



Energy Outlook

August 2016

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GENERATION MANAGEMENT

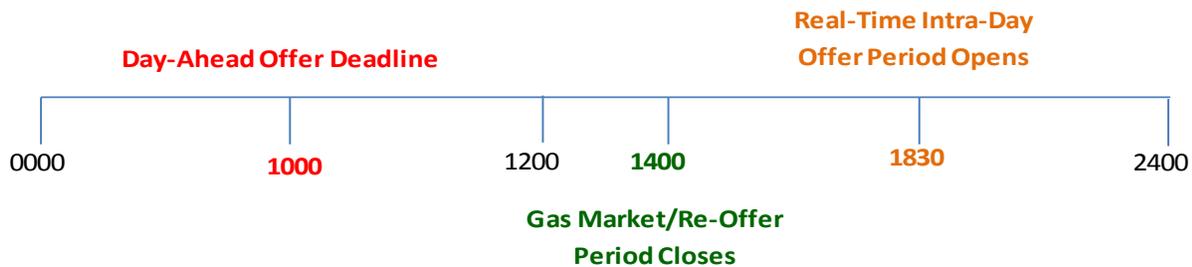
TRULY A 7X24 TASK

Gone are the days of submitting offers by noon and forgetting about them until the next morning. With recent changes to ISO rules, Day-Ahead Market (DAM) offers are now due by 10 a.m. Subsequent to the DAM submittal offers can be updated at any time throughout the day or night to reflect Real-Time fuel costs. Dual-fuel units have the added flexibility and complexity of ensuring offers match the fuel being burned. If a fuel switch is made during a day, offers must be manually updated to reflect the cost of the fuel being used or the generator risks financial loss – the ISO does not automatically change the offers to match the fuel.

To make things a bit more interesting, units participating in ancillary service markets such as Forward Reserves must incorporate the minimum offer requirements to qualify for payment with the often-times conflicting objective of ensuring offers do not violate the ISO’s mitigation thresholds. Thus, to ensure compliance with both requirements,

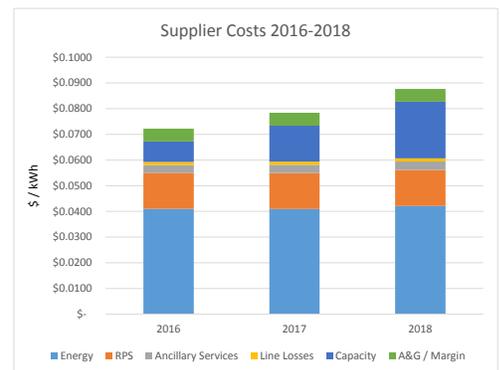
coordination with the ISO’s Internal Market Monitor (IMM) is often required to ensure maximum revenue recovery.

Weekends are no different than weekdays. If left unattended, offers will automatically roll from one day to the next. But, offers that required ISO approval to satisfy both the Forward Reserve and Mitigation thresholds do not automatically qualify for those exemptions from one day to the next. Each day requires distinct approval from IMM and such approvals cannot be given for more than the next operating day. Thus, offers for Sunday must be coordinated with ISO on Saturday and offers for Monday must again be coordinated with ISO on Sunday to ensure that maximum revenue recovery occurs every day.



RETAIL PROCUREMENT – “GOT CAPACITY?”

Falling energy prices are not so quietly being offset by the increasing cost of “capacity” for electric consumers. Longer term purchases require suppliers to price in these increasing costs. The ISO-NE capacity market is designed to ensure that the region has a sufficient level of resources to meet the demand for electricity, supplementing revenues received from actually generating power, since many power plants only generate part of the time. Capacity resources compete in Forward Capacity Auctions to secure delivery obligations for a 12 month commitment period that begins on June 1 three years in the future, allowing budgets to be planned around these costs. Early auctions resulted in generators being paid in the range of \$1 Billion annually for fulfilling that obligation. However, recent auctions have concluded with significantly higher pricing which will result in regional costs of around \$4 Billion. On a per KWH basis, by 2018



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capacity will increase to nearly ½ the cost of actually producing energy! Happily the following year those costs will drop by more than 20% due to lower market prices.

ENE STRATEGIES EXPANDS MEMBERSHIP

Participates in Governor Baker Energy Bill Signing

ENE Strategies, LLC was established in 2015 as a subsidiary of Energy New England. Our mission is simple - to provide local and state government relations assistance to select clients who would benefit from ENE Strategies strong relationships with state and municipal appointed and elected professionals. Our expertise is in the energy, power and telecommunications sectors. We develop professional relationships with our clients, other leaders in the industries we service and with the key decision makers within the Commonwealth of Massachusetts.

