UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

ISO New England Inc. and New England Power Pool	)	Docket No. ER10-787-000
New England Power Generators Association, Inc.	)	
	)	
v.	)	Docket No. EL10-50-000
	)	
ISO New England Inc.	)	
PSEG Energy Resources & Trade LLC, *et al.*	)	
	)	
v.	)	Docket No. EL10-57-000
	)	
ISO New England Inc.	)	

TESTIMONY OF PROFESSOR PAUL R. MILGROM, PH. D.
ON BEHALF OF NEW ENGLAND POWER GENERATORS ASSOCIATION

SEPTEMBER 1, 2010

Q PLEASE STATE YOUR NAME, TITLES, AND BUSINESS ADDRESS.

A My name is Paul Milgrom. I am the Leonard and Shirley Ely Professor of Humanities and Sciences in the department of economics at Stanford University, Senior Fellow of the Stanford Institute for Economic Policy Research, and professor, by courtesy, at the Stanford Graduate School of Business. My business address is Department of Economics, Stanford University, Stanford, CA 94305.

Q PLEASE DESCRIBE YOUR ACADEMIC EXPERIENCE AND QUALIFICATIONS.

A My academic degrees begin with an A.B. degree in mathematics from University of Michigan in 1970. I received my M.S. degree in Statistics and was awarded a Ph.D. in Business from Stanford University in 1978 and 1979, respectively. I received an honorary masters degree from Yale University in 1983 and an honorary doctoral degree from the Stockholm School of Economics in 2001.

From 1979 to 1983, I served on the faculty at the Kellogg Graduate School of Management at Northwestern University. From 1983 to 1987, I was on the faculty at at Yale University; from 1985 to 1987, I was the Williams Brothers Professor of Management Studies and Professor of Economics at Yale. In 1987, I was the Ford Visiting Professor of Economics at the University of California - Berkeley. In 2000, I served as the Taussig Visiting Research Professor at Harvard University.

I received the Erwin Plein Nemmers Prize in economics in 2008. The Prize is awarded every two years and recognizes “work of lasting significance.” In 2007, I was elected to the U.S. National Academy of Sciences. From 2007-2008, I served as the President of Western Economic Association International. I have been a fellow of the American Academy of Arts and Sciences since 1992.

I was elected or appointed a Fellow of the Center for Advanced Study in the Behavioral Sciences in 1990 and again in 1998, a John Simon Guggenheim Fellow in 1986, a Senior Research Fellow of the Institute for Policy Reform in 1993, a Fellow of the Institute for Advanced Studies (Hebrew University of Jerusalem) in 1985, a Fellow of the Econometric Society in 1984, a Fellow of Morse College (Yale University) in 1984, and a Fellow of the Society of Actuaries in 1974. I was elected to the Council of the Game Theory Society (2003) and the Council of the Econometric Society (2004).

I served as co-editor of the *American Economic Review* from 1990 to 1993, and as associate editor from 1993-2000. I served as associate editor of the *Journal of Financial Intermedia*tion (1989-1992), *Econometrica* (1987-1990), the *Rand Journal of Economics* (1985-1989), and the *Journal of Economic Theory* (1983-1987). I currently serve on the Editorial Boards of *Games and Economic Behavior* and *AEJ-Microeconomics.*

My academic journal publications cover a broad range within economics, from market design, auctions, game theory, and bidding strategies to industrial economics, economic history, financial economics and macroeconomics. My work is published in several leading economic journals, including *American Economic Review, Journal of Political Economy, Quarterly Journal of Economics, Econometrica, Journal of Economic Theory*, *Journal of Mathematical Economics, Journal of Economic Perspectives, European Economic Review, Rand Journal of Economics, Games and Economic Behavior, International Journal of Game Theory,* and *Advances in Theoretical Economics,* among others. Twenty-three of my papers have been reprinted in books of readings or other collections; some were reprinted multiple times. These publications are listed in my curriculum vitae.

I am also the author of three books, *The Structure of Information in Competitive Bidding,* (Garland Press, 1979); *Economics, Organization and Management* (with John Roberts), (Prentice-Hall, 1992); and *Putting Auction Theory to Work* (Cambridge University Press, 2004).

In 1996, I delivered the Nobel Prize Lecture to the Royal Swedish Academy on behalf of deceased laureate William Vickrey on the subject of auction design. I have delivered major invited lectures at well-known venues both in the U.S. and abroad. A partial list of those is available in my curriculum vitae.

Q DO YOU HAVE ANY RELEVANT NON-ACADEMIC EXPERIENCE WITH AUCTION MARKETS?

A Yes, I do.

I have advised the organizers of various large auctions, including radio spectrum regulators in Australia, Canada, Germany, Hong Kong, the U.K. and the U.S. I advised Google on its IPO auction, Microsoft Network on its search advertising auction, Yahoo, Admob and OpenX on auctions for display advertising, Southern California Edison on power procurement, the Oregon Public Utilities Commission concerning the auction sale of assets of a regulated utility, and the U.S. Treasury on auctions for bank warrants acquired in the Trouble Asset Relief Program ("TARP").

I have advised bidders in radio spectrum auctions in the U.S., U.K., Canada, Germany, Holland, India and Israel. I also advised First Energy of Ohio in a standard offer electrical service auction and Ciena in its successful bid to buy networking assets of the bankrupt Nortel.

I am a co-inventor on three U.S. patents concerning auction market design. I also co-founded three companies that work on designing markets: Market Design, Inc., Perfect Commerce, and most recently, Auctionomics.

Q IS THIS YOUR FIRST TESTIMONY IN THIS PROCEEDING?

A Yes, it is.

Q WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A I have three main points that I wish to establish in this testimony. First, the unmitigated exercise of buyer-side market power is particularly damaging in a market like the FCM, with its vertical demand curve and where long-term commitments are financed by revenues from a series of auctions. Second, recent trends toward the increasing use of multi-year bilateral contracts provide further evidence of the need to correct the buyer-side abuses. Third, full modeling of zones has important advantages and does not create any special difficulty for running an effective auction.

Q BEGINNING WITH THE FIRST POINT: ARE THERE FACTORS THAT MAKE THE EXERCISE OF BUYER-SIDE MARKET POWER PARTICULARLY DAMAGING IN MARKETS LIKE THE FORWARD CAPACITY MARKET ("FCM")?

A Yes, there are.

Q PLEASE EXPLAIN.

A There are two main reasons that unmitigated buyer-side market power in the FCM would be particularly damaging.

First, the decisions by participants in the FCM are long-term decisions. Suppliers of new capacity expect to receive a stream of payments over the life of the capacity to recover the cost of and earn a return on their investments. Even without the exercise of market power by load in a current FCM, if there are no explicit mitigation measures, suppliers must plan for the possibility of future manipulations of FCM prices. Failing to prevent manipulations of *future* capacity prices makes long-term revenues less reliable and discourages low-cost offers into the *current* FCM.

This problem of anticipation threatens a vicious cycle that can damage or destroy the effectiveness of the FCM. Suppliers, fearing future manipulations, would naturally seek higher margins in the current auction, which provides an additional reason for load to seek out-of-market ("OOM") supply, which further feeds supplier concerns. That is why the promise to protect tomorrow's capacity market from buyer-side market power is necessary to encourage robust participation in the FCM today.

Second, as other economists have emphasized in their testimony, if OOM supply is unmitigated, then the use of vertical demand curves in the FCM market can make prices especially sensitive to even small changes in new OOM capacity. An extra unit of OOM capacity can change the marginal unit in the Forward Capacity Auction ("FCA") from a unit of new capacity to a unit of existing capacity that may offer supply at a much lower price. If OOM capacity is allowed to affect prices in that way, load would find manipulation to be very profitable and would be encouraged to do it.

Q IT HAS BEEN CLAIMED THAT HIGH UNCERTAINTY ABOUT FUTURE CAPACITY NEEDS MAKE MULTI-YEAR BILATERAL CAPACITY CONTRACTS NECESSARY. DO YOU AGREE?

A No, I do not.

My analysis rests on the important distinction between the *uncertainty* of future prices and capacity needs and the *manipulability* of future prices. Ordinary financial markets have tremendous capacity to hedge risk and uncertainty for investors, but not to guard against price manipulations.

Q PLEASE EXPLAIN WHAT YOU MEAN BY "UNCERTAINTY" AND HOW UNCERTAINTY IS BEST MANAGED.

A There is fundamental *uncertainty* about future capacity needs and associated auction prices, because people today cannot be certain what conditions will be like in the future. They cannot predict perfectly how much economic growth will occur, how much energy will be needed for that growth, what the effectiveness of new technologies will be—for example how effectively demand response will be in offsetting peak needs—what future environmental regulations will be, and so on. But uncertainties of these sorts are not unique for capacity investment. Investors in various industries face major uncertainties about energy prices, housing prices, interest rates, currency exchange rates, new technologies, and more. The institutions of our financial system have developed ways to deal efficiently with those uncertainties. Financial markets enable investors to spread risk widely when that is appropriate and they allow individuals to take different positions that depend appropriately on their risk tolerances and beliefs. Although multi-year bilateral contracting can shift the risk off the initial investor in new generating capacity, it does so by transferring the risk and uncertainty onto ratepayers. Such a transfer assigns the financial risk narrowly and inflexibly onto just New England utility consumers, which is inefficient and unnecessary.

Q PLEASE EXPLAIN HOW “MANIPULABILITY” OF FCM PRICES DIFFERS FROM “UNCERTAINTY” AND WHAT THAT IMPLIES ABOUT THE NEED TO MITIGATE BUYER-SIDE MARKET POWER.

A *Manipulability* of FCM prices is quite different from *uncertainty* about those prices, and far more problematic. There is no uncertainty about the effects of buyer-side manipulation: such manipulations by load lead to year-by-year FCM prices that are predictably lower than they would otherwise be, discouraging new capacity from bidding in the FCM and creating inefficient incentives for early exit by existing capacity. It is the threat of price manipulation, *not* price uncertainty, that undermines the effectiveness of the FCM and promotes multi-year bilateral contracting for new capacity.

A supplier that invests in new or expanded capacity in the face of manipulable future capacity markets is encouraged to seek a long-term contract to protect its future revenues. The threat of manipulation in the FCM leaves a supplier without a long-term contract vulnerable, regardless of its ability to manage uncertainty, for even if its capacity proves to be efficient and much needed, it may still be unable to recover its investment with a reasonable return.

The right economic solution to the problem of manipulability is mitigation of buyer-side market power to end the manipulation. Conversely, regulations that allow long-term OOM contracts to manipulate prices would be particularly damaging, because those contracts are the main tools used for price suppression.

Q WHAT ARE THE ADVANTAGES OF A SYSTEM THAT INTEGRATES A FULLY MITIGATED FCM COMPARED TO ONE THAT RELIES SOLELY ON LONG-TERM BILATERAL CONTRACTS?

A If manipulations by buyers and sellers are both fully mitigated in the FCM, so that current FCA prices are always immunized against current and past exercises of market power, then the public and ratepayers can enjoy the usual benefits of a well functioning capacity market.

First, such a market encourages the most efficient suppliers—those with the lowest net social cost—to provide capacity into the market. In the long run, selecting efficient suppliers to provide capacity has many beneficial effects. It lowers the cost incurred by the whole system, with some of that saving enjoyed by customers. It encourages cost-saving innovations, because suppliers that succeed in reducing costs also succeed in getting business and earning profits, while higher-cost producers are excluded. It also encourages efficient retirement decisions by older, less efficient units, which should be retired when their economic cost of continued operation is higher than that of a replacement unit.

Second, compared to decisions made in a government-administered system, a well functioning market reduces arbitrariness and political influence. Parties that promote particular technologies or advance narrow interests and exploit political connections have fewer opportunities to affect economic decisions. And in a market, the decision makers who make economic and technical decisions are motivated more by the returns on their own investments and those that they steward, and less by the need to curry favor with influential parties.

If the mitigations that FERC adopts are insufficient and long-term bilateral contracts negotiated with state-controlled authorities come to dominate decision making, the likelihood is that efficiency will suffer and all of these benefits will be lost.

Q DOES THE INCREASING USE OF MULTI-YEAR BILATERAL CONTRACTS FOR NEW CAPACITY CHANGE YOUR ANALYSIS?

A No, to the contrary: the increasing use of multi-year bilateral contracts is evidence of the very problem I have identified.

The possibility of effective price manipulation by load in the FCM creates incentives for both buyers and sellers to rely increasingly on long-term bilateral contracts for new capacity. For load, the gains from such OOM transactions come partly from price manipulation, which as I already have described is damaging to efficiency. For sellers of new capacity, the manipulability of future capacity prices makes participation in current capacity markets less attractive, because their future payments for capacity determined through the FCA are at risk. Therefore, to the extent that we are seeing an increasing use of multi-year bilateral capacity contracts, that is consistent with an emerging realization on the part of all parties that the FCA has become vulnerable to the exercise of buyer-side market power.

To the extent that these OOM multi-year contracts are choking off in-market transactions, mitigating buyer-side market power in the FCM is necessary to reinvigorate that market. Proper mitigation can make it safe for new capacity to participate without the need for long-term contracting. At the same time, those mitigations would eliminate the uneconomic incentive of load to enter into multi-year OOM capacity agreements.

Q CAN OOM CONTRACTING CONTRIBUTE TO EFFICIENT DECISION MAKING?

A Yes, it can.

OOM contracting can contribute to efficient decisions whenever the buyer has reason to care about the technology used in supplying capacity. For example, a buyer's policy might favor wind power or some other form of generation, even when those resources are not the least expensive ones. Buying such a favored resource is efficient if either the resource is less expensive than in-market capacity or if the extra public or private benefits it conveys outweigh its additional cost.

Q ARE BUYERS INCENTIVES IN THESE CASES CONSISTENT WITH ACHIEVING EFFICENT OUTCOMES?

A That depends.

What standard economic analysis teaches us is that the outcome of the benefit-cost calculation using proper market prices leads to an efficient choice by aligning the buyer's decision with what I'll call the "efficiency objective" of maximizing the total net benefits enjoyed by all market participants. But that alignment is achieved only if the buyer uses unmanipulated market prices for evaluating its alternatives. In particular, its decision will be inefficient if it is changed by attributing any benefit to the effect that its OOM contract has on the market price.

That is why participants in *competitive* markets, who cannot influence price, find their incentives well-aligned with the efficiency objective and why participants with market power find their incentives to be misaligned. Buyers with market power are encouraged to twist their decisions in order to reduce market prices, even when the result is a less efficient resource allocation. In this case, the particular distortion is to engage in too much OOM contracting, relative to the efficient standard.

Q WOULD THE FULL MITIGATION OF SELLER AND BUYER MARKET POWER LEAD TO MORE EFFICIENT DECISIONS REGARDING OOM CONTRACTS?

A Yes, it would. If market power is fully mitigated, then participants know they cannot manipulate prices and have just the right incentives regarding making OOM contracts. Knowing that they cannot influence prices, the buyers have an incentive to purchase OOM exactly when one of two conditions holds. The buyer must expect either that it will be cheaper to buy OOM or that the extra cost will be offset by some extra value that it attributes to the supplier's particular technology.

Without mitigating buyer market power, this tendency of markets to promote efficient decisions is destroyed. Unmitigated buyers have an incentive to engage in excessive OOM contracting to promote lower auction prices.

This incentive to manipulate prices is not merely hypothetical: there is clear evidence that buyers are aware of it and at least sometimes act accordingly. Mr. Stoddard's written testimony in this proceeding points out reports by Synapse Energy Economics in 2007 and 2009 sponsored by load interests which coins the acronym "DRIPE" (Demand Response Induced Price Effect) to describe the price-lowering impact of additional demand-response resources.[1] And Professor McAdams' written testimony points out a Connecticut DPUC report asserting that the "legislature mandated that the

---

[1] *See Supplemental Testimony of Robert B. Stoddard on Behalf of New England Power Generators Association*, NEPGA Exhibit 9 ("Stoddard Supp. Test.") at 20:11–22:16 & n.29.

Department issue an RFP to procure new or incremental capacity to reduce the impact of the FMCCs [Federally Mandated Congestion Charges] on Connecticut ratepayers . . . ."[2]

Q DOES FULL MITIGATION GO TOO FAR BY DISCOURAGING BUYERS FROM MAKING EFFICIENT OOM CONTRACTS?

A No, it does not.

When the market is mitigated, a buyer still has every incentive to buy capacity OOM when doing so is less costly. It also has an incentive to buy capacity that it finds appealing for environmental or other reasons, provided that the extra benefits the buyer enjoys are larger than the extra cost.

Q DOES FULL MITIGATION DISCOURAGE BUYERS FROM MAKING OOM CONTRACTS THAT ARE INEFFICIENT?

A Yes, it does.

An OOM contract is inefficient if the extra cost of this particular supply source, compared to the market price, exceeds the extra benefit. With full mitigation, a buyer finds that its incentives are aligned with efficiency and its calculation is just the same as the efficiency calculation. Without the ability to exercise market power, it is discouraged from making an inefficient contract because the contract does not pay. Without market power, the efficiency loss is not hidden beneath the socially unproductive "benefits" of a price manipulation.

---

2 *DPUC Investigation of Measures to Reduce Federally Mandated Congestion Charges (Long Term Measures)*, DPUC Docket No. 05-07-14PH02, Second Interim Decision at 2 (Nov. 16, 2006), *available at* http://www.dpuc.state.ct.us/dockhist.nsf/8e6fc37a54110e3e852576190052b64d/7e7c37d2ff13354a85257323007814af?OpenDocument.

Q SHOULD REGULATIONS MITIGATE THE EFFECTS OF HISTORICAL OOM CONTRACTS THAT ARE INEFFICIENT?

A Generally, yes.

For a regulator with a goal of promoting competitive markets, mitigations should aim to restore future market prices to competitive levels—ones unaffected by any attempt to exercise market power. A policy that promotes a delayed response to exercises of market power—restoring market prices to competitive levels only with a lag – is hardly ideal, but it is more effective than a policy of making no mitigation for past manipulations. By following a predictable policy of mitigating market power as quickly and completely as reasonably possible, the regulator can achieve two kinds of benefits. First, it both corrects the market prices today to competitive levels and promotes a belief among market participants that future prices will be more nearly-free from manipulations. Competitive prices and the belief in future unmanipulated prices promotes the usual advantages of competitive markets, which I have already discussed. Second, maintaining such a policy promotes the expectation that the ill-gotten gains from market manipulations will be small, because the benefits of long-term market manipulations will be cut short.

These advantages of mitigating historical manipulations are particularly important in markets like the FCM, where interest group politics make it difficult for a regulator to respond quickly to changing circumstances and where an unmitigated manipulator's damaging behavior can sometimes lock in a long stream of ill-gotten benefits. Good policy should combat that outcome by restoring prices to competitive levels as quickly as the process allows.

Q WHAT IS THE RELATIONSHIP BETWEEN THE FULL MODELING OF ZONES IN THE FCA AND SUPPLIERS' EXERCISE OF MARKET POWER?

A There are three important issues to keep in mind when evaluating the relationship between modeling of zones and market power.

The first concerns the goal of promoting efficient, price-guided capacity decisions in the FCM. With that goal in mind, it makes no sense to suppress important zonal distinctions to establish a single market price. Such a price cannot guide efficient decisions, because it necessarily fails to reflect the actual situation in constrained zones. Such a price does not encourage the development of new capacity where it is most needed and it needs to be supplemented by extra rules, deviating from the single-price rule, even to avoid retirement of existing capacity that is urgently needed.

I list this issue first because it is foundational: if important zonal price distinctions are suppressed, then any policy successes in mitigating market power are Pyrrhic victories. To the extent that the underlying zonal model is unrealistic, even a perfectly functioning competitive market would fall short of achieving efficient outcomes. Full modeling of relevant zones is necessary for the FCM to promote efficient outcomes.

Second is the *structural* market power issue, which is entirely separate from the zonal modeling issue. If some supplier is pivotal—if its supply is needed to meet local resource requirements in a zone—then some mitigation of that market power will be needed. Without mitigation, a pivotal seller could potentially hold out for a very high price for all of its resources in that zone. This conclusion, however, holds regardless of whether zones are fully modeled and regardless of any other market rules. The market power problem cannot be avoided just by pretending that the relevant zone does not exist.

The proper response to market power is to mitigate it. Attempting to combat structural market power by eliminating the modeling of zones cannot fix the problem, but it can certainly undermine the efficiency of the market outcome and make the market unsustainable over the long run. To decide correctly about the need for mitigation, one must assess whether a seller is pivotal after taking account of *all* the potential suppliers in the same zone. It is not correct to exclude new resources when assessing whether an unmitigated supplier can disrupt the system by withholding some of its capacity.

