

MUNICIPAL LIGHT PLANT

David G. Wood, Director

Concord Light 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 2018 focused on a number of initiatives designed to achieve those goals.

The Town Manager appoints a five member, volunteer Light Board comprised of local residents. Current Light Board members include Peggy Briggs, Lynn Salinger, Gordon Brockway, Dan Gainsboro, and Wendy Rovelli.



(left to right) Peggy Briggs, Lynn Salinger, Gordon Brockway (Chair), Dan Gainsboro, and Wendy Rovelli.

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

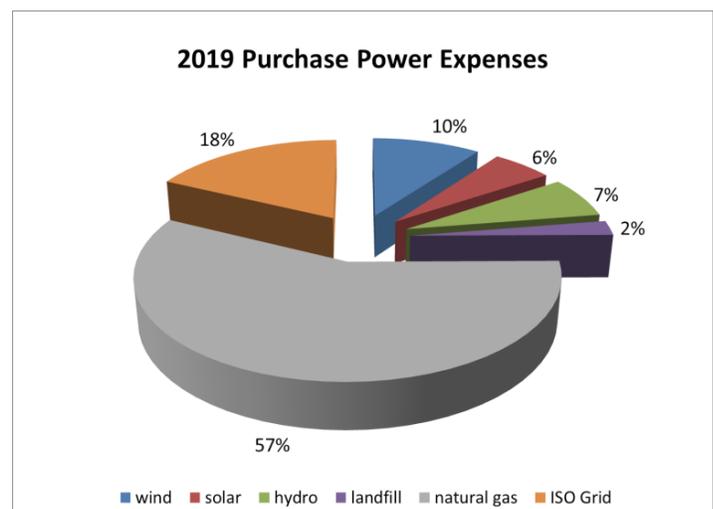
The Concord Municipal Light Plant (CMLP) operates as an Enterprise Fund within the Town government. No property tax money is required or used to operate the Light Plant. All operating expenses including electricity purchases, capital investments, and debt service are paid by the Light Plant customers. In addition, the Light Plant contributes to the Town's operating budget via a Payment-in-Lieu-of Taxes (PILOT). For 2018, this formula based payment was \$461,000.

Power Supply

Concord Light 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, Concord Light 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.



CMLP is actively cleaning the power supply and retires Renewable Energy Credits and will continue to expand this program until the power supply is 100% carbon free.

Power Supply includes the cost of Capacity and Transmission – two market services provided by the regional Independent System Operator at Federal Energy Regulatory Commission regulated rates. All power supply costs, generation, capacity and transmission, are passed to CMLP’s customer-owners at cost.

Energy Management

Concord Light continues to provide a variety of energy management services to its customers, including rebates and energy audits for residential and commercial customers.

Electric Vehicles

In 2018, CMLP geared up to drive electric vehicle adoption. In the fall, we began offering electric vehicle (EV) owners a rebate of \$250 to help offset the cost of installing some or all components of a Level 2 system for higher speed charging of an electric vehicle at their home. We launched the EV Miles Program. EV Miles participants program their electric vehicles to charge off-peak and receive a monthly bill credit for their participation. 44 EV owners enrolled in 2018. CMLP also introduced its EV ChargeSmart webpages, which answer common questions about electric vehicle charging at home.

CMLP has contracted with Energy New England (ENE) to provide a variety of EV awareness and education services. ENE launched an Electric Vehicle toll-free support line and email in late 2018, which allows Concord residents to get answers to their questions about all things EV.

HeatSmart Campaign

The Town’s Comprehensive Sustainable Energy Committee (CSEC) and CMLP were selected by the Massachusetts Clean Energy Center (MassCEC) to participate in HeatSmart Mass, a pilot program to promote the adoption of air-source and ground-source heat pumps. In addition to increased comfort, and cost savings for some customers, the use of heat pumps to heat and cool homes will reduce greenhouse gas emissions, helping Concord meet its goal of 80% fewer emissions by 2050.

From March through August 2018, Concord residents were able to get a free assessment to determine whether heat pumps would be a good fit for their heating and cooling needs. The assessments, and installations, if desired, were done by installers selected by MassCEC, CSEC and CMLP staff. Due in part to the HeatSmart campaign, 61 customers adopted air-source heat pumps (ASHPs) in 2018, exceeding our Fuel Switching Initiative Year 1 Goal of 40 ASHP installations by 50%. CMLP provided a total of \$103,000 in rebates to ASHP adopters.