As we completed our first year of business, ENE Strategies, LLC has grown our client list to twelve (12) municipal light plant clients. They include:

- Braintree Electric Light Department
- Concord Municipal Light Plant
- Georgetown Municipal Light Department
- Groveland Municipal Light Department
- Hingham Municipal Lighting Plant
- Littleton Electric Light & Water Departments
- Merrimac Municipal Light Department
- Middleton Municipal Electric Department
- North Attleborough Electric Department
- Rowley Municipal Lighting Plant
- Taunton Municipal Lighting Plant
- Wellesley Municipal Light Plant



Finally, because of our active work with the executive branch on the Omnibus Energy Bill, ENE Strategies, LLC and our clients were invited to participate in the signing of H-4568 with Governor Baker, Lieutenant Governor Karyn Polito, Energy Secretary Matthew Beaton, and Senate and House Energy Chairmen Ben Downing and Tom Golden on Monday, August 8th at a ceremony which took place on the State House Grand Lawn.

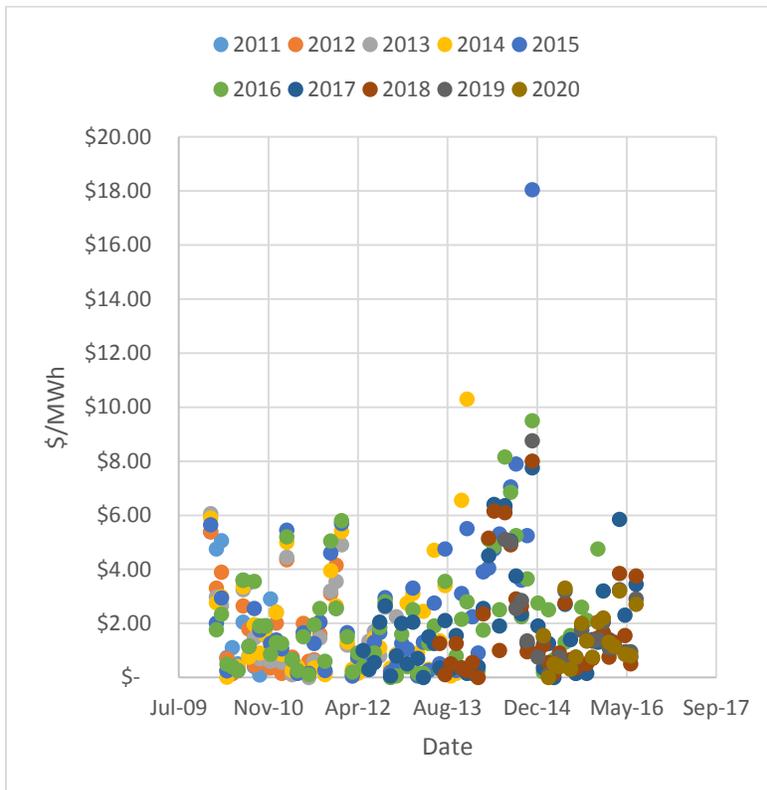
LACIMA ANALYTICS PLATFORM

In line with our commitment to constantly improve our analytical capabilities to best serve our customer’s needs in the ever evolving energy market, ENE has implemented the Lacima Analytics platform. Over the last 6 months the team at ENE has developed the infrastructure and knowledge base necessary to put the software’s many capabilities to work for our customers.

Lacima is a stochastic decision support software application which uses the combination of the historical movement of variables and future projections to randomly simulate future movement thousands of times on an hourly level in order to define statistically significant probability ranges that define the likely hood of an occurrence which can be computed in a timely and unbiased manner.

A prime example of this is using the historical movement in the spot price of power in combination with the forward energy curve to simulate hourly spot pricing for a defined term. This allows ENE the ability to simulate any customer’s portfolio on an hourly basis over the course of any defined period. As a result ENE can define statistically significant upper and lower bounds for potential exposure on a total cost basis. The establishment of those bounds informs a variety of critical processes for utility, generator, and end user financial management including budgeting, hedging strategy, rate making, credit risk management, individual transaction evaluation, and the valuation of potential asset purchases and investment. One example of simulating how much forward calendar year energy prices may move over a defined time period follows:-

The Lacima Analytics platform allows ENE the ability to simulate any customer’s portfolio on an hourly basis over the course of any defined period.



