LEBANON COMMUNITY POWER UPDATE #1

April 5, 2018

The Lebanon Energy Advisory Committee (LEAC),¹ and its two sub-committees, Municipal Aggregation and Street Lighting, are pursuing projects to reduce the City’s power costs and environmental footprint. A combination of state legislation, regulatory support from the NH Public Utilities Commission, utility ambitions, and rapidly changing technologies make this an exciting time to initiate new approaches and projects regarding energy and climate action for the City and its residents. While no one of these projects is ready for final review or approval, we would like to take this opportunity to let interested residents and businesses know what is in the works. This update simply aims to introduce, at a high level, the different possibilities and their relationships one to another.

The Players:

The City of Lebanon’s Master Plan, official policy adopted by the Planning Board and City Council, has an overall goal regarding energy that: “Lebanon is a leader in energy efficiency, renewable energy reliance, and innovation across municipal, commercial, institutional, and residential sectors.” In pursuit of that goal the City has participated in several recent NH Public Utilities Commission (PUC) proceedings using the volunteer services and expertise of City Councilor Clifton Below, a former NH PUC Commissioner for 6 years who also worked previously on energy policy in the NH legislature for 12 years. The proceedings have included:

1) a Grid Modernization investigation that examined how the distribution grid needs to evolve to support greater efficiency, resiliency, and increased integration of distributed renewable electric generation like solar photovoltaics (PV);
2) a Liberty Utilities electric distribution rate case where the City negotiated and secured options in April 2017 to convert to energy saving LED street lighting, with either Liberty-owned fixtures or City-installed and owned fixtures (which may allow for greater savings than the Liberty option); and
3) a proceeding to develop new net metering tariffs (rate terms and conditions) for renewable energy, including City-installed renewable electric generation such as solar PV. In that net metering proceeding the City proposed to pilot the use of hourly real-time pricing for both net metering and electric loads in general. Real-

¹ LEAC is advisory to the City Council and administration. See: https://lebanonnh.gov/519/Lebanon-Energy-Advisory-Committee.
time pricing (or RTP) is a price that changes each hour for electricity generated and sold in the regional wholesale power market run by the grid administrator ISO New England. RTP, based on supply and demand, is on average much lower in cost than the rates most consumers pay.\(^2\)

**The Town of Hanover** switched from fixed price electric rates to real time pricing a few years ago. This process of buying its electricity supply directly from the wholesale market has saved the town about $50,000 to $100,000 a year. If Lebanon had paid the average RTP that Hanover paid for the 12 months ending 2/17, the City would have saved over $160,000 and over $60,000 for the 12 months ending 2/18.\(^3\) While this approach could be an option for Lebanon, the alternatives described below may provide even greater savings and price stability over the long term while helping the City achieve its energy and environmental goals. Hanover and Lebanon may collaborate to implement some of these goals and projects.

**Liberty Utilities** was directed last year by the NH Public Utilities Commission to work with the City to develop its proposed RTP pilot to help inform the Commission about the value of real-time electricity rates. Liberty has also proposed a separate pilot program to offer residential customers home-scale batteries for electricity storage along with time-of-use rates for distribution and transmission costs. Time-of-use rates are fixed rates that vary over different periods of the day and week, and these will enable additional customers savings in conjunction with use of the battery during times of peak electric demand and rates. For this Liberty Utilities needs new metering technology, as does the City for its RTP pilot. In its battery pilot program proposal to the PUC Liberty states:

\(^2\) Energy suppliers purchase wholesale electricity at prices that reflect RTP but usually sell it to retail consumers at a price that is fixed for a specified period. An example is the utility’s default service, which shows up on the monthly bill as an “energy service” charge (distinct from distribution and transmission charges that pay for the wires and systems that deliver the electricity). Suppliers set their forward fixed prices based, in part, on projections of RTPs, to which they add an insurance cost to hedge the uncertainty of future RTPs and future load (the amount of electricity supplied). The vast majority of retail customers would save money if they could pay the varying RTP and not pay the additional hedging costs built into fixed prices. They could save even more by shifting flexible loads (electricity usage) to lower cost hours to avoid expensive peak use hours. They could, for instance, time their use of a storage hot water heater or clothes dryer, or when an electric vehicle charges. The City could choose when to pump water to hilltop reservoirs or when to operate portions of the wastewater treatment process, both of which are big electric loads. Real-time pricing will provide a signal to consumers to adjust flexible loads. This is called “demand response,” which is a key to economically integrating large amounts of local or distributed renewable power production and energy storage into the smart grid of the future.

