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Demand Response and Energy Efficiency Role in System Expansion Planning

One of the most promising roles for demand response and energy efficiency is as a component of System Expansion Planning. System Expansion Planning is the term for the process that ISOs and RTOs engage in when they review the functioning of their market and decide whether or not they need to intervene. There are three controversial issues here. The first is whether the ISO/RTO should intervene to address problems of persistent economic congestion—most people agree that they need to look for reliability problems and solve them. If the ISO/RTO decides that it needs to intervene in the market, the second issue arises: should it only use a transmission solution, or should it also consider generation and demand response solutions? The third issue is whether the cost of such non-market interventions should be paid by all customers or should be borne by the beneficiaries. In its proposed Standard Market Design proposal, the FERC favors having ISO/RTOs intercede in situations of persistent economic congestion, and prefers an "all sources" approach to any interventions, whether they are based on reliability or economic congestion concerns.

Our purpose here is as follows:

- Discuss briefly our support for an ISO/RTO role with respect to persistent economic congestion;
- Note our general support for allocating costs to beneficiaries when it is reasonably possible to identify them;
- Explain why generation and demand response solutions should be considered along with transmission ones when the ISO/RTO intervenes for System Planning purposes;
- Describe in very preliminary form one possible approach to System Expansion Planning; and
- Describe the benefits of including energy efficiency as one of the demand response approaches.

1) **Persistent Economic Congestion**. Congestion payments are made in order to provide incentives for the market to respond in ways that remove the constraint--if it is economic to do so (some congestion is necessary because the solutions to it cost more than the congestion itself). If there are economic solutions that are not acted upon for a significant period of time, and there are economic solutions to it, then it is inefficient and inequitable to have consumers continue to pay a premium that is simply being transferred to other market participants without being acted upon. The NYISO estimates that congestion

costs for the NYISO in 2002 will be approximately $900 million—out of total sales of about $5.7 billion. There are a number of good reasons to expect persistent economic congestion, such as enduring problems of siting in highly populated areas, financing difficulties, disappearance of high congestion prices once significant investments are made, and so forth. Opponents worry that the threat, and perhaps the reality, of market intervention will preempt true market responses. In its Standard Market Design and in previous decisions, FERC has indicated support for ISO/RTOs intervening for persistent economic congestion purposes as well as reliability ones.

For the present purposes of discussing the role of demand response and energy efficiency in System Planning, this debate is being put to the side. There is a general consensus that the ISO/RTO must monitor the operation of the market and intervene, if necessary, to assure that system reliability is maintained. The purpose here is to argue that if there has to be a market intervention for reliability (or other) reasons, all possible solutions should be examined and the most cost-effective one selected. There is general agreement that the system planners should examine all possible solutions of a market nature and encourage the market to respond without non-market payments. We are concerned here with what happens if this "prompted" market response fails.

2) **Cost Allocation**. If the market does not respond, and the ISO/RTO intervenes to require action, this non-market solution must be paid for by a charge to market participants. Many go a step further and argue that if there are identifiable beneficiaries from such investments, that they should pay for it rather than charging it to all customers. We strongly support cost allocation to beneficiaries as a general principle. One of the fundamental principles of restructuring is to get more accurate prices and confront consumers with them. Allocating costs to beneficiaries is a part of that process.

3) **Seek the Most Cost-Effective Solution.** Should the ISO/RTO, when it intervenes in the market for reliability (or other) reasons, limit itself to selecting from among non-market <u>transmission</u> solutions or should it look more broadly at non-market generation and demand response proposals as well? The current NERTO filing by ISO-NE and NYISO Boards calls for only a transmission approach. It is not clear to many of us why we would want to be limited to transmission solutions when one of the generation or demand response alternatives might be more cost-effective. The argument here is not that generation and demand response solutions are likely to be more cost-effective than transmission ones. Rather, we should look at all proposals so that we can select the most advantageous one. The FERC Standard Market Design seems to contemplate such an "open season" system that includes all feasible options.

Some have been concerned that ISO/RTO should not become an active participant in the market—such as owning and building generation or running demand response programs. We agree with this concern. The ISO/RTO should

be responsible for organizing a response to reliability (or congestion) that does not involve it in taking market positions. This should be accomplished in ways parallel to the existing ISO/RTO methods for addressing local reliability and capacity adequacy. These are system reliability concerns that the ISOs have already recognized as matters not adequately addressed by the market, and for which they have already developed market-like solutions. Essentially, these same solutions can be applied to requiring new investments in transmission, generation or demand response.

4) **Preliminary Approach to a Competitive Process for System Planning**. The following is one possible approach to an ISO/RTO reliability planning system:

a) **Open Process, Open Season**. The ISO/RTO could conduct an "open season" competition to resolve a reliability problem that the market does not address. The analysis of whether or not a reliability problem exists and all other aspects of the System Expansion Planning must be part of a totally open process at all stages, one that is not only transparent, but is also one that encourages input from all interested parties. The criteria by which competitive responses would be chosen would be part of the developmental process as well.
b) **Definition of the Reliability (or Congestion) Problem to be Solved**. There would have to be a very clear statement of the reliability problem to be resolved so that competitors would be focusing their proposals on the same concern.
c) **Clear Statement of Criteria by which Proposals would be Judged**. A list of the criteria by which proposals would be judged would be included in the Request for Proposals.
d) **Example Criteria**. The following are listed as the beginnings of a set of criteria for judging the value of reliability proposals:
    - **Cost**. Proposals would seek to recover whatever funds they could from market participation. In the open season competition they would be bidding for ISO/RTO support for that part that they did not think they could cover in the market. Obviously, the bid that involved less non-market payment would be rated higher than one requiring more.
    - **Probability of Siting**. A project that was more assured of being sited would be more valued than a more uncertain one.
    - **Security of Financing**. Projects would be compared with regard to the security of their financing, apart from the portion being bid for coverage by the ISO/RTO process.
    - **Timing of Implementation**. The RFP should describe by when the reliability features are needed. Proposals would be judged by their ability to hit that target.
    - **Minimal Market Intrusion**. Projects that involve less market intrusion for a lesser period of time, while still meeting the specified

reliability requirements, will be considered more advantageous. Generally, projects with lifetimes in the 3-5 year range may be more valuable to the market than those that are longer, since they involve a more confined intrusion into the market. Features here might include plans to sell or remove assets after several years.

