James R. Morrissey
Attorney

VIA ELECTRONIC MAIL AND FedEx

March 1, 2017

Mr. Robert Stein
Chairman
The Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Re: **Docket No. F-2016/2017** – Connecticut Siting Council Review of the Ten Year Forecast of Connecticut Electric Loads and Resources (2016-2025) – The United Illuminating Company

Dear Chairman Stein:

The United Illuminating Company (the "Company") respectfully submits to the Connecticut Siting Council an original and 15 copies of the Company's Report to the Connecticut Siting Council on Loads and Transmission resources.

Please do not hesitate to contact me at 203.499.2864 if you have any questions regarding this filing.

Sincerely,

James R. Morrissey

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Report to the Connecticut Siting Council on Loads and Transmission Resources

March 1, 2017

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Section I. Load Forecast Update

This section presents the results and a summary of the methodology for The United Illuminating Company's ("UI" or "Company") most recent ten-year energy sales forecast ("Sales Forecast") and ten-year system peak load forecast ("Peak Load Forecast"). The Sales Forecast is used for budgeting and financial planning purposes. The Peak Load Forecast is used by the Connecticut Siting Council ("Council" or "CSC") for resource planning purposes in Connecticut. The two forecasts use different forecasting methodologies chosen to fulfill their intended purpose.

Sales Forecast Purpose & Methodology

The primary purpose of the Sales Forecast is to accurately project monthly sales-by-class that is then converted to a revenue forecast using electric service rates by class. The principal output of the Sales Forecast is monthly energy sales. UI utilizes the ten-year Sales Forecast for a number of purposes. A key use of the Sales Forecast is to project the energy sales as the basis for predicting revenue over the next 12 to 24 months. The UI Sales Forecast produces monthly forecasted energy sales weather-adjusted to "normal weather" or average weather conditions.

Weather has a large impact on both sales and peak load. Any analysis of the actual historical sales and peak load must consider the weather conditions under which those sales and peak loads occurred. The Company's sales forecasting process begins by weather-adjusting the actual, customer-class specific, historical sales data to the sales that would have been experienced under normal weather, using heating degree days ("HDD") and cooling degree days ("CDD") based on a standard of 65 degrees Fahrenheit for the transition from heating-based to cooling-based sales.

The sales forecasting process then moves to the creation of a Base Energy Sales Forecast which reflects the projected sales from UI's existing base of customers. The Base Sales Forecast development employs focused analytical processes that weather-adjusts and evaluates the most recent energy sales history of its customers, trends in the local and state economies and the sales forecast team's interpretations of how these factors are likely to impact UI's future monthly sales.

The impact to sales from Conservation and Load Management ("C&LM") and Distributed Generation ("DG") currently on the UI system are embedded in the historical data used to develop the Base Energy Sales Forecast, and therefore, the future impact of these resources is accounted for in the Base Energy Sales Forecast results. UI adds to the Base Energy Sales Forecast the projected future annual impact of incremental additions of new C&LM and DG to account for the future additions of these resources.

Peak Load Forecast Purpose & Methodology

The purpose of the peak load forecast shown in Exhibit I is to allow the Council to effectively forecast and evaluate the demand and supply balance in Connecticut. The primary output of UI's Peak Load Forecast is the forecast of system peak loads under both normal and extreme weather conditions. Normal weather or average weather, also referred to as a 50/50 forecast, refers to a probability-based weather normalization of the historical usage data. A 50/50 weather normalization indicates a 50% probability of being exceeded and a 50% probability of falling short of the forecasted value in any given year. Extreme weather, also referred to as a 90/10 forecast, indicates that the forecasted extreme weather-adjusted system peak has a 10% probability of being exceeded on the system peak day, due to weather conditions. In other words, the forecasted 90/10 peak load will be exceeded once every ten years. The Company updated the weather normals in 2015 with recent weather data. The new normals were used to normalize the historic actual system peaks and to develop this year's peak load for both the 50/50 and 90/10 forecasts.

The Peak Load Forecast for 2017 was developed using a Direct Peak Forecast methodology, which utilizes the most recent ten years of weather-adjusted system peaks and econometric forecast models. The weather-adjustment for historic peak loads is based on a model that relates the twelve-hour average Temperature Humidity Index (the output of a mathematical formula that combines temperature and humidity into a single number) to historical summer weekday peak loads (THI Model). The THI Model is then used to adjust historic peak loads to the loads that would have been seen under normal or average temperature and humidity conditions and for extreme conditions. The econometric forecast relates the system peaks to economic drivers, obtained from independent sources using a multi-variable regression model.

The impact to the peak load from C&LM and DG currently on the UI system are embedded in the historical data used to develop the Base Peak Load Forecast. Similar to the Sales Forecast, the Company accounts for projected new C&LM, and DG programs separately. The Company also takes into account new or removed large customer loads separately. UI's final Peak Load Forecast results from the summation of the Base Load Forecast and new or removed large customer loads along with reductions due to new DG and new incremental C&LM.

