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December 17, 2025

VIA: ELECTRONIC MAIL

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

Re: Petition of Tampa Electric Company for approval of Direct Current Microgrid Pilot Program.
Annual Status Report
Dkt. 20200234-EI

Dear Mr. Teitzman:

Enclosed for filing is Tampa Electric Company's Direct Current Microgrid Pilot Program revised Annual Status Report.

Thank you for your assistance in connection with this matter.

Sincerely,

Malcolm N. Means

MNM/bml
Enclosure
cc: All Parties of Record (w/attachment)
TECO Regulatory Department

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing revised Annual Status Report, filed on behalf of Tampa Electric Company, has been furnished by electronic mail on this 17th day of December 2025 to the following:

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TAMPA ELECTRIC'S

MICROGRID PILOT FINAL REPORT

Revised: December 17, 2025

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EXECUTIVE SUMMARY

On June 30, 2021, the Florida Public Service Commission ("Commission") approved Tampa Electric Company's ("Tampa Electric" or the "company") Request for Approval of its microgrid pilot program ("Pilot") that involves the use of the Block Energy System ("BES") supplied, installed, and commissioned by BlockEnergy™ LLC (formerly Emera Technologies, LLC, referred to as "BlockEnergy™"). The BES connects 37 homes in the Medley subdivision at Southshore Bay, a Hillsborough County community that is built by Lennar Homes, LLC ("Lennar"). The BES is comprised of:

a) a buried DC loop;
b) a Community Energy Park ("CEP") containing a large battery, two natural gas fired generators, a control enclosure, and an interconnection to Tampa Electric's distribution Pilot grid; and
c) an average of 7.83 kW-DC of rooftop solar photovoltaic ("PV") panels and a BlockBox™ containing 17.75 kWh of battery storage and other equipment at each house. Each BlockBox™ has an inverter to convert direct current ("DC") microgrid power to alternating current ("AC") power for use inside the home. The BES is backed up by a traditional underground AC distribution system connected in parallel to the BES at each home for the purposes of the Pilot.

The overall objective of the Pilot was to test the capability of the BES and to supply energy and capacity to residential homes, with a minimum of 60 percent energy being renewable while providing superior reliability and resiliency. The BES achieved the following objectives:

1) isolated Pilot homes from upstream AC distribution system disturbances. Customers were not affected by any AC system disturbances;
2) integrated high levels of renewable energy, with over 60 percent of the total energy consumed by the homes coming from the BES solar panels; and
3) eliminated demand on the transmission and distribution system during peak load periods from the addition of the 37 homes.

In Section II, Overall Assessment of this Final Annual Report ("Final Report") for the Pilot, Tampa Electric will describe the results as related to the above objectives and the following benefits

1) increased renewable energy penetration;
2) reduced system losses;
3) reduced generation capacity costs;
4) reduced system transmission and distribution capacity costs;
5) reduced energy costs; and

6) increased reliability.

In the fourth quarter of 2024, Tampa Electric determined that it was not feasible to continue with the BES as a permanent solution for the 37 homes. BlockEnergy™ became insolvent and was no longer providing support or monitoring efforts to advance the technology. As a result, the company permanently switched all 37 homes to Tampa Electric's AC distribution system supply on February 7, 2025. The company began decommissioning and dismantlement of the Pilot equipment in February 2025 and completed that work on July 24, 2025. Tampa Electric and BlockEnergy™ collaborated closely with the customers in planning sessions and other community engagement efforts to ensure a smooth transition. As part of the closure of the Pilot, the Pilot customers agreed to retain their rooftop solar panel systems ("PV System") and convert those systems to net metering. As of the date of this report, all customers have been converted to net-metering customers.

Section I of this Final Report will present the operational performance of the Pilot over the reporting period June 1, 2024, to December 31, 2024 ("Reporting Period") as well as the cumulative results for the Pilot period. Section II will address the specific final reporting requirements as required by Order No. PSC-2021-0237-PAA-EI, issued on June 30, 2021, in Docket No. 20200234-EI. Finally, Section III will present the process undertaken by Tampa Electric to close the Pilot while minimizing the impact on customers during the decommissioning and dismantlement process.

SECTION I - ANNUAL REPORT

OVERVIEW

Tampa Electric's Pilot went in-service on May 27, 2022, and was operational until February 7, 2025, ("Pilot Period"). Throughout the final seven months of the Pilot, the Pilot maintained the same level of performance as the previous year and continued to meet the three primary objectives listed above. The Pilot advanced Tampa Electric's understanding of microgrid design and operational performance and resulted in valuable lessons learned that can be applied to other grid edge applications.

First, the Pilot achieved the first objective to isolate the homes from upstream AC system disturbances. This is best illustrated by Hurricane Milton, which made landfall in the Tampa Bay area on October 10, 2025. This storm interrupted the AC distribution system that supplies the Pilot for over 75 continuous hours. During this time, while surrounding homes had no electricity supply, the Pilot continued operating, with one exception, as noted later in this Final Report. Beyond this storm event, the Pilot also demonstrated the ability to maintain electric service during occasional outages on those AC circuits connected to the Pilot homes.

Second, the Pilot integrated very high levels of renewable energy, generating over 86 percent of the energy supplied to the homes over the Pilot Period.

