State of Florida
Public Service Commission
INTERNAL AFFAIRS AGENDA
Tuesday – June 19, 2018
9:30 A.M.
Room 105 - Gerald L. Gunter Building

1. Review of Electric Utility Hurricane Preparedness and Restoration Actions – Draft Report and Recommended Actions. (Attachment 1)

2. General Counsel's Report

3. Executive Director's Report

4. Other Matters

BB/aml

OUTSIDE PERSONS WISHING TO ADDRESS THE COMMISSION ON ANY OF THE AGENDAED ITEMS SHOULD CONTACT THE OFFICE OF THE EXECUTIVE DIRECTOR AT (850) 413-6463.

Attachment 1

State of Florida

Public Service Commission

CAPITAL CIRCLE OFFICE CENTER • 2540 SHUMARD OAK BOULEVARD
TALLAHASSEE, FLORIDA 32399-0850

-M-E-M-O-R-A-N-D-U-M-

DATE: June 8, 2018

TO: Braulio L. Baez, Executive Director

FROM: Division of Engineering (E. Knoblauch, P. Buys, T. Thompson)
Office of Industry Development & Market Analysis (J. Breman)
Office of Consumer Assistance & Outreach (R. Hicks)
Office of the General Counsel (R. Gervasi, R. Dziechciarz)

RE: Docket No. 20170215-EU - Review of Electric Utility Hurricane Preparedness and Restoration Actions.

CRITICAL INFORMATION: ACTION IS NEEDED - Please place on the June 19, 2018 Internal Affairs. Commission approval of draft report and recommended future actions is sought.

On October 3, 2017, the Commission opened Docket No. 20170215-EU to review the hurricane preparedness and restoration actions of Florida's electric utilities. The purpose of the review was to identify potential areas where infrastructure damage, outages, and restoration time for customers could be minimized in the future. Commission staff issued several data requests to all electric utilities and sought input from customers and non-utility stakeholders. On May 2-3, 2018, the Commission held a workshop to further explore the preparedness and restoration actions of Florida's electric utilities. A review of the information received and conclusions are included in the attached draft report. Staff is seeking approval of the report and to close Docket No. 20170215-EU.

Based on the review and conclusions contained in the attached report, staff also recommends the Commission initiate the following actions which are discussed in more detail below.

Recommended Action

Open storm hardening plan[1] review dockets for all investor-owned utilities (IOUs) and direct staff to gather the following information:

- A listing and summary of meetings with local governments regarding tree trimming and the identification of critical facilities.
- A description of the IOU's staffing practices for local emergency operations centers during a major storm event.
- A description of how each utility prepares for and responds to roadway congestion and fuel availability issues.
- A comparison of all viable alternatives considered before selecting each proposed project identified in the next storm hardening plan filings.

Utilities reported that they have regular meetings with local governments regarding tree trimming and identification of critical facilities. However, the utilities, local government representatives, and the Office of Public Counsel agreed at that communication among all affected parties could be improved. During the workshop, some local government representatives expressed a desire for additional utility staffing at local emergency operations centers.

Consistent with prior hurricanes, a major impediment towards restoration was fallen trees or branches that were outside of the utilities' rights of way. Other impediments to restoration unique to Hurricane Irma were roadway congestion and lack of motor fuel availability due to the size and scale of evacuations. IOUs should take these issues into consideration when reviewing their storm hardening plan.

Staff requested data from the IOUs on the performance of hardened and non-hardened facilities. Utilities responded that this information was not tracked in the days following Hurricane Irma as they were intent on restoring power as quickly as possible. However, some performance data for hardened and non-hardened facilities was presented at the workshop, which showed that the storm hardening efforts by the Commission and utilities appear to be working.

Approval of an IOU's storm hardening plan does not equate to approval for cost recovery. During a general rate case, the costs for storm hardening are taken into consideration and the utility has the burden of proof to show that the costs are prudent for cost recovery. However, recent rate case proceedings have resulted in settlement agreements between the parties, and the storm hardening costs are not specifically identified in the settlement agreements. In order to enhance the review process related to storm hardening activities, a comparison of all viable alternatives considered by the IOUs should be provided before selecting proposed hardening projects. By reviewing such comparisons, the Commission can ensure that storm hardening is being pursued in a cost-efficient manner. For example, a utility should be able to explain why a proposed underground project is preferable to a hardened overhead project or additional smart grid investment, etc.

[1] On February 1, 2007, the Commission adopted Rule 25-6.0342, F.A.C., to require IOUs to update their storm hardening plans every 3 years, and codified the contents to be included in each plan. The next update is currently scheduled to be filed in 2019.

Recommended Action

Direct staff to initiate management audits to:

- Examine the procedures and processes used by the IOUs to estimate and disseminate outage restoration times following a major storm.
- Examine the procedures and processes used by the IOUs to inspect and schedule maintenance on transmission structures.

Many customer comments that were submitted expressed frustration with inaccurate power restoration estimates. Some local government representatives also expressed similar concerns. While this did not appear to hinder actual restoration, customers were upset based on their expectations.

As part of their storm hardening plans, IOUs conduct post-storm forensic analyses which include a review of storm-related data and an assessment of damaged facilities that did not perform as designed. Despite regular inspection requirements, post-storm forensic reports identified corrosion and/or wood rot as a contributing factor to the failure of some Duke Energy Florida, LLC transmission towers. Post-storm analyses provided by Florida Power & Light Company reported five wooden transmission pole failures and Tampa Electric Company reported ten wooden transmission pole failures.

A more thorough examination of the procedures and processes used by the IOUs to estimate and disseminate outage restoration times following a major storm and the inspection and maintenance of transmission structures may identify areas of improvement in the future.

Observations for Consideration

Proactive tree trimming has been a key initiative of the Commission, and the results of the review indicate that vegetation continues to be a primary cause of damage and outages. Entities with authority over tree trimming policies should carefully consider options that would enhance the ability of electric utilities to conduct vegetation management within the public road rights-of-ways and easements in order to further reduce outages and restoration costs. Expanding the ability of electric utilities to work with local communities and private land-owners to conduct tree trimming and problem tree removal on private property should also provide additional benefits.

EK:pz

Attachment

cc: Office of the General Counsel (K. Hetrick)
Deputy Executive Director, Technical (M. Futrell)
Deputy Executive Director, Administrative (A. Lynn)

Review of Florida's Electric Utility Hurricane Preparedness and Restoration Actions 2018

June 2018

State of Florida
Florida Public Service Commission
Division of Engineering

Table of Contents

List of Figures

List of Tables

Terms and Acronyms

APPA	American Public Power Association
CIAC	Contributions-in-Aid-of-Construction
Cooperative	Rural Electric Cooperative Utility
DEF	Duke Energy Florida, LLC
DEM	Florida Department of Emergency Management
EEI	Edison Electric Group
EOC	Emergency Operation Center
ESF-12	Emergency Support Function 12
F.A.C.	Florida Administrative Code
FECA	Florida Electric Cooperatives Association, Inc.
FEMA	Federal Emergency Management Agency
FIPUG	Florida Industrial Power Users Group
FMEA	Florida Municipal Electric Association
FPL	Florida Power & Light Company
FPUC	Florida Public Utilities Company
FRF	Florida Retail Federation
F.S.	Florida Statutes
GIS	Geographic information system
GPC	Gulf Power Company
IOUs	The five investor-owned electric utilities: DEF, FPL, TECO, GPC, and FPUC
Municipal	Municipal Electric Utility
OPC	Office of Public Counsel
PURC	Public Utility Research Center – University of Florida
RMAG	Regional Mutual Assistance Groups
TECO	Tampa Electric Company

Executive Summary

The Florida Public Service Commission (PSC or Commission) has broad authority over the adequacy and reliability of the state's electric transmission and distribution grids. In exercising its authority, the Commission has taken action in a variety of forms:

- Rules on construction standards for electric transmission and distribution facilities.
- Rules on safe construction of electric transmission and distribution facilities.
- Rules pertaining to customer charges for underground facilities.
- Prudence reviews of hurricane restoration costs.
- Annual review of transmission and distribution service reliability.

The Commission's authority over investor-owned electric utilities (IOUs) is comprehensive and includes setting rates and all cost-recovery matters. While the Commission does not have authority to set rates for municipal electric utilities (Municipals) and rural electric cooperative utilities (Cooperatives), the Commission has authority over all electric utilities to:

- Prescribe uniform systems and classifications of accounts.
- Evaluate rate structure to ensure no undue discrimination between customer classes.[1]
- Require electric power conservation and reliability within a coordinated grid for operational as well as emergency purposes.
- Inspect new electrical utility facility construction using the National Electrical Safety Code of 2007 as the minimum standard.
- Approve territorial agreements between and among rural electric cooperatives, municipal electric utilities, and other electric utilities under its jurisdiction; and to resolve any territorial dispute.
- Require reports as deemed necessary.

The Commission first initiated rules on standards of construction for electric transmission and distribution facilities in 1969. These initial standards of construction were simply a broad statement promoting continuity and uniformity in the quality of service. In 1987, pursuant to Section 366.04(6), Florida Statutes (F.S.), the Commission adopted rules establishing safety standards for new transmission and distribution facilities. In 1992, the Commission established rules governing utility calculations of charges for the conversion of existing overhead electric distribution facilities to underground. In 1993, the Commission required utilities to file annual service reliability reports. Subsequent to Hurricane Andrew in 1992, the Commission implemented measures providing for self-insurance of transmission and distribution facilities because cost-effective commercial insurance offerings were no longer available.

[1] Rate structure refers to the classification system used in justifying different rates and, more specifically, to the rate relationship between various customer classes, as well as the rate relationship between members of a customer class. See Rule 25-9.051(7), Florida Administrative Code. https://www.flrules.org/gateway/RuleNo.asp?ID=25-9.051

Following the 2004 and 2005 hurricane seasons, to promote strengthening of Florida's electric infrastructure, the Commission adopted several storm hardening initiatives to reduce outages while mitigating excessive cost increases, including wooden pole inspection and replacement programs. The Commission also adopted rules to promote the undergrounding of electric facilities.

During the 2016 and 2017 hurricane seasons, Florida was impacted by four hurricanes. On October 3, 2017, the Commission opened Docket No. 20170215-EU to review the hurricane preparedness and restoration actions of Florida's electric utilities. The purpose of the review was to identify potential areas where infrastructure damage, outages, and recovery time for customers could be minimized in the future. Commission staff issued several data requests to all utilities and sought input from non-utility stakeholders and customers.

On October 9, 2017, a customer portal was opened on the Commission's website, allowing customers to submit comments regarding their reaction to utility restoration/communication efforts. The portal was closed on May 1, 2018, with 701 comments received. Initially, customers voiced frustrations with inaccurate power restoration estimates and cost responsibility for restoration while more recent comments from customers focused on support for additional distributed solar generation. Additional comments filed by stakeholders, such as local governments, also voiced a desire for improved pre-storm and post-storm information. Stakeholders also expressed a need to improve communication with utilities on where and when tree trimming occurs, as well as better education of the public on tree trimming. Increased involvement from utilities at local Emergency Operations Center (EOCs) was another area where stakeholders concentrated their comments.

On May 2-3, 2018, the Commission held a workshop to further explore the preparedness and restoration actions of Florida's electric utilities. At the workshop the utilities offered suggested improvements such as targeted undergrounding projects for certain lateral circuits, possible legislation to require inspections and hardening of non-electric utility wooden poles, and additional coordination and communication regarding vegetation outside of the utilities' rights of way. As mentioned above, participating stakeholders also suggested improvements on increased coordination with utilities, local governments, and customers. The information received and the findings presented in this report are summarized below.

In preparation for hurricane season, Florida's utilities, as well as Commission staff, participate in an annual hurricane exercise at the State's EOC. Utilities also participate in hurricane preparedness exercises and meetings with local governments to ensure that the proper critical facilities such as hospitals are identified. Florida's IOUs prioritize the hardening of infrastructure that serves these facilities which are generally restored first following a storm event.

In the event of a hurricane, utilities initiate pre-storm activities, such as requesting mutual aid, as early as 240 hours before landfall. Following the completion of post-storm damage assessment, utilities work to return service to the largest number of customers in the shortest amount of time

with prioritization given to critical facilities. Based on a review of the utility presented data for each hurricane, no abnormalities were identified between storms for the restoration process.

