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February 23, 2004

Honorable Magalie R. Salas,
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Room 1-A209
Washington, D.C. 20426

Re: Docket No. PL04-2-000 – Compensation for Generating Units Subject to Local Market Power Mitigation in Bid-Based Markets

Dear Secretary Salas:

For filing, please find my comments as a speaker at the February 4 and 5, 2004 Technical Conference in the above-entitled proceeding. Should you have any questions, please feel free to contact me at (518) 474-8267.

Very truly yours,

Mark Reeder
Chief of Regulatory Economics

Attachments

MITIGATION, SCARCITY PRICING, AND RESOURCE ADEQUACY IN LOAD POCKETS

Presentation at Technical Conference
PL04-2-000
Federal Energy Regulatory Commission
Washington, DC
February 4-5, 2004

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[1] The views expressed in this paper are those of the author and do not necessarily represent the views of the New York State Department of Public Service or the New York State Public Service Commission.

FERC's Technical Conference
Capacity Markets and Transmission Planning

February 4-5, 2004

I. Introduction

A. Thank you, qualifier.

Thank you for giving me the opportunity to share my thoughts on the important topics that are being explored here today. The usual qualifier applies: the views I express are my own and do not necessarily represent those of the New York Public Service Commission.

B. Focus on demand curve market design for locational capacity markets

While the subject of this technical conference is policies regarding mitigation, scarcity pricing, and resource adequacy in load pockets, I have been asked to focus my comments on New York's use of the demand curve market design for capacity markets. Since New York is the only place where such a design has been implemented, I can probably best add value to this conference by explaining how the demand curve approach works and how it fits in the overall issues related to load pockets.

II. Small vs. Large Pockets

Before going on further, I want to point out that there is a substantial difference in the policies one would consider for a small load pocket as opposed to a large load pocket. A large load pocket is one that is big enough to accommodate a market within it. For example, New York City is a large load pocket, and the policies in New York City are designed with the goal of creating a workably competitive market within that pocket. This is in contrast to much smaller pockets in which the demand of the entire pocket may be no larger than the size of a single generator. I'm going to focus my comments on the policies involved in large pockets.

III. Mitigation, Scarcity Pricing, and Locational Capacity Markets

A. Three critical categories of market design for load pockets

Before getting into the details of the demand curve, let me just, by way of introduction, note that there are three critical categories of market design for load pockets. First is the need for mitigation. Load pockets, when they are constrained off from the rest of the system, often do not contain enough competitive pressure to produce competitive prices naturally. In such situations, it makes a lot of sense to have mitigation, mitigation that is triggered by the presence of a constraint. This mitigation should be designed to produce bids that are close to the marginal costs of the generators in the pockets. The bids do not need to be allowed to rise as a way of forcing scarcity pricing to emerge from the mitigated pocket, because there are other, better ways to get the scarcity pricing, as I will explain next.

The second category is scarcity pricing. There are a number of ways to enable a mitigated pocket to yield scarcity prices. One is to allow a very small number of bids to equal the maximum (in New York's case, $1,000). This causes the price to reach $1,000 at all times when the system is down to its last few megawatthours. A second way is to have demand response in the pocket and to allow it to set the price. A third way is to have a pricing rule that automatically raises prices dramatically whenever the pocket is in a situation in which it is short of the desired level of operating reserves. With these kinds of features, scarcity pricing will occur as a result of natural scarcity and doesn't need to be produced artificially via a policy of permissible market power.

The third critical area of market design is locational capacity markets. Where one has a pocket in which the cost of building and operating generation is higher inside the pocket than it is outside the pocket, one needs a locational capacity market to provide a capacity revenue stream within the pocket that exceeds the one available in the general market outside the pocket. Capacity markets provide the residual revenues a generator needs to cover its costs after considering the revenues it receives from the energy and ancillary services markets. For example, if the annual fixed cost of a generator is $85/kW/year, and it receives $50/kW/year toward that recovery from sales in the energy and ancillary services markets, it will be $35 short. In the absence of a capacity market, the local electric system will need to experience a lowering of reliability over time to drive up the energy and ancillary services prices to the point where they yield the needed $85/kW/year. The problem is that the reliability that results from this equilibrating process will be lower than the one-day-in-ten-years desired level of reliability. To simultaneously maintain the desired level of reliability and have enough revenues produced to make entry into the market by new generators viable, one needs a capacity market. A single, system-wide capacity market is satisfactory except for a load pocket situation in which the cost of building and operating a generator inside the pocket exceeds the cost outside the pocket. It is in those situations, which certainly holds for New York City and Long Island, that a locational capacity market is essential.

IV. New York's Demand Curve Market Design for the Capacity Market

A. Problems with the traditional approach

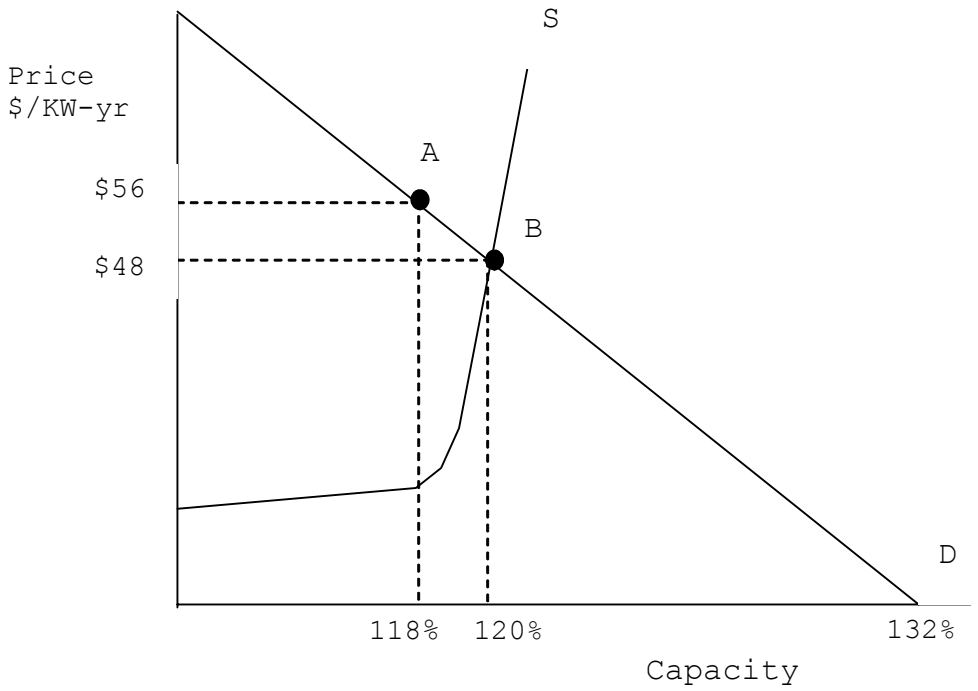
The demand curve was proposed to address some of the serious problems that are inherent in the traditional capacity market design. These problems are 1) a large amount of price volatility as the system moves from periods of near shortage to periods of excess and 2) the problem of excessive vulnerability to market power since, at times of near shortage, the withholding of supply can artificially induce a shortage and produce a highly profitable capacity market price spike. The volatility of the capacity prices is a particular problem because it undermines the goal of the capacity market, which is to provide an additional revenue stream to induce entry. We found that potential new entrants discounted the capacity revenue stream heavily because of its high volatility. This means that, while significant sums were spent via an capacity market revenue stream, its excessive volatility caused it to buy very little in terms of helping the financial calculus of potential new entrants.

B. Goals of the demand curve approach

The goals of the demand curve approach flow straight from the problems just discussed. One goal is to provide greater stability over time in the revenue stream received by generators from the capacity market. A second goal is to reduce the market power threat in the capacity market. A corollary goal is to facilitate the forward market by making the spot market more predictable and therefore easing the confidence with which buyers and sellers can agree to a reasonable forward price.

