![New York State Department of Public Service logo]

CASE 24-E-0140 - **In the Matter of 2023 Electric Reliability Performance in New York State**

2023 ELECTRIC RELIABILITY PERFORMANCE REPORT

Office of Resilience and Emergency Preparedness
June 2024

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EXECUTIVE SUMMARY

The attached report presents the Department of Public Service (Staff) assessment of electric reliability performance in New York State for 2023. The Public Service Commission (Commission) primarily relies on two metrics commonly used in the industry to measure reliability performance: the System Average Interruption Frequency Index (SAIFI or frequency) and the Customer Average Interruption Duration Index (CAIDI or duration).[1] Frequency is influenced by factors such as system design, capital investment, maintenance, and weather. Decisions made by utilities today on capital expenditures and maintenance policies, however, can take several years before being fully reflected in the frequency measure. Duration, on the other hand, is affected by work force levels, management of the workforce, and geography.

The Commission has established several means to monitor the level of service provided to New York State customers. First, the Commission requires that utilities submit detailed monthly interruption data to the Commission.[2] The utilities group interruption data into 10 categories that delineate the cause of the interruption (cause code).[3] Analysis of the cause code data enables the utilities and Staff to identify areas where increased capital investment or maintenance is needed. As an example, if outage data shows that a circuit is prone to lightning-caused interruptions, the utility could install arrestors on that circuit to minimize the effect of future lightning strikes. In general, utility interruptions typically result from major storms, equipment failures, tree contacts, and

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[1]   SAIFI is the average number of times that a customer is interrupted for five minutes or more during a year. CAIDI is the average interruption duration time in hours for those customers that experience an interruption during the year.

[2]   The regulated electric utilities consist of Consolidated Edison Company of New York, Inc. (Con Edison), Central Hudson Gas & Electric Corporation (Central Hudson), New York State Electric & Gas Corporation (NYSEG), Niagara Mohawk Power Corporation, d/b/a National Grid (National Grid), Rochester Gas and Electric Corporation (RG&E), and Orange & Rockland Utilities, Inc. (Orange & Rockland). PSEG Long Island LLC (PSEG-LI) provides interruption data that Staff used to calculate statewide performance in this report.

[3]   16 NYCRR §97.5, Information to be contained in reports, specifies and defines the following ten cause codes that reflect the nature of the interruptions: major storms, tree contacts, overloads, operating errors, equipment failures, accidents, prearranged interruptions, customers equipment, lightning, and unknown. Con Edison exclusively uses an additional seven cause codes for its underground network system.

accidents.[4] Staff maintains interruption data from 1989 to the present in a database, which enables the observation of trends.

Next, the Commission adopted Service Standards, which among other things, set minimum performance levels for both the frequency and duration of service interruptions for each major electric utility's operating divisions.[5] The Commission has established Reliability Performance Mechanisms (RPMs) in the most recent rate plan for that utility, against which that utility's performance is compared. The RPMs include company-wide targets for outage frequency and duration; some RPMs have additional measures to address specific concerns unique to an individual company. RPMs provide that companies are subject to negative revenue adjustments for failing to meet electric reliability targets excluding major storms.[6] Unlike the investor-owned utilities, for PSEG-LI, the Commission does not establish rate plans or RPMs, but PSEG-LI does have performance metrics associated with reliability set as part of an Operating Service Agreement.[7]

In addition to Staff's review, the utilities must perform an annual reliability analysis. Each utility must submit a report by March 31 of each year containing detailed assessments of performance, including historic performance for the preceding five years, outage trends in the utility's various geographic regions, reliability improvement projects, analyses of worst-performing feeders, and, where needed, corrective action plans. Each utility must also compare recent data with historic performance to identify positive or negative trends.

By compiling the interruption data provided by the individual utilities, the average statewide frequency and duration of interruptions can assess the overall reliability

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[4]   The accident cause code covers events not entirely within in the utilities' control including vehicular accidents, sabotage, and animal contacts. Lightning is reported under a separate cause code.

[5]   There are no revenue adjustments for failure to meet a minimum level under the electric service standards; utilities are, however, required to include a corrective action plan as part of the annual report.

[6]   Negative revenue adjustments are paid by shareholders and not by ratepayers.

[7]   Amended and Restated Operations Services Agreement between Long Island Lighting Company d/b/a LIPA and PSEG Long Island LLC, Dated as of April 1, 2022. (https://www.lipower.org/wp-content/uploads/2022/04/2nd-AR-OSA-in-effect-on-4-1-2022.pdf).

of electric service in New York State. Excluding major storms, the statewide interruption frequency performance for 2023 was 0.58. This is better than last year and better than the statewide five-year average (as shown in Figure 1, page 7).[8] The 2023 frequency performance for all utilities other than Con Edison was 0.94. This is also better than last year and also better than the five-year average. Statewide, the three major causes for interruptions, excluding storms, were equipment failures, tree contacts, and prearranged outages.[9] These three categories combined account for approximately 77 percent of all interruptions.

Excluding major storms, the statewide interruption duration performance was 1.92 hours. This is worse than the 2022 duration index by approximately 1.2 minutes, but better than the five-year average by 3.0 minutes (as shown in Figure 2, page 9). The statewide interruption duration index performance, excluding Con Edison,[10] was 1.88. This is worse than 2022 performance by 3.0 minutes but is in line with the statewide five-year average.

The state experienced 27 separate storm events that qualified as major storms in 2023, seven less events than 2022. Accordingly, customers affected by major storms decreased by 34 percent and customer hours of interruption due to major storms decreased by 56 percent.

Central Hudson, Con Edison, National Grid, Orange & Rockland, PSEG-LI and RG&E met their reliability targets in 2023. NYSEG failed its target for frequency for the fifth consecutive year, incurring a negative revenue adjustment of $3.5 million. NYSEG's frequency was 1.29, higher than the performance target of 1.20. Tree contacts continued to be the single largest contributor to system interruptions for NYSEG in 2023,

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[8]   16 NYCRR 97.1 defines a Major Storm as any storm which causes service interruptions of at least ten percent of customers in an operating area, or if the interruptions last for 24 hours or more. To balance between service interruptions under a utility's control, such as equipment failures, and those which a utility's control is more limited, such as an ice storm, Staff reviews reliability data both including and excluding severe weather events.

[9]   16 NYCRR 97.5 defines prearranged outages as interruptions resulting from actions deliberately taken by the utility upon advance notice to the customer affected. Deliberate interruptions without prior notice to the customers affected are reported under the classifications most directly related to the reasons the outages were needed.

[10] Con Edison's underground system is less prone to interruptions than overhead systems and Con Edison serves approximately a third of the state's electric customers. This combination can skew the statewide metrics.

accounting for 37 percent of interruptions and affecting approximately 456,000 customers. Although this is a five percent, or 50,000 customer, improvement over last year's performance, it was not enough to offset increases in planned outages, operating error outages, and outages due to events outside of the Company's control. In recognition of the impact that a well-executed vegetation management program has on reliability performance, as part of the 2023 NYSEG Rate Order, the Commission authorized an expanded distribution vegetation management budget for NYSEG to continue its Reclamation and Danger Tree programs and perform system-wide routine trimming on a six-year cycle.[11] The Company predicts that as it continues to reclaim its system and clear its rights-of-way (ROWs) to specification, it will not only halt degradation of unreclaimed circuits' reliability performance, but also improve system reliability. Since the issuance of the 2023 NYSEG Rate Order, Staff and NYSEG have met monthly to follow the Company's progress on increasing the program scope to meet the six-year cycle plan. Due to a slow ramp up, and the importance of an effective distribution vegetation management plan on reliability, Staff will continue to monitor NYSEG's progress throughout 2024.

On March 29, 2024, both NYSEG and RG&E filed petitions requesting the Commission to authorize the Companies to exclude certain outages from the calculation of SAIFI and CAIDI performance measures for calendar year 2023.[12] NYSEG and RG&E report that these outages were for causes such as Ash Tree Decay and Emerald Ash Borer infestation, Loss of Supply from a Foreign Utility, Customer or Customer Contractor Fallen Tree, and Required Make Ready Work. NYSEG requested a total of 2,624 unique outage events be excluded from its year-end reliability performance calculations and RG&E requested a total of 690 unique outage events be excluded from its year-end reliability performance calculations. For NYSEG, if the Commission were to authorize all proposed exclusions, NYSEG would still fail to meet its frequency target and be assessed a negative revenue adjustment. RG&E met both its frequency and duration performance

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[11] Case 22-E-0317, <u>NYSEG – Electric Rates</u>, Order Adopting Joint Proposal (issued October 12, 2023) (2023 NYSEG Rate Order), p. 40.

[12] Case 22-E-0317 and 22-E-0319, NYSEG and RG&E – Electric Rates, Petition For Exclusions from SAIFI and CAIDI (filed March 29, 2024) (NYSEG and RG&E Exclusion Petition).

targets and the proposed exclusions would not impact the Company's exposure to a negative revenue adjustment. The petition is subject to a comment period, after which the Commission will have the opportunity to take action at a later date. As such, Department Staff will not address the merits of the petition in this report.

2023 RELIABILITY PERFORMANCE

The following sections provide a summary discussion of the reliability performance statewide and for each of the major utilities. Individual company discussions identify issues or actions within each company that influenced performance levels for 2023 and indicate company-specific trends where applicable. Each year, Staff prepares an Interruption Report summarizing the monthly interruption data submitted by New York's utilities. The 2023 Interruption Report contains detailed interruption data for each utility and statewide statistics for the past five years. The Interruption Report for 2023 is attached as an Appendix to this report.

This report presents interruption data in two ways – including and excluding major storms. Staff excludes major storm interruptions from the data used in calculating performance levels for service standards and reliability performance mechanisms. This exclusion achieves a balance between service interruptions under a utility's control, such as equipment failures and line maintenance, and those over which a utility's control is more limited, such as a severe ice storm or a heavy wet snowstorm. Reliability performance data inclusive of major storms to reflect the overall customer experience during a year.

STATEWIDE - Excluding Major Storms

For many years, Staff has combined individual utility performance statistics into overall statewide statistics. By doing so, Staff can evaluate the level of reliability provided statewide and identify statewide trends. Since Con Edison's system includes many large, highly concentrated distribution networks that are generally less prone to interruptions than overhead systems, its interruption frequency may be extremely low (better) compared to the other utilities. This, combined with the fact that it serves the largest number of customers in the state, typically results in a skewing of the performance measures. As a result, Staff examines and presents aggregated data both including and excluding Con Edison's data.
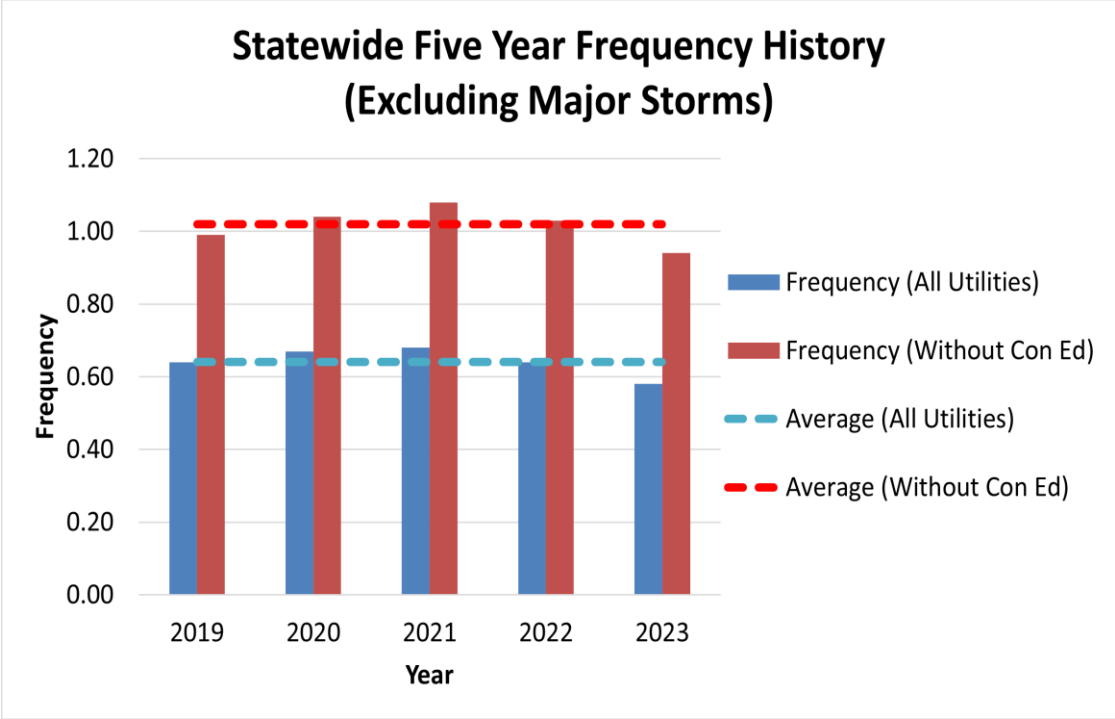
Figure 1: Statewide Frequency Performance

Statewide, as shown in Figure 1, the frequency of interruptions performance (frequency performance) in 2023 was better than the frequency performance in 2022. Excluding major storms, the frequency performance was 0.58 in 2023, which is approximately nine percent better than 2022's frequency performance of 0.64. This frequency performance is also nine percent better than the five-year average, also 0.64. The frequency performance in 2023 for all utilities other than Con Edison was 0.94, which is approximately nine percent better than the performance in 2022 of 1.03, and also approximately nine percent better than the five-year average performance 1.02. When including major storms, the statewide frequency performance was 0.72, and 1.19 for utilities other than Con Edison, indicating the effect that the large number of customers interrupted and customer hours of interruption due to major storms would have on the other utilities' reliability performance in 2023 if these interruptions were not excluded from calculations.

