

MUNICIPAL LIGHT PLANT

CONCORD MUNICIPAL LIGHT PLANT



Concord Municipal Light Board from left: James Terry, Brian Crouse, Bob Kusik, Jill Appel, Hugh Lauer, Chair

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. 2011 has been a worthy addition to Concord Light's history.

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

The Concord Municipal Light Plant operates as a completely self-sustaining, non-profit, Enterprise Fund within the Town government. No property tax money is required or used. All operating expenses, capital investments, and debt service are paid from electric revenues. In addition, the Light Plant contributes to the Town via a Payment-in-Lieu-of Taxes (PILOT). For 2011 this formula-based payment was \$380,000; this is the equivalent of the property taxes that would be paid by an equivalent, but non-municipal, electric utility.

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 out-grown 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 the spring of 2002, NSTAR having sold all of their generating facilities as part of deregulation, Concord Light signed a seven and a half year, all requirements contract with Constellation Power Source (parent of Baltimore Gas & Electric).

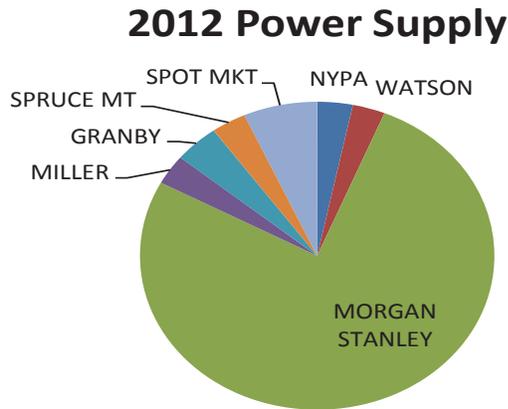
At the conclusion of the Constellation contract in the fall of 2009, none of the energy suppliers were offering all requirements contracts at reasonable prices due to the growing risk of load following, fixed rate contracts resulting from the wide fluctuations in the cost of natural gas. The alternative was the development of a power supply portfolio from multiple sources under a power supply strategy that best suited the needs of Concord. 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.

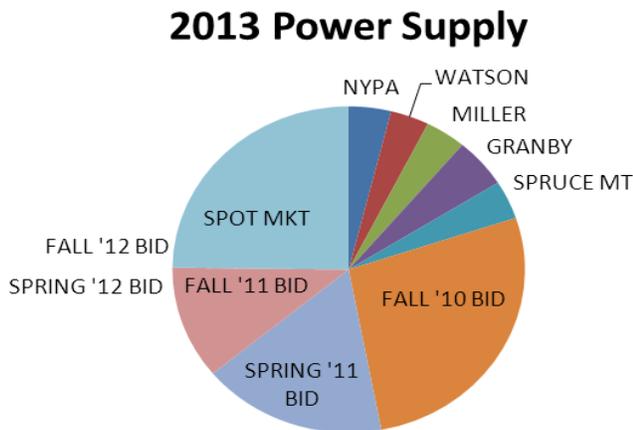
As Concord Light began creating the supply portfolio in 2009, a major purchase was required initially to provide the electric needs of Concord while the portfolio was being crafted. A major energy bid, approximately two-thirds of total energy requirements, was offered to the major suppliers for a three year period ending December 31, 2012. The successful bid was received from Morgan Stanley.

At the close of 2011, Concord Light's power supply portfolio mirrors the above strategy and is depicted by the following chart. It should be noted that energy from NYPA (hydro), Miller (hydro), Granby (land fill gas) and Spruce Mt. (wind) are all renewable sources

and will represent over 12% of all wholesale energy purchased in 2012.



With the expiration of the Morgan Stanley contract at the end of 2012, the power supply portfolio will change considerably with the addition of a series of three year wholesale energy contracts. Anticipated energy bids during the spring and fall of 2012, assuming pricing is advantageous, will be used to decrease Concord's Spot Market exposure.



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.

