

February 26, 2021

Mr. Robert Stein, Chairman Connecticut Siting Council 10 Franklin Square New Britain, CT 06051

Dear Mr. Stein:

The Connecticut Municipal Electric Energy Cooperative (CMEEC) herewith submits a copy to the Connecticut Siting Council of our Forecast of Electric Loads and Resources for 2021-2030 Report as required by Section 16-50R of the Connecticut General Statutes.

Should you require any additional information, please contact me.

Very truly yours,

CONNECTICUT MUNICIPAL ELECTRIC ENERGY COOPERATIVE

Charles Carpinella

Charles Carpinella Principal Planner Analyst

CJC/

Enclosures

Cc: Service List



FORECAST OF ELECTRIC LOADS AND RESOURCES 2021-2030

March 1, 2021

Connecticut Municipal Electric Energy Cooperative 30 Stott Avenue Norwich, Connecticut 06360

Introduction and Background

The Connecticut Municipal Electric Energy Cooperative ("CMEEC") is a not-for-profit joint-action power supply agency empowered to finance, plan, acquire, construct, operate, repair, extend, or improve electric generation and transmission facilities and sell power at wholesale and other markets to serve the needs of the Connecticut municipal electric utilities and other electric utility systems and customers.

The CMEEC member municipal electric utilities (collectively, the "Members" or "MEUs") are (1) Norwalk's Third Taxing District Electrical Department ("TTD"), (2) Groton Utilities ("Groton"), (3) Jewett City Department of Public Utilities ("JCDPU"), (4) Norwich Public Utilities ("NPU"), (5) South Norwalk Electric & Water ("SNEW"), and (6) Bozrah Power & Light Company ("BL&P"). The Mohegan Tribal Utility Authority ("MTUA") is also a full-requirements wholesale customer of CMEEC. The loads of the CMEEC Members, and the MTUA are represented on an integrated, single-system basis for purposes of ISO-New England ("ISO-NE") operations.

The joint power supply established by CMEEC is intended to meet the diversified power supply needs of all CMEEC's Members and customers. CMEEC's mission is to meet these requirements reliably and at the lowest possible cost over the long-term. Today, CMEEC's portfolio consists of CMEEC and member-owned generation, unit entitlement contracts, long-term contracts, intermediate and short-term system contracts, financial instruments, and ISO-NE market purchases.

The enclosed forecast for 2021-2030 shows negative or flat load growth for CMEEC's Members while its special contract customers show flat or slightly positive load growth in Connecticut. CMEEC's projections for the 2021-2030 period reflect an average compound growth rate of 0.04% for total system energy requirements and -0.87% for annual summer coincident peak demand. The main load growth areas of this years forecast appear to be the MTUA and the CyrusOne data center located in TTD service territory.

Future growth is further modulated by reductions in usage rates resulting from the conservation programs planned and implemented by CMEEC's Members. These programs remain very active and are popular with all sectors of MEU end users. The long-term forecasts of electric demand and the energy of the CMEEC Member and customer utilities are the primary tools used to ascertain future CMEEC power needs. These forecasts utilize regression techniques using 20 years of historical weather data simulated over 100 different weather forecast case scenarios. Member and customer reconstituted hourly demands are used to produce probabilistic models; these models are adjusted to account for changing dynamics in each member territory and take into consideration residential customer attrition where applicable. When the primary 50th percentile individual forecasts are combined, the result is a CMEEC system-wide energy, peak demand and capacity requirements forecast, which is filed with the Council herein and used to make power supply decisions.

The new Fitch Substation in East Norwalk (TTD service territory) is expected to meet the needs of that community for several decades and the similar SNEW South Norwalk 115 kV to 13.8 kV

SONO substation which opened in 2014 likewise sets the stage for meeting future load growth with improved reliability over the previous 27.6 kV supply system. Corresponding with this major supply route change, SNEW has upgraded its distribution system to 13.8 kV, reducing losses and improving distribution level reliability.

Information Required by Section 16-50r(a)

The following material and tables are in the specific itemized requirements of Sec.16-50r of the General Statutes and are provided on behalf of CMEEC and its Members and customers. Items (1) through (8) listed below correspond to the numbers included in that section.