The major causes for interruptions excluding storms were equipment failures, tree contacts, and prearranged outages. These three causes combined accounted for nearly

77 percent of all interruptions in 2023. To reduce the frequency of interruptions, the utilities invest in numerous capital projects, inspections, and maintenance activities. Projects targeted to reduce equipment failures include adding, updating, or replacing equipment and strengthening transmission and distribution lines. For example, to reduce the possibility of outages, utilities install reclosers and other protective devices on circuits. Detailed project descriptions aimed at reducing the frequency of interruptions can be found in the utility-specific sections of this report.

Figure 2, below, shows the historical statewide interruption duration index, excluding major storms. The 2023 overall statewide interruption duration index of 1.92 hours is 1.2 minutes worse compared to the previous year's duration index of 1.90 hours but is three minutes better compared to the statewide five-year average of 1.97 hours. Only Orange & Rockland's and Con Edison's Network duration performance improved from 2022. The statewide interruption duration index, excluding Con Edison, was 1.88 hours in 2023, which is three minutes worse than 2022 and 36 seconds worse than the statewide five-year average of 1.87 hours. This example shows the significant impact Con Edison's performance has on the statewide statistics.
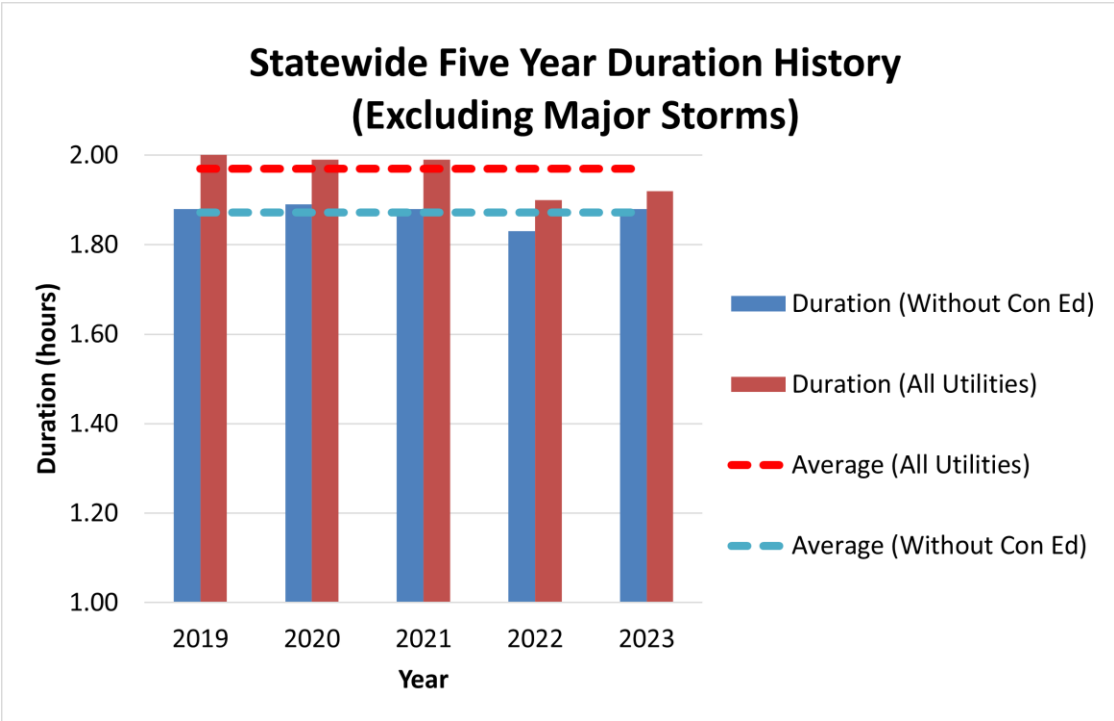
Figure 2: Statewide Duration Performance

STATEWIDE - Including Major Storms

 As detailed below, fewer major storms occurred in 2023 than in 2022. Including major storms, both the statewide interruption frequency index and the statewide interruption duration index, excluding Con Edison, improved. The 2023 overall statewide interruption duration index, excluding Con Edison, of 2.79 hours is approximately one hour and 13 minutes shorter than the 2022 duration index of 4.00 hours and one hour and 10 minutes shorter than the statewide five-year average of 3.95 hours. Including Con Edison, the statewide interruption duration index was 2.77 hours in 2023, which is one hour and eight minutes shorter than the 2022 duration index of 3.90 hours and one hour and 29 minutes shorter than the statewide five-year average of 4.26 hours.

 The state experienced 27 separate storm events that qualified as major storms in 2023, which generally impacted upstate service territories more than those downstate. These storms subjected the utilities' electric systems to damaging winds, rain,

thunderstorms, snow, and/or ice. Of the 27 major storm events, six impacted Central
Hudson, three impacted Con Edison, 11 impacted National Grid, 22 impacted NYSEG,
nine impacted Orange & Rockland, three impacted PSEG-LI, and seven impacted RG&E.
Customer interruptions associated with major storms in 2023 decreased by approximately
34 percent from 2022 and customer hours of interruption decreased by 56 percent from
2022. As can be seen in Figure 3, 2023 was one of the best years from the customers'
viewpoint regarding service interruptions caused by major storms since 2016.
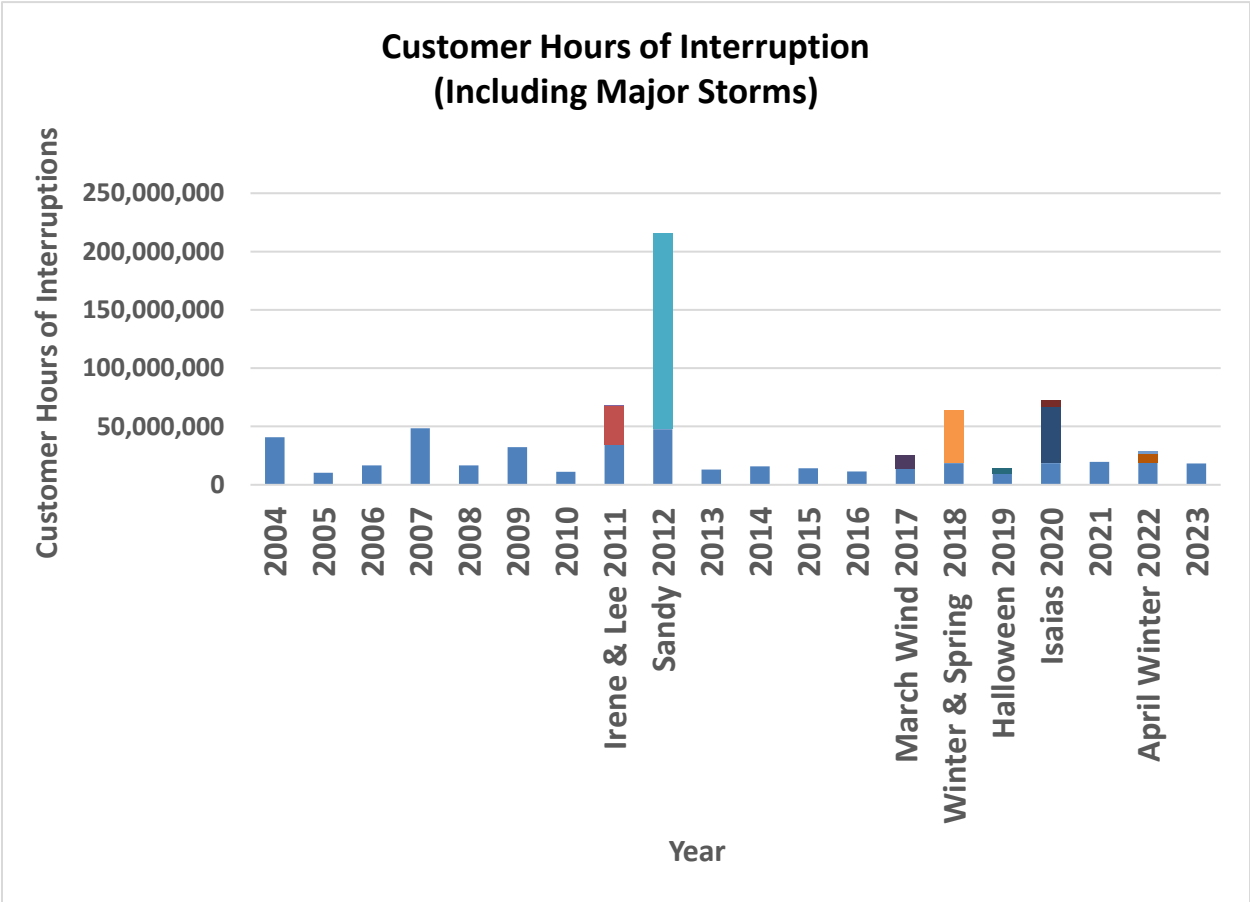
Figure 3: Customer Hours of Interruption (Including Major Storms)

        The most significant storm event in 2023 occurred in March when a
nor'easter tracked up the East Coast and severely impacted parts of the Capital District and
Mohawk Valley regions. Beginning the evening of March 13, rain, turning into snow,
moved across the area. Snowfall totals varied with elevation, with areas in the southeastern
Adirondacks and eastern Catskills receiving in excess of 30 inches, and valley locations

receiving 7 to 15 inches. The National Weather Service issued winter storm warnings for most of the Capital District, Mohawk Valley, Central New York, and Southern Tier regions, and declared winter storm watches for the rest of the State north of New York City. The heavy, wet snow led to numerous downed trees and power lines affecting Central Hudson, National Grid, and NYSEG service territories. In total, the three utilities reported approximately 230,000 customer outages.

The second most significant storm occurred on September 6 when, after a record-setting heatwave, high winds and thunderstorms impacted eastern New York State, affecting large portions of the Southern Tier, Mohawk Valley, Mid-Hudson, and Capital District regions. Wind gusts varied across the regions between 45 and 65 mph, bringing down trees and powerlines across the area. In total, approximately 162,000 customers lost service between NYSEG, National Grid, Central Hudson and Orange and Rockland, with National Grid's Capital Division experiencing 37,000 outages alone. By September 9, the event had concluded, and the National Weather Service canceled all remaining severe thunderstorm warnings in the regions.

The third most significant major storm event occurred on February 22 when the remnants of the coast-to-coast Winter Storm Olive tracked through the Finger Lakes and Central New York regions, blanketing Central New York in snow, sleet, and ice. The National Weather Service issued winter storm warnings and advisories for much of Western and Central New York, with some areas expected to see upwards of a foot of snow. The storm had the greatest impact in NYSEG's Lancaster Division, with approximately 92,000 customers interrupted. Combined, these three impactful storms were responsible for approximately 31 percent of the customers affected and 44 percent of the customer hours excluded as part of all major storm exclusions in 2023.

CON EDISON

Table 1: Con Edison's Historic Performance Excluding Major Storms

Performance Metric	2019	2020	2021	2022	2023	Current Target	Five-Year Average
Network Systems							
Frequency (SAIFI)	0.0223	0.0858	0.0170	0.0174	0.0117	0.0186[13]	0.0308
Duration (CAIDI)	6.72	1.79	6.57	6.23	6.13	6.89	5.49
Radial System							
Frequency (SAIFI)	0.526	0.469	0.489	0.467	0.398	0.495	0.470
Duration (CAIDI)	2.73	2.02	1.93	1.86	1.91	2.04	2.09

Note: Data presented in red represents a failure to meet the target for a given year.

Con Edison serves approximately 3.6 million customers in New York City and Westchester County. Con Edison supplies electricity to 2.7 million customers by a network system, while it supplies the remaining 920,000 customers by a radial system. The network system mostly consists of underground wires housed in conduits, whereas the radial system has a typical overhead configuration. The two systems are subject to different reliability metric targets specific to each configuration.