ENERGY CONSERVATION

Concord Light continues to provide a variety of energy conservation services to our customers. In 2011, eighty-seven households received home energy audits sponsored by Concord Light, a 24% increase over the number of audits performed in 2010. In addition,

through a new program launched during the winter of 2010 – 2011, forty customers borrowed hand-held thermal leak detectors from Concord Light. They used the detectors to identify air leaks and weak or missing insulation in their homes. Concord Light also provided customers with rebates for weatherizing electrically heated homes, and for purchasing energy efficient appliances, lighting and central AC systems. Rebates distributed for energy efficient appliances and central AC systems in 2011 exceeded the amounts provided to our customers in 2010. Concord Light also developed a number of guidance documents for its customers, including *Tips for Hiring a Heating or Air Conditioning Contractor* and *Resources for Understanding Energy Efficient Light Bulbs*.

In 2011, Concord Light also helped three of its business customers pay for energy audits of their facilities, and provided rebates for high efficiency lighting to four Concord businesses. In addition, Concord Light staff developed a plan for an enhanced high efficiency commercial lighting program, scheduled to be implemented in 2012. The plan features higher rebates, pre-qualified contractors who can install high efficiency lighting, and no-interest loans from Concord Light to cover the non-rebatable portion of a customer's lighting project cost.

Seven solar photovoltaic (PV) systems were installed by Concord Light's residential customers in 2011, bringing the total number of solar PV systems in Town to nineteen, for a total installed capacity of 271 kW. Concord Light contributed over \$23,000 in rebates towards the installation of these systems. The Town-owned solar PV system on the roof of the Willard School, installed in September of 2010, completed its first year of operation in 2011, generating 51,367 kilowatt hours of electricity, or about 7% of the school's total electricity needs. 51,367 kilowatt hours is enough to power a Concord home with median electricity usage for six years. The system generated 90% of the electricity it was expected to produce in its first year. Heavy snow cover, which prevented the system from producing any electricity for six weeks in January and February of 2011, reduced the total generation for year 1. By reducing the school's need for electricity generated by burning fossil fuels, the PV system prevented 27 tons of carbon dioxide from entering the atmosphere. The free, renewable

electricity generated by the system saved the Concord Public Schools \$8,000 in electricity costs. The system also earned over \$20,000 in Solar Renewable Energy Credits for the Town.

SMART GRID

The Smart Grid project is organized into four geographic phases for construction and implementation. Due to the severe 2011 winter season and overdue equipment shipments, the fiber network and infrastructure construction was delayed. Construction for underground and aerial networks, as well as deployment of the NexGrid infrastructure, was completed for Phase 1 in July. The final work on the 110-mile fiber optic network throughout Town is expected to be completed by the end of first quarter 2012. Deployment of the smart grid infrastructure continues throughout all phases.

Concord Light continues to develop ideas for load management using the smart grid infrastructure to reduce peak demand with minimal impact on residents, while reducing power and transmissions costs for the Town. Concord Light is currently converting load management customers' electric thermal storage heating (ETS heating) and electric water heaters to the smart grid's wireless, fiber-based system. Concord Light has installed street lights per the new street light policy, and new controllers designed to augment the Smart Grid system are being installed on these lights.

A pilot program using smart grid to control volunteers' central air conditioning that was planned for summer was delayed until 2012 due to technical problems with some of the hardware. A new electric rate was approved by the Light Board in June for off-peak charging of electric vehicles. The vehicle charging stations will be controlled by smart grid, and Concord Light had its first customer with an electric vehicle go on the rate in early December.

COMMUNITY SERVICE

Concord Light sponsored or participated in several events in 2011 which included:

- At the invitation of CCHS Environmental Science teacher Peter Nichol, CMLP participated in CCHS Back to School night in October by displaying an array of energy efficient CFL and LED light bulbs at the high

school. CMLP staff answered questions from parents and students about the growing number of energy efficient home lighting choices now available.

