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April 2, 2024

ELECTRONIC FILING

Mr. Adam J. Teitzman, Commission Clerk
Office of Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

Re: Docket 20240026-EI; Petition for Rate Increase by Tampa Electric Company

Dear Mr. Teitzman:

Attached for filing on behalf of Tampa Electric Company in the above-referenced docket is the Direct Testimony of Chip Whitworth and Exhibit No. CW-1.

Thank you for your assistance in connection with this matter.

(Document 7 of 32)

Sincerely,

J. Jeffry Wahlen

cc: All parties

JJW/ne
Attachment

BEFORE THE

FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 20240026-EI

IN RE: PETITION FOR RATE INCREASE

BY TAMPA ELECTRIC COMPANY

PREPARED DIRECT TESTIMONY AND EXHIBIT

OF

CHIP WHITWORTH

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

PREPARED DIRECT TESTIMONY

OF

CHIP WHITWORTH

Q. Please state your name, address, occupation, and employer.

A. My name is Chip Whitworth. My business address is 702 N. Franklin Street, Tampa, Florida 33602. I am employed by Tampa Electric Company ("Tampa Electric" or the "company"), and I am the Vice President of Electric Delivery.

Q. Please describe your duties and responsibilities in that position.

A. I have responsibility for all aspects of Electric Delivery which include Safety; Environmental Compliance; Customer Reliability; Transmission and Distribution Grid and Energy Control Center; Transmission, Substation, and Distribution Engineering and Construction; Storm Protection Plan ("SPP"); Asset Management; Meter Operations; Operational Technology and Strategy; Lighting Operations; Telecommunications; and Fleet Operations. I provide direct leadership to all the company's Electric

Delivery Directors and lead a team of approximately 1,050 team members.

My duties and responsibilities include the oversight of all functions within Tampa Electric's Electric Delivery Department including the planning, engineering, operation, maintenance, and restoration of the transmission, distribution, and substation systems; operation of the distribution and energy control centers; administration of tariffs and compliance; execution of the company's Transmission and Distribution ("T&D") strategic solutions including advanced metering infrastructure ("AMI"), outdoor and streetlight light-emitting diode ("LED") conversion project, and Advanced Distribution Management System ("ADMS"); line clearance activities; and fleet and equipment. In addition, I am responsible for the safe, timely, and efficient implementation of Tampa Electric's storm restoration plan.

Q. Have you previously testified before the Florida Public Service Commission ("Commission")?

A. Yes. I filed direct testimony in Docket No. 20230019-EI, Tampa Electric's Petition for recovery of costs associated

with named tropical systems during the 2018-2022 hurricane season and replenishment of storm reserve. I also provided testimony for two Transmission Line Siting Act ("TLSA") projects; Willow Oak,- Wheeler,- Davis and Lake Agnes to Gifford were the two projects.

Q. Please provide a brief outline of your educational background and business experience.

A. I graduated from The University of South Florida with a Bachelor of Science in Civil/Structural Engineering ("BSCE") and a Master of Business Administration ("MBA"). I have more than 27 years of experience in the energy industry, all of which has been at Tampa Electric. Prior to becoming Vice President of Electric Delivery at Tampa Electric in 2022, I held the position of Vice President of Safety beginning in 2021. Prior to taking that role, my work experience included approximately 24 years in Electric Delivery and Energy Supply where I worked as an engineer and held various engineering and operations leadership positions.

Q. What are the purposes of your direct testimony?

A. The purposes of my direct testimony are to (1) describe

the company's T&D system; (2) describe the changes to the T&D system since the company's last base rate case; (3) describe the company's future plans for its T&D system and our grid modernization strategy; (4) demonstrate that the company's T&D plant (*i.e.*, electric delivery) construction program and capital budget for 2025 is reasonable and prudent; and (5) show that the company's proposed level of operations and maintenance expense ("O&M") for Electric Delivery in the 2025 test year is reasonable and prudent. The T&D related capital and O&M spending discussed in my direct testimony does not include any capital or O&M associated with the SPP.

Q. Have you prepared an exhibit to support your direct testimony?

A. Yes. Exhibit No. CW-1, entitled "Exhibit of Chip Whitworth" was prepared under my direction and supervision. The contents of my exhibit were derived from the business records of the company and are true and correct to the best of my information and belief. The exhibit consists of eight documents, as follows:

Document No. 1 List of Minimum Filing Requirement Schedules Sponsored or Co-Sponsored by Chip Whitworth

Document No. 2	FPSC Adjusted Reliability Trends
Document No. 3	Service Area Customer Demand – Growth
Document No. 4	Electric Delivery Capital Summary 2022 - 2025
Document No. 5	DOE ICE Calculator Results
Document No. 6	Line Loss Reduction
Document No. 7	Grid Reliability and Resilience Project Schedule
Document No. 8	Service Territory Map

Q. Are you sponsoring any sections of Tampa Electric's Minimum Filing Requirement ("MFR") Schedules?

A. Yes. I am sponsoring or co-sponsoring the MFR Schedules listed in Document No. 1 of my exhibit. The data and information on these schedules were taken from the business records of the company and are true and correct to the best of my information and belief.

Q. Do the rate base and O&M amounts for the 2025 test year and otherwise discussed in your direct testimony include amounts related to the company's SPP?

A. No. The rate base and O&M amounts for the 2025 test year do not include SPP O&M.

TRANSMISSION AND DISTRIBUTION SYSTEM OVERVIEW

Q. Please describe the company's current T&D system.

A. Tampa Electric's service territory covers approximately 2,000 square miles in West Central Florida, including nearly all of Hillsborough County and parts of Polk, Pasco, and Pinellas Counties. The company has divided its service territory into seven "service areas" for operational and administrative purposes. Please refer to Document No. 8 of my exhibit entitled: "Service Territory Map".

Tampa Electric's transmission system consists of nearly 1,332 circuit miles of overhead facilities, including approximately 25,296 transmission poles and structures. The company's transmission system also includes approximately ten circuit miles of underground facilities.

The company's distribution system consists of approximately 6,137 distribution circuit miles of overhead facilities, and approximately 266,773 poles. The distribution system also includes approximately 6,475 circuit miles of underground facilities.

The company currently has 238 T&D substations.

Q. What role does safety play in Electric Delivery?

A. Safety is the top priority, a core value at Tampa Electric, and is integral to the work that we perform. Electric Delivery is committed to the belief that all injuries are preventable. In 2018, Electric Delivery implemented a Safety Management System ("SMS") designed to ensure compliance with Occupational Safety and Health Administration ("OSHA") regulations and to follow OSHA recommended practices. The SMS consists of 10 elements including: Safety Leadership; Risk Management; Programs, Procedures, and Practices; Communication, Training, and Awareness; Culture and Behavior; Contractor Safety; Asset Integrity; Measuring and Reporting; Incident Management and Investigation; and Auditing and Compliance.

Through 2021 and 2022 Tampa Electric Company worked over 6 million work hours without a lost-time injury. Through December 2023, Tampa Electric's lost-time injury rate is 16 percent better than the company's five-year average.

Additionally, Electric Delivery is focusing on preventative measures such as high energy identification, hazard recognition, and mitigation through new job risk briefing tools and training sessions. These tools teach

workers to identify high energy sources present and to not proceed with work until barriers are installed. Industry trends show that most Serious Injuries and Fatalities ("SIF") are the result of unmitigated high energy exposure contacting a worker.

Electric Delivery has a robust community-outreach safety program where we communicate in-person with first responders, educators, and community leaders about electrical facilities and how that relates to public safety.

Q. What is Asset Management and how has the company integrated Asset Management techniques into its planning and operations for Electric Delivery?

A. Asset Management is a disciplined way of thinking and managing that aligns engineering, operations, maintenance, other technical and financial decisions, and processes for the purpose of optimizing the value of our assets throughout their lifecycles.

Tampa Electric seeks to achieve its asset optimization goals by focusing on three Asset Management objectives, as described below.

The first objective is the integration of asset monitoring; health and risk assessment; work planning and scheduling; capital planning; outage planning; risk management; and other supporting asset management processes into continuous business processes.

The second objective is the broader engagement of team members and subject matter experts in these continuous improvement processes, the establishment of asset management responsibilities throughout the organization, and ensuring team members are empowered with industry best practices through awareness, training, and implementing these best practices.

Finally, we sustain the integrated processes and engagement of our teams through documentation and standardization of technical and business processes and the implementation of supporting operational and operations technology systems.

Applying Asset Management principles gives us a comprehensive understanding of the condition of our assets and the risks associated with them and allows us to better identify and prioritize the work that needs to be done.

This level of understanding enables us to improve our

planning and scheduling of work, lowers the costs and risks of operating our system, ensures full utilization of assets and often life extensions of assets, and improves efficiency and reliability – all of which promote a good customer experience.

PROGRESS SINCE TAMPA ELECTRIC'S LAST BASE RATE PROCEEDING

Q. How has the company's T&D system continued to evolve since the company's last base rate proceeding in 2021?

A. Since 2021, Tampa Electric's Electric Delivery department has continued to ensure that we can provide resilient, safe, and reliable power to our current and future customers.