Third, the Pilot demonstrated the ability to integrate within Tampa Electric's AC distribution system while not depending on the grid for firm power during periods of peak loads. Tampa Electric configured the Pilot control system to maintain zero tie line flows from the Tampa Electric system during peak periods; the Pilot accordingly met the objective of eliminating load impacts from the 37 homes to Tampa Electric's transmission, distribution, and generation systems during periods of peak demand.

Challenges with the previously reported unresolved operational issues continued during this reporting period[1]. Through our continued focused efforts, it became apparent that these carry-over issues were more related to limitations in the ratings of certain power delivery components and could not be fully resolved due to limitations of the primary BES equipment or the capabilities of the control system. These limitations are further elucidated in this report.

[1] See Document Nos. 09986-2024 and 05183-2023

BES PERFORMANCE RESULTS - JUNE 1, 2024 TO DECEMBER 31, 2024

The data and information presented below demonstrates the Pilot achieved the three Pilot objectives during the reporting period.

I. Energy Supply Reliability and Availability

The unique topology of the BES made it difficult to assess the reliability of the energy supply to the homes in the Pilot using traditional AC reliability indices such as SAIDI, SAIFI and CEMI-5. Instead, Tampa Electric evaluated the performance of the BES against the "Availability" of the BES to provide energy to each of the homes.

Availability is defined as the ratio of total number of hours in a reporting period that all homes were supplied from the BES to the total number of hours for all homes in that same period.

$$Availability, BES = \frac{Total\ \#\ hours\ that\ all\ homes\ were\ connected\ to\ BlockEnergy}{Total\ \#\ hours\ per\ week\ for\ all\ homes\ (37\ homes\ x\ 24\frac{hrs}{day} x\ 7\ days)}$$

Tampa Electric calculated this metric weekly, and the metric was a valuable tool in identifying performance issues or trends and resolving them in a timely manner.

The results reflected in Table 1 show the system availability for this reporting period. The number of Automatic Transfer Switch ("ATS") occurrences represents the frequency of switching the home energy source from the BES to Tampa Electric's AC distribution system. The six hours of outage time is related to one home that experienced an outage in the early hours on Saturday, October 12, 2024, prior to restoration of the AC distribution system, because of a low state of charge in the BlockBox™ battery.

Table 2 reflects the overall cumulative availability from the start of the Pilot in June 2022 through December 2024. These cumulative results were lower than originally anticipated at the start of the Pilot due in large part to those operational issues further elucidated later in the Final Report.

System Availability				
Item	**Total Time Spent AC Grid**	**Total Time Home Outage**	**Total Time Spent on BES (Availability)**	**# of ATS Occurrences**
Home-Hours	6,175	6.0	178,721	**265**
Percent	3.34%	0.003%	96.63%	

Table 1: System Availability, June 1, 2024 to December 31, 2024

Cumulative System Availability				
Item	Total Time Spent AC Grid	Total Time Home Outage	Total Time Spent on BES (Availability)	# of ATS Occurrences
Home-Hours	16,656.3	34.8	325,008	851
Percent	2.107%	0.003%	97.89	

Table 2: Cumulative System Availability, June 7, 2022 to December 31, 2024

II. Ability to Ride Through AC System Disturbances

There was only one outage on Tampa Electric's primary AC distribution system to the Pilot homes (Circuit 13305) and secondary (Circuit 14146) supply during this Reporting Period, as mentioned in Section I above. The dates and times of these AC outages are listed in Table 3.

Circuit 13305 Pilot Lateral Outages (Underground AC Service to Homes)			
Date (month/day)	Duration (hh:mm:ss)	Duration (min)	Time
10/9/24 (during Milton)	61:33:0	3,693	11:44 pm

Circuit 14146 Pilot Lateral Outages (Overhead Service to the CEP)			
Date (month/day)	Duration (hh:mm:ss)	Duration (min)	Time
7/22/24	0:20:00	20	6:54 AM
10/9/24 (during Milton)	71:25:00	4,285	8:14 PM

Table 3: List of Tampa Electric AC Circuit Outages on Circuits Connected to the BES, for the period June 1, 2024 to December 31, 2024

III. Reduction in System Losses

The cumulative BES energy flows for the Reporting Period are provided in Table 4. The net energy reduction on Tampa Electric's AC distribution system from the BES's generation (based on cumulative home energy metering and CEP net revenue metering) was 97,752 kWh which resulted in a corresponding reduction in AC distribution system losses of approximately 5,786 kWh.

The data in Table 4 shows a net difference between total energy produced/supplied and energy consumed of approximately 78,516 kWh. Tampa Electric was in the process of investigating the sources of this variance when the Pilot was ended. Table 5 shows the cumulative BES energy flows for the Pilot, from June 7, 2022, to December 31, 2024.

Energy Produced / Supplied (kWh)		
Rooftop Energy		
Energy Produced (PV)	Energy Dispatched to AC Grid	Net Energy Available to Home ** (see note below)
160,491	30,019	157,193
Energy Supplied from Tampa Electric's AC Grid		212,455
Energy Supplied from BES NGG		15,777
Total Energy Produced /Supplied		358,704
Energy Consumed by Homes (kWh)		
Total Energy Consumption		280,188
Variance		78,516

Table 4: Cumulative Energy Metrics, June 1, 2024 to December 31, 2024

** The control system managed the Battery Energy Storage in the CEP, drawing energy from Tampa Electric's AC distribution system and/or PV System as required. The BES does not afford a means to differentiate this energy use, thus the PV energy available to the homes as reported is to be treated as an approximation.