Network Systems Performance

On its network system, Con Edison achieved its system-wide frequency target of 0.0186 and its duration performance target of 6.89 hours with performance values of 0.0117 and 6.13 hours, respectively. Con Edison's network frequency performance of 0.0117 is a 33 percent improvement from its 2022 performance and is better than the five-year average. The Company's network duration performance of 6.13 in 2023 is a two percent improvement over its 2022 performance but is worse than the five-year average. When compared to their 2022 performance, network systems in the Bronx, Brooklyn,

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[13] In addition to the previously defined Major Storms, Con Edison's current RPM excludes snow/ice events affecting the underground system, and customers impacted by a storm who are served via overhead lines connected to the underground network system from network system reliability target calculations. See, Case 22-E-0064, Con Edison – Electric Rates, Order Adopting Terms of Joint Proposal and Establishing Electric and Gas Rate Plans with Additional Requirements (issued July 20, 2023). The values presented in the Appendix to this report do not reflect these exclusions.

Queens, and Manhattan experienced less frequent outages, while duration improved in Brooklyn, Bronx, and Manhattan.

The largest contributing events that impacted Con Edison's network performance continue to be underground equipment failures in manholes during the winter and cable burnouts during the summer. During the winter months, rain, snow, and salt can mix and seep into underground electrical structures. This can impact underground cables and lead to service interruptions. From February 28 to March 4, Con Edison's service territory experienced one of the first snowfalls of the season, with accumulation between one to three inches throughout the city, with a maximum reported accumulation of 5.6 inches. During this snow event, 1,173 customers were interrupted with an average duration of 5.24 hours due to several underground events throughout the city. Only Con Edison's Brooklyn Division qualified for an ice/snow event exclusion as part of the Company's RPM. Another significant event occurred on March 10, when a manhole outage affected 218 customers, with an average outage duration of 8.82 hours, greatly impacting the Company's network duration performance.

Con Edison works to improve the reliability of its underground distribution system through its network relief and reliability programs. Con Edison implements these programs system-wide to reduce both network outage frequency and duration. Equipment issues in the underground system are harder to identify than on the overhead system and generally don't materialize until an outage occurs. To specifically address interruptions due to equipment failure within the underground system, the Company has several capital programs focused on proactively replacing poorly performing equipment, such as vintage cable types, outdated splices and joints, and obsolete underground switches. One such proactive replacement program is the Company's Underground Secondary Rebuild Program. This program removes and replaces specific types of main cables in the Company's underground secondary system that are associated with manhole events. This proactive replacement both reduces the possibility of an outage and mitigates the public safety risk associated with these types of cable. In 2023, Con Edison rebuilt 15 underground distribution structures, significantly more than it rebuilt in 2022.

<u>Radial Performance</u>

On its radial, or overhead system, Con Edison achieved its system-wide frequency target of 0.495 and its duration performance target of 2.04 hours with performance values of 0.398 and 1.91 hours, respectively. The 2023 radial outage frequency performance improved by approximately 15 percent compared to 2022 and is better than the five-year average. The 2023 radial outage duration performance worsened by three minutes compared to 2022 but is still approximately 11 minutes better than the five-year average. When compared to 2022 performance, radial systems in Queens, Brooklyn, Staten Island, and Westchester had less frequent outages, while outage duration improved in Queens and Westchester radial systems.

As shown in Figure 4 below, the leading causes of interruptions to Con Edison's radial system continue to be Company equipment failures, followed by tree contacts and prearranged outages. The number of interruptions due to equipment failure decreased compared to 2022 values while the number of interruptions due to tree contacts increased. The largest factor contributing to Con Edison's radial performance continues to be outages occurring during rain, windstorms, and thunderstorms. One such radial incident that greatly impacted both the Company's outage frequency and duration performance occurred between January 25 and 26, when high winds and rainstorms impacted the Company's service territory. This weather event affected approximately 11,300 customers for an average outage duration of more than two hours.
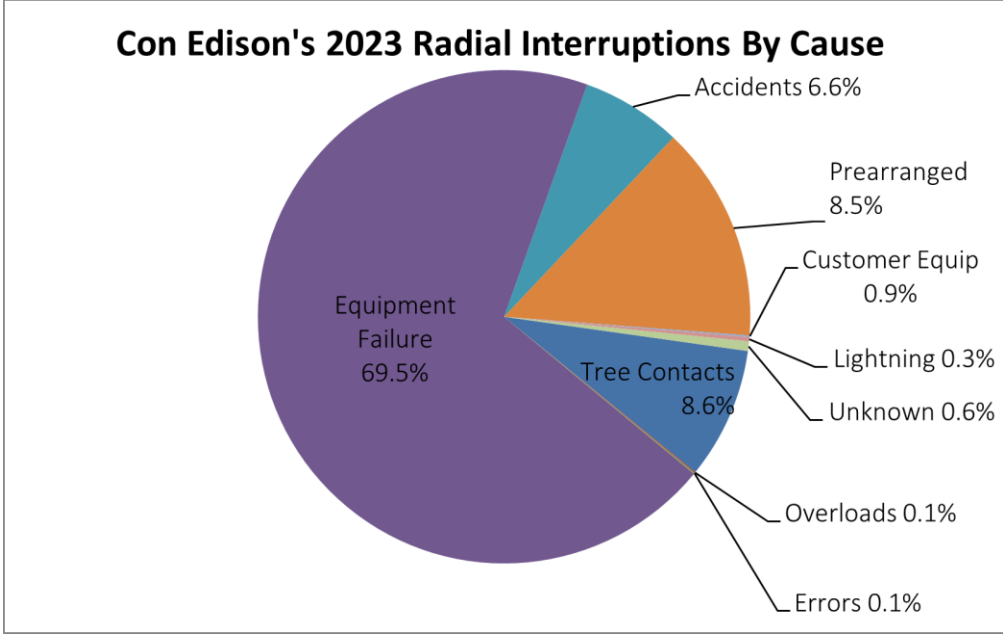
**Figure 4: Con Edison 2023 Radial Interruptions by Cause
(Excluding Major Storms)**

In order to improve the reliability and resiliency of its radial system, Con Edison manages numerous ongoing capital and preventive maintenance programs that both reinforce the system and prevent outages from occurring. As part of its Auto Loop reliability initiative, Con Edison hardens its radial system in order to improve storm performance using several different measures. In 2023, various projects were completed as part of this program, including the installation or replacement of reclosers and other sectionalizing switches on circuits throughout Brooklyn, Queens, and Staten Island. These switches improve both outage frequency and duration performance by limiting the customer impact an outage has and allowing the Company to better target feeder sections and restore them to service quicker. To address radial interruptions due to tree contacts, Con Edison implements a vegetation management program for its distribution system. As part of the Company's Tree Trimming maintenance activity, Con Edison trims tree branches to 10 feet on either side and below overhead primary wires and 15 feet above primary wires. Con Edison uses a two-year tree trimming cycle for its 33 kV and 27 kV primary wires, and a three-year cycle for its 4 kV and 13kV primary wires. In 2023 Con

Edison trimmed a total of 1,532 linear miles of distribution circuitry, nearly 100 more miles than in 2022.

NATIONAL GRID

Table 2: National Grid Historic Performance Excluding Major Storms

Performance Metric	2019	2020	2021	2022	2023	Current Target	Five-Year Average
Frequency (SAIFI)	1.02	1.04	1.06	1.06	0.92	1.08	1.02
Duration (CAIDI)	2.02	2.03	1.89	1.95	2.04	2.10	1.99

National Grid serves approximately 1.68 million customers across upstate New York. The Company's territory includes metropolitan areas, such as Albany, Buffalo, and Syracuse, as well as many rural areas in northern New York and the Adirondacks. For 2023, the Company met both the frequency and duration reliability targets. The 2023 frequency level of 0.92 is lower than last year, 15 percent below the target, and 10 percent lower than the five-year average. The 2023 duration performance of 2.04 hours is 5.4 minutes longer than last year's duration of 1.95 hours, three percent better than the target, and three percent higher than the five-year average.

As shown in Figure 5, three causes were responsible for approximately 76 percent of interruptions on National Grid's electric system. Tree contacts caused approximately 33 percent of interruptions, followed by equipment failures at approximately 27 percent, and accidents at approximately 16 percent. Customers experienced 30 fewer tree contact events in 2023 than in 2022 and the number of interruption hours decreased by eight percent.

National Grid's 2023 Interruptions By Cause

Tree Contacts
32.6%

Overloads 0.4%

Errors 0.5%

Unknown
15.6%

Equipment
Failure
27.4%

Lightning 3.3%

Accidents
16.0%

Prearranged 4.1%
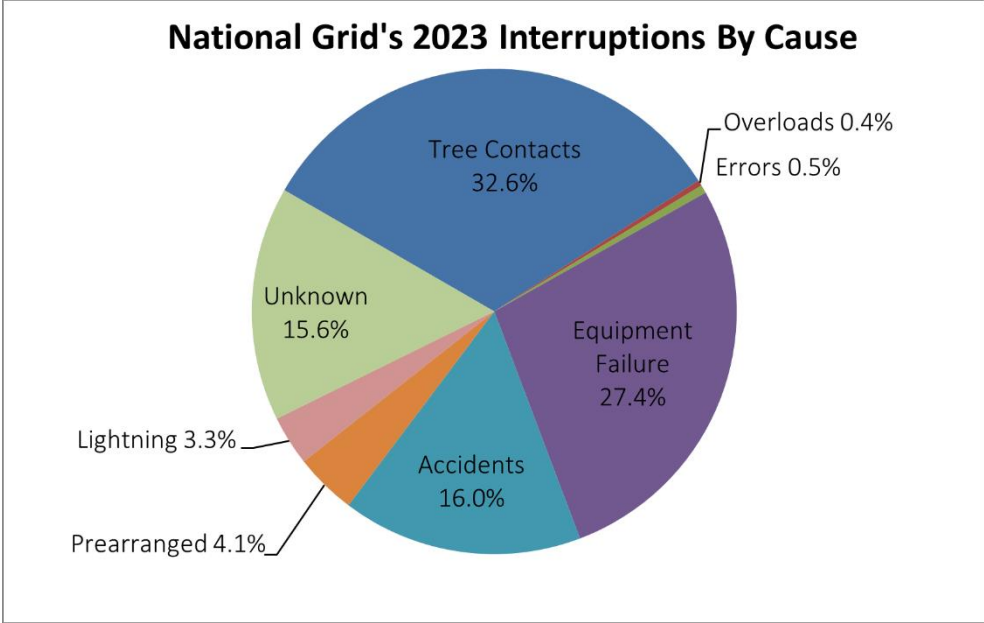
Figure 5: National Grid 2023 Interruptions by Cause
(Excluding Major Storms)

National Grid uses six subcodes to further breakdown the cause of tree contact interruptions excluding major storms: tree fell, broken limb, growth, vines, Emerald Ash Borer (EAB) tree fell, and EAB broken limb. Within tree contact interruptions, tree fell accounted for nearly 71 percent of the customer interruptions in 2023, followed by broken limbs at 24 percent. The volume of tree fell and broken limb interruptions demonstrates the importance of a robust hazard tree removal program. The small number of tree and vine growth interruptions indicate that the current pruning cycle and specifications are effective in minimizing interruptions related to vegetation growth. In addition to the subcodes, National Grid uses inspections, number of customers served, and circuit configuration to identify and prioritize circuits for the removal of hazards trees.

Since 2017, National Grid has implemented a robust hazard tree program to lessen the impact of the Emerald Ash Borer, or EAB, infestation on the electric system. In 2023, National Grid removed more than 17,000 hazard trees near its distribution and transmission systems. The Company's hazard tree program also includes a follow-up process to monitor the number of interruptions caused by tree type. According to the Company, this will aid in distributing vegetation management resources appropriately. This process will be especially important in future years as ash tree failures begin to

stabilize and National Grid's system continues to experience more failures of white pine, sugar maple, and other tree species due to invasive fungi and insects that compromise tree health and structure.

Equipment failures accounted for approximately 27 percent of interruptions in 2023, a decrease of nearly six percent. National Grid has several capital and maintenance programs in place to ensure it maintains and improves reliability on the electric system. Each year, National Grid selects several circuits from the worst performing circuit list for an Engineering Reliability Review. This review entails an analysis of the circuit characteristics and performance and potential remedial actions. Examples of improvements identified and implemented through these efforts include adding fault indicators, feeder ties, capacitor banks, switches, reclosers, load balancing, and reconductoring. National Grid also uses its Inspection and Maintenance Program to identify and correct equipment issues.

Accidents accounted for 16 percent of interruptions in 2023, a decrease of approximately 17 percent over 2022. Motor Vehicle Accidents continue to be one of the largest causes of interruptions. National Grid investigates all poles that are involved in vehicle accidents to identify hazardous locations and relocates poles if necessary. Unknown causes were the fourth largest cause of interruptions in 2023 at approximately 16 percent, a decrease of approximately three percent. Additional National Grid efforts to improve reliability include distribution patrols, maintenance programs, protection coordination studies, lightning protection, and tree trimming programs.

