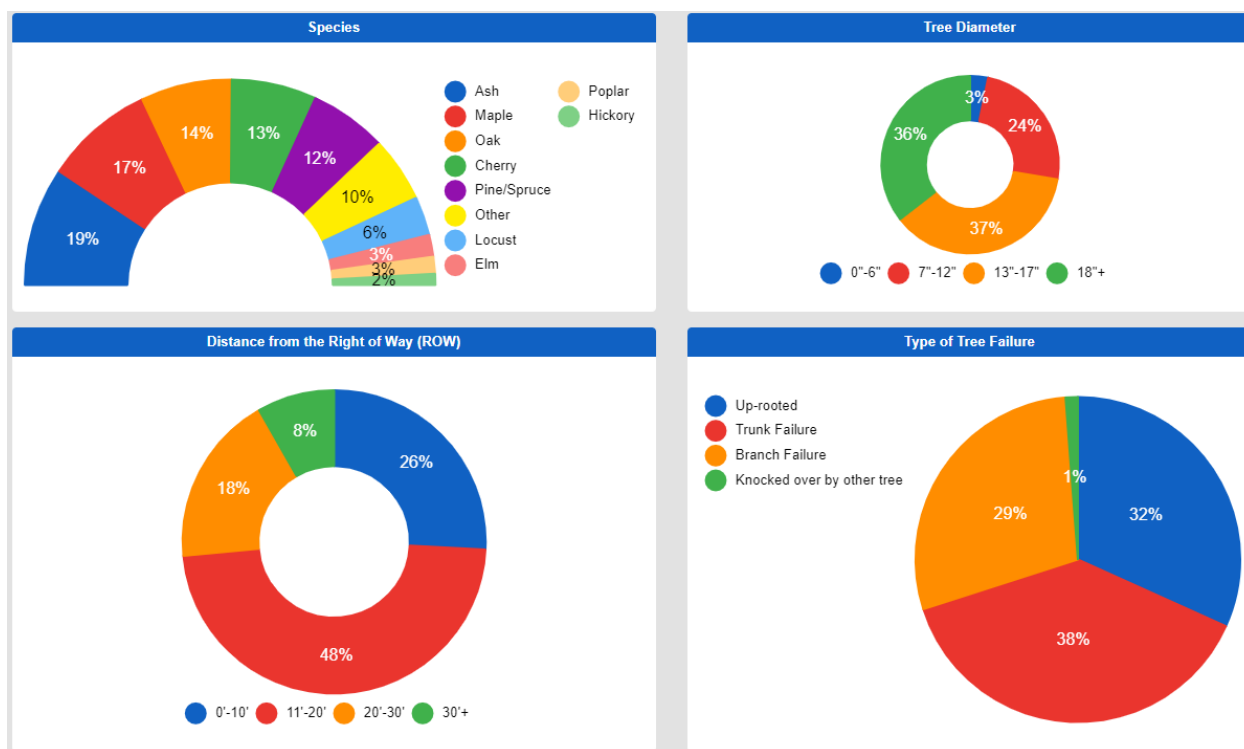
16 **V. CONCLUSION**

17 **Q18. DOES THIS CONCLUDE YOUR TESTIMONY?**

