

ComEd 2018 Summer Preparedness

Presentation to the Illinois Commerce Commission

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Delivering on the Smart Grid Promise – 2017 Highlights

Best on Record Performances

- 99.98% reliability rate
- 3.2M customers experienced 0 or 1 interruption
- SAIFI of 0.73; 46% favorable to pre-EIMA (2007 – 2011 avg)
 - Underground fault SAIFI is 54% favorable; T&S SAIFI is 55% favorable
- Lowest number of Customers Experiencing Multiple Interruptions
- Lowest reliability complaints, 81% favorable to pre-EIMA

Additional Highlights

- Achieved top decile OSHA Recordable rate 0.86
- Duration of outages reduced by 46% compared to pre-EIMA
 - 81% reduction in customers experiencing lengthy storm outages (>12 hrs)
- Overhead equipment related SAIFI is best in 16 years and improved by 39% compared to pre-EIMA
- Total customer interruptions during storms has decreased by 58% compared to pre-EIMA
- EIMA benefits since inception: ~3.9M avoided customer interruptions, 95.7M manual meter reads eliminated; 867K avoided truck rolls (\$66.77 million in savings)
- Consumption on Inactive Meters (CIM) favorable to target of 138k mWh by ~92K mWh
- \$270M (38% of total) spend with diversity-certified suppliers supporting the EIMA project in 2017

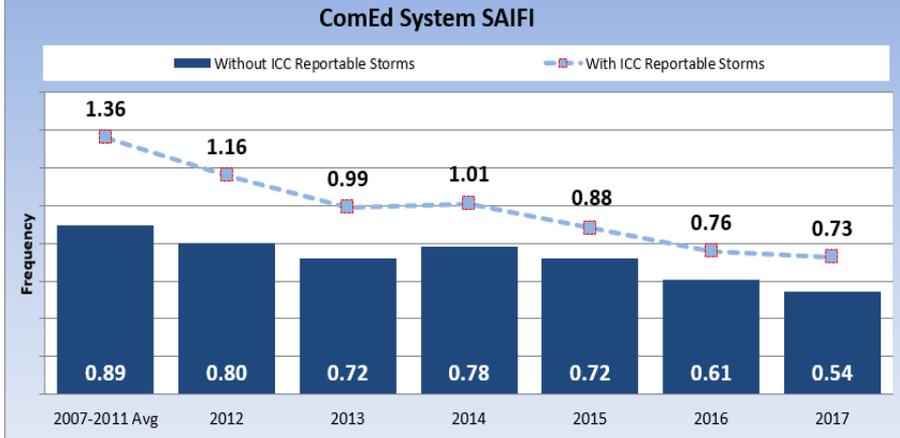
Looking to the Future

- Completed EIMA Infrastructure work in 2017, continuing Smart Grid work through 2021
- Future Energy Jobs Act (“FEJA”) – Energy Efficiency, Voltage Optimization, Solar, Workforce Development
- Continuing to focus on innovation through Bronzeville microgrid, Smart streetlight deployment, NextGrid, etc.