Third is the issue of auction market design. Bad auction rules—especially ones that provide too much information—can make it easier for a seller to detect when it is pivotal and how much capacity it needs to withhold to manipulate the market. Really bad auction rules could make it easier for a group of sellers which are jointly pivotal to coordinate. It is not my objective today to advise on the best auction rules, but I do wish to point out that it is easy to avoid bad rules of the kinds just described. The most standard kinds of sealed-bid auctions largely avoid these problems because they do not provide the extra information that can enable sellers to exercise market power.

Q DR. BLUMSACK AVERS THAT "SUPPLIERS DO NOT NECESSARILY NEED TO SUBMIT DE-LIST BIDS AT UNCOMPETITIVE PRICE LEVELS IN ORDER TO MANIPULATE THE FCA THROUGH THE TRIGGERING OF A CAPACITY ZONE."[3] DO YOU AGREE?

A No, I do not.

[3] *ISO New England Inc.*, Docket Nos. ER10-787-000, *et al.*, The Joint Filing Supporters' First Brief, Exhibit DPUC-23, Direct Testimony of Seth Blumsack, Ph.D. on Behalf of First Brief of the Joint Filing Supporters at 7 (July 1, 2010).

Dr. Blumsack's testimony about this is muddled because it has no anchor: it attempts to analyze the threat of market manipulations in the FCM without relating it to the foundational issue of how markets can promote efficient, price-guided decisions.

When a competitive bid triggers a capacity zone, which means that it causes the relevant zonal price to differ from that of unconstrained zones, that is just what it should do. That trigger causes prices to be correctly aligned with the cost of supplying that zone, thereby fulfilling a key objective of markets. To characterize such a bid as a manipulation and suggest that it needs to be mitigated evidences a fundamental misunderstanding of how competitive markets are supposed to work. When the competitive supply in a zone falls short, the competitive price rises. To claim there is something improper or manipulative about that is to misread the law of supply and demand.

Q DOES THE FULL MODELING OF CAPACITY ZONES MAKE IT MORE DIFFICULT TO OPERATE THE FCA SUCCESSFULLY?

A Not necessarily.

The current FCA collects bids using a descending clock auction. Retaining that bid-collection method in a fully-modeled zonal structure could pose a complexity challenge, depending on the structure of the zones to be modeled. But collecting bids by using a descending clock auction offers no important economic advantage that cannot be closely replicated by a suitable sealed-bid auction.

It would be easy and even routine to create a sealed-bid system to find market-clearing prices. Software to run such auctions already exists.[4] Given the possibility of

---

[4] One supplier is Auctionomics (www.auctionomics.com).

using sealed bids, there is no important reason in terms of simplicity or computational feasibility of the auction to limit the modeling of zones.

Q WHAT IS THE ADVANTAGE OF FULL ZONE MODELING COMPARED TO A SYSTEM WITH MORE LIMITED ZONES?

There are two advantages.

First, full modeling of zones reduces the need for guesswork about which zonal constraints will bind, requiring additional local resources to ensure the reliability of resource supply. No one can be certain before the auction whether a zonal constraint will be binding. In a standard sealed-bid auction system, zonal constraints do not affect the course of the auction and if they do not bind, they have no effect on the cleared resources or on the prices. So, the system eliminates guesswork.

Second, zonal pricing has the usual advantage of a market system of generating price signals that inform other potential suppliers about opportunities to supply valuable capacity *in the right places*. It is these price signals that guide private sector entry and innovation and that encourage unanticipated solutions to resourcing problems.

Q DOES THIS CONCLUDE YOUR TESTIMONY?

A Yes.

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

ISO New England Inc. and New England Power Pool	))	Docket No. ER10-787-000
New England Power Generators Association Inc. v. ISO New England Inc.	)))))	Docket No. EL10-50-000
PSEG Energy Resources & Trade LLC, PSEG Power Connecticut LLC, NRG Power Marketing LLC, Connecticut Jet Power LLC, Devon Power LLC, Middletown Power LLC, Montville Power LLC, Norwalk Power LLC, and Somerset Power LLC v. ISO New England Inc.	)))))))))	Docket No. EL10-57-000

I, Paul Milgrom, being duly sworn, depose and state that the contents of the foregoing Testimony on behalf of the New England Power Generators Association is true, correct, accurate and complete to the best of my knowledge, information, and belief.

Paul Milgrom
Paul Milgrom

SUBSCRIBED AND SWORN to before me this 24 day of August 2010.

(Notary Public)

My commission expires: 24 February 2013

AJITHA REDDY KAKLOOR
COMM. # 1838244
NOTARY PUBLIC - CALIFORNIA
SANTA CLARA COUNTY
My Comm. Exp. Feb. 24, 2013

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

ISO New England Inc. and New England Power Pool	)	Docket No. ER10-787-000
New England Power Generators Association, Inc.	)	
	)	
v.	)	Docket No. EL10-50-000
	)	
ISO New England Inc.	)	
PSEG Energy Resources & Trade LLC, *et al.*	)	
	)	
v.	)	Docket No. EL10-57-000
	)	
ISO New England Inc.	)	

TESTIMONY OF PROFESSOR JOSEPH P. KALT, PH.D
ON BEHALF OF NEW ENGLAND POWER GENERATORS ASSOCIATION

SEPTEMBER 1, 2010

QUALIFICATIONS AND SUMMARY

Q PLEASE STATE YOUR NAME, TITLE, AND BUSINESS ADDRESS.

A My name is Joseph P. Kalt. I am the Ford Foundation Professor of International Political Economy at the John F. Kennedy School of Government, Harvard University. I am also a senior economist at Compass Lexecon, an FTI Consulting Inc. economics consulting firm. My business address in this capacity is 200 State Street, 9th Floor, Boston, MA 02109.

Q COULD YOU BRIEFLY DESCRIBE YOUR BACKGROUND AND QUALIFICATIONS?

A I hold Bachelor's (Stanford University, 1973) and Master's and Ph.D. (University of California, Los Angeles, 1978 and 1980) degrees in economics. I joined the faculty of the Department of Economics at Harvard University in 1978 and taught the economics of antitrust and regulation in the Department as an Instructor, Assistant Professor, and Associate Professor. In 1986, I joined the Kennedy School of Government as a professor with tenure. The Kennedy School is Harvard's graduate school for public policy and management, and I teach courses in economics for public policy, with emphasis on the economics of antitrust and regulation. I have also taught courses in the economics of energy and the environment, as well as in economic development. Over my career, I have taught similar subject areas in programs for federal administrative law judges, working journalists, and elected and appointed political office holders.

An important area of specialization in my work has entailed the economics of competition and regulation in the energy sector. In addition to my academic teaching and publishing in the area, I have provided expert testimony on energy market competition and regulation on numerous occasions before the United States Congress, the Federal Energy Regulatory Commission ("Commission" or "FERC"), other federal and state agencies and courts, and various international tribunals. I have an additional specialization in the area of the politics and economics of economic development on American Indian reservations and in Indigenous communities worldwide. A full listing of my background and qualifications is attached hereto as NEGPA Exhibit 6-A.

Q WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A I have been asked by New England Power Generators Association, Inc. ("NEGPA") to assess the economic implications of certain key elements of market design for ISO New England's ("ISO-NE") Forward Capacity Market ("FCM"). In particular, I have been asked to assess the economic incentives of the FCM and especially, its price mitigation procedures for new entry sponsored directly or indirectly by state-controlled load interests. NEGPA is concerned that, without appropriate mitigation procedures, state-controlled load interests have had, and will continue to have, incentives to engage in downward price manipulation. Such manipulation is anticompetitive and threatens the integrity, viability and sustainability of the FCM over the long term.

Q IN SUMMARY FORM, WHAT CONCLUSIONS HAVE YOU REACHED FROM YOUR ANALYSIS?

A At least four major points stand out. ***First***, ISO-NE's FCM market design to date has, indeed, provided incentives for certain state-controlled load to engage in anticompetitive downward price manipulation (i.e., what economics refers to as the exercise of *monopsony market power*). The primary mechanism for such manipulation is found in the use of long-term bilateral contracts with power suppliers for state-sanctioned procurement of out-of-market ("OOM") capacity. In turn, state controlled load can effectively guarantee cost recovery for contracting suppliers by using *de facto* control over retail rates to ensure that ratepayers ultimately cover the cost of procuring otherwise uneconomic capacity. The proffered offsetting benefit to effectively captive ratepayers is the suppressing effects of such state-controlled bilateral capacity procurement on market-clearing prices in the FCM auction market.

Second, as recognized in United States antitrust policy and in the Commission's regulation of the nation's electric power markets, monopsonistic price suppression is every bit as contrary to the national public's interest in a healthy and efficient national economy as is monopolistic price elevation. Notwithstanding putative and promised private benefits to load in this case, artificial suppression of prices relative to levels generated under open competition distorts the efficient provision of electric capacity—discouraging supply from low cost suppliers and tilting overall investment in capacity toward higher cost alternatives brought in under state-controlled strategies of monopsonization.

Third, failure to guard against the use of state-sanctioned, ratepayer-backed procurement of capacity as a mechanism of artificial suppression of market-clearing prices threatens the viability of the FCM altogether and, concomitantly, the Commission's stated goal of relying on competitive markets to supply and price electricity for the nation's economy. To the extent that power suppliers participating in the FCM have trusted in the Commission making progress towards that goal, but instead find themselves subject to prices that are artificially depressed relative to competitive levels, investors can be expected to be "once burned, twice shy." As Professors Milgrom and McAdams point out in their companion testimony on behalf of NEGPA, developers of new capacity have sought protection against the prospect of monopsonistic auction results by avoiding the FCM and turning, instead, to bilateral contracting. Indeed, the implied path is a slippery slope on which state-controlled load has an artificial advantage in capacity procurement since the *de facto* state *monopoly* over ratepayers enables state authorities to guarantee suppliers cost recovery even if costs are above competitive levels. The end game may well be that state-controlled authorities end up directing the procurement of all or virtually all capacity—and we will then have moved a long distance back toward pre-restructuring, state public utility regimes and resulting balkanization of the nation's electric power sector.

Fourth, the "once burned, twice shy" character of market designs and regulations which encourage and permit state-sanctioned monopsony implies that the proffered private benefits to state-controlled load are short-run at best. Handicapping the viability of the FCM means dampening the forces of competition—forces which hold down costs and spur innovation. Moreover, the subject strategies of state-sanctioned price suppression only work against FCM suppliers who have already sunk their capital. Over the longer run, if "once burned" suppliers are even willing to continue to participate in the FCM, they can be expected to build risks of future monopsonistic expropriation into their offers, and their investors will certainly build such risks into their costs of capital.

While there is understandable myopia on the part of state officials (who can reasonably expect terms of office which are considerably shorter than the lives of electric power capacity investments), the longer run consequences of short-term strategies of state-controlled monopsonistic FCM price suppression portend only additional and unnecessary costs to state-controlled load. In fact, the state-sanctioned price suppression at issue here is familiar as a source of economic *underdevelopment* brought on by governments who, in the name of helping the people and pursuing sovereignty, utilize their *de facto* control over their jurisdictions' economies to promise short-term benefits from burdens placed on the backs of already-sunk investment. The long-run results, however, are inevitably increasingly difficult access to capital and discouragement of the very investment on which an economy's health, growth, and development depend. The public of the states that make up the nation will be better served by promoting viable *and competitive* electric power markets.

UNITED STATES WHOLESALE ELECTRICITY MARKET REGULATION AND BUYER MARKET POWER

Q WHAT IS THE UNITED STATES' BASIC REGULATORY FRAMEWORK FOR WHOLESALE ELECTRICITY MARKETS?

A United States federal policy has endorsed reliance on competitive markets for the provision of wholesale electricity supply. FERC has established a regulatory framework that supports wholesale competition wherever practical.[1] In particular, Commission regulations promote competitive wholesale electricity markets administered by regional transmission operators ("RTOs") as the preferred structure for wholesale electricity markets.[2] At the same time, many states outside of RTOs support competitive

[1] *See Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Servs. by Pub. Utils.; Recovery of Stranded Costs by Pub. Utils. & Transmitting Utils.*, Order No. 888, FERC Stats. & Regs. ¶ 31,036 (1996), *order on reh'g*, Order No. 888-A, FERC Stats. & Regs. ¶ 31,048, *order on reh'g*, Order No. 888-B, 81 FERC ¶ 61,248 (1997), *order on reh'g*, Order No. 888-C, 82 FERC ¶ 61,046 (1998), *aff'd in relevant part sub nom.*, *Transmission Access Policy Study Group v. FERC*, 225 F.3d 667 (D.C. Cir. 2000), *aff'd sub nom.*, *New York v. FERC*, 535 U.S. 1 (2002).

[2] *Regional Transmission Orgs.*, Order No. 2000, FERC Stats. & Regs. ¶ 31,089 (1999), *order on reh'g*, Order No. 2000-A, FERC Stats. & Regs. ¶ 31,092 (2000), *aff'd sub nom. Pub. Util. Dist. No. 1 Snohomish County v. FERC*, 272 F.3d 607 (D.C. Cir. 2001).

frameworks, albeit their wholesale market structures are generally less transparent than centralized wholesale electricity markets administered by RTOs.[3]

Q WHY DOES THE COMMISSION RELY ON REGULATED COMPETITIVE MARKETS FOR WHOLESALE ELECTRICITY TRADE?

A Competitive markets promote an efficient allocation of the nation's scarce resources, hold down costs to consumers, spur innovation, and ensure that prices paid reflect the costs of providing electricity. Accordingly, over the past two decades, the Commission has encouraged competition by supporting the growth of non-utility electric generation; opening access to transmission systems on a non-discriminatory basis so that the energy that generation produces can reach customers; endorsing the formation of transparent centralized wholesale markets (including auctions); and, regulating such wholesale markets to ensure that electricity prices are established competitively.

Q WHAT PRINCIPLES GUIDE THE COMMISSION IN REGULATING WHOLESALE ELECTRICITY MARKETS?

A The Commission's stated policy adheres to the principle that wholesale electricity prices must be determined competitively. Thus, an *important* focus of Commission regulation of wholesale electricity markets is protecting against the exercise of market power. In the case of the market's supply side, the Commission has an overarching framework for screening electricity sellers for the potential to exercise market power under its Order No. 697.[4] In addition, Commission regulations for centralized wholesale electricity markets

[3] These market structures tend to be based on bilateral contracting arrangements such as those described by Dr. McAdams in his Supplemental Testimony.

[4] *Mkt.-Based Rates for Wholesale Sales of Elec. Energy, Capacity & Ancillary Servs. by Pub. Utils.*, Order No. 697, FERC Stats. & Regs. ¶ 31,252, *order on clarification*, 121 FERC ¶ 61,260 (2007), *order on reh'g and clarification*, Order No. 697-A, FERC Stats. & Regs. ¶ 31,268, *order on reh'g and clarification*, 124 FERC ¶ 61,055, *order on reh'g and clarification*, Order No. 697-B, FERC Stats. & Regs. ¶ 31,285 (2008), *order on*

include various market power mitigation mechanisms—effectively, upper-bound price caps—that seek to take away any payoffs to the exercise of monopoly market power that a seller might otherwise hope for.

Q DO CENTRALIZED MARKET STRUCTURES, SUCH AS FORWARD CAPACITY MARKETS, WARRANT PROTECTION AGAINST *BUYER* MARKET POWER?

A Yes. Although historically less emphasis has been placed on protecting against buyer market power, the potential exercise of market power by both sellers and buyers must be taken into account in market design. Taking particular note of the potential for uneconomic capacity additions to artificially depress prices, the Commission has stressed that the exercise of market power by both sellers and buyers must be mitigated to ensure that prices are neither artificially inflated nor artificially suppressed.[5] In fact, as organized electric *capacity* markets have become more common, the protection against buyer market power has become critical. This reflects several fundamental attributes of electric capacity markets. First, such markets are commonly characterized by incumbents with already-sunk capital; they cannot easily pick up and move to more competitively priced regions in the face of a buyer (or group of buyers behaving collusively) attempting to suppress prices. Second, electric capacity markets clear relatively infrequently (e.g., yearly) and are "lumpy" such that a large buyer (or a sponsor with control over large

---

reh'g and clarification, Order No. 697-C, FERC Stats. & Regs. ¶ 31,291 (2009), *order on reh'g and clarification*, Order No. 697-D, FERC Stats. & Regs. ¶ 31,305, *order on clarification*, 131 FERC ¶ 61,021 (2010).

5 *N.Y. Indep. Sys. Operator, Inc.*, 122 FERC ¶ 61,211 at P 1 ("*NYISO*") ("In this order, the Commission accepts New York Independent System Operator, Inc.'s (NYISO's) proposals to strengthen the mitigation of market power in the New York City (NYC) Installed Capacity (ICAP) market. The Commission finds that NYISO's proposals improve the mitigation that exists today and are otherwise just and reasonable because they prevent sellers with market power from artificially raising capacity prices and prevent net purchasers from artificially depressing capacity prices with uneconomic generation."), *order on reh'g*, 124 FERC ¶ 61,301 (2008), *order on reh'g and clarification*, 131 FERC ¶ 61,170 (2010).

purchases) with the ability to supply itself (e.g., with bilaterally contracted units) outside the organized FCM can have potentially large and long-lived suppressing effects on FCM prices.

Third and finally, as we encounter in this case, state authorities can have *de facto* control over their jurisdictional ratepayers, effectively negotiating on their behalf, procuring their power needs through RFPs, and utilizing the *de facto* captivity of state consumers to back up guarantees needed to attract suppliers. With well-meaning (albeit, perhaps myopic) intentions, such authorities may attempt to act, effectively, as unified buying agents via mandated procurement policies and state-sanctioned RFPs that are the *economic* equivalent of a buyers' cartel.[6] The risk from the perspective of the health of the *nation's* electric capacity markets is that state authorities may see the exercise of monopsony in their interest at the expense of the overall national interest in competitive wholesale electricity markets.

Q BUT ISN'T MARKET POWER WHICH IS EXERCISED ON BEHALF OF CONSUMERS CONDUCT THAT IS IN THE PUBLIC INTEREST?

A No. The very same precepts that undergird the public's interest in protecting against seller-side monopoly market power apply to the need to protect against buyer market power. Ultimately, seller market power contravenes the overall public's interest in a healthy economy by distorting the relationship between prices and costs. The successful exercise of monopoly market power results in a withholding of supply that drives prices above competitive levels. The result is a wedge between the prices consumers pay for a product and the costs of supplying them with that product. Public policy properly

[6] I am, of course, drawing no *de jure*, legal conclusions regarding such *de facto* cartelization.

recognizes that net public benefits are generated by pushing monopolized markets to competitive outcomes wherever feasible: Ending the monopolist's withholding of supply and pushing prices to competitive levels—i.e., to average cost—means expanding industry output over a range in which the value generated for consumers, as reflected in the prices they are willing to pay, exceeds the cost to the economy of supplying that increased output.

In the case of monopsony, the buyer (or a group of colluding buyers acting in concert) with market power strategically withhold *demand* from the market[7] in order to push prices of what is purchased downward. As efficient suppliers shrink in response to the lower prices ("move down their supply curves"), the economy forgoes a range of incremental supply of the monopsonized product that could be had at lower cost than the incremental value generated for consumers. The overall economy shrinks as a result.[8] In addition, if monopsony is exercised (as is the concern here) against efficient suppliers by buyers subsidizing otherwise higher cost, inefficient supply sources of their own, the overall economy is distorted: Any given level of supply to consumers does not come from the lowest cost mix of supply sources. Resources are wasted, resources that could be used to produce further output for consumers across the economy.

In short, the healthy and efficient economy does not focus on holding down the prices paid by one kind of consumer for one kind of product (electricity). It recognizes that the overall consuming public has many needs and wants, and that wasting resources in one sector (e.g., by failing to minimize the costs of producing a given product) means

---

7 Perhaps by self-supplying.

8 The foregoing is a description of what the economics textbooks refer to as the "Deadweight Loss" of monopsony. *See, e.g.*, Robert S. Pindyck & Daniel L. Rubinfeld, Microeconomics ch. 13 (7th ed. 2008).

that other sectors have fewer resources to work with and, hence, more expensive supplies and higher prices for consumers in those sectors. The healthy and efficient economy uses competition to find the balance point where prices are driven to lowest feasible cost across all sectors. Monopsonistic price manipulation by the buyer or buyers of a particular product is contrary to the overall public's interest in a healthy and efficient economy that serves *all* consumers and their needs.