Energy Produced / Supplied (kWh)		
Rooftop Energy		
Energy Produced (PV)	Energy Dispatched to AC Grid	Net Energy Available to Home ** (see note below)
860,358	208,188	747,795
Energy Supplied from Tampa Electric's AC Grid		835,553
Energy Supplied from BES NGG		43,247
Total Energy Produced /Supplied		1,530,970
Energy Consumed by Homes (kWh)		
Total Energy Consumption		1,105,736
Variance		425,234

Table 5: Overall Cumulative Energy Metrics, June 7, 2022 to December 31, 2024

** The control system managed the Battery Energy Storage in the CEP, drawing energy from Tampa Electric's AC distribution system and/or PV System as required. The BES does not afford a means to differentiate this energy use, thus the PV energy available to the homes as reported is to be treated as an approximation.

IV. Integrate High Levels of Renewable Energy

Tables 6 and 7 reflect the actual household electrical load and rooftop PV generation for the Reporting and Pilot Periods. The tables below demonstrate that the PV system was able to produce the equivalent of approximately 66.82 percent of the household energy use for the Reporting Period and 86.5 percent for the Pilot Period.

	Actual Home Electrical Load (kWh)	Actual PV Energy Output - kWh	PV Energy as a % of Home Electrical Load
Total Reporting Period to Date	280,188	187,212	66.82

Table 6: Actual Household Electrical Load, PV Energy Output, June 1, 2024 to December 31, 2024

	Actual Home Electrical Load (kWh)	Actual PV Energy Output - kWh	PV Energy as a % of Home Electrical Load
Total Pilot Period to Date	1,105,736	955,983	86.46

Table 7: Cumulative Actual Household Electrical Load, PV Energy Output, June 7, 2022 to December 31, 2024

V. Reduce TECO System Impacts During the Peak

The BES did not add load to Tampa Electric's AC distribution system during peak load conditions for the entire duration of the Pilot Period. The BES was programmed to maintain zero energy flow from the AC distribution system tie at the CEP during Tampa Electric's identified peaks between 5:00 p.m. and 6:00 p.m. EST for June through August and between 7:00 a.m. and 8:00 a.m. EST for January through March, to demonstrate compliance with this performance goal.

VI. Natural Gas Energy Consumption

Tables 8 and 9 reflect the energy produced from the Natural Gas Generators ("NGG") for the Reporting and Pilot Period.

NG Energy Consumption Total Reporting Period to Date	
Forecasted NGG Output (kWh)	Actual NGG Output (kWh)
58,740	15,777

Table 8: Natural Gas ("NG") Energy Generation, June 1, 2024 to December 31, 2024

NG Energy Consumption Total Pilot Period to Date	
Forecasted NGG Output (kWh)	Actual NGG Output (kWh)
598,177	43,247

Table 9: Natural Gas ("NG") Energy Generation, June 7, 2022 to December 31, 2024

BlockEnergy™ was not able to add the required economic dispatch programming for the generators to its energy management and optimization software controls within the timeline for this Pilot, as was originally intended. As a result, Tampa Electric could not dispatch the generators as a system resource.

OPERATIONAL EXPERIENCES FOR YEAR 3 (REPORTING PERIOD)

- As noted in the company's 2024 Annual Report, Tampa Electric and BlockEnergy™ evaluated the capacity of the system to accommodate Level 2 charging. This evaluation is now complete, and the company concluded that the inherent limitations for kW load capacity and transient overload performance of the BlockBox™ would not accommodate Level 2 charging. One solution to this incompatibility was to switch from the BES supply to Tampa Electric's AC distribution system during EV charging. Switching from one source to the other results in a short duration power interruption of less than one second, also known as a "momentary." The "momentaries" can be an inconvenience to the homeowners because they require resetting clocks and Wi-Fi modems. If the company were to keep homes with EV Level 2 charging on the BES supply, those homes would experience multiple "momentary" events. As there was no means of resolving these limitations with this version of the BES, and in the interest of minimizing disruption to the customers, Tampa Electric decided to keep the home on the company's AC distribution system, with the provision to switch back to the BES supply for storms and other severe weather events.

- As noted in the company's 2024 Annual Report, the starting of motor-driven household loads such as pool pumps and air conditioning units continues to result in "momentaries" as defined in the bullet above. These momentary outages were related to inherent limitations for kW capacity and transient overload performance of the BlockBox™. The company concluded that there was no means of resolving these limitations with this version of the BES.

- Over the Reporting Period, unexpected early failure of Block Home interface inverter subcomponents resulted in those homes switching to Tampa Electric's AC distribution system for an extended time until these components were replaced or, if necessary, the inverter was replaced. These same issues also started to occur

with the power converters in the CEP towards the latter part of the Reporting Period.