Florida's utilities managed more than 27,000 crews during their restoration efforts following Hurricane Irma. The rate of restoration was fairly rapid, 50 percent of customers restored in one day, and comparable for all utilities. Consistent with prior hurricanes, the biggest impediment to restoration was vegetation clearing, many from fallen trees or branches that were outside of the utilities' rights of way. Other impediments to restoration unique to Hurricane Irma were roadway congestion and motor fuel availability due to the size and scale of evacuations. At the May 2018 workshop, all of the IOUs also provided data that hardened facilities generally performed better than non-hardened facilities. The IOUs also indicated that there were fewer outages for underground than overhead circuits. Based on the information gathered, storm hardening efforts by the Commission and utilities appear to be working.

Generally, transmission infrastructure appears to have performed as designed. Despite regular inspection procedures, post storm forensic reports identified corrosion on one steel tower and wood rot as a contributing factor to the failure of some Duke Energy Florida, LLC (DEF) transmission towers. Post storm analyses provided by Florida Power & Light Company (FPL) and Tampa Electric Company (TECO) also reported five and ten wooden transmission pole failures, respectively.

All Floridians should maintain a high level of storm preparedness. During restoration efforts, customers can also assist in the overall speed of restoration by limiting travel unless it is an emergency situation. Following a storm, customers can report a power outage to the utility through various means such as interactive voice response systems, customer call centers, the utility's website, and mobile applications. Florida's utilities used more than 3,500 customer contact representatives during Hurricane Irma and received more than 13 million customer contacts in relation to the hurricane. While post storm communication was not an impediment to restoration, customers expressed frustration with not getting timely and accurate restoration updates.

The review of information gathered throughout the course of this docket indicates that the efforts of the Commission and Florida's utilities since 2007 have improved the resilience of the electric system. Areas of further improvement, such as additional communication with stakeholders, have also been identified that can be addressed by the Commission in the future. As discussed, the on-going activities of Florida's utilities should balance the need to strengthen electric infrastructure and improve restoration time, while mitigating excessive cost increases to customers.

Section I: Background

In response to the large impact that the 2004 and 2005 hurricanes had on the state, the 2006 Florida Legislature directed the Commission to ". . . conduct a review to determine what should be done to enhance the reliability of Florida's transmission and distribution grids during extreme weather events, including the strengthening of distribution and transmission facilities." Based on its review of the 2004 and 2005 hurricane seasons, the Commission provided three recommendations in a 2007 report to the Legislature.[2] The recommendations were for Florida to: (1) maintain a high level of storm preparedness (2) strengthen the electric infrastructure to withstand severe weather events with the use of hardening activities; and (3) establish additional planning tools to identify and implement instances where undergrounding is appropriate as a means of storm hardening. As discussed in the 2007 report to the Florida Legislature, ". . . the Commission has been careful to balance the need to strengthen the state's electric infrastructure to minimize storm damage, reduce outages, and reduce restoration time while mitigating excessive cost increases to electric customers."

Storm preparedness also extends to educating the public on the necessary storm provisions they should possess in the event they are without power. The Commission's multi-faceted approach to storm preparedness and promoting the strengthening of electric infrastructure includes storm preparedness workshops, pole inspections, vegetation management, storm hardening plans, and construction standards.

[2] Report to the Legislature on Enhancing the Reliability of Florida's Distribution and Transmission Grids During Extreme Weather, July 2007, http://www.psc.state.fl.us/Files/PDF/Utilities/Electricgas/EnergyInfrastructure/UtilityFilings/docs/stormhardening2007.pdf

Since 2006, the Commission has held annual Hurricane Season Preparation Workshops, which allow the IOUs, Municipals, and Cooperatives to share individual hurricane season preparation activities. To promote the strengthening of Florida's electric infrastructure, the Commission has adopted several storm hardening activities including wooden pole inspection and replacement[3,4] as well as 10 additional storm hardening initiatives.[5] These initiatives were intended to upgrade design, construction, and maintenance practices that allow electric facilities to withstand extreme weather, such as high winds and flooding. The following are the 10 ongoing initiatives for storm preparedness as required by the Commission.

- A Three-Year Vegetation Management Cycle for Distribution Circuits.
- An Audit of Joint-Use Attachment Agreements.
- A Six-Year Transmission Structure Inspection Program.
- Hardening of Existing Transmission Structures.
- A Transmission and Distribution Geographic Information System.
- Post-Storm Data Collection and Forensic Analysis.
- Collection of Detailed Outage Data Differentiating Between the Reliability Performance of Overhead and Underground Systems.
- Increased Utility Coordination with Local Governments.
- Collaborative Research on Effects of Hurricane Winds and Storm Surge.
- A Natural Disaster Preparedness and Recovery Program.

In 2006, the Commission also required Florida's local exchange telecommunications companies to implement an eight-year inspection cycle of their wooden poles.[6] The Commission's authority to impose that requirement was pursuant to Section 364.15, F.S., which was subsequently repealed in 2011 as part of a number of deregulatory changes made to Chapter 364, F.S., at that time. Thus, the Commission no longer has the authority to require inspections of poles owned by telecommunications companies.

The Commission requires all IOUs to file an Annual Distribution Reliability Report with the PSC for review. This report includes updates of utilities' hardening efforts to allow the Commission to monitor progress. Additionally, each IOU updates its tariff as necessary to reflect the Commission requirement that the cost of conversion from overhead to underground, as well as the benefits of storm hardening, be incorporated into the CIAC calculation as outlined in Rules 25-6.0342 and 25-6.064, Florida Administrative Code (F.A.C.).

[3] Order No. PSC-06-0144-PAA-EI, issued February 27, 2006, in Docket No. 20060078-EI, *In re: Proposal to require investor-owned electric utilities to implement ten-year wood pole inspection program.*
[4] Order No. PSC-07-0078-PAA-EU, issued January 29, 2007, in Docket No. 20060531-EU, *In re: Review of all electric utility wooden pole inspection programs.*
[5] Order No. PSC-06-0351-PAA-EI, issued April 25, 2006, in Docket No. 20060198-EI, *In re: Requirement for investor-owned electric utilities to file ongoing storm preparedness plans and implementation cost estimates.*
[6] Order No. PSC-06-0168-PAA-TL, issued March 1, 2006, in Docket No. 20060077-TL, *In re: Proposal to require local exchange telecommunications companies to implement ten-year wood pole inspection program.*

During September and October 2016, Florida was impacted by two hurricanes: Hermine and Matthew. Hurricane Hermine made landfall east of St. Marks on September 2, 2016, while Hurricane Matthew never made landfall in Florida, it remained a few miles off the eastern coastline. In 2017, Hurricanes Irma and Nate impacted Florida. Hurricane Nate did not make landfall in Florida; however, parts of the Gulf coastline felt the effects of the storm. Hurricane Irma made landfall in Florida on September 10, 2016, as a Category 4 hurricane in Monroe County, followed by a second landfall as a Category 3 hurricane in Collier County, providing the first major test to the system since 2005.

On October 3, 2017, the PSC opened Docket No. 20170215-EU to review the hurricane preparedness and restoration actions of Florida's electric utilities. The review was intended to identify potential areas where infrastructure damage, outages, and recovery time for customers could be minimized in the future. In order to identify these areas, Commission staff issued several data requests to all utilities in the areas of preparedness, restoration practices, customer communication, outage causes, facility performance, meteorological data, and suggested improvements.

Commission staff also sought comments from non-utility stakeholders and customers. A summary of the non-utility stakeholders' comments are provided in Appendix A. On October 9, 2017, a customer portal was opened on the Commission website, allowing customers to submit comments. As of May 1, 2018, the Commission received 701 customer comments and 14 comments from non-utility stakeholders.

This report consists of six sections:

Section I: Background

Section II: Review of Hurricane Preparedness

Section III: Summary of 2016 and 2017 Storms

Section IV: Review of Outage Restoration Activities

Section V: Customer Communication

Section VI: Conclusions

Section II: Review of Hurricane Preparedness

Commission Actions

As noted earlier, utilities and their customers must maintain a high level of storm preparedness. In support of sharing individual hurricane preparation activities between IOUs, Municipals, and Cooperatives, the Commission has held annual Hurricane Season Preparation Workshops since 2006. The workshops provide an opportunity for electric utilities to discuss a variety of topics, such as their storm preparedness and restoration processes, coordination with local governments, and public outreach. The Commission's Division of Engineering is responsible for staffing the Emergency Support Function 12 (ESF-12) in the State's EOC. ESF-12 coordinates with the electric and natural gas utilities operating in Florida to ensure the integrity of their energy supply systems are maintained during emergency situations. In this role, Commission staff also participates in an annual hurricane preparedness drill and other EOC related exercises. The Commission provides information to consumers regarding storm preparedness, such as hurricane survival kits, portable generator safety, and ways to prepare your home before a storm. In the event of a storm, links to current Florida Division of Emergency Management information is highlighted on the PSC website (www.floridapsc.com), as well as links to the Federal Emergency Management Agency (FEMA) and the National Hurricane Center, which provides consumers easy access to important resources. The PSC issues statewide news releases at the beginning of each storm season regarding hurricane workshops, or Commission decisions on utility storm preparedness plans. All of this information is distributed via the PSC Twitter account (https://twitter.com/floridapsc) at appropriate times throughout the year.

Utility Preparedness and Storm Hardening Activities

Throughout the year, utilities participate in hurricane exercises and drills in order to better prepare for a storm event. Prior to hurricane season, utilities ensure that they have the required internal materials on hand, as well as commitments for external resources which may be needed following a storm. Utilities also partake in hurricane preparedness exercises and meetings with local governments, and ensure that the proper critical facilities (i.e., hospitals, water and wastewater treatment plants, and fire stations) are identified.

The storm hardening activities outlined in each IOUs' hardening plan vary to a degree; however, the overall goal of strengthening the utility's electric facilities is a common objective. Some storm hardening programs include: tree trimming, pole inspections, hardening of feeders and laterals, and undergrounding. All of these activities are designed to mitigate storm damage and decrease outage duration time, though these actions cannot entirely eliminate storm related outages. Utilities typically focus hardening efforts on transmission facilities, as these can impact large numbers of customers. Hardening efforts are also prioritized for facilities that serve critical infrastructure, such as hospitals, first responders, water and wastewater treatment plants, and local EOCs. Such facilities are generally restored first following a storm event.

IOUs complete tree trimming of their distribution circuits, comprised of laterals and feeders, in three to six-year cycles. Feeders run outward from substations and have the capability of serving thousands of customers. Laterals branch from the feeder circuits and are the final portion of the electric delivery system, serving a smaller portion of customers, and are typically associated with

residential areas. Each year, IOUs trim a certain percentage of their total lateral and feeder miles as part of their hardening plans; however, the trees trimmed only include those that are in the utilities' rights of way. Most IOUs trim overhead feeder circuits over a three-year trim cycle, excluding TECO which is currently on a four-year trim cycle.[7] For overhead laterals, IOUs must complete all trimming during a maximum six-year cycle.[8]

Table 2-1 below lists the number of miles trimmed that each IOU has completed for each IOU's feeder and lateral circuits since 2006. The number of miles provided includes planned tree trimming and may not include hot-spot or mid-cycle trimming. Hot-spot tree trimming occurs when crews are sent to specific areas that require unscheduled trimming due to rapid growth.

Table 2-1.
Vegetation Clearing from Feeder and Lateral Circuits (in Miles)

	DEF		FPL		FPUC		GPC		TECO	
	Feeders	Laterals	Feeders	Laterals	Feeders	Laterals	Feeders	Laterals	Feeders	Laterals
2006	723	2,703	10,094	825	-	-	-	-	268	840
2007	2,112	2,203	4,454	2,215	-	-	1,878	675	363	945
2008	708	2,544	4,262	2,078	59	86	274	821	374	806
2009	467	3,178	4,151	2,768	63	96	274	821	374	806
2010	787	4,139	5,222	2,741	65	84	281	1,060	617	1,634
2011	2,370	1,132	4,337	3,367	68	205	259	1,530	606	1,514
2012	196	3,228	4,045	3,703	52	123	240	857	435	1,282
2013	476	3,810	4,637	4,124	67	129	240	1,293	374	1,098
2014	3,297	2,782	4,249	3,685	52	145	241	1,294	465	1,161
2015	1,024	3,579	4,209	3,817	51	134	241	913	454	1,146
2016	1,016	2,173	4,418	3,745	62	188	241	331	386	926
2017	2,106	1,909	4,381	3,560	29	86	241	446	199	627

Source: IOUs' 2006-2017 distribution reliability reports.