Q DOES COMPETITION POLICY IN THE UNITED STATES RECOGNIZE THESE BASIC ECONOMICS OF BUYER MARKET POWER?

A Certainly. While students (including law students) are most commonly introduced to issues of antitrust and competition through the gateway of seller-side monopoly market power, sound competition policy provides no safe harbor for monopsony market power. Indeed, with general progress toward freer international trade in goods and services, many product markets are now characterized by quite vigorous competition among sellers, foreign and domestic, for consumers' business. Policy, thus, appropriately turns its eye toward local suppliers who are not geographically mobile and who may be susceptible to localized buyer monopsony.

Tellingly, the recently revised Horizontal Merger Guidelines issued by the United States Department of Justice and the Federal Trade Commission make it explicit that "[e]nhancement of market power by buyers, sometimes called 'monopsony power,' has adverse effects comparable to enhancement of market power by sellers."[9] Similarly, the Obama Administration's Antitrust Division has targeted monopsony for investigation, and made it clear that monopsony is no less objectionable than monopoly market power.

---

[9] U.S. Dep't of Just. & Fed. Trade Comm'n, Horizontal Merger Guidelines at 2 (2010), *available at* http://www.justice.gov/atr/public/guidelines/hmg-2010.pdf.

Joint Department of Justice/USDA workshops, for example, have recently begun to address the "dynamics of competition in agriculture markets including, among other issues, buyer power (also known as monopsony) and vertical integration."[10] The Commission's aforementioned admonition that the exercise of market power by both sellers and buyers must be mitigated to ensure that prices are neither artificially inflated nor artificially suppressed[11] is thus wholly in keeping with sound economics and overall federal concerns regarding monopsony market power.

Q HAVE COMMISSION ORDERS TAKEN INTO ACCOUNT THE POSSIBLE EXERCISE OF BUYER MARKET POWER, AND, IF SO, HOW?

A Yes. The Commission's orders have recognized the importance of guarding against the exercise of buyer market power in electric capacity markets. For example, while approving buyer market power mitigation in a recent NYISO capacity market proceeding, the Commission explained: "We accept NYISO's proposal for net buyer mitigation, with modifications, in order to prevent uneconomic entry [of capacity] that would reduce prices in the NYC capacity market below just and reasonable levels."[12] The Commission also recognized that uneconomic entry would result in unacceptable price suppression when approving the FCM.[13] As described above, however, current ISO-NE buyer market power rules have limitations which prevent them from mitigating all instances of

---

[10] Press Release, U.S. Dep't of Just., Justice Department and USDA to Hold Public Workshops to Explore Competition Issues in the Agriculture Industry (Aug. 5, 2009), *available at* http://www.justice.gov/atr/public/press_releases/2009/248797.htm.

[11] *NYISO*, 122 FERC ¶ 61,211 at P 1.

[12] *Id.* at P 100. *See also Edison Mission Energy v. FERC,* 394 F.3d 964, 968-70 (D.C. Cir. 2005) (finding "the Commission's contradiction of its prior rulings acknowledging the potential ill effects of forcing down prices absent structural market distortions [and yet still imposing seller market power mitigation as] the epitome of agency capriciousness.") (citation omitted).

[13] *See Devon Power LLC*, 115 FERC ¶ 61,340 at P 114 (2006).

monopsony. We are appropriately engaged in this proceeding in the search for market designs and policies that properly and fully circumscribe buyer market power.

Q WHAT PROBLEMS OF BUYER MARKET POWER ARISE IN THIS PROCEEDING?

A The Commission's April 23, 2010 order establishing this proceeding clearly recognized the need to ensure that buyer market power would not distort the FCM market while also acknowledging that buyers have legitimate reasons for striking bilateral supply contracts.[14] The Commission identified certain aspects of the existing and then proposed FCM rules that could result in the exercise of buyer market power.[15] A key challenge in this proceeding is to eliminate the incentive and ability of buyers to exercise market power, while allowing for bilateral contracts to be struck for new capacity that may be considered out-of-market ("OOM") when compared to prevailing electric capacity prices.

Although striking the balance between competition and regulation is not necessarily easy, eliminating the incentive and ability for buyers to exercise market power in the FCM is vital. Absent effective buyer market power rules and mitigation, conduct to date suggests that the market will not be able to ensure competitive prices. Such an outcome is clearly contrary to the Commission's regulatory objectives. It is also wholly inconsistent with the national public's interest in a healthy and efficient economy.

---

[14] *ISO New England Inc.*, 131 FERC ¶ 61,065 at P 77, *order on reh'g and clarification*, 132 FERC ¶ 61,122 (2010).

[15] *Id.*

THE PROBLEM OF BUYER MARKET POWER

A. The Economics of Buyer Market Power in Forward Electricity Capacity Markets

Q WHY DOES THE PROBLEM OF BUYER MARKET POWER ARISE UNDER ISO-NE'S FCM IN THIS CASE?

A The concern over the exercise of buyer market power and associated downward price manipulation arises as a result of the confluence of several factors. First, the FCM design to date (including rules for mitigation under the Alternative Price Rule ("APR")) provides that payments by load for bilateral long-term capacity contracts are OOM. With OOM supply satisfying some portion of loads' demand, the economic effect is equivalent to reducing demand in the FCM auctions—and, all else equal, reduced demand implies downward pressure on price.[16] Normally, under competitive conditions, "all else" would not be equal: Non-OOM capacity attracted into long-term bilateral contracts would be drawn from the overall supply of capacity and would be a mix of existing capacity and low cost new capacity. Reduced demand in the FCM auctions would then be approximately matched by reduced supply in the auctions, leaving FCM market clearing prices essentially unaffected. For this reason, as Professors Milgrom and McAdams describe in their companion testimony, a well-functioning electricity capacity market can readily entail a mixture of shorter-term auction transactions and longer-term bilateral contracting.

The norm of a competitively structured marketplace, with atomistic buyers each unilaterally unable to affect market prices for capacity, is not satisfied in the case of ISO-

---

[16] These economics are the same if we treat the bilaterally acquired capacity as entering as additional supply—thereby reducing prices through the supply-side effect. In fact, as discussed below, "the mechanics" of state-mandated OOM procurement treat (as a contractual requirement) such capacity as supply entering the FCM at prices sufficiently low to avoid being at or above the market-clearing price. This ensures that such OOM capacity "soaks up" demand and leaves the FCM market-clearing price suppressed.

NE. Instead, state authorities can (i) effectively aggregate their jurisdictional ratepayers into a single bloc of purchasers of capacity and (ii) mandate and subsidize procurement of capacity that may otherwise be inefficient and uneconomic. Under these conditions, state authorities can employ a relatively straightforward (albeit, myopic) calculation that makes net capacity additions and resulting price suppression politically attractive. Specifically, even if procured capacity is inefficient and costs more than the cost implied by market-clearing prices in the FCM, procuring such capacity can look attractive to a monopsonizing aggregate of ratepayers (i.e., the state authority) if the resulting price suppression realized in the FCM is enough to offset the excess cost of inefficient capacity.

Q HAVE THESE ECONOMICS BEEN RECOGNIZED IN THE ISO-NE CONTEXT?

A They certainly have. In fact, they are not complicated in their essentials and they have been described directly by state authorities. In Connecticut, for example, the Department of Public Utility Control ("DPUC") issued an RFP for capacity procurement which the DPUC noted "was specifically designed to create a market-wide impact rather than to simply hedge the costs of the contracted capacity."[17] According to the DPUC, its procurement strategy would "lower the market clearing price and therefore reduce costs to all load."[18] DPUC analysts assessed the benefits of the proposed projects by "looking at the incremental costs above the capacity market clearing price of the contracts

[17] *DPUC Review of Energy Independence Act Capacity Contracts*, DPUC Docket No. 07-04-24, Decision at 15 (Aug. 22, 2007) ("DPUC August 2007 Order"), *available at* http://www.dpuc.state.ct.us/FINALDEC.NSF/0d1e102026cb64d98525644800691cfe/bb19bc5f456023468525733f006a64d3?OpenDocument.

[18] *DPUC Investigation of Measures to Reduce Federally Mandated Congestion Charges (Long Term Measures)*, DPUC Docket No. 05-07-14PH02, Interim Decision at 14-15 (Sept. 13, 2006), *available at* http://www.dpuc.state.ct.us/FINALDEC.NSF/0d1e102026cb64d98525644800691cfe/93a706c96318bc32852571e8005f38ad?OpenDocument.

compared to the incremental benefits of lower capacity market clearing prices for all capacity."[19] This is the reasoning of a monopsonist, treating suppression of the price it pays across its purchases as a benefit to be weighed against the costs incurred to suppress market-clearing prices. The DPUC recognized that it was not a competitive price taker, unable to affect market-clearing price. Instead, its buying strategies were designed to "reduce wholesale market prices in the energy and capacity markets."[20]

Q UNDER WHAT CIRCUMSTANCES CAN THE ADDITION OF NEW SUPPLY BE AN EXERCISE OF BUYER MARKET POWER?

A The addition of new OOM capacity by a procurer of load (effectively, a kind of self-supply or vertical integration) can properly be viewed as either (i) leaving less total demand to be satisfied by FCM supply or (ii) increasing the total supply of capacity in the market. From either perspective, the result is downward pressure on the FCM market-clearing price for all third-party capacity resources purchased by load. The distortion to the market occurs when the subject OOM capacity would be uneconomic at competitively determined prices, either because the strategically procured OOM capacity is more expensive than other alternatives and/or generates uneconomic excess capacity in the overall marketplace. In either case, the subject OOM capacity depresses prices and squeezes out some amount of competitively offered capacity that would otherwise be supplied.

When these circumstances are present (i.e., when a procurer of load has the market power to unilaterally depress market prices and squeeze out competitors), state-

---

19 DPUC August 2007 Order at 21.

20 *Id.* at 27.

controlled load can find it attractive to effectively subsidize uneconomic OOM additions with benefits realized from suppressing the prices paid to third parties for supply. This price suppression means that such subsidization is effectively paid for by third party suppliers who would otherwise realize competitively-set market-clearing prices. That is, load's monopsonistic price suppression is effectively an extraction of revenues from third-party capacity suppliers.

Q WHY WOULD A BUYER EXERCISE MARKET POWER BY SUBSIDIZING NEW CAPACITY?

A As the foregoing analysis suggests, in exercising market power, a monopsonistic buyer (i.e., a buyer who can unilaterally move market-clearing prices by varying its level of demand in the FCM auction) benefits from lower capacity payments on *all* the supply it purchases in the market, while only bearing the increased cost of above-competitive OOM payments for the new capacity resource. Thus, such a buyer will gain from exercising market power if the resulting decrease in its FCM capacity payments to third parties is greater than the OOM payments to new capacity. For this to be the case, the buyer must be a sufficiently large purchaser of third-party capacity (or sponsor with control over sufficiently large purchases) in order for the benefits of its downward price manipulation to inure over enough volume of purchases to cover the cost of uneconomic OOM.

This is where the roles of state authorities and state-controlled ratepayer load become important. No individual ratepayer making up but a small fraction of overall market demand would realistically find it to be in its unilateral self-interest to procure uneconomic OOM in such quantity as to materially affect market-clearing prices in the FCM: The "benefits" of price suppression would be spread over all other consumers' purchases and inure in only a small amount to the erstwhile initiator of price suppression. In the case of ISO-NE, however, the capacity marketplace has market participants—in the form of utilities acting under the direction of state regulation and policy auspices of state policymakers—that either represent the interests of, or purchase capacity for, a substantial fraction of load. These large buyers and/or the state authorities that condition these buyers' conduct can find—and have found—the exercise of buyer market power attractive (at least in the short-run).

Q IS BUYER MARKET POWER A PARTICULAR PROBLEM IN THE FCM?

A Yes. The clearing price in electricity capacity markets is particularly sensitive to the exercise of market power because both demand and supply tend to be quite inelastic. Indeed, in the FCM, demand is treated as completely inelastic (i.e., unresponsive to price changes). Small changes in quantity in the FCM change can lead to large changes in price. In competitive markets, if an individual buyer attempts to exercise market power by artificially withholding demand in the hopes of inducing lower prices, even small and temporary reductions in price entice other consumers to step in to buy the available supplies and suppliers to cut back the volume they offer to the market. These responses put upward pressure on price and make the erstwhile attempt to exercise monopsony power in an otherwise competitive market unprofitable for the individual buyer. In a capacity market like the FCM, however, these responses are either muted or absent. This is illustrated in Figure 1, which shows the supply curve from ISO-NE's second FCA. With this supply curve, the clearing price would be \$6/kw-month if the ICR were 39.8 GW, but the clearing price would fall below \$5/kw-month if 500 MW of new OOM capacity were added (thereby effectively moving demand in the FCA to the dashed vertical line in Figure 1).

In fact, a fairly straightforward supply/demand analysis can guide state policymakers as to how to obtain the benefits of price suppression.[21] Before each forward capacity auction ("FCA"), policymakers can readily determine what the supply curve was for the last FCA,[22] as well as the current Installed Capacity Requirement (the "ICR"), which represents the total demand in the FCA. These provide ready foundations by which state authorities can form workable expectations regarding the impact of mandating procurement of OOM by their captive load. Notably, the steepness (inelasticity) of supply is evident from prior FCAs. As Figure 1 illustrates, this makes OOM procurement by state-controlled load particularly potent as a means of FCM price suppression. Using an estimate of the position of the supply curve based on prior auctions and contemporaneous expectations, policymakers can look at the point on the projected supply curve where quantity equals the ICR to estimate what the upcoming FCA clearing price will likely be. By looking X units of capacity to the left along the supply curve they project, policymakers can then readily estimate what the price would be if X units of extra OOM capacity were added. In terms of Figure 1, the resulting fall

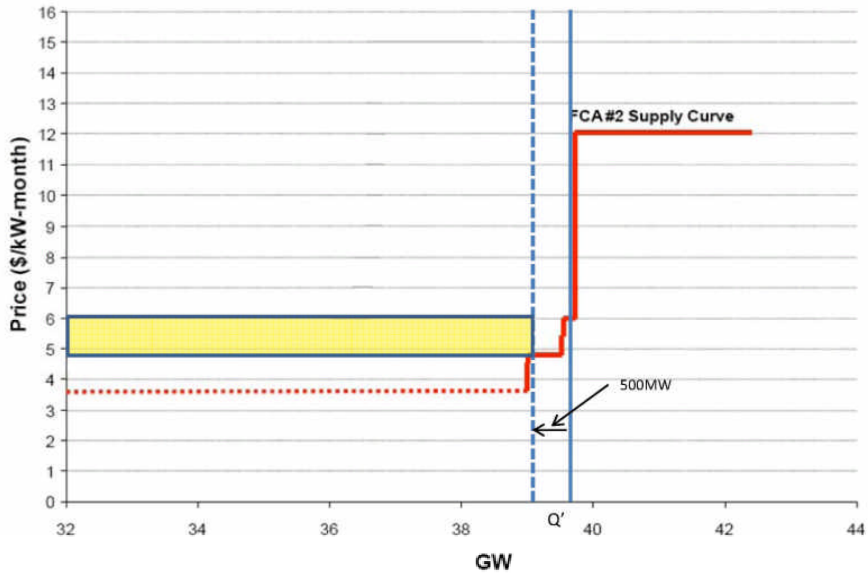
---

[21] *See, e.g.*, Rick Hornby *et al*., Avoided Energy Supply Costs in New England: 2007 Final Report (Jan. 3, 2008), http://www.synapse-energy.com/Downloads/SynapseReport.2007-08.AESC.Avoided-Energy-Supply-Costs-2007.07-019.pdf; Rick Hornby *et al.*, Avoided Energy Supply Costs in New England: 2009 Report (Oct. 23, 2009), http://www.synapse-energy.com/Downloads/SynapseReport.2009-10.AESC.AESC-Study-2009.09-020.pdf.

[22] ISO-NE's Internal Market Monitoring Unit has included the FCA Supply Curve as part of the report providing the assessment of the FCM the Unit is required to perform under the Market Rules and will presumably include the same information in its future reports. *See ISO New England Inc.*, Docket No. ER09-1282-000, Internal Market Monitoring Unit Review of the Forward Capacity Market Auction and Design Elements at 36 (June 5, 2009) ("Internal Market Monitor Report").

in price multiplied by the reduced quantity purchased in the FCA is shown as the shaded area in the figure.

Figure 1
Impact of Supply Changes on FCM Auction Results



Source: Internal Market Monitoring Unit Review of the Forward Capacity Market Results and Design Elements, ISO New England Inc., Market Monitoring Unit, June 5

In the example of Figure 1, the illustrated price suppression amounts to almost $600 million/year (i.e., a fall in price of $1.25/kw-month over a quantity of 39.3 GW). This area represents lost revenues for sellers in the FCA; and a state-controlled load's share of this area is its payoff to monopsonistic, downward price manipulation. The implication is unambiguous: The structure of the FCM allows large load interests to project correspondingly substantial price-suppression benefits from self-procuring significant amounts of uneconomic supply.

Q IS THERE EVIDENCE THAT UNECONOMIC SUPPLY ADDITIONS HAVE, IN FACT, RESULTED FROM STATE ACTIONS?

A Yes. The most significant examples of uneconomic supply additions that have affected the FCM have occurred in Connecticut. In 2007 and 2008, Connecticut state authorities initiated and oversaw the execution of various long-term contracts under which Connecticut utilities were required to be counterparties with new generation suppliers.[23] ISO-NE deemed the supplies obtained under these contracts to be OOM in the second FCA and the ISO-NE Internal Market Monitoring Unit noted the resulting significant excess capacity in the FCM.[24]

Q DO THESE CONTRACTS HAVE MECHANISMS THAT ENSURE UNECONOMIC SUPPLY WILL CLEAR IN FCM AUCTIONS?

A Yes. Connecticut has required owners of the capacity being built as a result of these contracts to make supply offers into the FCM at prices low enough to ensure that the capacity clears in the FCM auctions and does not set the auction price. For example, the authorized Kleen Contract between Connecticut Light and Power ("CL&P")—a major Connecticut utility with millions of captive customers—and Kleen Energy governs Kleen Energy's FCM bidding behavior. It specifies in Section 3.3(b)(a)(ii) that the contracted

[23] *See, e.g.*, *DPUC Review of Energy Independence Act Capacity Contracts*, DPUC Docket No. 07-04-24, Letter Filing, Exhibit 1, CfD Between the Connecticut Light and Power Company & Kleen Energy Systems, LLC (May 18, 2007) ("Kleen Contract"), *available at* http://www.dpuc.state.ct.us/dockhist.nsf/8e6fc37a54110e3e852576190052b64d/537623c7f0b37321852573800048a9f7?OpenDocument; *DPUC Review of Peaking Generation Projects*, DPUC Docket No. 08-01-01, Order No. 1 Compliance Filing, State of Connecticut Department of Public Utility Control, Peaking Generation Cost of Service Contract for Differences (Aug. 8, 2008) ("CT Peaking Contract"), *available at* http://www.dpuc.state.ct.us/dockhist.nsf/8e6fc37a54110e3e852576190052b64d/21658032cc48dd9585257773004dca42?OpenDocument.

[24] *See* Internal Market Monitor Report at 28, 33. There also appears to have been significant OOM capacity in the first FCA that ISO-NE did not deem OOM because new capacity could elect to be treated as existing capacity in the first FCA. In fact, 1,642 MW of qualified new resources was treated as existing capacity in the first FCA. *See ISO New England Inc.*, Docket No. ER08-190-000, Informational Filing for Qualification in the Forward Capacity Market at 6-7 (Nov. 6, 2007).

capacity be bid "such that it is not setting the Capacity Clearing Price." Similarly, the authorized CT Peaking Contract requires that the "[peaking] projects should be bid in a manner in which they do not set the clearing price in the FCM for a term of only one year," and that "[i]n all subsequent FCM auctions, the units must bid as price takers."[25]

Q ARE THE CONTRACTS STRUCTURED TO SPECIFICALLY ENSURE THAT CL&P MAKES CAPACITY PAYMENTS TO THE GENERATION OWNER WHENEVER THE CAPACITY IS UNECONOMIC?

A Yes. If bidding in the preceding manner and the associated FCA results do not yield the generation owner prices that allow full recovery of costs, this generation owner is protected. The aforementioned authorized capacity contracts are effectively "Contracts for Differences" ("CfD"). A CfD is typically structured so that payments under the contract are based in part on the difference between the prevailing price of a particular product, typically a reported market price, and the contract price negotiated by a buyer and seller. The seller does not need to directly provide the subject product to the buyer, but instead can sell into a transparent market in which the buyer purchases what it desires, with the buyer making up any shortfall between market revenues and the seller's costs. On the other hand, if market prices turn out to be higher than the contract price, the seller pays the buyer the difference.