- The occurrence of microgrid outages due to dynamic PV energy levels at homes continued to be an issue, where the DC loop was consequently disrupted due to shutdown of the CEP converters feeding this loop. In most cases this interruption to the DC loop did not impact the BES supply of energy to the homes. However, in a small number of exceptional cases, the timing and duration of these disruptions resulted in several homes switching to the AC distribution system. Tampa Electric adjusted the tuning parameters at the BlockBox™ and the CEP to address this issue; however, these incidents continued through to the end of the Reporting Period. Despite these challenges, the Pilot homes did not experience any outages.

CUSTOMER ENGAGEMENT

Customers participating in the Pilot enjoyed personalized, round-the-clock service from Tampa Electric. This ”concierge” approach enabled Tampa Electric to quickly address concerns and share plans. Throughout the Reporting Period, Tampa Electric maintained a high level of customer engagement as the company made changes to the local home BES equipment or the broader Pilot microgrid itself. For example, prior to Hurricane Milton, our Customer Experience team provided the Pilot homeowners with regular updates on Tampa Electric’s efforts to position the Pilot where the AC energy being delivered to their homes would not be impacted during the storm.

In our ongoing communication regarding the Pilot, Tampa Electric prioritized transparency and responsiveness to ensure our customers felt valued and informed at every step. Tampa Electric actively sought participant feedback and addressed any concerns, tailoring our support to meet customers’ unique needs.

In December 2024, Tampa Electric sent a survey to all 37 of the participating homes in the Pilot. Three of the homes had invalid email addresses which could not be resolved before the end of the survey; and sixteen customers responded to the survey. The survey period was December 6 through December 30, 2024. Figures 1 through 4 summarize the results of the survey.