Throughout 2023, the Company completed several projects to maintain and improve reliability. In 2023, outages due to equipment failure accounted for 41 percent of customer-hours of interruption in the Capital Division. In order to address asset condition issues on major substation equipment, including power transformers, distribution feeders, and metal-clad switchgear within the Capital Division, the Company completed the construction and energization of the Chrisler Avenue Substation. This project converted the existing 4.16kV infrastructure island to 13.2kV, giving the Company more operational flexibility during contingency conditions. Additional upgrades at the Chrisler Avenue

Substation, including additional feeder conversions, are in progress and will continue for the next several years. In 2023, National Grid also completed 18 remote terminal unit (RTU) upgrades and enhancements throughout its service territory to further build out the Company's Distribution Supervisory Control and Data Acquisition (SCADA) network. National Grid either replaced or upgraded RTUs that lack remote monitoring and control capabilities to enable communication with its FLISR-enabled devices, including switches and reclosers. This allows National Grid to isolate faulted sections of cable locally and make better and informed decisions regarding restoration actions. National Grid plans to have 21 active distribution FLISR schemes by mid-2024.

NYSEG

Table 3: NYSEG Historic Performance Excluding Major Storms

Performance Metric	2019	2020	2021	2022	2023	Current Target	Five-Year Average
Frequency (SAIFI)	1.35	1.36	1.46	1.45	1.29	1.20	1.38
Duration (CAIDI)	1.93	1.98	2.02	1.88	1.96	2.08	1.95

Note: Data presented in red represents a failure to meet the target for a given year.

NYSEG serves approximately 911,000 electric customers across upstate New York and some areas of Westchester and Putnam Counties. The Company serves a primarily rural area that covers approximately 40 percent of New York, including 42 counties and 149 small cities and villages. Cities served by NYSEG include Auburn, Binghamton, Geneva, Hornell, Ithaca, Lockport, Mechanicville, Oneonta, and Plattsburgh.

Although NYSEG had its best frequency performance in the past five years, and an 11 percent improvement over 2022 performance, the Company failed to meet its frequency target for a fifth straight year, with an outage frequency of 1.29 in 2023. Tree contacts continued to be the single largest contributor to system interruptions, accounting for 37 percent of the interruptions in 2023 and affecting approximately 456,000 customers. This five percent and 50,000 customer improvement over 2022's performance, however, did not offset increases in planned outages, operating error outages, and outages due to events outside of the Company's control.

In 2023, the primary driver for NYSEG's improvement in performance in tree contact events was a significant decrease in the number of outages from trees outside the right-of-way. From 2022 to 2023, NYSEG saw decreases of nine percent, 13 percent, and 15 percent in interruptions, customers affected, and customer hours, respectively, from tree outages outside the ROW. A large portion of the Company's tree contact outages continue to be from inside ROW tree contacts on unreclaimed circuits, or those circuits that NYSEG has not trimmed in several years. Department Staff recognizes the impact that a well-executed vegetation management program has on reliability performance. The continuity of these programs between rate years and the maintaining of vegetation management contracts is important, such that continued circuit degradation is slowed and any improvements in reliability are not undone due to lapses in program operations. As part of the 2023 NYSEG Rate Order, the Commission authorized an expanded distribution vegetation management budget for NYSEG to continue its Reclamation and Danger Tree programs and perform system-wide routine trimming on a six-year cycle.[14] The Company predicts that as it continues to reclaim its system and clear the ROW to specification, the degradation of unreclaimed circuits' reliability performance will not only halt, but reliability will improve. Since the issuance of the 2023 NYSEG Rate Order, Staff and NYSEG have met monthly to follow NYSEG's progress on increasing the program scope to meet the six-year cycle plan. Due to a slow ramp up, and the importance of an effective distribution vegetation management plan on reliability, Staff will continue to monitor NYSEG's progress throughout 2024.

As shown in Figure 6, in addition to tree contacts, equipment failures and prearranged outages were the next predominant causes of interruptions throughout NYSEG's service territory. These three causes together were responsible for approximately 80 percent of all interruptions. Equipment failures decreased by one percent over 2022 values, but prearranged outages increased by 12 percent. NYSEG attributes the increase in the number of prearranged outages to required Make Ready work needed to support the New York State "Broadband for All" initiative and other programs. Although

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[14] 2023 NYSEG Rate Order, p. 40.

the Company anticipates these outages to decrease as third-party installer work stabilizes, Staff continues to recommend that NYSEG remain in discussions with the other New York State utilities regarding their practices and the steps they have taken to coordinate with third-party pole-attachment owners and their contractors to appropriately manage these outages.
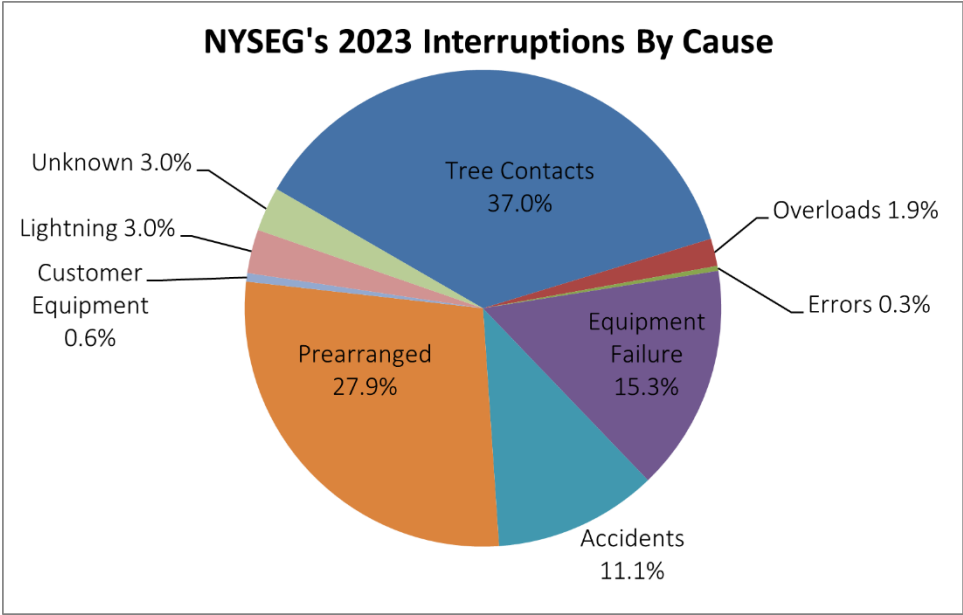
Figure 6: NYSEG 2023 Interruptions by Cause
(Excluding Major Storms)

In response to a series of significant storms in 2018, NYSEG announced that it would develop a comprehensive resiliency plan as part of an overall approach to harden its electric distribution system. According to NYSEG, its Distribution Resiliency Plan (Resiliency Plan) focuses on three components to limit outages resulting from severe storms: hardening infrastructure through more robust construction practices and materials that will increase the ability of the electric system to withstand severe storms; aggressive removal of hazard trees to increase the ability of the electric system to withstand severe storms; and changes to circuit design to allow the Company to isolate outages and restore power more quickly through actions such as adding or upgrading lines, increasing feeder

ties, and increasing automation.[15] Circuit resiliency projects are determined using a comprehensive identification and ranking system of NYSEG's circuits within its service territory.

In 2023, NYSEG completed eight circuit resiliency projects as part of its Resiliency Plan. These projects included wire upgrades, cable conversions, reconducting and smart device installations. NYSEG upgraded several miles of overhead wire sections with tree wire, an aluminum conductor covered with multiple layers that provides additional physical protection from light tree contact. NYSEG also installed trip savers, reclosers, and other SCADA devices, providing the Company with greater visibility of its system and the ability to sectionalize targeted circuits and spans. These efforts help to improve the Company's outage frequency performance by limiting the customer impact when an outage occurs and also improve outage duration performance by reducing the need for Company truck rolls to diagnose outage causes, shortening restoration time. Although completed in 2023, reliability improvements as a result of these resiliency projects may not be immediately evident and may take time to be reflected in the Company's performance metrics.

In spite of the Company's improved reliability performance and the additional funding authorized as part of the 2023 Rate Order for its numerous reliability, resiliency, and vegetation programs, on March 29, 2024, NYSEG, together with its affiliate RG&E, filed a petition requesting the Commission to exclude certain outages from the calculation of their SAIFI and CAIDI performance measures for calendar year 2023.[16] NYSEG reports that Ash Tree Decay and Emerald Ash Borer infestation, Loss of Supply from a Foreign Utility, Customer or Customer Contractor Fallen Tree, and Required Make Ready Work all contributed to these outages. NYSEG requested a total of 2,624 unique outage events be excluded from its year-end reliability performance calculations. The NYSEG and RG&E Exclusion Petition is subject to a public comment period before the Commission can take action on it. Without addressing the merits of the petition, Staff

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[15] Feeder ties connect two or more circuits together to ensure service is maintained in the event of an outage.

[16] NYSEG and RG&E Exclusion Petition.

notes that even if the Commission were to authorize all proposed exclusions, NYSEG would still fail to meet its frequency target and be assessed a negative revenue adjustment.

RG&E

Table 4: RG&E Historic Performance Excluding Major Storms

Performance Metric	2019	2020	2021	2022	2023	Current Target	Five-Year Average
Frequency (SAIFI)	0.72	0.88	1.13	0.83	0.71	0.90	0.85
Duration (CAIDI)	1.84	1.78	1.81	1.64	1.70	1.90	1.75

Note: Data presented in red represents a failure to meet the target for a given year.

RG&E serves approximately 385,000 electric customers across its service territory, located in and around Rochester. The Company's service territory comprises four Divisions: Canandaigua, Genesee Valley, Lakeshore, and Rochester, with the Rochester Division accounting for approximately 80 percent of its customer base.

For the past 20 years, RG&E has consistently maintained high levels of electric service reliability for both outage frequency and duration. After failing to meet its frequency target in 2021, RG&E has returned to its pre-2021 reliability performance levels. The Rochester and Canandaigua Divisions met both their frequency and duration performance targets, while the Genesee Valley and Lakeshore Divisions met their frequency targets but exceeded their respective duration targets.

In 2023, the three major causes for interruptions throughout RG&E's service territory were prearranged outages, tree contacts, and equipment failures, as shown in Figure 7. In 2022, prearranged outages were also the leading cause of interruptions. Prearranged outages first jumped in 2021 due to the broadband expansion work in the area that included pole replacements and this work has continued through 2022 and into 2023. Although prearranged outages continue to be a significant driver in the Company's reliability performance, both the number of customers affected by and customer hours due to prearranged outages dropped by approximately 39 percent in 2023 from 2022 values. RG&E attributes the improved performance on the Company's increased focus on

designing new jobs to allow for future additions without having to take an outage, and notifying customers well before the prearranged outages so they could plan accordingly.
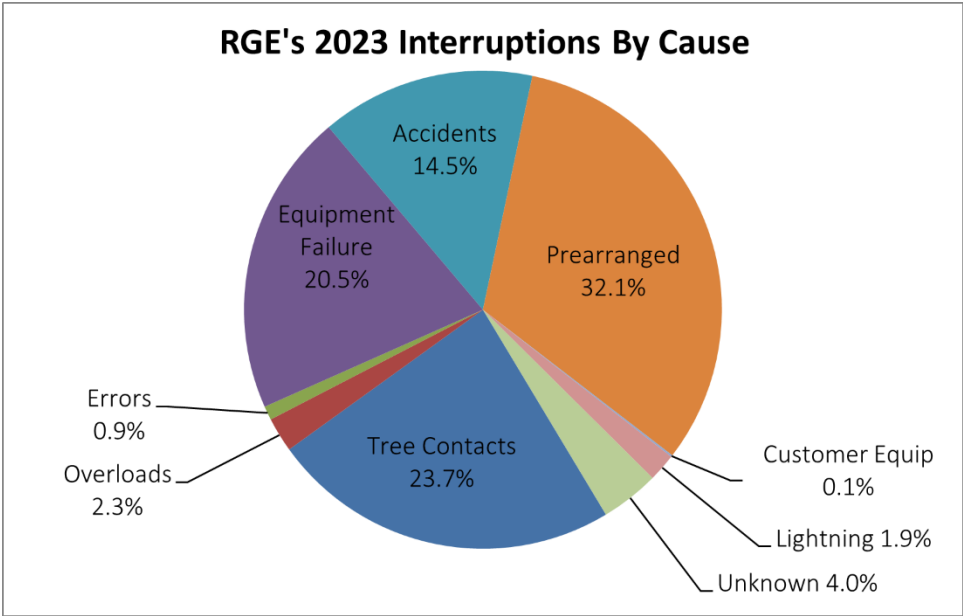
**Figure 7: RG&E 2023 Interruptions by Cause
(Excluding Major Storms)**

RG&E and NYSEG are both subsidiaries of Avangrid Inc. and, as a result, implement many of the same programs and procedures to reduce the number of interruptions, reduce overall duration times, and improve reliability. Examples include vegetation management programs, Circuit Breaker Replacement Program, Distribution and Transmission Line Inspection Programs, Distribution Line Deficiency Program, and Distribution Circuit Resiliency and Hardening Program. Similar to NYSEG, RG&E maintains its own Resiliency Plan focused on the same three main components: hardening infrastructure through more robust construction practices and materials that will increase the ability of the electric system to withstand severe storms; aggressive removal of hazard trees that will increase the ability of the electric system to withstand severe storms; and changes to circuit design to allow RG&E to isolate outages and restore power more quickly through actions such as adding or upgrading lines, increasing feeder ties, and increasing automation.