The payment terms of the authorized CL&P contracts (e.g., Article 6 of the Kleen Contract) specify that CL&P will pay the difference between the contract price and the market clearing price whenever the latter is lower than the contract price.[26] Thus, if

[25] *See* CT Peaking Contract § 3.3 (b) (referencing Section II.K of its June 25, 2008 Decision in DPUC Docket No. 08-01-01).

[26] Although the CT Peaking Contract does not explicitly reference the FCM clearing price, it contains equivalent terms which specify CL&P will make payments that are calculated by taking the difference between the (contractually specified) cost-of-service prices and market revenues.

bringing this capacity into operation lowers the FCM clearing prices, then CL&P pays the uneconomic portion of the cost of the capacity that is covered by the contract. The result of relevance here is that the seller is effectively kept whole even when its own entry depresses market prices below the levels at which it could otherwise just afford to enter the industry.

Q WHAT ABOUT A STATE THAT WANTS TO ADD CAPACITY RESOURCES IN SUPPORT OF ITS OWN SPECIFIC OBJECTIVES SUCH AS SUPPORTING ALTERNATIVE, "GREEN" POWER SOURCES, ENCOURAGING DEMAND RESPONSE PROGRAMS, OR ENSURING LOCAL RESOURCE ADEQUACY? IS THAT "MONOPSONISTIC MANIPULATION"?

A Nothing in what I have said regarding the undesirable consequences of monopsonistic manipulation of FCM prices implies that state authorities should be precluded from pursuing benefits for their citizens that can arise from investments in environmental protection, power system reliability, and the like. Instead, the implication is that the social *benefits* that justify such investments in the cost-benefit considerations of state policymakers do not and should not include the "benefits" to load of having incumbent capacity sellers effectively pay for such investments via monopsonistic price suppression in capacity markets. The latter "benefits" are not net social benefits; they are transfers from one private interest (sellers of capacity) to another (buyers of capacity). As Professor McAdams points out in his companion testimony, the benefits to the public as a whole that the market may not fully account for and that can justify government intervention are such attributes as greenness and reliability, not monopsonistic price suppression.

In short, a state should not be precluded from pursuing objectives such as supporting alternative power sources or ensuring supply adequacy. Indeed, attendant benefits of environmental protection or system reliability should be taken into account in a proper cost-benefit analysis of capacity procurement, and such benefits might well justify procurement of otherwise high-cost, uneconomic capacity. Moreover, to the extent that excess costs do need to be covered in order to bring ratepayers or taxpayers the benefits of conservation, improved system reliability and the like, it is not a net burden on ratepayers or taxpayers to bear such costs when and if the subject investments are *efficient* (i.e., when their public benefits exceed their costs). Enabling authorities to go beyond these basic economics of the public interest such that they use "benefits" of monopsony to justify incurring of higher cost alternatives can readily lead to excess investment of the type at issue here. Blocking such outcomes entails "mitigation" which puts a floor under FCM prices at the level of competitively justified offers so that OOM payments, efficient or otherwise, do not alter prices.

B. The Impact of Buyer Market Power

Q WHAT ARE THE CONSEQUENCES OF THE UNMITIGATED EXERCISE OF BUYER MARKET POWER IN A MARKET LIKE ISO-NE'S FCM?

A In the short-run, the unmitigated exercise of buyer market power has three primary economic effects: 1) it causes quantity to rise above the efficient level (i.e., it creates excess capacity); 2) it causes some higher cost suppliers to replace lower cost suppliers; and 3) it depresses the market-clearing price. When the cost of new capacity exceeds the benefit consumers derive from that capacity (ignoring possible monopsonistic benefits from depressing the price of other supply), then this capacity is inefficient and investing in it is contrary to the overall national public's interests. Spending the nation's resources to create it reduces overall national economic welfare by the amount by which the cost of the new capacity exceeds the value (including system reliability) of the electric power it produces. From the perspective of the private interests of load, it generates net positive value *not* because it makes a contribution of output to the nation's economy which exceeds its cost, but because monopsonizing load is able to get others—third-party sellers who have already sunk their capital into the capacity they supply—to bear the lion's share of the costs of uneconomic OOM by effectively forcing them to accept a depressed market-clearing price.

Q WHAT ARE THE FINANCIAL IMPLICATIONS FOR INCUMBENT SELLERS OF EXISTING CAPACITY RESOURCES?

A As Figure 1 described above makes clear, in the short run the opportunistic behavior of state-controlled authorities results in existing capacity effectively bearing the excess costs of uneconomic additions of subsidized OOM capacity. That is, FCM market-clearing prices are depressed, which reduces capacity prices realized by existing resources.[27] This reduction in revenues puts pressure on existing resources to reduce operation and maintenance expenditures, forego needed capital investments, and/or retire prematurely. Moreover, existing capacity resources are effectively stranded in the face of such exactions because they cannot be simply moved to other geographic locations. Indeed, if incumbents' capital were not sunk, the competitive discipline arising from the threat that attempted monopsonization would be met with incumbents' simply leaving the market would make strategies of monopsonization fruitless.

---

[27] Depressing prices in this way also results in existing capacity providers being paid less than they would have otherwise. This payment reduction is similar to a regulatory taking and ISO-NE has recommended that this inequity be avoided through its proposed two-tier pricing framework. *See ISO New England Inc.*, Docket Nos. ER10-787-000, *et al.*, First Brief of ISO New England Inc. at 23-27 (July 1, 2010).

Q ARE THERE IMPORTANT LONG-RUN CONSEQUENCES OF THE UNMITIGATED EXERCISE OF BUYER MARKET POWER?

A As we have seen, the ability of state-controlled load to exercise monopsony market power depends critically on the fact that, in the short term, incumbent third-party suppliers cannot generally pick up quickly (except, perhaps, by pursuing limited export opportunities) and move to a more competitively priced region in the event of monopsonistic procurement practices in ISO-NE. On the other hand, investors in third-party supply who have not yet sunk their capital into the region can avoid the threat of expropriation by allocating their investments to other regions. With the "demonstration project" of monopsonistic state-sponsored procurement as a legacy, allowing the unmitigated, uncorrected exercise of buyer market power today can readily create the expectation that such conduct may be allowed—even touted by state policymakers—in the future. This prospect yields "once burned, twice shy" responses in which investors reduce their supply of capacity to the region or, if they are to be induced to continue to supply their capital to the region, they will expect premiums to cover the perceived risks of ongoing and/or future downward price suppression in the name of benefits for load interests. With such expectations, lenders and equity investors will demand higher returns from developers of new generation to account for the risk of future monopsonistic conduct in the FCM on the part of state-controlled load. Thus, the unmitigated exercise of buyer market power will raise the cost of new entry into the FCM going forward.

The adverse effects of manipulative regulatory strategies are evident in empirical research. In fact, economic research has repeatedly found that regulatory policies influence the riskiness—and, hence, the cost—of investment in new capacity.[28] This is unsurprising, given that regulation determines both the level of expected future revenues and how revenues change in response to changes in a firm's market. The cost of new entry turns centrally on two factors: the cost of construction and the cost of (i.e., return required by) capital. Like all projects, new capacity is financed with a mix of debt and equity and so the cost of debt plays a key role in determining the cost of new entry. Riskier projects are less likely to have sufficient revenues to repay their debts and so lenders charge higher interest rates to risky projects to account for this default risk. Because capacity is a sunk asset once it is brought to market, developers of new capacity must rely on regulators to take actions that do not result in *ex post* deterioration of opportunities for a reasonable return on their investment. When there is regulatory uncertainty in this regard, developers will face higher debt costs (and equity requirements) and the cost of new entry will be higher.

Although experience with recently deregulated electric capacity markets is still emerging, there is strong empirical foundation for the conclusion that prospects of adverse *ex post* regulatory exactions lead to higher debt costs and higher *ex ante* costs of entry. Research confirms that for regulated utilities, lower debt costs are associated with regulatory policies that help to ensure that new capacity investments have opportunities to realize fair rates of return, unencumbered by such factors as regulatory delay and the refusal to provide interim rate relief.[29] Similarly, research has shown that investment by

---

[28] *See, e.g.*, Ernst R. Berndt, Karen Chant Sharp & G. Campbell Watkins, *Utility Bond Rates and Tax Normalization*, 34 J. of Fin. 1211, 1211-20 (1979). *See also* Robin A. Prager, *The Effects of Regulatory Policies on the Cost of Debt for Electric Utilities: An Empirical Investigation*, 62 J. of Bus. 33, 33-53 (1989).

[29] *See* Prager, *supra* note 28.

independent power producers was reduced during the period of profound regulatory uncertainty that accompanied the electricity market restructuring of the last 15 years.[30]

Q ARE THERE OTHER IMPACTS BEYOND THE DIRECT IMPACT ON INVESTORS?

A Yes. Although the exercise of buyer market power is sometimes asserted to be justified on reliability grounds, the resulting suppression of capacity prices tends to reduce system reliability and increase the need for reliability must-run contracts. Owners of existing generation have a strong incentive to minimize downtime because their capacity payments can be reduced in response to plant outages. If capacity prices fall in response to the unmitigated exercise of buyer market power, incumbent generation owners will have incentives to cut back on maintenance costs, unit-level outage rates can be expected to increase, and generation unit reliability will suffer. Of course, this does not portend major system outages, but instead can be expected to result in increased reserve requirements and the need for unit-specific reliability must-run contracts, exactly what the FCM was designed to eliminate.

Q WHAT ARE THE IMPLICATIONS OF UNMITIGATED BUYER MARKET POWER FOR THE FUNCTIONING OF THE FCM?

A If bringing capacity to the FCM carries risks of monopsonistic manipulation by large buyers (or sponsors), sellers of capacity will have incentives to turn to long-term bilateral contracting as means of protecting themselves. Indeed, threats of monopolistic manipulation in the FCM give such contracting a comparative advantage, to the detriment of the FCM since the greater protection afforded by long-term contracting implies lower

30 *See generally* Jun Ishii & Jingming Yan, *Investment Under Regulatory Uncertainty: U.S. Electricity Generation Investment 1996-2000*, Working Paper (Mar. 2010), https://www3.amherst.edu/~jishii/files/regrisk_2010c.pdf.

costs of capital for entry through that channel. In fact, as Professors Milgrom and McAdams point out, developers of new capacity are already observed to be seeking protection against the prospect of monopsonistic auction results by avoiding the FCM and turning, instead, to bilateral contracting. The implication is a "thinning out" of the FCM, with attendant adverse implications for its viability as a means of price discovery and flexible balancing of supply and demand.

While, as Professors Milgrom and McAdams discuss, a well-functioning capacity marketplace has room for both shorter-term FCM-type transactions and longer-term bilateral procurement, the balance is properly a matter for efficient markets to determine. Biasing the system's evolution toward bilateral procurement by failing to mitigate monopsonistic manipulation in the FCM threatens the Commission's goals of market-driven, competitive industry structure. The end game could well end up being a return to systems in which state-controlled authorities effectively plan and direct the procurement of all or virtually all capacity. If that is the case, interstate markets in electricity and electric capacity will have moved back toward domination by state-level public utility regimes.

Q FROM A STATE'S PERSPECTIVE, IS THERE A CONFLICT BETWEEN ITS SHORT-RUN INTERESTS AND ITS LONG-TERM WELL-BEING?

A Yes, I believe there is. It is understandable that state authorities are under pressure to pursue monopsonistic price suppression on behalf of load in their jurisdictions to achieve lower prices. But doing so is not only contrary to the overall *national* public's interest in a healthy and efficient economy, it also portends adverse effects on the long-run well-being of a state that engages in monopsonistic practices in electric capacity markets. Governments the world over are subject to pressures to lower electricity prices because electricity is so broadly consumed. At the same time, however, research finds that "[w]ell defined and credible political institutions are positively and significantly correlated with national electricity generating capacity."[31]

The unhappy lesson of many societies is that pursuing short run payoffs (in the electric sector or beyond) by manipulating markets and burdening investors who have already been induced to sink their capital into affected markets ultimately drives investors and their capital away.[32] Over the long run, this is a recipe for economic underdevelopment. It does not serve the sustained interests of the very citizens it purports to support.

PROTECTING AGAINST THE EXERCISE OF BUYER MARKET POWER

Q HOW CAN ISO-NE'S FORWARD CAPACITY MARKET BE PROTECTED FROM THE EXERCISE OF BUYER MARKET POWER?

A As suggested above in connection with the discussion of potentially socially justified "green" or reliability investments, the design of the FCM should not reward monopsonistic price suppression. A market design which provides such reward encourages those with control over large amounts of buying in capacity markets with purely private "benefits" that are destructive to the public's interest in a healthy and efficient economic system. Professor McAdams, Dr. Shanker and Mr. Stoddard have proposed modifications to the July APR that allow for OOM payments and bilateral contracting, while ensuring that if uneconomic capacity clears as a result of OOM payments, it will not suppress capacity payments for existing capacity. The principle

---

[31] Mario E. Bergara, Witold J. Henisz & Pablo T. Spiller, *Political Institutions and Electricity Utility Investment: A Cross-Nation Analysis*, 40 Cal. Mgmt. Rev. 18, 24 (1998).

[32] *See generally* Douglass C. North, Institutions, Institutional Change and Economic Performance (1990).

they invoke under the specific circumstances presented here is appropriate: While the proposed mitigation would not alter payments made or received for OOM capacity developed under bilateral contracting, the FCM auction mechanism would prevent OOM capacity from artificially depressing FCM prices for existing resources which would have their capacity prices set by rerunning the FCM auction after mitigating OOM capacity bids to competitive levels.

Q SHOULD EXISTING OOM CAPACITY WHICH HAS ALREADY BEEN BROUGHT TO MARKET ALSO BE PREVENTED FROM HAVING ONGOING DEPRESSING EFFECTS ON FCM PRICES?

A Yes. The issue here is one of appropriate precedent. Nothing in what might realistically be accomplished with the Commission's design of the FCM is going to alter the fact that state authorities are in *de facto* control of large blocks of load. Thus, the underlying source of buyer market power will remain intact. Understandably, state authorities will, themselves, face incentives to exercise that power via whatever outlets might be available. Providing appropriate going-forward mitigation for monopsonistic manipulation of the FCM through OOM procurement without also limiting the flows of monopsonistic "benefits" attributable to prior manipulative conduct would inappropriately incentivize large buyers (including state-controlled load) to search for yet other means of artificially depressing FCM prices through anticompetitive practices.

Q DOES THIS CONCLUDE YOUR TESTIMONY?

A Yes.

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

ISO New England Inc. and New England Power Pool	)	Docket No. ER10-787-000
New England Power Generators Association Inc.	)	
	)	
v.	)	Docket No. EL10-50-000
	)	
ISO New England Inc.	)	
PSEG Energy Resources & Trade LLC, *et al.*	)	
	)	
v.	)	Docket No. EL10-57-000
	)	
ISO New England Inc.	)	

I, Joseph P. Kalt, being duly sworn, depose and state that the contents of the foregoing supplementary testimony on behalf of the New England Power Generators Association is true, correct, accurate and complete to the best of my knowledge, information, and belief.

Joseph P. Kalt

SUBSCRIBED AND SWORN to before me this 31st day of August 2010.

(Notary Public)

My commission expires: 2/10/2017

JENICE N. WILLIAMS
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
February 10, 2017

NEPGA Exhibit 7

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

ISO New England Inc. and New England Power Pool	)	Docket No. ER10-787-000
New England Power Generators Association, Inc.	)	
	)	
v.	)	Docket No. EL10-50-000
	)	
ISO New England Inc.	)	
PSEG Energy Resources & Trade LLC, *et al.*	)	
	)	
v.	)	Docket No. EL10-57-000
	)	
ISO New England Inc.	)	

SUPPLEMENTARY TESTIMONY OF DAVID L. MCADAMS PH. D.
ON BEHALF OF NEW ENGLAND POWER GENERATORS ASSOCIATION

SEPTEMBER 1, 2010

PART ONE: INTRODUCTION

Q PLEASE STATE YOUR NAME, TITLE, AND BUSINESS ADDRESS.

A My name is David McAdams. I am Associate Professor of Business Administration and Economics at Duke University. My business address is Fuqua School of Business, Duke University, Durham, NC 27708.

Q IS THIS YOUR FIRST TESTIMONY IN THIS PROCEEDING?

A No, I previously provided written testimony in this proceeding on July 1st, 2010. I refer readers to that prior testimony, especially for the definition of terms—such as "stand-alone economic cost," "lowest-cost resource," "uniform-price auction," and "truthful bidding"—and for background discussion.[1]

Q WHAT IS THE PURPOSE OF YOUR TESTIMONY HERE?

A In my previous testimony, I established the basic soundness of the revised Alternative Price Rule ("APR") outlined by ISO-NE staff in a June, 15 2010 presentation ("June APR"). Bob Ethier *et al.*, Draft Response to FERC Order of April 23, 2010 (June 15, 2010) ("ISO-NE Response"), http://www.iso-ne.com/pubs/pubcomm/pres_spchs/2010/final_prop_fcm_rev6_15_10.pdf. ISO-NE subsequently updated the June APR in its Opening Brief filed on July 1 ("July APR").[2] The External Market Monitor reached a similar conclusion in its July testimony: "Overall, we find the ISO-NE's revised proposal largely satisfies the concerns that we had identified in our March 15 comments and we

---

[1] *Testimony of David L. McAdams on Behalf of New England Power Generators Association*, NEPGA Exhibit 4 to Opening Brief of the New England Power Generators Association, Inc. ("McAdams Test.").

[2] In addition, I referred to the "Historic APR" which was in effect for the first three FCAs and the "February APR" which was proposed by ISO-NE in February, *ISO New England Inc.*, Docket No. ER10-787-000, Various Revisions to FCM Rules Related to FCM Redesign (Feb. 22, 2010) ("FCM Revision"), and preliminary adopted by the Commission in April, *ISO New England Inc.*, 131 FERC ¶ 61,065 ("Hearing Order"), *order on reh'g and clarification*, 132 FER ¶ 61,122 (2010).

commend ISO-NE on its broad effort to address the complex and controversial issues associated with the [Forward Capacity Market ("FCM")] reform."[3]

In this testimony, I will demonstrate the basic *unsoundness* of the February APR. In the record of this proceeding, there is broad recognition that the February APR is flawed. In its Hearing Order, the Commission indicated that the February APR rules "fail to fully adjust for the effect of out-of-market ("OOM") investment on the capacity price."[4] Lengthy, detailed, and compelling critiques are also provided in the March 15 comments of Dr. David Patton, the External Market Monitor, and in the testimony of Mr. Robert Stoddard and Dr. Roy Shanker on behalf of NEPGA. However, load interests took the surprising position in their July filings that the Commission ought not replace the February APR with another rule, despite the February APR's manifest flaws. At least from load's perspective, then, the February APR remains "on the table."

This makes it all the more important to convey *how poorly* the February APR is likely to perform whereas, by contrast, the July APR will produce an economically sound result. My testimony here will establish a stark contrast. Switching from the February APR to the July APR is not a matter of tweaking a few details, or adjusting a few dials, to optimize the performance of an already well-performing machine. Much is at stake. Indeed, given its fundamental flaws, reforming the February APR is essential to allow for the *possibility* of robust market-driven entry and exit in the FCM.

In addition, I will comment on a few other related topics. In particular, I will (i) discuss how to resolve a significant flaw in ISO-NE's proposed rule regarding when to

---

[3] *ISO New England Inc.*, Docket No. ER10-787-000, Comments of Potomac Economics. Ltd. for the Commission's Paper Hearing on Revisions to the New England Forward Capacity Market Rules at 3 (filed July 1, 2010).

[4] Hearing Order at P 85.

retire a resource's designation as OOM and (ii) critique two recent proposals by ISO-NE and by load to intensify the mitigation of seller-side market power.

Q PLEASE SUMMARIZE THE MAIN POINTS OF THIS SUPPLEMENTARY TESTIMONY.

A In the course of my testimony here, I will establish eight main points.

First, <u>the July APR does not discourage efficient OOM entry</u>. If there were no OOM entry (and truthful bidding), the Forward Capacity Auction ("FCA") under the July APR would induce the lowest-cost new resources to enter the market when new entry is needed. However, it is possible that the lowest-cost new resources are not the most efficient, if high-cost resources provide unpriced benefits to load. Inducing such high-cost resources to commit to enter before the auction can increase overall welfare. Despite states' protestations to the contrary, the July APR does *not* discourage such efficient OOM entry.

