

MUNICIPAL LIGHT PLANT

CONCORD 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. 2014 has been a worthy addition to Concord Light's history.

The Town Manager appoints a five member, volunteer advisory Light Board comprised of local residents. The Board meets monthly to discuss topics such as rates, power supply and renewable energy options. The Board encourages customers to attend.



Light Board Members. From left: Dan Gainsboro, Lynn Salinger, Gary Clayton, Chair; Jim Terry, Peggy Briggs

The Concord Municipal Light Plant (CMLP) operates as a completely self-sustaining, non-profit, 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 2014, this formula-based payment was \$460,250.

Power Supply

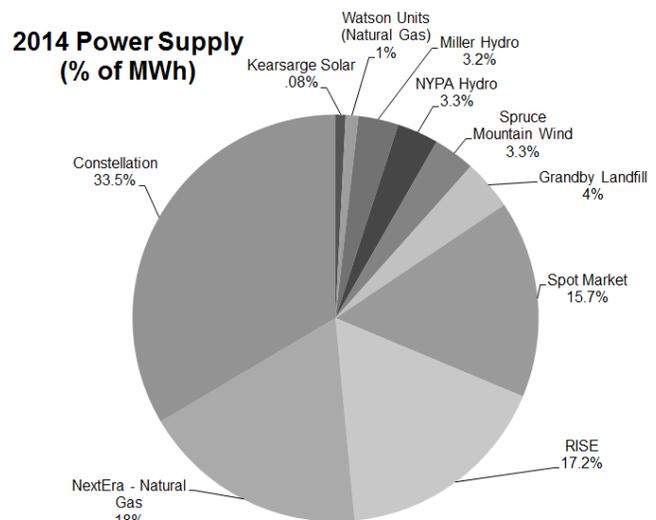
After the creation of Concord Light in 1898, the Town's electricity was provided by a coal fired plant located at Keyes Road. By the late 1920's, the Town had outgrown the capacity of the plant and decided to retire the plant

and purchase all of its electricity from the Boston Edison Company (now NSTAR). In 2002, NSTAR sold all of its generating facilities as part of the federal utility deregulation initiative. As a result, Concord Light entered into a seven and a half year contract with Constellation Power Source (parent of Baltimore Gas & Electric).

At the conclusion of the Constellation contract in the fall of 2009, no energy suppliers were offering contracts at reasonable prices due to the growing risk arising from the wide fluctuations in the cost of natural gas. For Concord, the alternative was the development of a power supply portfolio from multiple sources under a power supply strategy that best suited our community's needs. The power supply selection strategy included the following tenets:

- Diversified energy sources and types of fuel
- 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 as illustrated in the chart below, with a wide variety of suppliers and resources.



It should be noted that energy from NYPA (hydro), Miller (hydro), Granby (land fill gas), Spruce Mt (wind) and Ke-arsarge (solar) are all renewable sources and represented nearly 15% of all wholesale energy purchased in 2014. Concord Light will continue to seek out renewable energy opportunities along with other economic and reliable supplies of wholesale energy in an effort to provide the most beneficial energy mix for its customers. The Light Plant initiated a Cost of Service Study that will be used to inform a proposed new Rate Schedule that is anticipated to be adopted by the Light Board in 2015.

Energy Conservation

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

Residential Energy Efficiency Rebates

Concord Light provided residential customers with over \$34,000 in rebates for weatherizing electrically heated homes, and for purchasing energy efficient appliances, lighting and central air conditioning systems.

Commercial Energy Efficiency Rebates

Thirteen business customers upgraded to more efficient lighting, and received a total of \$32,000 in rebates through Concord Light's High Efficiency Lighting Program. The thirteen commercial lighting upgrade projects are projected to reduce electrical demand by 96 kW and electricity consumption by 324,000 kWh per year.

Solar Photovoltaic (PV) Rebates

Eighty-seven PV systems with an overall capacity of 610 kW AC were installed by Concord Light's residential and commercial customers in 2014. Concord Light contributed over \$250,000 in rebates towards the installation of these systems. There are now a total of two hundred and twenty PV systems between the residential and commercial customers in Concord.

COMMUNITY SERVICE

Hands-On Energy Education for Concord Public School Students
Staff met in February with each of the 12 third-grade classrooms in Concord's public schools to talk about how electricity is produced, how it gets to local homes, and how line workers do their job. As part of the interactive lesson, students got the chance to produce electricity by riding a bicycle generator, create circuits to operate fans and pinwheels, and touch a real solar panel – the same

type of panel that provides some of the electricity used by the Willard Elementary School.