One of the ways that the T&D system has evolved is through system expansion. We expanded our overhead transmission system by approximately 18 circuit miles and expanded our underground distribution system by approximately 760 circuit miles. Additionally, the company placed 15 new substations in service and added approximately 670 single and three phase reclosing devices on the distribution system.

Another way the T&D system changed is through a shift to

primarily providing distribution service through underground equipment, which is more reliable and resilient in extreme weather conditions. Since 2021, we have reduced our overhead distribution system by approximately 109 miles even as the overall mileage of the distribution system has grown. In 2023, Electric Delivery transitioned to a primarily underground distribution system, with more installed underground circuit miles than overhead. The ratio of underground to overhead circuit miles will continue to increase as the SPP lateral undergrounding program matures and as new single family housing developments continue to propagate.

These capital investments since the last base rate case were required to support the substantial increase in customer demand and support the economic development in Tampa Electric's service territory. For example, since 2016, customer system demand in terms of Mega Volt Ampere ("MVA") has cumulatively increased by 9.7 percent.

This growth in demand is directly correlated to our customer growth rate. Since 2016, Tampa Electric has had an overall average annual customer growth rate of 2.1 percent. The cumulative overall growth has been 17.7 percent. However, this does not reflect the rapid growth

and expansion within areas of Tampa Electric's service territory. For example, the South Hillsborough, Winter Haven, and Dade City service areas have seen cumulative customer increases of 53.3 percent, 22.8 percent, and 17.8 percent respectively. Please see Document No. 3 of my exhibit entitled: "Service Area Customer Demand".

The customer demand growth analysis shows that a significant influx of new customers are moving to formerly rural areas within our service territory requiring electric system expansion, *i.e.*, new substations, transmission lines, upgraded distribution services, and relocations of existing facilities to accommodate roadway improvements.

Q. Please describe the indicators the company uses to monitor reliability and how they relate to what customers experience.

A. The reliability of our service has the most impact on our customer experience. We track a variety of industry recognized reliability metrics that reflect how our Electric Delivery system performs from a customer's perspective.

The company focuses primarily on System Average

Interruption Duration Index ("SAIDI") and Momentary Average Interruption Event Frequency Index ("MAIFIe").

SAIDI indicates the total minutes of interruption time the average customer experiences in a year. It is the most relevant and best overall reliability indicator because it encompasses two other standard performance metrics for overall reliability – the System Average Interruption Frequency Index ("SAIFI") and the Customer Average Interruption Duration Index ("CAIDI").

MAIFIe reflects the overall impact of momentary interruptions on a circuit and is defined as the average number of times a customer experiences a momentary interruption event each year.

Tampa Electric sets reliability goals for both SAIDI and MAIFIe annually and reports these results to the Commission in compliance with Rule 25-6.0455, Florida Administrative Code, which requires investor-owned utilities ("IOU") to file distribution reliability reports.

The company also tracks and sets goals around a measurement known as Customers Experiencing Multiple Interruptions ("CEMI-5"). CEMI-5 indicates the percentage of customers

who experience six or more sustained outages annually. CEMI-5 yearly results are consistently improving each year, as shown later in my testimony.

Q. Has the company's delivery system reliability improved since 2021?

A. Yes, the company's T&D reliability has steadily improved since 2021. Our SAIDI improved from a high of 84.5 in 2021 to a low of 57.27 in 2023, and MAIFIe improved from a high of 6.5 in 2021 to a low of 6.44 in 2023. CEMI-5 improved from 9,744 in 2021 to 1,022 in 2023. These results are reflected in Document No. 2 of my exhibit entitled: "FPSC Adjusted Reliability Trends".

Q. How did the company achieve these improvements in Electric delivery system reliability?

A. Tampa Electric attributes these improvements to work performed in four major areas: the Asset Management Program, our Annual Distribution Reliability Plan, operational changes, and the SPP.

Q. Please describe the company's achievements through the Asset Management Program since 2021.

A. Tampa Electric completed several activities under the Asset Management Program that improved system reliability. For example, Tampa Electric inspected 2,691 of the company's 3,099 distribution switchgears. This inspection showed that some of these switchgears are at the end of life, while for others replacement can be deferred. Based on these findings, the company moved from a time-based replacement prioritization to a risk-based prioritization. This change will prioritize replacement of switchgear that are at their end of useful life, instead of simply prioritizing the oldest equipment, and will maximize the use of switchgear that has remaining life. Through this effort, Tampa Electric has replaced 444 of these switchgears since 2019.

As another example, the company used Asset Management analysis to prioritize proactive replacement and maintenance of medium power transformers, 69 kV oil circuit breakers, and 13 kV distribution circuit breakers. This proactive replacement and maintenance prioritization prevents potential customer outages, maximizes the useful life of installed assets, and mitigates risks associated with equipment failures. Our Asset Management processes also consider the impact of equipment failures to the community in the prioritization of maintenance. In 2022

and 2023, Tampa Electric proactively replaced 28 of our 13 kV distribution circuit breakers, including all breakers that feed one of the most critical facilities to our customers, Tampa International Airport.

Q. Please describe the annual distribution reliability plan and how it is prepared.

A. We prepare our distribution reliability plan by evaluating the reliability of each distribution circuit on an annual basis. The company uses the SAIDI, MAIFIe, SAIFI, and CEMI-5 results to determine which circuits to target for reliability improvement. We also evaluate circuit outages over a five-year period to determine the most frequent outage locations as well as the most frequent root causes. This allows us to effectively deploy capital to the circuits that have below average performance.

The results of these evaluations are used to identify the type of equipment needed to improve reliability, such as automatic feeder and lateral reclosers, and fault detectors, and to install that equipment in places that will optimize reliability improvements. The company has achieved significant reliability improvements through this targeted approach of research and field device

installation.

Q. What operational changes has the company made to improve reliability?

A. The company made operational changes within the control room to dispatch resources more effectively for outages. For example, Tampa Electric has line crews available during the night that can instantly mobilize to an outage. This avoids mobilizing line workers from their homes, which adds considerable time to restoration.

From an engineering perspective, Tampa Electric has utilized a relay and protection scheme known as "sequence coordination" between circuit breakers and lateral reclosers to better sectionalize momentary interruption impacts, leading to significant MAIFIe improvements.

Q. Please briefly describe the company's progress under the SPP program over the last several years.

A. Section 366.96(3), Florida Statutes, requires each public utility to file a T&D SPP that covers the immediate 10-year planning period, and to explain the systematic approach the utility will follow to achieve the objectives

of reducing restoration costs and outage times associated with extreme weather events and enhancing reliability. Tampa Electric submitted its first SPP to the Commission in April 2020 and it was approved later that year in Docket No. 20200067-EI. The Commission approved the company's second SPP in December of 2022, through Order PSC-2020-0293-AS-EI, which was issued on August 28, 2020.

Between April 2020 and the end of 2023, Tampa Electric completed the following SPP activities:

- 27 Feeder Hardening projects.
- 239 Lateral Undergrounding projects.
- 355 circuits (2,180 miles) trimmed under the Supplemental Vegetation Management program.
- 270 circuits (1,440 miles inspected, 3,680 spans trimmed and 1,917 hazard trees removed) under the Mid-Cycle Vegetation Management program.

Q. Can you please provide an update on how the SPP Program has impacted the reliability of the system during storms?

A. Our SPP activities have resulted in significant improvement in system performance during and after extreme weather events, which improves the customer experience. This improvement is best illustrated by comparing system

performance during Hurricane Irma, which predated the first SPP, and Hurricane Ian in September of 2022. During Hurricane Ian, wind speeds remained above 40 miles per hour for 8.5 hours, as compared to only 1.5 hours during Hurricane Irma. Despite these more severe weather conditions, the company saw significantly improved performance in several areas, including:

- A 57 percent reduction in the number of outages on the 18 circuits that were hardened under the Feeder Hardening Program, and zero pole or feeder wire failures on those circuits. There were four pole failures on non-hardened feeders within 1,000 feet of hardened feeders, which indicates that there would have been more pole failures but for the company's hardening efforts.
- None of the laterals that were undergrounded before Hurricane Ian experienced an outage during Ian. The company examined areas within 1,000 feet of each underground conversion project and identified four pole failures, indicating that weather conditions in those areas could have caused damage to overhead lateral equipment if it had been present.
- Circuits that received Supplemental Vegetation Management had a 20 percent reduction in the number of outages.

- Circuits that received Mid-Cycle Vegetation Management had a five percent reduction in the number of outages.
- Circuits that received both Supplemental and Mid-Cycle Vegetation Management had a 43 percent reduction in outages.

Q. Have the improvements made to the company's system performance and reliability since 2021 improved Tampa Electric's customer experience?

A. Yes. In 2023, Tampa Electric scored better than the industry average for every residential customer satisfaction criterion (as measured by J.D. Power), including Power Quality and Reliability, which is ranked at the top of the second quartile nationally (40th out of 149 brands). In the South Large segment, Tampa Electric is ranked third out of 12 brands, which is the highest ranked Florida brand in our segment for Power Quality and Reliability. On the business side, Tampa Electric also scored better than the industry average and is ranked in the second quartile nationally (37th out of 77 brands) for Power Quality and Reliability. Between 2022 and 2023, when most other satisfaction criterion scores decreased, Tampa Electric's Power Quality and Reliability score increased by three points.