C. An example of a demand curve

Figure 1



1. It yields greater revenue stability and mitigates market power

The diagram shows an example of a demand curve. It approximately matches the demand curve that is currently in use for the State of New York as a whole. Even though it is not for a load pocket, the demand curves used for load pockets are identical in philosophy and form, only the numbers are different. On the horizontal axis, the 118% point denotes the fact that, for the State as a whole, the required reserve requirement is 118% of the peak load forecast. On the vertical axis is the price that the demand curve produces in terms of dollars per kilowatt per year. At point A, this price is $56. Therefore, for this demand curve, at a time when the amount of capacity bid into the market equals 118%, i.e., exactly matching the required level, the capacity price received by generators and paid by load equals $56. As excess amounts of capacity are offered into the market, the market price of capacity drops along the demand curve, such as occurs from point A to point B in the diagram.

One can see, in looking at the demand curve, that the extent to which price drops with excess capacity is fairly gradual in the demand curve market design. This is intentional. This is in contrast to the traditional approach which exhibits a crash in prices way down towards zero whenever a significant amount of excess amount of capacity occurs. For example, right now the prices in both New England and PJM are quite low. This feature demonstrates the volatility reduction that occurs with the use of a demand curve. If a little bit more than 118% of capacity exists, or if a little less than 118% exists, the capacity price moves up or down, but only moderately. As such, over time, as the amount of capacity fluctuates in the vicinity of 118% or higher, the capacity price moves up and down, but in a way that produces a fairly stable revenue stream over time, and substantially more stable than is produced by the traditional approach.

2. It diminishes the financial inducement to exercise market power

The protection against market power also derives from the gradual slope of the demand curve. In the graph, if a generator withholds supply to make the system slightly deficient, i.e., to push it slightly to the left of 118% point, the price does not shoot up to the roof, as occurred in New York with the traditional approach; rather it slides along the demand curve to a level somewhat above $56 in the diagram. This gradual increase in price in response to a decrease in supply greatly lowers the financial benefit of a withholding strategy in comparison to the traditional approach.

3. The slope chokes off excess supply

In order to prevent a problem of establishing a capacity price that turns out to be too high and attracts way too much capacity into the market, the demand curve's downward slope causes it to yield a steadily decreasing price as the amount of excess supply increases. Thus, at some point, the demand curve chokes off any desire among entrants to enter. (Note that the problem of excess supply is also prevented by the reduced energy revenues that occur as more excess supply exists.) Thus, in deciding the slope of the demand curve, one needs to balance the three goals of 1) having the curve be gradual enough to promote revenue stability, 2) having the curve be gradual enough to mitigate market power, and 3) having the curve be steep enough to choke off excessive amounts of supply.

4. Determining the height of the curve

A key parameter is determining the height of the curve. Another way of saying that is: how does one determine what capacity price to establish at the point that corresponds to the required reserve margin? The basic economics is that the amount of money provided by the demand curve in the capacity market must be enough so that, when it is added to the net revenues a generator receives from the energy and ancillary services markets, the total is sufficient to cover the costs of a new generation entrant. As with the traditional approach, the numbers are all based on a peaker. This part of the process is administrative, if you will, and involves an attempt to estimate the annual fixed costs of a peaker as well as its expected net revenues from the energy and ancillary services markets. Because one must acknowledge that the estimate won't be exactly right, it is desirable to build in a cushion and to set the demand

curve somewhat higher than the exact level that the estimate would suggest. For example, in the diagram, if the estimate called for a capacity price of $50, it might make sense to position the demand curve at point A at the $56 level. Thus, one intentionally sets the curve slightly too high to ensure against the error of setting it too low, which could lead to insufficient reliability. The cost to consumers of setting the curve intentionally too high is minimal, because, in long-run equilibrium, the capacity market will clear at a price equal to the cost of new entry. In the diagram, if new entry occurs at the $48 level, the result would be a small amount of excess capacity, 120% vs. 118% in the diagram, all of it clearing at a price of $48. In other words, the error is not necessarily that you pay $56 instead of $48; rather you buy a little bit more than you might ideally need. In New York, the rules call for resetting the curve once every three years, based on new and improved information about the cost of a new GT.

5. Mechanics of auction

The demand curve operates as part of a spot auction that is held once a month. The supply side of the auction is just like a traditional capacity market in that suppliers put in bids voluntarily. The demand side of the auction is placed in by the ISO and is none other than the demand curve in the diagram. With both the supply and demand in the auction, the auction's clearing price and clearing quantity occurs at the intersection of the two, which on the diagram occurs at $48 and 120%. This brings out one of the features of the demand curve and that is the LSEs end up purchasing an amount of capacity, via the ISO's auction, that does not necessarily exactly equal the 118% minimum reserve margin. In the diagram, each LSE would be required to procure or pay for an amount equal to 120% of its contribution to the peak demand.

6. Lumpiness problem in a load pocket

One problem that can occur in load pockets is the lumpiness problem. Lumpiness refers to a situation in which the most efficient-sized new generator is large relative to the overall size of the market. In such a case, the addition of a single generator of 500 MW, or say, 1,000 MW, can move the intersection of supply and demand curves enough to have a substantial depressing effect on the price. As such, new entrants are discouraged simply by the fact that they themselves cause the price to become too low. Generally, this is not a problem with GTs, but it can be a problem with combined-cycle plants. Obviously, the more gradual the slope of the demand curve, the less a lumpy new entrant will suppress the price, but making the curve more gradual needs to be balanced against the need to have it be steep enough to choke off substantial amounts of excess supply as I described earlier.

V. Market Inducements vs. Long-Term Contracts

Ideally, the prospect for reasonable returns from a load pocket's wholesale electric market will provide a sufficient inducement to new generation entrants. If not, the first thought should be to raising the demand curve to increase locational capacity prices to the point where new generation entrants choose to locate inside the pocket (new merchant transmission into the pocket is also a possible market response). I would generally prefer to rely on market design (locational capacity markets and congestion pricing of energy) than on long-term contracts. As a

backstop, however, a long-term contract between a Load Serving Entity and a generator can be used to secure added generation needed to maintain generation adequacy within the load pocket.

VI. Consumer Perspective

As a summary, let me describe my view as someone who often represents the consumer, but also must balance the needs of consumers and producers in any policies that are supported. The demand curve's feature of providing more stable revenue streams to generators from the locational ICAP market is good for consumers because, for the same amount of money over, say, a 20-year period, stability allows one to buy more new entry. Looked at another way, one can pay less money over time to get the entry that is needed if the money is provided in a more stable way. Second, the consumer is much better off, as is the market on the whole, if the capacity market is one that is not characterized by the exercise of market power and artificial capacity market price spikes. Finally, the whole idea of capacity markets ensuring that there is sufficient supply is quite important from a consumer perspective. Obviously, reliability is critical, and for New York, with a focus on New York City, this cannot be overstated. Finally, when one has sufficient, perhaps even slightly excess amounts of supply, one will have a better functioning market, one that is more competitive.

