

**PECO**  
**2023 Summer Readiness Overview**  
**May 26, 2023**

As the summer season approaches, PECO Energy Company (“PECO” or the “Company”) is prepared and ready for planned and unplanned events. The Company bases its readiness on its reliability enhancement programs, preventive maintenance programs, and capacity planning. PECO’s Summer Preparedness Program is part of the Company’s ongoing investment in the reliability, resiliency, and safety of the systems serving customers.

**A. Reliability Enhancement Programs**

PECO has several reliability enhancement programs that significantly contribute to the Company’s successful performance. Under the Top Priority Circuits Program, PECO analyzes and completes reliability improvements on at least 5 percent of the system’s worst performing circuits on an annual basis. The Company takes steps to enhance reliability by installing reclosers for distribution automation, identifying and repairing issues through visual and thermographic inspections, increasing vegetation management activities, installing and upgrading fuses, and replacing cable and other equipment. From 2018 to 2022, PECO increased its investment in the replacement of overhead components and infrastructure and underground cable, and in adding reclosers to its distribution system.

Through distribution automation, PECO installed 131 three-phase reclosers in automated loop schemes in Bucks, Chester, Delaware, Montgomery, Philadelphia, and York counties in 2022, bringing the total to 3,345 reclosers. These reclosers reduce the number of customers affected by outages and automatically restore service to sections of circuits where repairs are not needed.

In addition, PECO continues storm hardening activities through infrastructure improvements and vegetation management work. PECO installed more than 12.8 miles of tree-resistant wire in areas impacted by high incidences of vegetation-related outages and removed approximately 12,000 priority trees in 2022 to enhance system performance and reduce service interruptions.

PECO continues advanced grid investments to enhance reliability through microprocessor-based relay upgrades, fiber optic communications among substations, disturbance monitoring equipment across the transmission system, modern computer systems for outage management, geographic information system, and upgrades to distribution system real-time management. In addition, PECO continues to leverage and optimize the Advanced Metering Outage System (“AMOS”), which provides the ability to create, analyze and escalate customer outage events. As part of PECO’s meter upgrades, AMOS has enhanced our ability to support outage management of the new Advanced Meter Infrastructure (“AMI”) meters. The tool provides better visibility of an outage, which can lead to targeted restoration efforts. As of April 2023, more than

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1.851 million electric meters and more than 571,000 natural gas AMI modules have been installed across the PECO service territory.

In 2022, PECO completed the second year of its second Long-Term Infrastructure Improvement Plan (“LTIIIP”), or Reliability and Resiliency Plan, with increased investment in three key areas: storm hardening and resiliency measures; replacing underground cable with higher risk profiles; and replacing older and degraded substation switchgear.

PECO holds regular cross-departmental meetings to coordinate this work with the Company’s existing electric, natural gas, and vegetation management programs. The goal is to minimize the impact of this enhancement work on local communities and to ensure project work plans are communicated to customers and key stakeholders.

PECO’s investments and operational excellence also support efficient service restoration when interruptions occur. CAIDI and SAIDI, the measures of interruption duration, are enhanced by PECO’s LTIIIP and other investments to improve reliability and resilience, especially by installation of tree-resistant overhead wire and replacement of cable for underground residential distribution. PECO also continues to use CAIDI response teams to have crews readily available for first-time repairs and will continue to evaluate opportunities for further improvement.

### **a. Storage/New Technology Pilots**

PECO continues to look for opportunities to pilot and leverage new technology. PECO has been using geospatial analysis tools to better identify areas of the system with local reliability challenges and to evaluate the impact of potential solutions. PECO is also using machine learning to predict transformers and cable failures in Underground Residential Developments. PECO is evaluating and piloting aerial and underground line sensors to enhance situational awareness for operators and reduce outage restoration times. Lastly, PECO has been expanding the use of drones for operational improvements (see Section B).

## **B. Preventive Maintenance Programs**

PECO periodically performs numerous aerial and underground distribution system and transmission and substation preventive maintenance inspections including substations, wood poles, distribution aerial circuits (which include automatic splice connections), padmount and below ground transformers, and recloser inspections. In addition, PECO inspects distribution capacitors, regulators, and performs distribution preventative maintenance tree trimming. Preventive maintenance programs have met or exceeded approved Public Utility Commission (“PUC” or “Commission”) inspection and maintenance requirements since 2003 when the Commission’s quarterly reliability reporting began.