(1) Provide a tabulation of estimated peak loads, resources and margins for each year (of the forecast period):

Table I shows forecasted energy and demand for the period as well as data on summer and winter peak demands. Table II reflects the forecasted annual peak demands for the 2020-2029 periods for both the 50/50 forecast as well as the 90/10 extreme condition forecast.

CMEEC is a participant in ISO-NE and meets its net power needs primarily through the ISO-NE market system. CMEEC also maintains power and related resources delivered to the Markets. Market resources over the forecast period include NYPA and Hydro Quebec ICAP credits (20 - 30 MW), Conservation & Load Response ICAP Credits (5 MW), A.L. Pierce (75 – 95 MW), Norwich Jet (15 - 18 MW). CMEEC maintains distributed generator resources (50 - 70 MW), an increase from years past incorporating our combined project with the Navy and State of Connecticut to further secure the energy future of the Submarine Base and to help attain local reliability goals.

(2) Provide data on energy use and peak loads for the five preceding calendar years:

Historical aggregated energy use and peak loads for the six-member CMEEC system and the MTUA are provided in Table III.

(3) Provide a list of existing generating facilities in service:

Generating facilities owned by CMEEC, CMEEC Members and other project participants are listed in Table IV. The mix of existing generating facilities and system power agreements that serve the CMEEC system are listed in Table V. Anticipated retirement dates of CMEEC Member generating facilities and Member cogeneration and small power production facilities are listed in Table VI and Table VII respectively.

(4) Provide a list of scheduled generating facilities for which property has been acquired, for which certificates have been issued, and for which certificate applications have been filed:

CMEEC executed a lease in 2014 with the United States Navy for use of an approximately 1 acre federally owned site located at the Naval Submarine Base in Groton. CMEEC is currently in development of a 7.4 MW fuel cell generating facility to be located at the Naval Submarine Base. The project is expected to be completed and online by July 2021.

(5) Provide a list of planned generating units at plant locations for which property has been acquired or at plant locations not yet acquired that will be needed to provide estimated additional electric requirements:

There are no planned CMEEC owned generating units responsive to this question.

(6) Provide a list of planned transmission lines on which proposed route reviews are being undertaken or for which certificate applications have already been filed.

There are no planned new transmission lines. There is a planned upgrade of the existing 400 line in Groton. That upgrade will change the voltage of that line and the adjoining Eversource 100/400 line from 69kVto 115kV and will do so using the existing conductor and upgrading pole and cross arm structures as needed within the existing right of way; this upgrade is subject to pending certificate application Petition No. 1436.

(7) Provide a description of the steps taken to upgrade existing facilities and to eliminate overhead transmission and distribution lines in accordance with the regulations and standards described in Section 16-50t.

Several projects are recently completed, underway or in various stages of completion in the CMEEC Member service territories, which are summarized below.

South Norwalk Electric & Water (SNEW) continues to see growth in electric sales due to various residential and commercial construction projects in South Norwalk, growth anticipated when SNEW put in service a new dual feed PTF level substation in 2014 to serve all of its load. These construction projects provide SNEW with the opportunity to make improvements to the electric distribution system by replacing near end-of-life cable, connectors, poles, and switches. In 2020, SNEW continued the replacement of deteriorated poles. While there were several significant storm events in 2020, SNEW's system remained resilient, consistent with the goals of the system improvements over the past few years including system wide smart meters that aid in outage management. In 2021, SNEW continues to survey and replace deteriorated poles and make system improvements to the overhead and underground systems. The underground distribution system upgrade plan is to have one end-of-life submersible transformer replaced in 2021; another was replaced in 2020. SNEW will continue the replacement of aging underground SF6 gas switches. Overhead system reliability will be improved by adding fuse protection, along with closely monitoring tree trimming requirements. SNEW is

currently in the process of converting all its wood pole mounted high-pressure sodium streetlights to LED streetlights.

East Norwalk (TTD) put in service a new PTF level substation in December 2013 (Fitch 47R) which is the subject of CSC DN 426. This project addressed long standing reliability issues, replacing distribution voltage level power supply to TTD installed in 1946 with dual feed bulk power supply directly from the high voltage grid. In addition, this project has allowed TTD to satisfy additional load growth within their system and improves the overall power supply resiliency of SWCT. TTD's Supervisory Control and Data Acquisition (SCADA) system monitors TTD's transmission system and allows for control of distribution substations. This system will accommodate future expansion and ensure compliance with NERC/NE-ISO regulations.