FUTURE PLANS FOR TRANSMISSION AND DISTRIBUTION SYSTEM

Q. Will the company need to continue investing in its T&D system?

A. Yes. Tampa Electric witnesses Archie Collins, Karen Sparkman, Carlos Aldazabal, Chris Heck, and David Lukcic describe how the expectations of our customers and the electric industry are changing. To meet the challenge, Tampa Electric must make long term investments in our T&D system to ensure that it will be safe, resilient, secure, reliable, compatible with distributed generation and energy storage, and will provide the data customers want for managing their electric service. Accordingly, our long-term plans include significant investments for grid resilience and reliability. These investments support digitalizing the grid which will increase our visibility into grid operations and make data available for more efficient and effective grid operations; improve reliability; reduce restoration times; increase resiliency; improve grid planning; allow new customer programs and new rate designs; and provide data directly to customers so they can better manage their electric service. Tampa Electric will implement a group of projects, known collectively as the Grid Reliability and Resilience Projects, including a Grid Communication Network Project,

to meet these needs.

Q. What are the Grid Reliability and Resilience Projects?

A. The Grid Reliability and Resilience Projects are components of a comprehensive program that builds on Tampa Electric's existing grid modernization strategy. The program includes more than 40 interdependent projects across the six primary domains of the electric system including: (1) telecommunications; (2) control center operational technology; (3) back-office information technology; (4) distributed energy resources ("DER") infrastructure; (5) field devices; and (6) substations. When completed, these changes to the grid will create a "system of systems" with many benefits for Tampa Electric's customers. Tampa Electric's goal is to complete all component projects by the end of 2030.

Mr. Lukcic provides greater detail regarding the Grid Reliability and Resilience Projects planned for the next several years in his direct testimony.

Q. Why is Tampa Electric aggregating the Grid Reliability and Resilience Projects?

A. Aggregating these projects results in more efficient capital spending and unlocks enhanced functionality as system elements are deployed. Pursuing these activities as individual projects would hinder the integration of the program and increase the risk of project delays, rework, and scope changes.

Q. What do you mean when you describe these projects as interdependent?

A. Through the Grid Reliability and Resilience Projects, Tampa Electric will deploy infrastructure in a coordinated program that will enable the company to exchange electricity and information across the six grid domains, and to exchange information from the grid edge to the company's control and information technology ("IT") and operations technology systems.

For example, sensors on lines and substations in the field device domain can continuously monitor circuits for faults or anomalies. Monitoring data from these field devices is relayed through the telecommunications domain to the control system operational technology domain. These control systems can then take appropriate corrective actions by sending signals back to the field devices.

Q. Why are the Grid Reliability and Resilience Projects necessary?

A. These projects are necessary to replace obsolete systems and equipment that have reached end of life as well as meeting customer demands for greater reliability, greater access to data, and to adapt to changes in how our customers consume energy.

Reliable and resilient electric service underpins everything Tampa Electric does. Our customers are increasingly demanding an "always-on" experience. As shown elsewhere in my testimony, our reliability metrics have significantly improved in recent years. The Grid Reliability and Resilience Projects are the next step in the journey to world-class reliability to help meet customer expectations.

The Grid Reliability and Resilience Projects will result in a better integration of back-office systems with field operations, which will lead to better in-service timelines and a simpler, more streamlined interaction with Tampa Electric for customers. This will allow customers access to more data to help them make informed decisions about energy usage and provide better visibility into the status

of work we are performing for them.

These projects are also necessary to respond to changes in how energy is consumed and produced, including the rapid growth of electric vehicle ("EV") adoption and the proliferation of customer owned distributed energy resources ("DER"), and to replace obsolete and unsupported operating systems. Tampa Electric forecasts that by 2030, there will be over 200,000 EV charging on the company's grid, consuming approximately 944 gigawatt-hours ("GWh") of energy and adding up to 282 megawatts ("MW") of peak demand. Some of these vehicles may also have vehicle-to-grid capability, meaning they can inject power back into the grid. The company also forecasts that by 2030, the number of customer-owned DER on Tampa Electric's system will triple from the current count of 25,000 to approximately 75,000. This level of DER is equivalent to a nameplate generating capacity of 770 MW resulting in 1,212 GWh of energy going back into homes/businesses with excess energy going back into the company's distribution grid.

Q. What effect will the increasing adoption of EV and customer owned DER have on Tampa Electric's distribution system?

A. Tampa Electric's distribution system is designed for a

centralized generation model under which power is generated at large, centralized power plants and transmitted and distributed over long distances to end users. With the proliferation of EV and DER, the grid will now experience two-way power flows. Through our AMI, Tampa Electric has begun to detect areas of elevated reverse loading due to concentrated DER installations. Unmanaged and undetected two-way power flows can back feed protective equipment, cause service disruptions, distort power quality, and create voltage instability causing negative customer impacts and reducing reliability.

Q. How will customers benefit from the Grid Reliability and Resilience Projects?

A. The Grid Reliability and Resilience Projects will result in quantifiable benefits in terms of reliability and avoided capital and O&M expense.

In terms of reliability, Tampa Electric forecasts that the combination of these projects and the company's ongoing SPP activities will reduce SAIDI to approximately 30 minutes per year, reduce MAIFIe to near zero, avoid 30 million customer minutes of interruption, and reduce the CEMI-4 and CEMI-5 metrics to near 0 by 2031.

Improving reliability has significant benefits for customers. The Department of Energy ("DOE") has developed an Interruption Cost Estimator – or ICE calculator – to measure the cost of electric service interruptions to different customer segments. The ICE calculator translates reliability metric improvement into avoided costs for customers based on the economic costs to customers resulting from service interruptions. The ICE calculator model is state-specific and based on the residential and non-residential customer mix. Using the ICE calculator, Tampa Electric estimates that by 2043, the total benefit of the reliability improvements from these projects is a Net Present Value ("NPV") of $2.88 billion. Please see Document 5 of my exhibit entitled: "DOE ICE Calculator Results". Driving down the frequency of outages and enabling more targeted field responses will also reduce the need to deploy utility vehicles to assess reported issues, resulting in cost savings and reduced vehicle emissions.

The Grid Reliability and Resilience Projects are also expected to avoid capital and O&M expenses. As DER proliferate and Tampa Electric develops the capability to manage decentralized circuits through a mix of field devices, substation devices, and management systems, the company forecasts that line losses will substantially

decrease. An analysis at one company substation with a high percentage of DER experienced a reduction in line losses of five percent during system peak and as high as 30 percent during off-peak conditions. When scaled across the company's entire system, these avoided line losses result in reduced energy needs. The company calculated the estimated load reduction from the Grid Reliability and Resilience Projects and ran that figure through the company's production cost models. This analysis showed savings in the forms of avoided fuel costs, avoided variable O&M expense, and avoided startup costs. In total, this equals $134.1 million in avoided costs based on the company's current weighted average cost of capital. Please see Document No. 6 of my exhibit entitled: "Line Loss Reduction".

Customers will also benefit from operational savings through automated line restoration and quicker troubleshooting due to automated, self-healing grid technologies installed through the Grid Reliability and Resilience Projects.

Q. When does the company plan to begin the Grid Reliability and Resilience Projects and when does it expect those projects will go into service?

A. The company plans to begin the Grid Reliability and Resiliency Projects in 2024 and conclude in 2023. I provide a schedule in Document No. 7 of my exhibit entitled: "Grid Reliability and Resilience Project Schedule", which shows the company's plans for in service dates and completing the Grid Reliability and Resilience Projects.

Q. What is the Grid Communication Network Project?

A. The Grid Communication Network Project is a component of the Grid Reliability and Resilience Projects. This project is the installation of a private Long Term Evolution cellular network that will allow the company to communicate with its existing field devices and the future field devices planned under the Grid Reliability and Resilience Projects. This project is instrumental in enabling near real-time, two-way communication and control of field devices where we will eliminate the need for field device communication through our radio system that is slow and unsecured. The ability to gather data from field devices and issue remote controls with low latency has a large impact in making the system safer and increasing customer reliability. This project is explained in greater detail in the testimony of Mr. Lukcic.

ELECTRIC DELIVERY AND OUR REQUEST FOR RATE RELIEF

Q. How does Tampa Electric determine the construction program and capital budget for additional T&D facilities?

A. The Electric Delivery department examines and balances many items including load growth, resilience, reliability, technology improvements, investments across all of Tampa Electric, customer demands and desires, and impacts to customer bills when determining the need for capital investments.

Tampa Electric determines its construction program and capital budget for major T&D facilities through an annual system and capital planning process. This process makes management aware of future capital needs to complete projects necessary to serve customer load, maintain reliability, and ensure resiliency in storms. The system and capital planning process prioritizes capital spending on the right projects to achieve the maximum benefit for customers in addition to balancing out financial requirements for smaller T&D additions, maintenance, restoration, and other T&D needs.