On its overhead system, RG&E relies on its Distribution Line Inspection program data and other inspection programs to find, prioritize, and repair equipment issues.

To address tree related interruptions, RG&E completed 1,158 miles of tree trimming in 2023 and will continue scheduled trimming in 2024. In 2023, RG&E completed three circuit resiliency projects as part of its current Resiliency Plan in its Rochester Division. These projects included wire upgrades, cable conversions, reconductoring and smart device installations. RG&E reconducted approximately 25 miles of overhead wire sections with tree wire, an aluminum conductor covered with multiple layers that provides additional physical protection from light tree contact. RG&E also installed trip savers, reclosers and over 20 SCADA devices, providing them with greater visibility of its system and the ability to sectionalize targeted circuits and spans. Similar to NYSEG, these efforts help to improve the Company's outage frequency and duration performance and although completed in 2023, the reliability impact of these projects may take time to be reflected in the Company's performance.

Despite RG&E's exceptional reliability performance and the additional funding authorized as part of the 2023 Rate Order for numerous reliability, resiliency, and vegetation programs, as noted above, RG&E together with NYSEG filed a petition on March 29, 2024, requesting the Commission exclude certain outages from the calculation of SAIFI and CAIDI performance measures for calendar year 2023.[17] RG&E reports that Ash Tree Decay and Emerald Ash Borer infestation, Loss of Supply from a Foreign Utility, Customer or Customer Contractor Fallen Tree, and Required Make Ready Work all contributed to these outages. As noted above, the NYSEG and RG&E Exclusion Petition is subject to a public comment period before the Commission can take action on it. Without addressing the merits of the petition, Staff notes that RG&E met both its frequency and duration performance targets and the proposed exclusions would not impact its exposure to a negative revenue adjustment.

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[17] NYSEG and RG&E Exclusion Petition.

CENTRAL HUDSON

Table 5: Central Hudson Historic Performance Excluding Major Storms

Performance Metric	2019	2020	2021	2022	2023	Current Target	Five-Year Average
Frequency (SAIFI)	1.25	1.29	1.42	1.27	1.08	1.30	1.26
Duration (CAIDI)	2.38	2.37	2.67	2.25	2.31	2.50	2.40

Note: Data presented in red represents a failure to meet the target for a given year.

Central Hudson serves approximately 315,600 customers in parts of eight counties of New York's Mid-Hudson River Valley. Counties served by Central Hudson include Albany, Columbia, Dutchess, Greene, Orange, Putnam, Sullivan, and Ulster. Central Hudson's five operating divisions are Catskill, Fishkill, Kingston, Newburgh, and Poughkeepsie. About 70 percent of Central Hudson's customer base is within the Kingston, Newburgh, and Poughkeepsie Divisions.

Central Hudson met both its outage frequency and duration targets for 2023. Central Hudson's 2023 outage frequency was its best performance over the past five years, but its duration worsened slightly. Tree contacts were responsible for 50 percent of Central Hudson's non-storm SAIFI in 2023. Yet, the frequency of tree contacts in 2023 was 11 percent lower than it was in 2022 and approximately 10 percent lower than the five-year average. The largest contributor, approximately 82 percent of tree contact interruptions, were limbs and trees from outside the clearance zone. Accordingly, Central Hudson is focusing on vegetation management to improve its outage frequency and duration performance.
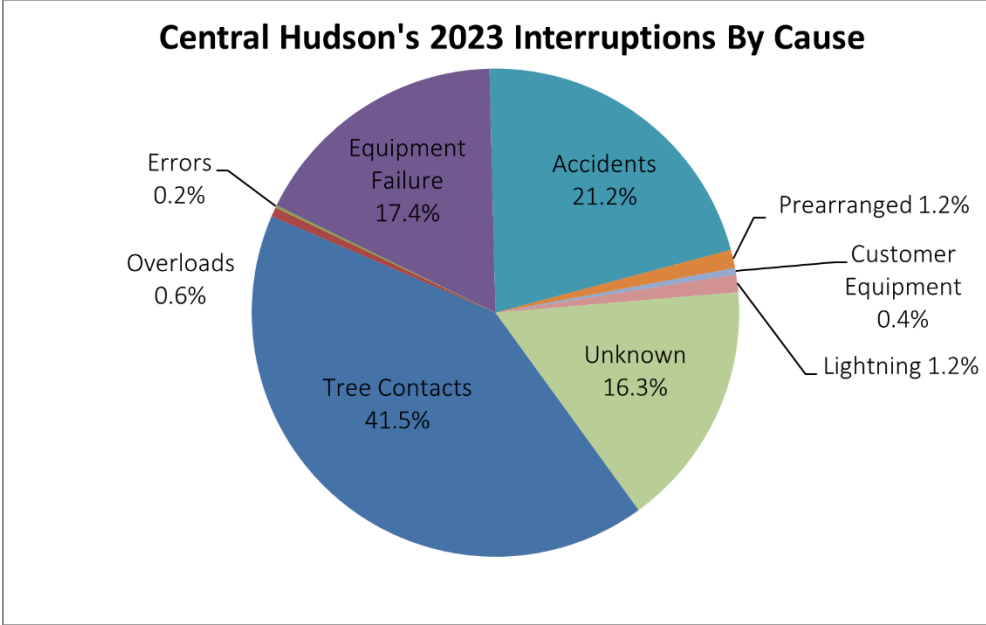
Figure 8: Central Hudson 2023 Interruptions by Cause
(Excluding Major Storms)

Central Hudson completed routine tree trimming and hazard tree removals in 2023 using new prioritization methodologies recommended by a vegetation management consultant study. Central Hudson prioritized circuits based on SAIFI per mile rather than total SAIFI. Although it will take some time to fully measure the impact of these changes, overall tree-related outages decreased in 2023 compared to the five-year average.

According to Central Hudson, distribution engineering collaborates with Line Clearance to identify circuits with suboptimal performance that require targeted hazard tree removal. As of the end of 2023, hazard tree removals have been completed on approximately 175 circuits since the program's inception. Central Hudson performed an analysis showing that on circuits where hazard trees were removed between the program's start in 2018 and the end of 2023, there was an average 20 percent reduction in non-storm SAIFI for outages caused by tree contact compared to the three-year historical averages for those circuits. In 2024, engineering analysis will continue to guide the line clearance work at Central Hudson as they carry out the scheduled trimming cycle. This analysis will also take into consideration any restrictions on trimming imposed by the presence of protected bat species.

Interruptions caused by accidents or events not under the utility's control were the second highest frequency driver. Interruptions caused by accidents are 19 percent lower than the 2022 level and 12 percent lower than the five-year average. The biggest driver was poles hit by vehicles accounting for 44 percent of accidents. Squirrel contacts were the second leading driver within the accidents category, contributing 25 percent to the total. The Company has been and will continue to install animal guards and closely follow ongoing research led by the Electric Power Research Institute (EPRI) on the effectiveness of various animal guards.

Interruptions as a result of equipment failures decreased approximately 33 percent from the 2022 level and were 23 percent lower than the five-year average. The biggest driver for equipment failure was conductor/cable failure, which contributed 21 percent of the total equipment failure SAIFI, although this is 29 percent below the five-year historical average. These failures are typically attributed to age and loss of strand connections, which cause gradual overheating during normal loading cycles. Central Hudson's Engineering department performs thermal scans of overhead wires to proactively identify and address potential hot spots. The infrared thermal inspection program identifies equipment such as conductors, cutouts, connectors, and arrestors with poor connections that can lead to thermal failure. Originally conducted annually during the summer, Central Hudson enhanced the program in the 2018-2019 season to also cover winter peaking circuits. Furthermore, in 2020, Central Hudson expanded the program to include spur lines that serve to a significant number of customers, including single-phase and two-phase lines. Central Hudson expects these measures to reduce equipment failure frequency by allowing the Company to proactively identify and replace or repair equipment that is near failure.

Central Hudson's duration performance of 2.31 hours is better than its CAIDI target of 2.50 and shorter than its past five-year average, by approximately five percent. However, this represents a three percent increase in CAIDI compared to 2022, primarily driven by outages due to tree contacts, typically trees or limbs from outside the clearance zone. Central Hudson continues to work on improving its duration performance by using

distribution switching to restore as many customers as possible before completing repairs and investing in multiple distribution reliability projects.

In 2023, Central Hudson made significant investments in distribution capital programs, including the Breaker Replacement Program. Central Hudson replaced 16 substation breakers as part of this program to enhance reliability and minimize potential circuit failures. Additionally, Central Hudson commissioned the Four Corners Microgrid in 2023 to ensure redundant service during source side supply outages, and it purchased and installed 33 new electronic reclosers as part of its Electronic Reclosers, or Distribution Automation, initiative. The Company expects the installation of electronic reclosers to improve reliability by providing better outage prioritization, instant notification of interruptions, fault data for troubleshooting, and more flexible system protection.

ORANGE & ROCKLAND

Table 6: Orange & Rockland Historic Performance Excluding Major Storms

Performance Metric	2019	2020	2021	2022	2023	Current Target	Five-Year Average
Frequency (SAIFI)	1.09	0.96	1.14	0.93	1.07	1.20	1.04
Duration (CAIDI)	1.71	1.67	1.57	1.76	1.72	1.85	1.69

Orange & Rockland serves approximately 239,000 customers in Orange, Rockland, and Sullivan Counties in southern New York. For operational purposes, the Company separates these areas into three divisions: Central, Eastern, and Western. Orange & Rockland met both its established outage frequency and duration targets for 2023. The Company's outage frequency performance of 1.07 was better than the established target of 1.20, but worse than the five-year average of 1.04. Orange & Rockland's outage duration performance of 1.72 hours was better than the established target of 1.85 hours, but worse than the five-year average of 1.69 hours. Overall, Orange & Rockland's performances have been continuously below the target levels – a good indication that its reliability initiatives continue to have a positive impact on reliability performance.

As shown in Figure 9, equipment failures and tree contacts continue to be the major causes of interruptions for Orange & Rockland. In 2023, these two categories accounted for approximately 60 percent of all interruptions and 59 percent of all customers affected.[18] Prearranged, or scheduled, outages were the third leading cause of interruptions.

Although Orange & Rockland saw nearly the same number of interruptions due to tree contacts in 2023, it saw an increase in the number of customers affected by approximately 13 percent. In 2023, Orange & Rockland completed several projects to improve the reliability of its distribution system, specifically with regards to tree contacts. For one such project Orange & Rockland upgraded and reconductored circuits to a Hendrix Spacer Cable system to reduce vegetation exposure. These new cables are more robust and resilient to weather and tree contact. Hendrix Spacer Cable is covered with two layers of polymer which allows for intermittent tree contacts without causing an outage on the line, lessening the frequency of tree contact outages. This storm hardening work improves both average daily reliability performance and also protects cable from future extreme weather events. In 2023, Orange & Rockland also commissioned new circuits and distribution ties, providing for additional supply feeds to support customers in the case of an outage.

Orange & Rockland intends its grid modernization and distribution automation programs to reduce the number of outages experienced by the typical customer. These programs continue to play a role in the Company's overall performance. In 2023, Orange & Rockland installed two auto-loops, 12 reclosers, and four smart capacitors. Additionally, it accelerated the installation of field devices throughout its system and installed 132 Motor Operated Air Break switches, 30 more than originally budgeted. Orange & Rockland uses these switches to sectionalize circuits into 250 customer segments, limiting customer impact when a fault on the circuit happens further upstream.