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Comprehensive vegetation management programs are completed on aerial distribution circuits and transmission lines to reduce customer power interruptions caused by vegetation-related events.

As part of PECO's aerial line inspections and a broader Circuit Patrol and Thermography Program, PECO inspects automatic splice connections and related equipment. PECO performs thermography (or infrared imaging) and visual inspection of the solid portion of aerial circuits on all distribution circuits every two years, rear property tap portions of the circuit behind fuses are inspected every five years. Visual and thermographic inspections of aerial distribution lines help identify defects which are repaired before they result in an outage event. In addition, three-phase reclosers are inspected on a regular basis to ensure the distribution automation system is ready to automatically locate and isolate faults and reduce the number of customers interrupted. PECO ensures that the inspection and maintenance of its equipment will help to maintain and improve the reliability of electric service to its customers.

Uncrewed aerial vehicle/drone technologies are being deployed at PECO on an opportunistic basis for storm damage assessment, post-construction audits, post event transmission line patrols, construction planning & design, and payload use cases (wire pulling). Drones are also used to gain situational awareness in hard-to-access areas during various electric operations.

#### **C. Capacity Planning**

Each year, as part of PECO's distribution capacity planning process, all distribution substation terminals and circuits are analyzed with data from the previous summer. During this review, PECO identified 20 projects that were designed to address capacity planning needs. Projects were designed to increase distribution capacity and to increase reliability in the identified areas. These projects are complete. Peak load and possible under-frequency conditions were assessed leading to updates to the load shed database and lists of locations to block automatic load transfers. PECO is continuing a program initiated in 2017, on an as-needed basis, to install automated load transfer blocking schemes, which maximize the amount of time automatic load transfer is available, therefore increasing reliability.

#### **D. 2022 Storm Update and Lessons Learned**

2022 was a relatively inactive storm year for PECO. PECO experienced 19 storm events of varying intensity, including two storms that were classified as "large" and zero storms classified as "very large" or "extreme."

After a major storm event, PECO conducts a formal "lessons learned" review to evaluate the elements of the planning and response efforts to determine what worked well and what could be improved. Several initiatives have already been implemented based on recent lessons learned evaluations, including:

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- Development of a crew onboarding video to minimize in-person interaction with foreign crews.
- Implement a new combined system for Emergency Response Organization (“ERO”) personnel scheduling and notifications.
- Develop new uses for Microsoft Teams software to improve communications.
- Assess a new “issue tracking” software system to better administer issues and document resolutions, storm role documentation, etc.
- Designing a new Secondary Operations Control Center, and ERO roles to better manage Secondary Operations during storms (work on <600v equipment).
- Expanding and refining the use of drone technology.
- Numerous modifications to storm role checklists and jobs aids to provide better guidance for back-office storm personnel.

#### **E. PECO’s 2023 Summer Readiness**

With the potential for severe storms this summer, PECO has been hard at work to ensure safe, reliable, affordable, and clean energy and energy services for customers during the summer of 2023. The Company has invested in new technology and projects to prepare for heat and storms this summer, including upgraded substation equipment, new wires, and poles and inspections.

PECO completes hundreds of tasks to prepare for the summer season, including system work, testing, and storm exercises. PECO employees across the region are ready to respond to severe summer storms or emergencies if needed. In addition, as part of the Exelon family of companies, PECO can draw on resources from sister utilities in Delaware, Maryland, New Jersey, Washington, D.C., and Illinois to restore power quicker after major storms.

PECO also maintains membership in two Regional Mutual Assistance Groups, which provide supplemental storm resources from across much of the United States and Canada for major storm events.

In addition to larger projects, PECO’s Summer Preparedness Program includes inspecting and maintaining aerial and underground electrical equipment, substations, and other facilities; upgrading, replacing, and repairing equipment to meet customer needs; emergency response drills and other training for employees; and maintenance and testing of various computer and support systems.