As part of each IOUs' storm hardening plan, the Eight-Year Wooden Pole Inspection Program requires each utility to inspect and assess the strength of all of its installed wooden poles over an eight-year period. IOUs also have wooden pole replacement programs in place where a select number of existing poles are replaced with hardened poles. The National Electric Safety Code is used as a basis for the design of the replacement poles. Table 2-2 shows the number of wooden poles replaced from 2006 to 2017.

[7] Order No. PSC-12-0303-PAA-EI, issued June 12, 2012, in Docket No. 20120038-EI, *In re: Petition to modify vegetation management plan by Tampa Electric Company*.
[8] Order No. PSC-07-0468-FOF-EI, issued May 30, 2007, in Docket No. 20060198-EI, *In re: Requirement for investor-owned electric utilities to file ongoing storm preparedness plans and implementation cost estimates*.

Table 2-2.
Wooden Pole Replacement

	DEF		FPL		FPUC		GPC	TECO	
	Trans.	Distr.	Trans.	Distr.	Trans.	Distr.	Distr.	Trans.	Distr.
2006	-	-	307	2,334	-		-	-	-
2007	956	1,130	1,471	8,164	-		185	494	1,536
2008	866	1,903	1,966	7,533	47		736	781	2,056
2009	704	3,018	3,206	7,342	34		969	713	1,640
2010	-	-	1,409	10,639	215		418	900	2,815
2011	635	2,887	1,559	9,942	215		1,060	1,060	3,328
2012	803	4,670	816	10,454	242		1,032	683	4,957
2013	1,347	5,722	1,106	13,639	135		380	866	6,572
2014	2,028	5,597	2,070	12,777	536		790	720	6,038
2015	1,738	8,420	1,888	15,089	382		676	649	5,392
2016	698	4,429	1,737	12,067	254		693	940	6,701
2017	530	2,654	1,934	8,486	-		746		
Total	10,305	40,430	19,469	118,466	2,060		6,939	7,806	41,035

Source: Document Nos. 01516-2018, 01517-2018, 01518-2018, 01519-2018, 01520-2018, DEF's 2006-2017 distribution reliability reports.

In response to staff's data requests, the IOUs stated that the majority of recent underground projects were for new construction, rather than the conversion of overhead facilities to underground facilities. Since 2006, the installed underground facilities have increased by approximately 5,300 miles for the IOUs. The total amount of installed underground facilities during the past five years was approximately 2,200 miles.

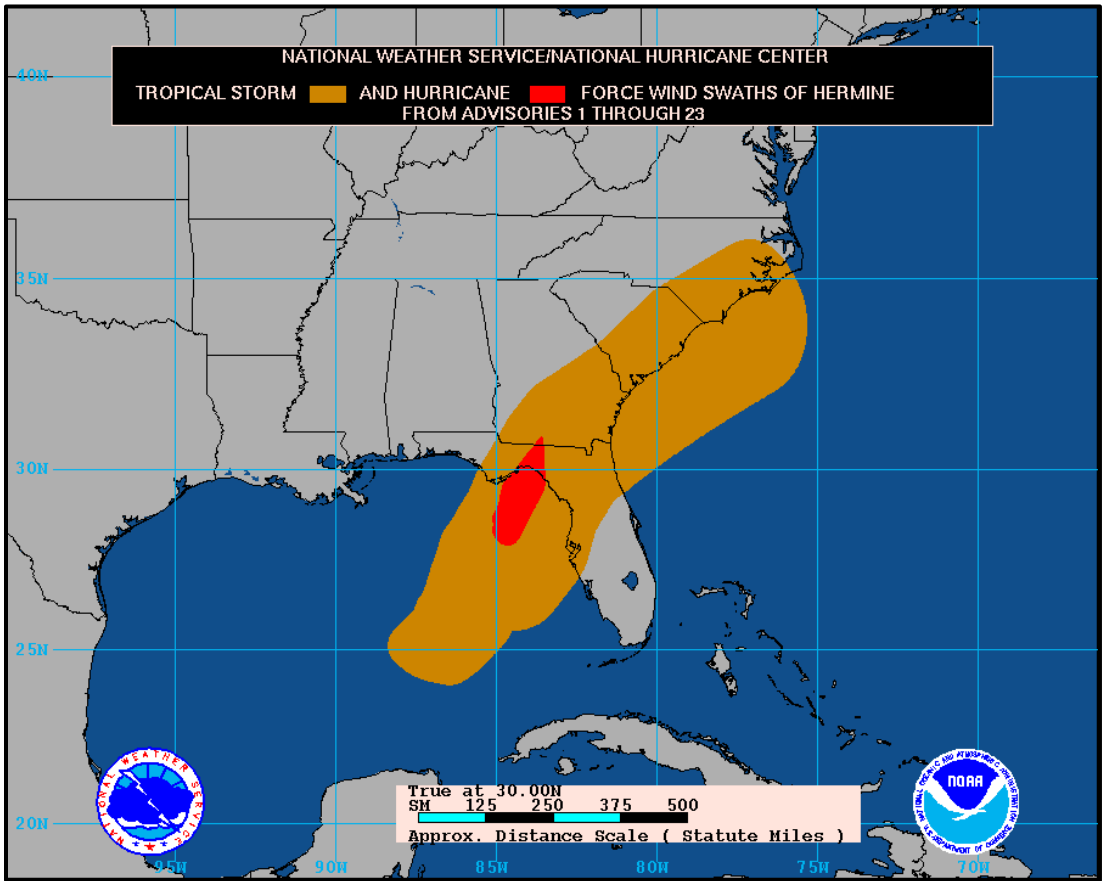
The construction of underground electrical distribution systems, when compared with overhead systems, is more expensive. For construction of underground, the customer is responsible for the difference in the costs between underground and overhead, which often results in an installation barrier. Pursuant to Rules 25-6.0342 and 25-6.064, F.A.C., the costs and benefits of storm hardening are factored into the cost difference calculation for new construction or conversion to underground facilities, as reflected on each IOUs' tariff.

Section III: Summary of 2016 and 2017 Storms

Hurricane Hermine

Hurricane Hermine made landfall on September 2, 2016, near Wakulla and Jefferson counties. Hurricane Hermine was a Category 1 hurricane when it made landfall, primarily affecting the Big Bend area. Figure 3-1 illustrates the path of Hurricane Hermine, and the areas that experienced tropical storm and hurricane force winds. The National Hurricane Center defines tropical storm force winds as winds between 39 miles per hour (mph) to 73 mph. Winds that are equal to or exceeding 74 mph are defined as hurricane force winds.

Figure 3-1.
Hurricane Hermine – Tropical Storm and Hurricane Force Winds



Source: NOAA's National Hurricane Center

Wind, rainfall, and storm surge data was requested from IOUs, Municipals, and Cooperatives for each hurricane. A total of 36 utilities provided data and the maximum reported sustained winds, wind gusts, rainfall, and storm surge for Hurricane Hermine, summarized in Appendix C. The three counties that experienced some of the highest sustained winds and wind gusts from

Hermine were Jefferson, Madison, and Taylor. These counties also received high levels of rainfall; however, the two counties with the largest amounts of rainfall were Manatee and Sarasota. These two counties did not rank highest for any other category, and appear to be outliers in the reported weather data. The reason for the large amount of rain experienced in Manatee and Sarasota counties may have been due to strong storm bands that hit that part of the state. The three counties that had the largest storm surges were Dixie, Taylor, and Wakulla. All of these counties, with the exception of Manatee and Sarasota, were located in the area where Hurricane Hermine made landfall.

Table 3-1 provides the five counties with the highest number of outages for Hurricane Hermine. This outage data was reported to the state EOC by IOUs, Municipals, and Cooperatives at set intervals of reporting times. The percentages of accounts without power were calculated based on the peak number of customer accounts without power divided by the total number of customer accounts for that county, which includes IOUs, Municipals, and Cooperatives customers. The total peak percentage of accounts in the state without power was approximately 3 percent for Hurricane Hermine. Appendix B provides a comprehensive list of the peak number of customer accounts by county that were without power for each hurricane.

Table 3-1.
Hurricane Hermine – Five Counties with Highest Maximum Outages

	Max. Account Outages	Max. Percent of Account Outages
Hamilton	5,864	87.9%
Jefferson	5,762	71.5%
Lafayette	2,965	71.5%
Madison	7,278	69.0%
Wakulla	14,009	93.0%

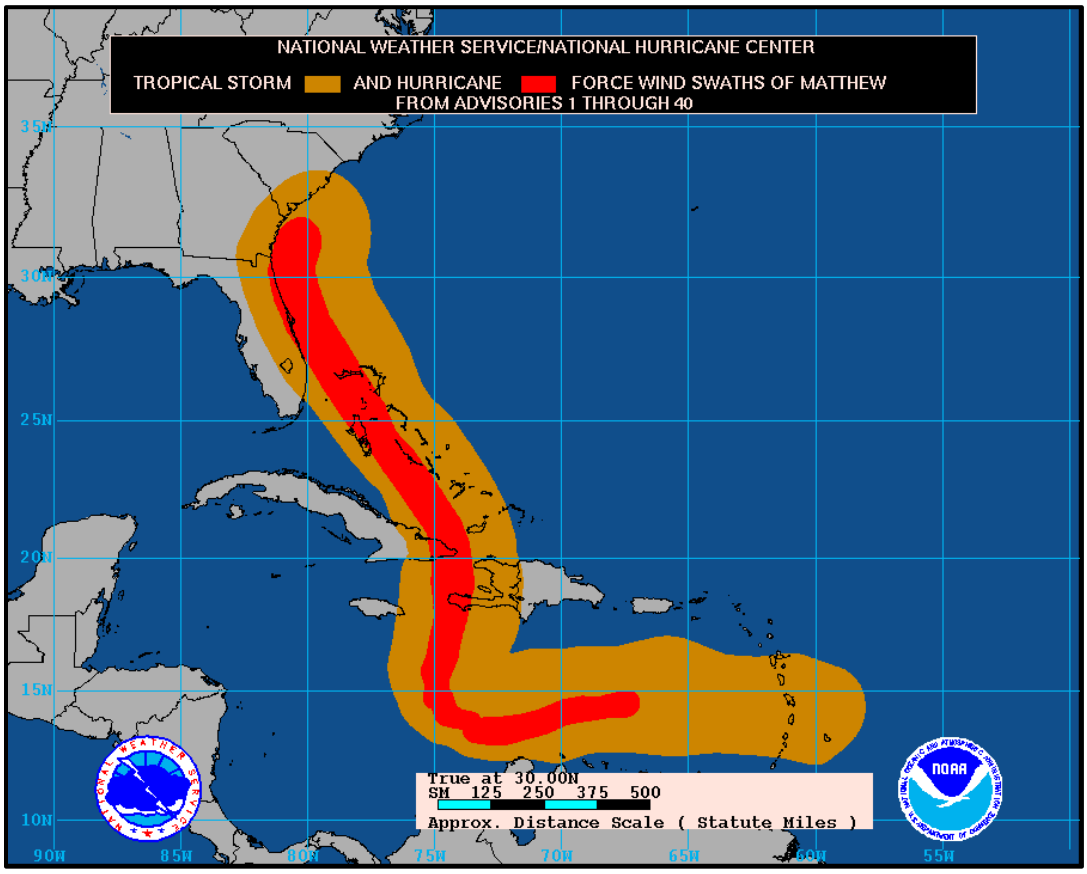
Source: State EOC power outage reports.

The outages for Jefferson, Madison, and Wakulla counties correlate to the reported weather data as they were among the counties that experienced the highest winds, rainfall, and storm surges. Wind data was not reported for Hamilton and Lafayette counties, though they both received large amounts of rainfall.

Hurricane Matthew

While Hurricane Matthew never made landfall in Florida; it passed along Florida's east coast shoreline, where some areas experienced sustained hurricane force winds. Hurricane Matthew began as a Category 4 hurricane on October 7, 2016, but weakened and later became a Category 2 hurricane northeast of Jacksonville Beach on October 8, 2016. Figure 3-2 illustrates the path of Hurricane Matthew, and the areas that experienced tropical storm and hurricane force winds.