GENERATOR OFFERS AND NATURAL GAS PRICING ISSUES

Navigating Increasingly Complex Market Rules to Maximize Cost Recovery

Reference pricing used by ISO-NE Internal Markets Monitoring (IMM) to evaluate generation offers is based on commodity and transportation costs, “next day” gas pricing published by Intercontinental Exchange (ICE) and a cost set by IMM respectively. Unfortunately, published commodity pricing is a day behind current market pricing used to generate daily offers. In addition, some generators are dispatched in real-time and are buying same-day and/or intra-day gas, resulting in pricing and mitigation risks. This risk can be managed through the use of fuel price adjustments (FPA), fuel consultations (should an FPA be capped or denied), and requested changes in transportation adders.

The difference between published pricing and “next day” commodity pricing is typically easily addressed thru the FPA process. More problematic is the next-day and same-day/intra-day market differences. The long-term average delta between next-day and same-day is typically small, even negligible. However, the standard deviation, an indicator of how closely the data correlates to the average, can be significant and indicative of pricing risk as shown below based on data collected from ICE prior to the day-ahead offer deadline.

	2015			
	Next Day	Same Day	Delta	Std Dev
AGT-CG	\$4.413	\$4.316	(\$0.096)	\$1.134
TGP-Z6 200L	\$5.534	\$5.388	(\$0.146)	\$2.067

Commodity plus transportation costs can be addressed through an analysis of actual “delivered” gas purchases against the published index. This type of analysis will capture not only transportation costs but also any generator specific pricing conditions that may not have been considered by IMM. This can be used to request an increase in the transportation adder which, if approved, would likely greatly reduce the number of FPAs and fuel consultations required. ENE constantly monitors all the price points impacting its customers and strives to maximize cost recovery for its generation clients. This effort has become a near constant activity since market rule changes that began in late 2014.

DEMAND SHED PROGRAMS

ISO Administered and Voluntary Alternatives

While energy costs are subject to commodity market price cycles and the factors like the cost of natural gas transportation, other costs such as capacity can be mitigated by managing when energy is consumed. Capacity costs are allocated in large part on the energy consumed at the same time as the regional New England peak.

For ISO market participants, the complexity of the ISO demand shed program could create a financial risk and negate savings generated by the program. An alternative for utilities is to design a voluntary load shed program for their customers which could offer incentives to residential, commercial, and industrial retail customers based on their participation.

Energy New England has developed a tool that tracks monthly ISO potential peak hours. If customer consumption is able to “shed”, even in part, during potential peak hours the utility and customer can reduce their capacity MW obligation for the entire next capacity year (the following June through May). Further, if the program is run throughout the year the utility also has potential to reduce local and regional transmission costs.

By using monthly ISO historical peak hours and MWs, we create a bandwidth as a guide for potential peak events. Although we analyze over 10 years of history, we typically focus on the most recent four years. For example, Figure 1 shows the historical August peaks that are considered. We couple history with the current ISO forecast for the next seven days to determine how the week load is progressing, as shown in Figure 2.