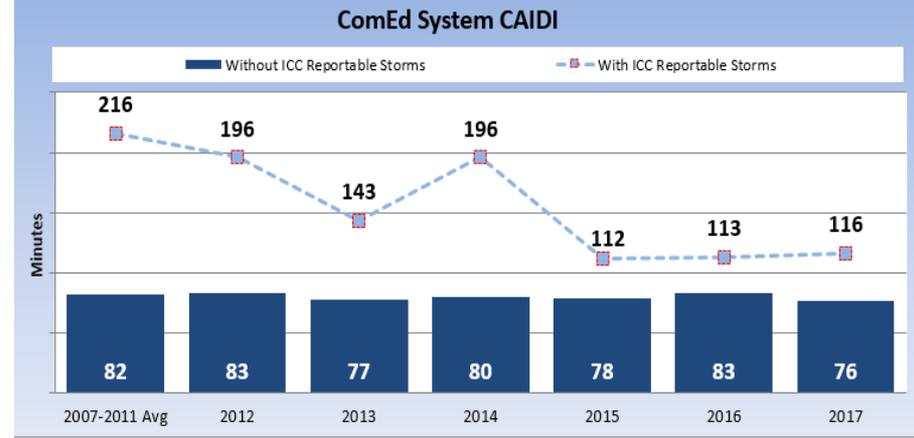


Reliability Trends

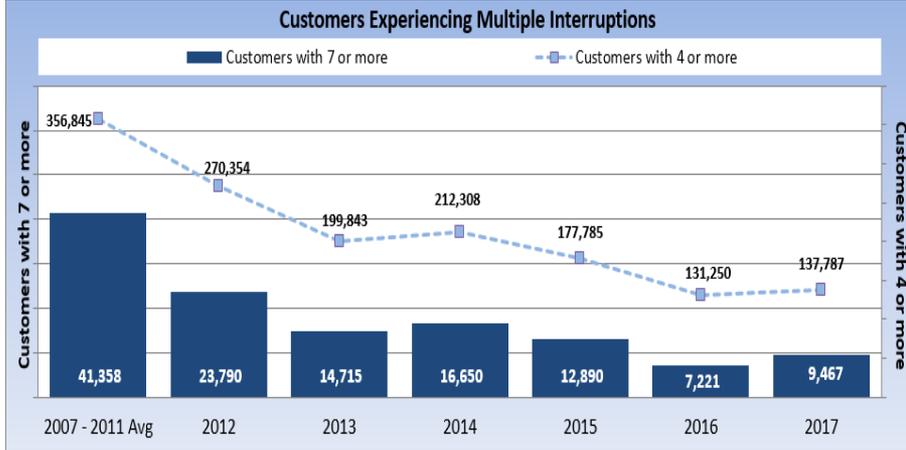
All-In SAIFI: 46% reduction in customer interruptions



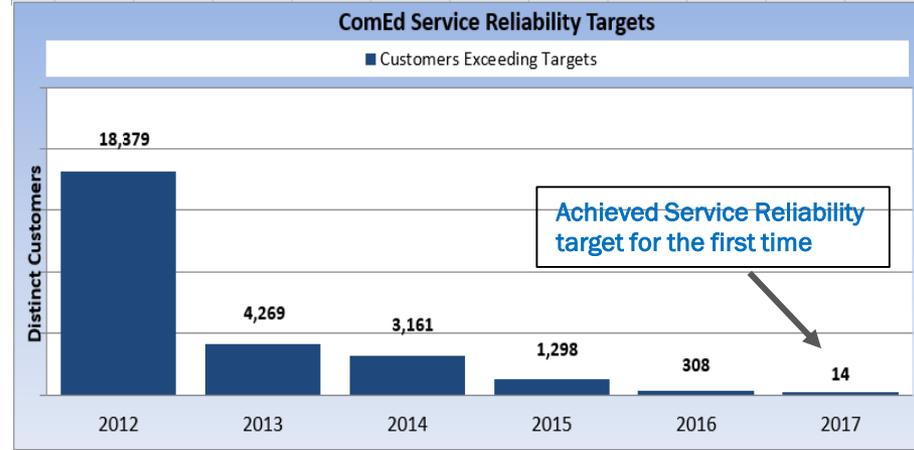
All-In CAIDI: 46% reduction in outage duration



61% reduction in CEMI4 and 77% in CEMI7



99.9% improvement in service reliability since EIMA began



Prepared for Summer 2018

ComEd is well positioned to provide reliable service during the summer months

- PJM's 90/10 summer peak load forecast for ComEd is 24,292 MW
- Significant investments continue in reliability, driven by EIMA, Grid Resiliency, Capacity Expansion and Voltage Optimization
- Demand response programs, spare equipment, and contingency / flood mitigation plans
- 236 of 237 Transmission & Distribution Summer Capacity Expansion projects to complete by June 1
- Summer system maintenance on Distribution Capacitor/Regulator inspections to complete by June 1
- Storm Task Force is driving seventh year of continuous improvements
- Annual emergency response training and exercises in progress; expected completion June 1
- Customer channels continue to offer improved outage reporting options and customer service