Figure 3-2.
Hurricane Matthew – Tropical Storm and Hurricane Force Winds



Source: NOAA's National Hurricane Center

Wind speed, rainfall, and storm surge data for Hurricane Matthew is contained in Appendix D. The three counties that experienced some of the highest sustained winds and wind gusts for Hurricane Matthew were Brevard, St. Johns, and Volusia. From the reported rainfall data, the counties with the three highest amounts of rainfall were Brevard, Indian River, and St. Lucie. The three counties that had the largest storm surges were Flagler, Nassau, and St. Johns. All of these counties are located on Florida's east coast and correspond to the path of storm. Table 3-2 provides the five counties with the highest number of outages for Hurricane Matthew. The total peak percentage of customer accounts in the state without power was 11 percent.

Table 3-2.
Hurricane Matthew – Five Counties with Highest Maximum Outages

	Max. Account Outages	Max. Percent of Account Outages
Flagler	57,016	100.0%
Indian River	59,244	67.2%
Putnam	27,393	66.8%
St. Johns	78,610	89.6%
Volusia	257,718	92.0%

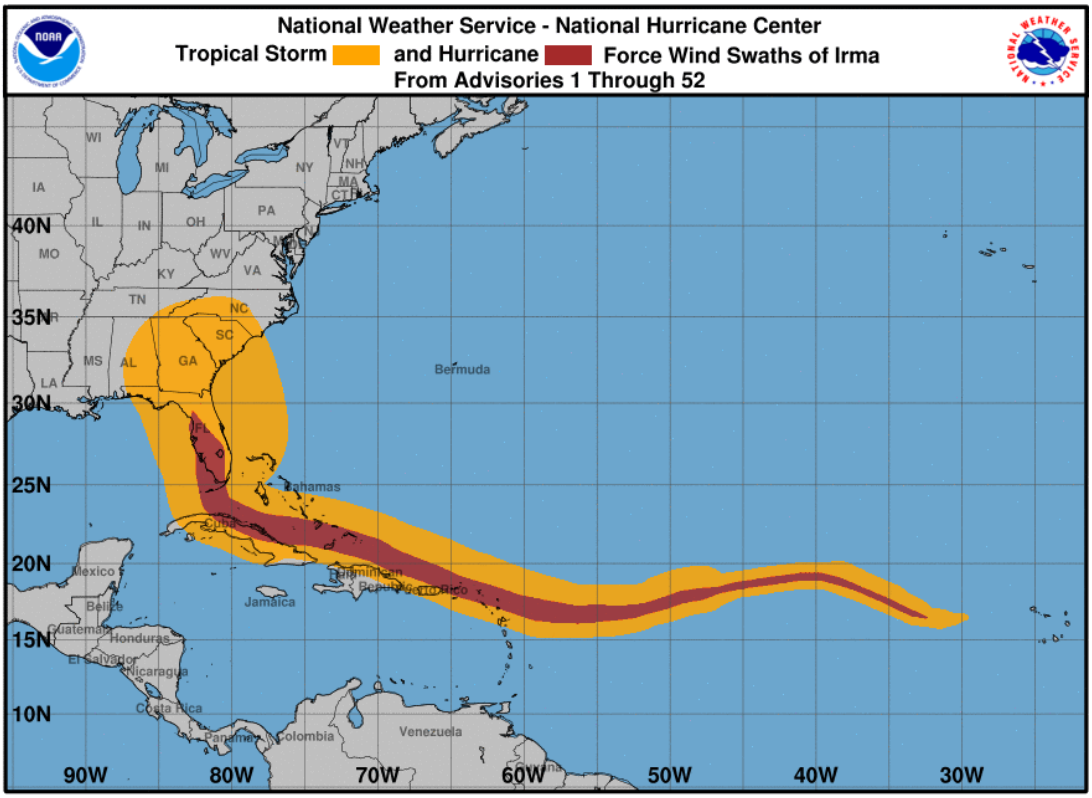
Source: State EOC power outage reports.

The outages for Flagler, Indian, St. Johns, and Volusia counties correlate to the reported weather data as they were among the counties that experienced the highest winds, rainfall, and storm surges. Rainfall data was not reported for Putnam County; however, it is located next to St. Johns County, which experienced severe weather conditions.

Hurricane Irma

Hurricane Irma was the first major hurricane to make landfall in Florida since the 2004 and 2005 hurricane seasons. On September 10, 2017, Hurricane Irma made landfall in the Florida Keys as a Category 4 hurricane and weakened to a Category 3 hurricane as it made a second landfall near Marco Island, Florida on the same day. The storm continued to weaken as it moved over Florida, affecting all 67 counties in the state and resulting in widespread power outages. Figure 3-3 illustrates the path of Hurricane Irma, and the areas that experienced tropical storm and hurricane force winds.

Figure 3-3.
Hurricane Irma – Tropical Storm and Hurricane Force Winds



Source: NOAA's National Hurricane Center

Wind speed, rainfall, and storm surge data for Hurricane Irma is contained in Appendix E. The three counties that experienced the highest maximum sustained winds for Hurricane Irma were Collier, Monroe, and Polk. The largest amount of rainfall was reported for Bradford, Hillsborough, and St. Lucie counties. The three counties that had the largest maximum storm surge were Collier, Monroe, and Nassau. Due to the path of Hurricane Irma, many of the southernmost counties, such as Monroe and Collier, experienced high winds and storm surges, while parts of central Florida had large amounts of rain. Additionally, parts of northeast Florida, such as Nassau County, experienced high winds and storm surges due to the outer bands and the path of the storm.

Table 3-3 provides the five counties with the highest number of outages for Hurricane Irma. The total peak percentage of customer accounts in the state without power was 62 percent.

Table 3-3.
Hurricane Irma – Five Counties with Highest Maximum Outages

	Max. Account Outages	Max. Percent of Account Outages
Hardee	11,976	97.4%
Hendry	18,750	100.0%
Highlands	62,010	99.3%
Nassau	43,740	97.6%
Okeechobee	21,990	96.5%

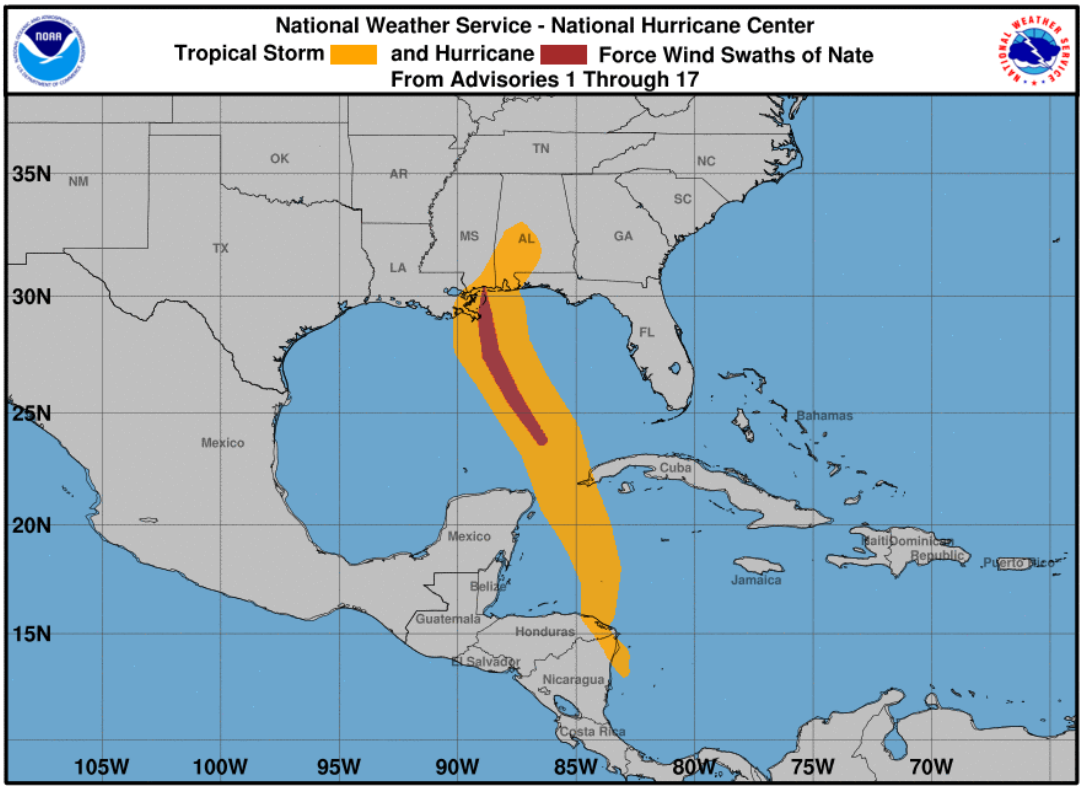
Source: State EOC power outage reports.

The outages for Nassau County correlate to the reported weather data as it was among the counties that experienced high storm surges. Okeechobee, Hardee, Henry, and Highlands counties are in close proximity to one another and are located in south Florida, near Hurricane Irma's landfall. All of these counties experienced wind gusts over 100 mph and all but Okeechobee recorded over 10 inches of rainfall.

Hurricane Nate

On October 7, 2017, Florida was impacted by a second storm, Hurricane Nate, which made its first landfall at the mouth of the Mississippi River as a Category 1 hurricane, followed by a second landfall near Biloxi, Mississippi on the same day. While Hurricane Nate did not make landfall in Florida, parts of the panhandle were impacted by the hurricane. Figure 3-4 illustrates the path of Hurricane Nate, and the areas that experienced tropical storm and hurricane force winds.

Figure 3-4.
Hurricane Nate – Tropical Storm and Hurricane Force Winds



Source: NOAA's National Hurricane Center

Wind speed, rainfall, and storm surge data for Hurricane Nate is contained in Appendix F. The impact of Hurricane Nate was much smaller in scope compared to the previous three hurricanes. The three counties that experienced the highest sustained winds, wind gusts, and rainfall were Escambia, Okaloosa, and Santa Rosa. The three counties that had the highest storm surges were Escambia, Franklin, and Santa Rosa. All of these counties are located in Florida's panhandle, close to where Hurricane Nate made landfall. Table 3-4 provides the five counties with the highest number of outages for Hurricane Nate. The total peak percentage of accounts in the state without power was 0.1 percent.

Table 3-4.
Hurricane Nate – Five Counties with Highest Maximum Outages

	Max. Account Outages	Max. Percent of Account Outages
Escambia	5,384	3.4%
Holmes	77	0.7%
Okaloosa	6,382	5.9%
Santa Rosa	1,712	2.2%
Walton	613	1.0%

Source: State EOC power outage reports.

The outages for Escambia, Okaloosa, and Santa Rosa counties correlate to the reported weather data as they were among the counties that experienced some of the highest winds, rainfall, and storm surges. While Walton County did not have the highest reported winds and rainfall, it experienced high winds comparable to Okaloosa County, as well as receiving several inches of rain. Wind data was not reported for Holmes County; however, it is located in the panhandle area near Okaloosa and Walton counties.

Section IV: Review of Outage Restoration Activities

Restoration Process

The restoration process is a year-round activity. Many utilities across the state engage in exercises that simulate storms in order to better prepare for an actual hurricane or other significant weather event. In the event of a hurricane, utilities may initiate pre-staging meetings and activities as early as 240 hours before landfall, which may include requests for mutual aid. Utilities communicate with county EOCs to identify critical facilities (i.e., hospitals, water and wastewater treatment plants, and fire stations) and coordinate on other restoration activities. As the storm approaches, restoration activities will continue until winds reach 35-40 miles per hour, at which time crews will be called back for a stand-down period. Once winds drop below 35-40 miles per hour and weather conditions are considered to be safe following a storm, utility crews are re-deployed to continue the restoration process.

