Remarks by Clifton Below, Assistant Mayor, City of Lebanon, NH

Community Power NH Virtual Summit, 6/5/20

Good afternoon,

I came of age during the 1973-1974 Arab Oil embargo that caused electricity price spikes as petroleum was a much more dominant fuel source for electric generation than it is today.

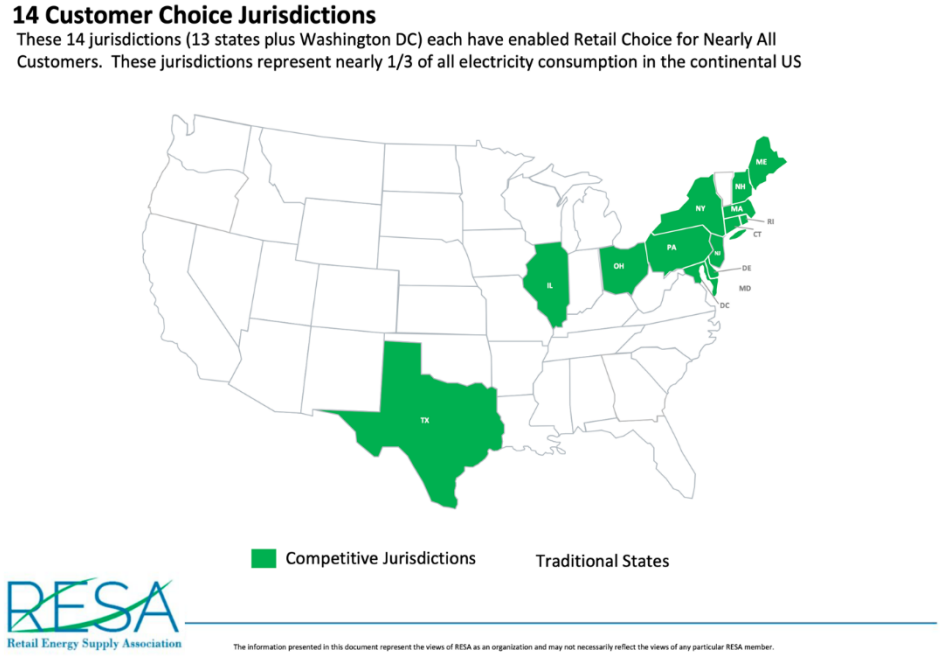
That crisis led to legislative action in 1978 to open up electric generation to a degree of competition with independent power producers through enactment of the Limited Electrical Energy Producer Act or LEEPA in NH and PURPA at the federal level.

In NH PSNH, then a stand-alone investor-owned utility (IOU), embarked on a single new generation project, the Seabrook nuclear station, that would more than double their generation capacity. With projected growth in electricity demand not materializing and out of control cost overruns, PSNH eventually abandoned Seabrook II and declared bankruptcy.

When I was first elected to the state legislature in 1992 and put on the energy committee, NH was on track to have the highest electric rates in the nation. In looking for solutions it became apparent that PSNH, as a regulated utility had made bad decisions that they wanted ratepayers to pay for. Blame could also be placed on the PUC and the legislature for compounding the problem. There had to be a better way.

By the mid- 90s the Federal Energy Regulatory Agency, FERC, began to open up the interstate transmission system to independent power producers and promote the idea that there could be organized wholesale markets for electricity supply rather than just relying on the administrative/regulatory processes of vertically integrated utilities.

In 1996 NH was at the forefront of the first wave of states to enact electric utility restructuring that sought to separate the generation business from the monopoly wires business and subject it to competition and customer choice. RSA 374-F begins by stating that "The most compelling reason to restructure the New Hampshire electric utility industry is to reduce costs for all consumers of electricity by harnessing the power of competitive markets." And states: "Increased customer choice and the development of competitive markets for wholesale and retail electricity services are key elements in a restructured industry" and further calls for customers to be able to choose interconnected self-generation and access to real time prices.



