Case 09-E-0115 - Proceeding on Motion of Commission to Consider Demand Response Initiatives

EVALUATION OF INCENTIVES TO PROMOTE AUTOMATED DEMAND RESPONSE

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Introduction

Consolidated Edison Company of New York, Inc. (“Con Edison” or the “Company”) submits this Evaluation of Incentives to Promote Automated Demand Response (“Evaluation”) pursuant to the New York State Public Service Commission’s ( “PSC” or “Commission”) January 20, 2011 Order Adopting Modifications to Demand Response Programs (the “Order”) directing the Company “to explore the concept of providing incentives to large customers seeking new or expanded service to provide for and build into their building’s electric infrastructure the ability for Con Edison to curtail from its control center an agreed upon portion of the building’s expected peak load.”

The Company strongly supports demand response programs that enable it to reduce capital expenditures and avoid peak energy costs, with associated cost, reliability and environmental benefits. The Company is very interested in providing incentives, with the New York State Energy Research and Development Authority (“NYSERDA”), that enable the Company to curtail demand directly from its control center. As directed by the PSC in the Order, this Evaluation investigates the concept of providing incentives and any applicable NYSERDA funding opportunities, addresses potential issues and proposes a process for implementing such incentives. The Evaluation is divided into six sections:

- which customers should be targeted; tools which can be used to enable automated load control; customer education of potential incentives; funding opportunities being offered by NYSERDA; a proposed process for implementing incentives; and recommendations and conclusions.

Target Customers

The Order directs that the Company explore the concept of providing incentives to large customers seeking new or expanded service, which raises the threshold question of whether that is the optimal target market. For the reasons discussed below, the Company has expanded the scope of the Evaluation to include all appropriately sized customers within the Company’s service territory.
The rationale for this expansion of target customer scope is to enable the Company to maximize the integration of demand response resources. The vast majority of buildings within the Company’s service territory which will be in place by 2030 have already been built. In fact, as identified in New York City’s PlaNYC Progress Report 2010 “today’s existing buildings will make up 85 percent of all real estate in 2030”. Expanding the target customer scope to include existing buildings dramatically increases the potential to capture the benefits of demand response and avoids the lost opportunity that would result if early adopters with existing load were not eligible for incentives.

New and expanding building stock in New York City, apart from having to meet building standards which have more energy focused elements than previous standards, is being built with more modern control equipment, which as will be explained below, is already, to a great extent, remotely controllable. It should also be noted that any new work is taking place with the backdrop of the commencement of New York City’s (“NYC”) Benchmarking and Water Use law Local Law 84 which will require all buildings over 50,000 square feet to benchmark their energy and water use. Building owners are to use the Environmental Protection Agency’s (“EPA”) free online Portfolio Manager to measure their energy use. Every year, building owners must submit their benchmarking reports and it is intended that the information will be made available to the public. This requirement will motivate all building owners, but particularly developers of new and expanding buildings, to ensure they are able to control their energy as effectively as possible. The Company also notes that NYC took the opportunity to expand Local Law 84 to require that all building renovations meet state energy standards, as opposed to the previous requirement that only renovations involving over fifty percent of the building were required to meet the state energy standards.

**Tools to Enable Greater Building Load Control**

The model anticipated in the Commission’s Order aligns with the solutions currently being developed under the term Automated Demand Response (“AutoDR”). A leading

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2 Administrative Code of the City of New York, Title 28, Chapter 3, Article 309.
institution in the development of AutoDR is Lawrence Berkeley National Laboratory (‘LBNL’). LBNL describe the levels of automation of Demand Response as follows;

    Manual Demand Response involves a labor-intensive approach such as manually turning off or changing comfort set points at each equipment switch or controller. Semi-Automated Demand Response involves a pre-programmed demand response strategy initiated by a person via a centralized control system. Fully-Automated Demand Response does not involve human intervention, but is initiated at a home, building, or facility through receipt of an external communications signal. The receipt of the external signal initiates pre-programmed demand response strategies. We refer to this as Auto-DR (Piette et. al. 2005). Auto-DR for commercial and industrial facilities can be defined as fully automated DR initiated by a signal from a utility or other appropriate entity and that provides fully-automated connectivity to customer end-use strategies. One important concept in Auto-DR is that a homeowner or facility manager should be able to “opt out” or “override” a DR event if the event comes at a time of when reduction in end-use services is not desirable. Therefore, Auto-DR is not handing over total control of the equipment or facility to the utility but simply allows the utility to pass on grid related information which then triggers facility defined and programmed strategies if convenient to the facility.³