Second, <u>the February APR encourages high-cost OOM entry</u>. The February APR fails to adequately address the price-suppressing effect of OOM. In particular, load stands to benefit by suppressing prices when inducing high-cost resources to enter the market that would not otherwise have cleared in the FCA. By contrast, OOM entry by lowest-cost resources (that would have cleared in-merit) has no effect on the auction price. Thus, the February APR perversely skews load's out-of-market procurement decisions to favor high-cost resources.

Third, <u>the February APR sows the seeds of a vicious cycle that could undermine the basic functioning of the FCM</u>. States such as Connecticut have clearly articulated their vision of the future of the FCM, a future *without* a robust market alternative to state-sponsored bilateral contracts:

> CT DPUC states that given recent economic and environmental developments, most, if not all, new generation resources in New England will be backed by multi-year bilateral contracts that pay developers independently from the FCM. CT DPUC argues that because the APR was designed assuming the FCM revenue streams would be sufficient to stimulate new investment, and because this assumption no longer holds true, the Rule Changes to the APR are just and reasonable.[5]

As long as most resources are backed by long-term contracts or, more precisely, as long as most *new* resources are backed by long-term contracts signed *before* the FCA, the auction will neither identify the lowest-cost resources needed to meet the Net ICR, nor generate any meaningful signal about the marginal social value of adequacy reserve capacity. Indeed, as long as the flow of new entry is dominated by resources that are already committed to enter, regardless of FCA outcomes, auction prices could be so suppressed as to force new resources to seek OOM contracts as the only viable means of entry.

Fourth, this vicious cycle is unnecessary, since <u>much of the putative efficiency benefits of OOM entry could be achieved by auction-based entry</u>. The states have argued that, given current market and non-market conditions, new resources in the FCM need to sign long-term contracts to be viable. In particular, one of their main arguments is that new resources are presently unable to obtain financing without a long-term contract in place:

[5] Hearing Order at P 60.

> CT DPUC argues that financial markets have demanded bilateral contracts in order to finance new generating facilities.[6]

Yet load cannot plausibly blame financial markets for the waves of load-sponsored OOM that have flooded the FCM in recent years. Even if capital were sufficiently skittish to demand long-term contracts, such skittishness does not provide any rationale for signing long-term contracts *before* the auction. Quite the contrary, sources of capital might well prefer to wait until *after* the auction has reduced uncertainty by identifying the lowest-cost resources needed to meet the Net ICR, before committing to fund a new project. And, if all resources were to wait until after the auction to sign long-term contracts (or remain as merchant resources, if that were preferred), then the auction could "do its work" of identifying and employing the lowest-cost resources needed to meet the Net ICR. For this reason, there is hope that auction-based new entry—even if not all "merchant" new entry in the purest sense—could rebound and thrive in the future, if only load's perverse incentive to sponsor high-cost OOM could itself be eliminated.

Fifth, <u>the price-suppressing effect of high-cost OOM needs to be mitigated</u>. Some high-cost OOM resources may be procured for reasons other than price suppression.[7] Regardless of intent, however, all high-cost OOM entry suppresses present and future auction prices. If left unmitigated, this price-suppressing effect will dampen merchant resources' expectations about future auction prices, potentially triggering the same sort of vicious cycle *as if* such OOM had been procured with the intent to suppress prices and destroy the long-term viability of the auction market.

---

6 *Id.*

7 As I will discuss, it may be efficient to procure some new resources outside of the auction. Further, some OOM might be procured by entities having no incentive to suppress the auction price.

Sixth, the July APR still does not fully correct for the price-suppressing effect of high-cost OOM. A problem remains with the July APR's rule specifying when OOM-designated resources stop being treated as OOM by the auction rules. (As shorthand, I will refer to this as the *"OOM-removal rule"* since it specifies when resources are removed from the OOM tally.) In its Hearing Order, the Commission recognized a potentially serious problem with the February APR's OOM-removal rule, which specifies that "no OOM resource that first clears after the third FCA would be considered [as OOM] in more than six subsequent FCAs (for a total of seven FCAs)."[8] This rule creates the following "possible loophole in the application of the APR":

> [U]nless such effects are adequately considered, an entity that represents a sufficiently large share of ISO-NE load could avoid mitigation in future years (and, in principle, indefinitely into the future) by investing in sufficient OOM capacity so as to eliminate the need for new capacity.[9]

ISO-NE proposed a new OOM-removal rule as part of its July APR. Rather than automatically removing resources from the OOM tally after seven FCAs, the July APR would remove resources from the OOM tally *on the basis of seniority*, on a one-for-one basis whenever load growth and/or resource retirements decrease excess supply. Unfortunately, as I will illustrate with a simple example, this rule again leaves an opening for load to simply and effectively suppress the auction price paid to existing capacity. Further, such price suppression is only effective when load sponsors *high-cost* new resources that would not have otherwise cleared in the auction. Thus, the July APR continues to provide load with a perverse incentive to procure high-cost OOM resources.

[8] Hearing Order at P 78.

[9] *Id.* at 83.

Seventh, there is a simple and intuitive way to fix the July APR's OOM-removal rule, so that load enjoys no extra benefit (and incurs no extra cost) when procuring high-cost resources outside of the auction. Suppose that, rather than removing resources from the OOM tally on the basis of seniority as under the July APR, when load growth and/or resource retirements reduce excess supply, we were to remove resources from the OOM tally on the basis of cost, with the cheapest OOM resources removed first. Such a rule removes each resource from the OOM tally *when it would have cleared* in the FCA (holding in-merit participation fixed in all auctions). Under this rule, load no longer gets any price-suppressing benefit from inducing high-cost resources to enter the market as OOM. Thus, load will only have an incentive to contract with such high-cost resources when load is *itself* willing to bear the incremental cost of inducing such resources to enter the market when new capacity is not needed, or when there are lower-cost alternatives to meet the demand for new capacity.

Finally, I will discuss the principles of proper market power mitigation, and how those principles have been misapplied in two recent proposals to increase the mitigation of suppliers' bids. In particular, I will demonstrate that ISO-NE's proposal to lower the threshold price for all Dynamic De-list Bids to $1/KW-month and load's proposal (put forth by Professor Seth Blumsack) to mitigate competitive offers from resources possessing structural market power will needlessly *create* inefficiencies in the FCM.

Q HOW IS THE REST OF THIS TESTIMONY ORGANIZED?

A Part Two develops background, including a discussion of states' request for proposal ("RFP") processes for new capacity and of the putative efficiency benefits of out-of-market procurement of new resources. Part Three establishes flaws inherent in the

February APR that will disrupt the efficient functioning of the capacity market. Part Four considers the July APR further, including a discussion of one area in which the July APR needs to be improved. Part Five concludes with a discussion of market-power mitigation.

PART TWO: BACKGROUND – MARKETS AND ALTERNATIVES

Q WHAT IS THE PURPOSE OF THIS PART OF YOUR TESTIMONY?

A In this section, I will discuss the potential efficiency advantages and disadvantages of two polar modes by which transactions can be organized—(i) "market exchange" and (ii) "bilateral exchange"—as well as (iii) "mixed exchange" allowing both market-based and bilateral transactions to occur side by side. My reading of the Commission's market-design guidance is that it envisions the FCM as one that promotes mixed exchange, in which the most efficient merchant resources are induced to enter the market through an auction (market exchange) *while at the same time* load is permitted to self-supply and otherwise sponsor new entry (bilateral exchange) should doing so be most efficient.

I support this vision of a mixed-exchange market, as it allows for the efficient deployment of merchant resources while not foreclosing the potential benefits of bilateral contracting. However, there is a danger with mixed-exchange markets that one mode of exchange may inefficiently "crowd out" the other. In Part Three, I will show that the February APR dangerously skews transactions in favor of bilateral exchange, so much so that it is likely to undermine the basic functioning of the auction market. Fortunately, in Part Four, I will then show that the July APR (once slightly modified) restores balance to the FCM, establishing a more level playing field that will encourage market exchange when market exchange is most efficient, or bilateral exchange when bilateral exchange is most efficient.

Q WHAT DO YOU MEAN BY “MARKET EXCHANGE”?

A A “market” is an institution that brings all buyers and sellers together to facilitate trade.[10] For example, in a farmer’s market, farmers display their products side by side at a specified time and place. This allows buyers to compare products and prices more easily, inducing greater competition while at the same time reducing transaction costs. Similarly, the FCA is an auction market that implicitly compares all offers by qualified resources when assigning capacity supply obligations. “Market exchange” refers to trade that is facilitated by a market.

Q WHAT DO YOU MEAN BY “BILATERAL EXCHANGE”?

A “Bilateral exchange” is trade that is not facilitated by a market. Without a market to bring players together, buyers and sellers must find each other and then decide whether to strike a deal without knowing what terms of trade would have been offered by those they have not yet negotiated with.[11]

Q WHAT DO YOU MEAN BY “MIXED EXCHANGE”?

A Under “mixed exchange,” some buyers and sellers transact through a market, while others transact through bilateral contracts negotiated outside of that market.

---

[10] Separately, the term “market” is also used to refer to a collection of buyers and sellers whose (real and potential) interactions determine the price, production, and consumption of a product, e.g., the “market for real-estate” or the FCM.

[11] In my testimony here, I largely abstract from the complex reality of how the terms of “bilateral exchange” are determined (or would be determined, absent a robust market alternative) in the FCM, treating such exchange as if proceeding via bilateral or multilateral contract negotiations. In fact, third-parties such as state legislatures can be instrumental to provide inducements (e.g., tax breaks) that *effectively* commit targeted resources to enter before the auction, even if no “contract” is signed.

Q SEVERAL STATES HAVE MANDATED "COMPETITIVE RFP" PROCESSES TO PROCURE NEW RESOURCES. ARE THESE EXAMPLES OF "MARKETS," IN THE SENSE JUST DEFINED?

A Unfortunately, no. Several states have conducted RFP processes for the procurement of new resources. For example, Connecticut's Energy Independence Act and Massachusetts' Green Communities Act each mandated an RFP to procure new resources. These RFPs are *not* "markets," as I will use that term in this testimony, since they prohibit participation by existing resources and hence do not bring together *all* buyers and sellers. By contrast, the FCA is designed to encourage participation by all potential sources of adequacy reserve capacity.

Another key difference is that the FCA is organized and run by an independent third party charged with the long-run efficiency of the regional market, while state authorities have a direct interest in market outcomes that lower the cost of adequacy reserves.[12]

Q EXCLUDING EXISTING RESOURCES RAISES THE COST OF RESOURCES PROCURED THROUGH AN RFP. WHY WOULD STATES DO THAT?

A There are many possible reasons why a state might exclude existing resources. For instance, if the state's policy objective is to increase the installed base of some particular type of energy resource—such as wind—then it is natural to restrict participation to new resources of that type. On the other hand, it is also possible that some states may have

---

[12] Sufficiently foresighted state authorities would also seek to maximize the long-run efficiency of the energy market in their state, as doing so provides long-term benefits to consumers. However, as Professor Kalt notes in his testimony, it is natural for elected officials to focus more on short-run benefits to energy consumers, as opposed to long-run efficiency concerns. *Testimony of Joseph P. Kalt on Behalf of New England Power Generators Association*, NEPGA Exhibit 6 at 4:20-5:9.

had an ulterior motive to manipulate payments made in the FCA. Indeed, this is not a matter of speculation, given the *public* findings of the Connecticut DPUC:

> The Connecticut legislature mandated that the Department issue an RFP to procure new or incremental capacity to reduce the impact of FMCCs [Federally Mandated Congestion Charges] on Connecticut ratepayers.[13]

> [E]ven if the contracted capacity is a small portion of the supply meeting Connecticut's requirements, these contracted resources are expected to lower the market clearing price and therefore reduce costs to all load.[14]

By restricting participation to new resources only, Connecticut decreased the need for new capacity to be procured in future auctions and hence suppressed the price paid to existing resources, now and in the future. By contrast, if existing resources were allowed to compete on an equal footing with new resources, then such an RFP would have no price-suppressing effect.

Q WHAT POTENTIAL ADVANTAGES DOES MARKET EXCHANGE HAVE OVER BILATERAL EXCHANGE?

A Market exchange can offer several sorts of advantages over bilateral exchange. *First*, the market serves as a coordinating device that lowers search costs. Lower search costs translate into greater participation, by both buyers and sellers. In the context of the FCM, absent the exercise of market power, the FCA provides a low-cost mechanism by which new resources can determine whether and when to enter the market. This expands the

---

[13] *DPUC Investigation of Measures to Reduce Federally Mandated Congestion Charges (Long Term Measures)*, CT DPUC Docket No. 05-07-14PH02, Second Interim Decision, at P 2 (Nov. 16, 2006), *available at* http://www.dpuc.state.ct.us/dockhist.nsf/8e6fc37a54110e3e852576190052b64d/7e7c37d2ff13354a85257323007814af?OpenDocument.

[14] *DPUC Review of Energy Independence Act Capacity Contracts*, DPUC Docket No. 07-04-24, Decision at 34 (Aug. 22, 2007), *available at* http://www.dpuc.state.ct.us/FINALDEC.NSF/0d1e102026cb64d98525644800691cfe/bb19bc5f456023468525733f006a64d3?OpenDocument.

universe of potential supply and makes it possible for the lowest-cost resources to be used to meet the Net ICR. *Second*, since competing market offers are easily compared—in the FCA, the auction mechanism itself compares offers without requiring bidders to observe all bids—market exchange tends to exhibit <u>increased competition</u>. Increased competition, in turn, increases the likelihood of an efficient outcome in which the lowest-cost resources are used to meet the Net ICR. *Third*, markets offer <u>transparency</u>; this is especially true of auction markets such as the FCA, in which all bids are observable by a market monitor and the rules of the game are set by an impartial third-party. *Finally*, by not allowing players to make customized offers to specific counter-parties, a *uniform-price* auction market limits players' ability to exercise their market power. Namely, while players with market power may be able to influence the market-clearing price in the auction, they <u>cannot price discriminate</u> in the manner that is possible with a bilateral contract.[15]

Q ARE THESE POTENTIAL ADVANTAGES OF MARKET EXCHANGE RELEVANT IN THE FCM?

A As discussed above, market exchange presents several advantages in the context of the FCM, including:

(1) *<u>Greater participation</u>*.

(2) *<u>Increased competition</u>*.

(3) *<u>Transparency</u>*.

---

[15] Players may still negotiate bilateral contracts in parallel with the auction, but the fact that players have the *option* to participate in a well-functioning auction market limits the scope of price discrimination that can be implemented through such contracts.

(4) *No unit-specific price discrimination*.[16]

The benefits of greater participation, increased competition, and transparency are well understood and appreciated. Less obvious, but also potentially important, is the fact that market exchange limits players' ability to price discriminate by customizing contractual terms on a unit-by-unit basis. Such unit-specific price discrimination in the FCM will tend to create inefficiencies *in addition to* those created by the exercise of market power in the FCA.[17] Indeed, as I will argue in Part Three, a potentially serious drawback of bilateral exchange in the FCM—should it be unchecked by the option to participate in a well-functioning auction market—is that price discrimination in bilateral negotiations may lead to inefficiencies in which *self-supply by load* is inefficiently favored. Unchecked bilateral exchange could therefore lead to inefficient vertical integration of the adequacy reserve market, as load favors its own resources over the lowest-cost resources.

Q WHAT POTENTIAL ADVANTAGES DOES BILATERAL EXCHANGE HAVE OVER MARKET EXCHANGE?

A Bilateral exchange can offer several sorts of potential benefits over market exchange, in certain circumstances.[18] I will focus here on two specific potential benefits of long-term

---

16 Contracting with new resources outside of the FCA has the effect of enabling load to practice a different sort of price discrimination as well, paying existing resources a low price while covering new resources' higher costs of new entry. I use the term "unit-specific price discrimination" to distinguish these two sorts of price discrimination.

17 Economics textbooks routinely emphasize that monopoly price discrimination can be more efficient than monopoly uniform pricing. The reason is that having the option to price discriminate may induce the monopolist to (efficiently) increase the quantity sold. However, in the context of the FCM, load already has an incentive to induce excess supply. Thus, the beneficial "quantity effect" of price discrimination is not relevant in the FCM. *See* Part Three for a detailed discussion.

18 Many of the theoretically-possible benefits of bilateral exchange—not fully enumerated here—seem implausible in the context of the FCM. For instance, architects devote significant time and energy when preparing a bid for a home renovation. By soliciting quotes and negotiating with only a few architects, home-owners sacrifice competition but gain architects' attention and effort in preparing a quality bid. Such bid-preparation costs appear to

contracts in the FCM that I have seen mentioned in the record: "hedging" and "encouraging green power."

Q PLEASE ELABORATE, FIRST, BY COMMENTING ON THE POTENTIAL BENEFITS OF "ENCOURAGING GREEN POWER"?

A In their legal briefs, the states have argued that they have a public-policy interest in encouraging wind and other "green resources" to enter the market, and that such resources would be unable to clear in the auction market without having already secured a long-term contract. If indeed green power is systematically more expensive than the resources that would otherwise clear in the FCA, then green resources typically will not clear in-merit in the FCA, even if states are willing to pay a premium for such resources.

Load's inability to express its willingness to pay extra for green resources is potentially a limitation of the uniform-price auction format used in the FCA. For example, suppose that the customers of a particular load-serving entity ("LSE") would be willing to pay more for power that is generated by green resources. Bilateral contracts can provide a means for load to induce such resources to enter the market, even when they are too expensive to have cleared in the auction. (Although such capacity is not among the lowest-cost resources in the market, it could be efficient if it creates unpriced benefits to the LSE that sponsors it.) Further, contracting *before* the FCA is essential to enjoy any such efficiency benefit of encouraging green power to enter the FCM.

be insignificant in the FCM. Indeed, since the FCM rules have effectively reduced the product to a commodity measured in the auction only by price, many of the customizable terms of a bilateral power contract are not in play, significantly reducing bid-preparation costs.

Q DOES THIS MEAN THAT OOM SHOULD NOT BE MITIGATED, WHEN IT CAN BE JUSTIFIED ON THE BASIS OF A VALID POLICY OR BUSINESS OBJECTIVE?

A No, not at all. The reasoning of my previous answer *only* supports the notion that load should be *allowed to sponsor* OOM, by signing long-term contracts before the auction with resources for which it is willing to pay a premium. However, as far as I am aware, no party to this proceeding is suggesting that states or other load interests not be allowed to sponsor OOM to achieve their own policy objectives. (Indeed, as far as I am aware, no party is proposing *any* restrictions on OOM sponsorship, despite its potential to disrupt the proper functioning of the FCM.)

The debate here is merely about what should happen if load decides to bypass the market so as to induce entry by resources that are not among the lowest-cost resources available to satisfy the Net ICR.[19] Should such entry be permitted to undercut the long-term sustainability of the market by artificially lowering the price paid to other resources? Or should load bear the incremental cost associated with procuring a resource that is more costly than others that would have been available to satisfy the Net ICR?

The answer is clear, if what one cares about is the efficiency of the FCM. Load should bear the incremental cost associated with out-of-market procurement of high-cost resources since, when it bears this extra cost, load has an economic incentive to sponsor such resources only when such resources provide enough extra benefits to load to be efficient despite their higher cost.

---

[19] Load does not bear any extra cost when bypassing the market to induce *lowest-cost* resources to enter, under either the February APR or the July APR. Such resources will demand payment equal to the expected price paid to new resources in the FCA (minus a risk premium, if the auction price is uncertain and the resource in question is risk averse). By signing a "contract for differences" with such resources, load will then receive an expected auction payment equal to (or greater than) the contract price that it pays, for no net expected loss.

Q WHAT ABOUT RESOURCES THAT ARE NOT PROCURED WITH THE INTENT OF SUPPRESSING AUCTION PRICES?

A Some resources may be procured outside of the auction market *without the intent* of manipulating auction prices. For example, a small LSE that commits before the auction to self-supply does not stand to gain from the price-suppressing effect of that commitment. Load's expert Mr. James Wilson has argued that the price-suppressing effect of OOM entry should not be mitigated, if such entry was not an intentional exercise of market power.[20] Such arguments are beside the point. The price-suppressing effect of OOM entry needs to be mitigated in order to preserve the viability of market exchange in the FCM, regardless of intent.

Q NEXT, PLEASE COMMENT ON THE POTENTIAL BENEFITS OF "HEDGING."