Q. How does the company plan and manage its major T&D capital improvement projects?

A. The company plans to meet the future requirements of all customers served through its T&D systems using established industry T&D planning requirements, standards, and criteria, and by using standard industry models and tools. These models and criteria ensure that Tampa Electric identifies the most cost-effective projects. Transmission projects are identified and planned through regional models and industry standards, and distribution projects are planned using local models and industry standards.

Tampa Electric's Project Management team is responsible for execution of these projects through engineering and operations and ensuring that project schedules and budgets are maintained through construction until the project is completed.

Q. How much capital did Tampa Electric invest in Electric Delivery during the three-year term of the 2021 Stipulation and Settlement Agreement from 2022 through 2024?

A. For the period 2022 through 2024, the company invested approximately $1.590 billion in capital projects for the Electric Delivery area, of which $994.2 million will be recovered through base rates. The remainder consists of

investments that are recovered through the SPP Cost Recovery Clause, AFUDC, and below the line non-utility projects.

Q. How much capital does Tampa Electric expect to invest in Electric Delivery in 2025?

A. In 2025, the company expects to invest approximately $716.0 million in capital projects for the Electric Delivery area, of which $380.8 million will be recovered through base rates. The remainder consists of investments that are recovered through the SPP Cost Recovery Clause, AFUDC, and below the line non-utility projects.

Q. What portion of the total projected capital for the years 2022 through 2025 is comprised of projects described in the direct testimony of Mr. Lukcic?

A. Our total rate base capital for Electric Delivery for the years 2022 through 2025 is projected to be $1.375 billion. Of the $1.375 billion, $357.7 million of the investment is comprised of Operations Technology and Strategy projects described in the direct testimony of Mr. Lukcic.

Q. Please explain which major projects make up the rate base

capital total investment in Electric Delivery, why they are needed, and how they will benefit customers.

A. Major projects for 2022 through 2025, and the associated customer benefits are described below.

- The company expects to invest $471.0 million from 2022 through 2024 and $135.9 million in 2025 for blanket capital.
    - Preventive maintenance activities on the distribution system including wood pole changeouts, underground cable replacements, transformer replacements, switchgear replacements, and capacitor bank maintenance. Replacing these units proactively ensures that the work is done more cost-effectively (scheduled weekday) compared to reactive maintenance that may be done on nights and weekends. It can also reduce customer outages.
    - Corrective maintenance activities on the distribution system, such as replacing failed overhead and underground equipment and restoration activities following typical storm events.
    - New lighting installations to satisfy customer requests.
    - Substation preventive maintenance activities,

including circuit breaker, relay, and switch upgrades, and spare transformer purchases. These investments were identified as part of our Asset Management Program and will significantly reduce the chances of large and sustained outages, improving reliability and service to our customers.

- The company expects to invest $224.9 million from 2022 through 2024 and $71.3 million in 2025 for specific capital, as follows.
  - Distribution system expansion to reliably serve new customers.
  - New transmission lines and upgrading existing transmission facilities to meet capacity and regulatory requirements;
  - Relocating existing T&D facilities located in public rights-of-way in conjunction with road improvement projects;
  - New substation construction and expansion of existing substation facilities to meet the required capacity and to provide reliable electrical service to residential and commercial customers; and
  - New fiber installation and the Grid Communication Network Project.

- The company expects to invest $69.4 million from 2022 through 2024 and $44.8 million in 2025 to support facilities construction, investments in land, and other non-clause SPP related activities. Please refer to Document No.4 of my exhibit entitled: "Electric Delivery Capital Expense Summary 2022 – 2025".

Q. What major factors caused the projected increase in 2025 capital investment over 2022?

A. There are several major factors that contributed to the increase in total capital spending in Electric Delivery. They include the following items:

1. Contracted labor cost increases.
2. Internal labor cost increases.
3. Material cost increases.
4. Customer growth.
5. Greater demand for utility worker labor.

For example, material cost increases for key components have increased substantially. From 2021 to present, the company experienced price increases for the equipment it buys to provide electric service as follows.

- Transformer prices increased 49 percent.
- The price of poles increased 34 percent.

- Outdoor lighting equipment prices increased 25 percent.
- Switchgear prices increased 21 percent.
- Substation equipment prices increased 36 percent.

Q. What steps is the company taking to make sure these projects are completed at the lowest reasonable cost?

A. Tampa Electric utilizes industry standards, specifications, and codes as the basis for system planning, engineering, and design to ensure our project designs are as efficient as possible while maintaining reliability and safety. Additionally, the company continuously tests the market for pricing regarding material and labor. By following the company's Request for Proposal ("RFP") policies, Electric Delivery ensures material and labor rates are fair and competitive and the selected service providers are qualified.

Q. What are Tampa Electric's projected capital investments in 2026 and 2027 for Electric Delivery and what projects are included in this total for the subsequent year adjustments ("SYA")?

A. The Grid Reliability and Resilience Projects, including the Grid Communication Network Project, are included in

the company's request for SYA. These are described in the direct testimony of Mr. Lukcic.

Q. Is there any property being held for future T&D use?

A. Yes. As reflected in MFR Schedule B-15, the company is holding property for future T&D use. One example is the River to South Hillsborough corridor, which was certified under the TLSA and could be used for future 230 kV facilities necessary to reliably serve existing and future load and to meet existing North American Electric Reliability Company ("NERC") Operations and Planning Reliability Standards. Tampa Electric also has several locations, sized from one to two acres, in areas of expected growth for future load-serving substations throughout Hillsborough County. Finally, the company owns property adjacent to the existing Big Bend Power Station at the intersection of Big Bend Road and U.S. 41 that could be used for a future substation, site expansion, or a renewable generation project.

2025 TRANSMISSION AND DISTRIBUTION O&M EXPENSES

Q. How have the Electric Delivery department's T&D operating expenditures changed since its last rate case?

A. The department's transmission expenditures decreased by $1.8 million, or 10 percent, from $18.1 million in the last rate case to $16.3 million in the test year. $1.2 million of the decrease is attributed to rate base expenditures. Distribution expenditures increased by $7.3 million, or 16 percent, from $65.3 million in the last rate case to $72.6 million in the test year. $7.6 million of the increase is attributed to rate base expenditures.

Q. What major factors caused the projected increase in 2025 O&M expenses over 2022?

A. There are several major factors that contributed to the increase in total O&M spending in Electric Delivery:

1. Contracted labor cost increases.
2. Internal labor cost increases.
3. Material cost increases.
4. Increased material lead times leading to higher inventory needs.
5. Customer growth.
6. Greater demand for utility worker labor.
7. Increased focus on restoration speed.
8. Increased focus on reactive tree trimming to benefit reliability and better meet customer expectations.
9. Technology upgrades and process changes within

distribution and transmission control rooms.

10. Staffing for a Renewable Control Center.

11. Staffing for a Diagnostics and Drone Center.

12. Deployment of distribution equipment that improves reliability.

13. Annual software service agreements.

Increased labor rates continue to be a major factor in upward pressure on O&M expenses. For example, the rates of our primary restoration distribution line contractors have gone up 45 percent since 2021. Higher fuel costs and a tight labor market nationwide for skilled line workers has driven up equipment rates and wages resulting in increased costs to Electric Delivery.

Q. What is the forecasted amount for 2025 O&M expense, and is the amount reasonable?

A. Yes. In 2025, the company plans to spend approximately $88.9 million in O&M expenses for the Electric Delivery department, of which $65.7 million is base rate expenditures. The proposed O&M expenses for 2025 are reasonable and support the activities required for system operations and restoration, inspection programs, maintenance of equipment and computer systems, meter

services, and required compliance activities.

Tampa Electric mitigated the need to increase O&M expenditures through the company's culture of continuous improvement, which has generated many initiatives and cost control measures that have been implemented since 2021. They helped mitigate cost pressures in several areas, including the higher labor rates and contractor costs, and material inflation due to market conditions, increased demand, and a limited supply of utility workers.

Q. Were any adjustments made to O&M expenses, and if so, how much?

A. Yes. To obtain an "apples to apples" comparison, an adjustment was made for the SPP related activities. We adjusted the test year by $23.2 million and the base year by $216,000. The SPP adjustments for the test year are shown in MFR Schedule C-38, and the adjustments for the base year are shown in MFR Schedule C-39. The adjusted T&D O&M benchmark calculations are shown in MFR Schedule C-41.

Q. What is the company's performance against the O&M benchmark of the company's T&D functional expenses?

A. MFR Schedule C-41 reports transmission and distribution expenses and benchmarks separately, and each is below the respective benchmark. Transmission O&M expenses budgeted for 2025 are $4.6 million less than the transmission benchmark. Distribution O&M expenses are $13.3 million less than the distribution benchmark. These variances compared to the benchmarks are due to the company's O&M expense reduction measures taken in the T&D areas, as I describe in my testimony.

Q. What steps has the company taken to manage Electric Delivery O&M expenses?

A. Electric Delivery continuously takes action to ensure O&M expenses are tracked and managed. These actions include managing overtime, seeking skilled labor rates through a fair RFP process, and ensuring team members' time is charged appropriately.

Our Asset Management Program has also played a critical role in controlling Electric Delivery O&M expenses by ensuring that the right assets are maintained, repaired, or replaced at the right time to eliminate outages, customer impacts and expensive unplanned maintenance activities.