2018 Forecasted Load Performance

- No transmission facilities projected to be loaded above 100% of applicable ratings under normal summer peak scenarios
- No distribution substations projected to be loaded greater than 100% of applicable ratings under "worst case" summer peak scenarios
- No distribution circuits projected to be loaded greater than 105% of ratings under "worst case" summer peak scenarios

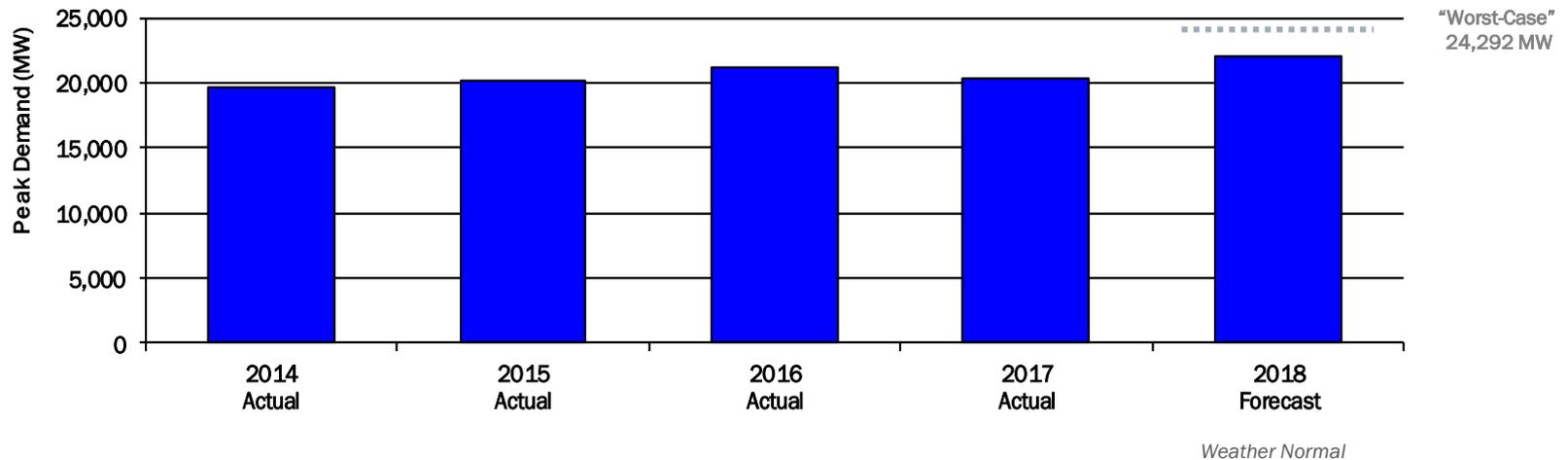
2018 Summer Forecast (National Weather Service)

- Above average temperatures for June, July and August
- Near normal precipitation amount (11.41 inches)



Transmission and Substation Adequacy

ComEd all-time system peak was 23,753 MW in 2011



Transmission and Substation supply exceeds forecasted demand

- Forecasted peak load is 24,292 MW (90th percentile); 22,121 MW for normal weather (50th percentile), per PJM
- Under normal system conditions no transmission constraints are expected to compromise reliability

Demand Response

- Demand Response is estimated at 1,030 MW by June 1
- In year four of the Peak Time Savings program, over 250,000 customers are enrolled providing approximately 38 MW of demand response; expanding the program by over 10% from 2017
 - \$1,211,572 was paid to program participants in 2017
- On June 1, 2018, 89,000 customers are projected to participate in the AC Cycling Program providing a potential peak hour reduction of 89 MW
 - 70,000 are participating in the Direct Load Control (DLC) option (70 MW)
 - 19,000 are participating in the Smart Thermostat option using their Nest Smart Thermostat (19 MW)