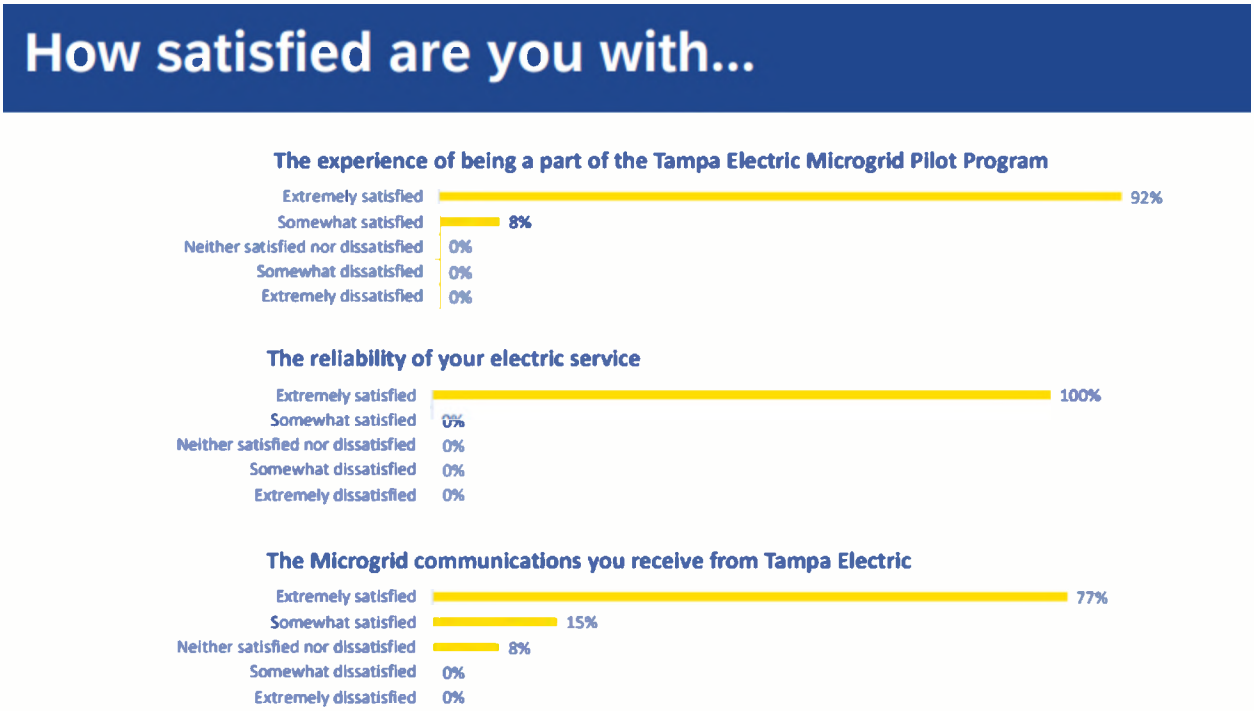

Figure 1: Customer Survey Results, Sheet 1

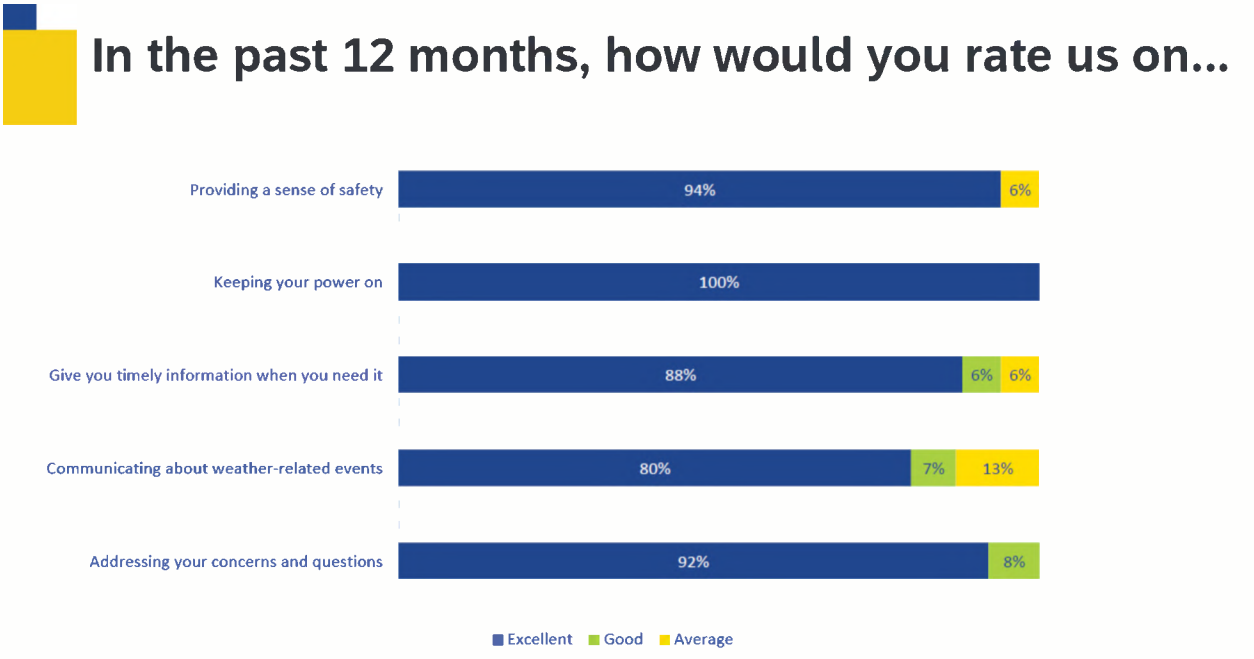

Figure 2 Customer Survey Results, Sheet 2

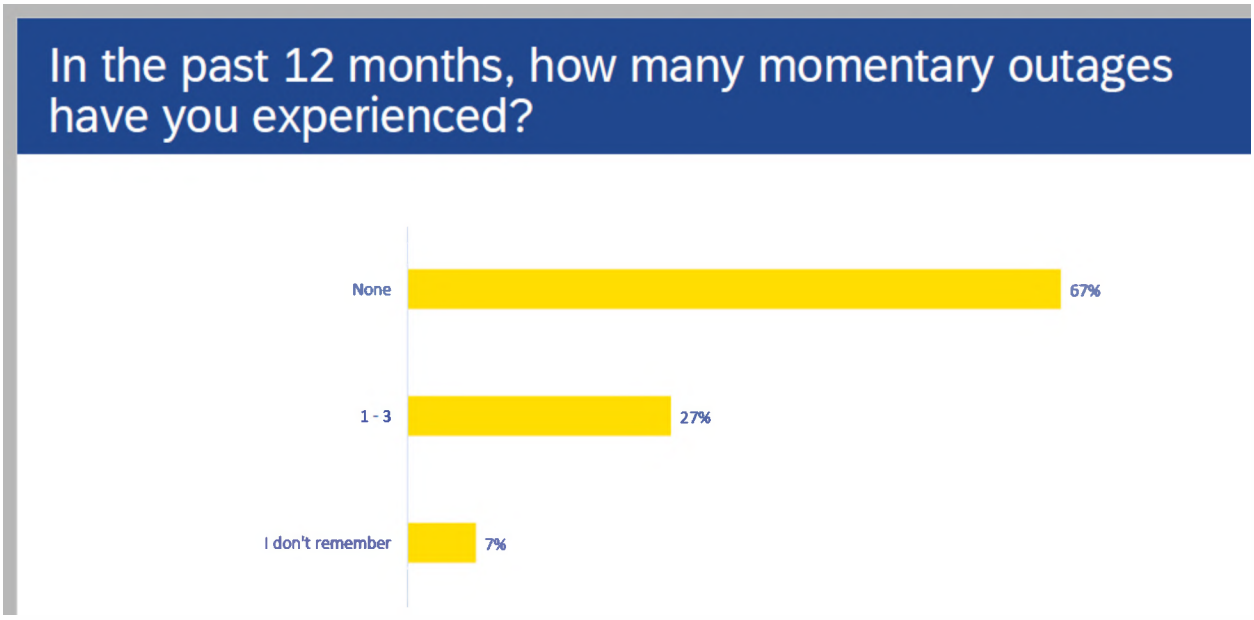

Figure 3: Customer Survey Results, Sheet 3

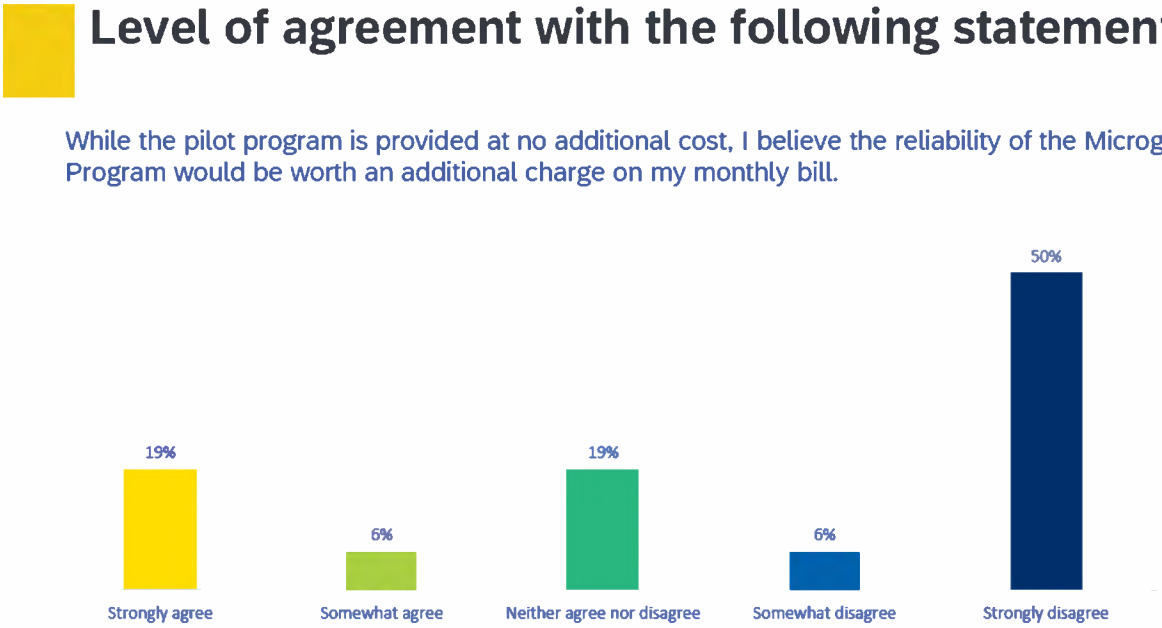

Figure 4: Customer Survey Results, Sheet 4

COSTS

Table 10 highlights the operating costs incurred by BlockEnergy™ during the final period of the Pilot as well as the total costs incurred during the entire Pilot period. Tampa Electric did not incur any operating or maintenance costs because the contract requires BlockEnergy™ to provide those services during the Pilot without payment.

	Cumulative Total as of June 1, 2024	June 2024 – December 2024 **	Cumulative Total as of December 31, 2024
Labor: Fixing an issue/outage	*$110,753*	*$11,343.0*	*$122,096*
Materials	*$218,305*	*$63,339.5*	*$281,645*
Operations and Maintenance	**$329,059**	**$74,682.0**	**$403,741**
Labor: System Requests/Enhancements	*$113,126*	*$6,007.5*	*$119,134*
Materials: System Requests/Enhancements	*$64,888*	*$6,340.0*	*$71,228*
Project Requests	**$178,014**	**$12,347.5**	**$190,362**
Total Operating Expenses	**$507,073**	**$87,029.5**	**$594,103**

Table 10: Pilot Operating Costs

** BlockEnergy™ did not make the operating costs for the Reporting Period available before BlockEnergy™ ceased operations. Tampa Electric's monitoring of the BES during the Reporting Period did not reveal any material changes to the previous Reporting Period (June 1, 2023 to May 31, 2024). The values shown above reflect those from the previous Reporting Period, pro-rated to reflect the shortened term.

SECTION II - LESSONS LEARNED

DECISION TO CLOSE OUT THE PILOT

In late 2024, Tampa Electric determined that it was not feasible to continue with the BES as a permanent solution for the 37 homes. All 37 homes were permanently switched to Tampa Electric's AC distribution system on February 7, 2025. Section III of this Final Report provides more details on how this Pilot close-out was implemented and the customer communication plan that was developed and executed during and following the Pilot close-out.