Normal Weather-Adjusted Historical and Forecasted Data

The data shown in Exhibit 1 includes actual historical data for system energy requirements, sales and peak load. Exhibit 1 also includes historical and forecasted sales and peak load adjusted to normal weather conditions. UI is a summer peaking utility primarily due to the air conditioning loads on its system. During recent history, between 2007 and 2016, UI has experienced a decline in normal weather-adjusted sales of 12.4% as compared to a simultaneous decline in its normal weather-adjusted peak load of only 3.8%. This is attributed to changes in customer behavior regarding energy usage and the economic recession. It should be noted that in three of the last ten years of historical data (2010, 2011, and 2013); the actual peak load has exceeded the normal weather-adjusted peak load. This recent history of peak loads reinforces the need for the Company to consider extreme weather in its Peak Load Forecasts. The forecast of the normal weather-adjusted peak load projects a growth rate of 2.3% or 0.23 % compounded annually between 2016 and 2026.

Extreme Weather-Adjusted Historical and Forecasted Data

In addition to the normal weather-adjusted data, Exhibit 1 also shows historical and forecasted peak loads adjusted to extreme weather conditions. The 2007 to 2016 historical data in Exhibit 1 shows a decline in the extreme weather-adjusted historical Peak Loads of 2.6%. The Company's extreme weather-adjusted Peak Load Forecast shows an increase of 2.1% or 0.21% compounded annually during the period from 2016 to 2026.

It should be noted that in one of the last ten years of historical data (2011), the actual peak load has exceeded the extreme weather-adjusted peak load. This exceedance is consistent with the design of the extreme weather adjustment in that typical variations in weather alone will cause the extreme weather-adjusted value to be exceeded 10% of the time on the peak load day.

The ability to predict when extreme weather will occur or the exact amount of economic activity that will be realized is always problematic. Therefore, prudent planning requires that the possibility of the effects of extreme weather (i.e., high temperatures and high humidity) within the forecast time period be recognized, as well as appropriate assumptions of future economic development activity. Plans must be formulated to meet this possible demand. The bounds of the Company's forecasts from the normal and extreme weather-adjusted scenarios are intended to provide a plausible range of futures. No single forecast will be accurate throughout the forecast period. When extreme weather occurs, regardless of the timing, the system infrastructure must be in place to serve the load safely and reliably.

Distributed Generation

The Connecticut General Assembly passed a landmark legislative initiative in 2005: Public Act 05-01, June Special Session, *An Act Concerning Energy Independence* ("PA 05-01"). The implementation of the Act, carried out by the former DPUC, provided monetary grants to offset the capital cost of installing DG, but the program was discontinued for all projects that submitted applications on or after October 14, 2008. The program successfully added about 36 Megawatts of DG capacity in the UI service territory. The program also successfully added 7.6 MW of Emergency Generation capacities required to operate in the Independent System Operator – New England ("ISO-NE") demand response programs.

On July 1, 2011, Governor Malloy signed into law Public Act 11-80, *An Act Concerning the Establishment of the Department of Energy and Environmental Protection and Planning for Connecticut's Energy Future* ("PA 11-80"). Section 103 of PA 11-80 establishes a three year pilot program to promote the development of combined heat and power projects, a three year pilot program for anaerobic digestion projects to generate electricity and heat, and a Low & Zero Emission Renewable Energy Credit (LREC/ZREC) program that is expected to drive the development of Class 1 Renewable Resources through a five year solicitation program for LREC's and six year solicitation program for ZREC's administered by both utilities in Connecticut. A Year 6 ZREC & LREC RFP will be issued by UI in April, 2017 with a second RFP to be issued in the Fall of 2017. Qualified ZREC and LREC projects greater than 100 kW (AC) will be eligible for the Year 6 RFP. There is technically no LREC program RFP as the 5 year LREC program established under CGA Sec. 16-244(t) has run its course. However, Public Act 16-196, enacted during the 2016 legislative session, provided for a 50/50 split of the Year 6 ZREC budget into ZREC and LREC solicitations. On January 26, 2017, UI and Eversource made

a joint filing with the Public Utilities Regulatory Authority ("PURA") in Docket No. 11-12-06 (motion No. 86) to establish rules for the Year 6 RFP process.

The PA 11-80 DG pilot program offers significantly lower dollar incentives than those provided through the earlier program established in PA 05-01, capped at $200 per kilowatt of capacity. Capacity built via the LREC/ZREC program is dependent on the outcome of the solicitation program. UI will continue to monitor the development of the DG pilot program established through PA 11-80.

All grants approved through the PA 05-01 DG program that have not been built, totaling 8.5 Megawatts[1] of capacity, have expired. There is no reason to believe that customers who had approved grants and chose not to construct a DG unit will decide to do so with current incentives. Tracking will commence following any new projects potentially submitted after the Department of Energy and Environmental Protection ("DEEP") re-initiates or establishes a new program. Even with the grants made available, each customer must decide for themselves, within the timeframe allotted, whether the installation is economically attractive.

The State of Connecticut continues to look for ways to further its clean energy vision through the implementation of the Comprehensive Energy Strategy. This will give Connecticut residents and businesses the power to choose from a wide array of energy options and guides the State on a path toward a cheaper, cleaner, and more reliable energy future. UI will monitor these efforts, identify potential opportunities and support Connecticut's clean energy vision. The Company continues to monitor all programs related to DG and is prepared for its growth in the future.

[1] Operational DG output is based on capacity listed on grant application and not the actual generator output.