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[18]   See, Case 24-E-0140, Orange & Rockland Service Reliability Filing For 2023 System Performance (filed March 31, 2023), Figure 2.7 - Outage Statistics by Cause, p. 31.
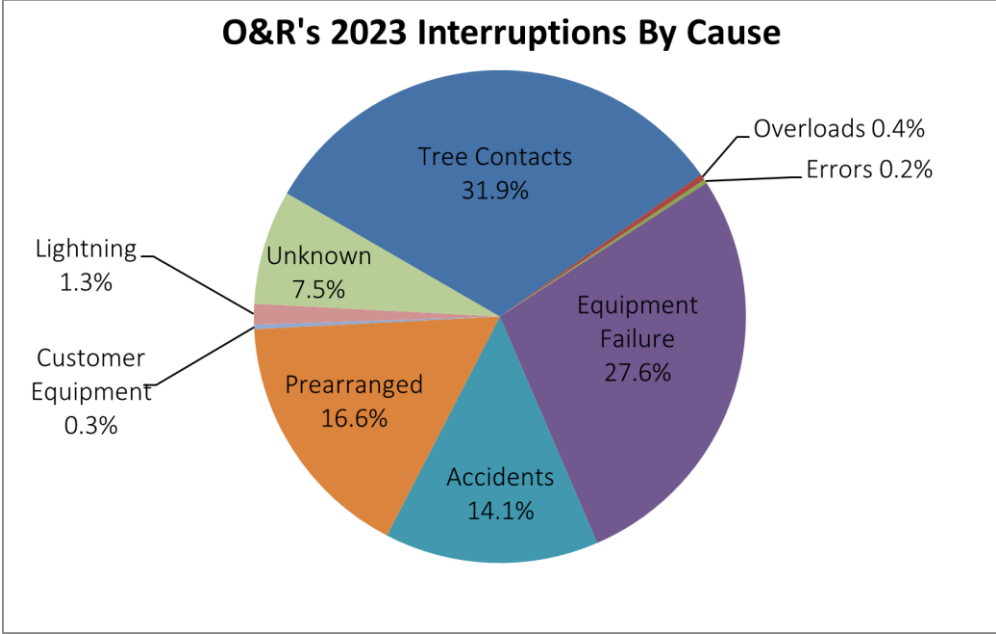
**Figure 9: Orange & Rockland 2023 Interruptions by Cause
(Excluding Major Storms)**

When compared to 2022 values, interruptions caused by equipment failures decreased in 2023. For Orange & Rockland's overhead system, secondary connector and splice failures, as well as transformer failures, were the most common causes of equipment failure interruptions. For the underground system, the equipment failure rate was lower than 2022 but still higher than the five-year average, primarily due to cable and splice failures.

Orange & Rockland has designed its service reliability programs to reduce interruption frequency and duration through inspection and maintenance of equipment installed on the transmission and distribution systems. These programs define activities that will most cost effectively meet customer reliability needs. Reliability programs establish inspection intervals, minimum component testing, minimum performance requirements, and maintenance procedures to be performed during each inspection. Orange & Rockland monitors the performance of all equipment types to detect any potential failures, identify trends, and take mitigation measures as necessary.

PSEG-LI

Table 7: PSEG-LI Historic Performance Excluding Major Storms

Performance Metric	2019	2020	2021	2022	2023	Current Target	Five-Year Average
Frequency (SAIFI)	0.67	0.80	0.68	0.68	0.69	0.70	0.70
Duration (CAIDI)	1.27	1.38	1.34	1.37	1.37	None	1.35

PSEG-LI serves approximately 1,146,000 customers on Long Island. Its territory includes Nassau County, Suffolk County, and the Rockaway Peninsula in Queens County. PSEG-LI began operating and maintaining the electric system for the Long Island Power Authority (LIPA) on January 1, 2014. To assist the Department in its statewide analysis, PSEG-LI supplies annual interruption data. The Amended Operating Service Agreement (OSA) between PSEG-LI and LIPA establishes the performance metrics for PSEG-LI.[19]

PSEG-LI met its outage frequency OSA target in 2023. The outage frequency level of 0.69 was lower than the OSA target of 0.70 and below the five-year average of 0.70. Beginning in 2022, PSEG-LI does not use CAIDI as its OSA target for duration as part of its performance metrics and uses alternative metrics to measure duration performance.[20] Nonetheless, the Department still maintains and tracks PSEG-LI's CAIDI performance for comparison with the other utilities. In 2023, PSEG-LI's outage duration performance of 1.37 hours was longer than the five-year average performance by 1.2 minutes.

As shown in Figure 10, equipment failures, tree contacts, and prearranged outages were the major causes of interruptions in PSEG-LI's service territory in 2023. These three categories accounted for approximately 85 percent of all interruptions. Interruptions caused by equipment failures decreased by three percent in 2023 but continue

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[19] Second Amended and Restated Operations Services Agreement between Long Island Lighting Company d/b/a LIPA and PSEG Long Island LLC, Dated as of April 1, 2022 (https://www.lipower.org/wp-content/uploads/2022/04/2nd-AR-OSA-in-effect-on-4-1-2022.pdf).

[20] PSEGLI 2023 Performance Metrics Package (https://www.lipower.org/wp-content/uploads/2023/03/LIPA-2023-Performance-Metrics.pdf).

to be the leading cause of interruptions. The top three equipment failure drivers are primary underground cable failure, primary line tap broken or burned open, and transmission/substation equipment problem. According to PSEG-LI, every year, as part of its Circuit Improvement Program (CIP), PSEG-LI inspects, prioritizes, and repairs hundreds of miles of distribution lines to ensure the equipment is in good working order. As part of the CIP, PSEG-LI plans to improve reliability by including the identification of substandard field conditions, installation of polymer type lighting arrestors on all riser poles, and identification of hazardous trees that have a potential to fall causing damage to electrical facilities. PSEG-LI plans to target 191 separate branchlines during 2024 to improve reliability.
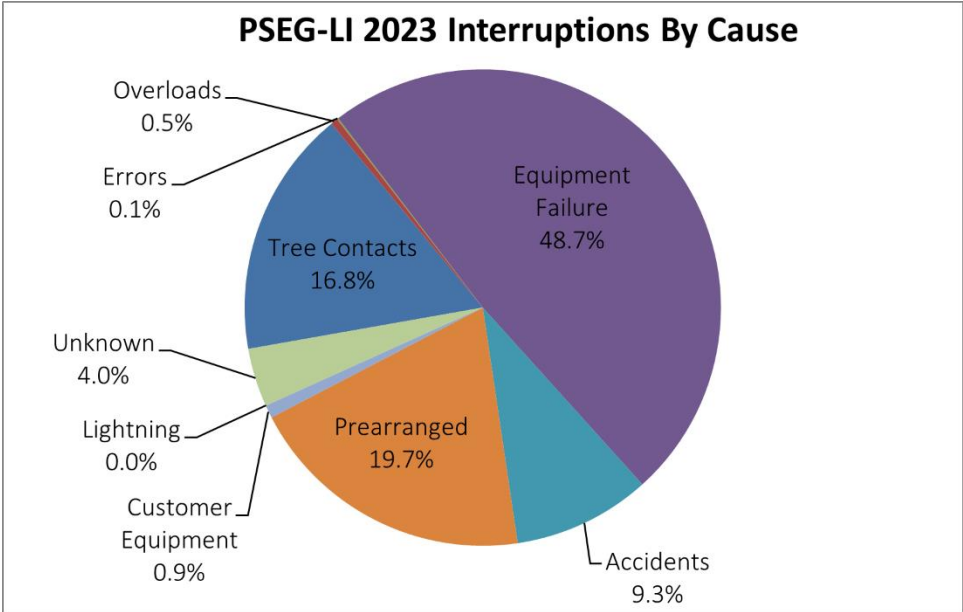
Figure 10: PSEG-LI 2023 Interruptions by Cause
(Excluding Major Storms)

Interruptions due to tree contacts decreased by approximately three percent in 2023 when compared to 2022. Tree related outages were the third leading cause of interruptions in 2023. PSEG-LI continues to address tree contact issues through its Enhanced Vegetation Management Program, which considers historical reliability performance and field observations when prioritizing circuits. The Enhanced Vegetation Management Program is having a positive effect on reliability for those circuits that are

being trimmed under the increased distribution line clearance specification. Specifically, PSEG-LI states in its reliability report that for the circuits trimmed to the new specification, on average there has been a 27.4 percent reduction in customers interrupted (including major storms) after the first year.

PSEG-LI continues to improve on its reliability performance with the ongoing PowerOn Program and Multiple Interruption Program. The PowerOn Program consists of storm hardening improvements and targets the system's entire mainline for circuits with poor performance.[21] Storm-hardening improvements include stronger poles that are less susceptible to stronger winds. In addition, to help wires deflect falling branches and limbs, stronger cross arms and conductors with more insulation will be installed on poles. The program also allows for the installation of automatic switches and the upgrade or replacement of deteriorated equipment as necessary. In 2023, PSEG-LI completed 30 circuits as part of its ongoing PowerOn Program. The Multiple Interruption program specifically targets areas where customers have experienced four or more sustained interruptions in the past twelve months. Projects included as part of this program include equipment replacements, such as replacing open-wire secondary with triplex secondary, cracked poles and crossarms, the identification of hazardous vegetation, and may also include a reconfiguration of the circuit for improved reliability.

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[21]   The PowerOn Program is an extension of the completed Federal Emergency Management Agency (FEMA) overhead mainline hardening program that PSEG-LI completed in 2020.

APPENDIX

The 2023 Interruption Report

Office of Resilience and Emergency Preparedness
June 2024

**Definitions and Explanations of Terms Used in
The Statewide Electric Service Interruption Report**

Interruption is the loss of service for five minutes or more.

Customer Hours is the time a customer is without electric service.

Customers Affected is the number of customers without electric service.

Customer Served is the number of customers as of the last day of the current year. For example, for the calendar year of 2018, customers served is the number of customers as ofDecember 31, 2018. For indices using customers served, the previous year is used.

Frequency (SAIFI) measures the average number of interruptions experienced by customers served by the utility. It is the customers affected divided by the customers served at the end ofthe previous year.

Duration (CAIDI) measures the average time that an affected customer is out of electric service.It is the customer hours divided by the customers affected.

Availability (SAIDI) is the average amount of time a customer is out of service during a year. Itis the customer hours divided by the number of customers served at the end of the year.
Mathematically it is SAIFI multiplied by CAIDI.

Interruptions per 1,000 Customers Served is the number of interruptions divided by thenumber of customers served at the end of the previous year, divided by 1,000.

Major Storm is defined as any storm which causes service interruptions of at least ten percent ofcustomers in an operating area, or if the interruptions last for 24 hours or more.

Operating Area is the geographical subdivision of each electric utilities franchise territory.These are also called regions, divisions, or districts.

Most of the data is presented in two ways, with major storms included and major storms excluded. Major storms tend to distort a utility's performance trend. Tables and graphs that exclude major storms illustrate interruptions that are under a utility's control. It portrays a utility's system facilities under normal conditions, although this can be misleading because interruptions during "normal" bad weather are included, and it is difficult to analyze from year toyear.

The first two tables show frequency and duration indices for the last five years for each utility and Statewide with and without Con Edison data. Much of the Con Edison distribution systemconsists of a secondary network. In a secondary network, a customer is fed multiple supplies, significantly reducing the probability of interruptions.

COMPARISON OF SERVICE RELIABILITY INDICES
(EXCLUDING MAJOR STORMS)

	2019	2020	2021	2022	2023	5 YR AVG
CHGE						
FREQUENCY	1.25	1.29	1.42	1.27	1.08	1.26
DURATION	2.38	2.37	2.67	2.25	2.31	2.40
CONED						
FREQUENCY	0.18	0.19	0.15	0.14	0.11	0.15
DURATION	3.33	2.75	2.99	2.58	2.34	2.80
PSEG-LI *						
FREQUENCY	0.67	0.80	0.68	0.68	0.69	0.70
DURATION	1.27	1.38	1.34	1.37	1.37	1.35
NAT GRID						
FREQUENCY	1.02	1.04	1.06	1.06	0.92	1.02
DURATION	2.02	2.03	1.89	1.95	2.04	1.99
NYSEG						
FREQUENCY	1.35	1.36	1.46	1.45	1.29	1.38
DURATION	1.93	1.98	2.02	1.88	1.96	1.95
O&R						
FREQUENCY	1.09	0.96	1.14	0.93	1.07	1.04
DURATION	1.74	1.67	1.57	1.76	1.72	1.69
RG&E						
FREQUENCY	0.72	0.88	1.13	0.83	0.71	0.85
DURATION	1.84	1.78	1.81	1.64	1.70	1.75
STATEWIDE (WITHOUT CONED)						
FREQUENCY	0.99	1.04	1.08	1.03	0.94	1.02
DURATION	1.88	1.89	1.88	1.83	1.88	1.87
STATEWIDE (WITH CONED)						
FREQUENCY	0.64	0.67	0.68	0.64	0.58	0.64
DURATION	2.05	1.99	1.99	1.90	1.92	1.97

COMPARISON OF SERVICE RELIABILITY INDICES
(INCLUDING MAJOR STORMS)

	2019	2020	2021	2022	2023	5 YR AVG
CHGE						
FREQUENCY	1.54	2.15	1.81	1.87	1.46	1.76
DURATION	3.15	7.15	3.44	6.29	3.95	4.80
CONED						
FREQUENCY	0.20	0.32	0.16	0.14	0.12	0.19
DURATION	3.51	18.83	3.70	2.65	2.62	6.26
PSEG-LI *						
FREQUENCY	0.98	1.43	0.73	0.72	0.71	0.91
DURATION	2.91	12.22	1.54	1.44	1.46	3.91
NAT GRID						
FREQUENCY	1.49	1.50	1.31	1.49	1.14	1.38
DURATION	3.64	5.06	2.82	3.98	3.04	3.71
NYSEG						
FREQUENCY	1.90	2.07	2.16	2.28	1.88	2.06
DURATION	3.13	5.41	2.81	4.91	3.02	3.86
O&R						
FREQUENCY	1.37	1.89	1.28	1.00	1.49	1.41
DURATION	2.49	10.47	1.77	1.86	2.51	3.82
RG&E						
FREQUENCY	0.92	1.05	1.37	1.18	0.84	1.08
DURATION	2.43	1.99	3.40	2.76	2.02	2.52
STATEWIDE (WITHOUT CONED)						
FREQUENCY	1.39	1.62	1.37	1.43	1.19	1.40
DURATION	3.22	7.03	2.71	4.00	2.79	3.95
STATEWIDE (WITH CONED)						
FREQUENCY	0.88	1.05	0.85	0.87	0.72	0.88
DURATION	3.25	8.58	2.79	3.90	2.77	4.26