The Demand Curve: An Approach for the Design of Electric Capacity Markets

FERC Filing of the New York PSC:

Affidavit of Dr. Thomas S. Paynter

April 11, 2003

Attachment I

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

New York System Independent Operator, Inc.	))	Docket No. ER03-647-000

Affidavit of Dr. Thomas S. Paynter

New York Public Service Commission
April 11, 2003

TABLE OF CONTENTS

I. QUALIFICATIONS AND PURPOSE.....1

II. OVERVIEW 2

III. THEORETICAL FOUNDATION.....2

A. The Role of Entry in Driving the Outcome of a Natural Market.....2

B. Why Intervene in the Electricity Market?.....3

IV. CURRENT CAPACITY MARKET DESIGN AND ITS PROBLEMS.....9

A. Current New York Capacity Market Design.....9

B. Problems Stemming From Current Market Design.....10

V. PROPOSED CHANGE TO THE NEW YORK CAPACITY MARKET DESIGN....13

A. Centralized Spot Market Auction With Sloped Demand Curve.....13

B. An Example of Volatility Reduction From Sloped Demand Curve.....15

C. Example of Market Power Mitigation By Sloped Demand Curve.....18

VI. THE PROPOSED CAPACITY DEMAND CURVES.....19

A. Setting the Capacity Demand Curves.....19

B. Conservative Estimates Can Be Used To Assure Resource Adequacy.....21

C. Development of Initial Demand Curves.....22

VII. RESPONSE TO CAPACITY DEFICIENCIES.....24

I. QUALIFICATIONS AND PURPOSE

1. My name is Thomas S. Paynter. My business address is Three Empire State Plaza, Albany, New York 12223-1350. I am employed by the New York State Department of Public Service as a Principal Economist in the Office of Regulatory Economics. My current responsibilities include analyzing competitive issues, efficient pricing, marginal costs, and regulatory policies. I am a member of a staff team responsible for analyzing and commenting upon the pricing rules of the New York Independent System Operator (NYISO), which operates the New York bulk transmission system. I have participated in numerous NYISO committee meetings related to energy and transmission pricing, capacity reserves, operating reserves, and market power issues.

2. I received a Ph.D. in Economics from the University of California at Berkeley (1985), with emphasis in econometrics and labor economics. I have a B.A. in Physical Science and in Economics, also from the University of California at Berkeley (1975). I am a member of the American Economic Association.

3. From 1983 to 1986, I was an Assistant Professor of Economics at Northern Illinois University, where I taught graduate and undergraduate courses in economic theory. From 1986 to 1990, I was employed by the Illinois Commerce Commission as a Senior Economic Analyst in the Policy Analysis and Research Division and served as a member of the Electricity Subcommittee of the National Association of Regulatory Utility Commissioners. I also authored an article concerning coordination and efficient pricing for independent power producers, "Coordinating the Competitors," published by The Electricity Journal in November 1990.

4. I joined the New York Department of Public Service in November of 1990. I have testified in numerous rate cases and other proceedings before the New York Public Service Commission (NYPSC). I also testified before the New York State Board on Electric Generation Siting and the Environment regarding transmission congestion and competitive markets in siting cases regarding the Athens Generating Station, Case 97-F-1563, and the Brookhaven Generating Station, Case 00-F-0566.

5. In this affidavit I discuss the theoretical foundation of the Demand Curve proposal and explain its various elements and long-term benefits. I also discuss the parameters of the demand curves and the procedures for resetting them.

II. OVERVIEW

6. The primary objective of this proposal is to reduce price volatility in the market for capacity resources by recognizing the value of additional capacity above minimum reserve requirements. Suppliers will benefit from a more stable and predictable revenue stream from the capacity market, complementing the more volatile energy market. Consumers will benefit from increased reliability and reduced exposure to extreme price spikes in the capacity and energy markets. A further objective of this proposal is to reduce the vulnerability of capacity markets to the exercise of market power.

7. The proposal addresses these objectives by establishing a demand curve (willingness to pay) for capacity, to be applied to all load-serving entities (LSEs) in New York via a centralized spot market auction conducted by the NYISO. This auction would replace the NYISO's current "deficiency" auction and its related deficiency charge. The NYISO would continue to allow self-supply of capacity via bilateral contracts and would continue to operate voluntary forward auctions from one to six months in advance to establish visible forward prices.

8. It is expected that under this proposal, the NYISO would often procure amounts of capacity above the minimum requirement levels. For example, if the minimum requirements level is 118% of summer peak load, but suppliers offer capacity equal to 120% of summer peak load at a low enough price, then the NYISO would purchase capacity equal to 120% of summer peak load and allocate this capacity to all LSEs. Thus, each LSE would be charged the market price for capacity equal to 120% of its summer peak load. This resolves the "free rider" problem, where each individual LSE currently has an incentive to purchase only the minimum capacity because the benefits of capacity levels above the minimum are shared among all LSEs regardless whether each LSE purchased additional capacity.

III. THEORETICAL FOUNDATION

A. The Role of Entry in Driving the Outcome of a Natural Market

9. Any businessperson knows well the importance of entry and how it drives the results of the market place. Ultimately, it is the cost of entrance that determines overall price levels and it is the amount of new entry, and exit, that determines the reliability of service seen by a buyer in the market place. If

prices are high relative to the cost of new entry, then new entrants will be attracted into the market place and prices will be pulled back down. If prices are low compared to the cost of new entry, then there will be little or no new entry, exit may occur due to the inability to make a reasonable profit, and prices will be pushed up. The process of prices affecting entry, and entry affecting prices, yields an equilibrium price that is tied to the cost of entry. Over time, prices will fluctuate up and down in cycles of several years, even many years, depending on the industry, with the price gravitating toward and fluctuating around the cost of entry.

10. The very same process also yields a natural level of quantity, also known as reliability. It is often the relative scarcity of a product that pushes its price up, and, at the point where the degree of scarcity yields a price that is just right, i.e., equal to the cost of new entry, the natural level of reliability in that market place is established.

11. For example, consider the market for hotels in New Orleans. In equilibrium, hotel rooms are prevalent during off-peak periods, but are in short supply during peak periods, such as during Mardi Gras. During a peak period, prices are pushed up and the ability to obtain a hotel room is difficult, if not virtually impossible. The overall annual revenue stream of a hotel operator is greatly enhanced by high prices during peak periods, and there needs to be at least some of these high-priced peak periods (often accompanied by shortages) in order to boost the overall annual revenue stream to a level that adequately compensates the hotel operator for its annual fixed cost. In its natural equilibrium, the hotel market yields an overall annual price level that matches the cost of new entry and overall reliability level that falls out naturally as part of the market. Virtually all markets for capital-intensive products and services use this process to yield the two outcomes of price and reliability.

B. Why Intervene in the Electricity Market?

12. At the onset of electric deregulation in the United States, policymakers were concerned about whether the electric market place would naturally yield reliability levels as high as those that policymakers and electric users had grown comfortable with under the status quo. The obvious default approach was to simply let the market operate naturally, without intervention, i.e., no generation adequacy requirement and no capacity market. Under such an approach, as discussed above, entry and exit would

occur and the market would reach its own natural equilibrium. The result would be energy market prices that just cover the cost of entry and a natural reliability level.[1] It is important to remember that in the wholesale electric market, as in any other market, if prices are too low to encourage new entry, the mechanism that raises prices is the lack of entry (and retirements), which tightens the market, drives up energy prices, and lowers reliability. As such, prices and reliability are the opposite sides of the same coin; to increase the former, the market needs to lower the latter.

13. Policymakers, at least in the Northeast, rejected the "natural" approach. Not knowing what level of natural reliability was likely to emerge, it was decided to ensure that a minimum level of reliability was maintained (118% of summer peak load in New York, which is consistent with the one-day-in-ten-years reliability standard).

14. Two factors entered into this decision. First, electricity was thought to require a treatment that differs from many of society's other, less crucial, products. For example, society tolerates the market's natural outcome in which several weeks a year people have to be turned away from hotels because they are sold out. In contrast, it is not acceptable to allow the electric system to turn electric users away with that same frequency due to shortages.

15. Second, the reliability of the electricity market exhibits significant externalities. If an LSE fails to procure sufficient capacity, leading to an actual shortage of energy, the NYISO does not yet have the technical capability of curtailing just the customers served by the deficient LSE. Instead, the NYISO must curtail load throughout the region, following specific criteria to ensure that the most critical services are maintained. Because the benefits of their generation capacity are shared, each LSE has an incentive to procure too little capacity and "lean on" the system.