Part of House Bill No. 6838, Sec 16-245ff and Sec 16-245gg stipulates that the Solar Home Renewable Energy Credit ("SHREC") program be established by the Connecticut Green Bank. The program was signed in to law in mid-2015 with an end date of December 31, 2016. This program was designed to procure up to 300 megawatts of new residential solar in the state and the REC's will be held by the Connecticut Green Bank and transferred to the Utilities under a master purchaser agreement. The master purchase agreement was finalized by the Connecticut Green Bank and the utilities in May of 2016, and approved by PURA in January 2017. It is anticipated that the first REC's will be purchased before mid-year 2017. Thus far, in UI's service territory, 25.6 MW were approved under the program and 14.6 MW have been installed. Under this program, REC's will last for a period of 15 years from the project start date.

Under CT Public Act 13-303 and more recently Public Act 15-107, Connecticut along with Massachusetts and Rhode Island issued the Final Clean Energy RFP in order to identify projects that will advance the clean energy goals for the three states. While the Clean Energy RFP was not for customer sited resources, it was the first step in three RFP's designed to guide the state in selecting the best mix of resources to address the regions reliability challenge, meet clean energy goals, and save rate payers money. DEEP issued a Request for Proposal on March 9, 2016 for renewable projects between 2-20 MW including Passive Demand Response and Energy Storage. Projects were submitted for UI's service area however, none were accepted.

In development of the sales forecast shown in Exhibit 1, those projects no longer anticipated have been excluded from the sales forecast. In development of the peak load forecasts presented in Exhibit 1, the forecasted DG units have been included as offsets to load (utilizing calculated generator output during times of peak demand).

Finally, under CT Public Act 16-135, Section 5, UI is required to integrate electric vehicle charging load projections into distribution planning efforts based on the number of

electric vehicles registered in the state, and the projected increase or decrease in sales of such vehicles.

Based on vehicle registration data and data from the CT Department of Energy and Environmental Protection's CHEAPR rebate program, UI estimates that as of December 2016 there were approximately 147 Battery Electric Vehicles (BEVs) and 587 Plug-in Hybrid Electric Vehicles (PHEVs) in UI's territory. Using projections from the US Energy Information Administration's Annual Energy Outlook 2016 Reference case for vehicle sales in the Northeast, UI anticipates these numbers to increase to 2,066 BEVs and 2,180 PHEVs in the next ten years. UI expects the majority of vehicle charging will occur at home, during off-peak hours and does not intend to include any additions to its peak forecast in the near term. On peak charging typically occurs at the workplace; however, the increase in load is 3-6 kilowatts per charge, roughly the size of a small air conditioning unit[2]. As of December 28, 2016 there are only 46 public charging stations in UI's territory. EV charging load is currently integrated into UI's distribution forecast as part of the historical data used to develop the base forecast model. UI will continue to monitor EV forecasts and may adapt its methodology for inclusion of this load if significant increases in vehicles, charging stations or patterns materialize.

[2] US DOE "Evaluating Electric Vehicle Charging Impacts and Customer Charging Behaviors – Experiences from Six Smart Grid Investment Grant Projects" December 2014

Conservation & Load Management

By statute and regulation, Connecticut supports expanded investments in the state's C&LM programs. The state is required to give priority to energy efficiency and demand side management, specifically stating that "resource needs shall first be met through all available energy efficiency and demand reduction resources that are cost-effective, reliable and feasible."

Pursuant to Conn. Gen. Stat. § 16-245m, as amended by Connecticut Public Act 13-298m the Company is required to develop a plan to implement cost-effective C&LM programs which the DEEP Commissioner has the authority to approve, modify, or reject. On December 31, 2015 DEEP issued an Approval with Conditions of the 2016-2018 Conservation and Load Management Plan ("Plan"). This decision represents continued support for full funding of energy efficiency programs. Consistent with the findings of the 2013 Comprehensive Energy Strategy for Connecticut, the decision highlights the primary role of energy efficiency in reducing the state's energy consumption while growing its economy and reducing harmful pollutants associated with energy use.

The primary funding for the 2016-18 C&LM Plan continues to be the three-mill charge and a Conservation Adjustment Mechanism ("CAM") of up to three-mill assessed on customer electric bills. The electric C&LM budget is also supported by proceeds from the sale of carbon dioxide ("CO_2") emission allowances to the power sector through the Regional Greenhouse Gas Initiative ("RGGI"), and revenues from the ISO-NE Forward Capacity Market ("FCM"). After January 1, 2014, C&LM programs are no longer eligible to receive revenues from the sale of Class III Renewable Energy Credits.

RGGI is the first mandatory, market-based effort in the United States to reduce greenhouse gas emissions. The participating RGGI states cap allowable CO_2 emissions, sell

emissions allowances through auctions, and use the auction proceeds to fund energy efficiency, renewable energy, and other clean energy programs and technologies.

The ISO-NE FCM has been fully implemented since June 1, 2010. The FCM allows market participants to bid their peak demand savings into the capacity market. Market participants earn capacity payments for qualifying resources, such as distributed generation, energy efficiency, load management or load response, equivalent to supply-side generation sources. UI has entered peak demand savings from energy efficiency and load management projects for the FCM on behalf of the Connecticut Energy Efficiency Fund and has successfully bid capacity in the first eleven capacity auctions, with an twelfth auction scheduled for February, 2018.

PA 11-80 assigned the responsibility for development of an Integrated Resource Plan ("IRP") to the DEEP. PA 07-242, *An Act Concerning Electricity and Energy Efficiency* ("2007 Act"), established the initial integrated resource planning process, which resulted in the EDCs preparing the previous IRPs. DEEP produced the 2014 IRP in consultation with the EDCs. The 2014 IRP presents a long-term, resource scenario for Demand Side Management ("DSM").