Norwich Public Utilities (NPU) continues to upgrade its remaining 4.8kV distribution system to 13.8kV that will provide a number of benefits: increasing efficiency by reducing system losses; improving reliability through better voltage conditions and newer equipment; and reducing operating costs.

All NPU substations, generating stations and several distribution switches are monitored and controlled 24 hours a day, seven days a week via a SCADA system in the utility's Control Room. All substation control s have been moved to NPU's fiber optic network for more reliable communication and monitoring.

In 2020, NPU, in conjunction with parallel efforts at Eversource, installed new PLC based control relays at two of its substations. This upgrade increases reliability and provides more system information to the NPU Control Room.

The Greeneville Dam and Occum Dam fish passages both operated successfully during 2020. NPU works closely with the State of Connecticut's Department of Energy and Environmental Protection (DEEP) on fish and eel passages, a pit tagging program, and shad trucking to promote the migration of shad to new spawning grounds. The Occum Dam continues to pass American Shad with NPU's annual efforts monitored by DEEP. NPU's Greenville and Occum Dams are certified by the Low Impact Hydro Institute (LIHI) and continue to accrue renewable energy certificates (RECs) while providing reliable base load clean power to NPU customers.

Over the last several years, NPU has successfully installed 20,669 electric AMI "smart" meters (99.7% converted) as part of a multi-year project. The remaining meters require service upgrades by the customers before AMI meters can be installed.

NPU has integrated the AMI system with its Outage Management System providing its Control Room Operators with real-time information on power outages for improved outage response and storm management. NPU uses this data to enhance public communication and information sharing in emergencies or as otherwise needed.

Jewett City Department of Public Utilities (JCDPU) is continuing the upgrading of its

distribution network in an intended development of long-range system expansion and as part of this effort, any business or residential expansion would involve underground cable installation. (For example: New Senior Center and newly constructed apartment complex were both underground installations.) All JCDPU customers are now served through smart meters. Jewett City recently completed the overhaul of their backup substation and this work will go towards increasing the reliability within their service territory. Jewett City DPU is beginning the task of correcting a Load Power Factor deficiency and this work will extend out in time (due to financial impacts of Covid-19 Pandemic) for the next year or two (expected to be complete by end of 2022).

Groton Utilities completed the re-conductor project on Laurelwood Road. As part of the project, numerous overhead services drop loop (SDL) cables were replaced with underground cable installed in conduit to increase reliability at the end of the road. This street is part of a cross connection circuit tie that can be used for an alternate feed to a large apartment complex. The underground cable and conduit were replaced because the conduit was damaged. Also, the utility poles were replaced due to age and new secondary cables were installed.

Bozrah Light and Power (BL&P) has started pole and overhead 13.8KV lines replacement work on South Road in Bozrah. The work consists of pole replacements due to age, primary conductor replacement, and secondary wire replacement. South Road, Bozrah is a major three phase line that runs east from Route 82 to Route 163 and is roughly 3.2 miles in length.

As part of a four-year maintenance program, Groton Utilities and BL&P perform the following: relay cleaning and testing, substation breaker maintenance, infrared scanning that looks for loose connections, and faulty connectors, transformer testing and vegetation control.

Nearly all meters on the BL&P and Groton circuits are now AMI. The commercial, industrial and odd meters will be replaced in the next few years.

The number of power interruptions due to tree contract are on the decline due to extensive tree trimming. Two tree trimming crew work 5 days per week for the entire fiscal year. Both tree trimming crews are hard at work reducing the potential of power interruptions by removing trees and tree branches away from power lines on primary, sub-transmission and the secondaries. They have done some trimming at the ground level near the transmission circuits.

(8) For each private power producer having a facility generating more than one (1) megawatt, and from whom CMEEC has purchased electricity during the preceding calendar year, provide a statement including the name, location, size, and type of generating facility, the fuel consumed by the facility, and the byproduct of the consumption:

Generally, the customers in CMEEC Members service areas who have generating capacity greater than 1 MW retain the power for ongoing internal utilization and/or load

management. Table VII includes on-site generation capability at customer locations within the municipal service territories for which CMEEC or the member municipal utility has arrangements in place to purchase some or all of the power output.

