The United Illuminating Company

Five-Year Capital Investment Plan Report

Exhibit UI-CIP-7

Docket No. 24-10-04

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I. Introduction

On an annual basis, The United Illuminating Company ("UI" or "The Company") utilizes a ten-year capital forecasting process to determine the levels of investment necessary to maintain safe and reliable operations, serve new customers, and replace aging infrastructure. In developing the capital plan, the Company assesses potential new customer connections, system upgrade needs, and aging infrastructure replacement. The result is a comprehensive five-year capital investment program (the "Five-Year Capital Investment Plan" or "Plan") that includes customer-related projects, infrastructure improvement and replacement projects, and general system operations programs. The Plan also includes the capital investments needed to support other core business functions such as information technology, customer service, facilities, cybersecurity and physical security.

In this report, the Company provides the needs assessments, costs, and benefits of the projects and programs comprising their major categories of capital investments for a five-year period, in conformance with the Public Utility Regulatory Authority's ("PURA") standard filing requirements,[1] including the 12-month rate year ending October 31, 2026. The Plan contains eight major categories of investments: Capacity, Customer, Reliability, Infrastructure Replacement (Substations and Distribution System), Resiliency, System Operations, Business Effectiveness, and Modernization. The Company's capital plan investments by category for the five-year period 2024 – 2028 are as follows:

[1] R.C.S.A. §16-1-53a, Standard Filing Requirements for Large Public Utility Companies ("SFRs"),

Five-Year Capital Plan (2024 – 2028)

Description	2024	2025	2026	2027	2028	Total
Customer						
New Connections	13,765,538	10,901,530	9,621,469	7,573,342	7,621,918	49,483,798
State & Municipal	(1,923,342)	9,108,639	4,834,483	5,135,892	5,279,939	22,435,612
Metering	5,452,651	8,274,854	12,313,719	5,852,424	7,442,478	39,336,125
Customer Lighting	2,006,206	911,489	7,883,655	1,419,506	1,445,191	13,666,046
Customer Service Technology	2,165,727	4,544,495	9,234,631	10,236,698	9,003,348	35,184,899
Third Part Pole Attachments/Replacements	9,091,785	10,176,129	10,651,530	10,888,835	11,130,887	51,939,166
Other Customer Programs	1,527,523	1,344,525	1,398,306	1,454,238	1,667,506	7,392,098
Total Customer	**32,086,088**	**45,261,661**	**55,937,793**	**42,560,936**	**43,591,267**	**219,437,745**
System Reliability						
Capacity						
Feeder Transfers	-	-	441,301	2,647,804	1,323,902	4,413,007
Substation Load Relief	-	-	593,167	1,618,384	1,082,190	3,293,741
Total Capacity	**-**	**-**	**1,034,468**	**4,266,188**	**2,406,093**	**7,706,749**
Corrective Reliability						
Reliability Improvement projects	2,711,032	2,209,896	3,499,492	3,557,335	3,616,336	15,594,091
Total Corrective Reliability	**2,711,032**	**2,209,896**	**3,499,492**	**3,557,335**	**3,616,336**	**15,594,091**
System Resiliency						
Step Down Bank Removals	677,847	137,643	3,233,673	3,584,250	3,550,008	11,183,421
Coastal Substations	6,191,646	-	-	-	-	6,191,646
Substation Getaways	170,671	-	-	-	-	170,671
Other System Resiliency	(391,394)	-	519,832	1,901,458	1,873,750	3,903,646
Total System Resiliency	**6,648,769**	**137,643**	**3,753,504**	**5,485,707**	**5,423,759**	**21,449,383**
Infrastructure Replacement - Substations						
Substation Rebuilds	3,913,573	7,468,607	14,112,271	10,669,562	10,744,120	46,908,132
Substation Removals	701,715	-	1,809,517	-	-	2,511,232
Total Infrastructure Replacement - Substations	**4,615,289**	**7,468,607**	**15,921,788**	**10,669,562**	**10,744,120**	**49,419,365**
Infrastructure Replacement - Distribution System						
Splice Chambers	647,251	433,479	6,748,915	10,255,171	8,669,590	26,754,406
Transformer Replacement	7,492,377	383,938	4,518,514	4,608,884	4,701,062	21,704,775
Cable Replacement	43,776	-	-	6,702,651	1,002,687	7,749,114
Pole Replacement	659,537	840,950	3,747,936	3,822,894	3,899,352	12,970,669
Network Infrastructure	3,715,601	1,318,524	10,417,396	9,745,568	10,988,269	36,185,358
Ground Mounted Equipment	1,058,607	2,008,463	4,031,732	4,349,140	3,919,048	15,366,991
Other Infrastructure Replacement	159,684	247,549	1,144,128	1,167,010	1,190,350	3,908,721
Total Infrastructure Replacement - Distribution System	**13,776,832**	**5,232,904**	**30,608,620**	**40,651,319**	**34,370,358**	**124,640,034**
System Operations						
Operations	18,078,093	10,190,881	9,707,055	9,742,264	9,755,048	57,473,340
Compliance & Safety	2,774,644	2,162,845	938,993	969,513	1,004,652	7,850,646
Fleet	2,559,790	2,853,482	5,671,211	6,885,476	7,324,750	25,294,708
Facilities	778,911	2,426,575	2,059,972	1,248,710	590,595	7,104,763
Total System Operations	**24,191,437**	**17,633,782**	**18,377,231**	**18,845,962**	**18,675,045**	**97,723,458**
Business Effectiveness & Evolution						
Business Effectiveness						
Information Technology	4,564,119	4,900,352	8,572,599	8,440,470	10,689,458	37,166,998
Operational Technology	2,005,180	2,192,166	2,376,963	1,064,750	1,827,472	9,466,532
Other Business Effectiveness	2,624,413	826,341	210,349	214,998	219,646	4,095,747
Total Business Effectiveness	**9,193,712**	**7,918,859**	**11,159,910**	**9,720,219**	**12,736,577**	**50,729,277**
Modernization						
Electric Vehicle	212,297	427,800	427,800	441,300	427,800	1,936,997
Distribution Automation	39,543	-	-	3,825,526	4,634,932	8,500,002
Energy Storage	-	2,009,917	6,382,254	5,250,836	3,037,524	16,680,531
Other Modernization	1,058,633	1,830,845	310,412	-	-	3,199,890
Total Modernization	**1,310,474**	**4,268,562**	**7,120,466**	**9,517,662**	**8,100,256**	**30,317,420**
Other	(9,308,663)	-	-	-	-	(9,308,663)
Total Capital Expenditures	**$ 85,224,970**	**$ 90,131,915**	**$ 147,413,271**	**$ 145,274,891**	**$ 139,663,809**	**$ 607,708,856**

A. Customer

Customer Investments (2024 – 2028)

Description	2024	2025	2026	2027	2028	Total
Customer						
New Connections						
Energy Storage						
Verogy Solar Mill Rd No Haven	35,252	-	-	-	-	35,252
Energy Storage Total	35,252	-	-	-	-	35,252
300 State St New Cust Serv	1,464,477	2,847,473	-	-	-	4,311,950
848 Chapel St Vault NH - CAP	2,089,625	-	-	-	-	2,089,625
Allco PV Park Ln	152,316	-	-	-	-	152,316
Applegreen RT15 EV Charging - Orange	-	382,224	897,907	911,010	803,001	2,994,142
Bullard Haven Tech H.S.	-	326,375	-	-	-	326,375
CA 2284 49 Coon Hollow Rd Derby	(269,351)	-	-	-	-	(269,351)
Steelpointe Harbor (West Block Ph1)	-	1,082,925	-	-	-	1,082,925
UI - Ind/Comm CAP	6,223,020	2,343,696	5,447,409	3,788,187	3,930,706	21,733,018
UI - New Haven Coliseum 1A	1,157,081	-	-	-	-	1,157,081
UI - New Haven Coliseum 1B & 1C - CAP	350,017	767,225	386,874	-	-	1,504,116
UI - Res Line CAP	2,173,004	2,254,093	2,306,111	2,306,111	2,306,111	11,345,430
UI - Serv Conn	390,098	596,444	583,169	568,035	582,100	2,719,846
USPS EV Charging Station	-	301,075	-	-	-	301,075
Total New Connections	13,765,538	10,901,530	9,621,469	7,573,342	7,621,918	49,483,798
State & Municipal						
Congress Bridge (State Proj)	26,271	-	-	-	-	26,271
Govt Hwy - Constitution Boulevard Extension	-	305,068	-	-	-	305,068
Govt Hwy - Lafayette Circle Reconfiguration	-	119,264	601,095	1,171,644	1,191,731	3,083,734
Govt Hwy - Rt1 Road Widening	-	738,487	-	-	-	738,487
Govt Hwy - Stratford Ave & Honeyspot Rd Streetscape	-	486,671	-	-	-	486,671
Govt Hwy - TIME-1 Metro-North - Longbrook Ave, Startford	-	2,996,860	-	-	-	2,996,860
Govt Hwy - TIME-1/ TIME-3 Metro-North Corridor Improvement	-	-	950,989	950,989	950,989	2,852,968
New Congress Bridge Ph 1B & 6	11,327	3,121,052	-	-	-	3,132,379
State #138-245 Bdg Replace Rt1 and MN	(3,190,783)	-	-	-	-	(3,190,783)
State 100-175 Sackett Point	49,628	-	-	-	-	49,628
State 36-184 Rt 34 Main St Derby	1,256,959	-	-	-	-	1,256,959
State 36-184 Rt 34 Main St Derby_V2	(1,965,252)	-	-	-	-	(1,965,252)
UI - Gov't HW CAP	1,442,977	829,339	2,749,097	2,470,505	2,584,824	10,076,741
UI - Gov't HW Minor Cap	445,530	511,898	533,302	542,754	552,396	2,585,880
Total State & Municipal	(1,923,342)	9,108,639	4,834,483	5,135,892	5,279,939	22,435,612
Metering						
F101370 METERS ELECTRIC DISTRIBUTION	(1,446,431)	-	-	-	-	(1,446,431)
Meter Tools & Equipment	68,623	87,269	89,015	90,795	92,611	428,313
UI - CAPEX Meters	6,830,458	8,187,585	12,224,704	5,761,629	7,349,867	40,354,243
Total Metering	5,452,651	8,274,854	12,313,719	5,852,424	7,442,478	39,336,125