The 2014 IRP was issued on March 17, 2015 and continues to support the commitment to energy efficiency. It recommends continued investment in energy efficiency to maintain a critical offset to load growth resulting from economic activity. It indicates that over the next ten years, this efficiency investment is expected to nearly eliminate growth in the state's annual electricity consumption (projected to rise an average of only 0.05% per year), and reduce growth in electricity consumption during peak demand periods to 0.5% per year as well as put the state on the path to have 80% of the state's homes weatherized by 2030, another goal established in PA 11-80.

On February 19, 2013, the DEEP released the first ever Comprehensive Energy Strategy for the state of Connecticut. The Comprehensive Energy Strategy is an assessment and strategic plan for all commercial, industrial, and residential energy issues, including: electricity supply (including all renewables), energy efficiency, industrial energy needs, natural gas, and transportation. The Comprehensive Energy Strategy is a blueprint for the DEEP, the Connecticut Energy Advisory Board, the Energy Efficiency Board, the Companies, and a myriad of stakeholders to provide cheaper, cleaner, and more reliable energy for Connecticut's future.

The Energy Independence and Security Act of 2007, a nationwide lighting efficiency standard ("Lighting Efficiency Standard") is fully reflected in the Plan savings. The purpose of the Lighting Efficiency Standard is to introduce minimum energy performance standards for standard incandescent bulbs that will, over a period of time, remove inefficient lighting products from the marketplace. These federal standards lower the energy consumption of a standard incandescent bulb, effectively reducing the energy savings of general service Compact Fluorescent Light bulbs ("CFLs") and LEDs in the C&LM programs.

Throughout 2016-2018, UI will continuously monitor the dynamic lighting marketplace to proactively address new regulations and their implementation, and emerging technologies. The 2016-2018 C&LM Plan will provide support for LEDs while strategically withdrawing support for CFLs. This strategy allows the Companies to anticipate and prepare the Connecticut market for the implementation of the 2020 performance standards of the Energy Independence and Security Act of 2007's ("EISA") requiring greater efficiency in many light bulb categories, without losing CFL and LED market share to less-efficient halogen bulbs in the interim.

The strategic focus of UI's programs is the result of a multi-level collaborative process involving UI and a diverse group of stakeholders. These stakeholders include: the DEEP, the Energy Efficiency Board, Connecticut state government, consumer and business interests,

national and regional environmental and energy efficiency organizations, design professionals and energy services providers.

UI participates in national and regional activities to develop a long-range focus for energy efficiency. To stay abreast of latest development, technologies and best practices, UI partners with the Consortium for Energy Efficiency ("CEE"), the American Council for an Energy-Efficient Economy ("ACEEE"), Northeast Energy Efficiency Partnerships ("NEEP"), and other utility and public benefit fund organizations. Together with these partners, UI is involved in regional or programmatic evaluations, market baseline research, and development of efficiency standards, exchange of programmatic ideas and concepts, and the assessment of the need for incentives. These efforts have produced many of the energy efficiency concepts and measures upon which the programs are based.

Since the 1990's, the Companies and the Energy Efficiency Board have been recognized as national leaders in the design and delivery of cost-effective and innovative energy-efficiency programs. The state's energy-efficiency programs (and other state energy policies and programs) have been perennial top-ten performers in the ACEEE State Energy Efficiency Scorecard, including first place recognition in 2006.

Additionally, individual Connecticut programs have been recognized by the ACEEE as among the best energy-efficiency programs in North America. Every five years, the ACEEE recognizes the energy-efficiency industry's top performing programs and Connecticut's programs are consistently recognized. In the 2013 ACEEE Review[3], the Companies' Small Business Energy Advantage program was once again named one of three "Exemplary" small business programs nationally, as it was previously in 2003 and 2008. In the 2003 and 2008

3 "Leaders of the Pack: ACEEE's Third National Review of Exemplary Energy Efficiency Programs," June, 2013, p. 1.

ACEEE Reviews, the Companies' Energy Conscious Blueprint program and other Retrofit programs for commercial and industrial customers were recognized by the ACEEE as "Exemplary," and both continue to be emulated national models today. Additionally, the Companies' Residential Program portfolio has also been recognized by the ACEEE with both the Home Energy Solutions and Residential New Construction programs earning "Exemplary" recognition in the 2013 ACEEE Review.

It is not just the recognition that Connecticut has outstanding energy-saving programs that is worthy of note; it is the persistence of that recognition over time. As the ACEEE noted in its 2013 Review:

> *…the leading customer energy-efficiency programs…have continued to evolve in response to sometimes dizzying numbers of changes in technologies, energy markets, economic conditions, and policies…programs with the most staying power [have] the ability to adapt and tune their core offerings to maintain and grow cost-effective savings.*

During the implementation of the 2016-2018 Plan, the Energy Efficiency Board and the Companies received numerous awards and recognitions. A list of these awards and recognitions can be found in Exhibit 3.

Section II. Transmission Planning

UI projects included in this report help UI fulfill its obligation to provide reliable service to its customers and to meet the reliability standards mandated by national and regional authorities responsible for the reliability of the transmission system, i.e., the North American Electric Reliability Corporation ("NERC"), the Northeast Power Coordinating Council ("NPCC") and ISO-NE.