A Long-term bilateral contracts can allow new resources to reduce financial risk. However, OOM contracts are by definition signed *before* the auction, and contracts signed just *after* the auction would also allow resources to hedge most of that risk. Thus, it is unclear what (if any) hedging benefit new resources enjoy by signing an OOM contract. Further, while long-term contracts allow new resources to hedge their risk, they do so by transferring that risk onto load.

Q WHAT IS WRONG WITH TRANSFERRING FINANCIAL RISK ONTO LOAD?

A Ultimately, load's financial risk is likely to be passed through to rate-payers, who are themselves not in a position to diversify that risk. As Professor Milgrom notes in his

---

[20] *ISO New England Inc.*, Docket Nos. ER10-787-000, *et al.*, The Joint Filing Supporters' First Brief, Exhibit DPUC-3, Direct Testimony of James F. Wilson on Behalf of First Brief of the Joint Filing Supporters at 10:4-14 (July 1, 2010).

testimony, "[s]uch a transfer assigns the financial risk narrowly and inflexibly onto just New England utility consumers, which is inefficient and unnecessary."[21]

Q ARE OOM CONTRACTS EVEN NECESSARY TO TRANSFER FINANCIAL RISK FROM NEW RESOURCES ONTO LOAD?

A Suppose for the moment that a new resource would like to transfer its financial risk onto load, and that load is willing to bear that risk. Load's argument in favor of OOM contracts depends on the implicit assumption that such contracts are necessary to achieve such a transfer of financial risk. In fact, alternative approaches exist to transfer such risk *without* suppressing auction prices. In particular, long-term contracts signed *after* the auction can also transfer onto load all financial risk associated with uncertain future market conditions. Further, unlike OOM contracts, contracts signed after the auction will not suppress auction prices or otherwise introduce inefficiencies into the FCM. (See the next Q&A for more discussion of this point.).

From the perspective of transferring financial risk, the only difference between long-term contracts signed before versus after the auction is that those signed before the auction also allow new resources to transfer the risk that *today's auction price* may be higher or lower than expected. However, as long as the FCM has substantial excess supply—as it does today—the auction price is very likely to be close to the price floor. Indeed, as long as the FCM continues to be flooded with OOM capacity, there is no "hedging" rationale whatsoever for OOM contracts. All financial risks that can be transferred onto load by OOM contracts could also be transferred onto load by long-term contracts signed after the auction. Furthermore, long-term contracts signed after the

[21] *Testimony of Paul R. Milgrom, Ph.D. on Behalf of New England Power Generators Association*, NEPGA Exhibit 5 ("Milgrom Test.") at 6:20-22.

auction provide several efficiency benefits, relative to OOM contracts signed before the auction.

Q WHAT ARE THE EFFICIENCY BENEFITS OF WAITING UNTIL *AFTER* THE AUCTION TO SIGN BILATERAL CONTRACTS?

A If new resources wait until after the auction to sign long-term contracts, the auction can serve to <u>identify the lowest-cost resources</u> available to meet the Net ICR. Signing contracts before the FCA that guarantee a long-term return effectively selects "who wins" the auction, since any bidder with such a contract in hand will be willing to enter the FCM regardless of the auction price. Thus, the practice of signing pre-auction contracts has the tendency to thrust load into the role of "gatekeeper to the FCM."

By contrast, if load were to wait until after the auction to negotiate long-term contracts with newly-entering resources, load would have no incentive to favor high-cost resources *per se*. Indeed, load's negotiations with any such new resources would be anchored primarily by the revenues that such resources can expect in spot energy markets should they fail to reach a long-term agreement. In particular, new resources having lower costs will expect to emerge from such negotiations more profitable on a going-forward basis, compared to high-cost resources. Consequently, low-cost resources will be willing to accept lower FCA payments to enter the market and hence bid less—reflecting their stand-alone economic cost—to be efficiently selected by the FCA.

Q ARE YOU SUGGESTING OR PROPOSING THAT LONG-TERM CONTRACTS BE SIGNED ONLY AFTER THE AUCTION?

A No, not at all. My goal here has been just to probe the putative efficiency benefits of long-term contracts signed before the auction that create OOM and artificially suppress prices in the FCM. Even if such OOM contracts provide no efficiency advantages over those signed after the auction, there remains a powerful rationale for new resources to sign OOM contracts so long as load is actively suppressing auction prices. Further, forbidding such contracts would be unwise in today's load-distorted market environment.

Q WHAT IS THE RATIONALE FOR OOM CONTRACTS THAT REMAINS, EVEN IF SUCH CONTRACTS PROVIDE NO EFFICIENCY BENEFITS?

A Quite simply, OOM contracts allow new resources to avoid having to face the prospect of artificially-suppressed auction prices. Once a resource has committed to enter the FCM via the auction, it loses all leverage in its negotiation with load over a long-term contract. Consequently, a new resource that has already committed to enter in the auction can only expect to receive a long-term contract that reflects the revenues that it can henceforth receive as a merchant resource. In other words, <u>new resources cannot expect to be subsidized unless they contract with load before the auction</u>, when they retain the leverage and credible threat of not entering the FCM.

Thus, OOM contracting need not provide any efficiency benefit in order to thrive in the FCM. Indeed, as more resources sign OOM contracts and the auction price is further artificially suppressed, even more resources become compelled to sign OOM contracts themselves in order to justify entry into the FCM.

Q OVERALL, WHAT IS MOST EFFICIENT IN THE CONTEXT OF THE FCM: MARKET EXCHANGE, BILATERAL EXCHANGE, OR MIXED EXCHANGE?

A There is no simple answer. As discussed above, market exchange provides several powerful advantages over bilateral exchange, but bilateral exchange might also offer important advantages in some circumstances, for some transactions. Further, it is easy to imagine that these benefits might change over time in response to changing circumstances, tilting the efficiency balance for some transactions from market exchange to bilateral exchange, or vice versa. For instance, states that are currently willing to pay a premium to induce "green" resources to enter the FCM might change that stance if a national carbon tax were imposed that gave such units a cost advantage that states felt was appropriate. (If so, states would prefer to let the auction do its work of determining the least-cost way to satisfy the Net ICR, taking the carbon tax into account.)

Bearing that in mind, my judgment is that the FCA should be designed with an eye to induce market exchange when market exchange is most efficient, and to induce bilateral exchange when bilateral exchange is most efficient.

Unfortunately, the design of the February APR is fundamentally flawed, so dangerously skewed against market exchange that market-based entry could be essentially foreclosed even when market exchange is most efficient (see Part Three). Fortunately, the July APR restores more balance to the FCM, allowing for the possibility that market exchange will thrive when market exchange is most efficient while *not* disadvantaging bilateral exchange when bilateral exchange is most efficient (see Part Four).

PART THREE: THE FEBRUARY APR UNDERMINES MARKET EXCHANGE

Q WHAT IS THE PURPOSE OF THIS PART OF YOUR TESTIMONY?

A In this part of my testimony, I will discuss why the design of the February APR encourages bilateral exchange to displace market exchange, even when market exchange would be more efficient. In particular, the February APR gives load both the ability and the interest to displace efficient auction-based new entry with inefficient OOM capacity. Near the end of Part Four, I will return to this point and discuss (i) why the July APR only *partially* corrects this concern and (ii) how this concern can be resolved by a further refinement of the rule specifying *which* OOM resources to carry forward.

Q WHY WOULD LOAD INTERESTS EVER HAVE AN INCENTIVE TO SPONSOR *INEFFICIENT* OOM CAPACITY?

A There are potentially two distinct reasons why load could have an incentive to sponsor inefficient OOM. *First*, the February APR only partially corrects for the effect of OOM on the auction price and, further, the February APR provides load with a loophole to evade even this partial corrective. Thus, load has an incentive to sponsor OOM entry because of its price-suppressing effect in the auction. Indeed, since low-cost OOM entry—which would have cleared in the FCA with or without out-of-market support—has no effect on the market-clearing auction price (see the next Q&A), load's incentive is specifically, and perversely, to induce OOM entry by resources that are *more* costly than other resources that were also available.

Second and more subtly, suppose that the auction price were so suppressed—perhaps due to the first effect described above—so as to foreclose auction-based entry as a feasible option for merchant resources. In that scenario, signing a bilateral contract with load becomes the only practical way by which to enter the FCM. Unfortunately, without a well-functioning auction market to check their oligopsony power, load-serving entities in such a scenario would have an incentive to exert their market power through price discrimination that, among other negative effects, inefficiently favors self-supply. (I will discuss this point later.)

Q WHY DOES LOW-COST OOM ENTRY NOT HAVE ANY EFFECT ON THE AUCTION PRICE?

A By signing long-term contracts that effectively commit new resources to enter the FCM before the auction, load induces these resources to bid zero in the auction. If these new OOM resources are among the lowest-cost resources, the market-clearing price in the auction will be the same as if they had not signed any contract. So, sponsoring low-cost OOM resources brings no price-suppressing benefit. On the other hand, the presence of high-cost OOM lowers the market-clearing price by displacing other, less-costly resources that would have set the auction price.

Q WHY DOESN'T THE FEBRUARY APR FULLY CORRECT FOR THE EFFECT OF OOM ON THE AUCTION PRICE?

A The February APR is only triggered when there is need for new capacity, after subtracting (i) OOM resources that entered in the current or previous six FCAs and (ii) resources whose de-list bids were rejected for reliability reasons. Such a formulation leaves two significant gaps. *First*, the presence of OOM can suppress the auction price when there is no need for new capacity, but this price-suppression is uncorrected by the February APR. *Second*, again under the February APR, OOM resources lose their OOM status after seven years and are counted among the "in-merit" resources that determine whether or not the APR is triggered. This "seven-year loophole" creates an opportunity for load to suppress the auction price both permanently and dramatically.

In particular, suppose that load sponsors a stream of enough OOM so as to have excess capacity sufficient to cover seven years of load growth and retirements. Such a scheme would avoid triggering the APR now or anytime in the future, guaranteeing very low auction prices now and forever. This would have the two-fold effect of (i) eliminating the auction market as a feasible avenue for merchant entry into the FCM and (ii) elevating load to the status of "gatekeeper to the FCM," since the only remaining avenue for entry into the FCM would be a bilateral contract with load.

Q WHAT'S WRONG WITH LOAD SERVING AS "GATEKEEPER" TO THE FCM, AS LONG AS THE NET ICR IS SATISFIED?

A If the auction price paid to reserve capacity is consistently suppressed by load's OOM sponsorship, the auction will not provide sufficient incentive for the lowest-cost merchant resources to enter when new entry is needed. Indeed, a new entrant's only option to cover its costs of new entry will be to approach load in hopes of securing a long-term contract. Load has a strong incentive to sign enough such contracts so that the Net ICR remains satisfied—if the FCM were to require merchant new entry, then the price that load pays in the FCA on all of its net demand would increase to reflect the cost of new entry. So, it is reasonable to expect that the Net ICR will typically be met (with a surplus) under such a "load as gatekeeper" model.

Unfortunately, there are several reasons to be concerned that the resources procured under such a gatekeeper model will be inefficient, i.e., they will *not* minimize the total economic cost of satisfying the Net ICR. *First*, in order for load to permanently avoid triggering the February APR, it needs to induce sufficient OOM entry for there to be an excess supply of several years' worth of load growth and retirements. *Second* and less obvious, load's market power in bilateral negotiations with capacity resources will tend to cause load to be systematically biased not to procure the lowest-cost resources available to meet the Net ICR.

On the other hand, if the *auction* were to serve as gatekeeper to the FCM—namely, if load were not permitted to sign long-term contracts with capacity until *after* the auction, so that all resources would be "merchant" resources at the time of the auction—then the resources procured to meet the Net ICR would be (absent unmitigated supply-side market power) those that minimize total economic cost.

Q WHY WOULD LOAD, AS GATEKEEPER TO THE FCM, *SYSTEMATICALLY* FAIL TO PROCURE THE LOWEST-COST RESOURCES TO MEET THE NET ICR?

A There are two related reasons why load, as gatekeeper, will tend to systematically fail to procure the least-cost resources: "inefficient price discrimination" and "inefficient vertical integration."

Q WHAT DO YOU MEAN BY "INEFFICIENT PRICE DISCRIMINATION"?

A When resources negotiate with load in hopes of profitably entering the FCM, the negotiated price that each resource receives will *not* be a uniform price. Resources that are known to have lower costs will require less inducement to enter, putting load in a stronger bargaining position that allows load to pay such resources a lower price. More subtly, the likelihood that load will reach an agreement with a particular resource depends on the extent of load's *uncertainty* about that resource's cost. Further, this "uncertainty effect" tends to skew entry in favor of resources having better-known costs.

To illustrate the uncertainty effect and why it skews entry toward those resources having better-known costs, consider the following example. Suppose that load needs to induce one of two potential new resources to enter the FCM, in order to ensure that the auction price remains suppressed. Load knows that one of these resources has a cost of new entry equal to $10/KW-month. Another resource is more of a mystery. This resource knows its own cost of new entry, but from load's perspective this cost is uniformly distributed from $8/KW-month to $12/KW-month. As can be easily shown, load minimizes its expected procurement cost by offering this mystery resource a take-it-or-leave-it price of $9/KW-month. When this resource's true cost is between $9/KW-month and $10/KW-month, load rationally procures the needed capacity from the higher-cost $10/KW-month resource. This inefficiency of price discrimination arises from the presence of *private information*. Capacity resources will never voluntarily reveal their true cost of new entry to load,[22] and this lack of complete information makes efficient trades less likely to materialize, especially when there is substantial private information.[23] At the same time, resources whose cost is very well known to load have no bargaining leverage in their bilateral negotiations. Whereas such resources would have typically earned a positive return in the auction—as long as they were part of the efficient mix, with cost less than the auction clearing price—they will expect load to exert its market power and extract much (or all) of that surplus via a customized bilateral contract.

Q WHAT DO YOU MEAN BY "INEFFICIENT VERTICAL INTEGRATION"?

A Should load become gatekeeper to the FCM, load has an incentive to favor self-supply over more efficient resources that are not self-supplied. The reason is simple. Load enjoys all surplus created by entry of a self-supplied resource, but extracts only some of

---

[22] David L. McAdams, *Discounts for Qualified Buyers Only,* Working Paper (2010), http://faculty.fuqua.duke.edu/~dm121/papers/mcadams_sticker.pdf (considering a setting in which it is feasible for buyers to reveal information about their willingness to pay to a monopolist (or equivalently, for sellers to reveal information about their costs to a monopsonist)). Buyers strictly prefer for disclosure to be more costly.

[23] *See* Roger Myerson & Mark Satterthwaite, *Efficient Mechanisms for Bilateral Trading*, 29 J. of Econ. Theory 265 (1983) (A highly influential paper cited when Myerson won the Nobel Prize in 2007. As I discussed in my initial testimony, perhaps the greatest triumph of auction theory is in showing how auctions (such as the FCA) can overcome such inefficiencies due to the presence of private information.).

those gains when another resource enters the market (if that resource earns a profit).[24] This bias in favor of self-supply will tend to have the effect of inducing inefficient vertical integration of the market.

Q THE PREVIOUS TWO Q&A'S SUPPOSED THAT LOAD WOULD EMPLOY A *HYPOTHETICAL* MULTILATERAL NEGOTIATION PROCESS TO PROCURE CAPACITY, WERE IT TO BECOME "GATEKEEPER TO THE FCM." IS THIS APPROPRIATE?

A At present, load interests (especially the states) are not yet *firmly* established as gatekeepers to the FCM. Indeed, as I have argued, this proceeding has the potential to uproot load's growing control of the market and restore the possibility of robust auction-based entry and exit in the FCM.

Consequently, the procedures that load employs now to procure out-of-market new entry have little bearing on what sort of processes load is likely to employ in the future, should it become firmly established as gatekeeper. Fortunately, economic theory provides sufficient guidance to forecast with some confidence the qualitative features of the economic *incentives* that load would face, were it firmly established as gatekeeper to the FCM. In particular, load would have an incentive not to conduct a uniform-price auction such as the FCA. Rather, load would have a strong incentive to conduct the sort of discriminatory, multi-lateral negotiation process assumed in my previous two Q&As.

[24] Further, whenever load has uncertainty about a resource's cost, that resource must be allowed to earn a profit when it enters the market. For example, in my previous numerical example, the "mystery resource" is paid the profitable price of $9/KW-month whenever its cost is between $8/KW-month and $9/KW-month.

Q CAN YOU PLEASE SUMMARIZE THE MAIN POINTS THAT YOU HAVE MADE IN THIS PART OF YOUR TESTIMONY?

A My testimony here has developed two main themes.

First, under the February APR, the health of the auction market is fragile and subject to effective—and potentially very destructive—manipulation by load via the entry of inefficient OOM resources. Load has an incentive to induce such inefficient OOM resources to enter because the February APR only partially corrects for the effect of OOM on the auction price. Further, even this partial corrective can be evaded should load engage in a strategy of inducing a sufficiently large *excess* supply of OOM to enter. If this evasive, loophole-exploiting strategy is followed, load can *forever* suppress the auction price, which benefits load, because it then avoids paying all other, non-OOM capacity resources the efficient market-clearing price.

Second, preserving a well-functioning auction market is essential to avoid an alternative scenario in which load serves as "gatekeeper" to the FCM. In such a scenario, load's exercise of its oligopsony power will tend to lead to an inefficient deployment of resources to satisfy the Net ICR. In particular, load has an incentive to self-supply even when other sorts of resources are more efficient, leading to an inefficient vertical integration of the resource adequacy market.

PART FOUR: THE JULY APR CAN RESTORE MARKET EXCHANGE, WHILE NOT FORECLOSING EFFICIENT BILATERAL EXCHANGE

Q WHAT IS THE PURPOSE OF THIS PART OF YOUR TESTIMONY?

A In this part of my testimony, I will argue that the APR reforms embodied in the July APR represent significant progress toward addressing the concerns with the February APR that

I raised in Part Three. I will also discuss the importance of a further refinement of the July APR, especially in regard to the rule that determines what OOM is carried forward.

Q PREVIOUSLY, YOU ARGUED THAT LOAD HAS AN INTEREST IN UNDERMINING THE AUCTION MARKET UNDER THE FEBRUARY APR. IS THIS STILL TRUE UNDER THE JULY APR?

A Unfortunately, yes. Load-serving entities with market power stand to gain if the auction market is foreclosed as a feasible option for merchant new entry (though they stand to gain *less* under the July APR). The reason is simple: If new entrants are forced to contract with load in order to justify the cost of new entry, then load can extract much of the benefits of that new entry at the contracting stage. In the auction market, LSEs have market power but their ability to exploit that market power is much more limited. In particular, by its very design as a uniform-price auction, the auction market does not allow LSEs to price discriminate.

Q DOES THIS MEAN THAT THE FLAWS THAT ARE INHERENT IN THE FEBRUARY APR ALSO PLAGUE THE JULY APR?

A No, not nearly to the same extent. My argument against the February APR had two distinct parts. *First*, load has the ability and incentive to suppress the price that it pays in the auction, by inducing inefficient entry by OOM resources. *Second*, should load sponsor so much OOM entry as to effectively foreclose the auction market, then load's bilateral negotiations with capacity resources will tend to induce an inefficient mix of resources to satisfy the Net ICR.

There is no way to avoid the possibility that *if* the auction market were foreclosed and hence incapable of attracting merchant new entry, load would have an incentive to inefficiently price discriminate at the contracting stage (the second point above). However, this sort of inefficiency can only arise if load has already sponsored so much inefficient OOM as to disrupt the proper functioning of the FCA (the first point above).

Under the February APR, load enjoys a benefit when sponsoring inefficient OOM, since it pays a lower auction price on the rest of its net capacity purchased in the auction. Thus, it is entirely plausible that load would find it in its short-term best interest to sponsor inefficient OOM entry, *even without* accounting for the long-term benefit that it might enjoy from foreclosing the auction market and being elevated to "gatekeeper" status.

Under the July APR, load is still *capable* of undermining the auction market as a legitimate avenue for merchant new entry, should they choose to sponsor a sufficiently large wave of inefficient OOM resources. However, unlike the February APR—under which load enjoyed the benefit of suppressing auction prices when sponsoring a large enough wave of OOM—the July APR makes such a strategy more costly. In particular, if load-sponsored OOM were to dominate the flow of new resources, load would incur the incremental cost associated with inducing inefficient OOM to enter the market. Thus, as long as the benefits of dominating the FCM as "gatekeeper" are sufficiently small, there is hope that load interests will choose not to incur the short-term losses necessary to undermine the auction market as a legitimate avenue for merchant new entry.