Description	2024	2025	2026	2027	2028	Total
Customer Lighting						
Hamden LED streetlights	-	-	5,352,558	-	-	5,352,558
Private Area Lighting LED Hamden PAL	-	-	1,001,545	-	-	1,001,545
UI - Street Lght CAP	2,006,206	911,489	1,529,552	1,419,506	1,445,191	7,311,943
Total Customer Lighting	2,006,206	911,489	7,883,655	1,419,506	1,445,191	13,666,046
Customer Service Technology						
CapEx Software Subscriptions	-	168,347	223,430	231,600	240,178	863,555
Bill Print Redesign - UIL	297,755	-	-	-	-	297,755
Bill Print Vendor Change	43,665	-	-	-	-	43,665
Customer Communications Platform RFP	-	-	-	226,270	-	226,270
Customer Experience Enhancements	-	-	1,684,959	1,865,128	1,992,290	5,542,377
Customer Service Generative AI	-	-	248,423	248,423	-	496,847
Digital Customer 360 Analytics	-	-	348,291	834,966	437,115	1,620,372
Digital Tech Stack Lifecycle and Upgrades	-	101,808	96,103	105,713	116,285	419,910
Energy Manager Enhancements	-	-	609,032	220,510	-	829,543
Energy Manager Platform RFP	-	-	-	82,280	-	82,280
eQuality Management System (QMS)	-	-	291,149	137,028	-	428,177
IDP Solution (OKTA) for Customer Sites & Apps	-	205,072	101,717	111,889	111,889	530,568
New IVR and Voice Solution	249,608	646,444	210,048	210,048	210,048	1,526,197
Orchestration Platform - Customer Journey	-	-	-	207,634	-	207,634
RPA Customer Service	-	119,084	119,084	215,047	219,348	672,562
S/4 HANA Implementation	10,767	2,098,405	4,356,173	5,540,160	5,676,195	17,681,701
UI - Green Button Connect	-	-	946,220	-	-	946,220
UI - Net Metering Changes	588,845	636,024	-	-	-	1,224,870
UI CX Digital Journey	786,344	-	-	-	-	786,344
UI EDB Customer Journey Redesign	(151,110)	-	-	-	-	(151,110)
UI Energy Manager	70,208	22,579	-	-	-	92,788
UI EV Regulatory Rate Requirements	175,298	449,407	-	-	-	624,704
Workforce Management Dashboard Improvements	-	97,324	-	-	-	97,324
Total Customer Service Technology	2,165,727	4,544,495	9,234,631	10,236,698	9,003,348	35,184,899
Third Part Pole Attachments/Replacements						
UI - Make Ready CAP	9,091,785	10,176,129	10,651,530	10,888,835	11,130,887	51,939,166
Total Third Part Pole Attachments/Replacements	9,091,785	10,176,129	10,651,530	10,888,835	11,130,887	51,939,166
Other Customer Programs						
Derby Cap	96,255	-	-	-	-	96,255
Muni Portal Refresh	-	-	-	-	155,098	155,098
Surge Protection	106,090	75,625	78,650	81,796	85,068	427,228
Water Heater lease	1,325,179	1,268,900	1,319,656	1,372,442	1,427,340	6,713,517
Total Other Customer Programs	1,527,523	1,344,525	1,398,306	1,454,238	1,667,506	7,392,098
Total Customer	**$ 32,086,088**	**$ 45,261,661**	**$ 55,937,793**	**$ 42,560,936**	**$ 43,591,267**	**$ 219,437,745**

The capital investments in the Customer category are primarily for new service connections, state and municipal work, metering, customer lighting, third-party pole attachments, customer service technology and other customer programs.

1. New Connections

With regard to new connections, localized demand growth will always exist and will drive the need for investments in infrastructure to support this dynamic. Residential and commercial customers routinely open new accounts, close old accounts, and move within UI's service territory. In some cases the net change in electric demand is zero at the system level, but often there is a need to provide additional facilities at the customer location at the circuit level. In addition, UI supports a number of municipal revitalization and redevelopment efforts in downtown and urban areas within its service territory. This work often includes upgrading older buildings to mixed use to accommodate residential apartments, restaurants, and other

commercial or light industrial uses. These types of projects drive customer demand, which in turn drives investment in the distribution system to upgrade existing services.

2. State and Municipal

Investments to support State and Municipal projects include constructing, expanding, replacing, or relocating electric infrastructure assets associated with state and municipal highway and road improvements. These improvements can range in scope from smaller, routine intersection and traffic signal upgrades to larger scale road widenings or bridge rebuilds, which often require significant modifications to the UI distribution system. Since 2021, several larger scale state and municipal projects have commenced in the UI service territory that will require significant investment through 2025 and beyond.

3. Metering

The Company also has a capital program for metering. The program is necessary to provide meters for new customers, replacement of failed meters, and upgrades of AMR meters to AMI.

The Company achieves cost efficiencies in purchasing meters by conducting three-year framework agreement procurement cycles. A framework agreement is a contract with a vendor to provide standard services for a defined period of time. The agreement defines the unit pricing for such services and purchase orders are issued against the framework agreements for specific scopes on projects. This approach enables the Company to leverage Avangrid's larger purchasing power, in that the procurements solicit vendor bids for framework agreements based on quantities that include UI's affiliates in New York and Maine, which leads to more competitive unit pricing.

The Company's Final AMI Plan, required in PURA's Decision dated January 3, 2024, is being presented as Exhibit UI-CIP-8. As outlined therein, the Company originally planned to complete AMI meter deployment by year-end 2024 (at approximately 90% as of July 31, 2024), but will need to extend that timeline to year-end 2026 given reduced funding approved in the 2022 Rate Case Final Decision along with a considerable number of failures in the existing AMI meter population due to a component defect combined with a significant increase in AMI meter order lead times since 2020. The Company anticipates receiving regulatory support for its final AMI plan, and deploying 100 percent of AMI meters by year end 2026.

4. Third Party Attachments

The third-party pole attachment application process and the associated work operations that support the process are mandatory. Third Party Attachment companies that have been certified by PURA to offer wireline or wireless services and have also executed Pole Attachment License Agreements with United Illuminating may submit applications to attach to poles. The PURA encourages broadband expansion. PURA has established compliance timeframes for the engineering and construction phases of the third party pole attachment application process. Failure to allocate adequate resources and complete the application process milestones as mandated may result in penalties.

The processing of these applications includes a field survey of the poles, collection of the survey data, analysis of existing conditions of the pole, analysis of conditions with the additional attachment, and development of a design solution that will provide space for the new attachment. These design solutions vary based on the current state of a pole prior to attachment. The majority of the resulting solutions are to bring the existing conditions into National Electric Safety Code (NESC) compliance. The amount of make-ready construction work required can vary based on the location of a pole and the number of existing attachments on a pole.

Funding requirements for this program are volume sensitive and highly volatile. Attachers do not typically share forecasts years in advance of their build outs. The Company conducts quarterly meetings with all Attacher companies and typically will receive six months to one year of forecast. These forecasts can change quarter to quarter, as Attacher companies business plans change.

5. Customer Lighting

This is an on-going program to install/replace/relocate/remove existing municipal streetlighting and customer private area lighting. The scope includes lights that are fed from overhead and underground, secondary and service wire work, poles and light heads and civil work for bases and conduit and miscellaneous hardware. A majority of the budget is used to repair existing infrastructure and is corrective/reactive in nature. The Company also has a project planned to convert the streetlights in Hamden from Low pressure sodium to LED. This can result in significant savings for the town and a reduction in energy usage. Hamden is the last UI town to approve conversion to LED due to a customer group opposing the move. The town has now indicated a desire to move forward.

6. Customer Service Technology

This category includes technology investments in customer systems that support day-to-day business such as customer billing systems, as well as initiatives targeted at improving the customer experience. These investments are primarily:

- **S/4 HANA Implementation**

UI's current SAP systems, ECC and CRM Suite on HANA, are reaching end of support at the end of 2027, after the implementation of the SAP HANA upgrade project. The existing SAP is based on the product that was developed in 1992 with different updates. In 2015, SAP released the new version of their software S/4HANA that simplifies the solution to accommodate the business processes to the new capabilities that the in-memory HANA database is allowing. This is a completely new product that has been evolving since then, and it will be the only SAP supported product starting on January 2028.

This project is not only a technical upgrade, as it is a completely different product, but is also an opportunity to accommodate the business processes to the newest technology and best practices, as the new product requires a re-implementation of the business processes. During the last part of 2023 UI, together with the rest of Avangrid´s operating companies, began conducting an assessment to determine the best strategy and to define the journey to migrate to SAP S4HANA. Ultimately, this effort will achieve efficiencies by a streamlined and harmonized processes for moves, address validation, AMI for meter reading processes, and dunning processes.

- **Customer Experience Enhancements**

The high level objectives of this program are to provide our customers with an improved customer experience and to increase contact satisfaction. We will also increase digital engagement which typically has a higher CSAT (Customer Satisfaction) than traditional contact methods; this will also have an impact on cost to serve by reducing the need for customers to use more expensive contact methods.

These improvements will include several digital and operational improvements as well as focusing on operational efficiencies including automation of non-value add tasks. There will also be several ongoing new initiatives to support our employees and customers. The scope of these improvements will reimagine how customers interact with the company's most critical touchpoints. 2023 JD Power and Associates residential satisfaction studies and the Voice of the

Customer (VOC) program have highlighted the need to further develop key customer experiences. Through the development of a matrix, key experiences for redesign have been identified and prioritized based on the following criteria: customer satisfaction, cost reduction, strategic value, and complexity.

These experiences will include:

- New connections phase 2
- Redesign the Outage Experience Phase 1
- Outage experience phase 2
- Redesign the billing end to end experience
- Redesign the Move-In/Move-Out experience Phase 2
- Redesign the App experience
- Redesign the High Bill/High Usage Journey (HBHU)
- Redesign Customer Contact experience and strategy (call reduction)
- Redesign the end-to-end Payments experience (vendor replacement)
- Redesign the end-to-end EBILL experience (vendor replacement)
- Journey Stability monitoring and improvements (Operations teams)
- Webchat/chatbot implementation, API (Application Programming Interface) enhanced
- Redesign the end-to-end debt collection experience

The Customer Experience Enhancements Program is rooted in an iterative process called Design Thinking. Design Thinking is used by some of the world's largest brands, including Bank of America, T-Mobile, Airbnb, and Apple. Through this process, each OpCo will go through five phases per experience to understand the end user and identify solutions that will result in new end-to-end experience maps and customer-tested prototypes for IT production and implementation.

- **Digital Customer 360 Analytics**

This customer analytics program presents business insights that help UI make data driven decisions to improve customer service levels and to improve operational efficiency. Examples include first call resolution rate (FCR), Customer 48 Hour Login Rate, reduced customer complaints, and higher engagement with digital channels. This program also helps to remove manual reporting tasks. The scope includes building data pipelines from various data sources like Web, Mobile App, AMI, and SAP into the backend Digital platform to support the development and adoption of new digital tools.

Understanding metrics such as the FCR for customer service agents will help measure agents' efficiency and devise improvement measures to be taken to improve the rate. FCR helps gauge customer satisfaction: the higher the rate, the more satisfied the customers tend to be. This is in turn will also reduce operational costs by lowering repeat calls.

The "48 hour login after call" metric will help the business understand if the digital channels deployed are effective or not.

- **New IVR and Voice Solution**

This program covers the costs associated with upgrading and enhancing our Contact Center as a Service (CCaaS) platform which includes our Interactive Voice Response (IVR) system and call flow software. It also includes the budget for our software licenses for the CCaaS which meet the thresholds and qualifications for capitalization.

The current Genesys IVR platform is reaching end of life by Mid 2025. Future IVR platforms are SaaS-based platforms. Upgrading these services will enable a unified call flow, better customer experience and cost-effectiveness through improved self-service, right channeling contacts and enhancing agent efficiency.

- **UI-Net Metering Changes**

This projects will implement SAP and other system enhancements to enable appropriate billing and crediting of customers who install solar utilizing UI's Netting and Buy-All Tariff options:

1) Enhance SAP to provide a method to provide an on-bill, volumetric non-bypassable charge to customers who install solar as part of the new renewable energy tariffs.

2) RRES (Residential Renewable Energy Solutions) and NRES (Nonresidential Renewable Energy Solutions) functionality to enable existing solar customers to add on additional solar through the RRES and NRES programs using the Netting configuration and tariff.

7. Other Customer Programs

This category includes the Company’s Surge protection and Water heater lease Programs The Surge protection program is a tariffed program in Connecticut, where participating UI customers pay a monthly fee for the use of a meter mounted surge protector and/or transfer switch. This is a regulated program and UI is responsible for installation, removal, and maintenance of this hardware.

Through the Water Heater lease program, customers are able to rent water heaters and conversion burners for a monthly fee. UI has submitted a phase-out plan for this program, however until such a plan is approved, UI is still contractually obligated to repair and replace assets where already deployed in the field. This program covers the capital costs to replace units in this scenario.