Ten Concord residents signed ground-source heat pump installation contracts during the HeatSmart campaign. One was fully installed in 2018, and was awarded a rebate through CMLP’s new ground-source heat pump rebate program, launched in March. The remaining systems are slated to be installed in 2019.

Home Energy Assessments

162 Concordians requested home energy assessments from CMLP in 2018, and collectively had over 5,600 incandescent light bulbs replaced by LEDs during the assessments.

Residential Energy Efficiency Rebates

CMLP provided residential customers with over \$13,000 in rebates for weatherizing their homes and for purchasing and installing heat pump water heaters and LED light bulbs.

Commercial Energy Efficiency Rebates

In 2018, 18 business customers installed more efficient lighting, and received a total of \$111,000 in rebates through CMLP’s High Efficiency Lighting Program. These commercial lighting projects are projected to reduce electricity consumption by 500,000 kWh per year.

Solar Photovoltaic (PV) Rebates

28 PV systems with an overall capacity of 240 kW DC were installed by CMLP’s residential and commercial customers in 2018. CMLP contributed \$82,000 in rebates towards the installation of these systems. There are now a total of 345 PV systems on residential and commercial rooftops in Concord with a combined capacity of 3.5 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 Concord Center's Monument Square.

Residential Rate Assistance

CMLP began the 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 2018, there were 163 Concord households enrolled in this program.

Operations

LED Streetlights

CMLP was awarded a grant from the Massachusetts Department of Energy Resources as part of the LED Streetlight Accelerator Program. Using the nearly \$80,000 in funding, CMLP replaced 600 overhead metal halide lights with LED equivalents which consume about 50% less electricity.

New EV Charging Station

CMLP completed the installation of a two new electric vehicle charging stations. The charging stations are located in the newly renovated Keyes Road parking lot and the newly renovated Walden Street parking lot. There are two dedicated electric vehicle parking spots for charging at each location. This brings the Town's municipally owned car chargers to 4, each dual port charging capability.



EV Charger - Keyes Rd Parking Lot

Underground Direct Buried Upgrade

CMLP completed installation of conduit on Tanglewood Drive which allowed for the upgrade of the existing underground distribution system. Crews installed approximately 2500 feet of conduit and wire. This upgrade further improves system reliable.

Overhead Distribution Upgrades

Reconductoring overhead single-phase primary distribution circuits, residential areas and streets including the following locations: Old Bedford Rd (Section), Annursnac Hill Rd (Section), Peter Spring Rd, Arrowhead Rd, Minuteman Dr, Prescott Rd, Cranefield Rd, Damon St, Adams Rd, Coburn Hill Rd, Nimrod Dr, Brister's Hill Rd.

Underground Conversion Projects

CMLP completed the Emerson Field underground conversion project. The Emerson Field Project area includes sections of Thoreau St, Sudbury Rd, Hubbard St, and subsequent side streets. Starting in 2019 we will turn our attention to the Belknap/Elsinore neighborhood.

Substation Security Upgrades and Maintenance

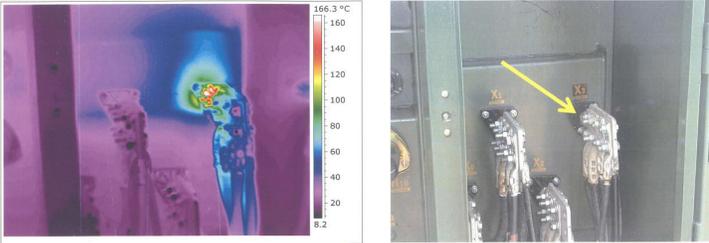
CMLP completed the installation of video surveillance security cameras at Substation 219 This new system will track all activity outside of the building.

Maintenance was completed at both of CMLP's substations. In order to keep equipment operating at peak performance substation maintenance is conducted once every three years. This typically includes transformer oil testing, relay testing and calibration, breaker testing and cleaning, and substation battery maintenance.