Tampa Electric's technology use also helped control O&M costs. For example, our installation of circuit reclosers not only minimizes total customers out during an outage, but also reduces the time it takes troubleshooters to patrol the circuit to find the damage. Control room technology, like our ADMS system, helps identify outage causes and helps troubleshooters respond more quickly. Since 2013, our customer count has gone up by over 150,000 customers, but our troubleshooting employee count has remained flat, mostly due to the efficient use of technology on our distribution grid allowing for faster troubleshooting.

Tampa Electric has also invested in the replacement of all streetlights and area lights with smart LED technology throughout our service areas. This innovative technology provides a higher-quality light and lasts longer than traditional streetlights, reducing needed maintenance. We have sent 85 percent fewer trucks to repair lighting since the start of the LED conversion, which saves labor and fuel costs.

Q. How has development of the company's SPP and implementation of the related SPP cost recovery clause affected the amount of T&D O&M expense to be recovered through base rates?

A. As part of the SPP, the company shifted several legacy storm hardening activities into SPP programs. Cost recovery of the O&M expenses associated with these activities was also shifted from base rates to the SPP cost recovery clause. These activities and costs included vegetation management, pole inspections, and transmission structure inspections.

Q. What safety initiatives are reflected in T&D O&M expenses for the 2025 test year and why are those initiatives beneficial for customers?

A. Abiding by the SMS described earlier in my direct testimony is one of the cornerstones of Electric Delivery's operations. The SMS is designed to ensure compliance with OSHA regulations and is aligned with OSHA recommended practices. The requirements and programs of each element are embedded in the operating costs of the business. By implementing an SMS, the company is not only promoting the safety of its team members, but also its customers and the public.

Q. What was the employee count for Electric Delivery in 2022 and 2023?

A. There were 1,013 team members within the Electric Delivery department in 2022 and 1,028 in 2023.

Q. How many employees are projected in the 2025 test year for the Electric Delivery department?

A. The Electric Delivery department expects to employ 1,081 team members in 2025.

Q. What factors are causing the need to add personnel in the Electric Delivery area?

A. The Electric Delivery team has the largest increase in team members among all areas within the company moving from 197 employees in 2022 to 243 in the test year. These additional employees are needed to complete implementation of Grid Reliability and Resilience Projects and new technologies to further integrate DER, improve restoration times, and collect data from field devices, as mentioned elsewhere in this testimony and as explained in the testimony of Mr. Lukcic.

The balance of new employees is comprised of craft labor and support staff that support operational functions within Electric Delivery, primarily positions within the Energy

Control Center, Substation, Transmission and Distribution operations.

Q. What metrics did your team use to identify the need for additional employees, contractors, service providers, when to add them, and how many to add?

A. Tampa Electric looks at several factors when considering adding incremental employees to the business. Project growth and changes in operational practices are evaluated to increase or decrease employee count. In certain areas, employee count is increased to moderate overtime and manage safety in the field. Anticipated attrition and the average time to replace employees is also considered when adding employees. Lastly, peaks and valleys in work that are transient are assessed and generally managed with contractors. Tampa Electric evaluated these factors in determining the need to add the employee count I described earlier in my testimony.

SUMMARY

Q. Please summarize your direct testimony.

A. Tampa Electric forecasts that it will invest $380.8 million in Electric Delivery capital and incur $65.7 million in

Electric Delivery O&M expenses for the 2025 test year.

Electric Delivery's capital budget includes investments for the transmission, distribution, and substation expansion and upgrades needed to support customer growth, maintain system reliability, resiliency, replace aging infrastructure, improve our customers' experience, and meet governmental and regulatory requirements. Our 2025 forecasted O&M amounts will support the activities required for system operations and restoration, inspections, maintenance of equipment and computer systems, meter services, and required compliance activities.

Electric Delivery's historical cost control measures and practices have resulted in O&M spending below the benchmark despite increased interest rates, inflationary material and equipment rates, and increasing wage rates.

Tampa Electric has significantly improved its system reliability since the company's last base rate case. The company's reliability improvements can be attributed in part to the company's robust Asset Management Program and by putting the right systems and personnel in place to minimize outage times when outages do occur.

The company's Grid Reliability and Resilience efforts described in my direct testimony are reasonable and prudent and are necessary to meet the future demands of our customers and to keep pace with electric industry changes. All these projects will provide real benefits to our customers.

Overall, Tampa Electric's proposed T&D capital and O&M budgets for 2025 represent a strategic and balanced approach that will provide the modern grid required to meet our customers' increasing expectations at a reasonable cost and should be approved.

Q. Does this conclude your direct testimony?

A. Yes, it does.

EXHIBIT

OF

CHIP WHITWORTH

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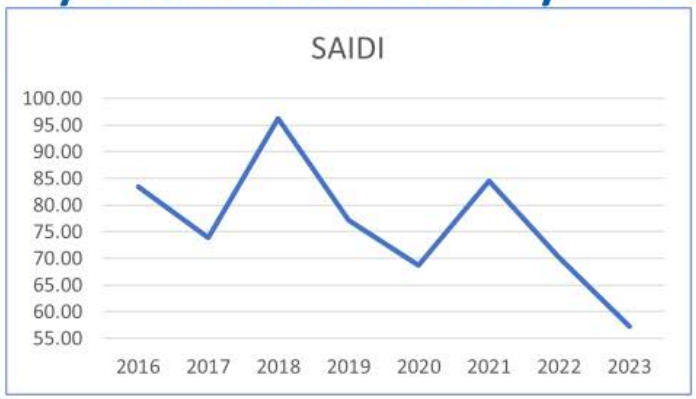
LIST OF MINIMUM FILING REQUIREMENT SCHEDULES

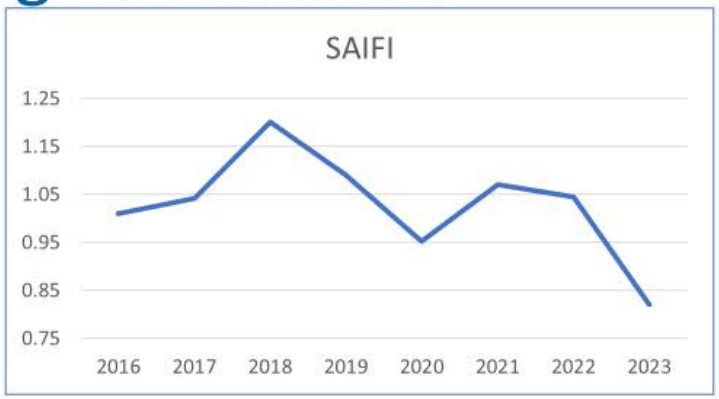
SPONSORED OR CO-SPONSORED BY CHIP WHITWORTH

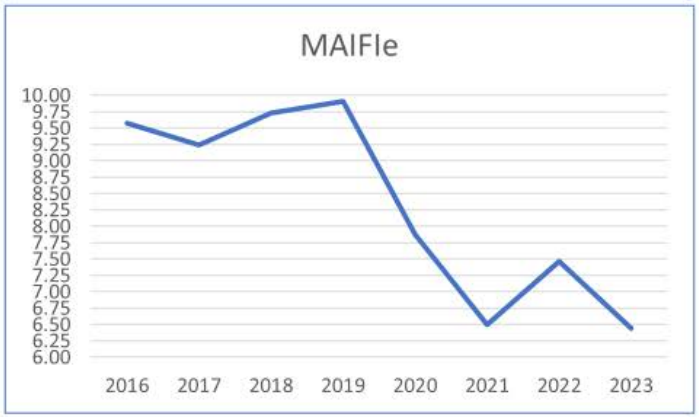
MFR Schedule	TITLE
B-06	Jurisdictional Separation Factors-Rate Base
B-07	Plant Balances by Account and Sub-Account
B-08	Monthly Plant Balances Test Year-13 Months
B-09	Depreciation Reserve Balances by Account and Sub-Account
B-10	Monthly Reserve Balances Test Year-13 Months
B-11	Capital Additions and Retirements
B-13	Construction Work in Progress
B-15	Property Held for Future Use-13 Month Average
B-21	Accumulated Provision Accounts-228.1 228.2 And 228.4
B-24	Leasing Arrangements
C-04	Jurisdictional Separation Factors-Net Operating Income

C-06	Budgeted Versus Actual Operating Revenues and Expenses
C-08	Detail of Changes in Expenses
C-09	Five Year Analysis-Change in Cost
C-16	Outside Professional Services
C-33	Performance Indices
C-34	Statistical Information
C-37	O&M Benchmark Comparison by Function
C-38	O&M Adjustments by Function
C-39	Benchmark Year Recoverable O&M Expenses by Function
C-41	O&M Benchmark Variance by Function
C-43	Security Costs
F-05	Forecasting Models
F-08	Assumptions