B. Capacity

Capacity Investments (2024 – 2028)

Description	2024	2025	2026	2027	2028	Total
Capacity						
Feeder Transfers						
Circuit 2683 Load Relief & Circuit 2688 Improvements	-	-	441,301	2,647,804	1,323,902	4,413,007
Feeder Transfers Total	-	-	441,301	2,647,804	1,323,902	4,413,007
Substation Load Relief						
UI Comprehensive Area Studies	-	-	593,167	1,618,384	1,082,190	3,293,741
Substation Load Relief Total	-	-	593,167	1,618,384	1,082,190	3,293,741
Total Capacity	**$ -**	**$ -**	**$ 1,034,468**	**$ 4,266,188**	**$ 2,406,093**	**$ 7,706,749**

The Company's planning process examines regional capacity on the distribution system and develops projects to optimally utilize the available capacity at each substation to serve growing customer demand. Given that the Company is forecasting only a modest growth in demand over the next decade, and these projections are not expected to surpass the all-time peak load on the distribution system, the focus of future capital investments to address capacity demand on the distribution system is primarily on localized demand growth at the substation and circuit levels. The necessary capacity investments mainly involve distribution load transfers between area substations and circuits with sufficient capacity. The Company does not expect to require new substations or substantial substation expansions to address capacity needs over the next ten years, although the capital plan includes several substation rebuild projects in the categories of Infrastructure Replacement and System Resiliency, as discussed below.

C. Corrective Reliability

Corrective Reliability Investments (2024 – 2028)

Description	2024	2025	2026	2027	2028	Total
Corrective Reliability						
Reliability Improvement projects						
Reliability Improvement TDRP	484,044	391,156	398,979	406,959	415,098	2,096,236
UI - Elec Better CAP	1,159,452	797,602	1,999,517	2,039,508	2,080,298	8,076,378
UI - Subst Better CAP-Non PTF	1,067,536	1,021,138	1,100,995	1,110,869	1,120,940	5,421,478
Reliability Improvement projects Total	2,711,032	2,209,896	3,499,492	3,557,335	3,616,336	15,594,091
Total Corrective Reliability	**$ 2,711,032**	**$ 2,209,896**	**$ 3,499,492**	**$ 3,557,335**	**$ 3,616,336**	**$ 15,594,091**

The corrective reliability investments are those planned to address identified reliability performance issues. The Main programs and projects in this category are as follows:

- **TDRP Reliability Improvement**

From a planning or programmatic perspective, the Company has in place a number of corrective measures to address specific conditions that are detrimental to distribution system reliability. For example, the Company annually develops and executes corrective action plans in accordance with the expectations outlined in PURA's final decision in Docket No. 17-12-03RE08 – Section II.B.3.c.iii. Targeted Improvements of Reliability: Worst-Performing Circuit Program 2.0. The new process in which the Worst-Performing Circuit Program Lists are developed is based on a tiered prioritization. Tier 1 circuits are determined based on the worst performing CEMI-7 and CELID-9 circuits using both all outages and non-excluded outages that occurred during the July-June range in accordance with PURA's expectation to use the more customer-centric CEMI and CELID metrics to determine the first level of system reliability improvement. The Tier 2 circuits are identified based on the worst performing SAIFI and SAIDI (minutes) using the same July – June range as the Tier 1 circuits; however, the Tier 2 lists only use the non-excludable outages in the calculations. The top worst performing 4 percent of circuits are selected from both the Tier 1 and Tier 2 (with special attention paid to circuits with performance that is 250% or greater above the system's blue-sky SAIFI and SAIDI) lists. These circuits are the basis of the Company's remediation plans, with priority given to the Tier 1 circuits.

- **Betterments**

This program includes (1) UI-Elec Betterment CAP – Distributions betterments and (2) UI-Substation Betterments CAP – Substation betterments.

- <u>Distribution Betterments</u>:

The Company monitors and analyzes outages and equipment failures to identify trends that may be negatively impacting reliability. When warranted, the Company develops initiatives to reverse or minimize further negative impacts. Preventive actions provide the benefit of reducing, and in some cases eliminating, the risk of future outages for certain failure modes. This category also includes Emergency work templates for problems and repairs found and made in the field. Make ready work for URD construction.

- <u>Substation Betterments:</u>

The work done under this program is generally corrective/reactive in nature. Whenever there is an equipment failure that is capital in nature this program is used in order to replace the failed equipment. It also includes additional planned actions such as:

- Control Rooms HVAC systems replacement or upgrades.
- Batteries replacement due to aging conditions.
- Replacement of aged breakers where asbestos has been found emanating from the breaker into the work environment.

D. Infrastructure Replacement – Distribution System

Infrastructure Replacement – Distribution System Investments (2024 – 2028)

Description	2024	2025	2026	2027	2028	Total
Infrastructure Replacement - Distribution System						
Splice Chambers						
Chapel St - between State and Temple (NH)	-	-	2,653,773	1,769,182	-	4,422,956
D SC Rebuild - Goffe St to Sperry St NH	212,671	-	1,733,918	1,733,918	1,733,918	5,414,424
D-SC Rebuild-Kings Hwy SC & I95	-	-	-	872,237	-	872,237
Old Wallace Demos and Paving	8,076	-	107,130	678,080	-	793,286
UI - Splice Chamber Rebuilds CAP	426,504	433,479	2,254,093	5,201,754	6,935,672	15,251,503
Splice Chambers Total	647,251	433,479	6,748,915	10,255,171	8,669,590	26,754,406
Transformer Replacement						
F101368 LINE TRANSFORMERS ELECTRIC DISTRIBUTION	7,171,899	-	-	-	-	7,171,899
UI - Transformer CAP	320,478	383,938	4,518,514	4,608,884	4,701,062	14,532,876
Transformer Replacement Total	7,492,377	383,938	4,518,514	4,608,884	4,701,062	21,704,775
Cable Replacement						
Rail Bridges Cable Removal Program	-	-	-	-	1,002,687	1,002,687
Sackett Point Rd – AMTRAK Core Boring UH-U0000531	43,776	-	-	6,702,651	-	6,746,427
Cable Replacement Total	43,776	-	-	6,702,651	1,002,687	7,749,114
Pole Replacement						
UI - Line Inspect (DLI) CAP	659,537	840,950	3,747,936	3,822,894	3,899,352	12,970,669
Pole Replacement Total	659,537	840,950	3,747,936	3,822,894	3,899,352	12,970,669
Network Infrastructure						
808 Chapel Street Network Vault	1,637,712	-	-	-	-	1,637,712
855 Main St - Office to Condo	-	276,550	-	-	-	276,550
L241 Network Vault Rebuild New Haven	16,797	-	-	635,915	4,210,552	4,863,264
L245 Church St Network Vault Rebuild	-	-	-	-	606,871	606,871
L266 New Haven Network Vault Rebuild	4,154	-	555,794	2,520,778	-	3,080,726
L855 Bpt Network Vault Rebuild	241,693	606,470	3,351,813	-	-	4,199,976
L874 (L1844) Rafael Netw Vault Bridgeport_V2	876,565	-	-	-	-	876,565
L874 Rafael Network Vault Bridgeport	176,615	-	-	-	-	176,615
Network Vault Roof Replacement	-	-	1,036,863	1,055,173	575,283	2,667,319
Radial Vault Replacement Program	-	-	1,004,686	1,011,257	1,017,828	3,033,770
UI - Network Infrastructure Pgm CAP	762,066	244,171	249,055	254,036	259,116	1,768,444
UI Network - VisioBlock install	-	191,333	593,840	605,716	617,831	2,008,720
UI Network Communications Program	-	-	3,625,346	3,662,693	3,700,788	10,988,827
Network Infrastructure Total	3,715,601	1,318,524	10,417,396	9,745,568	10,988,269	36,185,358
Ground Mounted Equipment						
Cage Replacement Program	-	-	383,438	346,000	350,493	1,079,930
G&W Switch Repalcement Program	-	-	449,252	458,237	467,222	1,374,710
Ground Level Inspection	411,249	223,346	929,091	947,673	966,627	3,477,985
Mark III - Sikorsky	-	-	556,438	-	-	556,438
Switchgear Replacement Program	408,352	1,785,117	1,204,762	1,732,305	1,254,911	6,385,447
Transclosure Replacement Program	-	-	-	346,000	350,493	696,493
UI - Ground Mounted Equipment CAP	239,006	-	-	-	-	239,006
UI Network - Primary Switch Install	-	-	508,751	518,926	529,305	1,556,982
Ground Mounted Equipment Total	1,058,607	2,008,463	4,031,732	4,349,140	3,919,048	15,366,991
Other Infrastructure Replacement						
Customer Facility Inspections and Repair	108,086	247,549	252,500	257,550	262,701	1,128,385
Spare G&W Reclosers and Controls (UI-U0054)	51,598	-	891,628	909,460	927,650	2,780,336
Other Infrastructure Replacement Total	159,684	247,549	1,144,128	1,167,010	1,190,350	3,908,721
Total Infrastructure Replacement - Distribution System	**$ 13,776,832**	**$ 5,232,904**	**$ 30,608,620**	**$ 40,651,319**	**$ 34,370,358**	**$ 124,640,034**

The capital investments in the Infrastructure Improvement and Replacement category are primarily for expenditures focused on assessing the condition of the Company's distribution system assets and replacing them before failure to mitigate safety risks to employees and the

public related to aging infrastructure. This category includes remediation programs related to aging substation equipment and other distribution facility asset classes and represents a continuation of the programs that UI began in 2005.

UI's Infrastructure Replacement programs are effectively mitigating the safety, environmental, and reliability risks typically associated with aging infrastructure. It is an unavoidable fact that distribution system assets, such as splice chambers and poles, will continually age and deteriorate. The Company's programs are necessary to ensure public and employee safety, which requires a continuous and steady level of investment to replace aging and deteriorating assets. The Company manages its Infrastructure Replacement investment requirements with respect to scope, benefits, and cost. Inspection processes collect asset condition information, which is used to assess the impact of aging infrastructure on UI's system performance. Mitigation and replacement strategies are based on ranking, prioritizing, and tracking action items. Over the long term, UI has maintained a consistent level of investment in this category. The outcome UI's last rate case in Docket 22-08-08 did not provide the funding to execute these programs at historic levels. In this case the Company is requesting the funding to return to the level of investment needed to replace infrastructure

1. Splice Chambers

UI has approximately 3000 underground splice chambers in the system. The installation date for these chambers ranges from the 1900's to present day. More than 60 percent of the in-service chambers were installed prior to the 1960's using brick walls with a brick and rail roof.

UI routinely conducts a field inspection of existing splice chambers and electrical cables. The purpose is to identify structural defects such as wall buckling/cracking, conduit blockage, roof degradation and electrical hazards. The findings of the field review could result in a follow up investigation by the UI Distribution Engineering Department. This process of a field inspection with a follow-up engineering evaluation allows for UI to prioritize and develop a proactive plan for repairing, rebuilding, or replacing the distribution civil infrastructure facilities that have deteriorated with time. When there is the need to replace a civil facility due to structural decay, the replacement is constructed to the current UI Distribution Standards.

Splice chambers along a particular street or in a geographic area are usually installed at the same time and utilized the same construction method. Therefore, the overall structural condition of the splice chambers along a particular street or in a geographic area tends to be similar. The repair, rebuild or replacement of a splice chamber could impact the electrical

facilities contained inside the targeted splice chamber. If there is an impact to the electrical facilities, UI engineering will inspect and evaluate the adjacent splice chambers. The final plan of action would include civil and electrical work.

This program provides the funding to remediate splice chambers whose condition has deteriorated or where working conditions do not meet standards. Over the last 20 years the Company has remediated over 600 splice chambers or half of the population that warrants remediation. The pace of the program targets remediation before failure and is intended to complete the remediation activity over the next 20-30 years.

2. Transformer Replacement Program

The Transformer Replacement Program reduces the occurrence of transformer failures due to overloads and condition and the associated risk to public safety and environmental impact. Transformers that contain or may contain Polychlorinated Biphenyl ("PCB") insulating oils are being removed to avoid the extensive impacts of cleaning up known or suspected PCB oil spills. In addition, this program reduces the overall duration of outages caused by transformer failures by replacing overloaded and deteriorating transformers before they fail in-service. The planned replacement of transformers can be scheduled and coordinated more efficiently than emergency replacements, and replacement transformers will operate more efficiently (with lower electrical losses) than transformers of older designs.

