

Prime Time for Efficiency

New England shows the benefits of demand resources in forward capacity markets.

BY SANDRA LEVINE, DOUG HURLEY AND SETH KAPLAN

New England is leading the way toward a future that is both cleaner and provides greater electric reliability at reduced cost. New England Independent System Operator (ISO-NE) has created an innovative mechanism that addresses concerns about ensuring adequate energy capacity by allowing the cleanest and lowest-cost resources to be used to meet the nation's power needs.

As the saying goes, the cheapest kilowatt is the one that isn't used. The challenge always has been how to create the business and regulatory structures to allow reduced and managed energy use to be as financially rewarding as building another power plant. By including demand resources in the forward capacity market (FCM) in 2007, New England is making this happen in ways that are easily transferable to other regions of the country.

Green New England

Throughout the 1980s, New England states created programs allowing utilities to use demand-side management (DSM), demand response and energy efficiency to better manage electricity usage and costs. Rapidly rising fuel and electricity costs, coupled with rising electricity demand, placed consumers and the environment at risk. Programs used ratepayer dollars, usually collected through a systems benefit charge (SBC),

to invest in energy-efficiency programs that improved lighting, cooling and industrial operations, while saving electricity. As a result, utilities and consumers saved money and reduced pollution by avoiding additional electricity generation to meet demand.

For example, Massachusetts ratepayers invested \$371 million in energy efficiency from 2003 to 2005, which avoided nearly 3,000 GWh of energy, prevented emissions (9 million tons of carbon dioxide, 4,300 tons of nitrogen oxides, and 16,000 tons of sulfur dioxide) and ultimately saved consumers about \$1.2 billion.¹ With these programs, new demand-side businesses created real efficiencies, and effective measurement and verification systems were developed to reliably account for the savings produced. Both of these are key building blocks to the future success and acceptance of demand resources.

From LICAP to FCM

As the New England economy grew throughout the 1990s, increased pressure was placed on the region's power supply—a supply that by the early 2000s was dominated by merchant generation that either had been divested by utilities or had been newly built by independent power developers.

Conflicts erupted everywhere. First, there were pressures to close down old coal and oil plants that did not meet new pollution standards, or at least force installation of modern pollution-control equipment. Upward spikes in natural gas prices undermined the economics of gas-fired generation, in some cases causing owners to write off newly built power plants, by simply turning over the keys to a lender. All the while, peak electricity demand was rising. Concerns over lack of capacity needed to meet this demand collided with economic and business realities when a number of older and less efficient plants filed requests to retire with the ISO-NE. The conclusion that »



these plants still were needed to maintain system reliability led to a number of reliability-must-run (RMR) contracts—FERC-approved contracts that pay a considerable premium to keep a facility available for operation.

Each retirement application led to a hotly contested FERC proceeding, resulting in a non-market RMR agreement, contracts that both FERC and ISO-NE believed undermined the wholesale market but were needed as a temporary backstop. Eventually, in a key RMR proceeding, FERC mandated creating a more systematic approach of paying for capacity to avoid this *ad-hoc* and non-market approach.

The FERC mandate resulted in a process that produced a mechanism for making locational installed capacity (LICAP) payments to generators. As with RMR contracts, the LICAP requirements would result in paying a premium to generation facilities to stay in operation—however the payments would be made to all generators, not just those that had applied to retire, creating a general incentive with a locational premium to develop capacity on the New England wholesale electric system. The cost of LICAP for consumers was estimated at roughly \$12 billion. This proved a tough pill for regulators, consumers and some utilities. Lengthy and painful legal and political challenges to LICAP followed.

As FERC considered an administrative law judge report advising approval of a highly contested settlement imple-

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menting LICAP, Congress included a section in the Energy Policy Act of 2005 (EPA 2005) directing FERC to reconsider the LICAP requirements. FERC subsequently entertained presentations and testimony on LICAP and its alternatives, eventually convening marathon and arduous settlement negotiations.

The challenge, as it has been since the beginning, is how to keep the lights on while continuing to provide New England with affordable power. A break in what seemed like never-ending gridlock came with a proposal to put in place a new FCM that would replace LICAP as a vehicle for inducing the creation and retention of capacity resources. A noteworthy provision of this settlement is that for the first time, energy efficiency and other demand resources would be allowed to compete with generation to meet reliability needs, provisions championed by key state regulators, major utilities and the representatives of efficiency providers

like the Conservation Services Group. Recognizing that demand resources had the potential to provide cleaner and lower-cost alternatives to new and existing generation, groups representing consumer interests and most of the region's regulators supported this compromise.²

Competitive Conservation

Key provisions in the LICAP settlement provided a level playing field for demand resources. This offered an opportunity to lower capacity costs and to reduce pollution. Instead of meeting capacity and reliability needs by simply paying generators additional money, there was to be an auction for all capacity, and demand resources were to be eligible to compete and participate in the auction.