So what has been the result; looking at slide 1 we see that 14 states provide choice in

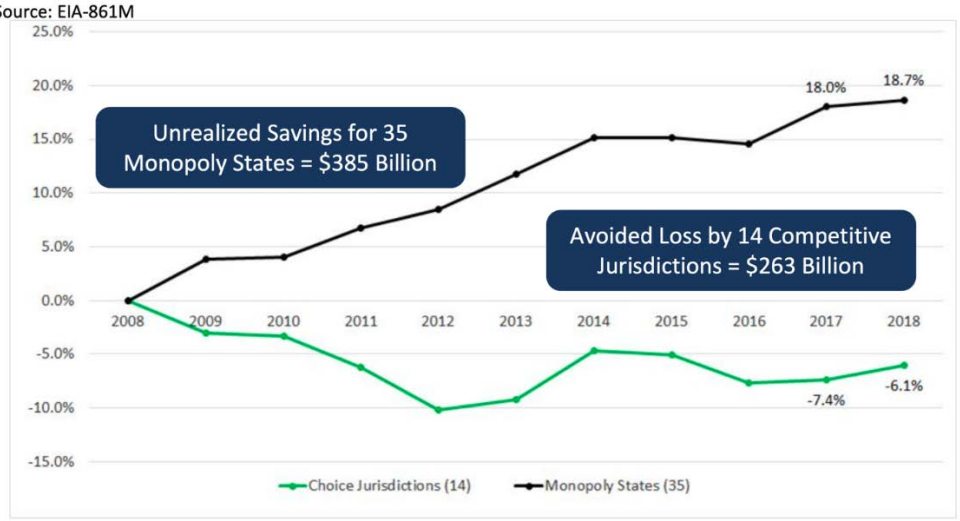
electricity supply to all customers -- about a third of the nation's load. California had an aborted attempt around 2000 that failed due to a very bad market design.

Slide 2 shows that in general the 14 states that restructured have seen significantly better control of electricity costs than the vertically integrated states. While residential customers have seen some of these savings, large industrial and commercial customers, most of which use competitive supply, have fared even better.

All-Sector Weighted Average Percentage Price Change, Choice vs. Monopoly States, 2008-2018

% Price Change – 24.8% Spread

Source: EIA-861M

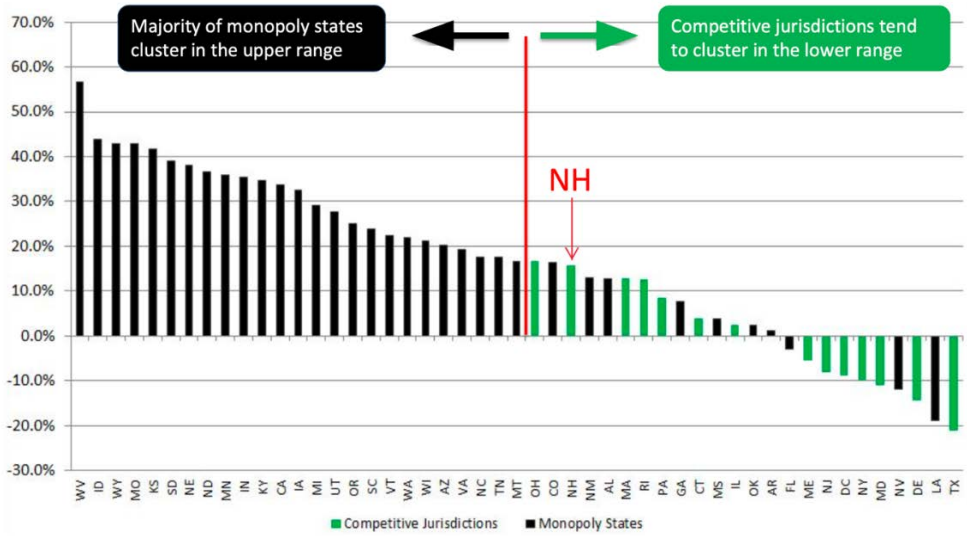


RESA Retail Energy Supply Association

As seen in slide 3 NH has not been the best performer, perhaps due to the stunted development of our retail market as PSNH/Eversource retained ownership of most of their generation until recently.

