S T A T E O F M I C H I G A N

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter, on the Commission's own motion, to investigate, audit, and review the methods employed by **Consumers Energy Company and DTE Electric Company** to secure good electric service and ensure the safety of the public pursuant to MCL 460.555 and MCL 460.556.	)	Case No. U-21305

COMMENTS OF OVERSTORY

December 16, 2024

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Comments of Overstory

Overstory thanks the Michigan Public Service Commission ("PSC" or "Commission") for the opportunity to comment on the above-captioned proceeding. In submitting these comments, Overstory is mindful of the Commission's initial Order in this proceeding.

The Order started by reminding stakeholders what is at stake, sharing the heartbreaking instance of 14-year-old girl being fatally injured when she contacted a downed 4.8 kilovolt (kV) power line.[1] The Commission found that "an independent review of the adequacy of the electric distribution system operated by Consumers and DTE Electric is necessary to determine measures that may mitigate or avert future crises including the loss of life and the loss of essential public services."[2] The Commission directed an audit that would include "a review of each company's engineering standards and inspection and maintenance programs to ensure they meet the needs of the distribution system, now and into the future" and "include a review of how the utility manages the operations of the distribution system, including how maintenance prioritization is determined."[3]

Through partnering with 53 utilities across North and South America to improve their vegetation management and wildfire mitigation programs, Overstory has gained experience and expertise on how utilities can prioritize maintenance of their systems to "mitigate or avert future crises including the loss of life and the loss of essential public services." Overstory provides the

[1] Michigan Public Service Commission. Case No. U-21305. "In the matter, on the Commission's own motion, to investigate, audit, and review the methods employed by Consumers Energy and DTE Electric Company to secure good electric service and ensure the safety of the public pursuant to MCL 460.555 and MCL 460.556." October 5, 2022. Page 1

[2] Ibid, Page 14

[3] Ibid, Page 16

following comments and recommendations to complement Liberty's insights and to offer the Commission actionable next steps for improving the reliability and affordability of utility vegetation management programs.

Overstory's comments are structured as following:

I. Brief Introduction to Overstory and to Using Satellite Imagery For Vegetation Management
II. Best practices for Reliable, Affordable, Technology-Enabled Vegetation Management
III. Comments on Liberty Consulting's "Utility Distribution Audit" of Consumers Energy and Comments on Consumers' Response
IV. Comments on Liberty Consulting's "Utility Distribution Audit" of DTE and Comments on DTE's response
V. Conclusion

I. Brief Introduction to Overstory and to Using Satellite Imagery for Vegetation Management

Overstory uses satellite imagery and proprietary artificial intelligence technology to provide utilities with actionable analysis for their vegetation management and wildfire prevention programs. This analysis helps utilities improve reliability, mitigate critical risks, and achieve cost savings through optimizing resources across their whole network. Overstory currently works with 53 electric utility companies in North and South America.

Historically, utilities have used simple time-based approaches to managing vegetation related risk and often revisited all circuits on a fixed cycle. As utilities have become increasingly data-driven, they have relied on foot patrols and LiDAR (Light Detection and Ranging) for assessing risk on portions of their network to augment their cycle-based vegetation management programs. However, in the last five years, the cost of satellite and aerial imagery for vegetation management has decreased while the quality and widespread availability of that imagery has increased. In just over a decade, there has been a transition from government-operated satellites providing 30 *meter* per pixel resolution to multiple commercially-operated satellite clusters providing 30 *centimeter* per pixel imagery and advanced sensor types offering multispectral and other types of data. This significant increase has led to the creation of several companies such as Overstory, AiDash and LiveEO providing satellite-based analysis of vegetation risks, a growth in utilities using satellite-based imagery for vegetation management, and enthusiasm from regulatory bodies regarding the potential of the technology. For instance, when evaluating Com Ed's plans for vegetation management and comparing satellite technology to LiDAR, Staff from the Illinois Commerce Commission ("ICC") recently noted:

> "…as well as the fact that high-resolution satellite technology, which ComEd considers using for the first time in conjunction with its scaled down TOP proposal, is a much

cheaper, cost-effective alternative and its accuracy in detecting tree overhang is expected to improve in the future…."[4]

