Chapter 5 – Demand Resource Participation in Ancillary Services Markets

Background

The NYISO desires to accommodate the participation of end-use customers in some of its ancillary services markets by allowing them to submit offers to curtail usage as equivalent to generation. When fully integrated into market operations, such curtailments supplement the resources available to maintain system reliability, and serve to ensure that resources are dispatched to match the marginal value of electricity in consumption. In this manner, curtailment bids compete with those of generation resources, so when they are selected, they are subject to essentially the same settlement rules that determine compliance payments and nonperformance penalties. The degree to which customers will avail themselves of these opportunities depends on the benefits they can expect to realize compared to the costs and risks they involve.

The NYISO has developed protocols (referred to as the Real-Time Demand Response Program (RTDRP)) for customer participation in its revised operating reserves markets. To evaluate customer interest in RTDRP, Neenan Associates conducted briefings to introduce potential participants to the concept and to measure their interest.

Protocols were developed to characterize the opportunities and barriers to demand resource participation in this market, including representations of how bids to provide service would be submitted by customer participants, how they would be evaluated by NYISO, and how performance would be measured and payment made for services rendered. These protocols were then used to simulate the outcome of alternative RTDRP bidding strategies representative of an industrial customer and a commercial building. These simulations provided numerical examples of RTDRP participation that supplemented extensive descriptive materials developed by Neenan.

To develop a preliminary indication of interest in participation in RTDRP, the NYISO organized concept briefings held in Manhattan and Albany in September of 2003 and extended invitations to a wide audience of stakeholders, including end-use customers, potential program providers (LSEs and CSPs) and other stakeholders. Attendees were given a presentation that described the details of the proposed RTDRP, including the numerical examples. To provide a

means of measuring interest in participation, the estimated benefits from three other demand response programs were presented, as follows:

1. **Day-Ahead Ancillary Services program**, which would allow end-use customers to bid to provide ancillary services in the Day-Ahead Market to meet the reliability needs of the NYISO;
2. **LSE-sponsored day-ahead bidding program**, whereby the LSEs extend their day-ahead bidding activities to allow customers an opportunity to reduce load when the LSE requires and receive a share of the resulting benefit, which is defined as the price differential between Day-Ahead and Real-Time market prices; or
3. **Real-Time Demand Response Program with an energy payment,** whereby the existing RTDRP program is modified so that customers that are scheduled to provide ancillary service and are dispatched, to provide energy or for a reserve pickup, are provided an additional payment for their curtailment based on the Real-Time LBMP.

Following each presentation, attendees were asked to complete a brief survey to assess level of interest in the current RTDRP and the proposed alternatives. The survey is included in Appendix 5A. The presentation materials are included as Appendix 5B.

Survey Results

Figure 5.1 shows the distribution of briefing attendees. The majority of attendees were representatives of customer interests: LSEs and CSPs (15% each) and other interested parties (55%). Customers comprised only 15% of those that attended one of the briefings. It is important in interpreting the results to recognize that only 30% of briefing participants are or represent entities to which the program is directed.

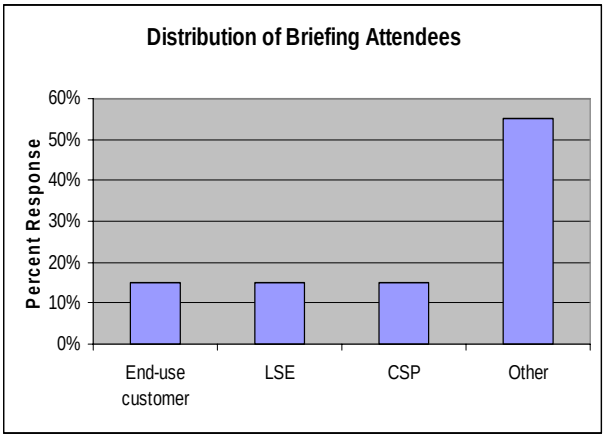

Figure 5.1. Distribution of Briefing Attendees

Briefing attendees were asked to indicate whether they would consider participating in the proposed RTDRP program (customers) or offer the program to their customers (LSEs and CSPs). While more than half of the LSE/CSP/Other Stakeholder attendees indicated that they were interested (YES in Figure 5.2), most of the end-use customers (2 out of 3) said they were not interested (No in Figure 5.2).

