

MUNICIPAL LIGHT PLANT

David G. Wood, Director *Power Supply*

Concord Light (“CMLP”) is a community-owned electric utility, created for and by the citizens of Concord in 1898. The goal then, as now, was to provide reliable and reasonably priced service in a responsive and thoughtful manner. Our mission is to partner with our customers, civic institutions, and employees to foster a vital community, in the near and in the long term, in which to live, raise a family, work, and operate a business. Our 2018 – 2025 Strategic Plan, available at concordma.gov/cmlp, describes our goals:

- Maintain service reliability at a very high level;
- Maintain or increase customer satisfaction and perception of value;
- Provide energy-related services to as many customers as possible;
- Increase revenue and net operating income modestly;
- Reduce greenhouse gas emissions

Our work in 2019 focused on a number of initiatives designed to achieve those goals.

The Town Manager appoints a five member, volunteer Light Board comprising local residents. Current Light Board members include (in alphabetical order) Peggy Briggs, Gordon Brockway, Alice Kaufman (Clerk), Lynn Salinger, and Wendy Rovelli (Chair).

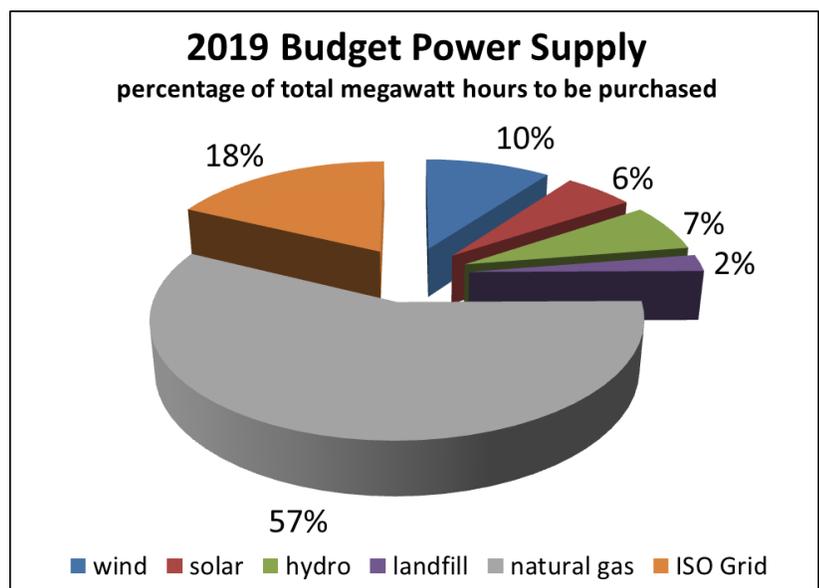
The Board meets monthly to discuss and/or vote on topics such as rates, power supply and renewable energy options. The Board encourages customers to attend.

The Concord Municipal Light Plant (CMLP) operates as an Enterprise Fund within the Town government. No property tax money is required or used to operate the Light Plant. All operating expenses including electricity purchases, capital investments, and debt service are paid by the Light Plant customers. In addition, the Light Plant contributes to the Town’s operating budget via a Payment-in-Lieu-of Taxes (PILOT). For 2019, this formula based payment was \$478,000.

All power supply expenses are passed to CMLP’s customer-owners at cost. Power Supply includes the cost of energy, capacity, and transmission. Capacity and transmission are two market services provided by the regional Independent System Operator at Federal Energy Regulatory Commission regulated rates. Energy supply, including the reliable provision of electricity and its price, are managed by CMLP. CMLP has developed a power supply portfolio from multiple sources under a power supply strategy that best suits our community’s needs. The power supply selection strategy included the following tenets:

- Diversified energy supply sources and fuel diversity
- Short and long term agreements to mitigate risk
- Peaking and base load supply sources to match needs
- Inclusion of cost competitive renewable energy sources
- Competitive bids for partial energy agreements on a rotating basis to minimize differences between our cost of power and current markets.