    The Auto-DR concept has been supported by an open communication architecture, OpenADR 1.0, which has been designed to interact with building management systems at low or no cost. The current fleet of building management systems, those installed within the last ten years or so, are generally able to directly communicate and operate via OpenADR 1.0. Those of an older vintage are expected to require an intermediary gateway device; currently such devices are manufactured by a number of suppliers. Establishment of the formal standard for OpenADR 1.0 is expected in August 2011 and an associated Smart Grid operability standard by the end of 2011.

    Understanding AutoDR and OpenADR is important when considering how to encourage participation in demand response programs, while resisting being prescriptive to specific device

³ Kiliccote et al, Installation and Commissioning Automated Demand Response, Ernest Orlando Lawrence Berkeley National Laboratory, p. 2.
or control protocols or both, which may not be the solution of choice for a specific customer or may become redundant as penetration of incentives is reaching a level of maturity. For example, controls for incandescent or compact-fluorescent lighting will become less important as LED lighting solutions are deployed.

The Company recognizes that education and incentives around AutoDR solutions on the customer side are needed to support quick and reliable demand response. The Company also recognizes that quick reliable response is an important tool in the context of emergency demand response, as opposed to peak shaving solutions. Hence, it is not surprising that the initial development of AutoDR was in a California market which contends with rolling blackouts and not in the Company’s highly reliable supply service territory. Tools based on economics that may be applicable to the unreliability of the system in California may not be as appropriate for New York and will need to be validated.

The Company is currently developing and deploying comprehensive Smart Grid pilots which, together with other initiatives, will test building control system communication and interaction with utility triggered demand response events. These pilots are fifty percent funded by Department Of Energy (“DOE”) funds, and therefore partly paid for by New York tax payers, and the other fifty percent is paid by the Company’s customers. In this context, the Company’s customers are already heavily invested in the development of technologies to more efficiently control load.

One of the key demonstration objectives of the Company’s Smart Grid Demonstration Grant project is to interface the grid with at least 10 key locations (buildings) in specific areas of Brooklyn, Manhattan and in Long Island City. The intent is to demonstrate the following abilities:

- integration of a diverse variety of distributed energy resources into the power grid as virtual generators;
- coordination, scheduling and optimization of those resources;
- interfaces with building management systems, the Company’s control center and NYISO;
- ability to schedule curtailed and shifted load into the day ahead, real time and ancillary service wholesale energy markets of the NYISO; and
- cost benefit analysis from both the customer and Company point of view.
The Company expects to complete this demonstration pilot by the end of 2012 and to have gained valuable insight into the technology required to perform the tasks anticipated by the Commission and, further, to have a greater understanding of customers’ ability to respond to different event situations and to more holistically manage their demand. Simultaneously terminus with the Smart Grid Demonstration Grant project are the Company’s peak-shaving pilots which will add to the depth of insight garnered and the strength of the base on which future solutions can be developed.

Customer Education

The Company recognizes that customer education is vital to maximize the efficiency of the energy supply chain. The demand response education should be part of an overall efficient energy management education strategy, designed to help customers participating in demand response programs also operate at the maximum efficiency level.

As the Company continues to educate its customers regarding demand response, it is important that the education be broadly focused on all of the customers’ energy related needs, not just those specific to the up-stream energy supply markets. The Company believes there are “common good” elements to demand response solutions for more effective generation and utility grid management. It follows, therefore, that the customer should be informed that the tools used to respond to either the Company’s demand response events or the NYISO’s events can also be used by the customer at times non-coincidental to such events. Doing so will enable the customer to reduce its normal operational peaks and so create an energy load profile which is more efficient to supply and will result in lower charges for the customer, irrespective of specific demand response incentives. Each customer operating more efficiently not only reduces its own cost, but also those experienced by every other customer.