STATEWIDE (WITHOUT CON ED)

Excluding Major Storms

	2019	2020	2021	2022	2023	5 YR AVG
Number of Interruptions	57,700	62,595	62,839	66,845	65,041	63,004
Number of Customer-Hours	8,570,971	9,094,328	9,410,601	8,811,149	8,219,249	8,821,260
Number of Customers Affected	4,567,531	4,816,965	4,999,962	4,808,092	4,374,540	4,713,418
Number of Customers Served	4,595,217	4,618,770	4,647,421	4,661,199	4,676,793	4,639,880
Average Duration Per Customer Affected (CAIDI)	1.88	1.89	1.88	1.83	1.88	1.87
Average Duration Per Customers Served	1.87	1.98	2.04	1.90	1.76	1.91
Interruptions Per 1000 Customers Served	12.61	13.62	13.61	14.38	13.95	13.63
Number of Customers Affected Per Customer Served (SAIFI)	0.99	1.04	1.08	1.03	0.94	1.02

STATEWIDE (WITH CON ED)

Excluding Major Storms

	2019	2020	2021	2022	2023	5 YR AVG
Number of Interruptions	73,972	76,677	78,461	82,288	75,721	77,424
Number of Customer-Hours	10,636,657	10,932,269	10,948,854	10,075,244	9,157,429	10,350,091
Number of Customers Affected	5,188,093	5,486,038	5,515,006	5,298,241	4,775,468	5,252,569
Number of Customers Served	8,100,204	8,154,220	8,146,146	8,224,654	8,303,399	8,185,725
Average Duration Per Customer Affected (CAIDI)	2.05	1.99	1.99	1.90	1.92	1.97
Average Duration Per Customers Served	1.32	1.35	1.34	1.24	1.11	1.27
Interruptions Per 1000 Customers Served	9.20	9.47	9.62	10.10	9.21	9.52
Number of Customers Affected Per Customer Served (SAIFI)	0.64	0.67	0.68	0.64	0.58	0.64

STATEWIDE (WITHOUT CON ED)

Including Major Storms

	2019	2020	2021	2022	2023	5 YR AVG
Number of Interruptions	77,483	92,523	74,176	82,748	75,984	80,583
Number of Customer-Hours	20,598,728	52,580,256	17,229,084	26,625,493	15,559,707	26,518,654
Number of Customers Affected	6,398,344	7,474,848	6,368,352	6,661,387	5,584,830	6,497,552
Number of Customers Served	4,595,217	4,618,770	4,647,421	4,661,199	4,676,793	4,639,880
Average Duration Per Customer Affected (CAIDI)	3.22	7.03	2.71	4.00	2.79	3.95
Average Duration Per Customers Served	4.50	11.44	3.73	5.73	3.34	5.75
Interruptions Per 1000 Customers Served	16.93	20.13	16.06	17.81	16.30	17.45
Number of Customers Affected Per Customer Served (SAIFI)	1.39	1.62	1.37	1.43	1.19	1.40

STATEWIDE (WITH CON ED)

Including Major Storms

	2019	2020	2021	2022	2023	5 YR AVG
Number of Interruptions	94,714	113,885	91,010	98,751	87,423	97,157
Number of Customer-Hours	23,018,645	73,733,264	19,351,098	27,980,280	16,693,582	32,155,374
Number of Customers Affected	7,087,711	8,597,929	6,941,133	7,173,472	6,017,371	7,163,523
Number of Customers Served	8,100,204	8,154,220	8,146,146	8,224,654	8,303,399	8,185,725
Average Duration Per Customer Affected (CAIDI)	3.25	8.58	2.79	3.90	2.77	4.26
Average Duration Per Customers Served	2.86	9.10	2.37	3.43	2.03	3.96
Interruptions Per 1000 Customers Served	11.78	14.06	11.16	12.12	10.63	11.95
Number of Customers Affected Per Customer Served (SAIFI)	0.88	1.05	0.85	0.87	0.72	0.88

CENTRAL HUDSON
Excluding Major Storms

	2019	2020	2021	2022	2023	5 YR AVG
Number of Interruptions	7,316	7,738	7,525	7,574	6,689	7,368
Number of Customer-Hours	908,953	946,420	1,181,259	900,449	792,075	945,831
Number of Customers Affected	382,350	399,149	442,323	399,975	342,370	393,233
Number of Customers Served	307,024	309,262	311,785	313,732	315,627	311,486
Average Duration Per Customer Affected (CAIDI)	2.38	2.37	2.67	2.25	2.31	2.40
Average Duration Per Customers Served	2.99	3.08	3.82	2.89	2.52	3.06
Interruptions Per 1000 Customers Served	24.04	25.20	24.33	24.29	21.32	23.84
Number of Customers Affected Per Customer Served (SAIFI)	1.25	1.29	1.42	1.27	1.08	1.26

CENTRAL HUDSON
Including Major Storms

	2019	2020	2021	2022	2023	5 YR AVG
Number of Interruptions	8,517	10,616	8,925	9,668	8,456	9,236
Number of Customer-Hours	1,490,509	4,756,359	1,939,104	3,683,676	1,813,727	2,736,675
Number of Customers Affected	473,130	664,830	564,376	585,260	459,475	549,414
Number of Customers Served	307,024	309,262	311,785	313,732	315,627	311,486
Average Duration Per Customer Affected (CAIDI)	3.15	7.15	3.44	6.29	3.95	4.80
Average Duration Per Customers Served	4.90	15.49	6.27	11.81	5.78	8.85
Interruptions Per 1000 Customers Served	27.98	34.58	28.86	31.01	26.95	29.88
Number of Customers Affected Per Customer Served (SAIFI)	1.54	2.15	1.81	1.87	1.46	1.76

CON ED (SYSTEM)

Excluding Major Storms

	2019	2020	2021	2022	2023	5 YR AVG
Number of Interruptions	16,272	14,082	15,622	15,443	10,680	14,420
Number of Customer-Hours	2,065,685	1,837,941	1,538,254	1,264,095	938,180	1,528,831
Number of Customers Affected	620,562	669,073	515,044	490,149	400,928	539,151
Number of Customers Served	3,504,987	3,535,450	3,498,725	3,563,455	3,626,606	3,545,845
Average Duration Per Customer Affected (CAIDI)	3.33	2.75	2.99	2.58	2.34	2.80
Average Duration Per Customers Served	0.60	0.52	0.44	0.36	0.26	0.44
Interruptions Per 1000 Customers Served	4.70	4.02	4.42	4.41	3.00	4.11
Number of Customers Affected Per Customer Served (SAIFI)	0.18	0.19	0.15	0.14	0.11	0.15

CON ED (SYSTEM)

Including Major Storms

	2019	2020	2021	2022	2023	5 YR AVG
Number of Interruptions	17,231	21,362	16,834	16,003	11,439	16,574
Number of Customer-Hours	2,419,917	21,153,009	2,122,014	1,354,787	1,133,875	5,636,720
Number of Customers Affected	689,367	1,123,081	572,781	512,085	432,541	665,971
Number of Customers Served	3,504,987	3,535,450	3,498,725	3,563,455	3,626,606	3,545,845
Average Duration Per Customer Affected (CAIDI)	3.51	18.83	3.70	2.65	2.62	6.26
Average Duration Per Customers Served	0.70	6.04	0.60	0.39	0.32	1.61
Interruptions Per 1000 Customers Served	4.97	6.09	4.76	4.57	3.21	4.72
Number of Customers Affected Per Customer Served (SAIFI)	0.20	0.32	0.16	0.14	0.12	0.19

CON ED (NETWORK)

	2019	2020	2021	2022	2023	5 YR AVG
Number of Interruptions	8,648	6,987	8,632	7,934	3,959	7,232
Number of Customer-Hours	765,764	973,079	685,954	472,142	239,631	627,314
Number of Customers Affected	144,678	241,562	72,670	64,155	35,148	111,643
Number of Customers Served	2,600,719	2,623,892	2,593,235	2,650,502	2,706,918	2,635,053
Average Duration Per Customer Affected (CAIDI)	5.29	4.03	9.44	7.36	6.82	6.59
Average Duration Per Customers Served	0.30	0.37	0.26	0.18	0.09	0.24
Interruptions Per 1000 Customers Served	3.37	2.69	3.29	3.06	1.49	2.78
Number of Customers Affected Per Customer Served (SAIFI)	0.056	0.092	0.028	0.024	0.013	0.04

CON ED (RADIAL)

Excluding Major Storms

	2019	**2020**	**2021**	**2022**	**2023**	**5 YR AVG**
Number of Interruptions	7,624	7,095	6,990	7,934	3,959	6,720
Number of Customer-Hours	1,299,921	864,862	852,299	791,953	698,549	901,517
Number of Customers Affected	475,884	427,511	442,374	425,994	365,780	427,509
Number of Customers Served	904,268	911,558	905,490	912,953	919,688	910,791
Average Duration Per Customer Affected (CAIDI)	2.73	2.02	1.93	1.86	1.91	2.09
Average Duration Per Customers Served	1.45	0.96	0.93	0.87	0.77	1.00
Interruptions Per 1000 Customers Served	8.51	7.85	7.67	8.76	4.34	7.42
Number of Customers Affected Per Customer Served (SAIFI)	0.526	0.469	0.489	0.467	0.398	0.470

CON ED (RADIAL)

Including Major Storms

	2019	**2020**	**2021**	**2022**	**2023**	**5 YR AVG**
Number of Interruptions	8,583	14,375	8,202	16,003	11,439	11,720
Number of Customer-Hours	1,654,153	20,179,929	1,436,059	882,645	894,244	5,009,406
Number of Customers Affected	544,689	881,519	500,111	447,930	397,393	554,328
Number of Customers Served	904,268	911,558	905,490	912,953	919,688	910,791
Average Duration Per Customer Affected (CAIDI)	3.04	22.89	2.87	1.97	2.25	6.60
Average Duration Per Customers Served	1.85	22.32	1.58	0.97	0.98	5.54
Interruptions Per 1000 Customers Served	9.58	15.90	9.00	17.67	12.53	12.94
Number of Customers Affected Per Customer Served (SAIFI)	0.602	0.967	0.552	0.491	0.432	0.609

PSEG-LI

Excluding Major Storms

	2019	2020	2021	2022	2023	5 YR AVG
Number of Interruptions	18,578	21,176	19,555	21,372	21,582	20,453
Number of Customer-Hours	966,360	1,246,625	1,037,492	1,067,733	1,075,684	1,078,779
Number of Customers Affected	760,091	901,830	773,082	779,221	787,062	800,257
Number of Customers Served	1,128,693	1,134,141	1,138,340	1,144,195	1,146,481	1,138,370
Average Duration Per Customer Affected (CAIDI)	1.27	1.38	1.34	1.37	1.37	1.35
Average Duration Per Customers Served	0.86	1.10	0.91	0.94	0.94	0.95
Interruptions Per 1000 Customers Served	16.52	18.76	17.24	18.77	18.86	18.03
Number of Customers Affected Per Customer Served (SAIFI)	0.67	0.80	0.68	0.68	0.69	0.70

PSEG-LI

Including Major Storms

	2019	2020	2021	2022	2023	5 YR AVG
Number of Interruptions	24,220	35,462	20,366	22,275	22,318	24,928
Number of Customer-Hours	3,204,176	19,756,921	1,276,823	1,190,274	1,193,450	5,324,329
Number of Customers Affected	1,102,036	1,616,774	827,804	827,533	816,040	1,038,037
Number of Customers Served	1,128,693	1,134,141	1,138,340	1,144,195	1,146,481	1,138,370
Average Duration Per Customer Affected (CAIDI)	2.91	12.22	1.54	1.44	1.46	3.91
Average Duration Per Customers Served	2.85	17.50	1.13	1.05	1.04	4.71
Interruptions Per 1000 Customers Served	21.53	31.42	17.96	19.57	19.51	22.00
Number of Customers Affected Per Customer Served (SAIFI)	0.98	1.43	0.73	0.72	0.71	0.91