As a result, CMLP has developed a diverse power supply portfolio with a wide variety of suppliers and resources. The chart below shows the sources and fuels that make up the generation portion of CMLP’s supply portfolio.



Non-Carbon Emitting

CMLP is actively replacing fossil-based generating resources with carbon-free sources in a fiscally responsible manner. Below is a list of recent power purchases from non-carbon emitting sources. In 2018 CMLP began collecting an extra \$0.01 per

Q1 2019 at a price of \$0.023/kWh and 11,351 Q2 2019 RECs at a price of \$0.037/kWh. At those levels of cost for RECs, CMLP will not be able to retire as many MA Class 1 RECs in 2019 as it did in 2018.

Non-Carbon Emitting Sources

| Project | Location | Year Purchased | % of needs |
|----------------------|----------------------|----------------|------------|
| Canton Mountain Wind | Canton, ME | 2017 | 2% |
| Seabrook Nuclear | Seabrook, NH | 2017 | 20% |
| Granite Wind | Coos County, NH | 2018 | 1.5% |
| Existing Hydro | Housatonic River, CT | 2019 | 3.4% |
| Chariot Solar | Hinsdale, NH | 2019 | 2.7% |

Forecasted Renewable Energy Credit Disposition for 2019

| | MWh | % |
|---------------------------------|---------------|------------|
| MA Class 1 | 16,383 | 10% |
| ME Class 2 | 7,341 | 4% |
| Total RECs | 23,724 | 14% |
| Other sources; no RECs | 23,248 | 14% |
| Total | 46,972 | 29% |
| Purchase of non-associated RECs | ? | ? |
| Expected sales | 164,272 | |

kilowatt hour from customers on all energy sales in order to establish a fund to pay for the purchase of Massachusetts Class 1 renewable energy certificates (“MA Class 1 RECs.”) With the money that was collected in 2018 CMLP bought 74,256 non-associated MA Class 1 RECs for 2018 generation. Together with its 19,115 MWh of direct purchases from renewable resources, a total of 54% of CMLP’s 2018 sales came from non-carbon emitting sources.

CMLP’s REC purchase strategy purposefully sets the cost of the program at a fixed level (\$0.01/kWh) while letting the amount of RECs purchased in any year to float based upon the market price of RECs. That program feature prevents the attainment of carbon neutral power from significantly increasing rates. Like commodity prices, REC prices fluctuate with supply and demand. 2018 REC prices were generally less than \$0.01/kWh. REC prices for 2019 have been much higher. CMLP purchased 18,222 MA Class 1 RECs for

For 2019, 33% of CMLP’s energy supply is forecasted to come from generation that does not emit carbon. However, CMLP does not own the Renewable Energy Credits (“RECs”) for all of that generation.

CMLP has title to Massachusetts Class 1 RECs for 10% of expected purchases. CMLP has title to Maine Class 2 RECs for a further 4% of expected purchases. An additional 14% of purchases come from generating resources that are renewable such as NYPA hydro power, in-Town solar generation from the third-party owned large solar arrays, and other solar and landfill plants; but to which CMLP does not own the RECs.

CMLP will continue expanding its percentage of non-carbon emitting power as market economics allow without increasing rates substantially.

Energy Management

CMLP's energy management services help our customers manage their energy costs and reduce their carbon emissions through electrification, improved efficiency, and generation of carbon-free solar power at their home or business.

Electric Vehicles

As of this annual report date, Registry of Motor Vehicles Q3 records showed 412 electric vehicles (EVs) garaged in the Town of Concord, an increase of 31% compared to the end of 2018. The number of EVs comes close to the target of 444 EVs set by CMLP in its strategic plan, which we projected would be achieved by the end of 2019 through a combination of business-as-usual growth in EV adoption and additional adoption fostered by CMLP's promotional efforts. We expect that RMV Q4 records will bring the 2019 total even closer to the target adoption figure.