- Concord Light hosted an Open House to celebrate Public Power Week on Saturday, October 1, and approximately 160 Concord residents and their families attended the event which included displays on energy efficient lighting, solar energy, demonstrations on weather-stripping and identifying heat leaks, and learning about how electricity is delivered to the home.
- Several Concord Light staff cooked and served lunch to senior citizens at the Harvey Wheeler Center in mid-October.
- Concord Light line crew decorated trees for the holidays in the West Concord business district and at the Town House with energy efficient LED lighting
- Concord Light introduced an e-newsletter for its business customers. The e-newsletter is a streamlined and environmentally-friendly alternative to the paper version.

SCHOOL ELECTRICAL SAFETY AND ENERGY CONSERVATION PROGRAMS

With the help of safety and conservation consultant Ray Gouley, 3rd grade students in the public schools learned about electrical safety and ways to reduce electric use. The program focuses on the potential dangers of electricity indoors and outdoors, and a variety of methods to save electricity. This multi-year program continues to be very well received – by both students and teachers alike.

DIRECT PAYMENT

The service provides customers with an automated alternative for paying electric and water bills. With over 1,000 customers participating, this program, operated in partnership with the Water Division of CPW and the Finance Department, has been a resounding success. Each customer's bill due amount is directly deducted from their bank account, saving them time and postage.

ONLINE PAYMENT

This service began on the first of January 2006 and has been very successful. Customers can now pay their bills through an encryption secured online bill payment center. They can also view their bills online and track their past electricity consumption. This approach also saves time and postage and lets the customer decide when to pay their bill.

OPERATIONS

2011 encompassed some wild weather including a hurricane (Irene) and the Halloween snow storm of October 31st. Rest assured, CMLP is operating at peak efficiency to upgrade and maintain our electrical infrastructure to prevent outages and limit those that are inevitable. In addition to ongoing efforts including underground conversions and tree trimming, past upgrades have included steel supported cable and tree resistant wire. Evidence for the effectiveness of these measures can be derived from Concord's storm response numbers to Irene and the Halloween storm.



While many neighboring communities were without power for several days and in some cases weeks, CMLP restored all affected customers within 12 and 24 hours respectively. During Irene, about 8.5% of our customers lost power and during the severe October snow storm that number jumped to 21.5%. CMLP's investments in tree resistant wire and steel supported cable certainly proved their worth. Only the heaviest trees and broken branches impacted the system, which is what was observed during the storms.

Moving into 2012, CMLP will continue to invest in reliability improvements. We are currently planning infrastructure upgrades to the oldest equipment in Town, primarily located south of Route 2. This will include new poles, transformer replacements, new tree resistant wire, and steady conversion of our 4 kilovolt system to our more reliable 14 kilovolt system. Simultaneously, we will continue to underground areas of Town that have conduit installed from previous years. This includes Whittemore Street, Walden Terrace, Willow Street, Union Street and Fielding Street to name a few.

Furthermore, CMLP is currently evaluating options to upgrade our Forest Ridge substation to meet the future peak electrical demands of the Town. Once all choices have been considered, the most favorable route will be presented at the 2012 Annual Town Meeting.

CONSTRUCTION ACTIVITY

Construction achievements for 2011 include:

Designed and installed new underground electrical facilities on Elsinore Street, Grant Street, Belknap Street, Brook Street and Whittemore Street.



- Completed the upgrade of the underground electrical distribution system in the West Concord Business District.
- Completed the installation of approximately 500 street lights per the Town Meeting vote.
- Designed and relocated the electrical distribution system at the Fowler Library as part of the renovation project.

SOLAR SITING COMMITTEE

Hugh Lauer, Chair
Dan Gainsboro
Coleman Hoyt
Mark Myles
Emily Wheeler

The Solar Siting Committee was appointed in the winter of 2011 and charged with evaluating municipally-owned land within Concord for the purpose of hosting utility-scale solar installations, with attention to balancing the competing land use needs in the Town, and providing a forum for the discussion of criteria for siting utility-scale solar installations on municipally-owned land in Concord. The Committee specifically decided not to attempt to create a definitive plan but