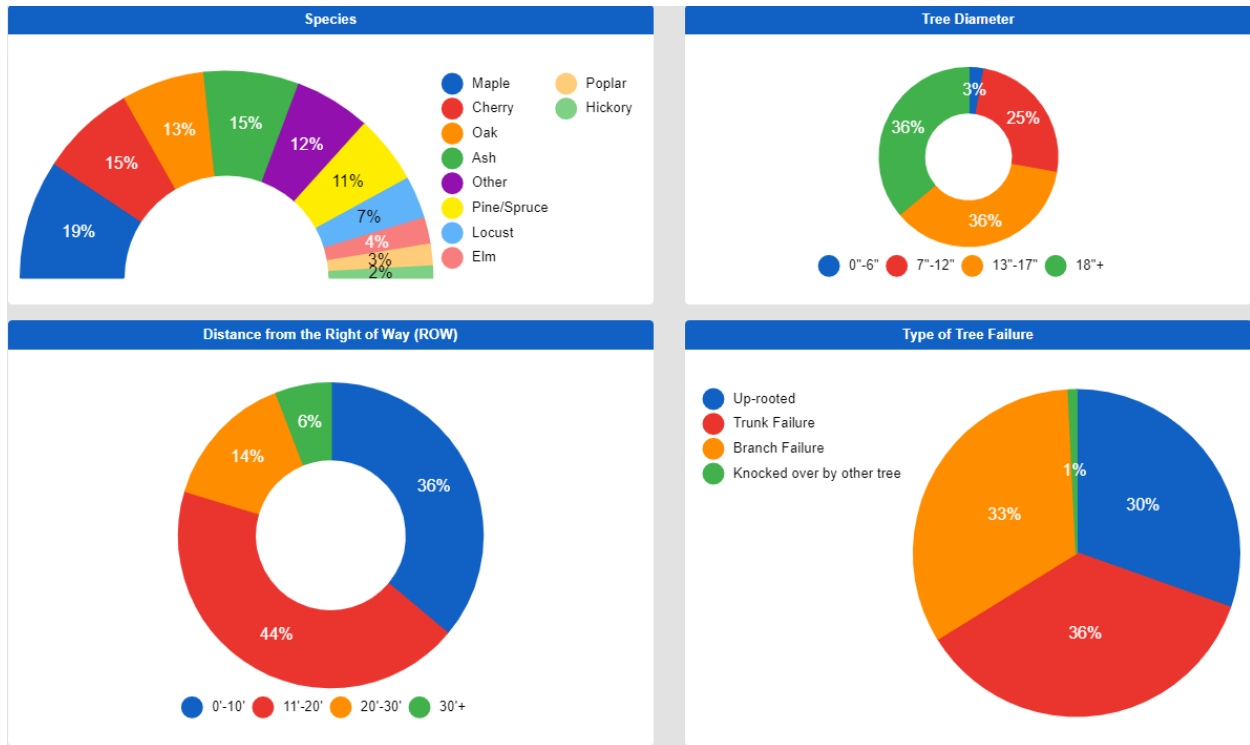
18 A. Yes.

Exhibit MAB-1 – Classification of Trees Outside the Right-of-Way Caused Outages (2020-2022)