All Sector Price % Price Change by State, 2008-2018

Source: EIA-861M



RESA Retail Energy Supply Association

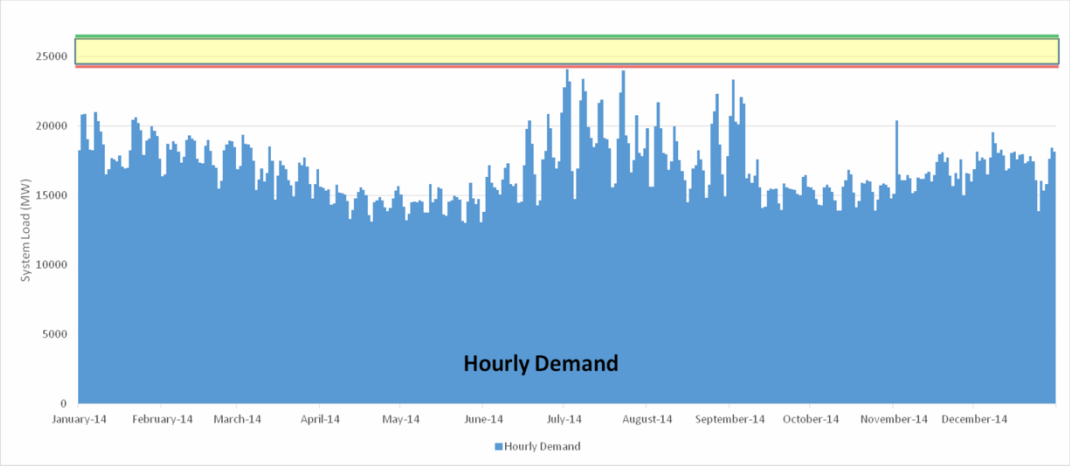
The City of Lebanon has had an active energy committee, LEAC, for more than a decade. We have done solarize and weatherize campaigns, installed solar on a bunch of City sites and are developing a landfill gas to energy project. Within a year we hope to generate more renewable power than the City itself consumes. As LEAC has sought a path to realize our goals of deep decarbonization for the community as a whole, relying on as much local renewable energy as possible, we began to look at the municipal aggregation statute as a possible vehicle. That law has been on the books since 1996 but allowed only opt-in participation and had other problems. So, we pursued legislation, enacted last year, to update this statute.

Now we are eager to work with other communities to unlock the potential of community power aggregations to offer and accelerate our transition to a sustainable renewable energy future and do so as cost-effectively as we can.

One innovation we want to pursue is accelerated access to time varying rates for smaller customers as a key to making load or customers full retail market participants to accelerate integration of variable renewable and storage technologies, and create new opportunities for customer savings. I have 3 quick slides to illustrate this and conclude.