System Reliability – Long Term Trends







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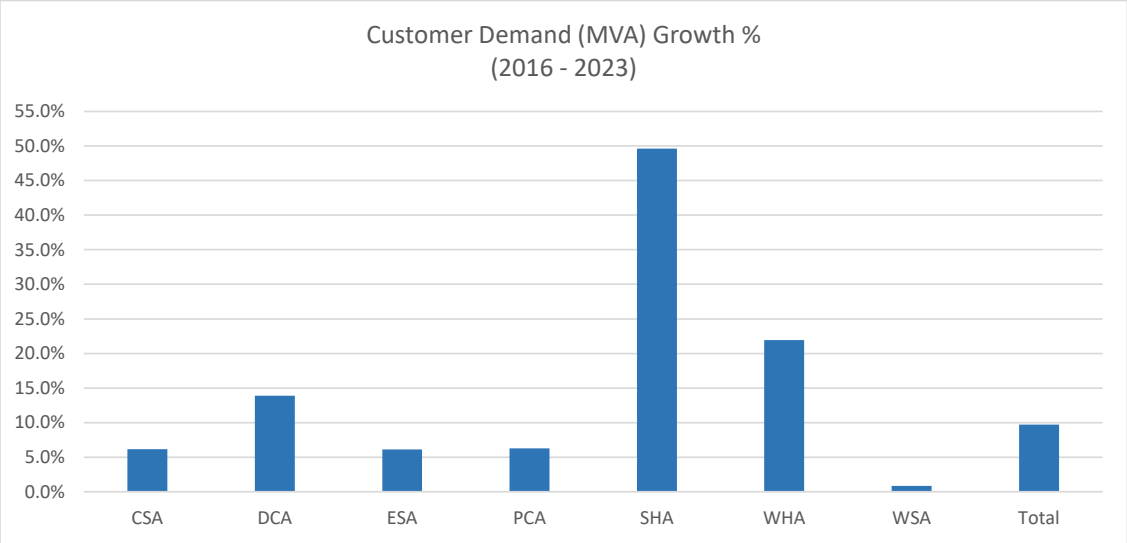
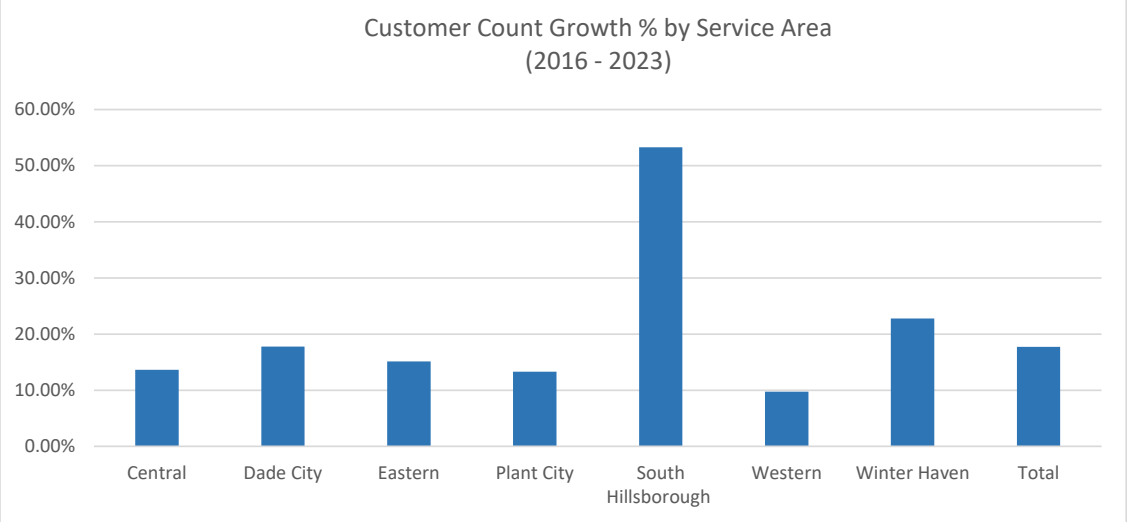
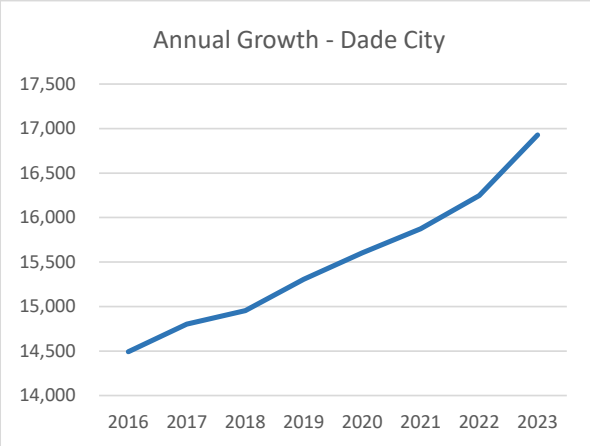
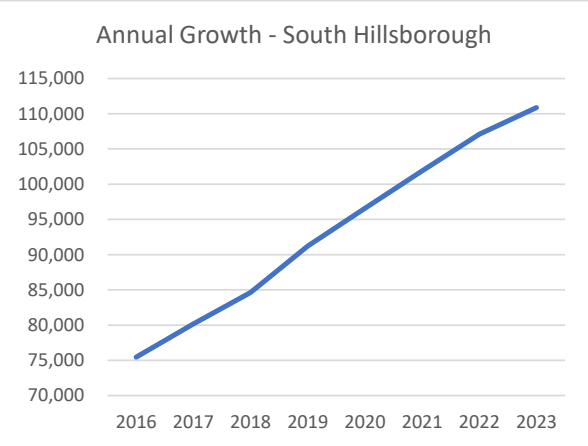
Customer Demand

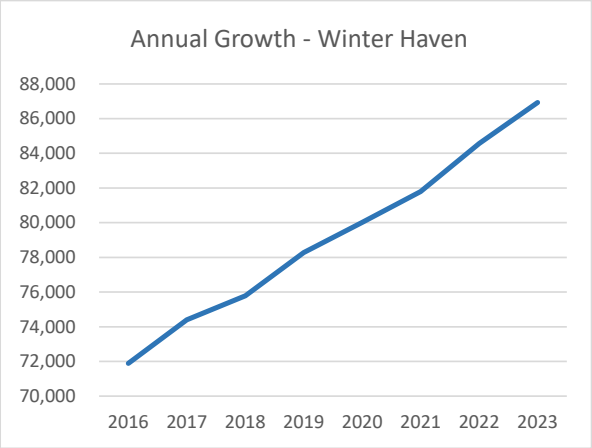


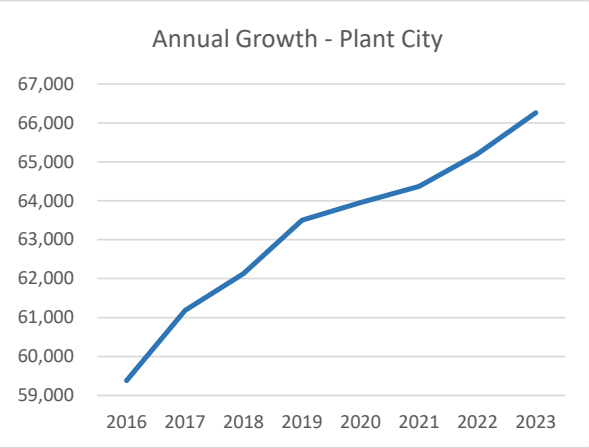
Customer Count Growth

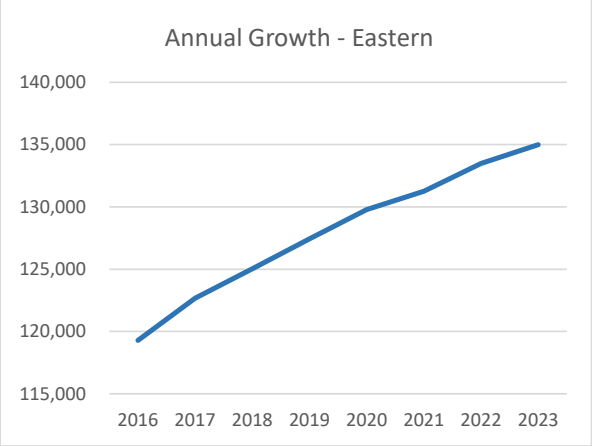


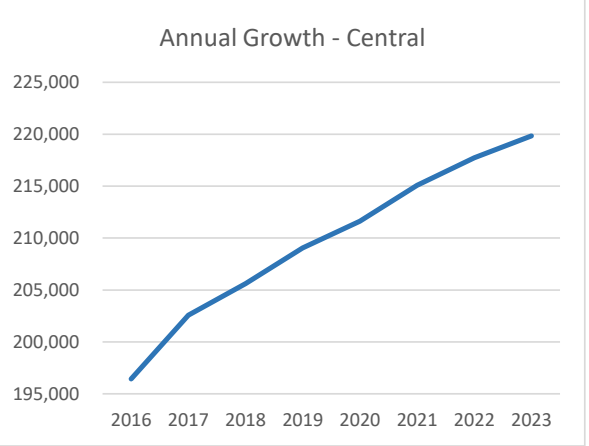


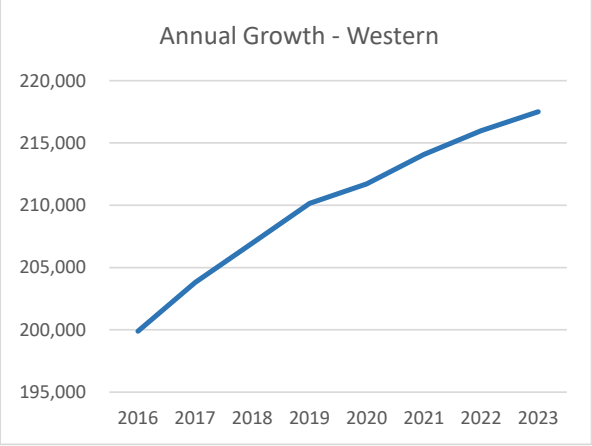



Annual Growth - Winter Haven
88,000
86,000
84,000
82,000
80,000
78,000
76,000
74,000
72,000
70,000
2016 2017 2018 2019 2020 2021 2022 2023