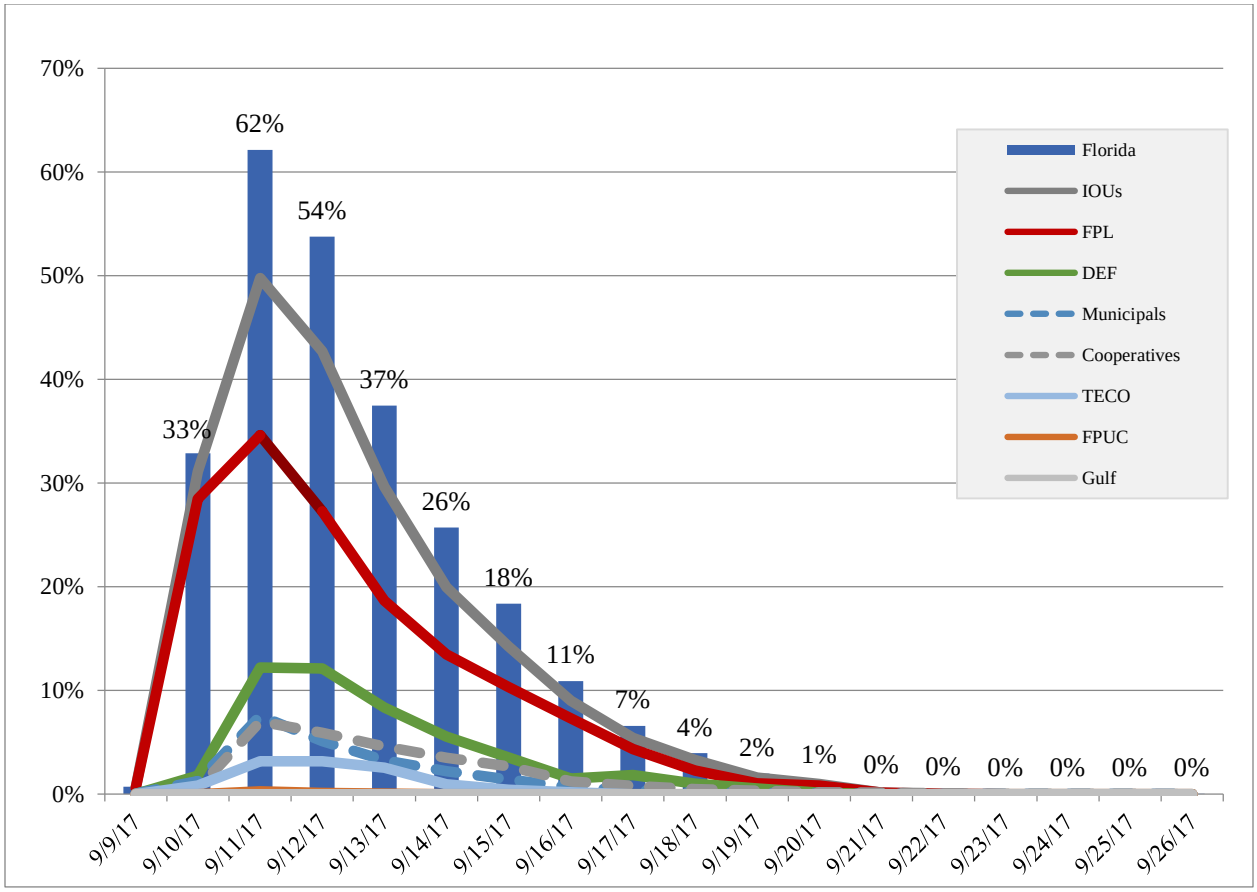
As part of restoration activities, damage assessment is completed prior to and following the storm. Before a storm makes landfall, an assessment of potential damage is completed by utilities based on the forecasted path of the storm. This information can be used to determine if mutual aid and additional material resources should be requested. Once the storm has passed, a post-storm damage assessment is completed, where utilities can establish what facilities have been damaged, refine restoration time estimates, manage workloads, and allocate resources to where they are needed. Restoration can continue following the storm, beginning with repairs to generation plants and transmission facilities that sustained damage, followed by repairs to substations and feeders. Substations and feeders that power critical infrastructure are prioritized first in order to get those necessary facilities back in service. Feeders that serve the largest number of customers are restored next, and finally laterals that serve neighborhoods with fewer customers are repaired and restored. Overall, utilities strive to restore as many customers as possible in the shortest amount of time.

Based on a review of the utility presented data for each hurricane, no abnormalities were identified between storms for the restoration process. Hurricane Irma affected the entire state and was the first significant test of Florida's electric infrastructure since the 2004 and 2005 hurricane season. For simplification purposes, and due to the size and scope of the storm, the following subsections on restoration, outage causes, mutual aid, overhead and underground, and impediments are specific to Hurricane Irma only. Data from other storms were used for comparison purposes to determine if there were any anomalies or unique circumstances.

Restoration Data

Using outage data reported to the Florida Division of Emergency Management (DEM), Figure 4-1 provides the number of customer accounts without power in proportion to the total state caused by Hurricane Irma. The peak outages occurred on September 11, 2017, with approximately 62 percent of all customers in the state without power. Five days following this peak, the number of outages dropped to approximately 11 percent. On September 20, 2017, 10 days following the outage peak, the percent of customer accounts without power dropped below 1 percent.

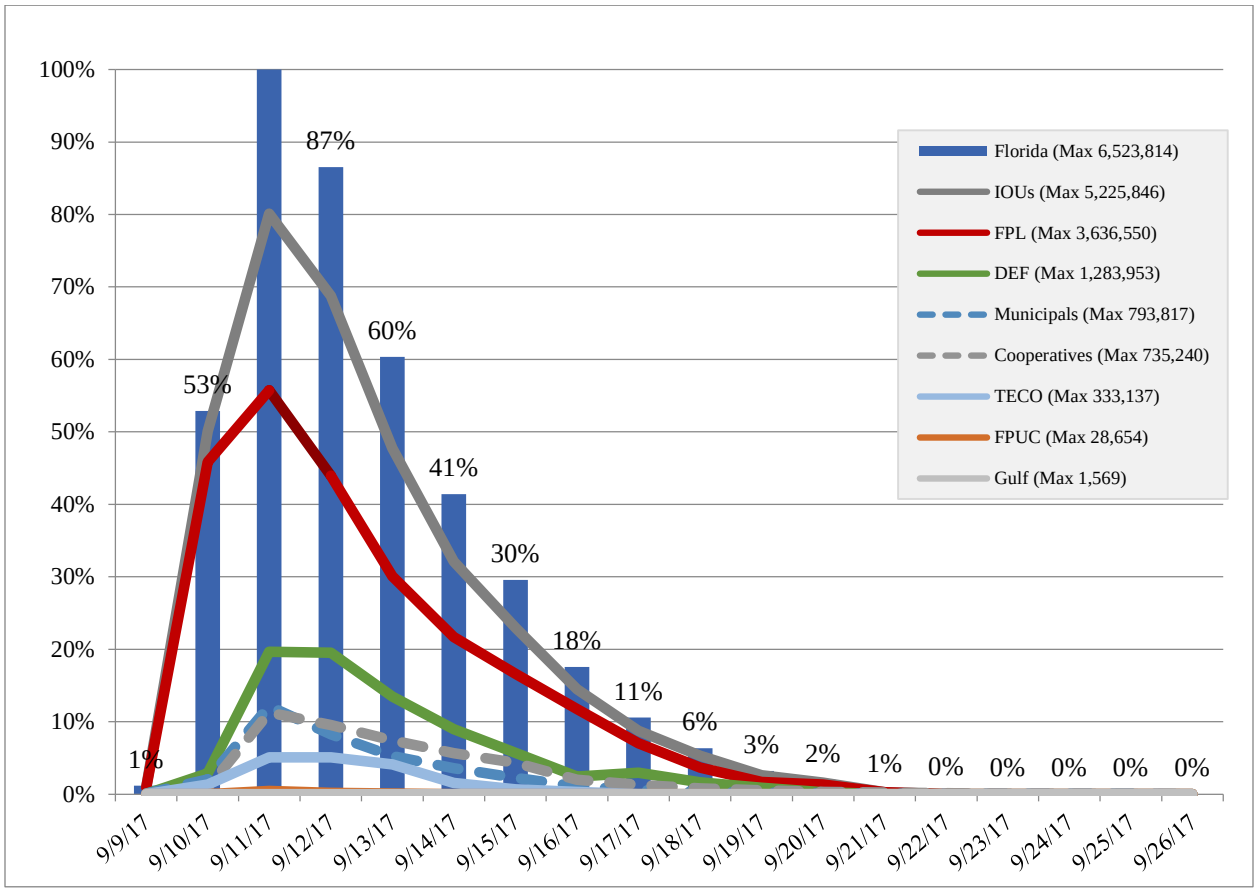
Figure 4-1.
Hurricane Irma – Daily Maximum Percent of Florida's Customers without Power



Source: State EOC power outage reports.
Note: Individual utility outage maximums occurred at different times and do not add to the total.

Figure 4-2 provides the affected customers that were without power from Hurricane Irma. As mentioned above, the peak number of customers without power occurred on September 11, 2017, and by September 14, 2017, the number of affected customers without power was below 50 percent. By September 20, 2017, the number of customers without power dropped to 2 percent. For several utilities, once the number of customers without power dropped to 2 percent or less, the utility stopped reporting outages to the DEM as these outages could be unrelated to the storm event.

Figure 4-2.
Hurricane Irma – Daily Maximum Percent of Affected Customers without Power



Source: State EOC power outage reports.
Note: Individual utility outage maximums occurred at different times and do not add to the total.

Overall, Figures 4-1 and 4-2 illustrate that the graphs for each IOU is similar in shape to the Municipals, and Cooperatives. This demonstrates that there were comparable power restoration achievements for the different utility groups, and no irregularities were observed in the data.

During the May 2018 workshop, FPL provided a comparison of outage data and restoration times for Hurricanes Wilma and Irma. Table 4-1 illustrates that it took one day to restore power to 50 percent of FPL's customer for Hurricane Irma, while it took five days for Hurricane Wilma. Additionally, it took 10 days to restore all customers for Hurricane Irma, and it took 18 days for Hurricane Wilma. Also at the workshop, TECO provided a comparison of outage data for Hurricanes Jeanne (11 days) and Irma (7 days). No other utility provided a similar comparison. While each storm is different and presents its own set of difficulties, it appears that the amount of time to restore all customers has decreased compared to previous storms.

Table 4-1.
FPL – Outage and Restoration Data for Hurricanes Wilma and Irma

	Wilma	Irma
Customer outages	3.2M	4.4M
Staging sites	20	29
% Restored / days	50% / 5	50% / 1
All restored (days)	18	10
Avg. days to restore	5.4	2.1

Source: FPL's presentation at the May 2, 2018, Commission Workshop.

Outage Causes

Data collected from 39 utilities identified that the biggest source of outages was vegetation issues. Many utilities described that these issues were from fallen trees or branches that were outside of the utilities' rights of way. Also, additional trimming by the utilities within their rights of way would not eliminate these vegetation related outages. It should also be noted that typical hardening projects are designed and constructed to withstand extreme wind loads, not fallen trees. The second most prevalent outage cause was from embedded severe weather events, such as tornadoes, microbursts, and flooding.

Some hardened and non-hardened data was presented at the workshop, which showed that the efforts by the PSC and utilities appear to be working. The IOUs affirmed that the hardened facilities, including poles, performed better than non-hardened facilities. FPL, FPUC, and TECO presented data on replacements of hardened versus non-hardened facilities for Hurricane Irma. FPL reported replacement of 5 non-hardened facilities and FPUC reported replacement of 37 non-hardened facilities. Neither utility reported replacement of hardened facilities. TECO replaced 20 hardened facilities and 165 non-hardened facilities. DEF reported no replacements of hardened facilities and repairs or replacement of 139 non-hardened facilities. Gulf Power Company (GPC) did not provide the number of non-hardened facilities that sustained damage; however, they reported that no hardened facilities were damaged.

The IOUs presented information on the performance of overhead and underground facilities at the workshop and reported that underground facilities generally performed better than overhead. Just like overhead facilities, it should be noted that underground facilities are also susceptible to damage. The damage may be caused by uprooted trees and flooding and the repairs to such facilities typically take longer to complete.

Mutual Aid

Many mutual aid agreements among IOUs throughout the country are managed by seven Regional Mutual Assistance Groups (RMAGs). Florida's IOUs are members of the Southeastern Electric Exchange RMAG. RMAGs facilitate the process of identifying available restoration workers and help coordinate the logistics to help with restoration efforts. IOUs that are in RMAGs follow guidelines established by the Edison Electric Institute (EEI), and also establish additional guidelines that aid in the communication process and rapid mobilization and response

efforts. If needed, utilities in one RMAG will assist those in another region.[9] EEI also communicates regularly with the associations that serve Municipals and Cooperatives during major outage incidents, providing a process for electric companies to request support from other electric companies that have not been affected by major outage events.[10]

Section 252.40, F.S., Mutual Aid Arrangements, authorizes the governing body of each political subdivision of the state, "to develop and enter into mutual aid agreements within the state for reciprocal emergency aid and assistance in case of emergencies too extensive to be dealt with unassisted." It also provides that, "[s]uch agreements shall be consistent with the state comprehensive emergency management plan and program, and in time of emergency it shall be the duty of each local emergency management agency to render assistance in accordance with the provisions of such mutual aid agreements to the fullest possible extent."