Infrared System Survey

CMLP contracted with Infrared Analyzers, Inc to perform an analysis of the Town's overhead electrical infrastructure, underground devices, and switch gear equipment utilizing infrared thermography. Infrared thermography utilizes a highly sensitive infrared imaging system which converts radiated energy into a thermal image of the object radiating the energy. The resulting image captures any hot spot indicating defective equipment, components, cables, and connections. In return these locations are repaired or replaced by CMLP and preventing unscheduled outages. Captured in the picture is a partially damaged

padmount transformer bushing located at a commercial property on Sudbury Road. CMLP was able to deenergize and replace this transformer before the bushing permanently failed. If it had failed and caused an oil spill, the cost to fix the issue could have easily been in the range \$50k along with an extended power outage at this location.



Telecommunications

2018 was the fourth 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. CMLP launched the Broadband service in March 2014 after the 2013 Annual Town Meeting had passed Article 48 which authorized borrowing to fund startup expenses. The 2017 Annual Town Meeting renewed support for the service by passing Article 24 which authorized CMLP to borrow an additional \$1 million to fund additional expansion of telecommunications service offerings. The principal and interest expense from this borrowing will be repaid exclusively from future telecommunication revenue.

Demand for the service continues to be strong. Subscriptions grew 27% to 1215 residential and business accounts between January and December 2018, a net increase of 258 subscribers for the year. Revenues in 2018 exceeded \$942,000, a 26% increase over 2017 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 without teaser introductory rates, fees, or hidden increases down the road. We were able to implement our third across the board speed increase while pricing for the services remained steady

in 2018. In fact, we have never had a price increase from our 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). The fiber-to-the-home installation includes the industry's best 802.11ac Wi-Fi router for those customers that wish to upgrade their wireless service. Information about the offerings is on the Town's web site at concordma.gov/broadband. Concord Light Broadband has a staffed help desk that answers calls for assistance 24 hours a day, seven days a week.

The ability to cost effectively deploy advanced secure telecommunications to municipal facilities is a benefit of having in-house telecommunications operations. In 2018, the telecom staff, working with Town IT staff, participated in projects to support the Town's network. These included installation of a Town-wide wireless system in every Concord facility. This new system allows for greater security of the Town data network, greater flexibility for employees moving between facilities, and secure, isolated guest Internet access for citizens, guests, and contractors in Town facilities. The telecommunications group was also able to assist in installing new phones and network infrastructure at 141 Keyes Road and the Beede Center.

In 2018, CMLP continued to provide additional leases for "dark fiber". The lease agreements provide access to CMLP fiber telecommunication providers or businesses who wish to gain access to premises in Concord. CMLP earns revenue from the fiber leases and customers benefit from faster, less-expensive installations and access to advanced telecommunication services.

COMPREHENSIVE SUSTAINABILITY & ENERGY COMMITTEE (CSEC)

Janet Miller, Chair
Julie Kleyn, Clerk
Bradley Hubbard-Nelson,
Douglas Sharpe
Sam Lines
Karen Gibson
Jerry Frenkil
Sharon Jones
Bob Shatten

Kate Hanley, Concord Sustainability Director
Alice Kaufman, Select Board Liaison

The Comprehensive Sustainable Energy Committee was established in 2007 to assist the Town in identifying, designing, and implementing programs and projects that foster energy conservation as well as renewable energy generation in all Town sectors. In 2018, the committee was renamed the Comprehensive Sustainability & Energy Committee (CSEC) and the updated Committee charge is to work together with the Director of Sustainability and the Concord Municipal Light Plant to identify, design, and implement community outreach programs and projects to reduce town-wide greenhouse gas emissions (GHG), and to encourage adoption of sustainability policies and practices in the Concord community. Program focuses include energy conservation, energy efficiency, renewable energy generation, electrification of vehicles, and other sustainability and climate resilience initiatives.

CSEC is very excited to be working with Kate Hanley, Concord's Sustainability Director, who was hired in the fall of 2017. She attends CSEC meetings, offers support to the committee, and has successfully applied for grants to support sustainability programs. For example, Kate obtained a grant to participate in the state's Municipal Vulnerability Preparedness (MVP) program, which entailed a Community Resilience Building workshop to identify top climate hazards and potential actions to improve resilience to climate change in town. Janet Miller represented CSEC at the workshops and attended the follow-up public meeting. This process identified and prioritized actions related to infrastructural, societal/economic, and environmental actions for the Town. Completion of this program makes Concord eligible to apply for action grants for specific projects.