The BES was a first-generation technology developed from a prototype deployed in New Mexico. BlockEnergy™ had already embarked on future designs of the system, including components, maintenance and parts for the BES to address gaps identified by the Pilot to increase the performance and value of the BES. After analysis and research, Tampa Electric concluded that it was not practical to incorporate these changes into the current version of the BES used in the Pilot. Tampa Electric also concluded that it was not in the best interest of customers to move to the most current version of the BES as it would require material changes to the onsite infrastructure at each home, nor was it economic to maintain the CEP as a distributed generation facility due to the high O&M costs associated with maintaining this small facility.

Tampa Electric did not incur costs to remove, dismantle and decommission the BES. Those costs were borne by BlockEnergy™. This included all salvage costs and remediation costs at each customer's home and the CEP. All modifications and new installation costs to convert the PV System to a "net metering" arrangement were also borne by BlockEnergy™. Tampa Electric incurred costs for internal labor by Tampa Electric employees and consultants related to the monitoring of the work and customer interactions.

OVERALL ASSESSMENT

The Pilot met the intended objectives to: (1) ride through all upstream AC distribution system disturbances with no interruption to the customer; (2) integrate high levels of renewable energy targeted to be at least 60 percent of the total energy used by the homes participating in the Pilot; and (3) reduce impacts on the transmission and distribution system during times of peak demand. The company's decision to terminate the Pilot and remove the equipment was based on BlockEnergy™ no longer being able to support the BES and is not intended to convey judgement on the potential for this specific DC technology or the future viability of a microgrid in general.