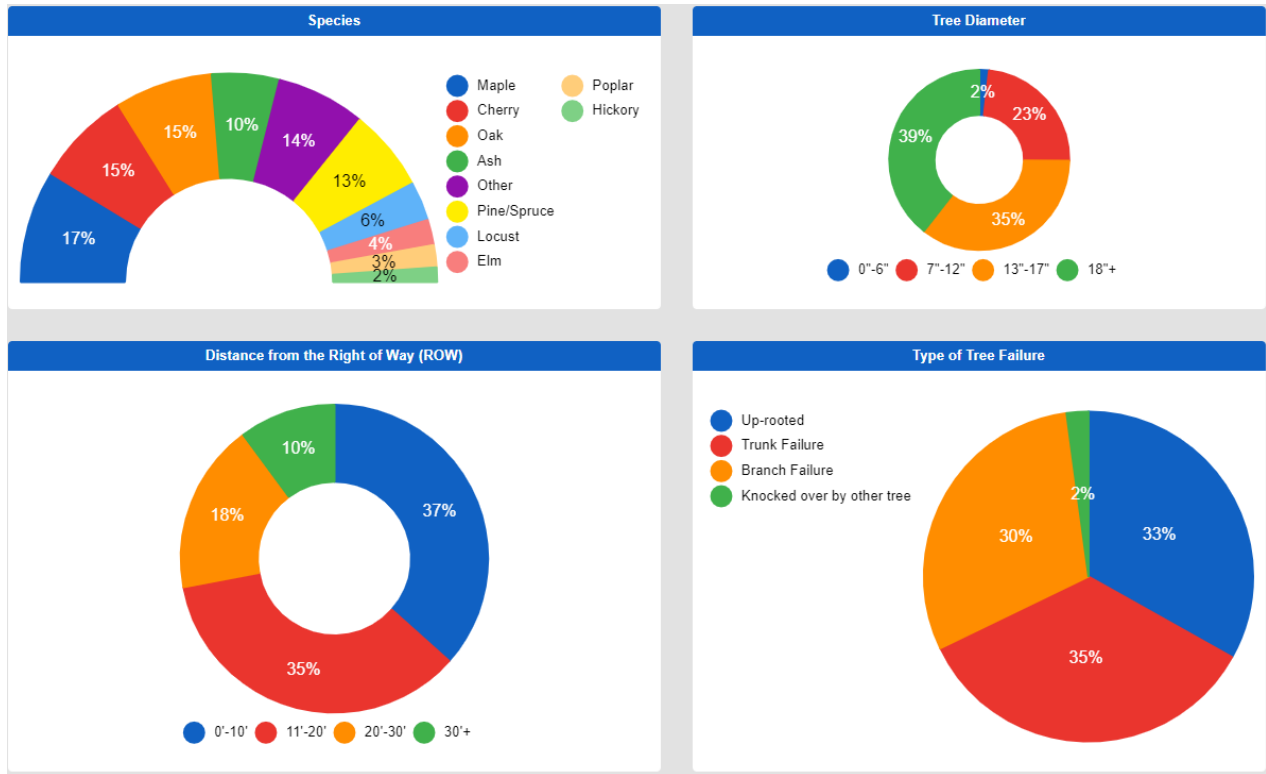
2020



2021



2022



In accordance with Rule 4901-1-05, Ohio Administrative Code, the PUCO's e-filing system will electronically serve notice of the filing of this document upon the following parties. In addition, I hereby certify that a service copy of the foregoing Ohio Power Company's Direct Testimony of Mark A. Berndt was sent by, or on behalf of, the undersigned counsel to the following parties of record this 6th day of January 2023, via electronic transmission.

/s/ Steven T. Nourse

Steven T. Nourse

EMAIL SERVICE LIST for ESP IV:

mpritchard@mwncmh.com
William.michael@occ.ohio.gov
Bojko@carpenterlipps.com
rkelter@elpc.org
paul@carpenterlipps.com
Stephanie.Chmiel@ThompsonHine.com
Kurt.Helfrich@ThompsonHine.com
Michael.Austin@ThompsonHine.com
ctavenor@theOEC.org
mkurtz@BKLlawfirm.com
kboehm@BKLlawfirm.com
jkylercohn@BKLlawfirm.com
lhawrot@spilmanlaw.com
dwilliamson@spilmanlaw.com
charris@spilmanlaw.com
sean.mcglone@ohiohospitals.org
ssheely@bricker.com
callwein@keglerbrown.com
mjsettineri@vorys.com
glpetrucci@vorys.com
ibatikov@vorys.com
michelle.d.grant@dynegy.com
rdove@keglerbrown.com
mdortch@kravitzllc.com
joliker@igsenergy.com
mnugent@igsenergy.com
whitt@whitt-sturtevant.com
kennedy@whitt-sturtevant.com
rsahli@columbus.rr.com

tony.mendoza@sierraclub.org
joe.halso@sierraclub.org
cpirik@dickinsonwright.com
todonnell@dickinsonwright.com
vvorys@dickinsonwright.com
sechler@carpenterlipps.com
rocco.d'ascenzo@duke-energy.com
jeanne.kingery@duke-energy.com
Larisa.vaysman@duke-energy.com
elyse.akhbari@duke-energy.com
william.wright@ohioattorneygeneral.gov
Greta.see@puc.state.oh.us

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Summary: Testimony DIRECT TESTIMONY OF MARK BERNDT ON BEHALF OF
OHIO POWER COMPANY electronically filed by Mr. Steven T. Nourse on behalf of
Ohio Power Company