We undertook extensive efforts in 2019 to help customers understand the benefits of driving electric and how free expert advice, test drive opportunities, dealer incentives and other resources can help them switch to an EV. CMLP staff and volunteers displayed EVs and distributed information at eight community events in 2019, starting with the Patriots Day Parade in April, and ending with the Sustainable Concord Open House in December. Further, in November, CMLP held a well-attended EV Ride & Drive at CCHS. Ten different makes and models of EVs were taken out for 130 test drives by attendees.

Electric Vehicle Ride & Drives

CMLP's free Electric Vehicle Toll-Free Support Line and Email, which allows Concord residents to ask questions about all things EV, handled over 370 interactions with over 160 unique customers in 2019. In August, we launched WattPlan EV Advisor, an online tool for comparing the lifetime costs and carbon emissions of specific plug-in and gasoline vehicles.

We promoted our Level 2 Charging System rebate and our EV Miles bill credits for off-peak charging via community events, bill inserts and e-newsletters sent to our customers. Forty customers received a \$250 Level 2 Charging System rebate in 2019. Over 100 EV owners have programmed their car to charge off-peak since the EV Miles Program began in 2018, qualifying for bill credits.



Ride and Drive Event

One quarter of all housing units in Concord are in multi-dwelling units (MDUs), where residents typically can't make EV charging system installation decisions independently of their condo association or rental property owner. In 2019, CMLP developed two programs to help multi-dwelling units (MDUs) install EV charging infrastructure for their residents: the EV Ready Pilot Program and the Shared Charger Program.

The EV Ready Pilot Program will provide three pilot program participants with customized EV charging infrastructure designs for MDUs, cost estimates for those designs, and partial funding for installation. The Pilot Program will create real life examples of how EV charging is done at MDUs with different parking area types, and will help CMLP better understand how we can support MDUs as they prepare for growing EV adoption. CMLP will select three EV Ready Pilot Program participants from among the six applications received, and begin the charging infrastructure design process in early 2020.

The Shared Charger Program offers MDUs the opportunity to have CMLP install, own, and operate one dual-port shared charging station on MDU property, subject to conditions related to location, easement and the number of committed EV purchasers at the property. Arrangements have been completed to install the first charging station on an MDU property in 2020.

Heat Pumps

CMLP actively promoted the adoption of air- and ground-source heat pumps and heat pump water

heaters in 2019. We published enhanced heat pump FAQs on our website, inserted “Heat Pump 101” flyers in customer bills, encouraged community event attendees to consider heat pumps, and participated in special events to educate our customers about climate-friendly heating and cooling with heat pumps, sponsored by HeatSmart Carlisle/Concord/Lincoln and EnergizeWayland.

CMLP’s strategic plan set a 2019 target of 46 heat pumps installed for space heating in Concord homes and businesses. That target was exceeded. Forty-one air source heat pumps and 9 ground source heat pumps were installed, for a total of 50 installations. CMLP provided over \$78,000 in rebates to ASHP and GSHP adopters. CMLP also provided \$3,000 in rebates to four heat pump water heater adopters in 2019.

Home Energy Assessments

One hundred fifteen Concordians requested home energy assessments from CMLP in 2019, and collectively had over 2,400 incandescent and compact fluorescent light bulbs replaced by LEDs during the assessments.

Residential Energy Efficiency Rebates

CMLP provided residential customers with almost \$9,000 in rebates for weatherizing their homes and for purchasing and installing LED light bulbs.

Commercial Energy Efficiency Rebates

In 2019, ten business customers installed more efficient lighting, and received more than \$100,000 in rebates through CMLP’s High Efficiency Lighting Program. These commercial lighting projects are projected to reduce electricity consumption by more than 400,000 kWh per year.