TABLE 1

CONNECTICUT MUNICIPAL ELECTRIC ENERGY COOPERATIVE 10-YEAR FORECAST OF MEMBER AND CUSTOMER ENERGY REQUIREMENTS AND CMEEC PEAK DEMAND

2021-2030

				Load	Factor	ЖI	63.9	68.8	68.9	68.8	68.9	70.3	70.3	70.3	70.1	70.3	70.3	
	CMEEC	Winter	Coincident	Peak	Demand	MW [2]	184.04	184.97	184.25	182.29	182.29	183.78	183.78	183.78	183.78	183.78	183.78	-0.01
	CMEEC	Summer	Coincident	Peak	Demand	MW [2]	218.12	202.99	203.76	203.86	203.51	199.83	199.83	199.83	199.83	199.83	199.83	-0.87
		Systems	Energy	Requirements	Met by CMEEC	Mwh [1]	1,225,208	1,224,059	1,229,503	1,229,290	1,231,672	1,230,321	1,230,321	1,230,321	1,230,321	1,230,321	1,230,321	0.04
					CyrusOne	MWh	4,331	5,094	5,085	5,089	5,099	5,086	2,086	2,086	2,086	2,086	980'5	1.62
		Mohegan	Tribal	Urility	Authority	MWh	118,461	129,514	134,875	134,757	135,234	134,807	134,807	134,807	134,807	134,807	134,807	1.30
					Air Gas	MWh	167,550	168,498	168,334	168,278	168,679	168,248	168,248	168,248	168,248	168,248	168,248	0.04
					Bozrah	MWh	51,570	49,601	49,487	49,442	49,628	49,528	49,528	49,528	49,528	49,528	49,528	-0.40
***************************************					South Norwalk	MWh	100,687	99,831	998'66	828'66	99,864	871,66	877,66	99,778	99,778	82,778	822,66	-0.09
					East Norwalk	MWh	58,700	59,608	59,819	59,828	60,019	59,924	59,924	59,924	59,924	59,924	59,924	0.21
					Jewett City	MWh	23,952	23,946	23,996	23,983	24,043	24,027	24,027	24,027	24,027	24,027	24,027	0.03
					Norwich	MWh	289,551	276,041	276,374	276,473	276,932	276,632	276,632	276,632	276,632	276,632	276,632	-0.46
					Groton	MWh	410,406	411,925	411,666	411,602	412,174	412,292	412,292	412,292	412,292	412,292	412,292	0.05
						YEAR	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	AACGR % Increase 2020 -2030

[1] Totals are the sum of kilowatthours rounded to the nearest megawatthour (MWh).

[2] The forecasted CMEEC coincident peak demands were computed by summing the Groton, Norwich Jewett Gity, East Norwalk, South Norwalk, Bozrah, Air Gas, the Mohegan Tribal Utility Authority and CyrusOne noncoincident peak demands and multiplying by an average historical coincidence factor.

TABLE II

March 1, 2021

CONNECTICUT MUNICIPAL ELECTRIC ENERGY COOPERATIVE (CMEEC) SUMMARY OF CMEEC PEAK FORECASTS (1)

Year	50/50 Peak Forecast	90/10 Peak Forecast
1001	rorecust	<u>1 orecase</u>
2021	202.99	224.65
2022	203.76	230.07
2023	203.86	229.37
2024	203.51	227.85
2025	199.83	222.56
2026	199.83	222.56
2027	199.83	222.56
2028	199.83	222.56
2029	199.83	222.56
2030	199.83	222.56

⁽¹⁾ CMEEC developed the 50/50 forecast and the 90/10 forecast using the same statistical approach of simulating historical weather as inputs to hourly models for each Member/Customer and then aggregating the results to arrive at the CMEEC forecasted annual peaks.

TABLE III

March 1, 2021

CONNECTICUT MUNICIPAL ELECTRIC ENERGY COOPERATIVE (CMEEC)

HISTORICAL ENERGY USE AND PEAK LOAD 2016-2020

<u>Year</u>	CMEEC Coincident Peak Load (MW) [1]	CMEEC Energy (MWh) [1]
2016	212.68	1,284,722
2017	212.19	1,229,457
2018	221.59	1,255,745
2019	217.58	1,231,632
2020	218.12	1,225,208

^[1] Reflects CMEEC Member loads inclusive of BL&P and the MTUA for 2016-2020. These values also include AirGas, an interruptible customer located in Bozrah, CT, and is a retail customer of BL&P.