3. Cable Replacement Program

Over the past 20 years, the Company has remediated all of the overhead paper-insulated lead cable, and a significant amount of underground paper insulated lead cable that had been prone to failure. Over the next 5 years the program will focus on remediation of cable attached to DOT and railroad bridges.

4. Pole Replacement Program

This program replaces deteriorated poles identified by the groundline inspection program that do not meet established NESC standards for the amount of solid wood remaining at the base of the pole. Additionally, this program replaces poles identified by the overhead visual inspection program (known as Distribution Line Inspection or DLI) and by UI field personnel performing daily work activities.

This program is necessary to achieve compliance with NESC requirements, which maintains safety for the public, UI employees, and field personnel from any company that may be required to perform work on poles in the UI service territory. The UI distribution system reliability and resiliency are positively impacted from this program, as poles are replaced based on current standards and as clearance and loading analysis determines (which is based on the NESC Northeast wind and radial ice modeling parameters).

There are three sources by which deteriorated poles replacements are identified at UI; Ground Line Inspection (program-based), Distribution Line (Overhead) Inspection (program based), Visual Inspections (observations from field engineering or power delivery crews, non-program based).

1. Groundline Inspection: A groundline inspection cycle is performed on a 10-year cycle for all UI custodian distribution poles. Wood poles in service for greater than 10 years are sounded to determine rot and voids, excavated at ground-line, and bored to determine shell thickness below ground-line. Poles are rejected and identified for replacement based on two criteria; minimum circumference and remaining strength.

    - Minimum Circumference – Circumference is measured at or below groundline, wherever the least sound wood is present. If the effective shell thickness is less than two inches, the pole is rejected.

    - Remaining Strength – Remaining strength is calculated by input of inspection results into standard industry software and through adherence with NESC Rule 260B and Table 261-1 (which states that wood poles and reinforced structure shall be replaced or rehabilitated when deterioration reduces the strength to 2/3 or 66% of strength when installed).

2. Distribution Line Inspection (DLI) - Distribution Line Inspection (DLI) is conducted on a 6-year cycle. This is a detailed visual inspection from the base to the top of the Distribution pole/structure which includes looking at the condition of the: pole, cross arm, insulators, braces, conductors, tie wire, taps, switches, transformers, and other pole-mounted equipment. Poles with significant visible rot, excessive cracking, hollow pockets, or deteriorated tops are identified and reported for replacement.

3. Visual Inspections (poles identified by employees) - Non-program poles are observations reported by field personnel, whereas program poles are inspected cyclically. The criteria

that determines replacement similar to that utilized for Distribution Line Inspection, but may also consider other factors such as the number of customers affected.

5. Network Infrastructure Program

The UI Network Infrastructure Program CAP project consists of the installation of the network monitoring system, fiber optic, network primary switches, replacement of deteriorated network transformers, and network protectors. The network is the most sophisticated type of distribution system since it does not employ a radial power flow concept, but instead relies on the fact that each load receives its power from several parallel paths operating simultaneously. For low voltage networks, the secondary sides of the network transformers are tied together. The transformers are fed from different primary feeders. This type of distribution system is the most reliable, however, it is also the most expensive to implement and maintain. The complexity of such a system also presents many challenges for the operation and protection of its components.

Electric Utilities realize the benefits of connecting two-way communications technologies into the distribution assets. This project provides more reliable and cost-effective service on the distribution grids. UI has installed CM52 network protectors with microprocessor-controlled network relays (MPCV-D) in the underground network vaults within the City of New Haven and the City of Bridgeport. This MPCV-D relays are equipped with communication capabilities that allow remote monitoring and control of the network protector. Currently, UI has no systems in place in the underground network system that can provide the communication link between the grid devices and operators in remote locations. The Company's objective is to analyze several of the available communication technologies in order to determine the solution best suited for this application. Distribution Engineering is tasked with evaluating multiple technologies that would provide UI with ability to get monitoring and control communication to the network protector relays serviced by the Mill River, New Congress, and Broadway substations.

Due to the complexity of this project and the number of network transformers and protectors, there will be multiple phases of implementations, which are detailed below. The project is expected to take five years to complete once construction starts.

The Company has installed CM52 network protectors with a microprocessor-controlled network relays (MPCV-D) in the underground network vaults within the City of New Haven and the City of Bridgeport. The MPCV relays are equipped with communication capabilities that allows remote monitoring and control of the network protector. There are a total of 107 network

transformers and 107 network protectors in the City of New Haven and 58 network transformers and 58 network protectors in the City of Bridgeport. Currently, UI has no systems in place in the underground network system that can provide the communication link between the grid devices and operators in remote locations. This project will provide the communications and remote terminal units to understand the status and condition of key points in the network and alarm the Company in advance of an issue

6. Ground Mounted Equipment Program

The This program involves the remediation of three asset classes: Padmounted Switchgear, Cages and Standup Switch and Fuse Gear

- Padmounted Switchgear

UI has identified that aging S&C Mark III/II Padmount Switchgears are prone to failure. The Mark III Switch Replacement project is to replace all of the deteriorated Mark III/II Switches prior to failure. Mark III switches have an open air design and over time condensation and contaminants can deteriorate the materials inside the gear leading to tracking and insulation failure. G&W switches were designed to be insulated with SF6. This eliminates the environmental moisture and contamination issues but introduces issues around the integrity of the gasketing and SF6. This proactive replacement effort will limit the possibility of customer power outages.

- Cages

UI has identified primary and secondary service points in the supply territory where pole top transformers are installed on concrete foundations and protected by a caged enclosure. This type of construction is referred to as a transformer cage. UI is undertaking a program to inspect these cage locations and modify or remediate existing safety conditions to ensure compliance with the National Electric Safety Code.

- Standup Switch and Fuse Gear

This gear is primarily installed in sensitive locations Hospitals, high rise elderly complex's, large buildings in downtown environments with elevators. While many of the elements that make up the service to these types of buildings have redundancy, cables, transformers, the switchgear itself is a single point of failure and restoration is dependent on solving the problem with the failed gear. This can lead to lengthy impactful outages. There have been two resent

events at the Bella Vista elderly housing complex in New haven and one failure at Milford hospital. This program proactively replaces aging switchgear in poor condition at these sensitive locations

E. Infrastructure Replacement – Substations

Infrastructure Replacement – Substations Investments (2024 – 2028)

Description	2024	2025	2026	2027	2028	Total
Infrastructure Replacement - Substations						
Substation Rebuilds						
ABB LCD relays Replacement Project	91,445	-	-	-	-	91,445
Ansonia - CAP	2,258,138	4,636,650	-	-	-	6,894,788
Old Town SS - CAP Package 2	4,609	-	2,632,748	2,127,555	1,276,533	6,041,445
Old Town SS - CAP Package 3	282	-	-	-	3,890,132	3,890,414
Old Town Substation Rebuild	1,026,848	356,902	11,156,881	8,542,007	5,577,455	26,660,092
Sackett Busway Replacement	532,251	2,475,054	322,642	-	-	3,329,948
Substation Rebuilds Total	3,913,573	7,468,607	14,112,271	10,669,562	10,744,120	46,908,132
Substation Removals						
Tunxis Sub Decommissioning LVSS	47,922	-	-	-	-	47,922
Whitney Sub Decommissioning LVSS UH-U0000005	653,793	-	1,809,517	-	-	2,463,310
Substation Removals Total	701,715	-	1,809,517	-	-	2,511,232
Total Infrastructure Replacement - Substations	**$ 4,615,289**	**$ 7,468,607**	**$ 15,921,788**	**$ 10,669,562**	**$ 10,744,120**	**$ 49,419,365**

The capital investments in the Infrastructure Improvement and Replacement category are Old Town Substation Rebuild, the Tunxis Substation Removal, and the Whitney Avenue Substation Removal. These projects will result in refreshed infrastructure serving the Company's communities.

➢ Old Town Substation Rebuild

The Old Town Substation Rebuild project consists of a full rebuild the Old Town Substation in Bridgeport, CT on an adjacent parcel to the existing substation. The project will include construction of a new control enclosure, 115kV single breaker arrangement with (2) 115KV transmission line interconnections and (2) 115/13.8kV 45/60/75MVA Power Transformers with associated gas circuit breakers. The substation will be designed for future expansion to a four-transmission line, two bay, breaker and one-half arrangement with three power transformers and a future 115kV capacitor bank connection. The project will also include decommissioning of the old existing substation.

The need for the project arose from a set of comprehensive evaluations of the substation which were performed as part of an on-going project at UI to assess the state of transmission and substation infrastructure. This was done to determine the present and future viability of this station. UI commissioned three evaluation studies to be performed: (i) a comprehensive station physical evaluation which included the foundations, perimeter fencing, grounding components, control wiring, conduit and control room; (ii) a condition assessment of the existing short-circuit

adequacy of equipment and bus structures, lightning protection, NESC conformance to clearance requirements and adherence to UI's Design Standards; (iii) a 3D LiDAR survey of the 115 kV yard to evaluate conformance to ANSI, NESC and UI clearance requirements with a focus on the areas surrounding the 115 kV Oil Circuit Breaker and associated disconnect switches.

To mitigate the deficiencies identified in the studies, an in-kind replacement of the substation components and a full rebuild of the substation were evaluated. Due to the operational complexities and associated cost of replacing the substation components in-place, the replacement of the substation on an adjacent parcel was determined to be the lowest cost solution which addressed the deficiencies, and also had less constructability and reliability risks associated with executing the project. The costs reflected in this plan are only representative of those related to the Electric Distribution infrastructure.

- **Old Town Substation Capital Package 2and 3:**

These projects are to build new distribution ductline and cable from the new substation and interconnect with the existing distribution cable infrastructure serving customers. This project provides for two ductlines and associated cable to transfer load from the existing old town substation to the new substation.

- **Ansonia Transformer Replacement**

The primary goal of the Ansonia Transformer Replacement project is to restore normal operational conditions at the Ansonia Substation by replacing Transformer B and the outdated exterior non-segregated busway with a new cable bus system. This initiative aims to enhance the reliability of power delivery to our customers, ensuring they receive consistent and safe electrical service.

The project is necessitated by the recurring gassing issues with Transformer B, which have led to operational disruptions and the deployment of a backup mobile transformer since 2020. These issues indicate that the existing transformer is unreliable and poses a risk to service continuity. Additionally, the recent fault due to moisture permeation on the bus duct highlights the urgent need for infrastructure upgrades to prevent further service interruptions.

The use of a mobile transformer is intended for emergency / temporary installation and the substation transformer needs to be replaced to restore the substation to normal operating conditions, and to make the mobile transformer available for use in the event of emergency at other substations. Additionally, the failures of the busway to due moisture ingress pose

additional risk to system reliability and require replacement. Addressing these issues is critical now, as maintaining operational reliability is essential for meeting customer expectations and supporting the commitment to provide safe and reliable service. Failure to act could result in further outages and increased operational costs, ultimately impacting customer satisfaction.

- **Sackett Busway Replacement**

The Sackett Busway Replacement project will enhance the reliability and safety of Sackett Substation by replacing the existing non-segregated busway with a new cable bus system. This project addresses immediate risks posed by moisture infiltration, which has led to failure of the current system.

The scope of the project involves comprehensive electrical and civil engineering, construction, and commissioning, ensuring a robust installation from the existing transformers to the switchgear building. The need for this project arises from the recent failures of the existing busway, which have necessitated temporary connections to maintain service. A permanent solution is critical to prevent service interruptions and safeguard the reliability of power distribution to customers.