Electric Grid is Sized for Highest Hour of Demand

Whole Energy System (T, D & G) Sized to Meet Peak Demand, With a Safety Margin

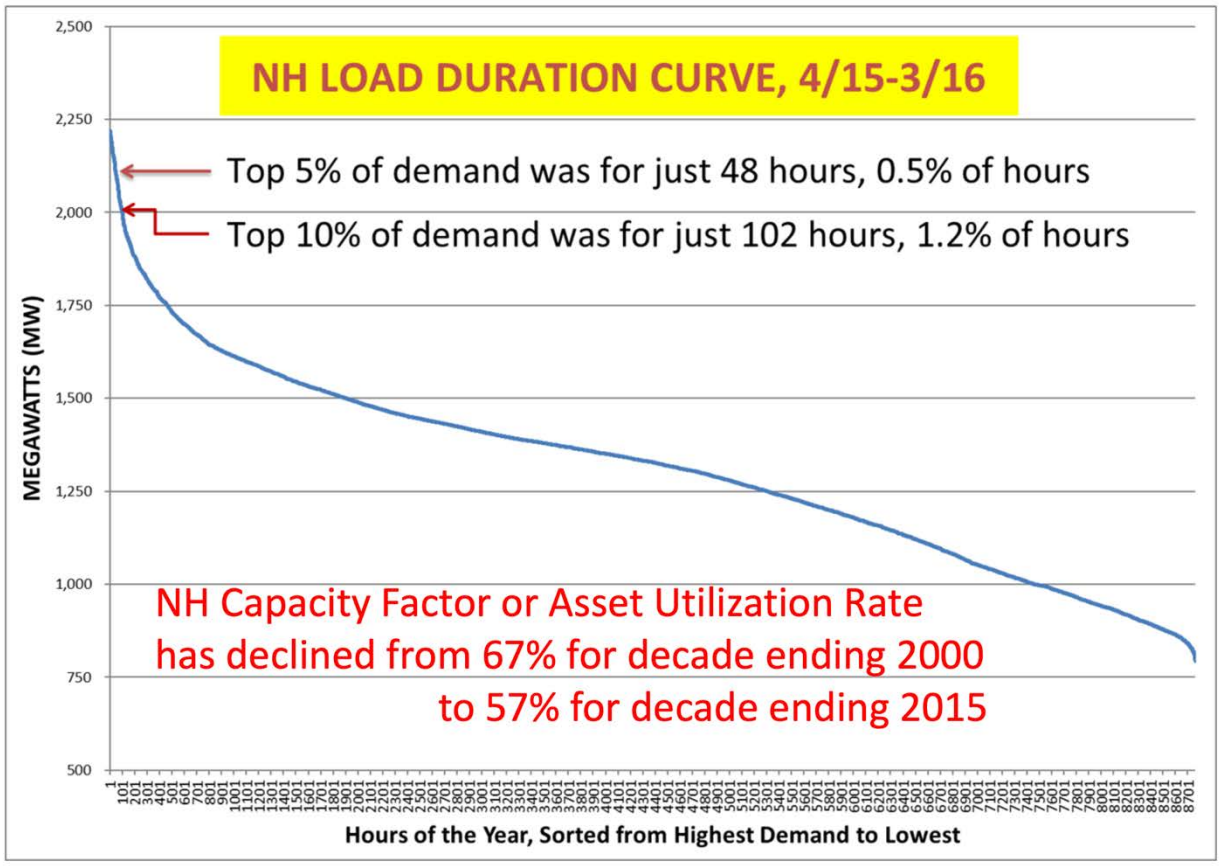


Top 1% of Hours accounts for 8% of Massachusetts Spend on Electricity
Top 10% of Hours accounts for 40% of Electricity Spend

The graph depicts ISO New England's electricity demand over the course of a year. The X-axis represents time from January 2014 to December 2014. The Y-axis represents electric load on the six-state electric system in megawatts. The blue shaded area represents generation capacity that was actively used, i.e., generating electricity. The white area beneath the green line represents inactive generation assets, power plants sitting idle, but still receiving hundreds of millions of dollars in capacity payments.

This figure illustrates the inefficiencies of the current system. In Massachusetts, the top 1% of hours accounts for 8% of electricity expenditures. The top 10% of hours accounts for the top 40% of electricity expenditures.

Community-centric resources such as distributed solar and storage, or even simple load shifting enabled by time-variant rates, are a better, more cost effective and market-based approach to meeting the peak demand events depicted by the blue spikes occurring during summer months. Community Power can enable this.



This next graph is a NH Load Duration curve for 2015-2016. It shows that a very small number of hours a year drive a disproportionately high level of cost. The X-axis depicts hours of the year sorted from the highest demand hours (left) to the lowest demand hours (right). The Y-axis depicts New Hampshire electric load, measured in megawatts. The graph shows that just 48 hours of the year, or 0.5% of all hours in a year, is responsible for the top 5% of electric load. Just 102 hours, or 1.2% of hours in a year, is responsible for 10% of electric load. But still, our over-reliance on centralized fossil-fuel plants, many of which are out-of-state, require us to pay an enormous amount of money for power plants that are only needed for a tiny number of hours a year.