During the term of the Pilot, there were numerous upstream AC distribution system momentary and sustained outages that are documented in the annual reports and in Section II herein. On all occasions when Tampa Electric's AC distribution system was interrupted, none of the homes on the Pilot experienced an outage. As a result, customers experienced better reliability than they would have had, had they been connected directly to the AC distribution system. During the term of the Pilot, there were two major hurricanes, resulting in a total of 117 hours of AC outages (42 hours for Hurricane Ian, 75 hours for Milton) to both the primary and alternate feeders that served this community. During both events, customers in the community experienced greater resilience because of the BES operating while "islanded" from the AC distribution system, using its generation and storage resources to provide continuous service for extended periods of time.

Over the Pilot Period, the control algorithm for the BES was able to manage the solar energy and BES battery storage at the home and the CEP to provide the 37 homes with 86 percent renewable energy.

As presented in Section I, Table 5, there was a significant variance in the total energy consumed versus energy produced/supplied. In consultation with BlockEnergy™, Tampa Electric concluded that the number of power conversions across the BES, coupled with the choices of equipment where energy efficiency was not one of the primary selection criteria, resulted in materially higher-than-expected energy losses within the BES. Energy losses from these conversions, as well as transformer losses, would vary based on the loading of each component. The BES did not have the means to calculate the actual, real-time total losses, thus making it impossible for Tampa Electric to confirm the final value of the losses (approximate or otherwise). The BES losses could be reduced and minimized with higher quality, more efficient, and optimized components in future designs. Future designs could also provide a reasonable estimate of the losses within the BES through additional metering and advanced control system algorithms.

Tampa Electric designed the control algorithm for the Pilot to zero out power flows at the interface between the DC microgrid and the AC distribution system during peak times on the AC grid. This was required to demonstrate the ability to operate the BES during peak load periods without the need for any incremental generation, transmission, or distribution capacity. To accomplish this, Tampa Electric chose a peak hour from 5:00 P.M. to 6:00 P.M. during the summer hours and 6:00 A.M. to 7:00 A.M. during the winter hours. The Pilot effectively demonstrated this capability throughout the Pilot Period. While not tested, the system has enough storage capacity and central generation so that, if required, those hours could be materially extended and/or made more dynamic to closely match system peaks.

While the Pilot met the initial objectives, there were problems that must also be noted. These deficiencies can generally be summarized in three categories: design deficiencies, equipment reliability, and controls instability.

Under certain conditions, such as starting a pool pump motor, the output inverters that convert DC at the BlockBox™ to AC to serve the home did not have sufficient power capacity. These inverters had the ability to produce up to 150 percent of normal rated power capacity for short durations (less than one second), shorter than the duration required to start a motor. As a result, some pool pumps and other motor loads would trip inverters and customers would transfer to the back-up AC supply as a means to maintain the energy supply to the home. Tampa Electric concluded that there was no means of resolving these limitations with this version of the BES.

The design load profiles used to size the BES primary components did not take into account the possibility of EV Level 2 charging as a component of the home load. A Level 2 charger has a range of approximately 7 kW to 11 kW, which can double the demand of the home. When the Level 2 charger was in use at its top rating, the AC supply to the home and the DC supply to the Block Box did not have the capacity to enable an EV to fully charge before the BlockBox™ battery ran out of energy, resulting in a transfer to the back-up AC grid. Despite the efforts of Tampa Electric and BlockEnergy™ to resolve this deficiency, these incidents could not be avoided due to the limitations of this version of the BES.

There were two homes in the Pilot that had Level 2 chargers; as each of the homeowners notified Tampa Electric of this additional load, the company explained this limitation and gave the homeowners the option of permanently switching their energy supply to the AC distribution system or staying on the Pilot with the condition that they would only use the lower kW charging setting on the Level 2 charger. This second option would reduce (but not eliminate) the chance of their BlockBox™ battery running out of energy during a reduced Level 2 charging cycle. This second option would also result in a much longer time to charge their EV battery. In both cases, the homeowner chose to have their energy supply switched to the AC distribution system, with the assurance that Tampa Electric would switch them back to the Pilot supply in advance of any major storms (as was done for Hurricanes Ian and Milton).

Finally, there were instances where the control system would freeze or become disabled due to the intermittent loss of the energy management optimization system. The control system also had difficulty maintaining a stable DC loop during large changes in PV energy flows. During daytime hours, these incidents were quickly identified by the BlockEnergy™ team and resolved promptly. However, in times when the BES was not being monitored, (e.g. late evenings or in the overnight hours) these incidents would result in BlockBox™

batteries providing energy to the homes without the means to maintain its charge. This resulted in the home's supply being transferred to the AC distribution system.

Tampa Electric believes that the above issues could be resolved by incorporating lessons learned from the Pilot into future system installation procedures, system design, and equipment selection in any future version of the BES.

Two key questions remain with the BES. First, while it's clear that the BES can eliminate the impacts of upstream AC momentary and sustained outages, it is not clear whether the BES itself can be designed to perform at a similar or greater level of reliability than the AC underground system it replaces. Second, it is not clear whether the value of other attributes of the BES such as reduction in losses or deferred transmission, distribution, or generation capacity needs will equal or exceed the capital and operating costs of the BES.