Given the potential for widespread outages, the implementing a new cable bus system now will mitigate risks, enhance operational efficiency, and ultimately benefit ratepayers by ensuring continuous and reliable service.

- **Tunxis Substation Decommissioning**

This project is part of Low Voltage Substation Removal Program. The program objective is to complete the removal of service and retirement of assets associated with all 4.16 kV and 2.4 kV substations on the distribution system due to the age of the equipment and the inability to maintain this obsolete equipment. Tunxis Substation is over 70 years old. Removal of low voltage (4.16kV) substations is accomplished through total conversion of the distribution infrastructure supported by the low substation to 13.8kV. Tunxis Substation is one of two remaining substations left in this program to be de-commissioned.

Tunxis substation was constructed prior in 1952 and is now over 70 years old. The equipment is well past its expected operating life and poses safety and reliability risks to employees and customers. Execution of the project will result in refreshed infrastructure serving the Fairfield community, and will provide additional backup ties at the 13.8 kV level to support restoration during outages.

➢ **Whitney Avenue Substation Removal**

This project is part of Low Voltage Substation Removal Program. The program objective is to complete the removal of service and retirement of assets associated with all 4.16 kV and 2.4 kV substations on the distribution system due to the age of the equipment and the inability to maintain this obsolete equipment. Whitney Avenue substation is over 80 years old. Removal of low voltage (4.16kV) substations is accomplished through total conversion of the distribution infrastructure supported by the low substation to 13.8kV. Whitney Avenue Substation is the last remaining substations left in this program to be de-commissioned.

Whitney Avenue substation was constructed prior to 1940 and is now over 80 years old. The equipment is well past its expected operating life and poses safety and reliability risks to employees and customers.

Execution of the project will result in refreshed infrastructure serving the communities of Hamden and New Haven, and will provide additional backup ties at the 13.8 kV level to support restoration during outages.

F. Resiliency

Resiliency Investments (2024 – 2028)

Description	2024	2025	2026	2027	2028	Total
System Resiliency						
Step Down Bank Removals						
Brookmead Ct SDB removal	-	34,411	355,001	-	-	389,412
Core SDB Cottage P606 Ck3674	-	34,411	451,819	-	-	486,230
Core SDB Dwight St P14848 ck1526	-	-	-	34,411	3,550,008	3,584,419
Core SDB Elizabeth P4806 Ck627	-	-	34,411	1,172,579	-	1,206,989
Core SDB Grove St	662,182	-	-	-	-	662,182
Core SDB Grove St - phase 2	-	34,411	1,054,245	-	-	1,088,656
Core SDB Iranistan Ave	-	-	34,389	333,316	-	367,705
Core SDB Jefferson St	-	34,411	1,269,397	-	-	1,303,808
Core SDB P1725 and P493 Sentinel Rd	15,666	-	-	-	-	15,666
Core SDB Samuel Smith / E Broadway	-	-	34,411	2,043,944	-	2,078,355
Step Down Bank Removals Total	677,847	137,643	3,233,673	3,584,250	3,550,008	11,183,421
Coastal Substations						
Congress Flood Mitigation	102,397	-	-	-	-	102,397
Pequonnock SS Getaway - Electrical Work	1,479,421	-	-	-	-	1,479,421
Resiliency DN Coastal Sub (Pequonnock)	4,609,828	-	-	-	-	4,609,828
Coastal Substations Total	6,191,646	-	-	-	-	6,191,646
Substation Getaways						
New Congress SS Ph 1 Congress St	23,768	-	-	-	-	23,768
New Congress SS Ph 4 Getaway South	146,903	-	-	-	-	146,903
Substation Getaways Total	170,671	-	-	-	-	170,671
Other System Resiliency						
D-Pole Loading - Milvon ROW	35,839	-	-	-	-	35,839
SIMS Metal Management	(450,125)	-	-	-	-	(450,125)
UI NWS Program Capex	22,891	-	-	-	-	22,891
UI Resiliency Program	-	-	519,832	1,901,458	1,873,750	4,295,040
Other System Resiliency Total	(391,394)	-	519,832	1,901,458	1,873,750	3,903,646
Total System Resiliency	**$ 6,648,769**	**$ 137,643**	**$ 3,753,504**	**$ 5,485,707**	**$ 5,423,759**	**$ 21,449,383**

The Capital investments in the Resiliency Category focus on reducing the system impacts of major storms. These are projects planned to harden UI's distribution system to mitigate damage inflicted by weather or to shorten the recovery time when damage to the system does occur. Additionally, RE08 has established a framework to identify vulnerable zones of the distribution system and formulate resilience solutions (including infrastructure hardening, automation, on-site backup generation, microgrids, system redundancies, etc.) for each identified zone. The company collaborated with a specialized consultant to model various storm scenarios and estimate the benefits of the proposed resilience solutions. The Resilience Plan was prioritized using a Benefit-Cost Analysis (BCA) framework, which helped in selecting the most effective resilience solutions for each area, thereby maximizing the overall benefit of the Resilience Plan.

- **Step Down Bank Removals**

UI's standard primary distribution voltage is 13.8kV, which allows the Company to operate and maintain the distribution system more efficiently and effectively. However, there are small pockets of our territory that still operate at an older distribution voltage of 4.16kV or 2.4kV. These areas typically contain electrical infrastructure that is beyond its useful life and are fed from overhead Step Down Banks (SDB's).

SDB's convert the primary voltage from 4.16kV or 2.4kV up to 13.8kV. Customers fed from a SDB have only one source of power – in effect creating a small "island" of customers that cannot be served from the surrounding area due to the difference in primary voltage. In the event of failure of the SDB or 4kV mainline, ALL customers behind the SDB will be out of power and face a prolonged outage until the repair is complete.

UI has a long-term plan to convert its entire territory to one primary voltage. Remediating the existing 4 kV infrastructure that is now well beyond it's intended service life and improving the resiliency of the system by elimination the pockets of 4 kV

- **Coastal Substations**

Historical weather events such as Tropical Storm Irene and Superstorm Sandy along with revisions to Federal Emergency Management Agency (FEMA) flood maps have necessitated The United Illuminating Company (UI) to take action to evaluate the risk and potential impact of a single 100-year coastal flooding event on its coastal Substations and evaluate mitigating solution alternatives. During Tropical Storm Irene the Pequonnock Substation in Bridgeport, CT experienced flooding one to two feet above the yard elevation and approximately 10 feet during Superstorm Sandy. This extreme level of flooding created a situation where flood waters were within inches of the control room floor. To mitigate the risk of catastrophic failure and the associated long-term recovery issues, UI had to preemptively de-energized Pequonnock

Substation. Along with the flooding concerns, there are several known asset condition deficiencies at this site, which was originally placed into service in 1956.

UI commissioned a study, "Coastal Substation Flooding Asset Condition Review" to evaluate the risks and impact at the Pequonnock Substation, and was concluded that because this station is built adjacent to Long Island Sound, and the FEMA 100-year flood plain has recently been updated, it is "at-risk" of destruction and/or incapacitation for a FEMA 100-year flood event. In addition, an asset condition assessment identified major structural and equipment deficiencies that need to be addressed.

After evaluation of various alternatives, it was determined that a full rebuild and relocation of the substation is necessary to properly mitigate the reliability risks posed by both the flooding conditions as well as the aging infrastructure.

- **UI Resiliency Program ("Other System Resiliency" Category)**

The UI Resiliency Program aims to enhance the reliability and resilience of the electric grid by implementing infrastructure upgrades across nine priority circuits. These upgrades include automation, topology improvements, and hardening measures to reduce customer outage costs and improve service continuity during major storms.

This Program encompasses a comprehensive set of infrastructure upgrades across nine priority circuits to enhance the reliability and resilience of the electric grid. The scope of the project includes the following key components:

Infrastructure Upgrades:

- **Cutouts:** Installation of 10 cutouts to improve the reliability of the circuits.
- **Disconnects:** Addition of 9 disconnects to facilitate easier isolation of faulty sections.
- **Air-break Switches:** Implementation of 10 air-break switches to enhance operational flexibility.
- **Reclosers:** Deployment of 32 reclosers to automatically restore power after temporary faults.
- **Aerial Cable:** Installation of 9,600 feet of aerial cable to strengthen overhead lines.
- **Underground Cable:** Laying of 19,800 feet of underground cable to protect critical sections from weather-related disruptions.

Overall, this program is intended to provide a reduction in customer outage costs, with annual

avoided interruption costs due to hardening estimated at $1.2 million and automation/topology measures at $0.2 million. This will also lead to a reduction in outage frequency and duration, leading to a more reliable power supply. Additional Information regarding the Resilience Program is included in Exhibit UI-CIP-10.

G. System Operations

System Operations Investments (2024 – 2028)

Description	2024	2025	2026	2027	2028	Total
System Operations						
Operations						
UI - Gen Equipment - OPS-SO	511,837	674,065	607,440	627,983	634,474	3,055,798
UI - Gen Equipment - OPS-TD	1,077,024	1,212,736	1,088,914	1,103,580	1,109,873	5,592,128
Oronoque URD South Single Phase	87,394	-	-	-	-	87,394
Derby Jct to Ansonia	258,516	414,753	-	-	-	673,268
Milvon to West River 115kV Railroad	181,210	-	-	-	-	181,210
UI - Dist Line CAP	15,919,588	7,889,327	8,010,701	8,010,701	8,010,701	47,841,017
UI - Trans Line CAP-Non PTF	42,524	-	-	-	-	42,524
Total Operations	18,078,093	10,190,881	9,707,055	9,742,264	9,755,048	57,473,340
Compliance & Safety						
UI Rate Design - Time of Use Rate Structure Phase 1	239,073	651,460	-	-	-	890,533
Arc Flash (Split Bus)-Elmwest Sub	60,553	-	-	-	-	60,553
Low-Income Discount Rate (LIDR) -UIL 2025	235,636	714,833	-	-	-	950,469
Rider LIDR	375,118	-	-	-	-	375,118
Security ASD-UI	50,209	-	-	-	-	50,209
UI - Regulatory Driven Efforts	314,838	576,445	576,445	593,739	611,551	2,673,019
FIRE PROTECTION	1,277,660	123,420	127,123	131,348	135,288	1,794,838
Physical Security Lifecycle Management Program-UI C	-	94,622	231,197	236,168	240,891	802,878
SOC Program-UI	-	2,064	4,228	8,258	16,922	31,473
SOC-UI	221,557	-	-	-	-	221,557
Total Compliance & Safety	2,774,644	2,162,845	938,993	969,513	1,004,652	7,850,646
Fleet						
UI Fleet Vehicle Replacement Plan	2,559,790	2,853,482	5,671,211	6,885,476	7,324,750	25,294,708
Total Fleet	2,559,790	2,853,482	5,671,211	6,885,476	7,324,750	25,294,708
Facilities						
GS - Training Facilities (HR) UI Trumbull Trng Facility	64,369	-	-	-	-	64,369
HR Training Facilities	-	195,484	195,477	195,526	195,651	782,138
UI 100 MHR Dispatch HVAC	21,819	-	-	-	-	21,819
UI 180 MHR Upgrade Generator	27,501	-	-	-	-	27,501
UI Avangrid HQ Projects	-	-	-	-	41,140	41,140
UI BMS System	51,538	246,840	-	-	-	298,378
UI Church St Upgrades	394,944	246,840	-	-	-	641,784
UI Electric Operations Center Projects	12,300	-	-	-	-	12,300
UI EV Charging Stations	1,765	-	617,100	617,100	-	1,235,965
UI Global Telematics Solution	-	-	157,185	-	-	157,185
UI Minor Projects	203,668	329,120	473,110	436,084	353,804	1,795,786
UI Solar Panels	1,007	-	617,100	-	-	618,107
UI Upgrade Parking Lot Drainage	-	1,408,291	-	-	-	1,408,291
Total Facilities	778,911	2,426,575	2,059,972	1,248,710	590,595	7,104,763
Total System Operations	**$ 24,191,437**	**$ 17,633,782**	**$ 18,377,231**	**$ 18,845,962**	**$ 18,675,045**	**$ 97,723,458**

The capital investments in the System Operations category are necessary for the Company to run its business and to provide its employees with safe working conditions and vehicles. System operations projects comprise four major areas:

1. Operations

The Operations Category includes investment for the capital portion of reactive replacement of overhead and underground distribution line components that are unplanned. This would include trouble response, minor storms, motor vehicle accidents, equipment failure etc. This category also includes investment for the replacement of underground residential distribution and feeder cable and equipment associated with routine maintenance.