Transmission Planning – National and Regional Reliability Standards

In 2006, the Federal Energy Regulatory Commission ("FERC") designated NERC as the nation's Electric Reliability Organization ("ERO"). FERC approved mandatory reliability standards developed by NERC in 2007. These mandatory reliability standards apply to UI as a transmission owner ("TO") and as a transmission planner ("TP") of the bulk power system, as designated by NERC through its compliance registry procedures. In addition to satisfying NERC reliability standards, UI must also satisfy NPCC and ISO-NE reliability standards. Both monetary and non-monetary penalties may be imposed for violations of the NERC, NPCC, and ISO-NE Reliability Standards.

Transmission Planning Process

ISO-NE, as the registered NERC reliability authority, along with UI and Eversource Energy ("Eversource"), formerly known as Connecticut Light & Power ("CL&P"), as the TOs in Connecticut, must comply with NERC and NPCC planning standards by performing reliability assessment studies of the transmission system. Needs Assessments in sub-areas such as

Southwestern Connecticut ("SWCT") are performed to determine if reliability issues are projected to occur within a ten year planning horizon. If a reliability problem is identified from a Needs Assessment, then mitigating solution alternatives are developed to ensure NERC, NPCC, and ISO-NE reliability standards are met. Viable transmission solution alternatives are compared based on a number of factors including overall cost, effectiveness, solution longevity, construction feasibility, and environmental impact. All recommended solutions are vetted through the ISO-NE process which includes the Planning Advisory Committee ("PAC") and the New England Power Pool ("NEPOOL") Reliability Committee. Final selected solutions eventually progress into detailed engineering and construction phases to mitigate all reliability exposure risks identified in the needs assessment study.

UI Proposed Transmission Projects

To address future reliability needs and consistent with the process described above, UI has multiple reliability projects at various stages in the process. UI's current transmission system projects are listed in Exhibit 2. These projects as well as recently completed projects are outlined below.

To address reliability, substation capacity, voltage support, and aging infrastructure in the UI service territory, UI requested and has received Declaratory Rulings from the Council that no Certificates of Environmental Compatibility and Public Need are required for the following projects:

- NERC FAC-008 Compliance Program – In 2013, UI received a Declaratory Ruling from the CSC involving this project, which addresses several 115-kV line National Electric Safety Code (NESC) clearance violations along the railroad

corridor between Stratford and West Haven. UI completed this compliance program in May 2016.

- Milford 115-kV Railroad Line Upgrades – In 2014, this project, which was identified to address the need for increased thermal capability for the 115-kV overhead railroad lines between Milvon Substation, Milford and Devon Tie Switching Station, Milford (1.4 mile transmission line corridor), received a Declaratory Ruling from the CSC. This project went into service in November 2016.
- Hawthorne 115-kV Capacitor Bank Additions – In 2015, this project, which was identified to address the low voltage conditions in the Old Town to Hawthorne 115-kV corridor by installing two 20 MVAr 115-kV capacitor banks at Hawthorne Substation in Fairfield, received a Declaratory Ruling from the CSC. This project was completed in February 2016.
- North Haven 115/13.8 kV Substation Transformer Replacement – To address PURA customer voltage regulation requirements, UI received a Declaratory Ruling from CSC in 2015 to replace two 50 MVA 115/13.8-kV fixed tapped transformers with similar sized load tap changing transformers at North Haven Substation. This project went into service May 2016.
- Housatonic River Crossing Project – In 2015, UI received a Declaratory Ruling from CSC to address issues with railroad corridor lattice transmission line structures that currently do not meet minimum NESC loading criteria. The proposed solution is to relocate UI 115-kV facilities along this Stratford-Milford railroad corridor onto new monopoles. The projected in service date of the Housatonic River Crossing project is August 2017.

- Mix Avenue 115-kV Substation Modifications – In 2015, this project, which was identified to address the need for thermal and voltage support in the Mix Avenue to Sackett 115-kV corridor by installing two 20 MVAr 115-kV capacitor banks and a 115-kV series reactor at Mix Avenue Substation in Hamden, received a Declaratory Ruling from CSC. This project was completed in December 2016.
- Substation Security Upgrade Program – In 2015, UI received a Declaratory Ruling for this project which addresses physical security needs at various UI substations. This four year program is expected to be completed by September 2019.
- Bridgeport - Stratford 115-kV Railroad Line Upgrades – In 2015, this project, which will address the need for increased thermal capability for the 115-kV overhead railroad lines between Congress Substation, Bridgeport and Baird Substation, Stratford received a Declaratory Ruling from the CSC. New transmission structures with larger capacity conductors are recommended along this 2.4 mile transmission line corridor. UI expects to complete this project by April 2019.
- Sackett 115-kV Substation Modifications – In 2016, this project, which addresses the removal of the Sackett 115-kV phase angle regulator due to maintenance reasons associated with its 50 years of operation and the need to upgrade the Sackett terminal end of the 115-kV 84004 underground cable line between Sackett Substation in North Haven and Mix Avenue Substation in Hamden received a Declaratory Ruling from the CSC. UI expects to complete this project by March 2017.