Cooler Concord

The Cooler Concord program was a big initiative of CSEC in 2017 and was winding down in 2018. That program included the development of a website, CoolerConcord.org and a subscriber list of 588 individuals, which was used to promote sustainable actions and rebates from the town and CMLP in 2018. The rebates and a survey were used to assess the success of the program. Traceable actions by fair participants reduced greenhouse gas (GHG) emissions by roughly 305 Tons/year (CO₂-equivalent).

Approximately one in four 2017 Cooler Concord Fair attendees followed up on sustainability actions they committed to at the fair. The greatest number of Cooler Concord rebates granted were for weatherization, electric lawn mowers, LED bulbs, and EnergyStar clothes washers, and were funded by the Town's Resource Sustainability Fund and the CMLP (via the CARES budget), totaling almost \$50,000. Note that although the Cooler Concord program has come to an end, CMLP continues to offer a number of home energy rebates.

HeatSmart

Another focus of CSEC in 2018 was the HeatSmart program. Together with Lincoln and Carlisle, CSEC applied for and received a grant from the Massachusetts Clean Energy Center (MassCEC) to fund the program, which promoted the adoption of air-source heat pumps (ASHP), ground-source heat



Sustainability Director, Kate Hanley, with the Town's new Nissan Leaf at the EV promotional event in September.

pumps (GSHP), and wood pellet heat with the goals of reducing fossil fuel use, saving money, and improving comfort. Brad Hubbard-Nelson was the Concord HeatSmart coach and was assisted by volunteers, Julie Kleyn, Alan Whitney, and Doug Sharpe, as well as Jan Aceti from CMLP. Meister Consulting Group developed a website (wepowr.com/heatsmartccl) for the Concord, Carlisle, and Lincoln HeatSmart teams to provide information about the program, technology and financial incentives, and provide online sign-up for energy audits and visits from selected equipment installers. Coaches provided help to residents to understand and compare equipment proposals.

The program ran from February until July 2018, although installations could continue until the end of the year. In order to qualify for the HeatSmart program, residents were required have an energy audit, which provided another opportunity to spur residents to reduce their GHG emissions.

Concord focused promotion on ASHP and GSHP, which made the most sense to the committee and for which CMLP offers rebates. Promotion activities included public presentations from installers, a letter-writing campaign by the CCHS Green Team, articles in the newspaper, mailings, social media, posters, lawn signs, video testimonials, open houses at homes with heat pumps, and outreach to local organizations such as the Council on Aging, League of Women Voters, schools, and faith-based organizations. A market segmentation analysis provided by Meister Consultants helped to identify 1,000 homes as optimal for heat pumps and marketing was targeted to those residents.

The HeatSmart program resulted in contracts for nine GSHP and 61 ASHP systems, exceeding the original goals set for the program. Over 1% of single-family homes in Concord participated during the 5-month program. The estimated GHG reduction of these installations is 350 Tons/year, which will increase to approximately 520 Tons/year by 2022 when CMLP power is 100% renewable. CMLP continues to offer rebates for heat pumps and CSEC hopes that the HeatSmart program has demonstrated their potential to enable all-electric, fossil fuel-free new construction in town.

Electric Vehicle Promotion

Another major project of CSEC in 2018 was the promotion of electric vehicles (EVs). The adoption of EVs is an essential part of reducing our dependence on fossil fuels. Brian Foulds was the primary organizer of an EV showcase event, held at Walden Pond in September. CSEC took charge of much of the publicity and recruitment of volunteers (including six high school students) to help at the event. An estimated 300–400 visitors attended the event. Both private owners and dealer brought cars for display. Kate Hanley brought the Town's new Nissan Leaf, Jan Aceti brought CMLP's EV, and the electric school bus provided a shuttle bus to CCHS, where there was overflow parking. In addition, dealers brought five plug-in vehicles for a total of 65 test drives. Pedal Power brought electric bicycles, which were popular for test rides. Several environmental organizations also participated.