Figure 1 - ISO Historical Peaks for August

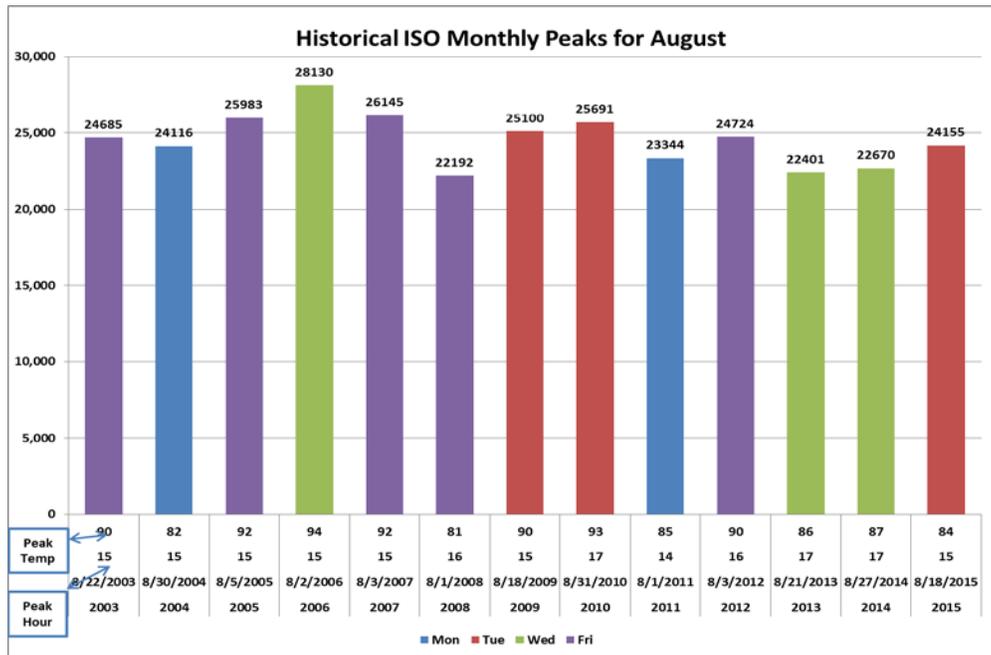
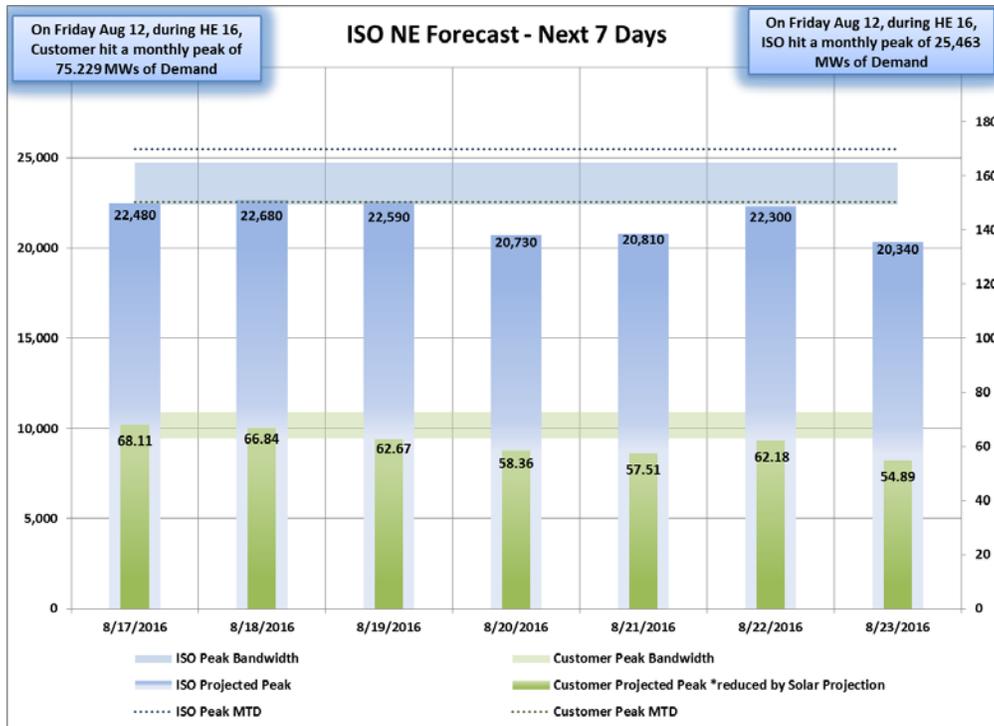


Figure 2 - ISO August bandwidth and forecasted peaks



A number of market developments present challenges and data to be analyzed in the determination of potential peak events. These include:

- Expansion of Energy Efficiency (EE) programs in each state has resulted in lower peaks despite relatively flat total energy consumption.
- Behind the meter (BTM) generation, largely solar projects reduce regional loads in the early afternoon, creating “peakier” later afternoon and early evening loads. Depending on cloud cover changes and storm locations, solar generation can introduce greater variability to peak occurrences.
 - ISO NE has estimated the MW amount of solar in the region to be 1,700 MW in 2016 and increases to 3,200 MW in 2025
- Weather indices like cloud coverage, humidity, dew point, and apparent (aka feels-like) temperature have always been critical considerations. Weather changes such as storm fronts moving across the region will affect consumption, and changes to the speed or timing of those fronts can throw off forecasts. The location and path of those storm fronts and heat and humidity must be considered as well, overlaid with the concentration of how demand is spread throughout the New England region.
- A self-fulfilling prophesy? The growth of distributed generation, ISO NE and voluntary/utility administered programs can introduce more variability in regional consumption patterns. With more programs chasing the same peak, at some point those concerted efforts could lead to a shifting of the very peak those parties are targeting!

SOUTH CENTRAL CONNECTICUT REGIONAL WATER AUTHORITY

ENE recently assisted the South Central Connecticut Regional Water Authority (SCCRWA) in obtaining a 3 year contract to purchase all requirements electric service. SCCRWA provides an average of 50 million gallons of water each day and consumes approximately 25,000,000 kilowatt hours annually to service 425,000 persons in 18 south central Connecticut municipalities. ENE’s services included identifying qualified suppliers, RFP preparation, power supply review and market analysis. The contract will provide SCCRWA’s customers with rate stability and is expected to save those customers over \$900,000 versus its current rate.



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