\(^3\) The latest period ending 2/28/18 included the coldest weather and largest spike in RTPs (in late December and early January) that the region has experienced in the past 4 years. Even with that spike in RTPs Hanover’s RTP averaged 6.62¢/kWh for those 12 months compared with the City’s 8.28¢/kWh. For the 12 months ending 2/17 Hanover’s RTP averaged 4.42¢/kWh while the City’s forward fixed price for energy service was 8.52¢/kWh. Hanover consumes about 2.6 to 3.2 million kWh/year, while the City consumes about 4 to 5 million kWh/year.
Electric utilities should move beyond simply selling customers more electricity. Instead electric utilities must understand and support their customers’ goals of reducing electricity use, managing costs, and obtaining electricity from an array of environmentally friendly sources. . . . Today’s electric customer wants more than to simply have safe and reliable electricity service to their home or business. They have a better understanding how the electricity they use is produced and are interested in environmentally beneficial products and services that reduce their carbon footprint and increase efficiency. They are cognizant of their behavior and its effect on the environment. Electric utilities need to recognize that customers not only want to reduce their environmental footprint, but also have the technological capacities to achieve their goal.4

The Projects:

**Lebanon Community Power** is the proposed name for Lebanon’s pilot RTP program that will incentivize users to shift some of their consumption of electricity from higher priced periods during the day to lower ones at night, on weekends, and sometimes in the middle of the day when solar power is especially abundant. Lebanon Community Power will also enable residents and businesses, as well as the City itself, to choose local sources of renewable generation to meet some or all of their power needs.

NH law enables communities to combine electricity loads, including those of any electric customers within the community who choose to participate, under what is known as municipal or community aggregation. They can then collectively arrange for the supply of electricity and potentially other services such as allowing for automated demand response.

NH law requires municipal aggregation to operate in such a way that it is not subsidized by taxpayers. At this stage LEAC is focused on fleshing out the aggregation plan and finding the best technologies and service providers to meet our project needs in collaboration with Liberty Utilities. A next step will be to issue a formal Request for Information to identify potential vendors, the most appropriate technologies, and to better learn what our options are. A final aggregation plan will have to be approved by the City Council and PUC before it is launched.

**Landfill Gas to Energy:** This project was recommended by LEAC and is moving ahead under the auspices of the Department of Public Works. The vision is to build a system to generate electricity from methane gas captured from our capped landfill that

is presently being flared (burned off). The biologically derived methane comes from
the breakdown of organic wastes, such as food, paper, and wood and thus is
considered renewable. The City has hired an engineering firm that is undertaking a
feasibility study, reviewing various options such as also capturing and using thermal
(heat) energy from the project, and doing preliminary design work. Our initial
estimate is that this project might produce enough green electricity to meet all of the
City’s municipal electricity needs and have excess to sell locally through Lebanon
Community Power, resulting in net savings and new revenue for the City without the
need to invest any general fund tax dollars into the project.

**LED Street Lighting:** this LEAC subcommittee is studying options for replacing
current outdoor City-owned or paid for lighting with high-efficiency LED lights. The
technology and vendors also exist to provide “smart” or adaptive street lighting,
where lighting could be dimmed during times when there is little or no traffic on the
streets, when there is a full moon, or for other considerations. Outdoor lighting levels
could also be increased for special events, emergencies, and during times such as dusk
when automobile accidents are statistically most likely to occur. Adaptive street
lighting also extends the life of LED fixtures by many years and enables substantial
additional energy and cost savings over time. A smart municipal street lighting
network could also support many other applications, such as better traffic controls and
the reading of electric meters in near real-time. This last feature will be needed for
the Lebanon Community Power aggregation project with RTP and Liberty Utility’s
battery pilot. However, such adaptive streetlights, require a wireless communication
system that would add to the initial cost, and LEAC must weigh all these factors in
making a recommendation to the City Council and administration.

**Community Scale Solar and other Distributed Generation** on both City- and
privately-owned locations within the City will be able to sell excess green power to
Lebanon homes and businesses through Lebanon Community Power, potentially at a
savings compared to other options. Virtual net metering, where a customer owns
offsite solar PV or a share of the output from a community solar or other renewable
project, will also be enabled through Lebanon Community Power.

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Manager Tad Montgomery, Tad.Montgomery@lebcity.com (Office: 603 442-6140). Additional
background information can be found through select agenda items (4.C-F and 5.A) found here:
https://lebanonnh.gov/AgendaCenter/ViewFile/Agenda/_01182018-1646?html=true.