Improving Capacity and Reliability through System Investment

Summer Program Investment Work

- 236 of 237 Capacity projects (3 Transmission 234 Distribution) including 138kV line extension/station expansion at Veterans & new 34kV terminal at Itasca to complete by 6/1
- On track to complete 2018 Lightning Enhancement program, 1% SAIFI/CAIFI system performance work, and T&D Cycle Trimming by summer

Additional Capacity Work and Major Reliability Projects completed since last year

- Voltage Optimization projects on track with 141 feeders and 13 substations completed 2017 through April 2018
- Relays for 97% of 345 kV lines and 70% of 138 kV lines upgraded to modern digital communications systems. Remaining 345kV and 138 kV lines upgrades to be complete in 2018 and 2019, respectively
- Major project work recently completed at Hegewisch, McCook, Normandy, Cherry Valley and Wayne Substations, as well as numerous smaller projects throughout the system

Reliability Targeted solutions and Smart Grid work completed since 2012

- Over 200 miles of Spacer Cable Solutions, ~100 miles of overhead to underground solutions and over 100 miles of reconductoring and re-routing solutions completed
- Over 1,000 miles of enhanced vegetation management, ~ 60,000 trees trimmed & over 90,000 trees trimmed
- Ten smart substation upgrades completed benefitting over 150,000 customers

Overhead Transmission Line Investment

- ComEd Transmission Overhead utilizes various tools and methods to complete work with energized transmission lines, allowing us to improve clearance and increase capacity while minimizing disruption to the system
- 1,349 wood structures replaced with steel structures since program start in 2014. 129 planned for 2018

Enhanced Security

- In 2014 a program to enhance physical security at ComEd sites was started. To date the program has upgraded security at 34 sites in total with 5 sites scheduled for upgrade in 2018

Emergency Preparedness

Storm Response Improvements

- Continued focus around Damage Assessment
- Streamlined processes and reporting around ERO Staffing and Training
- Continued enhancements with Dispatching
- Updated processes for External Crew Management

Mutual Assistance

- ComEd is an active member in three Regional Mutual Assistance Groups:
 - Great Lakes (14 Utilities),
 - Midwest (35 Utilities), and
 - Southeastern Electric Exchange (59 Utilities)
- ComEd supported restoration efforts in Florida due to Hurricane Irma by deploying 760 FTEs (ComEd & ComEd Contractor)
- ComEd deployed at total of 145 FTEs, over two waves, to assist with restoration efforts in Puerto Rico. ComEd worked alongside the other Exelon utilities, totaling over 290 FTEs.
 - Restored 11,180 customers and >108 miles of conductor replaced in some of the more mountainous and remote areas on the island
 - Replaced 376 poles, 267 transformers, 341,775 feet of primary conductor, and 230,218 feet of secondary conductor.
- In March of 2018, ComEd provided response to Mid-Atlantic Exelon utilities for Winter Storm Riley, Quinn, and Toby
 - 1,298 FTEs (ComEd & ComEd Contractor) and Mobile Command Unit were deployed



ComEd Crews stationed in Daytona FL, Hurricane Irma



Exelon vehicles heading to Puerto Rico



ComEd MCU – Philadelphia Winter Storm Riley

Emergency Preparedness Operational Exercises

55 Drills/Exercises to be conducted in 2018

- More than 60% of planned drills will involve external entities
- 2018 Keynote Exercises: Summer & Winter Readiness, Cyber Security (GridEx IV), Substation Event/Fire, Joint Operation Centers (JOC); EU National Response Event (NRE), Business Continuity and Seamless Integration (Feeder SPOC) with other Exelon Operating Companies
- Participated in Midway Airport Power Failure tabletop exercise on 1/24/18

Blackstart Restoration & Loadshed Preparedness

- Emergency Response Organization drill is scheduled for October 2018
- Cyber Attack during a Blackstart scenario
- Drill objective is to simultaneously test ERO activation & field substation response
- PJM drill occurred on 2/11/18; Transmission and Distribution Operations participated using the Transmission training simulator