Solar Photovoltaic (PV) Rebates

In partnership with Energy New England and the Massachusetts Department of Energy Resources (DOER), CMLP launched the MLP Solar Rebate Program in May, 2019. This new program provides an additional \$1,200 per kW for installed solar capacity up to 25 kW, funded with matching contributions from CMLP and DOER. The MLP solar rebate supplements CMLP’s traditional solar rebate of \$625 per kW installed, up to 5kW.

Applications for solar rebates, which had ceased subsequent to the termination of the SREC program in 2018, revived slowly starting in the 2nd quarter of 2019, as installers learned how to participate in the MLP Solar Program, and CMLP, ENE and DOER ironed out MLP solar rebate processing procedures. A lengthy turnaround time for DOER reviews has slowed down approvals to install. Approvals to operate were issued to ten residential customers in 2019, who installed an overall capacity of 87 kW DC. There are now a total of 355 PV systems on residential and commercial rooftops in Concord with a combined capacity of 3.6 MW DC.

Community Service

Annual holiday tree lighting

CMLP line crew decorated trees with energy-efficient LED lighting for the holidays in the West Concord business district and at the Monument Square.

Open Table Food Pantry

CMLP employees collected donations for the Open Table food pantry including food, adult personal care items, and diapers for babies. The donations were delivered to Everett St. and were distributed to families in need.

Bringing Hands-On Learning about Electricity to the Concord Public Schools

CMLP staff delivered interactive educational sessions on electricity to twelve fourth grade classes in the Concord Public Schools in 2019. This year, we included a new activity that we developed to help students learn about the differences between electric and gasoline-powered vehicles.



Residential Rate Assistance

CMLP began our Residential Rate Assistance program in 2006 to help Concord residents in financial need. Eligible customers are able to lower their bills by as much as 50%. As of December 2019, there were 145 Concord households enrolled in this program.

Concord Municipal Utilities Customer Service

CMLP collaborated with the Public Works Water & Sewer Department, Town Accountant, and Deputy Treasurer to consolidate customer service for all Town utilities into one team. The Concord Municipal Utilities team is housed at CMLP and provides service and support to residential and commercial services for electric, water, sewer, and broadband. Customers can contact Customer Service at 978-318-3101 or concordutilities@concordma.gov.

New Enterprise Software

CMLP partnered with NISC (National Information Solutions Cooperative) to implement new enterprise software. In May 2019, CMLP went live with iVUE, the new customer billing system, and SmartHub®, the customer self-service portal.

With the new billing system, CMLP now offers customers paperless billing and payment options including making a payment via SmartHub, credit card, Internet banking, or with our automated phone system. Customers can opt to receive one bill for all their utilities or to have multiple accounts mailed together in one envelope.

Customers can also register for a SmartHub account or download the free app for their smartphone or tablet to access information, receive updates, pay bills and more.

CMLP implemented NISC's Accounting and Business Solutions (ABS), MapWise and OMS (Outage Management System) software in 2019. ABS integrates with the billing and operational applications and is designed to streamline processes and improve financial reporting. MapWise and OMS are designed to enable CMLP to monitor the state of the distribution system, maximize assets, allocate resources more efficiently, improve outage response times, and streamline operations.

Operations and Engineering

New EV Charging Stations

CMLP completed the installation of three new electric vehicle charging stations in 2019. Two are located in West Concord at the Gerow Park Rail Trail parking lot and the Rideout Park parking lot. The third is located at the CMLP Operations Center parking lot opposite the Public Meeting Room entrance.

There are now 9 publicly available electric vehicle charging stations in Town – 7 operated by CMLP and 2 operated by the Walden Pond Visitors Center. Each station has two ports.

To date, the CMLP EV charging station usage has avoided the production of approximately 19,796 kg of greenhouse gas emissions, and has created an environmental impact equivalent of planting 508 trees and letting them grow for ten years (source: Charge-point).