This category also provides for the tools and safety equipment our Line, substation Underground Test and Meter Services workforce utilizes in their everyday work, hot sticks, voltage detectors, gas detection equipment for underground work in confined spaces etc.

2. Fleet

The Fleet Replacement Program is designed to provide a safe, reliable, regulatory compliant and cost-effective fleet of vehicles and equipment for Company operations. The capital expenditures for fleet are necessary for the replacement of light-, medium- and heavy-duty vehicles and equipment, and are based on established life cycle criteria such as years, mileage, and/or hours. The capital plan includes funding necessary for the acquisition of fleet vehicles and equipment.

Fleet Services strives to achieve economies of scale that result in cost reduction opportunities by utilizing national contracts, standardized or “off the shelf” specifications and, wherever feasible, to take advantage of preferential purchasing terms in accordance with procurement guidelines. The annual Fleet Replacement Program is based on unit age and/or usage (Miles/Hours). Understanding that units achieving the replacement criteria based on age and/or mileage are proposed for replacement and the results checked and collated to form the Fleet Replacement Matrix. This criterion ensures that the optimum combination of age and mileage is attained, while also taking into consideration the total cost of ownership. Model year advancements by the vehicle and equipment manufacturers are factored into the acquisition process to ensure that the latest technical and safety features are included when applicable. Changes in operational requirements are also considered, based on feedback form the end-users of the fleet.

Forecasted pricing is based on historical purchases and assumes a 3 percent inflation rate.

The need for increased capital expenditures in the years 2024-2028 is influenced by several factors. Primarily, the evolving operational demands of the Company necessitate

planning for the acquisition of additional fleet assets. Moreover, market fluctuations, including rising asset acquisition costs and limited availability, have also impacted the yearly capital requirements. Additionally, the discrepancy arising from reduced capital spending in previous years compared to the actual capital needs has compelled the injection of additional capital to ensure a dependable and cost-efficient fleet.

The increase is primarily attributable to operational demands, but a small portion is attributable to market fluctuations. Specifically, approximately three percent of the total increase each year is due to market fluctuations. The remaining increase is due to operational demand needs.

The operational demand is primarily driven by the need for timely acquisition, maintenance and disposal of aging fleet vehicles and equipment including light-, medium- and heavy-duty vehicles and equipment (e.g., trailers, backhoes, ATVs).

There are several factors that drive the need for vehicle replacements. First, replacements are based on established life cycle criteria (years, mileage, and/or hours). The standard lifecycle is 7 years for light and medium vehicles, to 10 years for heavy duty vehicles, with equipment having a lifecycle of 10-15 years. Each year, the Company reviews the existing fleet according to the established criteria and identify those vehicles that meet or exceed the replacement criteria. These are the units that are proposed for replacement. Model year advancements by the vehicle and equipment manufacturers are factored into the acquisition process to ensure that the latest technical and safety features are included. Changes in operational requirements are also considered, based on feedback form the end-users of the fleet.

The Fleet program funding mitigates risks. If the Company is unable to replace aging fleet vehicles, there would be impacts to reliability and operations, which would negatively affect customers. One such example is that older vehicles have reduced reliability and performance capabilities, resulting in slower response times to emergencies, such as electric outages. This delay can put customers at risk and exacerbate the impact of the situation.

Additionally, aging fleet vehicles are more prone to breakdowns and mechanical failures, leading to increased downtime for repairs and maintenance, which strains the Company's workforce and reduces the ability to meet customer demands promptly.

In addition, aging fleet vehicles tend to be less fuel-efficient and have higher maintenance costs, leading to higher operating expenses for the Company. Also, older vehicles may have higher emissions and contribute to air pollution, therefore delaying fleet replacements can

hinder the Company's efforts to reduce its carbon footprint and meet environmental sustainability goals.

Older vehicles may also lack modern safety features and technologies, putting employees and customers at increased risk of accidents and injuries during field operations. Without increased capital funding to purchase vehicles, the Company will be required to lease or rent vehicles, thereby increasing operations expense.

The Company considers the potential use of electric vehicles ("EV") and alternative-fueled vehicles in their planning process. However, given the current challenges and limited opportunities related to fleet electrification and alternative-fueled vehicles, the near-term strategy prioritizes the use of diesel-powered vehicles, which can be run on renewable-diesel. As a result, the current 5-year fleet replacement plan does not include specific provisions for EVs or alternative-fueled vehicles. However, as vehicle electrification technology advances and becomes more feasible, the fleet replacement plan will be adapted to incorporate a greater number of sustainable and environmentally friendly vehicles and equipment. Flexibility and continuous monitoring of advancements in eco-friendly technologies will guide future decisions for a greener and more efficient fleet.

2. Buildings and Facilities

The Building and Facilities area is part of the General Services Department and is responsible for maintaining and improving the Company's owned and leased facilities, including office buildings, service centers, warehouses, training centers, Emergency Command, Operations, and Data Centers. The Building and Facilities area ensures that the Company's facilities meet health and safety standards, code compliance and required upgrades to maximize asset life cycles. The capital investments in this area needed to maintain, upgrade, and replace the Company's facilities and equipment, due to asset condition, age, risk mitigation, efficiency loss, functional obsolescence, code compliance requirements, safety and/or environmental considerations. Project improvements typically include mechanical, electrical, building structure and envelope, and control systems. The facilities projects are aimed at providing safe working conditions, greater efficiencies, and maximizing asset life cycles at all Company locations.

The projects in this area include upgrading HVAC systems to energy efficient models, Building Management Systems (BMS) upgrades and installations, LED lighting with controls, building envelope upgrades, environmental and site improvements (e.g., tanks, spill containment), back-up systems, uninterruptible power supply (UPS) systems, generators, solar

panels, installation of EV chargers, requests to meet the growing and changing needs of the business, and strategic projects to optimize utilization of UI facilities.

Building and Facilities collaborates with internal departments, to address requests for additional space requests, improvements to existing locations, expansion requests for new locations, and site-specific upgrades for operational benefits, which examples include new structures for covered fleet parking or equipment storage.

Other types of projects include equipment replacement due to normal wear and tear, roof replacements due to end of life or to mitigate cumulative repair costs, general replacement of material, systems and equipment required to keep the facilities in proper working order.

- **UI Minor Projects**

Minor capital projects are improvements to upgrade systems in UI facilities due to end-of-life assets, failures associated with mechanical, electrical, building structures, control systems and the like. These projects improve efficiency, reduce energy consumption, reduce greenhouse emissions and address health, safety and security concerns.

Minor projects typically range up to $100,000 per project and are grouped to allow for faster responses and efficient funding approvals. Minor projects follow the Avangrid procurement guidelines and utilize framework agreements for awarding projects that have already gone through a procurement bidding process.

Minor projects are required on an annual basis, due to planned and unplanned replacement of assets at the end of their useful life, unplanned failures, emergency replacement, security concerns, employee changes, storm support, and a multitude of emergency needs that can occur.

These projects create savings in operational maintenance expenses with the installation of new and more efficient equipment. They enhance reliability and mitigate risks to provide safer working conditions, extends the life cycles of assets, avoid disruption to Electric Operations, and support green and sustainable initiatives, while creating an overall safer more efficient building to support operational needs, responses times and storm support.

Minor project needs are prioritized based on impacts to the business, level of critical facility assessment, end-of-life assets, failures, employee changes, storm response, emergency

needs and health, and safety related requirements. Priorities change on an annual basis and throughout any given budget year.

4. Compliance and Safety

The Plan includes investments for projects which impact the safety of the public, the distribution system, or the Company's employees. Additionally, these investments include projects required for physical security or to comply with the NESC or other industry, regulatory, legislative, or municipal regulations.

Physical Security investments include projects and programs for life-cycle replacement of physical security infrastructure, the Security Operations Center ("SOC"), and fire protection.

- **Physical Security Lifecycle Management Program (formerly Security ASD)**

The company has a duty to its employees and the public to ensure their safety by ensuring that Corporate Security has the most up to date systems. The upgrade of the systems impacts everyone by giving a greater ability to protect the company's physical assets and the safety of the public. The main goal of the project is to upgrade exiting and installing new security systems at critical facilities. There is a continued need to ensure that the electric grid is protected from physical attack. The current equipment installed is aged and, in most cases, using analog cameras. This prevents the Security Operations Center from properly monitoring the Physical Access Control and Video Management systems efficiently and effectively. Updating and installing new equipment at our critical locations gives the company an advantage against malicious actors that are trying to breech our physical security perimeter and systems. Upgrading the systems allows for a greater opportunity to detect and determine potential threats before they are given the chance to act. The upgrade or installation of new equipment allows the Security Operations Center to have enhanced tools to better monitor critical facilities that let UI provide safe and reliable services to both commercial and residential customers.

- **Fire Protection Projects**

Avangrid's fire protection program tests and inspects each fire protection system within UI. This program follows the conditions and requirements of the Connecticut State Fire Code. During these tests, all components on the system are visually and functionally tested and inspected. These inspections also verify the dates of the equipment being tested and the manufacture dates listed on each panel (fire alarm systems statistically fail at 8-12 years of age). System components that are not in compliance with the Fire code are replaced. Installation of

nitrogen generation and pressurization systems are also included in the scope to protect the pre-action and dry sprinkler piping from corrosion and system failure. This will help to mitigate future leaks that result from piping corrosion.

H. Business Effectiveness

Business Effectiveness Investments (2024 – 2028)