TABLE IV

CONNECTICUT MUNICIPAL ELECTRIC ENERGY COOPERATIVE (CMEEC)

EXISTING GENERATION FACILITIES OWNED BY CMEEC AND ITS MEMBERS

As of March 1, 2021

Generating Facility	Winter Rating (MW)	Summer Rating (MW)
Norwich Combustion Turbine (Oil-Fired) [1]	18.800	15.255
Pierce Generating Unit (Oil/Gas-Fired) [2]	97.000	77.500
Norwich Waste Water Treatment (Oil-Fired)	2.00	2.00
Norden I (Oil-Fired)	2.00	2.00
Norden 2 (Oil-Fired)	2.00	2.00
Norden 3 (Oil-Fired)	2.00	2.00
Norwich Second Street (Hydro)	[3]	[3]
Norwich Tenth Street (Hydro)	[3]	[3]
Norwich Occum (Hydro)	[3]	[3]
MicroGen Units [4]	50.00	50.00

^[1] Represents CMEEC current joint-ownership share. The full capability of the Norwich combustion turbine unit is under contract to CMEEC.

^[2] Represents CMEEC current joint-ownership share and the ownership share of the Town of Wallingford, CT. The full capability of the Pierce generating unit is under contract to CMEEC.

^[3] Winter and summer ratings are based on average river flow conditions. The nameplate rating for the Second Street hydro station is 0.95 MW. The nameplate rating for the Tenth Street hydro station is 1.40 MW. The nameplate rating for the Occum hydro station is 0.80 MW. These hydro units remain a resource of the Norwich Department of Public Utilities. The generations of these hydro units are used by Norwich to directly offset Norwich load.

^[4] Represents the CMEEC MicroGen Units which are currently commercially operating. Seven (7) 2.50 MW units are located in Groton service territory, two (2) 2.50 MW units are located in Norwich, one (1) 2.50 MW unit is located in Jewett City, two (2) 2.50 MW units are located in Lebanon, CT, four (4) 2.50

MW units are located at the Mohegan Tribal Utility Authority and (4) 2.5 MW units located at Backus Hospital in Norwich.

TABLE V

As of March 1, 2021

MIX OF EXISTING GENERATION - CMEEC RESOURCES

	In-	Net Winter	CMEEC	Net Summer	CMEEC	CMEEC Percent
	Service	Capacity	Share	Capacity	Share	of Unit
Unit Designation	<u>Date</u>	(In MW) [1	(<u>MW</u>)	(In MW) [2	<u> (MW)</u>	<u>(%)</u>
Long-Term System & Asset Con	tracts [3]					
Base System Purchase		75.38	75.38	59.81	59.81	
On-Peak System Purchase		12.00	12.00	10.00	10.00	
Total System Contracts		87.38	87.38	69.81	69.81	
Municipal Generation						
Norwich Combustion Turbine	1972	18.80	18.80	15.25	15.25	100.00
Norwich Waste Water Treatment	2008	2.00	2.00	2.00	2.00	100.00
Pierce Generation Unit	2007	97.00	97.00	77.50	77.50	100.00
Norden I	2009	2.00	2.00	2.00	2.00	100.00
Norden 2	2009	2.00	2.00	2.00	2.00	100.00
Norden 3	2009	2.00	2.00	2.00	2.00	100.00
Total Municipal Generation		123.80	123.80	100.75	100.75	
TOTAL CMEEC CAPACITY	RESOUR	CES	211.18		170.56	
Other Resources						
PA Hydro (Firm & Peaking) [4]			13.30		13.30	NA
Short-Term Purchases [5]			Varies		Varies	NA
CMEEC's Microgen Units [6]			50.00		50.00	