16. The potential that, in an interconnected system, LSEs might procure too little capacity was a concern even prior to restructuring, among traditional utilities. In New York and

[1] Ancillary services markets would provide an additional revenue stream, but are ignored here to keep the discussion simple.

elsewhere, this concern was addressed by the establishment of minimum capacity requirements, expressed as a percentage of the utilities' peak loads. New York and other state commissions enforced this requirement and provided for the recovery of the prudent costs associated with it.

17. With retail competition, it is even more difficult to limit curtailment to customers of deficient LSEs, since their customers will be intermingled with customers of LSEs that have procured more capacity. Thus the NYPSC supports continued application of capacity requirements to all LSEs serving load in New York. The NYISO enforces minimum capacity requirements established by the NY Reliability Council, based on the accepted one-day-in-ten-years standard.

18. Intervention does have its consequences, however. The extra generation capacity associated with a minimum capacity requirement affects the energy market. It depresses annual energy market revenues for all generators, which in turn leads to the need for an alternative revenue stream via some kind of generation capacity payment mechanism.[2] This extra revenue stream enables the market to entice more entry than would otherwise occur, thereby achieving the goal of enhanced reliability.

19. It is useful to think of a capacity market mechanism as a government-mandated "thumb on the scale" that puts more revenues into the mix for those that are supplying generation capacity. This is a normal policy activity for government. For example, it is akin to the policy of deductible interest on mortgages held by homeowners, which gives more money to those who choose to own a home rather than to rent one. The goal is to stimulate increased homeownership, and it works.

20. Once a decision has been made to intervene in the market, administratively, there are three alternatives on how to do so, as follows:

(a) Administratively establish a minimum quantity level (minimum requirement), enforced with a

[2] For a discussion of the relationship between capacity reserve requirements, energy market prices, and generation capacity payments, see Eric Hirst and Stan Hadley, "Maintaining Generation Adequacy in a Restructuring U.S. Electric Industry," ORNL/CON-472, Oak Ridge National Laboratory, October 1999, available at www.ehirst.com.

large penalty for deficient LSEs. This fixed quantity is often referred to as a "vertical demand curve", for reasons explained below. With this approach, the intervention takes the form of a quantity target and the market is left to reveal the price adder that it needs (up to the deficiency charge) in order to achieve that quantity target rather than the natural quantity that it would otherwise provide.

(b) Administratively establish a fixed price adder (price floor). This fixed price can be regarded as a horizontal demand curve. According to this approach, an added revenue stream is made available to all providers of capacity, the amount (per MW) of that revenue stream is determined administratively, and the market is then left to reveal the amount of extra quantity it is willing to provide.[3]

(c) Administratively establish a price adder formula (demand curve), in which the price adder declines as the quantity of capacity increases. This is often referred to as a "sloped demand curve." With the demand curve specified, the market determines the point along the demand curve, revealing the combination of price and quantity it is willing to provide.

21. In New York, we initially chose the first of the above three options (vertical demand curve). We established a 118% capacity requirement and let the marketplace reveal the price it needs to achieve this government-imposed target. The actual experience with this approach, discussed below, has led me to conclude that this design is seriously flawed because it yields excessive price volatility and is prone to market power abuse.

22. However, I would not recommend switching to the second approach, a fixed price adder (horizontal demand curve), because of the difficulty of administratively determining the cost of capacity. If the price were set too low, the market might not provide the minimum capacity required. On the other hand, if the price were set too high, investors might rush in and build

[3] This is akin to the tax deduction on home mortgages that is provided to stimulate increased homeownership.

excessive amounts of capacity, imposing excessive costs on consumers.

23. The sloped demand curve provides a middle ground, in which small changes in supply yield only small changes in price, reducing price volatility and market power problems. Yet, significant changes in the supply of capacity yield significant and predictable changes in capacity prices, providing appropriate long-term price signals for new entry. Under the sloped demand curve approach, the market will ultimately determine the price of capacity, since entry will drive the price toward the cost of new generation. If the corresponding quantity of capacity proves too low or too high, over a sustained period, the NYISO and its market participants may consider adjusting the level of the demand curve to compensate. My analysis suggests that this mechanism can mitigate the price volatility and market power concerns of the fixed quantity approach, while avoiding the dangers of encouraging inadequate or excessive capacity under the fixed price approach.

24. The sloped demand curve would stabilize the spot market-clearing price for generation capacity since at times of modest excess supply the price for capacity will fall only slightly, rather than crash, as is the current situation. This stability would enable new merchant generation entrants and their investment bankers to more easily forecast the likely future stream of capacity market prices. Also, it would facilitate forward markets for capacity since both buyers and sellers would be able to reasonably predict the future spot market for capacity, thereby giving them confidence that the forward price they negotiate is within a reasonable range.

25. Extremely high price spikes in the spot market for capacity would also be moderated by the sloped demand curve approach. Capacity price spikes occur under the current NYISO approach as the result of slight capacity shortages, whether they are true shortages or those that result from the exercise of market power. Unreasonable price spikes can create intolerable financial problems for fledgling LSEs and for consumers.

26. A demand curve would be set high enough to ensure reasonable amounts of resources are supplied in the long run, but not so high that consumers become saddled with a large amount of expensive capacity that is not needed.[4] In the vicinity of the minimum reserve levels, the demand curve should reflect the long-run cost of capacity. This is calculated by determining the cost of building a new gas turbine and subtracting anticipated net revenues from the sales of energy and ancillary services. Balance is the key. On the one hand, a demand curve should be designed to have sufficiently shallow slopes to limit price volatility and mitigate market power. On the other hand, it should be steep enough so that the emergence of substantial excess capacity can be dampened by a falling capacity market price. It is the declining price that protects the system against the mistake of setting a demand curve that is too high and which, absent the declining price, would elicit too much capacity. In other words, the declining (sloped) demand curve provides a self-correcting aspect to the overall design.[5]

27. The sloped demand curve would better represent the true value to the system, both short-term and long-term, of a little more or a little less capacity at or near the minimum requirements level. The minimum requirements level is a technical reliability requirement aimed at ensuring that outages occur no more than one day in ten years due to generation capacity shortages. However, a little more capacity has value to the market as a whole. In addition to making generation supply, as a whole, more reliable, additional capacity could

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[4] The NYISO and its market participants should review the demand curves periodically in conjunction with the NYISO's long-term planning functions. Demand curves would not be changed frequently; changes should only be made to address long-term imbalances.

[5] In order to induce capacity to come on-line, the capacity market must provide a revenue stream to cover the annual fixed costs of a peaker that are not expected to be recovered through the energy and ancillary services markets. For example, assume that the annual (non-fuel) costs of a peaker, including return on and of investment, are $80 per kw-yr, and that the peaker can be expected to achieve energy and ancillary services market net revenues of $25 and $5, respectively. In such a case, the capacity market need not provide the full $80, but only $50.

result in lower energy prices with more supply available. Additional capacity also moderates energy price spikes, including those caused by an exercise of market power.

28. With these benefits, the electric system should be willing to acquire more than 118% capacity levels, when it can be obtained at somewhat lower prices than the price that would prevail at the 118% capacity level. Similarly, when reserves fall short of 118%, the system should pay a higher price to encourage additional capacity, but not nearly so high as the current mechanism's extremely large deficiency penalty.

29. Because the benefits of capacity are largely socialized, we cannot rely on the bids of individual LSEs to determine the value of capacity. To the individual LSE, the only value of purchasing capacity is to avoid a deficiency charge. The value to the system as a whole must therefore be estimated by other means. Thus, it is appropriate for the NYISO, working with the NYPSC and other parties, to estimate this value and place the bids for the loads. As the electricity markets mature, and more loads can respond to real-time price signals, non-priced curtailments may become increasingly rare. At that point, the need for a capacity requirement can be reevaluated.