The American Public Power Association (APPA), together with state and regional public power utilities and organizations, coordinate the mutual aid network for the nation's public power utilities. These utilities have local, state, and regional contracts and agreements for mutual aid, and there is a national mutual aid agreement with over 2,000 public power and rural electric cooperatives so they are able to assist one another when needed. In addition to helping public power utilities in need, public power utilities also provide mutual aid to cooperatives and to IOUs when requested and have also received assistance from cooperatives and IOUs when needed. Mutual aid played a key role in restoring the power quickly after Hurricane Irma. Public power utilities and IOUs aided one another in the restoration efforts.[11]

Prior to Hurricane Irma making landfall, many utilities made requests for mutual aid. Based on information from the state EOC, a total of 49 utilities received mutual aid. Information on the number of crew managers and crews managed, which includes both utility and mutual aid crews, was requested from utilities. Table 4-2 illustrates the large number of crews that were managed by a limited number of experienced managers. From the 47 utilities that responded to staff's data request, the average experience level of the crew managers was 25 years. This demonstrates the level of expertise that is required to coordinate large recovery efforts, particularly in regard to mutual aid crews that are unfamiliar with local terrain, the transmission and distribution systems, and procedures specific to each utility. Considering the large number of mutual aid crews that were brought in to assist with power restoration, the number of injuries were low and there were no fatalities. Of the total 103 injuries, 38 were reported for utility personnel and 65 were reported for mutual aid personnel.

[9] Miles Keogh and Sharon Thomas, NARUC Grants and Research, *Regional Mutual Assistance Groups: A Primer* (November 2015).
[10] Edison Electric Institute, *Understanding the Electric Power Industry's Response and Restoration Process* (October 2016).
[11] APPA letter to U.S. House Energy & Commerce Committee, Subcommittee on Energy (November 1, 2017).

Table 4-2.
Hurricane Irma – Utility Coordination, Injuries, and Fatalities

	Managers	Crews Managed	Meals	Injuries	Fatalities
IOU	48	22,398	1,409,352	76	0
Municipals	96	1,935	109,266	13	0
Cooperatives	104	3,295	171,803	14	0
Total	248	27,628	1,690,421	103	0

Impediments to Restoration

Data was collected from 39 utilities on the primary impediments that were identified for Hurricane Irma. Consistent with prior hurricanes, the biggest impediment to restoration was clearing vegetation, much of which was debris from fallen trees or branches that were outside of the utilities' rights of way. Other impediments to restoration unique to Hurricane Irma were roadway congestion and lack of motor fuel availability due to the size and scale of evacuations. Therefore, utility crews that were tasked to aid in power restoration for various areas were delayed by some fuel shortages and traffic congestion on the roadways.

Forensic Analysis

As part of their storm hardening plans, IOUs conduct post-storm forensic analyses which reviews storm-related data and an assessment of damaged facilities that did not perform as designed. Following a review of the storm damage data, which typically takes several months, a report is issued outlining the findings of the review. For Hurricane Irma, FPL, DEF, and TECO completed a forensic analysis to evaluate the performance of their facilities during the storm. GPC and FPUC indicated that forensic analyses were not completed due to a lack of significant damage or determined that all damage was caused by vegetation.

DEF provided five forensic analysis reports related to failures of wooden distribution poles, transmission wooden poles, and a transmission tower. One of DEF's forensic reports included analysis on a steel transmission tower that fell during Hurricane Irma. The failure was identified as corrosion at the base of the tower. DEF's forensic reports also identified 27 wooden transmission pole failures due to high winds, with wood rot contributing to some of the failures. FPL provided a post-storm forensic review for Hurricane Irma, which identified five wooden transmission pole failures caused by wind only. TECO's forensic analysis identified three leaning structures following Hurricane Irma, and at the workshop, TECO reported that it had ten transmission structure failures.

Section V: Customer Communication

As noted, customers also have a critical role in the overall level of storm preparedness and restoration. When advised that power, water, and even cell phone service could be disrupted for three to five days, customers should plan accordingly. The utilities and the Commission provide information to consumers regarding storm preparedness, such as hurricane survival kits, portable generator safety, and ways to prepare a home before a storm.

Following a storm, customers are provided various methods to communicate with utilities. Customers can report a power outage to the utility through various means such as interactive voice response systems, customer call centers, the utility's website, mobile applications, and the PSC. A total of 41 utilities provided data on the number of customer representatives that were utilized during Hurricanes Hermine, Matthew, Irma, and Nate. This information is summarized in Table 5-1, which includes third-party representatives.

Table 5-1.
Total Number of Utility and Third-Party Customer Contact Representatives

	Hermine	Matthew	Irma	Nate
IOUs	948	1,825	2,418	106
Municipals	300	571	1,059	48
Cooperatives	163	84	297	6
Total	1,411	2,480	3,774	160

Source: Utilities' responses to staff's first data request, No. 14.

Table 5-2 provides the number of customer contacts for Hurricanes Hermine, Matthew, Irma, and Nate. Customer contacts may include various forms of communication, including phone, email, mobile application, utility website, and social media.

Table 5-2.
Total Customer Contacts

	Hermine	Matthew	Irma	Nate
IOUs	395,358	3,605,174	11,424,246	30,545
Municipals	71,302	414,202	1,634,438	0
Cooperatives	53,804	12,053	207,488	343
Total	520,464	4,031,429	13,266,172	30,888

Source: Utilities' responses to staff's first data request, No. 15.

Table 5-3 provides the average number of customer contacts that were handled by each utility and third-party customer contact representatives. For Hurricane Irma, an average number of 2,513 customer contacts per representative were handled for the IOUs, which demonstrates the large scale of communication that occurred between customers and the electric utilities.

Table 5-3.
Average Number of Customer Contacts per Utility Representative[12]

	Hermine	Matthew	Irma	Nate
IOUs	628	1,776	2,513	332
Municipals	138	774	1,061	0
Cooperatives	439	84	796	57

Source: Utilities' responses to staff's first data request, Nos. 14 and 15.

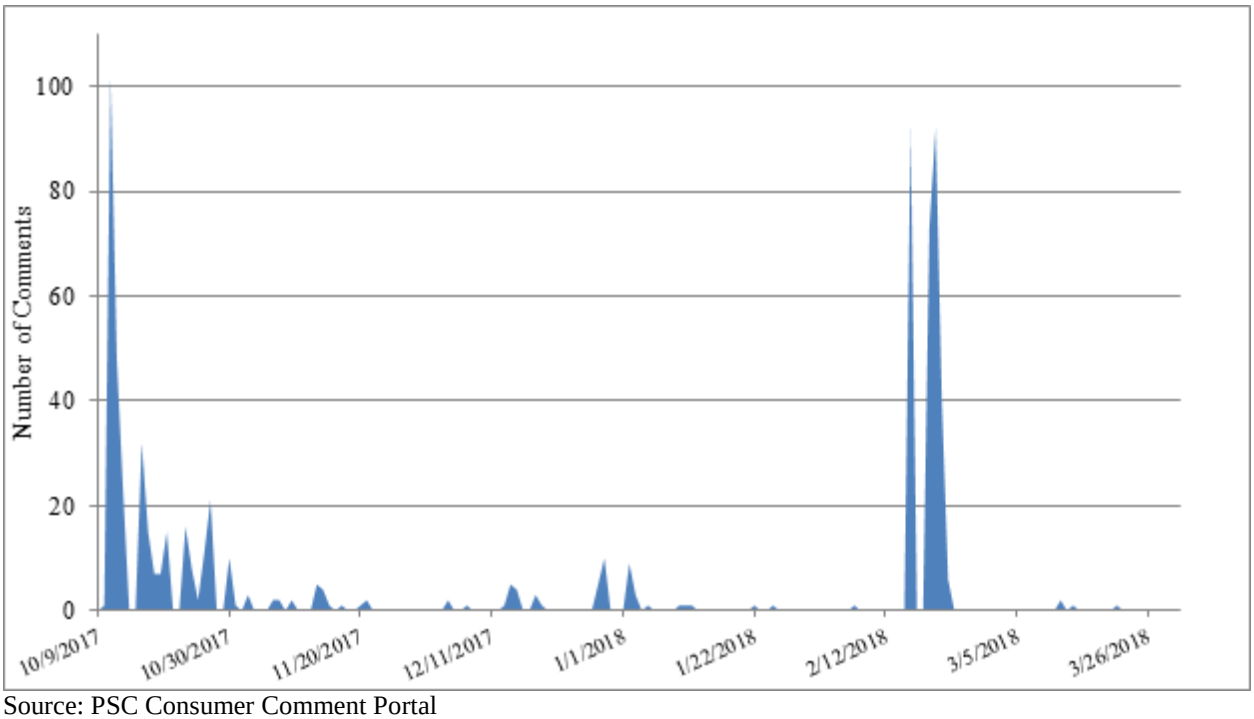
Following the establishment of Docket No. 20170215-EU, a customer portal was opened on the Commission's website, allowing customers to submit comments regarding their reaction to utility restoration/communication efforts. The portal provided consumers four categories to select from, as well as the option to submit written comments, where consumers could address any specific concerns. The four categories that consumers could select from were:

- Power restoration time.
- Information provided by electric utility provider prior to the storm.
- Information provided by electric utility provider after the storm.
- Other.

[12] It should be noted that this average includes only utilities that were affected by a storm.

Figure 5-1 provides a timeline of the number of comments received through the PSC Consumer Comment Portal.

Figure 5-1.
PSC Portal – Timeline of Consumer Comments Received



Source: PSC Consumer Comment Portal

The consumer portal was opened on October 9, 2017, and for the month of October the PSC received 319 comments. These comments were mostly related to consumers' experiences and feedback during Hurricane Irma. Comments focused on frustration with timely communication, inaccurate estimated restoration times, and tree trimming. The number of comments received decreased after the month of October, but there was a small swell of comments from December 28, 2017, to January 12, 2018. During this period, the consumers expressed concerns related to the potential addition of a surcharge to customer bills as a result of the hurricane. From February 16 to February 22, 2018, a total of 303 comments were received, which were predominately focused on supporting and encouraging the use of distributed solar generation. The portal was closed on May 1, 2018, with a total of 701 comments received.

Staff collected and sorted the comments by category and divided them into subcategories based on whether the comment was negative, positive, or neutral. Table 5-4 provides a summary of the comments that were received.

Table 5-4.
PSC Portal – Customer Comments

Category	Comments
Power Restoration Time	345
Information Provided Prior to the Storm	14
Information Provided After the Storm	69
Other	273
Total	701
Positive vs. Negative Comments	
Negative Comments on Electric Utility	346
Positive Comments on Electric Utility	74
Not Expressed	281
Total	701

Source: PSC Consumer Comments Portal

Table 5-5 provides the number of comments received for IOUs, Municipals and Cooperatives. Two of the customer comments did not provide the names of their electric utilities.

Table 5-5.
PSC Portal – Customer Comments by Utility Type

Utility Type	Comments
Investor Owned Electric Utility	616
Municipal Electric Utility	48
Cooperative Electric Utility	35
Not Specified	2
Total	701

Source: PSC Consumer Comments Portal

The most prevalent topics were related to supporting and encouraging the use of distributed solar generation, cost responsibility for restoration, frustration with communication, tree trimming, and effectiveness of storm hardening.

Table 5-6 provides the number of comments that were received for each of these topics.

Table 5-6.
PSC Portal – Most Prevalent Topics Discussed in Customer Comments

Subcategory	Comments	Percent of Total
Support and encouragement of solar	258	37%
Cost responsibility for restoration	105	15%
Frustration with timely communications	84	12%
Tree trimming	73	10%
Effectiveness of hardening	60	9%

Despite the wide-spread impact of Hurricane Irma on the state and the number of customers that were affected, the number of comments the Commission received were nominal.