"Staff considers the existing and potential future use of satellite technology to be significant, in that many utilities, including ComEd, have very scripted timing for conducting vegetation management….In essence, the utilities that make use of satellite technology appear to use it in a more proactive approach for vegetation management planning."[5]

While foot patrols are an important complement to satellite imagery, relying exclusively on foot patrols has negative implications for both reliability and cost. Regarding reliability, the results are subjective, vary by inspector, and the inspectors may miss certain vegetation-related risks due to location and access issues (e.g., lines far from roads or on private property) or their angle for viewing relative to LiDAR and satellites. Regarding cost, the need for labor is increasing significantly faster than the qualified labor pool of inspectors, driving up labor costs which necessitates more efficient solutions. For one Overstory customer that traditionally dedicated two crews to address hot spots throughout the year as they were identified by foot and aerial patrols, access to satellite imagery meant that they were to complete all hot spot work in only three months. This was effectively a 75% reduction in labor costs and they were able to reallocate those crews to perform additional vegetation management activities without increasing their budget.[6]

LiDAR can provide granular accuracy for evaluating tree proximity, but as Consumers recently noted, "LiDAR is especially cost-prohibitive on a large scale."[7] The granularity can also complicate, not simplify, an optimized vegetation management program. Based on publicly available information, Overstory estimates this LiDAR cost to be $340-$450/line mile, more than double the $90-$175/mile for satellite-based analysis.[8] Previous filings from Consumers suggests that LiDAR might actually be more than three times the cost of satellite imagery in Michigan.[9] The benefits gained by the increased accuracy of LiDAR over satellites can be outweighed by the negatives of this significant additional cost. As Consumers has noted, "LiDAR captures more accurate data than the dedicated satellite imagery but at this point in time the value of the

[4] Illinois Commerce Commission. Docket No. 22-0486, Docket No. 23-0055, Docket No. 24-0181. "Initial Brief On Refiling Of The Staff Of The Illinois Commerce Commission." September 5, 2024. Page 29.
[5] Ibid. Page 36.
[6] Overstory Case Study: Sho-Me Power Electric Cooperative
[7] Direct Testimony of Pamela L. Bolden of Consumers Energy in Docket U-21586. May 2024. Page 18.
[8] Estimate is based off multiple public filings. For instance, CenterPoint Texas System Resilience Plan where they proposed a $9.9M LiDAR investment for their 29,270 miles of overhead distribution miles, which equates to $338/mile. Source: PUC of Texas Docket 56548. Application Of Centerpoint Energy Houston Electric, LLC for Approval of Its Transmission And Distribution System Resiliency Plan Direct Testimony of Eugene L. Shlatz, CenterPoint Energy Houston Electric, LLC. P. 528
[9] Michigan Public Service Commission. Case: U-21224. Filing made by Consumers Energy Company. Witness: Ally Durfee. U21224-ST-CE-0161. Exhibit: S-14.1. Date: 8/24/2022. Page 2 of 2

additional accuracy of LiDAR is not necessary to bring the system into cycle in the most beneficial customer outage reduction schedule."[10]

It also can take several months longer to capture and process LiDAR data compared to satellite data. Saving several months to process data is critical when identifying and addressing high-risk areas. As Consumers noted: "After an approximate 3-month timeframe to LiDAR the system, it would take an additional 3 months to convert LiDAR data to analytic data status whereas satellite imagery of the entire system would take 2-4 weeks to convert data to the analytic data status."[11]

In sum, satellite imagery is gaining in popularity due to a more affordable price point for timely data with the necessary level of accuracy relative to foot patrols and LiDAR.

Option	Accuracy	Cost	Processing Time
Satellite imagery	30 cm	$90-$175/mile	2-4 weeks
LiDAR	6-10 cm	$350-$450/mile	6+ months

II. Recommended Best practices for Technology-Enabled Vegetation Management

Michigan's two largest Investor-Owned Utilities, Consumers and DTE, are each deploying or are considering deploying technology-enabled vegetation management.[12] Overstory applauds Consumers and DTE, as this has the potential to optimize resources towards the highest risk area.