- Pootatuck 115-kV Substation Modifications – In 2016, this project, which addresses the need for additional Naugatuck Valley thermal capacity and voltage support by installing three 115-kV circuit breakers and a 30 MVAr 115-kV capacitor bank at Pootatuck Substation in Shelton, received a Declaratory Ruling from the CSC. UI expects to complete this project by June 2018.
- Ansonia 115-kV Capacitor Bank Additions – In 2016, this project, which addresses the need for Naugatuck Valley voltage support by installing two 25 MVAr 115-kV capacitor banks at Ansonia Substation in Ansonia, received a Declaratory Ruling from the CSC. UI expects to complete this project by December 2018.

Other Identified Reliability Projects / Concerns

Substation Projects:

In 2015, UI began the process to obtain a certificate of environmental compatibility and public need filing regarding the significant upgrades associated with Baird 115/13.8-kV Substation in Stratford. In 2016 UI received a certificate of environmental compatibility and public need for this project, which addresses transmission thermal overloads, distribution voltage regulation issues and control room space restrictions. Baird Substation, originally constructed in 1963, will require a new 115/13.8-kV substation built near the current substation location. The projected in-service date for the Baird 115/13.8-kV Substation Rebuild project is May 2018.

Southwest Connecticut Needs Assessment:

UI, along with ISO-NE and Eversource, completed a long term (2022) reliability Needs Assessment of the Southwest Connecticut ("SWCT") area in 2014. This assessment's objective was to evaluate the reliability performance of SWCT in meeting NERC, NPCC, ISO-NE, Eversource and UI standards and criteria. The study was conducted in accordance with the regional planning process as outlined in Attachment K of the ISO-NE Open Access Transmission Tariff ("OATT"). This study identified reliability transmission needs in the greater New Haven, greater Bridgeport, and Naugatuck Valley areas of UI's service territory related to capacity limitations, unacceptable voltage performance, and high short circuit current levels. Additional details of specific reliability concerns/needs are provided in the SWCT Needs Assessment report, dated June 23, 2014, which is posted on the ISO-NE website.[4]

A second study, the ISO-NE SWCT 2022 Area Transmission Solution Study, developed and analyzed transmission solutions to address the needs identified in the 2022 SWCT Needs Assessment. As a result of the ISO-NE SWCT Area Transmission Solution Study, at the July 15, 2014 PAC meeting, ISO-NE presented the SWCT Preferred Solutions for the New Haven Bridgeport and Naugatuck Valley Areas. Based on UI's involvement in ISO-NE's re-assessment of the SWCT Needs Assessment and Solution Study, UI anticipates making the following Bridgeport Area project filing to the CSC in 2017:

- Baird - Housatonic River 115-kV Railroad Line Upgrades – The 115-kV overhead lines between Baird Substation, Stratford and the Housatonic River in Stratford require increased thermal capability. New transmission structures with

[4]ISO-NE SWCT Needs Assessment Report – Final, 6/23/2014, available at the following link: https://www.iso-ne.com/system-planning/key-study-areas/swct/

larger capacity conductors are recommended along this 2.26 mile transmission line corridor. UI expects to complete this project by May 2020.

Coastal Substation Flooding Asset Condition Review & Mitigation Study:

Due to recent weather events such as Tropical Storm Irene in 2011 and Superstorm Sandy in 2012 along with revisions to the Federal Emergency Management Agency ("FEMA") flood maps, UI evaluated the risk and potential impact of coastal flooding events on its coastal substations. The UI Coastal Substation Flooding Asset Condition Review study[5], dated February 29, 2016, concluded that five of the seven UI coastal substations built adjacent to Long Island Sound are "at-risk" of being destroyed by a FEMA 100-year flood event and could result in a significant impact to the New England Bulk Electric System ("BES") and Connecticut customers.

The seven UI substations evaluated in the March 2016 Asset Condition study include Ash Creek, Congress Street, Pequonnock and Singer substations in Bridgeport and East Shore, Grand Avenue and Mill River substations in New Haven. The study concluded that all of these substations except Ash Creek and East Shore are "at-risk" of being destroyed by a FEMA 100-year flood event. The study also concluded that the 100-year event had no impact on Ash Creek substation and only a minor impact on East Shore substation, limited to three 115-kV disconnect switch motor operators. In addition to the flood related risks, the study identified significant equipment and structural deficiencies at Pequonnock substation.

[5] UI Coastal Substation Flooding Asset Condition Review – Final, 2/29/2016, available at the following link: https://www.iso-ne.com/committees/planning/planning-advisory

The UI Coastal Substation Flood Mitigation Solution Report[6], which was completed January 23, 2017 provided the mitigating strategy for each of the various "at-risk" UI substations. Due to the combination of asset condition deficiencies and flooding risk, Pequonnock 115 kV Substation will be raised and rebuild on a more elevated property near the existing substation location. To address the flooding risk at Congress Street, Singer and Grand Avenue-Mill River substations, perimeter floodwall systems (including access gates, pumps, piles, etc.) will be installed at each of these substations. At East Shore substation, three 115-kV disconnect switch motor operators will be raised to address the flooding risk there. The in-service dates for these projects are expected to be between 2019 and 2022.

Other Substation/Transmission Projects Requiring CSC Approval:

UI anticipates making a filing in 2017 requesting a Declaratory Ruling for the Seaview 115 kV Transition Station Ground Grid Mitigation project, which address the ground grid system of this UI underground cable to overhead 115 kV transition station in Bridgeport. The projected in service date of this project is December 2017.