##### **a. Capacity Additions**

PECO completed two transmission capacity expansion projects. The first being the replacement of a 230kV circuit breaker at Linwood substation with back-to-back circuit breakers, to address contingency overloads identified by PJM on the Edge Moor-Claymont- Linwod 230kV lines. The second project was to move 2 MVA of load from

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the Roxborough substation to Bala substation and adjust tap settings on the Master 138/69kV transformer to address contingency overloads of the Master-Westmoreland East- Pencoyd 69kV lines. The completion of these projects enhanced our summer readiness. PECO has also completed the new Civic GIS (gas-insulated substation), which was constructed to 230kV standards and energized at 69kV, to address 69kV lines from Schuylkill River to Island Road and University and to supply load in University City and Peltz. Additionally, PECO replaced an end-of-life 138kV underground low-pressure fluid filled cable with new XLPE style cable at Master substation which increased the transmission facility rating of the 230/138kV Master #8 transformer. These projects will help to ensure that system reliability is maintained

### **b. Supplemental Vegetation Management Maintenance Activities**

PECO's Vegetation Management Department, also known as Vegetation Management, schedules an extended shift of tree crews from May through September. These crews are available to respond to emergency situations in a timely manner during the peak storm season. Vegetation Management completes an annual ground patrol of electric transmission lines, conducts patrols of aerial distribution network operating lines, and completes all identified emergent work before June 1 of each year. Vegetation Management uses dedicated funding to manage the Emerald Ash Borer Program, which focuses on mitigating high risk ash trees that could impact PECO facilities.

### **c. Employee Preparations/Training**

PECO's annual Summer Readiness Program also includes emergency response drills and other training for employees including, but not limited to: training and summer equipment preparations; employee review of PPE; inspection of all buildings and substations for summer readiness; and maintenance and testing of various computer and support systems. Extensive scenario-specific and more general drills allow employees to exercise the processes utilized by PECO personnel to address storms and other events. The Company also continues to work closely with utility counterparts across the country, including sister Exelon utilities, in its efforts to identify and implement best practices emergency preparedness training methods.

### **d. Event Preparedness**

Procedures and checklists are continually enhanced and updated to improve clarity and comprehensiveness. These procedures and checklists are reviewed and utilized during storm drills to ensure understanding and further refine processes. The drills may include the following elements: (1) substation fire, with participation by the local fire company at a substation; (2) environmental; (3) security (suspicious package found in substation); (4) load shed; and (5) road closures. In addition, separate drills for specific events are conducted, including substation physical security; electronic work packages; crew sharing and integration amongst Exelon utilities; exercising common processes and communications for larger events involving multiple Exelon utilities; and a

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“substation-based” restoration methodology utilized to focus on concentrated areas of impact.

### **e. Transmission and Substation Preparedness**

PECO’s transmission and substation preparedness includes the following: completion of preventative maintenance; identification and completion of corrective maintenance at critical substations, including generating substations; identification and completion of corrective maintenance on transmission lines; annual sump pump maintenance in substations; and verification of spare equipment and parts availability, including mobile transformers and portable units. The mobile transformers can be utilized as spare transformers in the event of equipment failures during extreme weather events. PECO also actively participates in the Spare Transformer Equipment Program, a national utility member group, hosted by Edison Electric Institute (“EEI”), focused on identifying ways to share transformers among participating members in the event it becomes necessary. Further, PECO joined a complementary program, SPARE Connect, which provides another mechanism for Bulk Power System (“BPS”) asset owners and operators to network concerning the possible sharing of transformers and other transmission related equipment, including bushings, fans, and auxiliary components. SPARE Connect is open to all BPS owners and operators in North America. In addition, PECO has recently designed and procured emergency overhead transmission structures capable of being installed quickly to address emergent structural failures on both 500kV and 230kV transmission lines.

### **f. Transmission Planning**

Transmission Planning, in collaboration with PJM Interconnection, conducted look-ahead planning studies in 2022 for 2027. All required transmission needs for the PECO system to meet the reliability standards and criteria of the industry, the region, and the Company were identified and are going to be constructed as an integral part of PECO’s summer readiness program. These summer critical projects are completed to assure that the load can be reliably served throughout the summer period.

## **F. Storm Response**

### **a. Storm Preparations**

Once a potential storm threat is identified, PECO initiates its pre-event planning and preparations. PECO’s Emergency Preparedness (“EP”) Team implements a “scalable approach” for crew mobilization as the potential for storm-related damage in the service territory increases. For anticipated significant weather events, such as hurricanes, PECO initiates pre-event planning and preparations days before an event. For events with minimal advance warning, the EP Team responds based on pre-established procedures and checklists.