IV. CURRENT CAPACITY MARKET DESIGN AND ITS PROBLEMS

A. Current New York Capacity Market Design

30. The New York Reliability Council annually determines the minimum capacity levels needed to meet the standard reliability criteria of one day's loss of load in 10 years. The current NYISO capacity market design requires each LSE to procure contracts for installed capacity (ICAP) equal to 118% of its summer peak load.[6] Deliverability of ICAP is ensured via locational requirements. Up to 2755 MW of ICAP may be procured from regions outside New York. LSEs serving load in New York City must procure ICAP equal to 80% of their in-City summer peak load from capacity in New York City. LSEs serving load on Long Island must procure ICAP equal to 95% of their Long Island summer peak load from capacity on Long Island. Deficient LSEs are charged a large penalty, set at three times the estimated

[6] The ICAP requirement is converted to Unforced Capacity (UCAP) to recognize differences in forced outage rates among suppliers. All capacity measures and prices in this affidavit reflect ICAP measures and prices before translation to UCAP.

cost of new gas-fired turbines. The NYISO has estimated the cost of new gas-fired turbines to be $159 per kW-year in NYC, $139 per kW-year on Long Island, and $85 per kW-year in the rest of New York. These yield deficiency charges of $477 per kW-year ($39.75 per kW-month) in NYC, $417 per kW-year (34.75 per kW-month) on Long Island, and $255 per kW-year ($21.25 per kW-month) in the rest of New York state, to go into effect in May 2003.

31. The NYISO operates forward auctions for each six-month capability period (beginning May and November), and each month also operates monthly auctions for each of the remaining months of the current capability period. These auctions are voluntary and open to all parties. The NYISO accepts supply offers and demand bids (MW and price) and ranks these by price to create supply and demand curves. In each auction, the market-clearing price is paid by all chosen LSEs and to all chosen suppliers. Locational requirements can lead to clearing prices for suppliers in New York City and on Long Island above the statewide prices prevailing in the rest of the state and limits on imports can lead to clearing prices for suppliers outside New York below those statewide prices.

32. Prior to each month, each LSE must provide contracts to demonstrate to the NYISO that it is covering its ICAP requirement for the coming month. If one or more LSE's are deficient, then the NYISO will attempt to procure the deficient quantities in a centralized deficiency auction. The NYISO enters a bid for each deficient MW at a price equal to a predetermined deficiency charge and accepts supply offers from uncommitted capacity. If a sufficient amount of capacity is offered, the needed amount is bought at the deficiency auction's clearing price, and the deficient LSEs are charged that price. If the capacity offered is less than the total deficiency, then the NYISO will charge the LSEs the deficiency charge for the remaining amounts and use the funds to attempt to procure additional capacity.

B. Problems Stemming From Current Market Design

33. The current New York capacity market design can be expected to produce very high market prices when capacity is short and very low market prices when the market is in even moderate surplus. When the market is short, deficient LSEs must pay the very high deficiency charge. If suppliers expect a shortage, they have no incentive to offer capacity at less than the deficiency charge. As a result, the entire capacity market will

tend to clear at a price equal to the deficiency charge. Conversely, when the amount of existing capacity is even moderately above the minimum level, competition among existing suppliers will drive capacity prices down precipitously. However, even with very low capacity prices, LSEs are unlikely to purchase additional capacity because the benefits are socialized: LSEs who purchased more than the minimum would end up subsidizing their competitors. Because the LSEs place no value on capacity above the minimum requirements, any additional supply will drive market prices down toward zero.

34. Actual market-clearing prices in New York have borne out these expectations of extremely volatile prices. There was one occasion in which the upstate capacity market was short and cleared at the extremely high deficiency charge, while more recently, given a roughly 5% excess (i.e., 123% of summer peak load), the market has crashed to an exceedingly low value below $1.00/kW-month. Market participants often talk about the 118% minimum requirement as a cliff, and use the term "falling off the cliff" to represent what happens to price when supply exceeds the minimum requirement. Although the current 123% supply within New York State does not seem excessive, it has nevertheless driven the market-clearing price down dramatically and undervalues the benefit of the additional capacity.

35. The current New York capacity market design can be characterized most prominently as a vertical demand curve, i.e., the demand is fixed at the minimum requirements. The results are unsatisfactory to both buyers and sellers. Capacity prices are often low, but cannot stay low and still have generators all stay in business. There will inevitably be periods in which the supply shrinks, drops below the minimum requirement, and drives capacity prices to the deficiency charges, yielding short-term bonanzas for generators and nightmares for consumers. These would, in turn, be followed by periods in which new investment occurs, yielding sufficient or excess capacity, accompanied by extremely low capacity prices.

36. Such a pattern of extreme volatility in prices and reliability in the capacity market is not helpful to producers or consumers. From the producer's perspective, it is difficult to make efficient investment or maintenance decisions based on extremely volatile and unpredictable capacity prices. This is especially problematic for higher-cost peaking units, which only operate during a few peak hours and therefore have limited, and unpredictable, earnings from energy sales. Moreover, this extreme volatility is likely to increase costs of capital, since

suppliers cannot demonstrate predictable revenue streams. These effects will tend to increase the cost of supplying capacity, and ultimately these higher costs will flow through to consumers. Additionally, volatile prices make it difficult for consumers to budget for this essential product.

37. The current market design also raises serious concerns about market power. Sellers exercise market power by withholding supply.[7] Withholding can drive the market price up enough to make it profitable for the withholding generator. This strategy is successful if the extra revenues a generator receives from its supply that remains in the market exceeds the lost profits associated with the supply that is withheld from the market.

38. When existing supplies are only slightly above the minimum requirements, the vertical demand curve provides an enormous temptation for large suppliers to withhold some of their capacity from the market, in order to create a deficiency and drive the market price up toward the deficiency charge.

39. Moreover, the current design (vertical demand curve) may be ineffective in encouraging new generation even if a shortage occurs and prices reach the deficiency charge, which are paid to existing, not prospective generators. If there is only a moderate shortage, or if a deficiency is the result of withholding, then investors may fear that adding new capacity would cause the price to "fall off the cliff." Further, the addition of new capacity sufficient to place the system above the minimum reserve margin would immediately eliminate the deficiency charge. As a result, investors may discount potential capacity revenues in deciding whether to finance new generation. This poses a bleak prospect for consumers, since they would then be suffering inadequate reliability and paying extremely high deficiency charges to existing suppliers without effectively encouraging the new entry needed to provide relief.

[7] Withholding is accomplished either via a reduction in the amount of capacity that participates in the market (physical withholding) or via the pricing of a portion of one's capacity so high as to price it out of the market (economic withholding).

V. PROPOSED CHANGED TO THE NEW YORK CAPACITY MARKET DESIGN

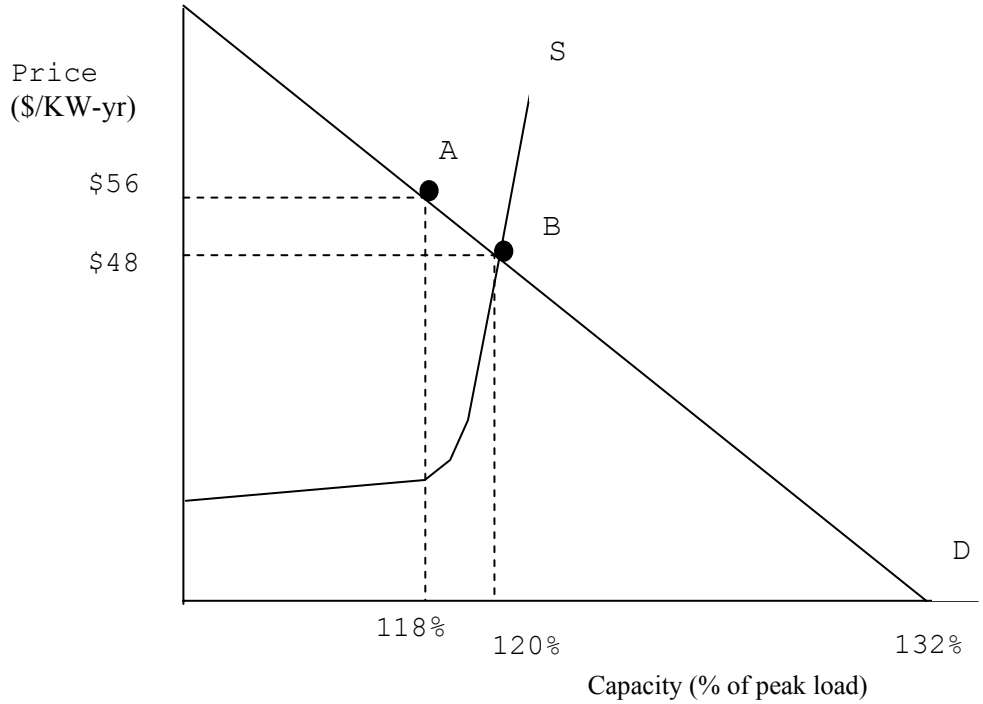
A. Centralized Spot Market Auction With Sloped Demand Curve