Concord Light's energy conservation coordinator, engineering staff, line workers, electrician and custodian all pitched in along with Concord Public Schools faculty and staff to make these sessions a success.

Reducing Energy Consumption in Town Operations

Concord Light coordinated a workplace energy conservation campaign in Town government buildings. Electricity consumption across fifteen buildings was reduced by 5% during the campaign. In addition to measures promoted by the campaign, major equipment upgrades initiated by Town building managers also contributed to the reduction. The 5% decline saved the Town \$17,000 during the campaign year, and prevented 65 tons of carbon dioxide emissions. That's equivalent to the CO₂ emitted by an average passenger vehicle driven 140,398 miles.

Concord Light also participated in the campaign by reducing energy consumption in its own Operations Center. Through a wide variety of initiatives, Concord Light employees reduced the amount of electricity used for heating by 21% and the electricity used for cooling, lights and office equipment by 14%.

Smart Grid

CMLP continued to move forward with Smart Grid controls. CMLP has 361 electric water heater customers participating in its controlled water heating program; 141 electric thermal storage (ETS) heating customers; 4 electric vehicle customers; and 1 customer with a swimming pool pump. The systems and programs allow Concord Light to schedule one time, daily, and recurring load management events for all these devices to reduce peak demand.

Concord Light Presentations on Energy Conservation Resources

Concord Light staff spoke at the Rotary Club of Concord's January 5th meeting and at the Concord Business Partnership's May 3rd meeting, providing members with a description of the energy conservation services, rebates and information resources available to them from Concord Light and other area utilities.

Annual holiday tree lighting

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

Hugh Cargill Trust

Concord Light contributed \$18,000 to the Hugh Cargill Trust which helps eligible Town residents with emergency assistance to pay their electric bills.

Residential Rate Assistance

Concord Light 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, there were 194 Concord households enrolled in this program.

OPERATIONS

Landfill Solar

Commercial renewable energy production began at the Kearsarge installed and managed, 1.2 MW solar photovoltaic array, located at the former Concord Landfill. It is expected that CMLP will purchase approximately 2,000 kWh annually or about 1% of the Town's electric energy needs.

Substation 479 Voltage Upgrade

CMLP's Substation 479 Conversion Project began in 2013 and is aimed at converting the remaining section of the Town's electrical distribution system from the antiquated 4,000 volt system to the current 13,800 volt system. This consisted of four separate 4,000 volt circuits which are fed out of Substation 479 located off Williams Road. These circuits account for approximately 20% of the Town's total electrical load. Throughout 2014, CMLP crews constructed the new distribution system and converted hundreds of customers over to the new system. This allowed crews to safely perform their work and transfer customers to the new system while minimizing customer power outage time. Crew converted 98% of the customers from the antiquated 4,000 volt system to the updated 13,800 volt system. The remaining 2% will be completed in 2015 and the 4,000 volt system will be subsequently removed and the Substation will be de-commissioned.

Telecommunications

CMLP and the Town successfully brought the Town's municipal fiber optic internet service to market. The 2013 Annual Town Meeting approved Article 48 which authorized borrowing to fund startup expenses. The article provided a funding mechanism to expand CMLP's telecommunications service offerings, while ensuring that those expenses are repaid exclusively by current and future telecommunication revenue. Under the leadership of

Chief Information Officer Mark Howell, CMLP employees Tom Power and Bill Underhill began the process of delivering internet service to residents and businesses in Concord.

Expanding on the pre-production customer base, Concord Light Broadband was announced to residents and businesses that had expressed interest via an e-mail sign-up on the web site. Within 18 hours 150 customers had signed up, that number grew to over 200 within the second day.

As of December, CMLP installed the new internet service with 189 business and residential customers in Concord with additional installations growing at a rate of 20-25 clients a month. This has generated annual revenues of over \$160,000. Concord Light Broadband has contracted with a vendor to assist CMLP line crews with the fiber installations from the street to the house which has greatly reduced installation lead times. An emergency restoration contract is in place with another vendor to assist with repairs due to accidents or inclement weather. We have established a staffed "help desk" that will answer calls for assistance 24 hours a day, seven days a week.

Concord Light Broadband has increased speeds twice in the past 9 months, some as much as 200%, and implemented fully symmetrical bandwidth (matching upload and download speed) without a price increase. This service improvement was across the board, all customers received it automatically, not just new customers. We continue to offer straight-forward pricing without teaser or introductory rates with hidden increases down the road. The fiber to the home installation includes an optional integrated Wi-Fi and is competitively priced. Information about the offering can be found on the Town's web site at www.concordma.gov/broadband.