Underground Direct Buried Upgrade

Two direct buried replacement projects were completed as part of CMLP's direct buried replacement program. These locations included South Meadow Ridge and a section of Williams Rd between #96 and #196. As part of these projects, CMLP crews installed a new underground primary and secondary electrical and communication duct bank, new underground primary and secondary cable, devices, and transformers.

Overhead Distribution Upgrades

The primary overhead conductors in the following areas were upgraded to "tree wire" this year: Bristers Hill, Adams, Coburn Hill, Nimrod, Minot, Butternut, Mallard, Black Duck, Dalton Road, Prescott, Peter Spring, Minuteman, Arrowhead, Cranfield and Old Bedford (single phase).

Underground Conversion Projects

As part of the Cambridge Turnpike Improvement Project, CMLP extended the existing underground ductbank along Lexington Rd near Cambridge Turnpike. The installation of this ductbank allowed for the overhead to underground conversion. This also allowed for two new switchgear devices to be installed on the new underground line. This greatly improves the reliability, expansion of broadband services and visual impact in the area.

Substation Safety, Security and Efficiency Upgrades

The exterior lighting at Substation 219 has been upgraded to high-efficiency, low-maintenance LED lighting. Sensors were installed in various locations to ensure that lighting only comes on when needed.

At Substation 223, the high-efficiency lighting upgrade project is well underway. Some of the defective exterior light fixtures have been replaced with LED upgrades, and the rest will be completed early in January. Security cameras have been added to the exterior of Substation 223, and have a full recorded view of the entire exterior.

Substation Relay Equipment Upgrades

CMLP, in conjunction with EverSource, has replaced and upgraded the transmission line relay protection at Substation 219. These new SEL, relays will provide faster and more reliable fault protection to Concord's transmission lines between EverSource Substation 416 and Concord Substation 219.

Substation Metering Upgrade Project

Power quality meter replacement is required at both of CMLP's Substations. These meters are needed to measure power consumption, loss, efficiency, etc on all distribution feeders. CMLP is working with several vendors to discuss options and technical requirements.

Street Light Conversion Project

CMLP was awarded a grant from the Massachusetts Department of Energy Resources as part of the LED Streetlight Accelerator Program. CMLP replaced approximately 600 overhead metal halide street lights with high-efficiency and reliable LED equivalents this year. The new LED fixtures consume about 50% less electricity, and are far more reliable. The conversion of all "cobra head" street lights, throughout the Town, has been completed.

Parking Lot Lighting Upgrade

CMLP upgraded the overhead lighting at the Walden and Keyes Road Parking Lots.

Concord Library Transformer Relocation Project

CMLP relocated and upgraded the transformer serving the Concord Library. This greatly improves reliability and flexibility in regards to the library's electrical service.

Telecommunications

2019 was the fifth full year of operation for the CMLP's Broadband service. Operating as "Concord Light Broadband" the demand for the service has remained steady and community support and feedback has been excellent.

Demand for the service continues to be strong. Subscriptions grew to 1399 residential and business accounts between January and December 2019, a net increase of 249 subscribers for the year. Revenues in 2019 exceeded \$1,097,719, a 13% increase over 2018 as well. Operating costs are in line with expectations. Since the end of 2016, Concord Light Broadband has been generating sufficient operating income to cover the expected operating expenses. Within the next year or so, we expect to be able to fund growth out of current revenue as well.

Concord Light Broadband has continued to offer straight-forward pricing and was able to implement our internet third speed increase without increasing prices. In fact, broadband has never had a price increase since the initial offering in 2014. Residential service starts at \$49.95 per month for 35 Mbps. Standard offerings provide speeds up to 300 Mbps; higher speeds are available as a custom bid. These plans offer fully symmetrical bandwidth (matching upload and download speed). Information about the offerings is on the Town's web site at concordma.gov/broadband. Concord Light Broadband also has a staffed help desk that answers calls for assistance 24 hours a day, seven days a week.