Based on the consumer comments received, one of the largest concerns was regarding cost responsibility for restoration. While an IOU's storm hardening plan may be approved by the Commission, this does not guarantee an IOU the recovery of all incurred costs for the implementation of the plan. The issue of storm hardening costs is addressed during an IOU's general rate case proceeding, since these costs are considered a part of providing electric service in Florida. During a general rate case, the costs for storm hardening are taken into consideration and the Commission makes a ruling on whether the costs are prudent. However, recent rate case proceedings have resulted in settlement agreements between the parties, and the storm hardening costs are not specifically identified in the settlement agreements. While storm hardening may help to reduce the number and magnitude of storm related outages, it does not prevent outages from occurring. Storm restoration is addressed differently and is in addition to storm hardening costs. Following Hurricane Andrew in 1992, which resulted in changes to the commercial insurance market, IOUs requested that the Commission allow for storm damage self-insurance. On an individual basis, the Commission considered various forms of self-insurance for the IOUs and settled on a three part approach:

- A storm damage reserve
- An annual storm accrual
- A provision to seek recovery of costs that exceed the storm damage reserve balance

Cost recovery of storm related damage is typically addressed through a storm damage reserve, a surcharge, or a combination of the two. A storm damage reserve can address the costs associated with less severe storm damage, and the storm reserves annual accrual can help to alleviate the consumer rate shock by collecting the amount over a longer period of time. Once the storm reserve reaches a target value, the storm accrual can be suspended.

In order to define what type of costs can be recovered, the Commission adopted Rule 25-6.0143, F.A.C., which specifies that only incremental costs (e.g. overtime payroll, contract labor hired for storm restoration) can be charged to the storm reserve. As outlined in recent settlement

agreements, in the event that the storm reserve is depleted from a major storm or multiple storms, or if a utility does not have a storm reserve, a surcharge can be put into effect to recover incremental costs. In such an instance, an IOU can file a petition for a surcharge to be implemented over a set period of time, depending on the total amount of incurred costs. However, all resources and labor costs are initially borne by the IOU prior to the surcharge petition. Once a docket has been opened for a surcharge petition, initiation of interim recovery can begin, which is subject to true-up once the storm damage and restoration costs are found eligible for recovery pursuant to the Rule.

Stakeholder Comments

In addition to comments from utilities and customers, staff also solicited comments from non-utility stakeholders, which included Associated Industries of Florida, the Florida Chamber of Commerce, Florida Association of Counties, and Florida League of Cities. Appendix A provides a summary of the stakeholder comments that the Commission received. A total of 14 stakeholders provided comments on the topics of vegetation management, undergrounding, and coordination and communications. For vegetation management, the comments mainly focused on improving communication between stakeholders and utilities on where and when tree trimming occurs, as well as better educating the public on tree trimming. While the comments on undergrounding varied, many voiced a positive position on undergrounding, though stakeholders expressed differences in opinion on cost responsibility. Last, the comments on coordination and communication largely concentrated on more involvement from utilities at local EOCs, in addition to improving post-event information and power restoration time estimates. Aside from the suggested areas of improvement mentioned, the overall comments that stakeholders provided were positive.

Workshop Summary

Leading up to the workshop, staff provided topics for utilities to address, which included preparedness and restoration processes, hardened vs. non-hardened facility performance, underground vs. overhead performance, impediments to restoration, customer/stakeholder communication, and suggested improvements based on lessons learned. At the workshop held on May 2-3, 2018, the following provided input:

- FPL
- DEF
- TECO
- GPC
- FPUC
- Florida Electric Cooperatives Association, Inc. (FECA)
- Florida Municipal Electric Association (FMEA)
- OPC
- Florida Industrial Power Users Group (FIPUG)
- Florida Retail Federation (FRF)
- City of Dunedin
- St. Johns County
- City of Monticello

At the workshop, all of the IOUs provided data that hardened facilities generally performed better than non-hardened facilities. The IOUs also indicated that there were fewer outages for underground than overhead circuits. The utilities offered suggested improvements such as targeted undergrounding projects, inspections and hardening of non-electric utility poles, addressing vegetation outside of the utilities' rights of way, and increasing coordination with local governments and customers. Stakeholders also suggested increased coordination with local governments and customers and more utility staffing at local EOCs.

Section VI: Conclusions

Conclusion 1: Preparedness and Restoration

Preparedness and restoration efforts appear consistent across the different utility entities. All utilities have similar staging, damage assessment, and workload management processes. Under current pricing policies the installation of underground facilities has been growing steadily, primarily in new construction.

Conclusion 2: Distribution Infrastructure

While granular data appeared to be somewhat lacking due to a focus on restoration, storm hardening efforts by the PSC and utilities appear to be working. The IOUs affirmed that the hardened facilities, including poles, performed better than non-hardened facilities. The Commission's required eight-year wooden pole inspection program resulted in proactive replacement of poles before outages occurred. Based on the wooden pole replacement data provided by the IOUs, as well as the post-storm review, there were fewer broken poles due to non-vegetation causes than with prior storms.

Conclusion 3: Transmission Infrastructure

The transmission infrastructure appears to have generally performed as designed. One of DEF's forensic reports determined that a steel transmission tower had fallen during Hurricane Irma was due to corrosion. The forensic reports for DEF also identified several wooden transmission pole failures, which were due to high winds, as well as wood rot in some instances. FPL's forensic review reported five wooden transmission pole failures due to wind only. TECO's forensic analysis found ten transmission structure failures and three leaning structures.

Conclusion 4: Impediments to Restoration

In addition to the usual impediment of vegetation clearing, the majority of the utilities identified roadway congestion and procurement of fuel to be impediments to restoration during Hurricane Irma. Due to the large number of evacuations, major roadways experienced high amounts of traffic. This presented problems in allowing utility crews to reach areas where aid in power restoration was needed. Additionally, there was a shortage of fuel leading up to and following the storm which also presented an impediment to utilities' restoration efforts.

Conclusion 5: Vegetation Management Coordination

While the miles of laterals trimmed have gradually reduced over the past few years, utilities identified that a major contributor to outages continues to be vegetation outside of the utility's right of way. Therefore, more frequent tree trimming by utilities within rights of way would not alleviate this outage cause. Tree trimming outside of a utility's right of way requires coordination and cooperation with local government and customers.

Conclusion 6: Post-storm Communication

Post storm communication with customers was not an impediment to power restoration, yet many customers expressed dissatisfaction with the information provided by utilities following Hurricane Irma. In particular, customers voiced frustrations with inaccurate power restoration estimates, cost responsibility for restoration, and support for additional distributed solar generation.

Appendix A.
Summary of Stakeholder Comments

Date	Stakeholder	Summary of Comments
01/26/2018	City of Homestead	Regarding coordination on vegetation management, the majority of FPL's power lines are underground, but it should focus on the local level. City ordinances require new construction be underground. Stated that communication with the utility is good, but would like to see more "granular, city-specific" information and outage status.
01/29/2018	City of St. Petersburg Fire Rescue	Suggested continuing aggressive tree trimming program. Continue to support annual pre-storm meetings at city level, and DEF should provide representative to city's EOC. As well as develop a system to report downed lines and assure downed power lines are safe for city crews to work on. Difficult to establish reliable line to communicate with DEF.
01/30/2018	City of Boca Raton	Very little communication from FPL. FPL should make contact with City 48 hours before storm, implement distribution and street light GPS program, have FPL liaison at City or trained staff, and interactive map that provides updates.
02/01/2018	City of South Daytona	Suggested that tree trimming is too infrequent. FPL has tried to inform public of tree trimming, but no way for city/customers to submit tree trimming requests. More information to public about planting vegetation near power lines. For undergrounding, suggested removing requirement to bury additional conduit for future growth. Yearly review of critical infrastructure should be required, and not enough accurate/fast information available during Irma. More representatives to communicate information.
02/06/2018	City of Naples Fire-Rescue Department	FPL is doing well with tree trimming, but more information should be provided to the public about property rights. Good communication with FPL, but improvement on the removal of problem trees should be made. New construction policy requires electrical line to be underground, and there should be communication with FPL on connection. Critical infrastructure was not previously identified to FPL, but this should be done in the future. Great communication at the EOC level.
02/07/2018	City of Dunedin	Utility should remove trees/palms listed on Florida Exotic Pest Plant Council list, and use proper trimming techniques. Utility should provide notice of when and where trimming will occur, and issue information on proper plants below power lines. Ordinance requires new construction to be underground, but it would be helpful to establish metrics for where conversion to underground should occur. There were challenges with extent of the outages, response times, and communication during restoration with DEF. Suggested that representatives are provided to local EOCs.
02/09/2018	Town of Belleair	Would like to see area risk assessments from DEF and consistent tree trimming. More proactive communication from DEF of when they will be in an area, what they are planning, and what work was completed. Suggested having an area administrator or a single point-of-contact. DEF should provide a more active role in undergrounding, and a set amount of area that is set up for undergrounding. More proactive communication on critical facilities and better information on restoration (DEF did not meet set restoration deadline).

Date	Stakeholder	Summary of Comments
02/12/2018	St. Johns County	Suggested enacting a program for local and state agencies to notify utilities of problem trees and vegetation areas. Currently have policy/practice in place for new construction, which is to require undergrounding. FPL is implementing county wide hardening projects, which is a much cheaper alternative than undergrounding. Communication between county and utility is critical for new projects to discuss subjects such as cost sharing. Currently good communication and coordination with both FPL and JEA at EOC.
02/15/2018	City of Wilton Manors	There should be an aggressive, proactive schedule for tree trimming and notification of when/where trimming is occurring. FPL should devise a plan to transition overhead to underground, and complete a cost benefits analysis. City should have a part in the process of updating and maintaining a list of critical facilities, and communication could be improved. Also, there was no way for the city to report outages to FPL, so there should be more technology resources for tracking restoration efforts.
02/19/2018	City of Monticello	Suggested no change to vegetation management as the city does not believe it was a contributing factor to outages. However, the staging of repair equipment prior to storm by DEF could be improved. Action by legislature and/or PSC for promoting undergrounding (ex. possible monetary incentives from the state). Suggested continued improvements with local DEF representative, and more accurate post storm information.
02/19/2018	Citrus County Public Works	Suggested providing notifications to utility if tree trimming or removal is needed, and facilitating undergrounding with County ordinances and state statues. More proactive interaction at EOC prior to, during, and after storm event.
02/20/2018	City of Rockledge	Suggested implementing a survey to list potential trimming or tree removal, and joint meetings on potential problem areas. For undergrounding, explore shared costs by grant funding. Communication of real time events was lacking; therefore, utility representative(s) should have contact with field representatives and management for plan of action. It would be beneficial to have a representative in each Brevard County EOC.
02/21/2018	City of Sarasota	Currently have close coordination with FPL on vegetation management, and should continue to have utility review and comment on ordinances and code changes. Suggested providing incentives for undergrounding. Potential problems may arise due to limited spots on priority list; therefore, criteria should be established to prioritize critical facilities. Suggested having designated FPL crew for the city to remove their power lines, so the city crews can make repairs to infrastructure.
02/22/2018	Marion County Utilities	Suggested that each electric utility should have a website with a critical infrastructure list, dedicated outage phone number for critical facilities (rather than consumer outage phone number), and better communication with all utilities to address issues.