The ability to cost-effectively deploy advanced secure telecommunications to municipal facilities is a benefit of having in-house telecommunications operations. In support of municipal services, the telecommunication staff, working with Town IT staff, added fiber-optic connections and free Wi-Fi service to the Concord Public Library and Beede Center. CMLP upgraded the Internet service it provides to the School Department from 400 megabits per second (Mbps) to 1 Gigabit per second (Gbps). The IT staff and the telecommunications staff installed fiber-optic service to the new Public Safety Radio System. This

allowed an upgrade in the Radio system from a single phone service connected antennae to a fiber-connected multiple antennae system.

CMLP added another “dark fiber” lease to its business as well, bringing this total to eight. The lease agreements provide fiber connections to telecommunication service providers who wish to gain access to serve a local business in Concord. CMLP earns revenue from the fiber leases, the service provider benefits from faster, less-expensive installations, and the businesses get access to advanced telecommunication services.

CONCORD COMPREHENSIVE SUSTAINABLE ENERGY COMMITTEE

The Comprehensive Sustainable Energy Committee was established to assist the Town with identifying, designing, and implementing programs and projects for fostering energy conservation, energy efficiency, and renewable energy generation in the Town and to track and report on the financial and environmental impacts of such programs. Programs and projects should address all forms of energy use: electricity, natural gas and heating oil, and transportation fuels, and energy use in all segments of Town: municipal, business, nonprofit, and residential.

A major responsibility of CSEC has been to identify projects and recommend funding from the Alfred H. Sawyer Trust. The Sawyer Trust was established in 2008 with a \$1.7 million gift to the Town for the purpose of promoting energy and other resource conservation in public facilities. This year, the Committee considered and recommended Sawyer Trust funding for several projects:

- Lighting design for CPW facilities (\$1,250)
- Programmable thermostats for CPW (\$1,500)
- Lighting improvements for CPW facilities (\$13,000)
- Improved dehumidification system for the Beede Center (\$175,000)

About \$200,000 remains in the Sawyer Trust for future municipal or school energy projects.

In early 2013, CSEC initiated the Concord Solar Challenge, modeled after the State-wide Solarize Mass program, to promote the installation of residential rooftop photovoltaic (PV) electric systems. 2014 saw the conclusion of this highly successful program, with 166 contracts signed and systems installed by the designated vendor, Astrum Solar. These 166 systems represent about 1.3MW

of PV capacity, which will displace over 500 tons of greenhouse gas emissions every year. This large number of contracted systems qualified Concord for an award of \$14,700 worth of additional PV capacity from the installer. This was combined with additional funding of \$12,000 from Town funds to install a PV system on a barn at McGrath (Barrett’s Mill) Farm. The system became operational in August. The success of the Concord Solar Challenge now serves as a model for other municipalities in the Commonwealth who want to promote PV adoption in their own communities. CSEC is proud of and grateful for the support of Concord citizens, as well as the Selectmen, the Historic Districts Commission, the business community, and many others for making the program an enviable success. Of particular note is the support of the Concord Municipal Light Plant (CMLP), whose rebates served as a significant incentive for its customers to adopt solar power.

In December 2013, Concord was awarded designation as a Green Community by the Massachusetts Department of Energy Resources (DOER). The Green Communities program began with the passage of the Commonwealth’s Green Communities Act of 2008, which seeks to reduce the State’s dependence on fossil fuels, reduce energy demand, promote adoption of renewable energy sources, and reduce greenhouse gas emissions. Funded through fees collected by commercial electric utilities from their customers for the State’s Renewable Energy Trust fund, the program initially excluded Concord because our electric utility is Town-owned and has not collected these fees. This changed in 2012, when DOER enabled towns, like Concord, served by municipal electricity providers to take part in the program as long as one or more residents are served by an investor-owned utility. As a Green Community, Concord must abide by five criteria:

1. Provide as-of-right siting in designated locations for renewable/alternative energy generation, research & development, or manufacturing facilities. (Concord complied with this criterion by installing ground-based PV systems, such as the one at the former landfill, by CMLP)
2. Adopt an expedited application and permit process for as-of-right energy facilities. (This applies to the permitting process for renewable energy generation, which, in Concord, was adopted by CMLP as part of the process for establishing its ground-based PV installations.)