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Funding for this work was provided by the NYISO. The authors acknowledge the guidance and technical contribution of the project manager, Dave Lawrence.

The opinions expressed in this article are those of the authors and do not necessarily reflect the views of the NYISO. The authors are responsible for any mistakes or errors of judgment.

The Benefits of Customer Participation in Wholesale Electricity Markets

By participating in the New York ISO's price-responsive load programs, customers have contributed importantly to the prevention of forced outages at a time when system electricity demands hit record levels. Through their load curtailments, they also exerted some downward pressure on market prices and price volatility.

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I. Introduction

Most would now agree that wholesale electricity markets need the discipline that can only be possible by allowing customers to respond to wholesale prices.¹ Customers must be coaxed away from the safety of conventional, hedged retail services and be provided with sufficient incentive to accept the risks inherent in wholesale market price volatility. Standard offer services in competitive retail markets remain highly hedged, partially to secure the collection of stranded assets. New competitive retailers feature

various hedging products in response to what they hear from customers. Moreover, legacy load management programs that provided some semblance of price responsiveness under regulated market regimes have fallen victim to the new market order. The value of legacy load management programs, which were based upon an individual utility's avoided costs, is eroded substantially when regional transmission organizations (RTOs) are instituted.

So far, any potential market influence of customer price responsiveness remains largely

untapped. Some have prescribed an extreme remedy: make the standard retail offer some variant on real-time pricing, thereby forcing customers to confront wholesale market price volatility head on. While most customers will continue to seek the safe harbor of a hedged price, a small fraction will likely find that they can lower costs by avoiding high prices through effective load management. In the end, customers will assume the degree of risk that fits their circumstances and in the process exert the appropriate influence over market price. While this extreme remedy may eventually bring about this desired result, customers may at first rush to a hedged service to avoid those risks, leaving price volatility unabated.

An alternative remedy is to offer customers limited and highly structured opportunities to participate in wholesale markets through price-responsive load (PRL) programs managed by independent system operators (ISOs) and RTOs.² By scheduling or dispatching PRL resources, the ISO can ensure that these resources are deployed when their value to the market is highest.

During the summer 2001, the New York ISO's (NYISO's) Market Members elected to implement two pilot PRL programs that are consistent with this alternative view. In what follows, we review these PRL programs briefly, outline the several categories of PRL program benefits, and provide an empirical assessment of the pro-

gram effects during the summer 2001.

II. NYISO's PRL Programs

One program, the Emergency Demand Response Program (EDRP), is intended to provide a stock of dispatchable resources that would be available to bolster reserves during times of system

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emergency. The NYISO provides participants at least two hours advance notice of when curtailments are needed to supplement conventional generation resources. Customers that curtail during the specified periods are paid the locational-based marginal price (LBMP) or \$500/MWh, whichever is higher. On three consecutive days this past August, when system reserves were low statewide, the 292 participants supplied on average 420 MW of peak load reduction during events ranging from 4 to 8 hours in length.

Customers with at least 100 kW of curtailable load are allowed to

subscribe to EDRP;³ 40 percent of EDRP subscribers also chose to participate in an existing NYISO load management program, ICAP/Special Case Resource (SCR).⁴ Given that electricity demand in New York state during two consecutive days in August 2001 surpassed the previous all-time peak by over 2 percent, it is difficult to imagine more appropriate circumstances under which to assess the performance of this emergency program.

Customers with a similar load reduction capacity may also subscribe to NYISO's Day-Ahead Demand Response Program (DADRP), which extends to retail customers access to the NYISO's day-ahead electricity market. Participants submit demand reduction bids comparable to the supply bids offered by generators, and they receive market prices for load reductions that are scheduled for the next day. They settle any curtailment shortfalls at the higher of the day-ahead market (DAM) or real-time market (RTM) price, plus a 10 percent penalty. The 16 DADRP participants provided over 25 MW of load reduction coincident with peak summer prices, but bids were offered and scheduled throughout July and August.

III. Characterizing PRL Benefits

Curtailments made under PRL programs managed by an ISO generate two distinct types of

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