Load Shed Workshop:

- Partnering with our Counties through the year to educate / train on Load Shed expectations & response from each agency

Joint Illinois Partnership:

- Continue meeting with Ameren & Mid-American Energy to discuss best practices for emergency response

ICC Communications Exercise (Dec 5, 2017)

- Per request from ICC, ComEd helped design and facilitate drill focusing on communications around a cyber security attack on Illinois utilities



Substation Event/Fire Exercise



ComEd EOC - Summer Readiness Drill



ComEd Training Center

Contingency Planning

Emergency Equipment Ready and Available for Storm Season

- Seven Mobile Substations
- 2 MW Generators – 17 ComEd owned units, with additional generators on standby with vendor
- 30 Portable Generators (125kVA, 175kVA, and 250kVA)
- Spare substation transformer fleet includes:

Transformer Class	Units on System	Spare Inventory
33 MVA	26	2
40 MVA	577	8
50-60 MVA	132	12
75 MVA	11	4
200 MVA	27	2
300 MVA	87	5
333 MVA	15	2

Supply Readiness

- Restocking Mobile Storm Trailers following every event
- Summer Readiness items (storm kits, transformers, wire/cable) verified at stocking levels and key suppliers have ramped up their 'stock-on-hand' for summer-related items

Substation Flood Mitigation Plans

- Permanent flood mitigation measures are in place at six flood prone substations, with one additional substation in progress to complete in 2019



Portable transformer at substation deployment exercise

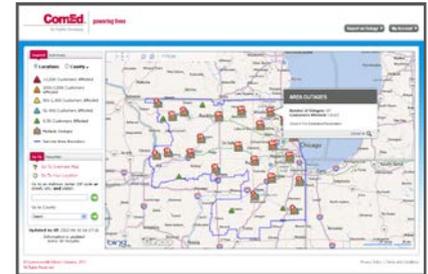


North Chicago Substation during flood event

Customer Communication and Energy Programs

Call Center and Outreach

- Ongoing development of CSRs with Ready for the Season training such as LIHEAP, Manual Cut-In, DPA set-up, CARE programs, Red/Blue Rules, etc.
- Backup call center at Maywood Tech Center successfully tested and utilized in 2017
- Customers will be able to use Chatbots that will be featured on Facebook Messenger, Google Home, and Alexa to report an outage, receive outage updates, and check balance
- Customers now have full Virtual Wallet Management functionality in the IVR
- ComEd's new Mobile App launched February 2018 with a redesigned interface and the ability to report and check outage information without logging in to My Account
- Social media team publishes Facebook and Twitter posts regarding potential outages in preparation of an anticipated storm
- Over 575,000 customers are subscribed for outage alert text messaging

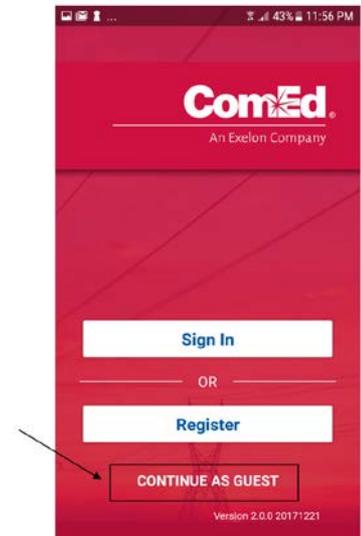


Energy efficiency programs targeted at income eligible customers including:

- FREE Home Energy Upgrades – Single-Family, Multifamily, and Public Housing Authorities
- Instant Lighting Discounts (deeply discounted products)
- FREE Food Bank LED Distribution
- FREE Energy Savings Kits

Traditional residential EE offerings are available to all customers

- Home Energy Assessments (free unless customer opts for smart thermostat)
- Multi-Family Market Rate (free in-unit upgrades)
- Fridge & Freezer Recycling
- Online Energy Management Tools



Alexa, I would like to report an outage.