Annual Growth - Plant City
67,000
66,000
65,000
64,000
63,000
62,000
61,000
60,000
59,000
2016 2017 2018 2019 2020 2021 2022 2023


Annual Growth - Eastern
140,000
135,000
130,000
125,000
120,000
115,000
2016 2017 2018 2019 2020 2021 2022 2023


Annual Growth - Central
225,000
220,000
215,000
210,000
205,000
200,000
195,000
2016 2017 2018 2019 2020 2021 2022 2023


Annual Growth - Western
220,000
215,000
210,000
205,000
200,000
195,000
2016 2017 2018 2019 2020 2021 2022 2023

Tampa Electric

ELECTRIC DELIVERY

	2022	2023	2024	Total 2022-2024	2025	Total 2022-2025
Total Capital	520,149,582	550,714,553	519,057,011	**1,589,921,146**	716,003,431	**2,305,924,577**
SPP	(173,742,540)	(173,533,849)	(170,983,384)	**(518,259,773)**	(170,000,000)	**(688,259,773)**
AFUDC	(7,004,787)	(12,516,491)	(54,767,519)	**(74,288,797)**	(165,182,177)	**(239,470,974)**
BTL	(913,538)	535,321	(2,788,000)	**(3,166,217)**	-	**(3,166,217)**
Rate Base	**338,488,717**	**365,199,533**	**290,518,109**	**994,206,359**	**380,821,254**	**1,375,027,613**
Rate Base Projects						
OPERATIONAL TECHNOLOGY	69,260,066	89,586,570	70,017,062	**228,863,698**	128,855,509	**357,719,207**
BLANKETS	164,944,818	173,702,751	132,355,072	**471,002,641**	135,895,958	**606,898,599**
SPECIFICS	77,070,644	88,967,077	58,864,794	**224,902,515**	71,312,681	**296,215,196**
OTHER	27,213,189	12,943,135	29,281,181	**69,437,506**	44,757,105	**114,194,611**
TOTAL	**338,488,717**	**365,199,533**	**290,518,109**	**994,206,359**	**380,821,254**	**1,375,027,613**