Appendix B.
Peak Number of Account Outages

	Hermine		Matthew		Irma		Nate	
	Peak Accounts Out	% of Accounts Out	Peak Accounts Out	% Accounts Out	Peak Accounts Out	% Accounts Out	Peak Accounts Out	% Accounts Out
Alachua	30,065	24.9%	5,796	4.8%	68,557	52.7%	2	0.0%
Baker	3,810	34.4%	4,527	40.8%	10,731	94.4%	0	0.0%
Bay	116	0.1%	18	0.0%	3,533	3.1%	388	0.3%
Bradford	2,285	23.3%	4,757	48.5%	12,010	94.9%	0	0.0%
Brevard	2,921	1.0%	196,729	64.6%	268,343	86.4%	0	0.0%
Broward	420	0.0%	12,340	1.3%	709,360	76.0%	0	0.0%
Calhoun	0	0.0%	0	0.0%	1,018	25.9%	0	0.0%
Charlotte	200	0.2%	220	0.2%	73,230	63.7%	0	0.0%
Citrus	15,375	16.0%	1,317	1.4%	69,269	79.0%	0	0.0%
Clay	6,000	4.2%	33,965	23.5%	74,424	78.5%	0	0.0%
Collier	110	0.0%	400	0.2%	236,141	96.0%	0	0.0%
Columbia	9,605	29.7%	2,953	9.1%	30,734	92.1%	0	0.0%
Desoto	10	0.1%	10	0.1%	15,627	88.9%	0	0.0%
Dixie	4,853	48.8%	290	2.9%	7,540	75.3%	0	0.0%
Duval	8,500	2.1%	253,725	61.5%	257,261	57.2%	0	0.0%
Escambia	27	0.0%	0	0.0%	1,421	0.9%	5,384	3.4%
Flagler	370	0.7%	57,016	100.0%	52,746	90.9%	0	0.0%
Franklin	2,264	22.5%	172	1.7%	5,869	57.5%	0	0.0%
Gadsden	9,747	44.0%	0	0.0%	14,998	67.2%	0	0.0%
Gilchrist	5,370	61.2%	590	6.7%	7,029	79.0%	0	0.0%
Glades	0	0.0%	10	0.1%	6,272	86.5%	0	0.0%
Gulf	540	5.0%	83	0.8%	4,198	38.5%	0	0.0%
Hamilton	5,864	87.9%	255	3.8%	5,249	78.2%	0	0.0%
Hardee	0	0.0%	26	0.2%	11,976	97.4%	0	0.0%
Hendry	10	0.1%	10	0.1%	18,750	100.0%	0	0.0%
Hernando	5,514	6.1%	117	0.1%	58,644	61.8%	0	0.0%
Highlands	128	0.2%	472	0.8%	62,010	99.3%	0	0.0%
Hillsborough	17,956	2.8%	262	0.0%	265,542	42.0%	0	0.0%
Holmes	0	0.0%	0	0.0%	1,254	12.0%	77	0.7%
Indian River	60	0.1%	59,244	67.2%	73,311	80.1%	0	0.0%
Jackson	0	0.0%	0	0.0%	11,092	42.4%	0	0.0%
Jefferson	5,762	71.5%	107	1.3%	6,092	75.1%	0	0.0%
Lafayette	2,965	71.5%	199	4.8%	3,676	90.9%	0	0.0%
Lake	1,699	1.0%	16,849	10.0%	123,954	69.7%	0	0.0%
Lee	50	0.0%	400	0.1%	361,999	82.5%	0	0.0%
Leon	94,088	65.6%	2	0.0%	59,821	42.2%	0	0.0%
Levy	10,007	41.2%	254	1.0%	17,932	72.6%	0	0.0%
Liberty	438	13.5%	0	0.0%	3,303	81.2%	0	0.0%
Madison	7,278	69.0%	69	0.7%	7,171	67.0%	0	0.0%
Manatee	2,290	1.1%	113	0.1%	132,455	63.1%	0	0.0%
Marion	11,525	6.3%	27,389	14.9%	143,485	75.9%	0	0.0%
Martin	40	0.0%	44,600	48.1%	76,120	81.5%	0	0.0%
Miami-Dade	400	0.0%	16,850	1.5%	919,340	80.9%	0	0.0%
Monroe	0	0.0%	0	0.0%	52,855	84.4%	0	0.0%
Nassau	3,052	11.1%	19,092	43.5%	43,740	97.6%	0	0.0%
Okaloosa	2	0.0%	45	0.0%	323	0.3%	6,382	5.9%
Okeechobee	100	0.5%	1,680	7.7%	21,990	96.5%	0	0.0%
Orange	685	0.1%	69,231	12.3%	362,088	62.4%	0	0.0%
Osceola	306	0.2%	7,321	5.7%	55,352	36.2%	0	0.0%
Palm Beach	30	0.0%	58,870	7.7%	566,250	73.8%	0	0.0%
Pasco	10,213	3.9%	472	0.2%	190,567	70.6%	0	0.0%
Pinellas	24,179	4.4%	1,111	0.2%	434,037	78.6%	0	0.0%
Polk	535	0.2%	1,306	0.4%	216,839	65.6%	0	0.0%
Putnam	1,011	2.5%	27,393	66.8%	36,634	88.8%	0	0.0%
Santa Rosa	0	0.0%	0	0.0%	259	0.3%	1,712	2.2%
Sarasota	3,570	1.4%	280	0.1%	174,672	66.2%	0	0.0%
Seminole	184	0.1%	68,597	33.1%	158,065	75.1%	0	0.0%
St. Johns	1,140	1.3%	78,610	89.6%	107,130	81.9%	0	0.0%
St. Lucie	150	0.1%	57,477	38.3%	113,280	73.6%	0	0.0%
Sumter	2,643	3.9%	1,307	1.9%	28,598	38.9%	0	0.0%
Suwannee	11,493	52.9%	1,300	6.0%	20,991	92.2%	0	0.0%
Taylor	8,742	67.9%	138	1.1%	9,665	74.8%	0	0.0%
Union	990	19.0%	920	17.7%	4,695	86.3%	0	0.0%
Volusia	635	0.2%	257,718	92.0%	222,328	77.6%	0	0.0%
Wakulla	14,009	93.0%	153	1.0%	11,513	74.5%	1	0.0%
Walton	3	0.0%	0	0.0%	139	0.2%	613	1.0%
Washington	0	0.0%	0	0.0%	605	4.6%	29	0.2%
Totals	323,505	3.2%	1.13M	11.0%	6.52M	62.1%	13,539	0.1%

Source: State EOC power outage reports

Appendix C.
Utility Reported Weather Data - Hurricane Hermine

County	Maximum Sustained Wind (MPH)	Maximum Gusts (MPH)	Maximum Rainfall (inches)	Maximum Storm Surge (Feet)
Alachua	34	52	4.85	-
Baker	32	50	-	-
Bay	35	69	2	-
Bradford	32	50	-	-
Brevard	26	39	-	-
Broward	19	29	-	-
Calhoun	30	64	-	-
Charlotte	30	45	4.47	-
Clay	39	60	2.02	0.73
Collier	25	38	-	-
Columbia	34	52	-	-
Desoto	24	36	-	-
Dixie	-	48	-	7.3
Duval	41	61	2.53	1.4
Flagler	34	51	-	-
Franklin	-	58	4.41	-
Gadsden	60	64	4	-
Glades	20	30	-	-
Gulf	-	79	-	-
Hamilton	-	-	3.15	-
Hardee	24	36	-	-
Hendry	21	31	-	-
Highlands	21	31	3.28	-
Hillsborough	36.8	57.5	7	4.2
Indian River	21	32	-	-
Jackson	30	64	-	-
Jefferson	75	90	7	6.1
Lafayette	-	-	6.1	-
Lee	29	43	1.49	-
Leon	60	70	6	-
Levy	-	-	-	6.2
Liberty	30	64	-	-
Madison	65	80	7	-
Manatee	38	57	10	-
Marion	33	45	6.18	-
Martin	21	32	-	-
Miami-Dade	21	32	-	-
Monroe	29	44	-	-
Nassau	37	64	-	-
Okeechobee	20	29	-	-
Orange	25	37	3.5	-
Osceola	22	34	3.25	-
Palm Beach	21	32	-	-
Polk	29.9	41.4	-	-
Putnam	36	55	-	-
Sarasota	35	53	10.71	-
Seminole	24	37	-	-
St. Johns	39	60	0.84	0.61
St. Lucie	21	32	-	-
Sumter	-	-	3.27	-
Suwannee	41	62	4.52	-
Taylor	75	90	7	8.6
Union	32	48	-	-
Volusia	32	49	-	-
Wakulla	65	75	5.81	6.3

Source: Utilities' responses to staff's first data request, No. 27.

Appendix D.
Utility Reported Weather Data - Hurricane Matthew

County	Maximum Sustained Wind (MPH)	Maximum Gusts (MPH)	Maximum Rainfall (inches)	Maximum Storm Surge (Feet)
Alachua	35	60	1.49	-
Baker	30	46	-	-
Bradford	40	65	6	-
Brevard	80	121	17.01	4.09
Broward	39	60	1.61	-
Calhoun	39	87	7	-
Charlotte	26	39	-	-
Clay	44	68	10.3	3.77
Collier	26	40	-	-
Columbia	26	40	-	-
Desoto	20	30	-	-
Duval	61	88	9.63	4.69
Flagler	68	102	6	6
Glades	30	45	-	-
Hardee	23	34	-	-
Hendry	30	42	-	-
Highlands	29	43	-	-
Indian River	64	97	13.85	-
Jackson	39	87	7	-
Lake	31	48	5.22	-
Lee	26	40	-	-
Leon	23	30	-	-
Liberty	39	87	7	-
Manatee	30	45	-	-
Marion	23	39	3	-
Martin	61	92	4.18	-
Miami-Dade	31	48	-	-
Monroe	30	46	-	-
Nassau	45	87	7	7
Okeechobee	34	50	-	-
Orange	48	73	6.17	-
Osceola	49	69	0.03	-
Palm Beach	49	75	-	-
Pinellas	24.2	40.3	-	-
Polk	36	44	-	-
Putnam	48	74	-	-
Sarasota	29	43	-	-
Seminole	47	72	8.99	-
St. Johns	73	109	9.97	8.39
St. Lucie	71	100	13.85	-
Suwannee	24	37	-	-
Union	29	45	-	-
Volusia	72	109	7.75	-

Source: Utilities' responses to staff's first data request, No. 27.

Appendix E.
Utility Reported Weather Data - Hurricane Irma

County	Maximum Sustained Wind (MPH)	Maximum Gusts (MPH)	Maximum Rainfall (inches)	Maximum Storm Surge (Feet)
Alachua	64	99	13.07	-
Baker	65	100	9.76	-
Bay	34	46	1.5	-
Bradford	62	96	15	-
Brevard	75	114	13.74	4.2
Broward	83	127	9.72	2.7
Calhoun	50	71	12	-
Charlotte	70	104	-	4
Citrus	-	64	10.65	-
Clay	73	112	11.32	5.97
Collier	115	144	14.98	6.5
Columbia	62	95	9.63	-
Desoto	77	100	-	-
Dixie	-	56	-	-
Duval	89	136	11.11	6.44
Escambia	30	42.6	0.25	-
Flagler	64	97	9.83	4.19
Franklin	-	50	-	-
Gadsden	50	55	2	-
Gilchrist	-	-	6.68	-
Glades	71	106	8.38	-
Gulf	-	45	1	-
Hamilton	-	-	-	-
Hardee	100	111	12	-
Hendry	80	102	10.31	-
Hernando	-	-	7.67	-
Highlands	70	103	10.95	-
Hillsborough	56	68	16.08	3.1
Holmes	23	37	2	-
Indian River	75	116	14.15	3
Jackson	50	71	12	-
Jefferson	-	60	3	-
Lake	43	69	11.59	-
Lee	72	110	9.02	6
Leon	43	55	2	-
Levy	-	55	8.07	-
Liberty	50	71	12	-
Madison	-	62	4	-
Manatee	80	122	-	-
Marion	-	51	13.24	-
Martin	79	119	10.53	-
Miami-Dade	85	127	8	6
Monroe	120	160	12.54	8
Nassau	89	135	12.7	7.8
Okaloosa	27.7	42.5	1	-
Okeechobee	72	107	-	-
Orange	71	110	12.36	-
Osceola	70	108	10.61	-
Palm Beach	85	127	10.35	2.7
Pasco	-	55	9.83	-
Pinellas	49.4	88	5.6	2.17
Polk	115	130	11.1	-
Putnam	59	91	-	3.6
Santa Rosa	28.9	40.3	0.75	-
Sarasota	72	108	8	-
Seminole	66	101	12.14	-
St. Johns	79	121	10.22	5.61
St. Lucie	84	127	21.66	-
Sumter	70	75	11.3	-
Suwannee	58	88	-	-
Taylor	-	48	4	1
Union	62	95	-	-
Volusia	78	116	12.55	-
Wakulla	35	56	2	0.7
Walton	25.3	33	1.5	-
Washington	10	27	2	-

Source: Utilities' responses to staff's first data request, No. 27.

Appendix F.
Utility Reported Weather Data - Hurricane Nate

	Maximum Sustained Wind (MPH)	Maximum Gusts (MPH)	Maximum Rainfall (inches)	Maximum Storm Surge (Feet)
County	Max	Max	Max	Max
Bay	38	50	2	-
Escambia	50	85	5	5
Franklin	29	37	0.18	4
Gulf	25	34	0.2	3
Holmes	-	-	2	-
Jackson	25.3	33.4	0.75	-
Leon	25	31	0.52	-
Okaloosa	45	65	10	-
Santa Rosa	52	85	8	5
Walton	40	60	4	-
Washington	8	17	2	-

Source: Utilities' responses to staff's first data request, No. 27.