Description	2024	2025	2026	2027	2028	Total
Business Effectiveness						
Information Technology						
AGR - IOC-Microsoft Deployment LC-UI	-	-	1,331,286	-	1,475,742	2,807,028
AGR - IOC-NET-END USER LC-UI	1,526,064	564,708	705,592	703,980	670,916	4,171,261
AGR - IOC-NETENG LC-UI	300,059	317,412	311,541	325,556	312,521	1,567,088
AGR - IOC-NETSEC LC-UI	236,344	276,271	279,034	281,824	284,642	1,358,115
AGR - IOC-STORAGE LC-UI	499,232	429,182	359,350	619,073	632,479	2,539,315
AGR - IOC-UNIX LC-UI	109,307	361,482	328,438	557,605	1,284,841	2,641,673
AGR - IOC-WINTEL LC-UI	729,671	739,163	759,024	944,128	969,152	4,141,139
AGR-2022-NET-CS-02-Digital Journey EDB Transformation-U	35,196	-	-	-	-	35,196
AGR-2022-NET-CS-09 BillPrintRedesign-P2-UI	15,603	-	-	-	-	15,603
AGR-2022-NET-SG-01-Esri UN Deployment-UI	284,627	901,631	1,803,258	2,704,888	1,803,258	7,497,662
AGR-COR-24-CYBER-SIEM-UI	41,905	-	-	-	-	41,905
AGR-NET-24-IT-01-Global S4Hana Assessment-UI	107,524	566,959	1,417,401	1,417,401	1,133,921	4,643,207
AGR-NET-24-IT-04- Supply Chain Digitization - UI	63,514	-	-	-	-	63,514
AGR-NET-24-IT-06- Mobility Apps Enhancement-UI	189,958	-	-	-	-	189,958
AGR-TAS-24-SIT-NET-UI	281,826	-	-	-	-	281,826
AGR-TAS-24-Wifi Site Enhancement-UI	121,389	-	-	-	-	121,389
Azure SW Cloud Subscription – UI	-	-	531,693	-	385,221	916,913
Client project requests & integration Projects - UI	-	627,220	627,220	627,220	1,612,853	3,494,514
Infrastructure Security - UI	-	116,323	118,761	121,286	123,912	480,282
IT SW Cloud Subscriptions - UI	-	-	-	137,508	-	137,508
RPA Program	21,900	-	-	-	-	21,900
Information Technology Total	4,564,119	4,900,352	8,572,599	8,440,470	10,689,458	37,166,998
Operational Technology						
166 - 89 East Ave Decommission	24,429	-	-	-	-	24,429
Avangrid Security Domain (ASD) OSG Infrastructure (UI)	63,483	-	-	-	-	63,483
Avangrid Security Domain (ASD) OSG Telecommunications (U	485,625	-	-	-	-	485,625
Historian and Analytics Upgrades Program	17,906	-	-	-	-	17,906
NMC Solar Winds UI - D	123,785	-	-	-	-	123,785
RTU Replacement Program	-	-	35,380	38,177	39,584	113,141
Telecomm Infrastructure	444,106	1,985,846	1,196,702	734,283	812,849	5,173,786
UI Resiliency Project	95,954	-	-	-	-	95,954
UI SG ASD Lifecycle Cap	20,942	-	-	-	-	20,942
UI SG Zetron Consoles	48,057	-	-	-	-	48,057
UI Smart Metering	669,200	206,321	1,144,881	292,290	975,039	3,287,731
UI Tripwire Implementation	11,693	-	-	-	-	11,693
Operational Technology Total	2,005,180	2,192,166	2,376,963	1,064,750	1,827,472	9,466,532
Other Business Effectiveness						
EMS/ADMS Replacement Project	-	375,789	-	-	-	375,789
FERC 881 UI Regulatory Compliance	48,896	-	-	-	-	48,896
GPG - Graphic Design (Field) UI	98,765	111,432	-	-	-	210,197
Networks ECTRM	(23,035)	10,000	-	-	-	(13,035)
New Scheduler UI	2,090,810	246,840	-	-	-	2,337,650
NON RES Tariff Project	203,276	-	-	-	-	203,276
UI HR Training Equipment & Tools	-	-	42,070	128,999	43,929	214,998
UI HR Training Technology Projects	205,700	82,280	168,279	85,999	175,717	717,976
Other Business Effectiveness Total	2,624,413	826,341	210,349	214,998	219,646	4,095,747
Total Business Effectiveness	**$ 9,193,712**	**$ 7,918,859**	**$ 11,159,910**	**$ 9,720,219**	**$ 12,736,577**	**$ 50,729,277**

The capital investments in the Business Effectiveness category are necessary for technology-based investments, targeted to improve the efficiency and execution of the Company's work activities. The category includes investments for information technology ("IT")

software and hardware, as well as operational technology ("OT") investments to support system control and monitoring activities, and cyber security.

1. Information Technology

In the IT area, capital investments are categorized in two different groups: Life Cycle projects to reinforce and improve infrastructure assets, and Applications projects to build and improve applications that support business processes.

- **IT Life Cycle Projects**

IT conducts a set of annual projects focused on Infrastructure Technology Life Cycle. "Life Cycle" refers to the Hardware refresh and Operating Systems/Firmware Obsolescence upgrade. Hardware refresh is the process to replace current hardware with newer models to combat performance and capacity issues that old hardware can create. This performance degradation will impact the applications hosted on that infrastructure, impacting business directly. Obsolescence refers to the operating systems and firmware upgrades when they become end of support by the software vendors. Impacts may be different based on software vendor, but generally, running out of support software increases the risk of not being able to get vendor support when application issues arise that are related to the infrastructure layer. Out-of-support Software also creates a security risk, by not having updated security patches for the software.

Hardware refresh is done in a periodic way. All Hardware has a specific utilization process from purchase, commissioning, life and refresh known as Life Cycle. Avangrid follows industry common practices in establishing the life cycle periods:

- End User Computers: Laptops / Desktops: 4 years
- Computing and Storage: Servers, storage switches, storage cabins, storage arrays, backup hardware: 5 years
- Network equipment: routers, switches, access points, firewalls: 7 years

Life Cycle projects also include Infrastructure Organic Growth and Evolution. As part of the hardware refresh, these projects are also leveraged to determine if the infrastructure being refreshed requires growth or evolution. Growth refers to capacity increase, and Evolution refers to technological transformation, when a different newer technology is more suitable to replace the hardware being life cycled.

Considering company application evolution, another outcome for an asset is removal. If the application is not needed anymore the asset is not refreshed. In that case, it would move to a removal status.

The following Life Cycle projects are planned for the Company:

- AGR - IOC-NET-END USER LC-UI
- AGR - IOC-NETENG LC-UI
- AGR - IOC-NETSEC LC-UI
- AGR - IOC-STORAGE LC-UI
- AGR - IOC-UNIX LC-UI
- AGR - IOC-WINTEL LC-UI
- Infrastructure Security - UI

For purposes of the budgeting process, Life Cycle projects are not multiyear and typically do not roll over from one year to the next. All of the Life Cycle projects have a duration of one year, and are repeated annually within the program. Each project is considered a new project not connected with the effort done the year before. Each project includes the scope of the assets to be refreshed, evolved or grown, and is budgeted accordingly within the program for that yearly period.

Project scopes are defined on a yearly basis, considering asset lives, application needs, user evolution (to determine growth), technology existing in the market (to determine evolution), vendor obsolescence calendar (to determine OS migration), and migration schedule (to determine timeline). Life Cycle budget forecasts are prepared by factoring current and previous year cost with growth patterns, driven primarily by estimation on user evolution, technology strategy and standard inflation.

Life Cycle projects are necessary to company operations and provide important benefits. These projects provide reliability and resiliency by replacing old hardware and obsolete operating systems with newer hardware and supported operating systems. This allows applications to run in an infrastructure environment optimized to their computing and data needs. The following summary provides a high-level explanation of the Life Cycle project scopes and benefits:

- **AGR - IOC-NET-END USER LC**. The overall goal of this project is to refresh the Company's computing devices following the refresh lifecycle defined for this technology (four years) for users in scope. This project also provides personal

computers ("PCs") in support of new hires and refresh demand requirements enterprise wide. Project scope is the continued refresh at least 25 percent of computer environment (four year life cycle) and end user equipment for new employees joining the Company.

Benefit: Replace aged equipment with new PCs to avoid service disruptions due to PCs not working properly due to their age. New computers also provide higher computing capabilities. This project also provides PCs in support of new hires and refresh demand requirements.

- **AGR - IOC-NETENG LC**. The objective of the Network Engineering Lifecycle project is to plan and implement a continuous improvement and refresh process every seven years, such that Company's network infrastructure meets or exceeds established availability requirements. The lifecycle plan is also the Company's mechanism for ensuring that the network infrastructure is scalable, meeting the increasing demands of our business users. The following infrastructure is included under this project: Cisco Switches, routers, switches, WiFi access points and WiFi controllers. Project scope includes continued refresh at least 14% of all network infrastructure environment per year (seven-year life cycle). Network Infrastructure to support growth, network mobility expansion and correct redundancy and reliability levels.

  Benefits: This project ensures network company infrastructure run under support, with hardware within the defined lifecycle period for this technology. This minimizes the risk of hardware failures that may lead to outages, and users not being able to access Corporate resources or applications. The project seeks to avoid service disruptions due to aged hardware not properly working. Additionally, this project supplies new devices and equipment as necessary to follow company growth.

- **AGR - IOC-NETSEC LC**. This project entails refreshing the Company's network security devices following the seven-year refresh lifecycle. Network security devices include primarily Firewalls, Proxies, Intrusion Preventions Systems (IPS), Anti Distributed Denial of Service (AntiDDos) technologies or Secure Socket Layer (SSL) decryption devices. This project also provides network equipment to support new offices or company assets that require secure corporate connectivity. Project scope covers the continued refresh at least 14 percent of all network security infrastructure environment per year (seven-year life cycle). Network Security Infrastructure to support growth, network security solutions evolution and perimeter hardening.

Benefits: Continued refresh of at least 14 percent of all network security infrastructure environment per year (seven-year life cycle). Network Security Infrastructure to support growth, network security solutions evolution and perimeter hardening.

- **AGR - IOC-STORAGE LC**. The overall goal of this project is to refresh all data storage equipment following the five-year refresh lifecycle. Storage equipment primarily includes storage virtual switches, Storge Area Network (SAN) directors and switches, storage arrays, file storage, and backup units. This storage will be used to provide data storage capabilities to the company applications, and company data network shared drivers. It includes the hardware required to ensure company data is correctly stored and backed up, allowing data recovery when necessary. Project scope includes the continued refresh of at least 20% of all storage infrastructure per year (five-year life cycle). Project also includes scope to support company new storage needs and growth.

  Benefits: This project ensures storage infrastructure remains under support, with hardware in the defined lifecycle period for this technology. This minimizes the risk of hardware failures that may lead to application outages and data loss. The project seeks to avoid service disruptions due to aged hardware not working properly.

  Replacing aged equipment with new storage equipment avoids application performance issues or service disruptions. New devices also provide higher performance and capabilities for a better application performance.

  Another benefit of this project is the refresh and growth of company data backup infrastructure, including data protection. This allows data to be restored from an earlier point in time to help the business recover from an unplanned event. Storing the copy of the data on separate mediums is critical to protect against primary data loss or corruption. Additionally, this project supplies new devices and equipment as necessary to follow company growth.

- **AGR - IOC-UNIX LC**. This project entails refreshing the Company's Unix equipment following the five-year refresh lifecycle. Unix equipment includes primarily IBM AIX Frames and HMC controllers. This project also provides UNIX equipment in support to company growth. Project scope covers the continued refresh at least 20% of all

Unix infrastructure per year (five-year life cycle). The project includes also as scope to support company new Unix needs and growth.

Benefits: This project ensures UNIX company infrastructure runs under support, with hardware within the defined lifecycle period for this technology. This minimizes the risk of hardware failures that may lead to applications outages. The project seeks to avoid service disruptions due to aged hardware not properly working.

Replacing aged equipment with new Unix equipment avoids application performance issues or service disruptions. New devices also provide higher performance and capabilities for a better application performance. Additionally, this project supplies new devices and equipment as necessary to follow company growth.

- **AGR - IOC-WINTEL LC**. This project entails refreshing the Wintel infrastructure following the five-year refresh lifecycle. Wintel infrastructure includes primarily servers, chassis, and server blades. This infrastructure primarily hosts applications and Structured Query Language (SQL) databases. This will provide Wintel Infrastructure that supports the Company's organic growth. Project scope includes the continued refresh at least 20% of all Wintel Server infrastructure per year (five-year life cycle). The project includes also as scope to support company new server, computer needs and growth.

  Benefit: This project ensures company infrastructure operates under support of Wintel, with hardware within the defined lifecycle period for this technology. This minimizes the risk of hardware failures that may lead to applications outages and data loss. The project seeks to avoid service disruptions by refreshing aging hardware.

  Replacing aged equipment with new Wintel equipment avoids application performance issues or service disruptions. New devices also provide higher performance and capabilities for a better application performance. Additionally, this project supplies new devices and equipment as necessary to follow company growth.

➢ **Client Project Requests & Integration**

This program is for business initiatives identified by the Networks business areas for future efficiency projects. UI has a rigorous process of identifying the technology needs of the business, gathering information, vetting the project list and prioritizing based on need, business value and resource availability.

The process starts from the "IT Roadmap," which is a document that outlines the strategic direction over the next 3-5 years. The Project Demand Planning cycle runs annually and involves collating the requirements across all business areas for projects requiring IT expenditure. Projects are prioritized by the Vice Presidents in each business area before completing the estimation and capacity planning process. This process runs from the beginning of May through the end of August each year. The final portfolio is then presented to senior management for acceptance.