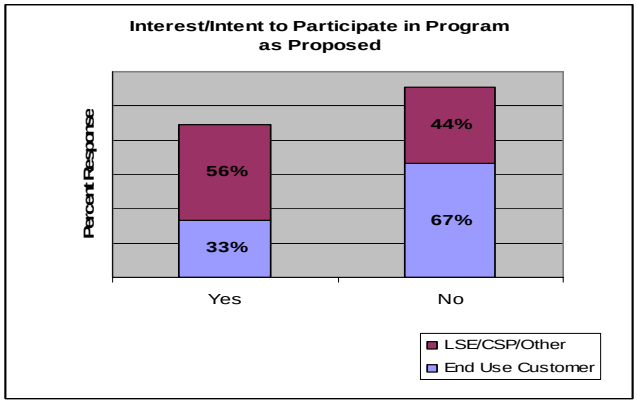

Figure 5.2. Interest/Intent to Participate in RTDRP Program as Proposed

Attendees were asked to indicate the importance of alternative types of assistance that might help them to participate. Figure 5.3 shows the types of assistance each group identified as important to facilitating participation by each group.

The results suggest that customers and their representatives have different views on what would be required to induce participation. Customers (two out of three) selected higher benefits and funding to cover the high cost of the telemetry required to participate, while the other participants indicated standardization of protocols with other ISOs (presumably those in the northeast), or another concern. The only overlap of interest was for the cost of telemetry.

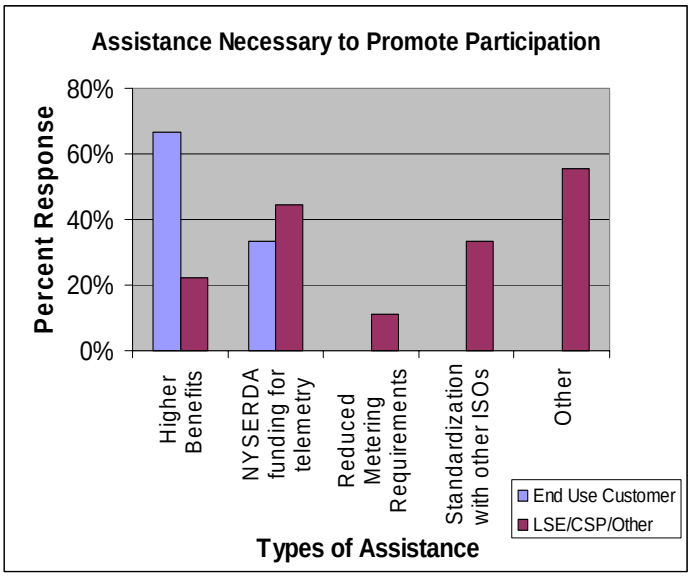

Figure 5.3. Types of Assistance Necessary to Promote Participation in RTDRP

Descriptions of each of the three proposed programs were presented to the attendees along with numerical examples of potential benefits. The examples suggest that RTDRP would produce very low benefits relative to the other program options, and that RTDRP bidding might be over ten times more lucrative if participants also received an energy payment, in addition to their availability payment, when they were dispatched (required to curtail). Attendees were asked to rank, on a scale of 1 to 5, with 1 being Most Likely to Participate, the likelihood of participating in each of the proposed programs. Figure 5.4 illustrates the results separately for customers and for others. In general, their responses were about the same.

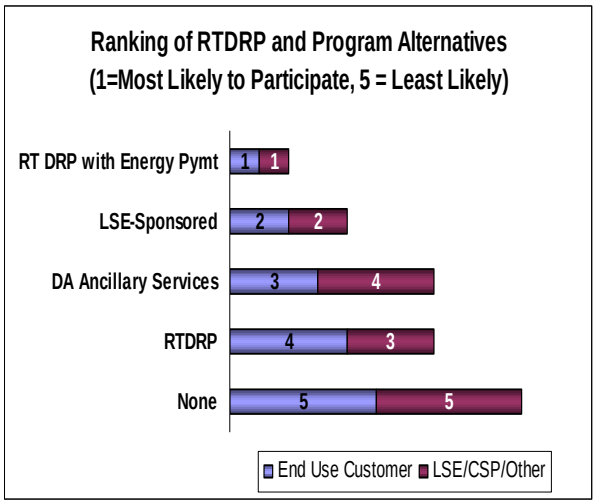

Figure 5.4. Ranking of RTDRP and Alternative Programs

Both groups indicated the strongest preference for the Real Time Demand Reduction Program with an energy payment. Under the current design customers would receive an availability payment if selected to provide ancillary services but they would not receive any additional compensation when they are actually curtailed, which may explain why the proposed