First, under the settlement, the LICAP requirements were replaced with an FCM. This is a locational market where all capacity needs and prices are determined by auction. Resources that could meet power needs are bid into the auction. The bids determine the price for capacity in the region. Second, the settlement provided that demand resources explicitly were included as eligible to meet capacity needs. Recognizing the different qualities and specific value of demand resources, the settlement required that a distinct method be developed to allow demand resources to be fully integrated as qualified capacity in the FCM.³

These provisions allowed demand resources to be treated as comparable to generation. Where reliability and capacity needs responsibly could be met by reducing demand, those resources were eligible for capacity payments the same as were generation.

New England already had a successful experience with demand resources providing needed reliability. In the early years of this decade, Southwest Connecticut experienced significant capacity constraints. When ISO-NE issued a gap RFP for resources to address that constraint, significant demand resources »

FIG. 1 TOTAL NEW AND EXISTING SUPPLY- AND DEMAND-SIDE RESOURCES BY STATE

	(IN MEGAWATTS)			
	New Supply-Side Resources	New Demand-Side Resources	Existing Supply-Side Resources	Existing Demand-Side Resources
Connecticut	354	238	6,835	610
Maine	—	170	3,244	103
Massachusetts	190	567	12,777	481
New Hampshire	10	64	4,083	54
Rhode Island	21	78	2,401	87
Vermont	50	71	900	30
Imports	—	—	934	—
Total	626	1,188	31,373	1,366

DR in New England's 2nd Forward Capacity Auction

- ❑ 282 Show of Interest (SOI) Forms Received
- ❑ 260 projects paid Qualification Deposit on or before Dec. 18, 2007
 - 167 Carry-Over Projects, which also participated in FCA-1
 - 53 Expansion Projects totaling over 536 MW
 - 40 New Projects totaling 319 MW
- ❑ 22 projects rejected for non-payment of Qualification Deposit by Dec. 18, 2007

Source: ISO-NE

successfully were bid, and 92 MW of energy efficiency and load reduction were used to meet the overall 250 MW of awarded contracts. The intervening years have shown that demand resources are capable of competing with generation to meet reliability needs.

Although the LICAP settlement created the opportunity for demand resources to compete in the market, the devil was still in the details. A year-long working group process shaped the rules for the demand-side aspects of the FCM. Effective rules were needed to ensure adequate resources would be available and eligible to compete in the new market. Reliable measurement and verification (M&V) was needed for all demand resources. Responsible operation of a power grid requires being able to confidently account for, and call upon, all the resources being used. For demand resources, the extensive M&V rules that had already been developed and were being used for the various DSM and efficiency programs in the region provided a firm foundation. The M&V provisions for demand resources in the FCM rules relied extensively on the experience and infrastructure created for the region's efficiency programs. These existing M&V procedures gave ISO-NE confidence that actual demand resources would fulfill commitments made through the auction process.

Demand Futures

The first auction for the FCM is now complete, and the market experienced a very robust response from demand

resources. In rough terms, nearly half of the new resources that qualified to bid were demand resources. This is remarkable for the first auction. It shows that existing programs and efficiency are barely the tip of the iceberg.

The final auction results as reported by ISO-NE are even more remarkable (see Figure 1).⁴ New demand resources outperformed new supply by a nearly 2:1 ratio. For every 1 MW of new generation, there will be 2 MW of new demand resources. The auction also shows a near doubling of the existing demand resources to meet future needs.

In terms of cost, the auction opened at \$15 per kilowatt-month and systematically decreased through each round. In the eighth and final round of the auction, the price reached the predetermined floor of \$4.50/kW-month with 2,000 MW of excess resources remaining.⁵ These results show the potential for demand resources to be used much more widely to meet the region's reliability and capacity needs.

After this first auction, more than 5 percent of the region's peak load will be met with demand resources. Over a seven- to ten-year period, this could

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grow to 10 percent or even 15 percent of the region's reliability requirement.