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As part of its preparations, PECO identifies the need and secures additional personnel to supplement PECO's resources for restoration and tree trimming. Additional personnel can be obtained through approved local contractors, PECO's sister Exelon utilities (Atlantic City Electric, Baltimore Gas and Electric Company, Commonwealth Edison, Delmarva Power, and PEPSCO Holdings), as well as resources through mutual assistance organizations in which PECO is a member: the North Atlantic Mutual Assistance Group and the Southeastern Electric Exchange. Independent contractors from across the country can also be called upon to augment resources even further. PECO's EP Team maintains contacts for these contractors and can secure their support if other resources are constrained.

Another key component of PECO's storm preparedness is communication and outreach. PECO conducts frequent interviews and briefings with the media to discuss storm preparations, planning, and customer outage expectations. During significant events, PECO also conducts daily conference calls with elected officials and local governments, state regulatory and elected officials, and municipal and county governments. Particular attention is paid to the county 911 centers and emergency responders to ensure coordinated preparations and PECO employee staffing at 911 centers when appropriate.

Additionally, PECO encourages customers to prepare before severe weather hits. For example, customers are encouraged to visit [peco.com/alerts](https://peco.com/alerts) to choose how to receive information (via text, email, or phone), including when power is out in their area, when service is expected to be restored, or when power is restored. Customers are also encouraged to text "ADDOUTAGE" to MYPECO (6973260) to enroll in the Company's two-way texting program to report outages and check the status of their outage.

As part of an on-going initiative with the counties in our service territory, PECO continues to work with the county 911 centers that are still considering developing an automated interface with PECO's systems to be able to submit outage tickets directly into PECO's systems. Currently Delaware, Chester, and Montgomery Counties have implemented interfaces to PECO's system. Bucks and Philadelphia Counties have expressed interest but have not pursued developing an interface to this point. York County is not interested at this time.

### **b. Outage Restoration Strategy**

PECO follows an overall system restoration priority strategy that results in the most effective way to restore service to all customers who are geographically dispersed throughout PECO's service territory.

For all severe weather events, PECO's first step in its restoration strategy is to ensure that the general public and field crews are safe.

PECO's next step for addressing outages is to target restoration to any impacted transmission lines and substations to restore capacity within the affected area. Then, any

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possible switching to re-route power to customers is performed. PECO then evaluates the remaining primary outage event list and dispatches repair crews in descending order of the number of affected customers, simultaneously prioritizing “critical customers,” such as police and fire stations, hospitals, nursing homes, public water and sewer facilities, and communication systems. In this manner, repairs are performed that will restore service to the largest number of customers in the least amount of time, while still addressing the “critical customers” as quickly as possible. PECO thereafter restores power to smaller outages within neighborhoods and individual services.

For logistics associated with major storm events, PECO makes extensive use of its existing service centers for staging materials and mutual assistance crews. PECO operates a number of permanent service centers in each county, which include office facilities, as well as materials and supply staging for normal operations. Additional supplies and materials are delivered to the service centers as needed to respond to storm events. This approach allows PECO to disperse crews and materials from numerous sites, which are located throughout the service territory. This arrangement allows the crews and materials to be staged as close as possible to the areas of damage, as opposed to a small number of centralized staging areas. The relatively small footprint of PECO’s service territory makes this approach effective for most storm responses.

For extreme storms, temporary staging centers are set up at “non-PECO” facilities such as hotels, fire houses, and similar facilities. When the number of mutual assistance crews exceeds the capacity of the PECO service centers to manage them effectively, these supplemental facilities are activated. Arrangements and relationships with these non-PECO facilities are made in advance and maintained to ensure availability and concurrence with the facility owners. Materials and supplies are delivered to these facilities for use by the mutual assistance teams, and oversight and control is provided by PECO personnel. Inventories at service center storerooms, PECO’s central storeroom, and with key vendors are monitored to ensure adequate stocking level.

PECO has recently developed a new strategy to mitigate the risk of hotel availability constraints by identifying large base camp locations capable of handling a large number of crews. This plan would be implemented if hotel availability was limited due to a large event occurring at the same time as the storm (a political convention, for instance). A number of sites have been identified across the service territory, agreements with the property owners are in place, and contracts with vendors to provide temporary lodging, facilities, catering, etc., have been arranged. Materials and supplies would be delivered to these facilities for the crews, and oversight and control is provided by PECO personnel.