Future Energy Jobs Act (FEJA)

Energy Efficiency

- Launched \$351M of annual spend for Energy Efficiency portfolio of 27 programs – 9 residential programs, 7 income-eligible programs and 11 business programs (including public housing)
- Through Q1, ComEd has achieved ~266K MWh of savings, on track to achieve its YE goal of 1.7M MWh

Voltage Optimization

- 61 of 149 planned feeders for this year complete thus far in 2018 (impacting 62,500 customers)
- Substation Transformer LTC Controls and Feeder Component Controls are being tested

Solar

- ~800 interconnection applications received in 2018 with 1,600 MW of new solar generation
 - April 2018 saw 4.5 times as many applications as April 2017
- \$250/kW C&I solar rebates to be distributed by end of 2018 (tariff filed with ICC on April 6th)
- Community solar design efforts underway (748 MW of community solar currently in interconnection queue)
- Digital Solar Toolkit to be delivered in two releases by the end of 2018 ahead of solar adoption increase
 - Solar Calculator, Interconnection/Project Tracker, Solar Trade Ally Portal
 - Hire Right, Community Solar Portal, and Energy Dashboard

Workforce Development

- Protects and creates thousands of jobs, while provides clean job training in communities that need it most
 - \$10M dedicated to Solar training pipeline, Craft apprenticeship, and Multicultural jobs programs
 - Chicago Community Trust (CCT) identified 4 grantees to receive the \$3M solar of pipeline training funds; grantees to host their first training sessions in 2018
- The Act Commits \$750M for low-income assistance through EE, solar funding, and ComEd CARE funding

Conclusion

ComEd...

...is prepared to provide reliable electric service to our customers during the summer months of 2018

- Transmission and Distribution facilities are ready to meet 2018 Forecasted Load
- Significant summer capacity expansion projects, reliability improvement, and other summer investment projects to be complete by June 1
- Storm response improvements, preparedness drills and exercises ensuring readiness to handle the Summer
- Customer Service channels are ready to respond to customer inquires

Questions ?

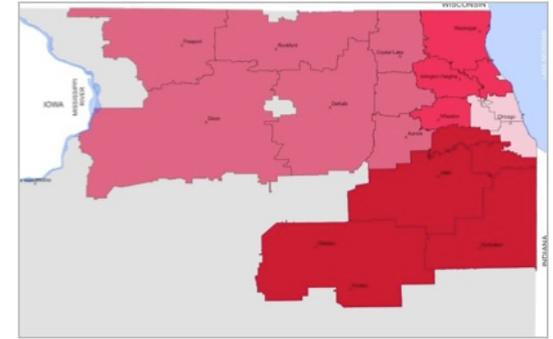
APPENDIX

ComEd Service Territory

ComEd proudly serves 70 percent of the population of Illinois.



Nearly 4 Million Customers in Northern Illinois



ComEd is a Transmission and Distribution Company

ComEd is an electric delivery company providing service to nearly four million customers across Northern Illinois. ComEd manages more than 90,000 miles of power lines in an 11,400-square-mile territory. Over the past 10 years, ComEd has invested more than \$9 billion in electrical transmission and distributions systems to reduce and shorten power outages.

ComEd understands how important safe, reliable power is to customers, and it is continuously looking for new ways to improve service. ComEd is investing in technology that will make power outages shorter and less frequent and offering programs to help customers make smarter choices about their energy use.

As a major Illinois corporation, ComEd takes seriously its responsibility to be a good community partner. ComEd supports a range of initiatives that are making a difference in peoples' lives, with particular focus on education, environment, arts and culture, and community development programming.

- ✓ **11,000 square miles**
- ✓ **More than 400 municipalities**
- ✓ **25 counties**
- ✓ **6,000 employees**, including linemen, cable splicers, substation mechanics, customer service reps, fleet mechanics, material handlers, meter techs, engineers, dispatchers, first responders, work planners, scientists, lawyers and more.

ComEd's service territory borders Iroquois County to the south (roughly Interstate 80), the Wisconsin border to the north, the Iowa border to the west and the Indiana border to the east.