40. The NYISO would operate a centralized monthly spot market auction for capacity resources, replacing the current deficiency auction. In this auction, the NYISO will submit demand bids for all loads in the region as a predetermined schedule of willingness to pay for capacity. By this schedule, or demand curve, the NYISO will indicate a willingness to procure more than the minimum amount of capacity, but at a price that declines gradually as capacity increases. The NYISO will accept offers from all qualified suppliers.[8] LSEs can self-supply by procuring supply in advance (via forward auctions or bilateral contracts) and selling into the spot auction.[9] The NYISO will rank supply offers by price (from low to high) to create a supply curve. The intersection of the supply curve with the demand curve will determine the market-clearing price and quantity of capacity. All LSEs will be charged the market-clearing price for their share of the capacity. Figure 1 depicts an illustrative spot market auction.

[8] Qualified suppliers should include qualified providers of price responsive demand.

[9] This is the equivalent of to the LSE selling the bilateral contract to itself; the NYISO will pay the LSE the auction's clearing price for the sale, and will then charge the LSE that same clearing price for the capacity needed to satisfy the LSE's resource adequacy obligation.

FIGURE 1: Illustrative Spot Market Auction



41. The minimum capacity requirement necessary to satisfy the one-day-in-ten-years criterion in New York is 118% of summer peak load. The annual cost of peaking capacity, less energy and ancillary services net revenues, is $56 per KW-yr.[10] The demand curve, therefore, is established at a height such that it equals $56 per KW-yr at a capacity level of 118% of peak load (Point A). The demand curve slopes down in a straight line and reaches $0 at 132% of summer peak load. Beyond this point, additional capacity is believed to offer no additional benefit to the system.

42. *D* is the demand curve. It is placed into the auction by the NYISO. *S* is the supply curve. It represents the voluntary offers of all suppliers, including supplies under contract to LSEs. The market-clearing price for capacity in this example occurs at the intersection of the demand and supply curves, at point B. The price is $48 and the quantity is 120% of peak load. Based on these results of the spot market auction, all LSEs are required to possess capacity rights equal to 120% of their contribution to peak load.

[10] The numbers used are illustrative.

43. For example, assume an LSE has a peak load of 100 MW and contracts for 70 MW at $40 per kW-year. Suppose also that the NYISO sets the capacity demand curve to $56 per kW-year at a quantity equal to 118% of peak load, gradually declining to $52 at 119%, $48 at 120%, etc. In the spot auction, the LSE would offer its 70 MW contract towards its resource requirement. The NYISO would add this to all other resource (supply) offers to come up with a supply curve and compare this to its capacity demand curve. Suppose the spot auction clears (i.e., supply and demand curves cross) at a price of $48 per kW-year and quantity of 120% of peak load. The LSE is allocated a resource requirement of 120 MW and is charged for an additional 50 MW (120 MW minus 70MW) at the spot price of $48 per kW-year.

44. For another example, assume the LSE had contracted for 122 MW at $40 per kW-year. In that case, it would have been credited with a net sale of 2 MW in the spot auction, at the spot price of $48 per kW-year. The LSE would have been compensated at the market price for providing an extra 2 MW of resources.

B. An Example of Volatility Reduction From Sloped Demand Curve

45. A simple numerical example can be used to demonstrate the volatility-reducing properties of the demand curve. Through this example, the spot capacity prices produced by the demand curve are compared to the spot capacity prices produced by the current NYISO deficiency charge approach over a hypothesized 15-year period.

46. Consider a 15-year period in which there are years with large surpluses, years with modest surpluses, and years with deficiencies. The deficiency charge approach will yield extremely high capacity prices, equal to the deficiency charge, during years in which the system is deficient, extremely low prices when the system is safely in surplus, and intermediate prices for years of small surpluses. The demand curve approach will yield prices that track the gradual slope of the demand curve; they will be higher in years of tight capacity and lower in years of surplus, but will not vary as dramatically from one period to another.

47. Table 1 and Figure 2 compare the pattern of yearly capacity prices that would arise from the two approaches over a hypothesized 15-year period. One can see the extreme volatility of the deficiency approach, which depends heavily on an

occasional extreme price spike in the capacity market to generate substantial funds. In contrast, the Demand Curve approach is much less volatile and yields a more dependable capacity market revenue stream to potential new generation entrants.