- [1] Represents NEPOOL Winter Maximum Claimed Capability.
- [2] Represents NEPOOL Summer Maximum Claimed Capability.
- [3] System Purchases, Contract Purchases & Unit Entitlement Purchases from several counterparties.
- [4] Represents maximum hourly contract deliveries to CMEEC. New York Power Authority (NYPA) hydro purchases began July 1, 1985. Energy contributions from NYPA are considered to be firm contracts and used to reduce electric requirements thereby reducing CMEEC Capability Responsibility in NEPOOL.
- [5] The MW amounts shown for Short-Term Purchases vary from month to month from 0 MW to 25 MW through December 2021.
- Represents the CMEEC MicroGen Units which are currently commercially operating. Seven (7) 2.50 MW units are located in Groton, two (2) 2.50 MW units are located in Norwich, one (1) 2.50 MW unit is located in Jewett City, two (2) 2.50 MW units are located in Lebanon, CT, four (4) 2.50 MW units are located at the Mohegan Tribal Utility Authority and (4) 2.5 MW units located at Backus Hospital in Norwich. These resources will be used for demand reduction purposes and are not anticipated to be enrolled in the ISO New England markets.

TABLE VI

CONNECTICUT MUNICIPAL ELECTRIC ENERGY COOPERATIVE

March 1, 2021

Anticipated Unit Retirement Dates

Retirement Date

Conventional Hydro

Norwich Tenth Street Hydro	Not Scheduled
Norwich Second Street Hydro	Not Scheduled
Norwich Occum Hydro	Not Scheduled

Peaking

Norwich Combustion Turbine	Not Scheduled
Pierce Generating Unit	Not Scheduled
Norwich Waste Water Treatment	Not Scheduled
Norden I	Not Scheduled
Norden 2	Not Scheduled
Norden 3	Not Scheduled

Table VII

Connecticut Municipal Electric Energy Cooperative (CMEEC)

COGENERATION & SMALL POWER PRODUCTION FACILITIES GREATER THAN 1 MW IN TOTAL SIZE & from which CMEEC and/or its Members Purchase Power

As of March 1, 2021

Groton Utilities

Facility <u>Name</u>	Facility <u>Type</u>	Facility Location	No. Of <u>Units</u>	Prime <u>Mover</u>	Type <u>Fuel</u>	Summer & Winter Capacity	Years I <u>nstalled</u>
Pfizer, Inc.	Cogen[1]	Groton CT	3	Steam Turbine (NG	Steam BOILERS)	37,040 kW	1993 2001 2009
			1	Gas Turbine	Gas/#2 Oi	I 10,000 kW	2008
			2	Fuel Cell	Natural Gas	5,600 kW	2017
GFSE	Fuel Cell	SUBASE NLON Groton CT	2	Fuel Cell [2]	Natural Gas	7,400 kW	2021

^[1] The customer retains most of the power from each of these facilities; CMEEC purchases excess output.

^[2] Fuel Cells are located on at Subbase New London on property leased by CMEEC from the Navy and are currently expected on-line in July 2021. Their output is fully subscribed to by CMEEC however the output can be dedicated in island mode to serve the SUBASE during grid emergencies.

Groton Utilities (continued)

Tesla's Pelican Farm	Solar Farm	Groton CT	Solar Panels	432 kW Solar Photovoltaic	2017
Tesla's Trident Farm	Solar Farm	Groton CT	Solar Panels	1,000 kW Solar Photovoltaic	2017
Tesla's Polaris Farm	Solar Farm	Groton CT	Solar Panels	3,500 kW Solar Photovoltaic	2018
Groton Naval Housing	Rooftop Solar	r Groton CT	Solar Panels Residential	4,105 kW Solar Photovoltaic	2016
Groton Naval Housing	Rooftop Sola	r Groton CT	Solar Panels Commercial	291 kW Solar Photovoltaic	2016
		Bozrah Light and	l Power		
Tesla's Brush Solar Farm	Solar Farm	Bozrah CT	Solar Panels	2,500 kW Solar Photovoltaic	2016
		Norwich Public	Jtilities		
Tesla's Stott Avenue Solar Farm	Solar Farm	Norwich CT	Solar Panels	3,500 kW Solar Photovoltaic	2017
Tesla's Rogers Road Landfill Solar Farm [3]	Solar Farm	Norwich CT	Solar Panels	1,500 kW Solar Photovoltaic	2017
Tesla's Rogers Road Greenfield Solar Farm	Solar Farm	Norwich CT	Solar Panels	1,000 kW Solar Photovoltaic	2017

^[3] This project is currently off-line and not operational. Also, please note that all Tesla projects listed above are currently subject to a contractual dispute.