Bridgeport's Old Town Substation, originally constructed in 1968, was recently evaluated for solutions to address equipment obsolescence and condition issues, transmission electrical clearance issues and control room space restrictions. A proposal involving a new 115/13.8-kV substation adjacent to the existing Old Town Substation is expected to be presented to the CSC in 2018. The projected in-service date for the Old Town 115/13.8-kV Substation Rebuild project is December 2020.

[6] UI Coastal Substation Flood Mitigation Solution Report – Final, 1/23/2017, available at the following link: https://www.iso-ne.com/committees/planning/planning-advisory

Please note that Exhibit 2 includes only those planned transmission projects that UI is responsible to undertake. It does not include any plans or proposed actions by third parties that would require transmission system modifications in UI's service territory. It would be the responsibility of such third parties to provide the CSC with a report of their plans as appropriate. Any such proposed modifications would require notification and coordination with UI so the Company can assess the impacts on its transmission system and ensure the system's continued reliability.

Section III. EXHIBITS

EXHIBIT 1 System Energy Requirements, Annual Sales, and Peak Load Table

The United Illuminating Company

System Energy Requirements, Annual Sales, and Peak Load

History								Normal Weather Adjustment					Extreme Weather Adjustment		
Year	Total Sys. Req. (GWh)	Annual Change (Pct.)	Actual Sales (GWh)	Annual Change (Pct.)	Actual System Peak (MW)	Annual Change	Load Factor (Pct.)	Weather Adjusted Sales (GWh)	Annual Change (Pct.)	Weather Adjusted System Peak (MW)	Annual Change	Load Factor (Pct.)	Weather Adjusted System Peak (MW)	Annual Change	Load Factor (Pct.)
2007	6,119	-	5,917	-	1,298	-	54%	5,929	-	1,381	-	51%	1,487	-	47%
2008	5,912	-3.4%	5,729	-3.2%	1,301	0.3%	52%	5,709	-3.7%	1,403	1.6%	48%	1,474	-0.9%	46%
2009	5,673	-4.0%	5,493	-4.1%	1,253	-3.7%	52%	5,593	-2.0%	1,351	-3.7%	48%	1,450	-1.6%	45%
2010	5,950	4.9%	5,735	4.4%	1,369	9.2%	50%	5,587	-0.1%	1,315	-2.7%	52%	1,417	-2.3%	48%
2011	5,783	-2.8%	5,576	-2.8%	1,398	2.2%	47%	5,485	-1.8%	1,284	-2.3%	51%	1,382	-2.5%	48%
2012	5,679	-1.8%	5,431	-2.6%	1,317	-5.8%	49%	5,411	-1.3%	1,336	4.1%	49%	1,399	1.3%	46%
2013	5,617	-1.1%	5,422	-0.2%	1,365	3.6%	47%	5,375	-0.7%	1,292	-3.3%	50%	1,417	1.3%	45%
2014	5,507	-2.0%	5,327	-1.8%	1,186	-13.1%	53%	5,342	-0.6%	1,280	-0.9%	49%	1,391	-1.8%	45%
2015	5,625	2.1%	5,450	2.3%	1,241	4.6%	52%	5,359	0.3%	1,358	6.1%	47%	1,434	3.1%	45%
2016	5,521	-1.8%	5,334	-2.1%	1,264	1.9%	50%	5,193	-3.1%	1,329	-2.1%	47%	1,449	1.1%	43%
2007 - 2016 growth			**-9.8%**		**-9.8%**		**-2.6%**			**-12.4%**		**-3.8%**			**-2.6%**

Forecast								Normal Weather Scenario					Extreme Weather Scenario		
Year	Total Sys. Req. (GWh)	Annual Change (Pct.)						Weather Adjusted Sales (GWh)	Annual Change (Pct.)	System Peak (MW)	Annual Change	Load Factor (Pct.)	System Peak (MW)	Annual Change	Load Factor (Pct.)
2017	5,450	-1.0%						5,243	-1.9%	1,319	-2.9%	47%	1,439	0.3%	43%
2018	5,381	-1.3%						5,177	-1.3%	1,326	0.5%	46%	1,446	0.5%	42%
2019	5,366	-0.3%						5,162	-0.3%	1,331	0.4%	46%	1,451	0.4%	42%
2020	5,371	0.1%						5,167	0.1%	1,339	0.6%	46%	1,459	0.5%	42%
2021	5,345	-0.5%						5,142	-0.5%	1,342	0.2%	45%	1,462	0.2%	42%
2022	5,338	-0.1%						5,135	-0.1%	1,343	0.1%	45%	1,463	0.1%	42%
2023	5,333	-0.1%						5,130	-0.1%	1,345	0.1%	45%	1,465	0.1%	42%
2024	5,346	0.3%						5,143	0.3%	1,349	0.3%	45%	1,469	0.3%	42%
2025	5,328	-0.3%						5,126	-0.3%	1,354	0.4%	45%	1,474	0.3%	41%
2026	5,327	0.0%						5,125	0.0%	1,360	0.4%	45%	1,480	0.4%	41%
2016 - 2026 growth			**-3.5%**							**-1.3%**		**2.3%**			**2.1%**
Compounded Annual Growth Rate (2016 - 2026)			**-0.36%**							**-0.13%**		**0.23%**			**0.21%**

1. System Requirements are sales plus losses and Company use.
2. Load Factor = System Requirements (MWh) / (8760 Hours X System Peak (MW)).
3. All forecasts include C&LM, DG & potential new large customer planned loads identified by UI Economic Development.