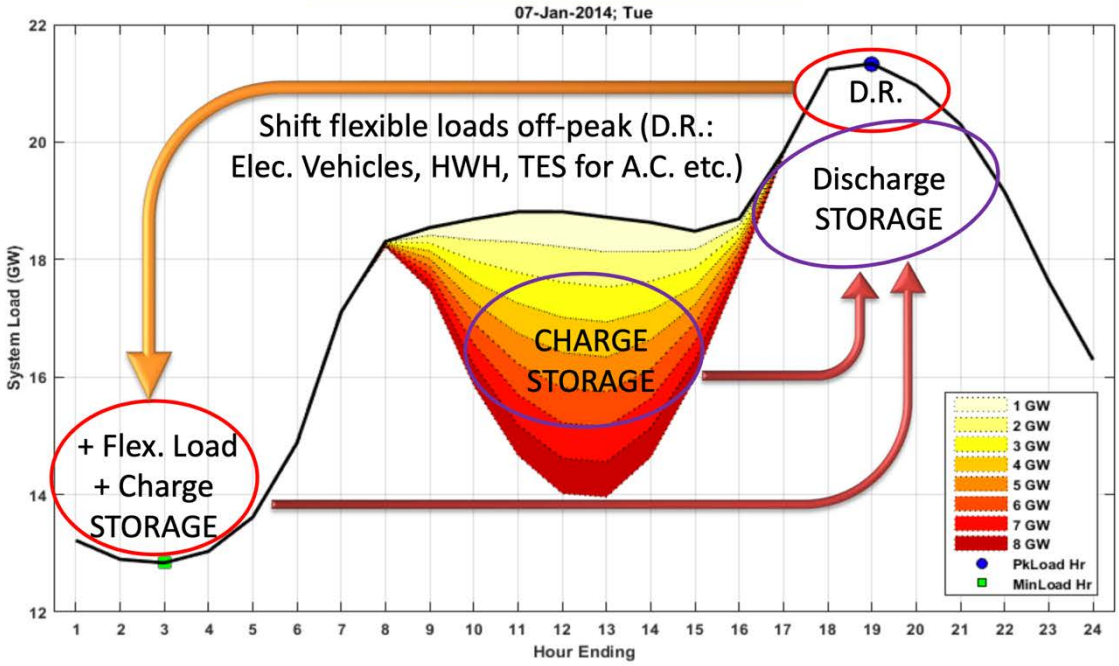
There is a better way. Through Community Power Aggregations, we can give customers access to price signals that enable them to save money by shifting consumption away from peak times. This will allow New Hampshire businesses to offer customers solutions like batteries, smart thermostats, time-of-use electric vehicle charging, and other solutions that can chip away at the top left tail of the load duration blue curve. We can build up a modern and sustainable New Hampshire energy economy that meets our energy needs and frees us from costly reliance on inefficient and out-of-state fossil fuel power plants.

Lebanon Community Power: Need for TVR

Illustrative Winter Impact of Solar at Different Levels of Dev. (from ISO-NE)

from: https://www.iso-ne.com/about/what-we-do/in-depth/solar-power-in-new-england-locations-and-impact

New England's Duck Curve



This last chart shows New England's "Duck Curve" and further illustrates the need for time-varying rates (TVR) to enable distributed solar and energy storage. The X-axis represents hours of the day on January 7, 2014, typical of many winter, spring and fall days. The Y-axis represents ISO New England electric load in gigawatts. As more and more solar is deployed on the New England grid, it causes a dip in demand required from centralized power plants (shown in yellow and red). Then, when the sun sets in the afternoon, we see a spike in demand as shown by the steep slope that ramps up to the peak in demand at hour 19 (7pm).

The smart way to manage this influx of new solar would be to use it to charge electric vehicles, electric hot water heaters, batteries, and other resources during the day, and then to dispatch those resources to lower peak demand events. This can be achieved with access to more accurate price signals and time-varying rates, which Community Power can achieve.

Summary & Conclusion

I've spent much of my life working to improve energy market rules and regulations to enable greater market competition and customer choice. The Community Power law is a powerful tool to further the goals of market competition and customer choice, which I know will lead to greater innovation and growth in a sustainable, New Hampshire-based energy economy. Community Power Aggregations can democratize energy markets and enable communities to choose innovation and investments in local and sustainable energy resources.