Table 5.1. Most Appealing Features of RTDRP and Alternative Programs

	End-Use Customer	LSE/CSP/Other
RTDRP	*none*	*Economically efficient*
Day-Ahead Ancillary Svcs	*Should be standardized to other ISO programs*	*Economically efficient*
LSE-Sponsored Program	*Should be standardized to other ISO programs Might work with other ISO DR programs*	*Economically efficient*
RTDRP with Energy Pymt	*Should be standardized to other ISO programs Might work with other ISO DR programs*	*Economically efficient*

RTDRP program ranked fourth, ahead only of No Ancillary Services Program, which was the least favorable alternative for both customers and other stakeholders. Finally, attendees were asked to specify the most appealing feature of each proposed program and identify any barriers to each program. Table 5.1 provides the most appealing features by group and Table 5.2 shows barriers identified by each group of attendees.

Customers' stated perspective is clearly different than that of the other stakeholders. Customers could find nothing favorable about the proposed RTDRP program, while the others indicated that it has merit because it is economically efficient. For the other programs, customers indicated that standardization was important, while the others are focused on ensuring an efficient market structure.

As Table 5.2 shows, customers indicated that none of the four programs provided sufficient benefits based on the analyses they were presented. The other stakeholders joined them in this belief. An additional consideration to both groups is the high-cost metering requirements for RTDRP given the expected benefits.

Table 5.2. Barriers to Participation in RTDRP and Alternative Programs

	End-Use Customer	LSE/CSP/Other
RTDRP	*Benefits, prices too low* *Metering requirements*	*Benefits, prices too low* *Metering requirements*
Day-Ahead Ancillary Svcs	*Benefits, prices too low*	*Benefits, prices too low* *Metering requirements* *Too complex*
LSE-Sponsored Program	*Benefits, prices too low*	*Benefits, prices too low*
RTDRP with Energy Pymt	*Benefits, prices too low* *Need forecasted benefits*	*Benefits, prices too low*

Conclusions

Gauging interest in a new and complex electricity-purchasing program is difficult. In order to indicate their degree of interest, customers have to wade through the highly technical nature of NYISO bidding and settlement rules. In addition, without the benefit of experience to provide a framework for

comparing benefits with risks and costs, customers can be expected to be tentative about obligating themselves to shut down part of their operations and services.

The proposed RTDRP is complex, as befits the nature of how ancillary services are used to maintain system reliability. It's not surprising that some customers are wary of undertaking such an obligation, especially since the estimated benefits are very low. However, one customer indicated that it would be likely to participate, which indicates that there is at least some prospects for customer participation. The other stakeholders indicated through the survey results a stronger interest in participation, presumably reflecting their constituency. Perhaps they see no downside in having such a program available to their customers, and their relative optimism does not reflect the expectation of participation by a substantial number of customers.

As one might expect, making RTDRP more lucrative improves customers' (and others') view of participation, ranking it even above an LSE-based split the savings. But, given the apparent low customer interest in similar LSE offerings in the day-ahead market, whereby obligations are established with much greater notice, and limited interest in the more beneficial DADRP program, it seems unlikely that even with this concession there would be a substantially greater number of participants. However, it might ensure participation by those customers that have the technical ability and managerial acumen to participate in the RTDRP.

Would the results be different if the workshops involved more customers? Is there a constituency that was not represented that might be willing and able to participate in RTDRP? Regarding the first question, it seems unlikely that holding additional workshops would do more than reinforce the results of already recorded. The NYISO extended invitations to the entire demand response community, located the workshops to accommodate participation by a wide range of interests,

and provided an opportunity to participate through a conference bridge. It seems reasonable to assume that those that did participate, by virtue of their taking time to understand such a highly technical matter, represent those that would be most capable of participation.

Some have proposed that residential electricity devices under close control represent a rich ancillary services resource (Hirst 2003). This research effort did not explicitly investigate that potential, although one of the workshop participants represents residential buildings interests. Given the relatively low stream of benefits from RTDRP participation, even with an additional energy payment, provides an added perspective on the feasibility of financing an investment in load control technology based on ancillary services participation.