2. Operational Technology

The Operational Technology category includes investments related to the critical OT systems used to monitor and control the electric distribution system serving UI customers. Capital requirements include control and automation systems, telecommunication infrastructure, smart meter collections and compliance/cyber related equipment. These investments fall within the following areas:

- Cyber Assurance & Compliance (OSG Networks Cybersecurity): This includes the Energy Control Systems (ECS) Cyber Lifecycle replacement program. This program includes all of the equipment and applications that are approaching obsolescence that need to be replaced or renewed across the Energy Control Systems, including the detection and response tools. These improvements are necessary to keep production, operational support, security, and reliability at appropriate levels required by the demands of high availability of Supervisory Control and Data Acquisition ("SCADA") environments.

- Telecommunications: The Company operates and maintains a private telecommunications fiber network to operate and control the electric distribution system. This network provides diverse telecom paths from each endpoint to a termination point – generally from substation to the energy control centers. Telecommunications also include a private radio frequency ("RF") network that transmits both land mobile radio ("LMR") and data communication. The RF network provides transport throughout the Company's service area beyond the availability and cost effectiveness of the fiber network. This can include telecommunications for a growing number of smart grid devices such as Distribution Automation, SCADA, and AMI aggregation end points. The Telecom Infrastructure Program completes lifecycle replacement for LMR radio,

networking, cellular, and related equipment to mitigate obsolescence and manage network build-out.

- Control Systems and Automation: The RTU Replacement Program helps to provide accurate and undisrupted operational information from the UI substations into the Energy Control Center ("ECC"), by replacing critical remote terminal units ("RTU") and data concentrators. These devices are replaced every five to seven years on a rolling basis as the devices run continuously and become prone to failure after being in service for this period of time. The RTU is a single device that collects all information for a given substation and delivers it to the head-end SCADA system. By proactively replacing these devices prior to failure, the Company is mitigating the operational risks associated with RTU failure and ECC operators being unable to access critical alarms and system information, nor to be able to remotely operate devices in the field.

I. Modernization

Modernization Investments (2024 – 2028)

Description	2024	2025	2026	2027	2028	Total
Modernization						
Electric Vehicle						
UI - Electric Vehicle Program	212,297	427,800	427,800	441,300	427,800	1,936,997
Electric Vehicle Total	212,297	427,800	427,800	441,300	427,800	1,936,997
Distribution Automation						
UI - Distribution Automation Project	-	-	-	3,825,526	4,634,932	8,460,458
UI DG 4GLTE Cellular Transport System Mtr & SCADA (RITEC)	39,543	-	-	-	-	39,543
Distribution Automation Total	39,543	-	-	3,825,526	4,634,932	8,500,002
Energy Storage						
Circuit 1542 Energy Storage	-	-	-	1,301,796	3,037,524	4,339,320
Energy Storage Resiliency - Bridgeport	-	-	1,692,446	3,949,040	-	5,641,486
Energy Storage Resiliency - New Haven	-	2,009,917	4,689,808	-	-	6,699,725
Energy Storage Total	-	2,009,917	6,382,254	5,250,836	3,037,524	16,680,531
Other Modernization						
Bridgeport Solar Project	15,182	-	-	-	-	15,182
CYME Server - Hardware & Software UI	216,100	-	-	-	-	216,100
DER Integration Hosting Capacity	45,730	-	-	-	-	45,730
Pleasure Beach Solar + Storage	723,329	1,830,845	310,412	-	-	2,864,586
Seaside Solar Repower	58,292	-	-	-	-	58,292
Other Modernization Total	1,058,633	1,830,845	310,412	-	-	3,199,890
Total Modernization	**$ 1,310,474**	**$ 4,268,562**	**$ 7,120,466**	**$ 9,517,662**	**$ 8,100,256**	**$ 30,317,420**

The capital investments in the Modernization category are necessary to evolve the grid to support the State's renewable energy portfolio standards and storage targets. The Company's existing and planned investments have positioned its distribution system to evolve into the grid

of the future. With more than 17,000 interconnected generators, the Company's distribution system is on the precipice of evolving from radial, one-way power flow to an interconnected network of loads and renewable generation that requires more situational awareness and control than the power system of the 20th century. Additionally, the Company is entering an era of electrification for transportation that will require investments to support the adoption of emerging technologies. To support this evolution, the Company's investment in the modernization category focus on Electric Vehicle, Energy Storage, and Distribution Automation projects.

Energy Storage Resiliency – Bridgeport

This battery storage project consists of installing a 2.3 MW, 5.5 MWh Battery Energy Storage System (BESS) mid-circuit on circuit 2550 in Bridgeport, CT. The battery will be used to provide circuit resiliency and capacity benefits. Specific use cases for this project include:

1. Resiliency and back up to a targeted section of a poor performing circuit
2. Provides circuit capacity relief to an overloaded circuit
3. Provides targeted relief during ISO-NE capacity events
4. Backup senior housing critical facility

The BESS microgrid will provide outage ride-through capabilities to an underserved and medically vulnerable population residing in three elderly, multi-family affordable housing complexes for up to 12 hours. The microgrid will feature the ability to expand its perimeter to provide outage ridethrough to an additional 598 customers on Circuit 1550 for up to 4 hours at full load. Secondarily, the BESS microgrid will strategically dispatch energy when not being used for reliability and resilience to lower system wide peak, providing net economic benefit to all UI customers by reducing Local Network Service, Regional Network Service and annual ISO capacity charges. Tertiary use cases include grid services such as volt/vAR optimization.

When successful, this project can help pave the way for more utility-owned BESS microgrid assets in the field, diversifying the Company's capital portfolio mix while remaining in-line with statewide renewable energy goals.

Energy Storage Resiliency – New Haven

This battery storage project consists of installing a 2.5 MW, 7.0 MWh Battery Energy Storage System (BESS) mid-circuit on circuit 1526 in New Haven, CT. The battery will be used to provide circuit resiliency and capacity benefits. Specific use cases for this project include:

1. Resiliency and back up to a targeted section of a poor performing circuit
2. Provides back-up to LMI and environmental justice customers
3. Provides targeted relief during ISO-NE capacity events
4. Provides load relief to an overloaded circuit

This BESS microgrid to provide outage ride-through capabilities to Hill Regional Career High School, which serves as a multi-jurisdictional emergency shelter, for up to 16 hours under full load. The microgrid will feature the ability to expand its perimeter to provide outage ride-through to an additional 166 customers on Circuit 1526 for up to 4 hours at full load. The BESS microgrid will feature seamless transition to island mode and will integrate with the buildings solar PV and combined heat & power generating systems to increase outage ride-through duration capabilities. Secondarily, the BESS microgrid will strategically dispatch energy when not being used for reliability and resilience to lower system wide peak, providing net economic benefit to all UI customers by reducing Local Network Service, Regional Network Service and annual ISO capacity charges. Tertiary use cases include grid services such as volt/vAR optimization.

When successful, this project can help pave the way for more utility-owned BESS microgrid assets in the field, diversifying the Company's capital portfolio mix while remaining in-line with statewide renewable energy goals.

Circuit 1542 Energy Storage

This battery storage project consists of installing a 1.5 MW, 4 MWh Battery Energy Storage System (BESS) mid-circuit on circuit 1542 in North Haven, CT. The battery will be used to provide circuit resiliency and capacity benefits. Specific use cases for this project include:

1. Resiliency and back up to a targeted section of a poor performing circuit
2. Provides circuit capacity relief to an overloaded circuit
3. Provides targeted relief during ISO-NE capacity events
4. Increases hosting capacity on a circuit with limited DER capacity

The BESS microgrid will provide outage ride-through capabilities to a 120 bed elderly health and rehabilitation facility for 4 hours or more under full load. Secondarily, the BESS microgrid will strategically dispatch energy when not being used for reliability and resilience to lower system wide peak, providing net economic benefit to all UI customers by reducing Local Network Service, Regional Network Service and annual ISO capacity charges. Tertiary use cases include grid services such as volt/vAR optimization on a circuit (1542) that has a very high level of solar PV penetrations (~10MW) and has experienced power quality issues such as voltage "flicker".

When successful, this project can help pave the way for more utility-owned BESS microgrid assets in the field, diversifying the Company's capital portfolio mix while remaining in-line with statewide renewable energy goals.

UI Distribution Automation

UI's plans for Distribution Automation focus on installing devices, communication systems, and cybersecurity infrastructures necessary to establish a platform for dynamic control of the distribution system. This will provide ECC operators with enhanced situational awareness, especially considering the current trend of high penetration of new Distributed Energy Resources (DERs). Additionally, the plan includes devices aimed at improving reliability. While UI's distribution system has generally provided excellent blue-sky reliability for its customers, there are 62 circuits with a four-year average SAIFI performance higher than the regulatory target of 0.68. The Distribution Automation program aims to bring these outlier circuits' SAIFI performance in line with the average.

The plan also focuses on enhancing grid resilience and operational efficiency through the deployment of advanced automation technologies, including automatic grid restoration capabilities. This involves integrating intelligent devices such as automated reclosers and sectionalizers to enable real-time fault detection, isolation, and restoration.

Key requirements for this project include robust communication networks, advanced control systems, skilled personnel, and comprehensive cybersecurity measures, ensuring the system's ability to operate seamlessly and securely as recommended in the DOE's Modern Distribution Grid Guidebook.

Pleasure Beach Solar + Storage

The solar-plus-BESS microgrid project is an innovative energy solution for two UI customers on Pleasure Beach Island ("PBI") in the City of Bridgeport (the "PBI Project"). The PBI Project consists of a 71 kW PV solar system, paired with 1,334 kWh of battery storage to provide reliable, 24/7/365 power to PBI, which is a small island/peninsula about 2.5 miles long located in Bridgeport. The two customers located on the island consist of two self-supporting, 300-foot-high steel radio transmission towers owned by the WICC radio station and a pavilion owned by the City of Bridgeport. Electric service is currently provided to these two customers through a submarine cable installed in 1940 which is at the end of its useful life.

The innovative pilot was presented in Docket No. 22-08-08, where PURA authorized "deferred accounting to allow the Company to track the costs of the PBI solar plus storage project."

The Company has completed conceptual engineering tasks required to design and implement an open request for proposal ("RFP") process to comply with Order No. 35 in PURA's final decision in Docket No. 22-08-08, which required the Company to provide the results of the RFP to the Authority no later than June 1, 2024. As part of that conceptual engineering work, the Company conducted a detailed sizing analysis of the solar and BESS solution. The analysis looked at various factors that affect the sizing of each solution to include historical consumption data, historical solar irradiance, site space constraints and other factors to size the solution to provide a comparable level of reliability as the current circuit providing energy to PBI. In addition, the Company conducted activities for siting and permitting, which include environmental assessments, permit requirements gathering and engagement activities with the municipalities, customers, and other stakeholders. The initial RFP was released on April 11, 2024, with UI extending an invitation to 19 vendors for proposals. At the conclusion of the bid period, the Company received only one bid[2] and was not able to make a good faith selection without multiple like-vendor bids to compare against.

UI anticipates releasing an amended RFP in the fourth quarter of 2024, sending it to the previously participating vendor plus seven additional vendors who have expressed interest in bidding. The amended RFP will include feedback received from vendors who decided not to bid on the original RFP with the intent of creating a more robust solicitation and include additional vendors who specialize in microgrids and/or smaller BESS applications. The amended RFP will include a revised battery size range, potential access for an emergency route, UI's soil management process, more detailed real estate information, a leasing option for the solar, and information regarding the Investment Tax Credit. UI anticipates vendor bid selection to occur within two months of the RFP release.

[2] See Docket No. 22-08-08, UI letter filed in compliance, Order No. 35, May 23, 2024.