In this sense, <u>the July APR allows for a robust market alternative</u> by which merchant resources can enter the FCM. However, there is no certainty that market exchange will thrive under the July APR. Load is still capable of flooding the FCM with inefficient OOM—though at greater cost—in which case the FCA would still fail to function as a credible market alternative to bilateral contracts.

Q HOW DOES THE JULY APR MAKE IT COSTLY FOR LOAD TO UNDERMINE THE FCA BY SPONSORING INEFFICIENT OOM RESOURCES?

A First of all, let me clarify that the July APR does not *unambiguously* reduce load's incentive to sponsor OOM. By design, the July APR allows load to freely manipulate the "FCA clearing price" paid to new resources, by sponsoring more or less OOM entry. In other words, an incentive remains to sponsor inefficient OOM in order to lower the price paid to new resources. However, also by design, such OOM entry has no effect on the price paid to existing resources. In particular, if the flow of new resources is dominated by OOM entry, then such OOM entry will only affect the price paid to those very resources. Consequently, load has substantially less incentive to "stack the margin" with OOM under the July APR than under the February APR.

Q DOES THE JULY APR DISCOURAGE LOAD FROM SPONSORING OOM WHEN SUCH BILATERAL CONTRACTING IS EFFICIENT?

A No. If, for some reason, sponsoring OOM before the auction is more efficient than waiting until just after the FCA to sign long-term contracts, then the July APR creates just the right incentives to encourage such efficient bilateral contracting.

To be more precise, suppose that bilateral contracting were generally more efficient than contracting through the auction, so that most (or all) new entry were sponsored by load. Under the July APR, sponsoring OOM only suppresses the auction price paid to new resources and hence provides no price-suppression benefit to load. On the other hand, load must pay these resources at least the *maximum* of (i) the expected value of the FCA clearing price that they could get in the auction and (ii) their cost of new entry, in order to induce them to agree to an out-of-market contract.

For low-cost OOM resources that would have won in the auction anyway, load has to pay just the FCA clearing price, which it would have paid anyway if it had allowed those resources to bid in the auction as merchant resources. On the other hand, for high-cost resources that would not have been selected to enter by the auction, load must pay those resources' cost, which exceeds the FCA clearing price. Without any price-suppression benefit, load only gets a short-term benefit from such OOM sponsorship if it genuinely prefers for that resource to enter the market over an alternative, merchant entrant. In particular, load will have a short-term incentive to sponsor high-cost OOM resources only if load enjoys some benefit from such high-cost resources that exceeds the premium (cost – FCA clearing price) that it must pay to induce them to enter. In other words, load has an incentive to induce high-cost resources to enter as OOM exactly when such entry can be justified on efficiency grounds.

Q DOES THE JULY APR CLOSE THE "LOOPHOLE" THAT YOU MENTIONED IN PART THREE?

A Yes, but only partly. ISO-NE proposed in its July brief to replace the current system in which OOM is automatically retired after seven years, with a new approach by which OOM is retired on the basis of seniority in the market:

> The quantity of new OOM capacity clearing in an FCA will be added to a running tally of past OOM capacity that will be carried forward. The tally will be decreased each year by load growth and resource retirements. . . . Reductions in the tally would be applied first to the oldest OOM resources . . . .[25]

[25] *ISO New England Inc.*, Docket Nos. ER10-787-000, *et al.*, Opening Brief of the New England Power Generators Association, Inc. (July 1, 2010) at 18-19.

Under this proposed approach, the APR will be triggered whenever the accumulated supply of OOM resources exceeds the accumulated demand for new resources created by load growth and resource retirements. Thus, it will no longer be possible to "game" the auction in the way described in Part Three. However, the resulting APR price when the APR is triggered will be *systematically lower* than what it would have been absent inefficient OOM entry. Consequently, under this proposed rule, the July APR continues to fail to fully correct for the effect of OOM on the auction price.

Q PLEASE ELABORATE. WHY DOES THE JULY APR STILL NOT FULLY CORRECT FOR THE EFFECT OF OOM ON THE AUCTION PRICE?

A A simple example helps to illustrate this point. Imagine that there are ten units that could potentially enter, having cost $1/KW-month, $2/KW-month, . . . ,$10/KW-month, and these costs are commonly known. Further, imagine that just one of these units is needed in year #1, two will be needed in year #2 and so on until all ten units are needed in year #10. Absent any OOM entry, the cheapest T resources would serve the market in each year T=1, . . . ,10 and be paid a market-clearing price of $T+1/KW-month.[26]

Imagine now that load were to sponsor the $10/KW-month unit in year #1 as OOM. In year #1, this unit would bid $0/KW-month and be paid a FCA clearing price of $1/KW-month under the July APR. However, since this unit is OOM, the APR price paid to all existing resources would be $2/KW-month, as it would have been absent OOM entry. However, consider what happens in year #2. The $1/KW-month unit enters to serve the increased load and is paid the FCA clearing price of $2/KW-month. Under

[26] The cheapest resource not needed in period T has cost $T+1/KW-month and will drop out at that price. Although demand first equals supply at price $T+1/KW-month, the FCA specifies that the descending clock will continue until the next unit drops out. However, this makes no difference in this example as the remaining bidders will, in any bidding equilibrium, stop the descending clock at price $T+1/KW-month rather than let it fall to $T/KW-month.

my understanding of ISO-NE's July APR proposal—which eliminates the oldest OOM resources first from the carried forward tally—the \$10/KW-month unit's OOM status is retired so that *the July APR is not triggered*. Thus, existing resources receive the depressed price of \$2/KW-month, instead of the \$3/KW-month price that they would have received absent OOM entry. This price-suppressing effect can be very long-lived: in every year T=2, . . . , 9, existing resources will receive a price of \$T/KW-month instead of the unsuppressed price of \$T+1/KW-month.

Indeed, the price-suppressing effect of OOM entry under the July APR is greatest the *more* inefficient the OOM resources that are induced to enter. To see this in the example, imagine that load had sponsored the \$3/KW-month resource at time T=1, instead of the \$10/KW-month resource. Doing so would suppress the APR price paid to existing resources at time T=2 (from \$3/KW-month to \$2/KW-month) but would not suppress the APR price in any later period. Fundamentally, the reason why load has an incentive in this example to sponsor more-inefficient resources is that *only inefficient OOM suppresses the APR price*. In year T=3 and afterward, the \$3/KW-month unit is part of the efficient mix and hence has no price-suppressing impact.

Q CAN THE JULY APR BE FURTHER REFINED TO RESOLVE THIS CONCERN?

A Yes and, fortunately, the fix is simple and intuitive. Rather than automatically removing OOM resources from the OOM tally in response to load growth or resource retirement, remove OOM resources from the OOM tally *when they would have entered efficiently as merchant resources*. More precisely, remove each OOM resource from the OOM tally in the first period in which the APR price exceeds its stand-alone cost of new entry (where the APR price is determined by mitigating the bids of all resources currently in the OOM tally).

This simple rule completely corrects for the effect of OOM entry on the APR price, as it essentially "re-creates" how the market would have evolved had all resources lacked access to out-of-market subsidies. For instance, in the example above, the inefficient $10/KW-month unit would remain classified as OOM throughout years #1-#9, when its unmitigated presence would otherwise have suppressed the price paid to existing resources. After that, when the $10/KW-month unit would have entered the market even on a merchant basis, there is no need for further mitigation and this resource can (and should) be removed from the OOM tally.

PART FIVE: PROPER MITIGATION OF SELLER-SIDE MARKET POWER

Q WHAT IS THE PURPOSE OF THIS PART OF YOUR TESTIMONY?

A In this part of my testimony, I will critique two of the proposals now on the table to mitigate seller-side market power. Proper mitigation of market power seeks to stop those with market power from exercising that power so as to create inefficiencies in the market, while *at the same time* seeking to minimize the inefficiencies created by market mitigation itself. Viewed from this perspective, ISO-NE's proposal to lower the threshold price for Dynamic De-list Bids to $1/KW-month is improper, as is load's proposal (put forth by Professor Blumsack) to mitigate even *competitive* offers from resources possessing structural market power.

Q WHAT DO YOU MEAN BY "PROPER" MARKET-POWER MITIGATION?

A Market power mitigation restricts the options available to (some or all) market participants. *Proper* market power mitigation seeks to maximize the *net* economic benefit of such restrictions, bearing in mind their economic costs. The economic benefit of market power mitigation is that all those with market power who are subject to mitigation will have less ability and/or incentive to distort market outcomes. The economic costs of market power mitigation, by contrast, can come in various forms. *First*, <u>unequal mitigation</u>—that is not equally applied to all market participants having market power—can potentially induce more inefficient market outcomes than if there were no mitigation at all.[27] *Second*, <u>overly-broad mitigation</u>—that is applied even to market participants without market power—imposes an unnecessary regulatory burden. *Third*, <u>overly-restrictive mitigation</u>—that stops (or disincentivizes) market participants from behaving as they would in a competitive market—needlessly creates inefficiencies in market outcomes.

Q OTHER NEPGA EXPERTS DISCUSS THE HARMFUL EFFECTS OF *UNEQUAL* MITIGATION IN THE FCM. DO YOU AFFIRM THEIR ANALYSIS?

A Yes, I do. NEPGA's other experts have stressed the important point that there is unequal market power mitigation in the FCM, with sellers mitigated much more intensively than buyers. Indeed, some of the biggest issues at stake in this proceeding—from APR reform to the treatment of "Historic OOM"—are linked to the deeper question of whether the price-suppressing effects of buyers' past and future actions should be corrected.[28]

---

27 In some (but not all) circumstances, players' market power can "cancel out" if left equally unmitigated. For instance, consider a hypothetical market with one buyer ("monopsonist") having demand $D(p) = 20 - p$ and one seller ("monopolist") having supply $S(p) = p$. If both are left unhindered to exercise their market power, all "renegotiation-proof" transactions are efficient and involve the trade of ten units. (A renegotiation-proof outcome is one that cannot be mutually improved upon. For example, consider an outcome in which 9 units are traded at a total price of $99, i.e. $11 per unit. Both the buyer and seller would be strictly better off agreeing to trade 9.5 units at a total price of $104, i.e., $10 per unit for the additional half unit. Thus, 9 units at $99 is not a renegotiation-proof transaction.) By contrast, if just one of the two players is mitigated, the other will distort the market through the unilateral exercise of its market power.

28 The fact that buyers are bold enough to suggest that the price-suppressing effects of their actions should not be corrected provides ample proof of unequal market-power mitigation in the FCM. No seller would dare suggest that its unilateral or concerted manipulation of market prices should go uncorrected.

If Historic OOM resources are henceforth treated as existing, as ISO-NE proposes, then the (long-lasting and going-forward) price-suppressing effects of load's *past* actions will be left uncorrected. In his written testimony, Professor Milgrom has discussed why correcting the price-suppressing effect of past market manipulation is essential, and especially so in the FCM:

> By following a predictable policy of mitigating market power as quickly and completely as reasonably possible the regulator can achieve two kinds of benefits. First, it both corrects the market prices today to competitive levels and promotes a belief among market participants that future prices will be more nearly-free from manipulations. . . . Second, maintaining such a policy promotes the expectation that the ill-gotten gains from market manipulations will be small, because the benefits of long-term market manipulations will be cut short.[29]

I agree with this assessment.

Similarly, if the February APR is allowed to stand, as load proposes, or if the flawed OOM-removal rule of the July APR is not corrected (see Part Four of this testimony), the price-suppressing effect of load's *future* actions will be left uncorrected.

Q WHAT MARKET POWER MITIGATION PROPOSALS, IN SPECIFIC, WILL YOU CONSIDER HERE?

A My focus here will be to show that market power mitigation measures recently proposed by ISO-NE and by load are seriously flawed, as they are overly broad and/or overly restrictive. I will focus on two specific proposals. *First*, ISO-NE has proposed to lower the threshold for Dynamic De-List Bids to $1/KW-month. Such proposed mitigation is both overly-broad, as it applies even to bidders without market power, and overly-restrictive, as it imposes costs and otherwise constrains bidders who seek to bid their

[29] Milgrom Test. at 13:9–17.

costs truthfully but have stand-alone economic costs in excess of the $1/KW-month threshold. *Second*, load's expert Professor Blumsack has proposed that "cost-based screens . . . are necessary but not sufficient in preventing the exercise of market power in the FCA" by those bidders who are pivotal to satisfy zonal reliability requirements.[30] Such mitigation is overly-restrictive, as it precludes bidders having market power from behaving as if in a competitive market.

Q WHY IS ISO-NE'S PROPOSED $1/KW-MONTH THRESHOLD FOR DYNAMIC DELIST BIDS BOTH OVERLY BROAD AND OVERLY RESTRICTIVE?

A Under this proposal, any resource interested in delisting at a price greater than $1/KW-month must submit to a Static De-List Bid review. In his testimony, Mr. Stoddard has provided evidence that this threshold is likely to be binding on a number of existing resources, whose true stand-alone economic cost is greater than $1/KW-month.[31] Furthermore, as I understand it, ISO-NE's proposal *includes no safe harbors* to protect bidders who lack market power from the burdens associated with this regulatory review.

If bid review were perfect, costless and quick, such mitigation would impose little regulatory burden on bidders. Unfortunately, Static De-List Bid review is neither perfect nor costless nor quick. The process is cumbersome and requires bidders to commit to a Static De-List Bid months before the auction, foreclosing bidders' flexibility to modify their bid to reflect changing costs or new opportunities that may arise in the months preceding the auction. Further, the market monitor conducting a Static De-List Bid review does not have all relevant information about bidders' economic costs and,

[30] Blumsack Test. at 7:14-16.

[31] *See Supplemental Testimony of Robert B. Stoddard on Behalf of New England Power Generators Association*, NEPGA Exhibit 9 at 27:9–30:20.

especially, about the alternative opportunities available to each resource. Should the market monitor incorrectly estimate a supplier's true cost, the monitor could reject a Static De-List Bid that reflects that supplier's true cost and thereby *create* market inefficiencies.

This "mistaken mitigation problem" has an important *asymmetrical impact* on bidders lacking market power. Consider a bidder who lacks market power and would, if given the opportunity, submit a truthful bid that reflects its actual cost. If the market monitor *over-estimates* this bidder's true cost, the bidder will be permitted to submit a wider range of bids. However, since by presumption the bidder in question lacks market power, it will choose to bid truthfully—exactly the same as if the market monitor had correctly estimated its cost. On the other hand, if the market monitor *under-estimates* this bidder's true cost, mitigation will force it to remain in the FCM even at prices at which exit would have been efficient. As a final step in this chain of reasoning, suppose that the market monitor sometimes under-estimates and sometimes over-estimates this bidder's true cost, but that the market monitor's cost estimates are unbiased. Since over-estimates have no impact on market outcomes, while under-estimates force the bidder to remain in the market even when exit is efficient, mitigating bidders who lack market power needlessly and unquestionably creates inefficiencies.

Since some competitive resources are not permitted to exit when exit is efficient, one effect of such overly-broad mitigation is to decrease the efficiency of the current mix of resources used to meet the Net ICR. Further, resources will require a larger upfront payment to enter the market, if they anticipate the possibility of not being allowed to exit once exit is efficient. In this way, the barriers to exit created by overly-broad mitigation can in turn create a significant barrier to *entry*, when new entry is needed.

So far, I have argued that ISO-NE's proposed $1/KW-month threshold for Dynamic De-List Bids ought not to be applied to bidders who lack market power, since such a mitigation strategy needlessly creates inefficiencies in the market *even if* the monitor's cost estimates are unbiased. In fact, many suppliers are concerned that these cost estimates are systematically biased downwards. As Mr. Stoddard notes in his testimony, the cost estimates used to evaluate Static De-List Bid proposals "[exclude] cost categories that many suppliers consider to be going-forward or opportunity costs . . . ."[32] If so, any efficiency benefit from reducing the exercise of market power could be overwhelmed by the inefficiencies created from the regulatory barriers to exit created by such biased mitigation.

Q PLEASE DESCRIBE PROFESSOR BLUMSACK'S PROPOSAL IN MORE DETAIL.

A Professor Blumsack, in his July testimony on behalf of the Joint Filing Supporters, makes the remarkable claim that, in some circumstances, even truthful bidding in the FCA needs to be mitigated:

> [S]uppliers do not necessarily need to submit de-list bids at uncompetitive price levels in order to manipulate the FCA through the triggering of a Capacity Zone. Thus, cost-based screens by the ISO-NE Internal Market Monitor . . . are necessary but not sufficient in preventing the exercise of market power in the FCA.[33]

---

32 Stoddard Test. at 39:6-8.

33 Blumsack Test. at 7:12-16.

The suggestion, apparently, is that a supplier ought to be required to bid less than its true cost for resources that are required for reliability, if truthful bidding would trigger a zonal separation that benefits that supplier.

Q PROFESSOR BLUMSACK'S PROPOSED MITIGATION ONLY APPLIES TO THOSE WITH STRUCTURAL MARKET POWER, WHO WOULD TRIGGER ZONAL SEPARATION WERE THEY TO BID TRUTHFULLY. WHY IS THAT OVERLY-RESTRICTIVE?

A Such a suggestion is deeply confused, as it conflates *having* market power with *exercising* market power. To see the point, consider a monopolist that, for some reason, behaves *as if* in a perfectly competitive market. One would say that this monopolist has market power but fails to exercise it. In much the same way, consider a large supplier in the FCA who bids *as if* all of its resources have been divested to bid competitively. Such competitive resources will bid truthfully and no sensible regulatory regime would stop them from doing so. Thus, any suggestion that suppliers with market power should not be allowed to bid truthfully is as strange and misguided as a suggestion that a monopolist should not be allowed to charge the same price that would prevail in a competitive market.

Q PLEASE SUMMARIZE YOUR ARGUMENT IN THIS SECTION.

A All market participants always ought to be allowed to submit truthful, competitive bids. This is one of the most basic principles of proper market-power mitigation, but it has received short shrift in two of the most recent proposals to mitigate seller-side market power. Indeed, in their exuberance to restrict suppliers' ability to bid freely in the FCA—regardless of whether that supplier has or is exercising market power—both ISO-

NE's proposal to lower the threshold for Dynamic De-List Bids to $1/KW-month and Professor Blumsack's proposal to mitigate competitive bids when such bids would cause a zonal separation are likely to *create* needless inefficiencies in the market.

Q DOES THIS CONCLUDE YOUR TESTIMONY?

A Yes.

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

ISO New England Inc. and New England Power Pool	))	Docket No. ER10-787-000
New England Power Generators Association Inc. v. ISO New England Inc.	)))))	Docket No. EL10-50-000
PSEG Energy Resources & Trade LLC, PSEG Power Connecticut LLC, NRG Power Marketing LLC, Connecticut Jet Power LLC, Devon Power LLC, Middletown Power LLC, Montville Power LLC, Norwalk Power LLC, and Somerset Power LLC v. ISO New England Inc.	)))))))))	Docket No. EL10-57-000

I, David L. McAdams, being duly sworn, depose and state that the contents of the foregoing testimony on behalf of the New England Power Generators Association is true, correct, accurate and complete to the best of my knowledge, information, and belief.

David McAdams

SUBSCRIBED AND SWORN to before me this 26th day of August 2010.

(Notary Public)

My commission expires: OCT. 14, 2012

LISA Y. MAK
COMM. #1817678
Notary Public - California
Contra Costa County
My Comm. Expires Oct. 14, 2012
NR01

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

ISO New England Inc. and New England Power Pool	)	Docket No. ER10-787-000
New England Power Generators Association Inc.	)	
	)	
v.	)	Docket No. EL10-50-000
	)	
ISO New England Inc.	)	
PSEG Energy Resources & Trade LLC, *et al.*	)	
	)	
v.	)	Docket No. EL10-57-000
	)	
ISO New England Inc.	)	

SUPPLEMENTARY TESTIMONY OF ROY J. SHANKER PH.D.
ON BEHALF OF NEW ENGLAND POWER GENERATORS ASSOCIATION

SEPTEMBER 1, 2010

I. INTRODUCTION

Q PLEASE STATE YOUR NAME, PROFESSION AND ADDRESS.

A My name is Roy J. Shanker. My address is P.O. Box 60450, Potomac, Maryland 20859. I am the same Roy J. Shanker who previously submitted testimony in this proceeding, filed on July 1, 2010. NEPGA Exhibit 1 ("Shanker Test."). A statement of my experience and qualifications was presented with my original testimony in this proceeding.