NATIONAL GRID

Excluding Major Storms

	2019	2020	2021	2022	2023	5 YR AVG
Number of Interruptions	13,747	15,134	14,883	14,738	13,844	14,469
Number of Customer-Hours	3,426,393	3,512,446	3,334,033	3,478,746	3,149,825	3,380,289
Number of Customers Affected	1,692,764	1,732,491	1,767,661	1,781,841	1,544,023	1,703,756
Number of Customers Served	1,656,128	1,663,214	1,673,962	1,677,625	1,679,956	1,670,177
Average Duration Per Customer Affected (CAIDI)	2.02	2.03	1.89	1.95	2.04	1.99
Average Duration Per Customers Served	2.08	2.12	2.00	2.08	1.88	2.03
Interruptions Per 1000 Customers Served	8.33	9.14	8.95	8.80	8.25	8.69
Number of Customers Affected Per Customer Served (SAIFI)	1.02	1.04	1.06	1.06	0.92	1.02

NATIONAL GRID

Including Major Storms

	2019	2020	2021	2022	2023	5 YR AVG
Number of Interruptions	21,177	20,782	18,559	20,914	16,999	19,686
Number of Customer-Hours	8,946,922	12,629,772	6,177,279	9,920,022	5,822,707	8,699,340
Number of Customers Affected	2,459,557	2,494,794	2,190,203	2,493,613	1,915,421	2,310,718
Number of Customers Served	1,656,128	1,663,214	1,673,962	1,677,625	1,679,956	1,670,177
Average Duration Per Customer Affected (CAIDI)	3.64	5.06	2.82	3.98	3.04	3.71
Average Duration Per Customers Served	5.42	7.63	3.71	5.93	3.47	5.23
Interruptions Per 1000 Customers Served	12.83	12.55	11.16	12.49	10.13	11.83
Number of Customers Affected Per Customer Served (SAIFI)	1.49	1.50	1.31	1.49	1.14	1.38

NYSEG
Excluding Major Storms

	2019	2020	2021	2022	2023	5 YR AVG
Number of Interruptions	11,051	11,807	11,774	13,839	14,882	12,671
Number of Customer-Hours	2,329,587	2,419,098	2,658,719	2,458,728	2,297,715	2,432,769
Number of Customers Affected	1,207,533	1,224,028	1,317,127	1,310,034	1,172,341	1,246,213
Number of Customers Served	895,050	899,315	905,005	905,435	911,323	903,226
Average Duration Per Customer Affected (CAIDI)	1.93	1.98	2.02	1.88	1.96	1.95
Average Duration Per Customers Served	2.61	2.70	2.96	2.72	2.54	2.71
Interruptions Per 1000 Customers Served	12.40	13.19	13.09	15.29	16.44	14.08
Number of Customers Affected Per Customer Served (SAIFI)	1.35	1.36	1.46	1.45	1.29	1.38

NYSEG
Including Major Storms

	2019	2020	2021	2022	2023	5 YR AVG
Number of Interruptions	15,500	16,859	15,963	19,584	19,044	17,390
Number of Customer-Hours	5,323,921	10,051,986	5,509,346	10,137,576	5,182,858	7,241,137
Number of Customers Affected	1,699,146	1,859,509	1,958,103	2,064,781	1,714,076	1,859,123
Number of Customers Served	895,050	899,315	905,005	905,435	911,323	903,226
Average Duration Per Customer Affected (CAIDI)	3.13	5.41	2.81	4.91	3.02	3.86
Average Duration Per Customers Served	5.97	11.23	6.13	11.20	5.72	8.05
Interruptions Per 1000 Customers Served	17.39	18.84	17.75	21.64	21.03	19.33
Number of Customers Affected Per Customer Served (SAIFI)	1.90	2.07	2.16	2.28	1.88	2.06

Orange & Rockland

Excluding Major Storms

	2019	2020	2021	2022	2023	5 YR AVG
Number of Interruptions	3,712	3,546	3,858	4,027	4,001	3,829
Number of Customer-Hours	435,462	371,083	418,697	384,873	436,283	409,280
Number of Customers Affected	250,784	222,505	267,493	219,180	254,224	242,837
Number of Customers Served	229,181	231,512	234,333	235,938	237,591	233,711
Average Duration Per Customer Affected (CAIDI)	1.74	1.67	1.57	1.76	1.72	1.69
Average Duration Per Customers Served	1.91	1.62	1.81	1.64	1.85	1.77
Interruptions Per 1000 Customers Served	16.28	15.47	16.66	17.18	16.96	16.51
Number of Customers Affected Per Customer Served (SAIFI)	1.09	0.96	1.14	0.93	1.07	1.04

Orange & Rockland

Including Major Storms

	2019	2020	2021	2022	2023	5 YR AVG
Number of Interruptions	4,306	5,245	4,127	4,118	4,585	4,476
Number of Customer-Hours	783,968	4,585,941	529,830	438,501	889,791	1,445,606
Number of Customers Affected	314,613	437,942	299,986	235,364	354,331	328,447
Number of Customers Served	229,181	231,512	234,333	235,938	237,591	233,711
Average Duration Per Customer Affected (CAIDI)	2.49	10.47	1.77	1.86	2.51	3.82
Average Duration Per Customers Served	3.44	20.01	2.29	1.87	3.77	6.28
Interruptions Per 1000 Customers Served	18.89	22.89	17.83	17.57	19.43	19.32
Number of Customers Affected Per Customer Served (SAIFI)	1.37	1.89	1.28	1.00	1.49	1.41

RG&E
Excluding Major Storms

	2019	2020	2021	2022	2023	5 YR AVG
Number of Interruptions	3,296	3,194	5,244	5,295	4,043	4,214
Number of Customer-Hours	504,217	598,656	780,401	520,620	467,666	574,312
Number of Customers Affected	274,009	336,962	432,276	317,841	274,520	327,122
Number of Customers Served	379,141	381,326	383,996	384,274	385,815	382,910
Average Duration Per Customer Affected (CAIDI)	1.84	1.78	1.81	1.64	1.70	1.75
Average Duration Per Customers Served	1.33	1.58	2.05	1.36	1.22	1.51
Interruptions Per 1000 Customers Served	8.72	8.42	13.75	13.79	10.52	11.04
Number of Customers Affected Per Customer Served (SAIFI)	0.72	0.88	1.13	0.83	0.71	0.85

RG&E
Including Major Storms

	2019	2020	2021	2022	2023	5 YR AVG
Number of Interruptions	3,763	3,559	6,236	6,189	4,582	4,866
Number of Customer-Hours	849,232	799,277	1,796,702	1,255,444	657,175	1,071,566
Number of Customers Affected	349,862	400,999	527,880	454,836	325,487	411,813
Number of Customers Served	379,141	381,326	383,996	384,274	385,815	382,910
Average Duration Per Customer Affected (CAIDI)	2.43	1.99	3.40	2.76	2.02	2.52
Average Duration Per Customers Served	2.25	2.11	4.71	3.27	1.71	2.81
Interruptions Per 1000 Customers Served	9.96	9.39	16.35	16.12	11.92	12.75
Number of Customers Affected Per Customer Served (SAIFI)	0.92	1.05	1.37	1.18	0.84	1.08

Central Hudson Gas and Electric
(Excluding Major Storms)

Frequency

1.25	1.29	1.42	1.27	1.08	1.26
2019	2020	2021	2022	2023	5 YR AVG

Duration

2.38	2.37	2.67	2.25	2.31	2.40
2019	2020	2021	2022	2023	5 YR AVG

Availability

2.99	3.08	3.82	2.89	2.52	3.06
2019	2020	2021	2022	2023	5 YR AVG

Customers Affected

382,350	399,149	442,323	399,975	342,370	393,233
2019	2020	2021	2022	2023	5 YR AVG

Customer-Hours

908,953	946,420	1,181,259	900,449	792,075	945,831
2019	2020	2021	2022	2023	5 YR AVG

Interruptions

7,316	7,738	7,525	7,574	6,689	7,368
2019	2020	2021	2022	2023	5 YR AVG

Consolidated Edison - System
(Excluding Major Storms)

Frequency

Year	Value
2019	0.18
2020	0.19
2021	0.15
2022	0.14
2023	0.11
5 YR AVG	0.15

Duration

Year	Value
2019	3.33
2020	2.75
2021	2.99
2022	2.58
2023	2.34
5 YR AVG	2.80

Availability

Year	Value
2019	0.60
2020	0.52
2021	0.44
2022	0.36
2023	0.26
5 YR AVG	0.44

Customers Affected

Year	Value
2019	620,562
2020	669,073
2021	515,044
2022	490,149
2023	400,928
5 YR AVG	539,151

Customer-Hours

Year	Value
2019	2,065,685
2020	1,837,941
2021	1,538,254
2022	1,264,095
2023	938,180
5 YR AVG	1,528,831

Interruptions

Year	Value
2019	16,272
2020	14,082
2021	15,622
2022	15,443
2023	10,680
5 YR AVG	14,420

Long Island Power Authority
(Excluding Major Storms)

Frequency

0.67	0.80	0.68	0.68	0.69	0.70
2019	2020	2021	2022	2023	5 YR AVG

Duration

1.27	1.38	1.34	1.37	1.37	1.35
2019	2020	2021	2022	2023	5 YR AVG

Availability

0.86	1.10	0.91	0.94	0.94	0.95
2019	2020	2021	2022	2023	5 YR AVG

Customers Affected

760,091	901,830	773,082	779,221	787,062	800,257
2019	2020	2021	2022	2023	5 YR AVG

Customer-Hours

966,360	1,246,625	1,037,492	1,067,733	1,075,684	1,078,779
2019	2020	2021	2022	2023	5 YR AVG

Interruptions

18,578	21,176	19,555	21,372	21,582	20,453
2019	2020	2021	2022	2023	5 YR AVG

National Grid
(Excluding Major Storms)

Frequency

2019	1.02
2020	1.04
2021	1.06
2022	1.06
2023	0.92
5 YR AVG	1.02

Duration

2019	2.02
2020	2.03
2021	1.89
2022	1.95
2023	2.04
5 YR AVG	1.99

Availability

2019	2.08
2020	2.12
2021	2.00
2022	2.08
2023	1.88
5 YR AVG	2.03

Customers Affected

2019	1,692,764
2020	1,732,491
2021	1,767,661
2022	1,781,841
2023	1,544,023
5 YR AVG	1,703,756

Customer-Hours

2019	3,426,393
2020	3,512,446
2021	3,334,033
2022	3,478,746
2023	3,149,825
5 YR AVG	3,380,289

Interruptions

2019	13,747
2020	15,134
2021	14,883
2022	14,738
2023	13,844
5 YR AVG	14,469

New York State Electric and Gas
(Excluding Major Storms)

Frequency

Year	Value
2019	1.35
2020	1.36
2021	1.46
2022	1.45
2023	1.29
5 YR AVG	1.38

Duration

Year	Value
2019	1.93
2020	1.98
2021	2.02
2022	1.88
2023	1.96
5 YR AVG	1.95

Availability

Year	Value
2019	2.61
2020	2.70
2021	2.96
2022	2.72
2023	2.54
5 YR AVG	2.71

Customers Affected

Year	Value
2019	1,207,533
2020	1,224,028
2021	1,317,127
2022	1,310,034
2023	1,172,341
5 YR AVG	1,246,213

Customer-Hours

Year	Value
2019	2,329,587
2020	2,419,098
2021	2,658,719
2022	2,458,728
2023	2,297,715
5 YR AVG	2,432,769

Interruptions

Year	Value
2019	11,051
2020	11,807
2021	11,774
2022	13,839
2023	14,882
5 YR AVG	12,671

Orange & Rockland Utilities
(Excluding Major Storms)

Frequency

Year	Value
2019	1.09
2020	0.96
2021	1.14
2022	0.93
2023	1.07
5 YR AVG	1.04

Duration

Year	Value
2019	1.74
2020	1.67
2021	1.57
2022	1.76
2023	1.72
5 YR AVG	1.69

Availability

Year	Value
2019	1.91
2020	1.62
2021	1.81
2022	1.64
2023	1.85
5 YR AVG	1.77

Customers Affected

Year	Value
2019	250,784
2020	222,505
2021	267,493
2022	219,180
2023	254,224
5 YR AVG	242,837

Customer-Hours

Year	Value
2019	435,462
2020	371,083
2021	418,697
2022	384,873
2023	436,283
5 YR AVG	409,280

Interruptions

Year	Value
2019	3,712
2020	3,546
2021	3,858
2022	4,027
2023	4,001
5 YR AVG	3,829

Rochester Gas and Electric
(Excluding Major Storms)

Frequency

2019	2020	2021	2022	2023	5 YR AVG
0.72	0.88	1.13	0.83	0.71	0.85

Duration

2019	2020	2021	2022	2023	5 YR AVG
1.84	1.78	1.81	1.64	1.70	1.75

Availability

2019	2020	2021	2022	2023	5 YR AVG
1.33	1.58	2.05	1.36	1.22	1.51

Customers Affected

2019	2020	2021	2022	2023	5 YR AVG
274,009	336,962	432,276	317,841	274,520	327,122

Customer-Hours

2019	2020	2021	2022	2023	5 YR AVG
504,217	598,656	780,401	520,620	467,666	574,312

Interruptions

2019	2020	2021	2022	2023	5 YR AVG
3,296	3,194	5,244	5,295	4,043	4,214