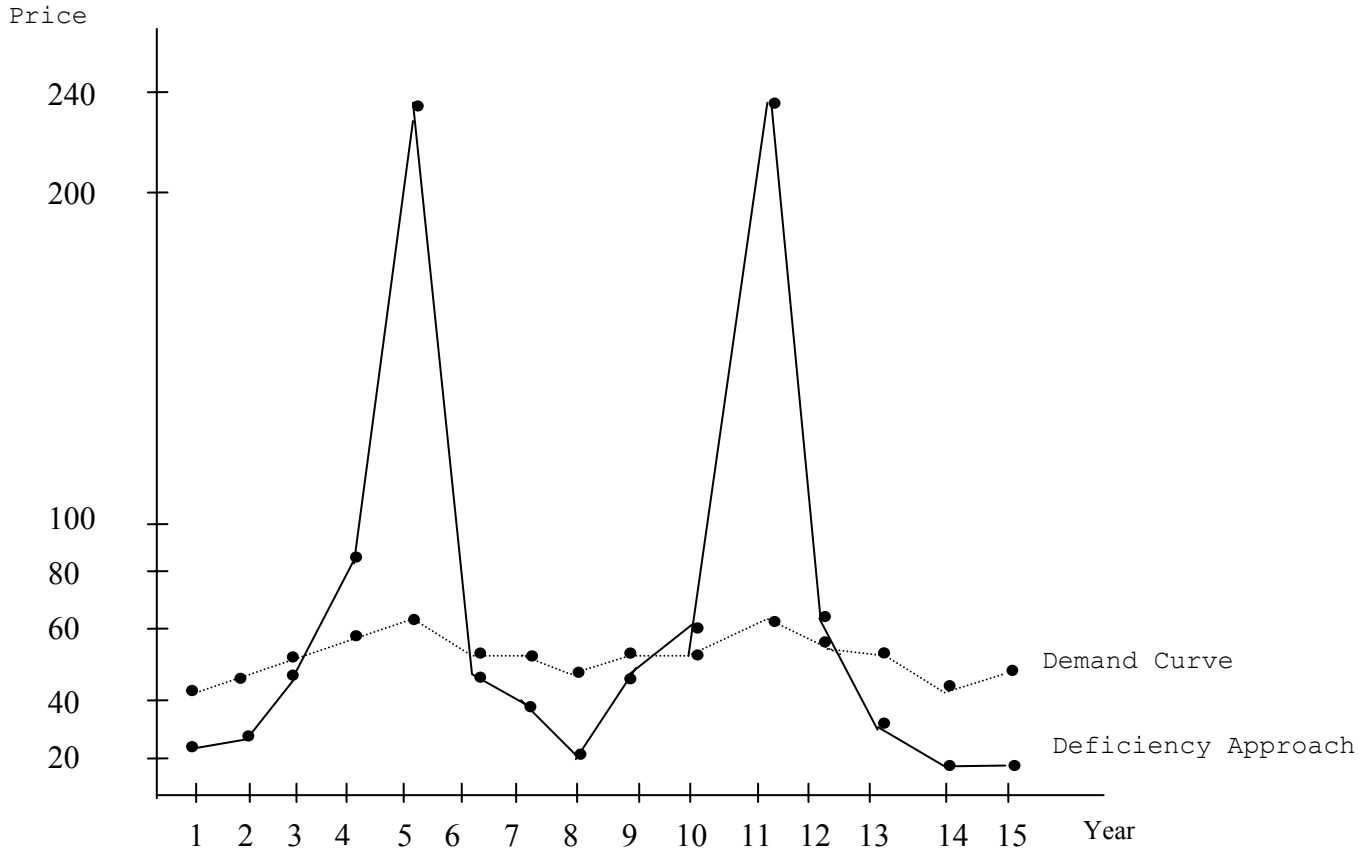
TABLE 1

Capacity Price Volatility: Deficiency Approach vs. Demand Curve

Year	Quantity % of Peak Load	Deficiency Approach's Capacity Price	Demand Curve's Capacity Price
1	23%	$12	$36
2	22%	$13	$40
3	20%	$40	$48
4	18%	$80	$56
5	17%	$240	$60
6	20%	$40	$48
7	21%	$24	$44
8	22%	$13	$40
9	20%	$40	$48
10	19%	$60	$52
11	17%	$240	$60
12	19%	$60	$52
13	21%	$24	$44
14	23%	$12	$36
15	22%	$13	$40

FIGURE 2

Capacity Price Volatility: Deficiency Approach vs. Demand Curve



C. Example Of Market Power Mitigation By Sloped Demand Curve

48. One concern that has been continually raised about the current deficiency charge approach for capacity requirements is its vulnerability to the exercise of market power. With a deficiency charge that equals a multiple of the estimated annual carrying charges of a combustion turbine (three times for the NYISO), the financial benefits to a generation owner during times of deficiency are so huge that a large supplier may be tempted to artificially induce a deficiency by withholding capacity from the market.

49. For example, assume a situation in which the system-wide supply is 600 MWs above the minimum requirement, at 120% of peak load. A 2000 MW supplier can act competitively, i.e., as a price taker, and sell all 2000 MW at $40 per kW-year, for an annual payment of $80 million. Alternatively, it could withhold 1000 MW, half its capacity, and drive the price to the deficiency charge of $240 per kW-year, for an annual payment of $240 million. Such an act is profitable since the supplier sells only half as much but at six times the price. This problem is caused by the sudden jump in prices inherent in the existing deficiency charge approach.

50. In contrast, a gradually sloped demand curve yields only modest price increases for an act of withholding. If supply is withheld, the market-clearing price moves up and to the left along the demand curve, raising the price, but not as dramatically.

51. For example, consider the same 2000 MW supplier under a demand curve regime. If it sells all 2000 MW, it receives a competitive price of $48 per kW-year, for an annual payment of $96 million. If it withheld 1000 MW, which for New York State as a whole represents about a 3% reduction in reserves, the price would rise along the demand curve to $60. The supplier would then receive only $60 million, losing $36 million from its attempt to exercise market power. Since the supplier's quantity sold drops by half, the price would have to double for the withholding strategy to be profitable, yet the price increases only by 25%. The withholding strategy, therefore, is not profitable.[11]

[11] The example assumes that no costs are shed by withholding from the capacity market.

52. Table 2 shows the results of the same withholding strategy at different prices in the market under the Demand Curve approach.

TABLE 2

Profitability of Withholding in Capacity Market Resource Demand Curve Approach

Starting Price $per kw-yr	Revenue At 2000 MW Sold	Price If 1000 MW Is Withheld	Revenue at 1000 MW Sold	Revenue Gain From Withholding
52	$104 mill.	64	$64 mill.	-$40 mill.
44	$ 88 mill.	56	$56 mill.	-$32 mill.
36	$ 72 mill.	48	$48 mill.	-$24 mill.
28	$ 56 mill.	40	$40 mill.	-$16 mill.
20	$ 40 mill.	32	$32 mill.	-$ 8 mill.
12	$ 24 mill.	24	$24 mill.	0
4	$ 8 mill.	16	$16 mill.	$ 8 mill.

53. Table 2 reveals that withholding is unprofitable for a 2000 MW supplier at all market prices other than the very lowest price ranges. These low price ranges will occur only at times of large surpluses. At those times of large surpluses and low prices, the overall capacity payments are so low that consumers will be little impacted by any withholding; moreover, those are periods when supply would be expected to exit. For more normal years, the market will clear at more competitive prices, and will be relatively free of market power concerns.

VI. THE PROPOSED CAPACITY DEMAND CURVES

A. Setting the Capacity Demand Curves

54. The Demand Curve approach is, in the long run, self-adjusting: If the cost of capacity is over-estimated, it will encourage too much supply, which will then drive the price down the demand curve until it reaches the true market cost of capacity (i.e., excess capacity will automatically reduce wholesale prices.) Nevertheless, the numbers used to establish a demand curve directly impact the price that is paid in the short run, and an excessively high demand curve will lead to excessively high quantities in the long run.

55. There are two key steps in developing an estimate of the price, per KW-yr, that a new generation entrant would need in the capacity market for entry to be economic. First, one must estimate the annual carrying costs of a new gas-fired combustion turbine. Second, one must estimate the expected net revenues that a new combustion turbine would earn, per year, by selling into the energy and ancillary services markets. The extent to which the net revenues from the energy and ancillary services markets fail to cover the combustion turbine's annual carrying costs becomes the basis for determining the capacity revenues that the new generator needs to receive. In other words, the price needed in the capacity market is a combustion turbine's annual carrying cost, offset by its expected net revenues from the energy and ancillary services markets.

56. In practical, numerical terms, it is very important to account for the energy and ancillary services markets' offsets in estimating the annual cost of new entry. Failure to account for the energy and ancillary services markets' net revenues can result in a severe overpayment to generators because the curve would be set too high.

57. The offsets for energy and ancillary services net revenues should be estimated based on the assumption that the electric system is at its minimum capacity requirement (currently, 118% of peak load). This fixed offset is used to determine the height of the demand curve (i.e., the price at the minimum requirement level). Actual supplies may be different, leading to different levels of actual net revenues from energy and ancillary services, but the demand curve will not be moved on that account. Instead, changes in supply will simply cause the clearing price and quantity to move along the (frozen) demand curve. If supplies shrink (or fail to keep up with load growth), revenues from energy and ancillary services will tend to increase, encouraging entry. We do not want this price signal canceled out by reducing the level of the demand curve. Instead, the demand curve remains fixed, and reductions in supply increase capacity prices, reinforcing the price signals from higher energy and ancillary services revenues.[12]

[12] Changes in scarcity pricing rules and other long-term changes that impact expected revenues from energy and ancillary services would be considered in the periodic three-year reviews of the demand curves.