The Company is moving toward a more holistic approach to demand management, including efficiency, demand response, peak shaving power quality, etc. The Company believes that such an approach will leverage efficiency, demand response and Smart Grid investments. This message will be an important component of customer education moving forward.
In line with the Federal Energy Regulatory Commission’s (“FERC”) National Action Plan for Demand Response, Con Edison believes it is important that it educate broadly regarding the concept of demand response, providing concept validation and incentive awareness so that customers can recognize this process as a valid energy management strategy which can be executed with minimal or no impact on their business. Unfortunately, “demand response” currently has one of the highest negative ratings for energy terms widely used and tested with the energy consuming public. Demand response will not approach its true economic level until the negative perception barrier is reduced.

The Company believes this will only be achieved via a broad education process, using simple, customer friendly language and concepts, that is part of a larger conversation about energy management generally. To focus customer demand response education only on demand that is coincidental to the utility system peak does not help customers to the fullest extent possible as they work to get the full value of their investment in better building management solutions and processes. As an industry, we do a disservice to customers by not expanding the energy management conversation in an as accessible and comprehensive a manner as possible. We should not continue to segregate the conversations about demand response and efficiency from one another. The Company, and FERC, recognize this and the Company has already commenced broader outreach and education.

Design engineers and architects, who are engaged in the design of new, expanding and renovated building stock long before the utility may even be aware of possible construction, will be valuable participants in the process of educating building owners about demand response opportunities and about instrumentation, building intelligence and interconnections. Other important allies include product manufacturers (lighting, HVAC, etc.) who are looking to differentiate and establish an improved value proposition for their products. The Company believes the majority of manufacturers are highly attuned to the need for improved energy efficiency in their products and the move towards a controls rich building environment.

**NYSERDA Funding Opportunities**

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NYSERDA currently has incentives specifically directed toward promoting customer participation in demand response programs. NYSERDA further supports this commitment to demand response by being actively involved in pilot programs to test new potential demand response tools; NYSERDA’s involvement in lighting ballast control development and the development of OpenADR standards testifies to this.

NYSERDA’s current demand response incentives for the Company’s service territory are as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>Incentive</th>
<th>Details</th>
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<tbody>
<tr>
<td>Demand Response</td>
<td>$200/kW</td>
<td>Performance-based incentives are offered to offset the cost of equipment that enables facilities to participate in DR programs.</td>
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<tr>
<td>Bonus Incentives – Fleet Integrated Demand Response</td>
<td></td>
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<tr>
<td>Room Air Conditioners</td>
<td>$100/kW</td>
<td>Minimum project - 100 enabled window, through-the-wall, PTAC or PTHPs in a single facility. Requires direct load control. Maximum $350,000 per project.</td>
</tr>
<tr>
<td>Load-Shedding Ballasts</td>
<td>$50/kW</td>
<td>Lighting must meet applicable electricity criteria for electric efficiency incentives and be registered with NYISO ICAP SCR.</td>
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As the Commission is aware, NYSERDA is in the process of finalizing its design for the deployment of funds under the Systems Benefit Charge (“SBC”) IV funding. Public comments closed on March 31, 2011 and NYSERDA will present its plan to the Commission by May 1, 2011. As part of its broader comments, the Company provided the following statement to NYSERDA in support of NYSERDA’s continued commitment to demand response in the context of building stock:

Following-up on the Company’s comments on automated demand response during the Technical Conference, Con Edison believes that as advances are made towards the truly connected smart grid, greater consideration will have to be given to developing tools which enable the integration of building management systems. This is especially important in heavily populated urban areas like New York City, where it is likely that the large commercial building will form an important hub for interaction of many energy consuming devices with the grid. Certainly in an
area with limited parking options, the integration of electric vehicles will require a building-centered charging strategy.

The development and integration of building loads and any other loads temporarily connected to these “hubs” will require rich controls and communication architecture, the like of which is only just beginning to be developed. NYSERDA is already involved in initial pilots of such solutions as OpenADR and it is important that NYSERDA’s involvement in this area continue, particularly since there are real, short-term benefits that can derive from even the early stages of advanced building load control. The commencement of building benchmarking for buildings over 50,000 square feet in New York City provides an excellent opportunity to begin to penetrate the commercial building market.

**Developing and Implementing Incentives**

The development and implementation of incentives for demand response, and better load control in general, is important and requires a strategy developed with consideration of the full impact of such incentives on all of the Company’s customers.