According to the Liberty report, Consumers' "Workplan Intelligence & Strategy Engine" ("WISE") incorporates "historical weather data, circuit attribute details, satellite-imagery supported canopy cover, pole attributes, and analytic capabilities" that "have, according to management, enhanced predictive outage model modeling used to target clearing work where most beneficial."[13] Based on previous filings from Consumers with the PSC referenced above, our understanding is that the imagery comes from the National Agriculture Imagery Program ("NAIP"). As Consumers has noted, "NAIP imagery is public data, but the imagery is captured throughout the year and captured during the most effective timeframe for this type of application… NAIP data can be 2 years old."[14] Later in this section, we detail why relying

[10] Michigan Public Service Commission. Case: U-21224. Filing made by Consumers Energy Company. Witness: Ally Durfee. U21224-ST-CE-0161. Exhibit: S-14.1. Date: 8/24/2022. Page 1 of 2

[11] Ibid

[12] As Liberty notes, "In 2022, Consumers developed an in-house forestry analytics program to optimize the yearly LVD full circuit clearing workplan. This Forestry Workplan Intelligence & Strategy Engine ("WISE") tool incorporates the calculated highest reliability and safety benefits achievable for each annual clearing budget." "Final Report: Utility Distribution Audit of Consumers Energy." Part Two. Presented by Liberty Consulting Group. September 23, 2024. Page 44.

[13] Ibid. Page 61

[14] Michigan Public Service Commission. Consumers Energy Company. Case: U-21224. Exhibit: S-14.1. Witness: Ally Durfee. Date: 8/24/2022. Page 1 of 2

exclusively on publicly available NAIP data for imagery conflicts with improving reliability and reducing costs.

Regarding DTE, Liberty notes "In addition, after bringing distribution overhead circuits in line with a five-year cycle, and sub-transmission overhead circuits in-line with a three-year cycle, management plans to use modeling supported by Light Detection and Ranging and other data to set optimum cycles for individual circuits based on their unique circumstances." Further, industry trade press reported that "DTE also plans to explore other remote-sensing technologies to monitor vegetation control in more rural areas of its service territory."[15] It is prudent of DTE to consider deploying different technology-enabled solutions across its service territory depending on the local geography.

When considering approval of technology-enabled vegetation management, Overstory recommends that the PSC adopts the following three criteria and best practices:

1. **The imagery should allow measurement of height and strike potential**. In other words, the imagery should indicate the risk posed by a tree falling. A 30-foot tree poses significantly more risk to a distribution line than a five-foot tree, but 2D imagery fails to measure height and thus accurately determine vertical distance to a line.

   Therefore, NAIP's 2D imagery provides minimal value to utilities in differentiating high-risk from low-risk areas. Returning to the Commission's initial Order and the loss of life that resulted from downed lines, NAIP, or any solution that cannot accurately measure height, is an inferior option for preventing downed lines, maintaining reliability, and optimizing utility expenditures towards the highest need areas. Any limited upfront savings to deploying NAIP over the satellite technology of private companies quickly evaporate when considering the impacts on reliability, safety, and the significant additional costs of not being able to optimize labor resources. This is especially true in Consumers' territory, where there is a several-year backlog for trimming certain areas. As Consumers' response to Liberty indicates, Consumers indicates that they can save $32 million/year by using a five-year cycle instead of a four-year cycle and therefore reducing the number of miles to trim each year. This suggests that ratepayers derive significant value from deferring clearing in low-risk areas and reducing the number of miles to trim in a year.

2. **The imagery should be less than one-year old and should take no longer than 2-3 months to process**, **especially in higher-risk areas.** As detailed below by AEP, extreme weather conditions are driving rapid changes in vegetation. Using images that are older than a year or that take six months or longer to process could prevent utilities from identifying

[15] https://www.tdworld.com/vegetation-management/article/21152221/leveraging-high-density-distribution-lidar-in-detroit

emerging risks to reliability. As Consumers noted, NAIP images are typically two years old and LiDAR takes over six months to process.

In a recent filing with the Public Utility Commission of Texas, AEP noted the following regarding the shortcomings of publicly available imagery compared to the imagery provided by technology vendors.