Additionally, all owners of new resources that intend to participate in the second auction have submitted the required show of interest forms to the ISO, representing more than 800 MW of new demand resources. This amount is above and beyond those resources that were bid into the first auction. Now that ISO-NE has offered the opportunity to participate in the capacity auction, demand-resource providers are responding in great numbers (see sidebar, "DR in New England's 2nd Forward Capacity Auction").⁶

This early experience suggests the New England FCM is a successful model. FERC Commissioner Jon Wellinghoff said the FCM's provisions for integrating demand resources were "as advanced as any market in the country."⁷

After the third FCM auction in mid-2009, the floor and ceiling prices set by the original settlement will disappear. The clearing price from the first auction suggests prices might stabilize at a level that is more competitive for inexpensive demand resources than fossil-fuel-fired generation. Additionally, consistent with FERC's recent NOPR on Wholesale Competition in Regions with Organized Markets (Docket Nos. RM07-19-000 and AD07-7-000), the New England markets have an opportunity to incorporate demand resources into ancillary services markets like those for forward reserves and the energy markets. Much work will be needed to figure out how to accomplish this integration.

Repeating Success

Ultimately, the greatest value of this work in New England is in the creation of a replicable precedent that can be applied across the nation. An obvious place this replication can play out is in California, which has the same architecture of well-developed demand-side management, demand-response and »

energy-efficiency programs—creating a reservoir of demand resources that could be purchased in capacity, ancillary services and energy markets. The California ISO has the ability, working with stakeholders and the state government, to use the same legal and regulatory tools the New England ISO has employed to create a new market, a new revenue stream and incentive for demand resources.

The FCM provides an effective gateway for demand resources to participate in other markets as well. For example, PJM is in the process of working out the details of how energy efficiency will participate in its capacity construct, the reliability pricing model (RPM), to comply with a FERC order issued on December 22, 2006.⁸ Since its first auction in April 2007, RPM has included demand-response resources, which have long been participating in PJM's existing capacity, energy and ancillary services markets. In fact, 127.6 MW of demand response cleared in that first auction. But these market designs have not yet included other demand resources such as energy efficiency. PJM plans to include energy-efficiency resources in both its incremental and base residual auctions starting in January 2009.

Additionally, in the Midwest Independent Transmission System Operator (MISO) region, demand resources are considered in the transmission-expansion planning process, and MISO says

the forthcoming ancillary service market will provide a platform for demand response to participate. Other demand resources, such as energy efficiency or behind-the-meter generation, are not specifically incorporated. They are considered in retail load planning but aren't treated as a biddable resource in the MISO market.

Like demand response, many energy efficiency resources provide reliable capacity at costs lower than new generation, and markets that include these resources will become more efficient. Many details still must be ironed out through the stakeholder process, but already in its nascent stages, the FCM has shown that demand resources can, and will, compete with generation—and that a significant amount of those resources will enter service if the markets provide a fair price signal.

If the cheapest kilowatt is the one that isn't used, then those unused kilowatts deserve a chance to compete in organized markets, as they do in New England. The challenge is to ensure the nation's energy future includes meaningful and robust opportunities that increase reliance on demand resources—and allow ratepayers and society to capture the real value of efficiency and conservation. ■

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Endnotes

1. *Massachusetts Saving Electricity: A Summary of the Performance of Electric Efficiency Programs Funded by Ratepayers Between 2003 and 2005*, Massachusetts Division of Energy Resources, Apr. 2007, available at www.mass.gov/Eocad/docs/doer/pub_info/ee03-05.pdf.
2. *Maine Public Utilities Commission v. FERC*, No. 06-1403 (D.C. Cir. 2008): On March 28, 2008, the D.C. Circuit, deciding an appeal of a settlement brought by the Maine PUC, the Attorneys General of Massachusetts and Connecticut and a group of industrial customers, affirmed the substance of the settlement and the FERC decision approving it. The Court did, however, find for petitioners on the procedural question of what standard of review applied to decisions implementing the settlement, refusing to apply the "Mobile-Sierra" standard to challenges brought by non-settling parties.
3. *Devon Power, LLC*, 115 FERC ¶61,340 (2006) Settlement Agreement at 14, §11.II.E.2.b.
4. *Wholesale Marketplace Helping to Achieve Long-term Power System Reliability Goals*, ISO-NE report on FCM results, available at www.iso-ne.com/nwsiss/pr/2008/press_release_fcm_auction_results_02_13_08.pdf
5. *Id.*
6. "Demand Resource Show of Interest (SOI) for the 2nd Forward Capacity Auction (FCA#2) ISO-NE," Demand Resources Working Group, Jan. 21, 2008, available at www.iso-ne.com/committees/comm_wkgrps/mrktts_comm/dr_wkgrp/mtrls/2008/jan252008/index.html.
7. Commissioner Jon Wellinghoff, Presentation, Northeast Power Markets Forum, March 29, 2007, Washington, D.C.
8. *PJM Interconnection, L.L.C.*, 117 FERC ¶61,331 (2006), December 22 order; and June 25 order on rehearing, 119 FERC ¶ 61,318.

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