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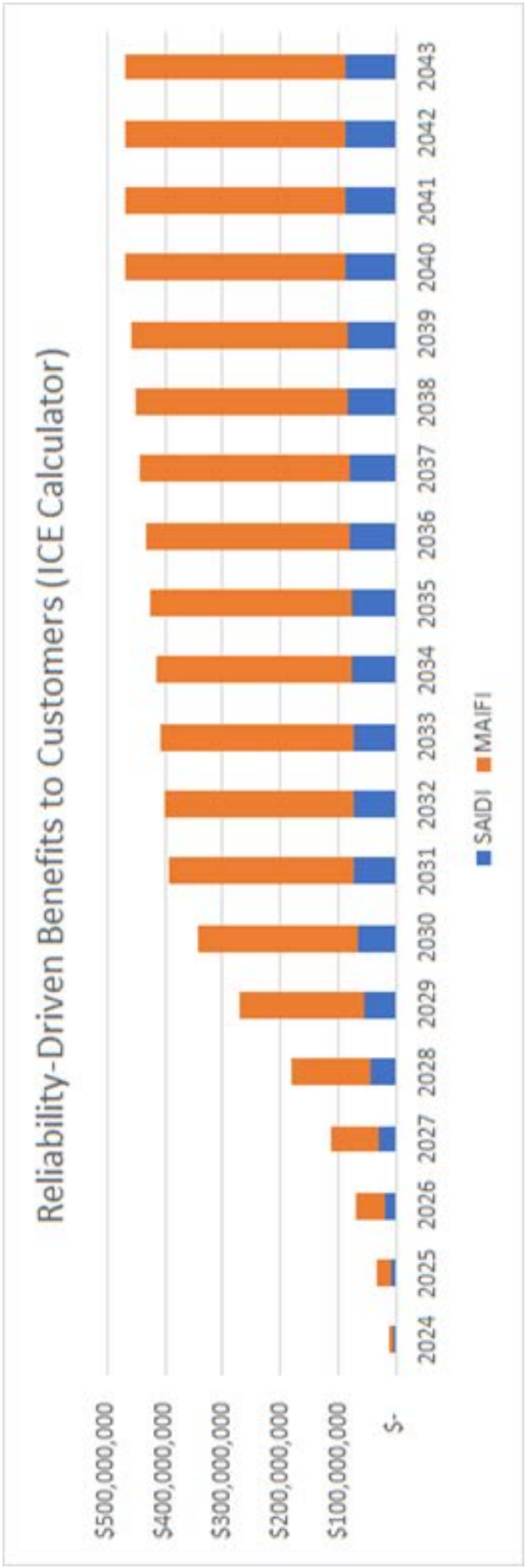
Reliability-Driven Benefits to Customers (ICE Calculator)
$500,000,000
$400,000,000
$300,000,000
$200,000,000
$100,000,000
$-
2024
2025
2026
2027
2028
2029
2030
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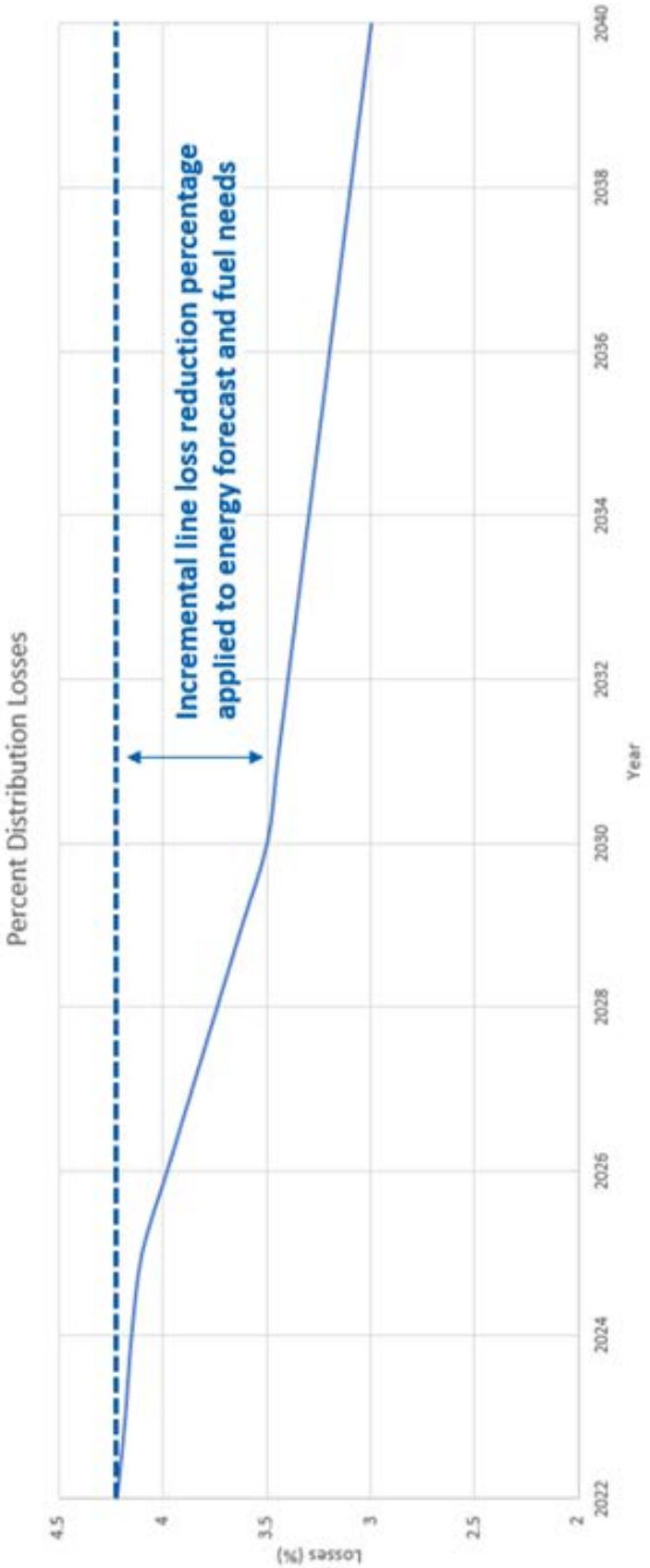
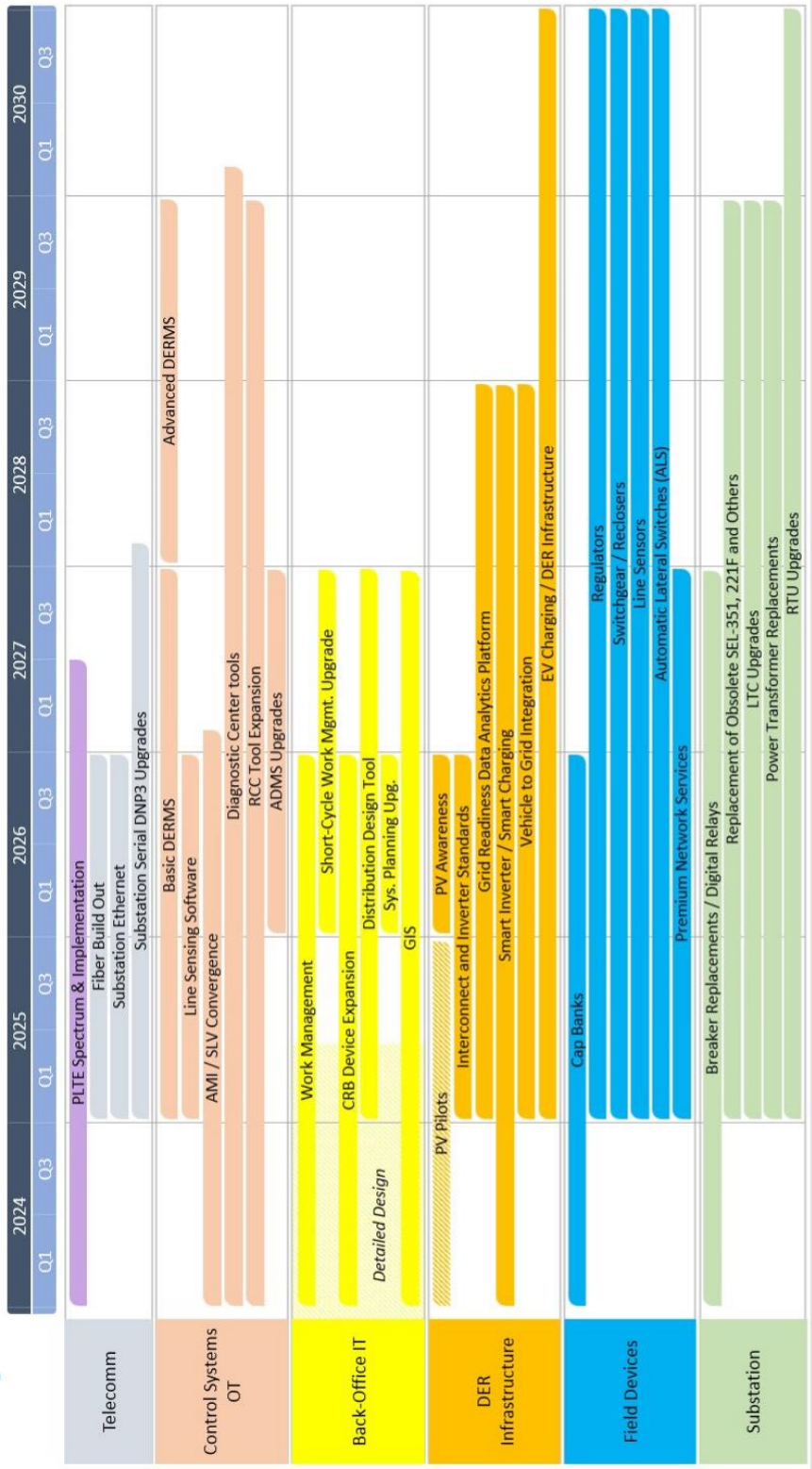
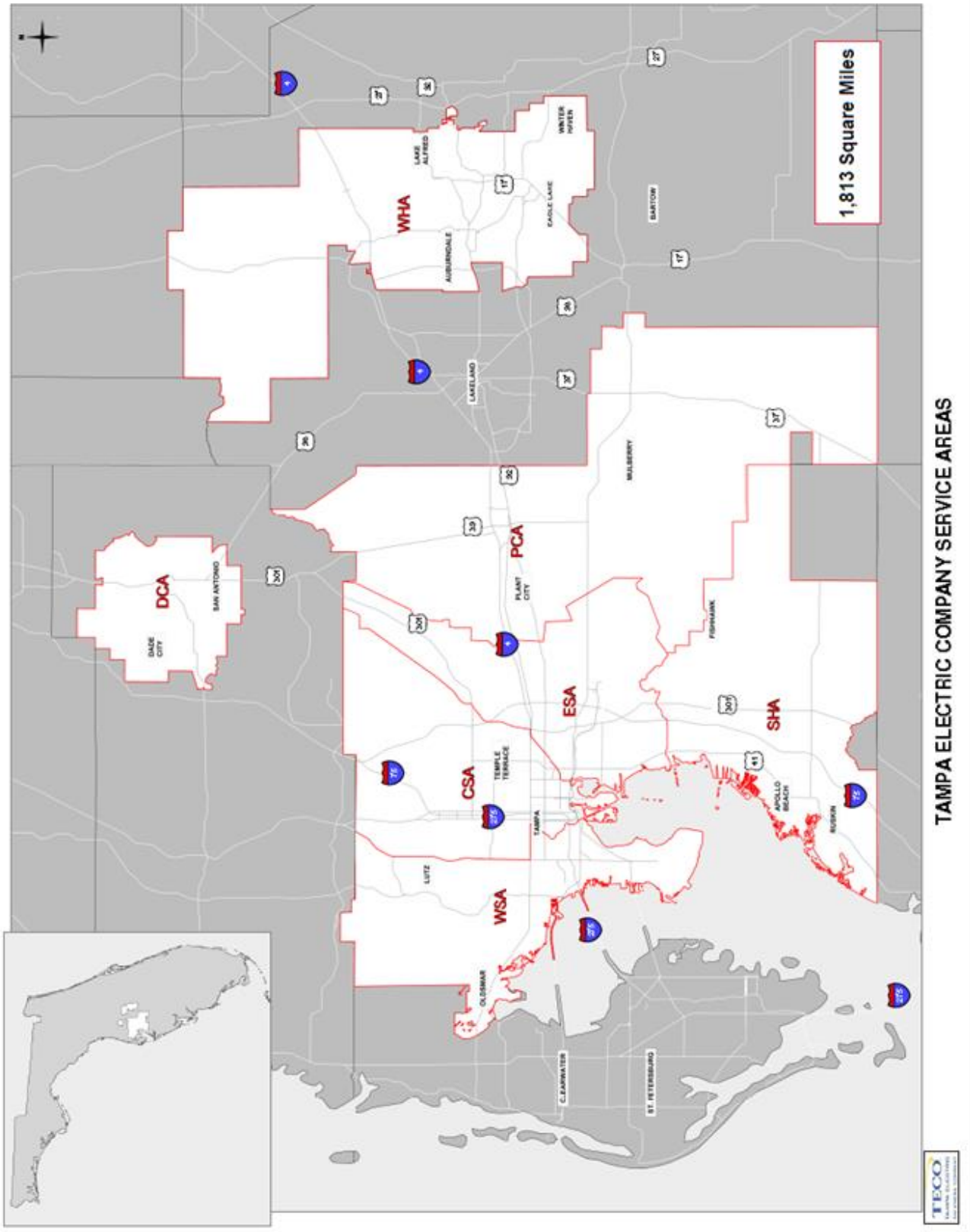
SAIDI
MAIFI


Percent Distribution Losses
Incremental line loss reduction percentage applied to energy forecast and fuel needs
Losses (%)
4.5
4
3.5
3
2.5
2
2022
2024
2026
2028
2030
2032
2034
2036
2038
2040
Year


2024
2025
2026
2027
2028
2029
2030
Q1
Q3
Q1
Q3
Q1
Q3
Q1
Q3
Q1
Q3
Q1
Q3
Telecomm
PLTE Spectrum & Implementation
Fiber Build Out
Substation Ethernet
Substation Serial DNP3 Upgrades
Control Systems OT
Basic DERMS
Advanced DERMS
Line Sensing Software
AMI / SLV Convergence
Diagnostic Center tools
RCC Tool Expansion
ADMS Upgrades
Back-Office IT
Work Management
Short-Cycle Work Mgmt. Upgrade
CRB Device Expansion
Distribution Design Tool
Detailed Design
Sys. Planning Upg.
GIS
DER Infrastructure
PV Pilots
PV Awareness
Interconnect and Inverter Standards
Grid Readiness Data Analytics Platform
Smart Inverter / Smart Charging
Vehicle to Grid Integration
EV Charging / DER Infrastructure
Field Devices
Cap Banks
Regulators
Switchgear / Reclosers
Line Sensors
Automatic Lateral Switches (ALS)
Premium Network Services
Substation
Breaker Replacements / Digital Relays
Replacement of Obsolete SEL-351, 221F and Others
LTC Upgrades
Power Transformer Replacements
RTU Upgrades



TAMPA ELECTRIC COMPANY SERVICE AREAS