> "However, public datasets do not have the necessary details to match the data available through Overstory; the unit of mitigation activities are individual trees and the poor resolution of public data sets makes individual tree delineation difficult if not impossible in many cases. Additionally, public data sets lack the recency necessary to effectively enhance the Company' s ability to understand, prioritize, and execute vegetation management tasks for wildfire mitigation. Vegetation is dynamic and constantly growing, trees may experience sudden decline in health or fall victim to a pest or disease. For these reasons, having recent imagery is key to informed decision making."[16]

A useful analogy here is to consider a doctor evaluating an x-ray to make a recommendation on whether a person should have surgery. The person would undoubtedly prefer the doctor's recommendation to depend on the most recent X-ray that is easy to read and that has sufficient detail, not an older x-ray that is difficult to read and that lacks sufficient detail. Even if the more recent x-ray cost slightly more than relying on the older x-ray, we would save much more money over the next several years on medical care from making an informed decision about surgery.

3. **When pursuing technology-enabled vegetation management, utilities and the Commission should consider both the total upfront cost of the technology and the ongoing cost to ratepayers. If utilities are building a solution in-house, the Commission should ask utilities to estimate the upfront and ongoing maintenance costs of the solution (including any rate of return if the utilities plan to capitalize it), compared against a commercially available solution.** Likewise, to have updated images and detect emerging threats, scans need to be done of a utility territory each year, especially all high and medium risk areas. Therefore, when utilities are deciding what technology to deploy, and the Commission is deciding what to approve, it's important to consider the frequency and cost of data updates not just the initial deployment.

III. Comments on Liberty Consulting's "Utility Distribution Audit" of Consumers Energy and Comments on Consumers' Response

[16] Public Utility Commission of Texas. Docket No. 57057 Application Of AEP Texas Inc. For Approval Of A System Resiliency Plan. September 25, 2024. Attachment A. Page 27 of 37.

Overstory agrees with The Liberty Report's finding supporting Consumer's use of data driven analysis. Liberty's Report and Consumers' response also covers cycle lengths in detail. Liberty states that "The seven-year overall forestry cycle that Consumers has targeted for its LVD circuits is too long to be effective in avoiding interruptions…it appears that some of the Company's circuits have not been trimmed in 20 years and it will take until 2030 according to Company plans to perform work as required by that overall seven- year cycle."[17] In response to this comment as well as others, Consumers stated:

> "Furthermore, based on discussions with utility peers and industry professionals, the Company is aware of utilities evaluating and implementing new risk based tools (some similar to the Company's Forestry Workplan Intelligence & Strategy Engine (WISE) tool) and technologies (e.g. satellite and LIDAR imagery), as well as processes to enable more "targeted" or "condition-based" vegetation management strategies, which are strategies that seek to optimize line clearing cycles based on vegetation-related risk. Due to these conversations and the Company's understanding of these industry trends, the Company anticipates that some utilities will be extending line clearing cycles (i.e. beyond 4- and 5-year cycles) for some circuits that are lower risk."[18]

Overstory agrees with both Consumers and Liberty. A seven-year cycle is too long if the entire territory is on that cycle, and if no part of the territory is inspected and trimmed more than once every seven years. However, satellites can enable "risk-informed" vegetation management which could result in trimming high-risk areas as needed (e.g. every 1-2 years) and trimming no and low-risk areas far less frequently (e.g. once every seven years or even less frequently). To make the distinction between high-risk and low-risk areas, the utility needs to routinely scan the entire territory. As previously highlighted, LiDAR is "cost-prohibitive" for routinely scanning at this scale, and routine foot patrols across an entire territory are impractical. Satellites are the most practical solution.

Consumers highlights that moving to a five-year cycle and four-year cycle would annually cost an additional $119 million and $151 million, respectively. Therefore, Overstory recommends that the Commission support Consumers and DTE desire to transition toward "risk-informed" cycles. To ensure that these cycles are appropriately targeted and as effective and affordable as possible, the Commission should follow the three best practices highlighted in Section II.