B. Conservative Estimates Can Be Used To Assure Resource Adequacy

58. The annual cost of new entry, net of the energy and ancillary service offsets, provides a reasonable value upon which to base the demand curve. It sets the price point on the demand curve at which it crosses the minimum required 118% capacity level. It is prudent, from a resource adequacy standpoint, to err somewhat on the side of an overestimate of the capacity payment needed to ensure that entry of new generation becomes economic as the system's capacity drops down toward its minimum required level. This can be accomplished by building a slight cushion, or adder, into the estimate of the cost of new entry. A slight overstatement causes little harm since, if new entry truly is less costly than the estimate, additional new entry will add to the system's capacity and move down the demand curve to the point at which the demand curve's price equals the cost of new entry. This is the self-correcting aspect of the downward sloping demand curve. The added cost to society is simply the cost of slightly more capacity (a few percent), which is partially offset by the benefits of greater reliability and lower energy prices.

59. The economics of new entry under the Demand Curve approach is worth describing briefly. Consider a situation in which load growth is occurring in the absence of new generation entry. As load growth occurs, the capacity steadily shrinks as a percent of peak load. As the capacity level shrinks, the expected profitability of a potential new entrant grows in two ways. First, revenue from the capacity market grows as the shrinking capacity causes a movement up the demand curve to a steadily higher capacity market price. Second, net revenue from the energy and ancillary service markets grows as increased tightness of these markets causes their prices to rise.[13]

60. As one approaches the minimum capacity level, the growth in energy market revenues becomes pronounced and, when combined with the capacity market's revenues, yields an environment in

[13] As noted in the previous section, the energy and ancillary services markets' offsets used in establishing the demand curve are based on an assumed level of capacity that equals the minimum capacity requirement. As such, as the actual system gets tighter, the actual energy and ancillary service markets' revenues ramp up, but the offsets assumed for purposes of setting the height of the demand curve stay fixed.

which new entry becomes profitable. One may think of the growth in energy market revenues as the key driver of entry, with the Demand Curve approach supplementing it as it also produces ever growing capacity prices in response to a lessening of capacity levels.

C. Development of Initial Demand Curves

61. The demand curves are to be set high enough to ensure that reasonable amounts of capacity resources are supplied in the long run. As noted above, in the vicinity of the minimum requirement levels, the demand curves should reflect the long-run cost of capacity. An estimate of the cost of capacity is provided by the annual cost of a new combustion turbine, offset by net revenues from energy and ancillary services.[14]

62. The NYISO, through its market participant committee process, developed preliminary estimates of the cost of new gas-fired combustion turbines for New York City, Long Island, and upstate New York. The cost estimates are $159 per kW-year in New York City, $139 per kW-year on Long Island, and $85 per kW-year upstate. These values do not include offsets for revenues from energy and ancillary services.

63. Although these estimates are based on historic data from New York City, Long Island, and New England, there are some uncertainties regarding these estimates. Accordingly, the parties agreed to reevaluate these costs prior to 2005, and every three years thereafter.

[14] Other resources, including demand-side resources and older, inefficient generation, may be able to provide capacity at lower cost.

64. The parties were not able to reach consensus on the appropriate offsets for revenues from energy and ancillary services. However, based on data provided by Dr. Patton, the NYPSC developed a conservative, i.e., understated, offset of $21 per kW-year, implying an annual cost of capacity of $64 per kW-year for a generic upstate New York location.[15] The NYPSC staff made comparable estimates for New York City and Long Island. Some market participants argued for higher estimates of capacity costs, based in part on uncertainty regarding anticipated revenues from sales of energy and ancillary services.

65. The supporting parties agreed to smaller phase-in values for 2003 and 2004 to mitigate rate impacts. The tariff filing provides for a further review of these costs and revenues, to be completed in time to determine the appropriate levels of the demand curves in 2005. The first year's statewide[16] demand curve (beginning May 2003) is set to recover $50 per kW-year at the 118% capacity level, increasing to $60 per kW-year in May 2004. The demand curves were adjusted upward to account for the fact that capacity prices are generally depressed in winter months,

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[15] Dr. Patton provided estimates of annual net revenues from energy and ancillary services for gas-fired combustion turbines with various heat rates, for the 12 months ending August 31, 2002. These included $7.50 per kW-year for energy revenues and $12 per kW-year for ancillary services revenues. In addition, Dr. Patton estimated that prospective rules changes to more accurately price shortage periods in the energy markets would add $13 per kW-year. Also, NYPSC staff estimated that a reduction in capacity from the current 123% of peak load to the 118% minimum requirement would increase energy revenues by $10 per kW-year. Adding these values yielded an estimate of revenues from energy and ancillary services of $42.50 per kW-year. The NYPSC suggested an offset of only one-half of this value, or $21 per kW-year, as a conservative value.

[16] The statewide requirement can be met by generators located anywhere in New York State; the statewide demand curve is set to reflect the lower cost of capacity in upstate locations.

so that a gas turbine would have to receive more in the summer months to compensate for the lower prices in the winter months.[17]

VII. RESPONSE TO CAPACITY DEFICIENCIES

66. The NYISO currently forecasts load growth and capacity additions to provide an early warning of impending shortages. Under the Demand Curve proposal, tight supply conditions would automatically increase capacity prices, encouraging additional supply. In addition, the NYISO could respond to persistent tight conditions by increasing the level of the demand curve to provide a greater cushion and avoid actual deficiencies. The NYISO will review the level of the demand curves every three years, with input from independent consultants, market participants, and the NYPSC. Forecasts of impending shortages that are thought to be an indication of insufficient generation revenues could lead to increases in the levels of the demand curves.

67. In the event of an unanticipated actual deficiency in the Capacity Spot Auction (i.e., where the market clears at a capacity level below the minimum requirement), the NYISO would take emergency measures to ensure reliability. The NYISO would charge deficient LSEs (those which have not procured their minimum capacity requirements) a deficiency charge set to 1.5 times the estimated annual cost of a new gas-fired combustion turbine. The NYISO would use the funds to attempt to purchase capacity from new or existing suppliers (whose offers may have been rejected in the Spot Auction).

68. Dr. Patton has raised concerns in his affidavit regarding the potential for suppliers to exercise market power in these circumstances. It is important to recognize that these

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[17] In order to recover an annual cost of $X per kW-year, the capacity demand curve must be adjusted for the fact that many generating units, including gas turbines, can generate more output in the winter months than in the summer (due to more efficient cooling in the winter). This results in increased supply of capacity and, therefore, lower capacity prices in winter. The demand curves are adjusted upward to account for these effects, so that if the supply were just equal to the minimum requirement in the summer, but higher in the winter, the annual capacity revenues of a new gas turbine would total $X per kW-year.

circumstances can arise with even greater consequences under the existing tariff procedures, where withholding can drive the entire market price to the deficiency charge. Under the Demand Curve, a deficiency causes only a moderate increase in the Spot Market Auction price, and only a relatively small amount of capacity, equal to the size of the deficiency, is charged the deficiency charge. Moreover, the Demand Curve should encourage additional capacity above the minimum requirements, thus avoiding deficiencies in the first place.

69. Nevertheless, I share Dr. Patton's concerns. The NYISO, through its committee process, is currently developing additional market mitigation measures to guard against suppliers that may take advantage of these circumstances. It is my understanding that the NYISO intends to file these measures shortly.

70. This concludes my affidavit.

ATTESTATION

I am the witness identified in the foregoing affidavit. I have read the affidavit and am familiar with its contents. The facts set forth herein are true to the best of my knowledge, information, and belief.

/s/ Thomas S. Paynter
Thomas S. Paynter

April 11, 2003

Subscribed and sworn to before me
this 11th day of April, 2003

/s/ David VanOrt____
Notary Public

My Commission expires: 3-30-07

CERTIFICATE OF SERVICE

I, David G. Drexler, do hereby certify that I will serve on February 23, 2004, the foregoing Comments of Mark Reeder, Chief of Regulatory Economics of the New York State Department of Public Service by depositing a copy thereof, first class postage prepaid, in the United States mail, properly addressed to each of the parties of record, indicated on the official service list, if any, compiled by the Secretary in this proceeding.

Date: February 23, 2004
Albany, New York

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David G. Drexler