EXHIBIT 2 Transmission System Planned Modifications

Report to the Connecticut Siting Council

List of Planned Transmission Projects for which Certificate Applications are being contemplated, may be subject to Declaratory Ruling, or have already been filed

Projects for which Certificate Applications are being Contemplated	kV	Date of Completion
1. Seaview 115-kV Transition Station Ground Grid Enhancement Project	115	2017
2. East Shore 115-kV Raising Impacted Equipment Project	115	2019
3. Baird-Housatonic River 115-kV Railroad Lines Upgrade Project	115	2020
4. Congress 115-kV Substation Flood Wall Project	115	2021
5. Singer 345-kV Substation Flood Wall Project	345	2022
6. Grand Avenue-Mill River 115-kV Substation Flood Wall Project	115	2022
Projects which have Received CSC Declaratory Approval		
1. Sackett 115-kV Substation Modification Project	115	2017
2. Housatonic River Crossing Project	115	2017
3. Pootatuck 115-kV Substation Modification Project	115	2018
4. Ansonia 115-kV Capacitor Bank Additions Project	115	2018
5. Substation Security Upgrade Program	115	2019
6. Bridgeport-Stratford 115-kV Railroad Lines Upgrade Project	115	2019
Projects which have received a CSC Certificate of Environmental Compatibility and Public Need Approval		
1. Baird 115/13.8-kV Substation Rebuild Project	115	2018
Projects which have begun the process of obtaining a CSC Certificate of Environmental Compatibility and Public Need Approval		
1. Old Town 115/13.8-kV Substation Rebuild Project	115	2020
2. Pequonnock 115/13.8-kV Substation Rebuild Project	115	2022

EXHIBIT 3 Conservation & Load Management Awards and Recognitions

2013 ENERGY STAR® Partner of the Year in Energy-Efficiency Program Delivery. The U.S. Environmental Protection Agency ("US EPA") recognized the Connecticut Energy Efficiency Fund and the Companies as a 2013 ENERGY STAR Partner of the Year;

2013 ENERGY STAR Sustained Excellence Award. The US EPA recognized the Northeast Energy Efficiency Partnerships' ("NEEP") Northeast Retail Products Initiative, including the Companies and the Energy Efficiency Board, with the 2013 ENERGY STAR Sustained Excellence Award for Excellence in ENERGY STAR Retail Products Promotion;

2013 ACEEE Certificate of Recognition for Exemplary Programs. The ACEEE recognized the Residential New Construction program as Exemplary;

2013 ACEEE Certificate of Recognition for Exemplary Programs. The ACEEE recognized the Home Energy Solutions program as Exemplary;

2013 ACEEE Certificate of Recognition for Exemplary Programs. The ACEEE recognized the Small Business Energy Advantage program as Exemplary;

2013 ENERGY STAR-Certified Homes Leadership in Housing Award. The US EPA recognized the Energy Efficiency Board, Eversource, and UI for the Residential New Construction program's achievement of reaching the threshold of 300 ENERGY STAR-certified homes in a calendar year, and for increasing builder, contractor, and homeowner awareness of the ENERGY STAR brand;

2013 Connecticut Quality Improvement Award ("CQIA") Silver Innovation Prize. The CQIA Silver Innovation Prize was awarded for the Connecticut Energy Efficiency Fund's Comprehensive Initiative for Commercial and Industrial customers;

2013 NEEP Business Leader Champion. Covidien, a UI customer, was nominated for the NEEP Business Leader Award and was chosen as the State champion;

2014 ENERGY STAR Partner of the Year for Sustained Excellence. The US EPA recognized NEEP's Northeast Retail Products Initiative with the 2014 ENERGY STAR Sustained Excellence Award for excellence in ENERGY STAR Retail Products Promotion;

2014 ENERGY STAR Award for Excellence. The US EPA recognized UI and the Energy Efficiency Board for Excellence in ENERGY STAR Promotion through the Retail Products program at the SmartLiving™ Center;

2014 ENERGY STAR Award for Excellence. The US EPA recognized the Connecticut Energy Efficiency Fund for its continued enhancement and expansion of the Home Performance with ENERGY STAR program;

2015 NEEP Business Leader State Champion. Aptar-Stratford, a UI customer, was nominated for the NEEP Business Leader Award and was chosen as the State champion;

2015 ENERGY STAR Partner of the Year Award for Sustained Excellence. The US EPA recognized NEEP's Northeast Retail Products Initiative with the 2015 ENERGY STAR Sustained Excellence Award for Excellence in ENERGY STAR Retail Products Promotion;
2015 ENERGY STAR Award for Excellence. The US EPA recognized UI and the Energy Efficiency Board for the Great Light Bulb Exchange Initiative.

2016 ENERGY STAR® Partner of the Year in Energy-Efficiency Program Delivery. The U.S. Environmental Protection Agency ("US EPA") recognized the Connecticut Energy Efficiency Fund and the Companies as a 2016 ENERGY STAR Partner of the Year;

2016 EPA Environmental Merit Award. The US EPA recognized UI for its innovative efforts to promote energy efficiency. Each year, the EPA New England district office recognizes individuals and organizations in New England who have worked to protect or improve the environment in distinct ways.