Customer Stories from Puerto Rico

Winter 2018



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Luminoids

Exelon crews handed out Luminoids to residents

Luminoids were developed in the Chicago area to provide a renewable light source in areas such as Puerto Rico. The following was included with each lantern:

On behalf of the 16,300 employees of ComEd, PECO, BGE, and Pepco Holdings in Illinois, Pennsylvania, Maryland, New Jersey, Delaware, and Washington DC, we are honored to be here to help in Puerto Rico's recovery. We are awed by your perseverance. This Luminoid solar powered lantern is made by a company based in Chicago. We hope it can help provide you some light as power is being fully restored.



En el nombre de los 16,300 empleados de ComEd, PECO, BGE, y Pepco Holdings en Illinois, Pennsylvania, Maryland, New Jersey, Delaware, y Washington DC, es un honor para nosotros estar aquí en la isla ayudando en la recuperación de Puerto Rico Su perseverancia nos inspira. Esta linterna "Luminoid" que funciona con energía solar es fabricada por una compañía basada en Chicago. Esperamos que esta linterna le provea un poco de luz mientras su electricidad sea restaurada.



Residents were grateful for the Luminoids as well as the crews working to restore their power. Additional Luminoids were given to the Red Cross for distribution in other areas of the island.

Residents Giving Back

Most days lunch for the crews were provided by local residents. The crews reported this was the best meal of the day. These meals were organized by community leaders to help schedule the groups preparing meals on a given day. Several of these meals were prepared by residents that still had not had their power restored.



Community Teams Helping Restore Power

Community Leaders also organized teams to clear paths in the heavy brush. This helped our crews focus on their work at hand.



Community Teams Helping Restore Power

One of the locals here made us aware of Africanized bee inside a concrete pole. This circuit was critical to energizing several hundred customers. After a job briefing our crews worked along with PREPA and the local municipality to mitigate this issue.

A local municipality employee donned a bee protective suit and tried to seal the nest inside the pole, but after several attempts to seal the hole the bees became more aggravated. One of our linemen in a cotton bee keeper suit with fall protection rubber gloves and sleeves and proceeded to complete the connection.

Thanks to the local community and municipality partners our crews were able to mitigate the risk and complete the job



Families in Need

Restored power to a child on life support. An FLS asked the Exelon team at our morning huddle on the following day to donate to the Lopez family, within 10 minutes they raised over \$2,000.

Pictured below is a handing the mother the donation. The mother stated donated money will help buy expensive medication needed for her son, catch up on some past due bills, and be used to build a wheel chair ramp to get her child into the van.

Their appreciation is shown by getting the community together cooking for the crews at a rec center on a daily basis and will not accept any type of payment.



Families in Need

Energized a paralyzed child's home and the father broke out in tears. The entire neighborhood broke out into cheer. Middle picture is a lineman with the paralyzed child.



Schools in Need

A preschool teacher asked for an empty wooden reel to use for the kids to play on. The Exelon Fleet team and Security personnel purchased 2 swing sets, covered swing for teachers, a trampoline and a playhouse with their own money. The team also assembled the equipment.



Let's Play Ball

For seven months the baseball field used by MLB elite for practice and games was not functional after sun down because Hurricane Maria damaged one of the light towers causing 3 towers to not function. ComEd employees were able to troubleshoot the issue and restore power to all lights except the one that was hit by a tree. The baseball players and coaching staff asked that the employees meet them at the field during a practice game. They were very grateful for the help we provided and grateful that they could now practice and play baseball well after sunset



Solar Suitcase

As part of a STEM program, high school students in the Chicago area created a “solar suitcase” that provides lighting and power to charge small electronic devices. The solar suitcase was installed in a community center in Aguas Buenas.



Easter Celebration

The communities in Puerto Rico have been very welcoming to our crews. They have prepared numerous meals and cookouts for our crews showing appreciation for their work. In return, the Exelon Strike Leadership Team prepared two hundred Easter bags for the crews to hand out to the children in the community. The community members were very happy to see this gesture.



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powering lives