COST COMPARISON

Tampa Electric and BlockEnergy™ conducted a quantitative analysis of the cost to serve residential customers of similar characteristics (single family home with an average demand of 7.5 kW) using Tampa Electric's AC system. BlockEnergy™ developed a model that produced a 30-year Cumulative Present Worth of Revenue Requirements ("CPWRR") cost of about $52,200 per average residential home.

Tampa Electric developed a similar model for the BES, incorporating the total estimated capital costs of the BES ($4.7 million)[2], battery replacements for the CEP and BlockBoxes in years 11 and 21, actual O&M costs incurred by BlockEnergy™ during the Pilot period, and forecasted O&M costs for the remaining years. The total CPWRR for the BES is estimated to be $247,649 per Pilot home.

Table 11 provides the cost comparison between the BES and AC system investments.

Cost Comparison[3]	AC System (Cost per Home 2023 $)	BES (Cost per Home 2023 $)
Generation (G) Capacity	$21,600[4]	$155,800 (G&D)
Distribution (D) Capacity	$15,600	
Transmission(T) Capacity	$4,600	N/A
Fuel, O&M and T&D Losses	$8,000	$91,849
Storm Hardening	$2,400	$0
Total Cost per Home	$52,200	$247,649

Table 11: Cost Comparison

[2] This estimated capital cost is the cost that BlockEnergy™ incurred to build the BES system. It does not represent the discounted cost that Tampa Electric paid for the BES.

[3] Estimates do not include costs such as fuel, other cost recovery clauses, or other operating costs.

[4] Pro-rata cost to build next available unit.

SECTION III - PILOT UNWINDING & CUSTOMER IMPACT

CLOSING OUT THE PILOT

Tampa Electric completed the decommissioning and dismantlement of the Pilot assets. The company had three objectives for the Pilot decommission process, including: 1) remove all BES equipment from the 37 homes and remediate the yard and roof, if necessary; 2) remove the CEP and secure the dog park; and 3) transfer ownership of the PV System to the Pilot customers and convert the 37 homes to net metering. Tampa Electric contracted with a third-party vendor, SolarSource, to assist with this conversion.

I. BES Equipment Removal & Net Metering

Tampa Electric worked with BlockEnergy™ to remove all Blockboxes and the corresponding equipment from the Pilot homes. The company allowed Pilot customers to decide whether they wanted to keep the rooftop solar panel system. If the customers elected to keep the rooftop solar panel system, then the customers would move forward with the net metering conversion. Should the customers choose to remove the PV system, then BlockEnergy™ committed to restore their roofs. All 37 customers elected to retain their PV system, and 13 of the 37 customers elected to keep the Blockbox™ pads. For the remaining customers that chose to remove the pads, the company remediated their lawns and laid new sod.

All Pilot customers received a Bill of Sale to take ownership of the PV System. Customers were billed $1 for the PV System and an additional $1 for the Blockbox™ pads. Once the customer executed the Bill of Sale and paid the associated fee, customers were able to execute Tampa Electric's Standard Interconnection Agreement for net metering customers. SolarSource worked with these customers on the conversion of their rooftop system.

II. CEP Equipment

BlockEnergy™ agreed to dismantle the CEP and restore the land to its original state as part of the decommissioning and dismantling of Pilot equipment. BlockEnergy™ removed all equipment from the CEP as well as the CEP walls and gates. BlockEnergy™ also provided the Homeowners Association ("HOA") funding to fully enclose the existing dog park. This CEP-related work is complete as of the date of this Final Report.

CUSTOMER COMMUNICATION

Once Tampa Electric decided to discontinue the Pilot, Tampa Electric notified the Pilot customers. Tampa Electric and BlockEnergy™ collaborated closely through strategic planning sessions and community engagement efforts to ensure a smooth transition from the Pilot. Multiple in-person meetings—including two community town halls, multiple HOA meetings, and a Q&A session— provided residents with clear communication, updates on the decommissioning process, and guidance on solar system ownership and net metering. Resident feedback has been overwhelmingly positive, with appreciation expressed for transparency, professionalism, and personalized support.

Tampa Electric informed Pilot customers of key milestones throughout the decommissioning process. Communication covered the completion of all rooftop PV system transfer of ownership agreements, pad transfers, and interconnection documentation for 37 residents, as well as the removal of BlockEnergy™ infrastructure and restoration of the affected landscaping. As of October 3, 2025, the Pilot equipment has been fully decommissioned, and all customers have been converted to net metering customers.

CONCLUSIONS

Tampa Electric generally considers the Pilot a success. The technology met the overall objectives set for the Pilot by 1) providing high levels of reliability due to the isolation of the microgrid from the AC distribution system, while 2) integrating very high levels of renewable solar, and 3) not adding additional burden to existing transmission, distribution, and generation infrastructure during peak system periods. DC microgrid technology that includes distributed renewable generation has the potential to provide much higher levels of reliability and resilience along with very high renewable energy content. While this early version of the technology had equipment capacity limitations, those can likely be resolved in future BES system designs. The O&M costs for the Pilot technology were more expensive compared to costs to operate and maintain the Pilot homes from the AC distribution system. The long-term ownership benefits of that technology did not exceed the total costs of the Pilot; future development of the technology applied at a larger scale could provide these benefits at a reduced cost. Most importantly, customers who had the BES installed at their home were very satisfied with the reliability and resiliency and their overall experience during the term of the Pilot.