#### **c. Communication and Outreach**

PECO strongly believes that open, transparent customer communication before, during, and after a storm or emergency is critical. The Company conducts regular outreach with stakeholders through all available communication channels, including: earned and paid media; direct communication, including PECO’s Customer Care Center

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and automated phone system, which provides customers with storm and restoration status information and an estimated time of restoration through an up-front Interactive Voice Response message; Storm Center, which is a dedicated section of PECO's website that provides updates on emergency and restoration information; and a link to the Company's interactive outage map, which provides more information about outages by location.

In 2016, PECO launched a new website, providing anytime, anywhere access for customers. The responsive design of the site optimizes the online experience for customers from any online device – mobile, tablet, and desktop. Customers can easily access important account information and customize their online experience, including reporting and checking the status of outages and viewing their energy usage. In 2022, the outage section of the website was modernized to make finding outage information more intuitive.

By visiting [peco.com/alerts](https://peco.com/alerts), customers can choose how they would like to receive information (via text, email or phone), including when power is out in their area, when service is expected to be restored, or when power is restored. PECO's outage emails were enhanced this year to include more customer-friendly language, useful outage preparation tips and links to online resources for outage-related information. Additionally, by texting "ADDOUTAGE" to MYPECO (697326), customers can enroll in PECO's two-way texting program to report outages and check the status of their outage.

In more severe outage events, PECO also makes proactive calls to customers expected to experience the most extended outages to ensure they are aware of the extent of conditions so they can make necessary plans.

Another important vehicle for communicating with customers and other stakeholders is the media. Throughout storm events, PECO conducts numerous interviews with local and regional print, broadcast, and radio outlets to provide important outage-related information.

In addition to traditional media, the Company uses social media (Facebook, Twitter, Instagram, and YouTube) to provide customers and stakeholders with storm preparedness, restoration updates, emergency contact information, outage reporting procedures, and important safety information. Facebook and Twitter are updated every two to four hours – and more often when additional information becomes available. In addition, PECO responds to public and private customer inquiries on social media regarding emergencies.

PECO also maintains close contact with elected and regulatory officials through personal outreach and regular follow-up communication. During major storms, PECO stays in continuous contact with PUC Commissioners and key staff through daily statewide conference calls, ad hoc outreach, PUC visits to the storm center and service territory, as well as daily routine reporting on storm status. During significant events, PECO conducts daily conference calls with elected officials and local governments, state regulatory and elected officials, and municipal and county governments. Particular

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attention is paid to the county 911 centers and emergency responders to ensure coordinated preparations and PECO employee staffing at 911 centers when appropriate.

In addition, calls are made to state legislators in the service territory's Harrisburg and district offices and the district offices of Southeastern Pennsylvania members of Congress.

Outreach also is made to local municipal officials and to the emergency responders in PECO's service territory. PECO utilizes regular email updates and a text alert system for municipalities to provide information about restoration efforts and the number of overall and municipality-specific outages.

Finally, PECO's communications include continuous contact with Company employees and contractors through regular email updates from the Emergency Response Organization. These messages ensure that employees and contractors are fully aware of the extent of the storm and the restoration process, as well as providing a continual channel to emphasize employee, contractor, and customer safety.

### **G. Supply Chain Issues**

PECO has responded to the global supply chain situation through the implementation of a set of initiatives that leverage our relationships with our integrated suppliers, fellow Exelon operating companies, and the enhanced utilization of our repair facilities. Current strategies include:

- To combat long lead times, we have increased the inventory of storm kit materials on our system. In addition to our normal 375 storm kits spread throughout our service territory we have engaged an integrated supplier to have an additional 200 kits of material available for immediate distribution to crews when necessary.
- PECO will utilize the flexibility of its centralized supply model to allow material sharing across Exelon operating companies, as well as swap production slots as material needs are identified.
- Implementation of a Material Risk Task Force team that meets bi-weekly to review "at-risk" materials and identify potential solutions including alternative suppliers or materials. This process prioritizes the reserve levels of critical emergent restoration materials. These emergent material inventory levels are then segregated from general use inventories. Materials reviewed are distribution transformers, poles, wire and cable, meters and other EED components.
- PECO repair facilities have expanded their repair triage criteria to increase the population of materials being repaired internally. Refurbishment efforts for distribution transformers, CT/PTs and meters (both electric and gas) have been ramped up to support increased demand. Any priority needs identified in the bi-weekly meeting between departments are moved up in the repair prioritization queue.