[17] Michigan Public Service Commission. Case No. U-21305. "Final Report: Utility Distribution Audit of Consumers Energy." Part Two. Presented by Liberty Consulting Group. September 23, 2024. Page 68
[18] Michigan Public Service Commission. Case No. U-21305. Comments Of Consumers Energy Company. November 15, 2024. P. 38

IV. Comments on Liberty Consulting's "Utility Distribution Audit" of DTE and Comments on DTE's response

Overstory supports Liberty's Category 3 - Recommendation 1-15: "Make the planned examination of further adjustments to trim cycles a priority."[19] Overstory also strongly supports DTE's response to the recommendation, which stated the "Company proposes a risk-based cycle determined at either the substation or circuit level is the optimal approach to determining cycle-length. A risk-based cycle, determined through more advanced modeling and field observations, enables the Company to target shorter cycles in areas with faster growing species and increased reliability issues, without excessively trimming in areas with fewer tree related events. Remaining on a fixed, five-year cycle across the entire system, or moving to a four-year cycle, would have significant cost implications and require a cost benefit analysis to sufficiently measure if the incremental reliability benefits would justify the cost."[20] Michigan can see improvements in both reliability and affordability by transitioning to a risk-based cycle that leverages technology-enabled solutions for identifying risk.

Liberty also stated that "In addition, after bringing distribution overhead circuits in line with a five-year cycle, and sub-transmission overhead circuits in-line with a three-year cycle, management plans to use modeling supported by Light Detection and Ranging and other data to set optimum cycles for individual circuits based on their unique circumstances." As highlighted in Section II, LiDAR is significantly more costly than satellite imagery and any additional accuracy from LiDAR is unnecessary for differentiating high-risk and low-risk areas. This claim is supported by the testimony of the ICC staff that we provided in Section II. and Consumers' testimony regarding the cost-prohibitive nature of deploying LiDAR. While LiDAR is appropriate for limited applications, as Consumers stated, it is "cost-prohibitive" to deploy it at scale.

Therefore, the Commission should clarify to utilities that when they plan to seek approval for technology-enabled vegetation management solutions, they should provide a reliability and cost comparison between LiDAR, satellites (and any other major options), including upfront cost and any ongoing costs for refreshing the data or maintenance. If the Commission receives proposals that do not have this comparison, the Commission should require the utility to come back with it, and a rationale for their decision.

V. Conclusion

To summarize, Overstory provides the following recommendations to the PSC:

[19] Michigan Public Service Commission. Case No. U-21305. "Final Report: Utility Distribution Audit of DTE Energy." Part Two. Presented by Liberty Consulting Group. September 23, 2024. Page 53

[20] Michigan Public Service Commission. Case No. U-21305. Comments Of DTE Energy. November 15, 2024. Category 3 - Recommendation 1-15. P. 45 of 67

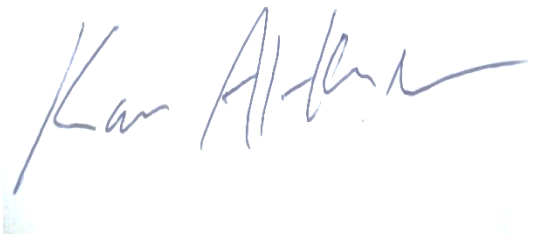
1. When considering approval of technology-enabled vegetation management, Overstory recommends that the PSC adopts the following three criteria and best practices:
   - The imagery should allow measurement of height and strike potential
   - The imagery should be less than one-year old and should take no longer than 2-3 months to process, especially in higher-risk areas
   - Consider both the total upfront cost of the technology and the ongoing cost

2. Support Consumers' and DTE's desire to transition toward "risk-informed" cycles.

3. The Commission should clarify to utilities that when they plan to seek approval for technology-enabled vegetation management solutions, they should provide a reliability and cost comparison between LiDAR, satellites (and any other major options), including upfront cost and any ongoing costs for refreshing the data or maintenance. If the Commission receives proposals that do not have this comparison, the Commission should require the utility to come back with it, and a rationale for their decision.

Overstory thanks the Commission for their consideration of these comments. Please contact Overstory's Head of Business Development Karim Al-Khafaji (karim@overstory.com) if you have any questions.

Sincerely,



Karim Al-Khafaji, PhD (he/him)
Head of Business Development
+1 (858) 255-4632
karim@overstory.com