There are several method by which the ISO/RTO could have market participants pay for the non-market portion of the winning reliability project—again, it is assumed that the proposing parties will be receiving most of their revenues from market sources, and will seek recovery from the ISO/RTO only the additional payment needed to make their project economic.

5) Advantages of Energy Efficiency for System Planning (and Capacity Resource). There are significant reasons why energy efficiency should be given consideration as a planning and capacity resource in an ISO or RTO setting. It is granted that there are special methodological problems associated with measuring "net new" energy efficiency that would not otherwise have occurred absent ISO/RTO payments. However, these problems are solvable in most circumstances, and payments for efficiency must be limited to those conditions where it can be adequately measured and verified. We will address measurement and verification of energy efficiency in a subsequent presentation. The purpose here is simply to clarify the reasons why it is important that energy efficiency quickly be integrated into the normal operations of ISOs and RTOs.

The following is a preliminary listing of the market advantages that energy efficiency provides:

a) <u>"Consumer Unfriendliness" of Day-Ahead Price Responsiveness</u>**.** Classically, consumers provide demand responsiveness by not buying the product when it is too expensive for them. There is mounting evidence that day-ahead and hourly price response programs may not yield significant participation, especially in urban areas and load pockets, but perhaps elsewhere too. NYISO's economic load response program, even with incentives, yielded only 26 MWs of peak coincident load response in 2001. The results for 2002 were even lower, and almost none of the economic price responsiveness was in the New York City area. At the same time, customers need to respond to high priced periods as a way to counter market power and as a way to push back the high priced periods. It may be that there are almost no residential and commercial customers for whom short-term price responsiveness works well. Such a conclusion would be completely premature at this point, and new technological breakthroughs are always possible. However, the evidence to date, along with the experience of those who have worked on demand response programs in urban areas over the past decade, suggests that there may never be more than very small amounts of price responsiveness in most cities—even with incentives. At this point all this means is that we should be looking for additional and alternative ways for consumers to protect

themselves and respond to high prices. Receiving market payments—through System Expansion Planning or resource/capacity adequacy--would be ways of doing so.

b) Consumer Willingness to Pursue Energy Efficiency. There is clear evidence that consumers are willing to respond to high prices by investing in energy efficiency. Also, there are a number of efficiency investment possibilities that are marginally unattractive to consumers—but that could be made attractive with an additional payment from a resource adequacy/capacity payment or through participation in a system planning RFP.

c) Peak Load Efficiency**.** Probably the most significant efficiency investments in terms of ISO/RTO value are ones that concentrate energy savings during high use and high price periods. Not only are the avoided energy costs greater, but also the value of the capacity is considerable. Furthermore, in some circumstances, such efficiency investments can avoid costly investments in distribution and transmission upgrades. Finally, such investments can have reliability advantages. More efficient air conditioning is the perhaps the best example of a peak baseload efficiency investment.

d) Siting. One of the great difficulties confronting the development of electric systems is the successful siting of new generation and transmission and distribution facilities. This was always difficult, especially in the more densely populated areas, and has become perhaps even more challenging under competitive restructuring. Energy efficiency is easily sited, whether it is an option selected under a System Expansion Planning competition or is acquired as a capacity resource. In some instances, it may be the only new resource that can be acquired and sited with any confidence if there is a time frame of three years or less. When one looks at prospective problems in New York City, Boston and Southwest Connecticut, it is not clear that reasonable solutions can be fashioned using only transmission and generation approaches.

e) Financing**.** Barriers to financing have been made manifest the past year. In the present environment efficiency approaches may offer some advantages in terms of financing, although they, like transmission and generation investments, involve multiyear paybacks.

f) Resource Diversity**.** Most new central station plants will be combined cycle gas. This is a highly efficient and clean technology. But there are risks for the system in having an increasing preponderance of electric generation be fossil fueled, with more and more being gas-fired as time goes on. Obviously, improved efficiency yields benefits of reducing dependence on one class of fuel supply.

g) Persistent Congestion**.** As noted earlier, there has been great controversy about whether or not an ISO or RTO should intervene in the market process and identify and seek solutions to cases of persistent congestion. Opponents make strong arguments that even the threat of the ISO/RTO intervening in this way will discourage normal investments

> and corrupt the market process. And there are risks of this nature. At the same time, some situations may arise--and may already have arisen--where consumers are asked to pay a premium (congestion) in order to pay market incentives to generators to build new plants. But if the new plants are not forthcoming—for whatever reasons—then all that is really happening is a transfer of money from consumers to generators. In a place like New York City and Long Island this can involve hundreds of millions of dollars each year that is paid as a premium to encourage new construction. It may be that one of the few things that can be done to help consumers—given their short-term inelasticity of demand—is to develop mechanisms for investing in base load energy efficiency. Such investments will reduce most high price periods, backing-out peakers and yielding a more efficient load curve.

There are compelling economic efficiency and system reliability reasons for ISO/RTOs to include energy efficiency in their system expansion planning and capacity/resource adequacy programs.