While the intent of the incentives is to create an environment of improved supply and demand efficiency resulting in real sustainable benefits to Con Edison customers, the Company must be prudent in aligning incentives which are also being funded by customers. Incentives that are not aligned, or, worse, competitive with each other, do not benefit Con Edison’s customers. The Company believes that the current model of demand response programs is appropriate, where NYSERDA incentivizes the development and installation of equipment while NYISO and Con Edison incent action based on their specific operational objectives.

The Company is currently in the early stage of a two year pilot to test incentivizing customer participation in peak-shaving demand response. The peak-shaving pilot runs through the end of 2012 and the Company provides an annual evaluation of progress to the Commission on December 1st of each year. The results of this pilot will enable a better understanding of
customers’ ability and motivation to respond to peak-shaving events. This information will be used to design incentive programs to complement the technology initiatives identified above.

Once the pilots have been completed, and other incentives identified, the Company will analyze the results and determine the appropriate design and economics for any incentives. This will include identification of appropriate target populations and demand response resource characteristics.

Based upon the pilot results, the Company may consider moving the demand response programs to an incentive based on time to respond, for example 24 hours, 2 hours or 15 minutes. The customer would bid demand response based on the time frame in which the customer is able to respond. The goal of the AutoDR model of a few seconds for the resource to respond will require great customer engagement, especially as the benefit also derives from certainty that the customer will not over-ride the response of the promised load. While the LBNL description allows for over-ride, if over-rides are allowed then the certainty and value of the response resource will be reduced. Customer acceptance of quick response with no over-ride in a highly reliable supply environment will need to be tested. The issue of response time is of particular interest in the context of the current commercial emergency response program, which is specifically designed to give customers up to two hours to respond to load reduction requests.

During the preparation for this filing it came to the Company’s attention that the United States Green Building Council (“USGBC”) is in the process of enhancing its incentive for demand response capability as part of the Leadership in Energy and Environmental Design (“LEED”) building rating system. The LEED scoring system is being modified to enable commercial building owners and LEED building projects to earn credits in LEED for enrolling in utility or wholesale market demand response programs. The Company intends to stay engaged with USGBC on developments in regard to this incentive.

**Recommendations**

The Company recommends that the Commission encourage and approve NYSERDA SBC IV funding that continues to support the development and deployment of energy management solutions for large commercial building stock.
The Company recommends that demand response incentives be aligned to ensure maximum efficiency of customer benefit.

The Company recommends that incentives for demand response continue to focus on existing buildings and demand, not just new and expanding load.

The Company also recommends that demand response, efficiency, and similar efforts be addressed in a comprehensive and holistic manner that will provide the customer with effective energy management solutions.

**Conclusion**

For the reasons stated regarding the nature of the building stock in the Company’s service territory and to maximize alignment and efficiency of incentives, the Company believes it is prudent for it to provide incentives for action, as opposed to equipment, based on the economic benefit of that action. Further, the Company believes that the incentives should not be specifically targeted to newer building stock which is better equipped to integrate new solutions and already has (or will have in the case of the USGBC incentive) other incentives to perform, but rather should provide a simple and clear motivation for managers of all commercial load, and their various suppliers, to develop the instrumentation and controls to effectively participate in demand response activities. This will improve Con Edison’s system design and performance, wholesale market efficiency, and the customer’s own unique load efficiency.

The Company believes that it is appropriate that NYSERDA stay strongly engaged in the development and deployment of new load control technologies and communication standards to the benefit of all New Yorkers.

The Company intends to stay actively engaged in the development of innovative solutions on the grid side of the supply and demand dynamic to create new opportunities for customers to gain maximum value from their investments in a more efficient energy supply system.

The Company strongly supports a broader education focus which delivers a complete energy management message to customers and empowers them to manage all aspects of their energy needs in a more efficient fashion.
The Company will provide its annual demand response evaluation report to the Commission on December 1st of this year and will be able to identify developments with regard to customer participation in the Company’s peak-shaving pilots and associated education efforts.

The coincidence of the completion of the peak-shaving and Smart Grid Demonstration pilots in 2012 will enable the design of effective incentives based on tested market aspects so that the optimum end-to-end solution may be identified and deployed.