Q WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A I have been asked by the New England Power Generators Association, Inc. ("NEPGA")[1] to review and comment on the filings and testimony submitted by several parties on July 1, 2010. In particular I was asked to review the Joint Filing Supporters first brief ("Supporters First Brief") and the associated testimony of Mr. James Wilson ("James Wilson Testimony"), and the Eastern Massachusetts Consumer Owned Systems brief ("EMCOS First Brief") and the associated testimony of Dr. John Wilson ("John Wilson Affidavit").

Q WOULD YOU SUMMARIZE YOUR OVERALL FINDINGS AND HOW THE REMAINDER OF THIS TESTIMONY IS ORGANIZED?

A Yes. Fundamentally there is a tug of war going on in front of the Commission about the purpose of the capacity market. This proceeding is just the latest iteration of this long-standing debate that the Commission has addressed many times before.

[1] NEPGA is a private, non-profit entity that advocates for the business interests of non-utility electric power generators in New England. NEPGA's member companies represent approximately 28,000 megawatts of electrical generating capacity throughout the New England region.

On one side are those who believe that the overall design objective of the FCM (and other capacity markets) in organized electric markets is to provide a potential source for the so-called "missing money." It is to allow suppliers the reasonable opportunity to, on average and over time, recover the total cost of new entry in order to attract new entry *and* retain economic existing supply. I am firmly on this side. So, too, is the Commission, as I outlined in my prior testimony. Shanker Test. at 6:9-21, 21:6-25:5.

Pulling in the other direction are those who want the capacity mechanism to only target and pay specific new resources, while existing resources receive some *de minimis* amounts, just sufficient to prevent them from exiting the market, at or near their going forward costs. Those who favor this view are primarily load, consumers and states. They seek, via one means or another, changes and procedures that allow themselves to price discriminate and exercise buyer side market power to depress the prices that are paid to existing supply.

This does not mean that there is never any merit in any individual position taken by load interests, but collectively they are engaged in a relentless effort to price discriminate and artificially suppress price below levels that are sustainable over the long term. Though appearing in a seemingly never ending variety of guises, their objectives are always the same: pay a market price only to new entrants (most likely via bilateral agreements) and minimize any payments to captive existing supply. Their ideal payment to existing resources is one that is just sufficient to prevent exit in the near term. Such payments, however, are insufficient to support (1) new competitive entry, (2) additional investment in existing facilities, or (3) continued operation of the "right" needed facilities over the long run.

Both Mr. James Wilson on behalf of the "Supporters" and Dr. John Wilson on behalf of EMCOS advocate positions that in aggregate facilitate such discriminatory pricing and the introduction of uneconomic new entry into the capacity markets. In the following sections I address point by point the exceptions I take to their testimony.

II. CRITIQUE OF JAMES WILSON TESTIMONY

A. Blanket Exemption to APR for All But Net Buyers

Q MR. WILSON SUGGESTS AS PART OF A BRIGHT-LINE TEST FOR THE APPLICATION OF ANY APR, THAT IT APPLY ONLY TO NET BUYERS. DO YOU AGREE?

A Only partially. In theory, I think this position is correct with respect to the incentives associated with a narrow view of the exercise of market power by a "stand alone" market participant. One can only benefit by the exercise of monopsony power via the introduction of uneconomic entry, in the short run, when there is a residual unhedged portion of demand that remains to be purchased at the depressed market price (the net-short position). I discussed this in my original testimony. However, such a bright-line test would ignore the overall deleterious effects of the out-of-market procurement of new uneconomic resources. I discuss these harms later, and this theme is also expanded in the current testimony of Professors Kalt, McAdams and Milgrom.

But even in the narrow context of a "stand alone" market participant, the Commission considered and rejected a proposition nearly identical to Mr. Wilson's when addressing the structure for the New York City capacity market. *New York Indep. Sys. Operator, Inc.*, 122 FERC ¶ 61,282 (2008), *order on reh'g*, 124 FERC ¶ 61,301 at P 28 (2008) ("*NYISO*"). On rehearing, the Commission explicitly rejected limiting the application of mitigation to circumstances where the buyer was net short (i.e., its loads exceeded its supply, and thus it was a net buyer). *Id.* at P 29. The logic was simple and straight-forward: there are simply too many ways to circumvent direct ownership so that the notion of "net short" becomes virtually impossible to enforce, and there is no justification for supporting uneconomic market entry.

The Connecticut Department of Public Utility Control's ("CDPUC") solicitation for new resources, which I previously discussed, Shanker Test. at 61:12–68:15, demonstrates some of the difficulties in implementing a net-buyer test. The CDPUC undertook a specific discriminatory solicitation *only for new* capacity resources. The objective was unambiguous: to add generation for the purpose of depressing capacity market prices—*not* to efficiently procure needed capacity.

But it is unclear how a net-short requirement would be applied to the CDPUC. Should it be based on the hedging of all load and LSEs in the state? Should it be based on one year only, or the potential duration of the period of excess and any potential short LSE's in the state? What would it mean if Connecticut, or for that matter any LSE in New England, were to become short during the period of the purchase of the uneconomic entry, or if such LSEs were encouraged not to renew hedges with existing generation? What happens if the state delegates the procurement to an agent, agency or in-state utility? *See also* Stoddard Supp. Test. at 16:8–17:6 (discussing some of the limits on state procurement behavior in New England).

These types of considerations are only the tip of the iceberg, and, complex as they are, can only be articulated to any degree because the actions of the CDPUC are—as a matter of public record—undertaken for the stated purpose of suppressing prices. Consider how much more complex the evaluation task would be with "hidden" bilateral agreements. Or consider a party interested in artificially suppressing market prices that just built capacity and then sold it off at a substantially discounted price to an independent third party. Even if this third party were not net short, it would nevertheless offer capacity at prices only reflecting going-forward costs, achieving the objectives of artificial price suppression of the original project sponsor.

Q ARE THERE OTHER CONSIDERATIONS SHOWING WHY THE USE OF THE NET-SHORT CRITERION SHOULD NOT BE USED?

A Yes. Even setting these issues aside, there is no reason to facilitate uneconomic entry by any party regardless of its net position. Whether done with bad intent or not, the deleterious impact on the market is the same, as the Commission recognized in the *NYISO* case. *NYISO*, 124 FERC ¶ 61,301 at P 29. The presence of other exogenous factors such as concern for local economic or social objectives further complicates the notions of "uneconomic or net short" and reinforces the precedent the Commission set with the *NYISO* order.

Externalities such as renewable portfolio standards and environmental concerns may motivate states or other entities to procure additional capacity for reasons outside of the basic adequacy objective of the capacity market. While such procurement is within the states' legitimate powers, it cannot be permitted to enter the market at below its actual costs, and thus disrupt or impede the just and reasonable opportunity for the recovery of costs within the Commission's jurisdictional markets. I addressed this in my original testimony, Shanker Test. at 48:16-49:8, 51:8-19, and Dr. McAdams discusses this further in his supplementary testimony, McAdams Supp. Test. at 14:3-14:17.

Under these and many other situations, price suppression occurs regardless of whether the offeror of the capacity is net short. Absent appropriate mitigation measures, such as those recommended in Mr. Stoddard's testimony, Stoddard Test. at 13:18–17:13, there is no reasonable way both to allow states to address legitimate externalities *and* to protect the pricing integrity of the jurisdictional capacity market. In determining the Tier 1 APR price, any uneconomic supply receiving out of market ("OOM") payments should be mitigated because of (1) the ease of circumventing, and inability to effectively measure, the net-short requirement, and (2) the general economic harm of uneconomic entry. Professors Kalt and Milgrom further expand on the damage that is done to the economy and economic efficiency via uneconomic entry in general, and the specific harms to the viability of the FCM market. Kalt Test. at 12:3–29:9; Milgrom Test. at 4:14–5:17. A bright-line test is needed, and it should be that any uneconomic supply receiving direct subsidies or otherwise supported through out of market means should impact clearing prices at its *true* economic cost. Only this test will prevent the economic harm of uneconomic and discriminatory procurement.

Q WHAT DOES THIS MEAN WITH RESPECT TO THE SUPPORTERS' ASSERTION THAT ACTIONS TO LEGITIMATELY PURSUE STATE POLICY DO "NOT INAPPROPRIATELY SUPPRESS MARKET-CLEARING PRICES BELOW A COMPETITIVE LEVEL"?[2]

A As discussed above, this statement is just incorrect. Uneconomic supply, in the pursuit of external goals is put into the FCA at very low levels or as a price taker. Of course it suppresses prices by shifting the supply curve. Both Mr. Wilson and the Supporters'

[2] Supporters First Br. at 25 (quoting *ISO New England Inc.*, 131 FERC ¶ 61,065 at P 77 (2010)).

First Brief reflect a profound confusion regarding basic economic concepts. The pursuit of other state policy objectives through uneconomic entry clearly is at odds with competitive pricing within the Commission-jurisdictional capacity markets. The principal design objective of ISO-NE's July APR (which NEPGA generally supports) is to allow the states to pursue their own policy objectives without adversely affecting competitive pricing in the Commission's jurisdictional market. As Professors McAdams, Milgrom and Kalt explain, it simply becomes a matter of the willingness of the state to pay for what otherwise would be uneconomic entry to achieve its own identified benefits. This can—and should—be accomplished without distorting prices to others. *See* McAdams Supp. Test. at 14:3–15:4; Milgrom Test. at 11:3-12:2; Kalt Test. at 22:6–23:14.

This is not a transient issue. The states already plan to pursue more and more out of market entry in the future, for various policy reasons:

> Current economic conditions as well as the New England states' renewable energy policies will undoubtedly cause the number of OOM resources to increase for reasons that have nothing to do with the FCM. Without some limit, those OOM resources could continue to affect the FCA by triggering the APR for decades in the future, far beyond any reasonable expectation, even if the OOM were deliberately intended to suppress the market-clearing price.

Supporters First Br. at 31 (citations omitted). A bright line must be drawn to mitigate any uneconomic supply receiving OOM payments. Otherwise such actions will fatally undermine pricing in the FCM.

Because it is difficult or impossible to draw a bright line in these circumstances, when there is clearly no need for additional adequacy supplies, the outcome has to be mitigation of all bids that cannot be expected to reflect economic cost because of OOM payments.[3] This is the conclusion that the Commission drew in the New York case. Policy decisions of this kind by state entities, particularly those with the ability to grant assured cost recovery, simply make the determination of intent too difficult. Any proposed test would be too easy to game. Removing the effects of uneconomic entry, regardless of the motive, is a critical component of any future FCM structure. ISO-NE's proposed APR and the proposed NEPGA clarifications are a reasonable way to do so.

B. Excluding Existing OOM Capacity from Mitigation

Q IS THERE ANY MERIT TO THE EXCLUSION OF EXISTING OR "HISTORIC" OOM RESOURCES FROM THE DETERMINATION OF THE APR TIER 1 PRICE?

A No. The Supporters, Supporters First Br. at 32-34 & n.109, and Mr. Wilson, Wilson Test. at 18:8-16, argue that the mitigated offer prices of existing resources should be exempted from the process to determine the APR Tier 1 price (the so-called "Historic" OOM). In support, Supporters cite the previous Commission decision on mitigation of uneconomic entry in New York City. I participated in that proceeding and the situation here is materially different. *See* NEPGA First Br. at 51-53. *First*, there was no applicable monopsony pricing rule in effect in NYISO during the periods when the contested new entry occurred, nor was there any determination at that time of what constituted out of market entry. *Second*, and most importantly, the new mitigation scheme in New York sets a floor price on the new capacity being offered that is directly linked to the cost of new entry for the reference capacity unit (or a lesser demonstrated unit-specific cost). If the market clears below the floor, the resource does not clear and

[3] Mr. Wilson seems to recognize the ability of state action to disguise OOM entry and agrees to the notion of precluding such actions. James Wilson Test. at 11:6-14. But he offers no solution other than the idea of maintaining the net-buyer criterion. Further, he then eviscerates even this safeguard by suggesting that any action undertaken in support of a state policy goal, such as renewable energy, be exempted from any mitigation. *Id.* at 11:22-12:7. The proposal effectively becomes an outline for circumvention of the APR.

no one is able to use the associated capacity to fulfill any capacity market requirements/obligations. The new entrant is effectively removed from the market completely, unless its mitigated price clears in the single auction.

PJM's minimum offer price rule ("MOPR") produces a similar result to NYISO's rule. Units that do not clear at a minimum mitigated auction price cannot participate. (In both markets the thresholds for mitigation are a function of the "true" net cost of new entry for the reference capacity unit).

In contrast, under ISO-NE's July APR proposal, OOM resources would be allowed to enter and would be compensated at least at its offer price. *It would clear and be paid at least as bid*. The mitigation process addresses the APR/Tier 1 rate for existing in market resources, not the eligibility of the OOM units to participate in the market. This is a critical distinction between the ISO-NE proposal and the *NYISO* case. In the *NYISO* case, mitigation of existing OOM units constructed prior to the advent of any mitigation rules could have conceivably excluded the units from the entire market. That is not being proposed here.

Because, under the July APR, all OOM resources can enter the market regardless of their cost or purpose, it becomes critical to fully mitigate all OOM built while the original APR rules were in effect. No one should have offered new supply below cost without the expectation of some mitigation going forward. Any such suggestion by supply resources would be laughed at, and, indeed, the Commission has previously not just strengthened mitigation, but completely revisited existing exemptions.[4] And as

[4] In PJM the initial market rules provided that new generation built after April 1, 1999 would be exempted from cost capping as they reflected new competitive entry to the market. The logic was that the new supply could only improve conditions, even if locating in constrained areas. Prices had to be the same or lower than prior to the new entry. Despite this, concerns over market power prevailed, and the exemption was removed. Similarly

discussed by Mr. Stoddard, Stoddard Test. at 35:11–36:2, absent reasonable mitigation, the entire pricing structure of the market will fail for years (and even decades) under the weight of the existing OOM. Professor Milgrom addresses this as well and explains the long-term adverse impacts. Milgrom Test. at 7:1-16.

In sum, the APR price for in-market resources must be set on the basis of a clearing price determined using mitigated bids from OOM resources—including existing or "historic" OOM. I take no specific position regarding whether any previously cleared resources—other than existing in-market resources—should receive the resulting higher APR price. Hence, I would not quarrel with the Commission deciding to pay this historic OOM either the APR (Tier 1) price or the FCA (Tier 2) price.

C. Use of Net Going Forward Costs for Evaluation of Offers

Q DO YOU AGREE WITH MR. WILSON THAT NET GOING FORWARD COST IS THE APPROPRIATE BENCHMARK FOR OFFERS FROM OOM RESOURCES?

A No. This proposal, if adopted, would make the APR and any mitigation of uneconomic new entry meaningless. I agree that existing, competitive resource may offer at their net going forward or to-go costs (though there are some issues with ISO-NE definition of these costs, I will not belabor here). But adopting to-go costs as the benchmark for uneconomic entry renders the APR virtually meaningless, particularly if to-go costs are calculated *after* the new plant is already built and has submitted an offer. Mr. Wilson's proposal ignores the very important issue that the facility was uneconomic *when* it was built in the first place. It also ignores whether any rational determination, made at the

in New York City, divested generation units were explicitly acknowledged by both the New York Public Service Commission and the Commission to potentially rationally follow bidding patterns that might otherwise be deemed economic withholding. The Commission, while acknowledging this previous determination, subsequently modified the applicable mitigation rules to limit these rights. *See Md. Pub. Serv. Comm'n v. PJM Interconnection, L.L.C.*, 123 FERC ¶ 61,169 at PP 34-45, *reh'g denied*, 125 FERC ¶ 61,340 (2008).

time a commitment was entered to build the facility, would have found the facility economic in the context of the Commission's jurisdictional markets. Finally, Mr. Wilson further aggravates this problem by *deducting* market credits or subsidies from his calculation of his version of to-go costs. James Wilson Test. at 14:14-15:2.

After a new unit has already been built, its to-go costs provide no useful information about whether a new resource should be classified as OOM. The correct measurement of costs in the context of entry decision-making is the long-run levelized average cost of new entry, as discussed below.

An OOM offer for a new resource based on to-go costs would likely be in the same range of in-market offers, which are also based on to-go costs. Existing units may have relatively low incremental costs. If the determination of whether a new resource is OOM or not is also based on to-go costs, the entire point of the mitigation—preventing artificial price suppression—will be lost.

I previously analogized this as tantamount to simply stating that a fired bullet follows the laws of physics, while failing to address why the trigger was pulled in the first place. Shanker Test. at 64:3-5. In this situation, we simply cannot ignore the implications of uneconomic entry by noting that, after it occurs, an associated bid that is low is rational. By that time, the harm is already done. Allowing the results of the action to go unmitigated would simply reward, rather than discourage, the anti-competitive behavior.

Q BUT DOESN'T THAT MEAN THAT THE MITIGATED UNIT MAY NOT CLEAR IN THE FCM?

A Not at all. It is important to distinguish between the criteria for applying mitigation and the treatment of the uneconomic resource itself. It appears that Mr. Wilson ignores this distinction in some of his discussion. As proposed, the July APR would not disqualify the OOM resource from participating or clearing in the market, nor from bidding at very low levels. Sponsors remain free to bid as they choose, and may even deduct any out-of-market subsidies or side payments in such offers if they want. The mitigation only removes or limits the ability of the OOM resource *to distort the market clearing prices for existing resources* through uneconomic and anti-competitive offers in setting the APR Tier 1 price. It also places the economic burden of anti-competitive conduct on the offeror and sponsors of the OOM resources, where it belongs, rather than foisting it off onto the entire market.

In short, OOM supply may bid exactly as Mr. Wilson is recommending, and it will receive at least its offer price should it clear the market. He can define the OOM suppliers' offer price in any fashion he wants, so long as such offers do not distort the clearing price for other market participants.[5]

Q WHAT SHOULD BE THE APPROPRIATE BASIS FOR ESTABLISHING WHETHER A RESOURCE IS OOM?

A I discussed the definition and criteria for classifying OOM in my original testimony, Shanker Test. at 57:11–68:15, as did others, Stoddard Test. at 26:19–45:8. The concept

[5] To be specific, all OOM resources, new or existing, will be mitigated to their proxy price in the determination of the Tier 1 APR price. That Tier 1 price will apply to all existing in-market resources. Paying that APR price to existing OOM resources would constitute a transfer among load interests and those acting on their behalf (such as state governments). I take no position with respect to such transfers.

is simple: The test should be whether, at each decision point over time during the development or construction of a facility, the expected market returns (energy and capacity, excluding any discriminatory subsidy) are greater than the total economic costs.

This general criterion subsumes most of the criticisms that Mr. Wilson makes regarding specific bids and mitigation. He may be right that there are reasons for an existing competitive new entrant to bid low. But this conflates two different ideas. The first question that must be addressed is whether the entry was economic on a free-standing basis. Should the unit have been built in the first place? Should it be considered economic in the context of a Commission jurisdictional market for adequacy? If the answer is no, than there is no point in discussing how the unit ought to bid after it is built (given it is going to be allowed to be built and count as capacity in the ISO-NE design). The issue is how to mitigate the price-suppression effect of the unit being there in the first place.

D. Determining the Correct APR Proxy Price for OOM Offers

Q IS THE USE OF THE AVERAGE LEVELIZED PRICE OF A NEW ENTRANT A REASONABLE PROXY FOR UNECONOMIC OFFERS IN ESTABLISHING APR PRICES?

A Yes. Having moved beyond the question of whether to mitigate or not, the issue is protecting the reasonable opportunity of other market participants to earn an equitable return from the capacity market that approximates as closely as possible what would have occurred but for the uneconomic entry. Ideally, we would use specific cost data for each new entrant to determine whether it has made a rational, economic decision to enter based on the jurisdictional revenues in the ISO-NE capacity and energy markets over time. If the entry were not economic, the resource would be excluded from the market.

Absent such exclusion, a proxy is needed to establish an equitable price. This resource-specific analysis would be burdensome, however, and it is more customary to use a proxy for a competitive bid to attempt to reconstruct the fair market pricing result for the other market participants. The use of the long-run levelized average net cost of entry is a reasonable proxy for mitigation.

I agree that the use of the long-run average may not necessarily reflect any specific bid that a new entrant would make once it had entered. And in general, Mr. Wilson's logic concerning how offers from competitive new entry would be structured is correct. But by extending that logic to the mitigation, he completely ignores the predicate that there was an initial determination that out of market entry has occurred. His position fails to recognize that a new unit has been brought into the market via discriminatory "new only" procurements, when cheaper existing resources were otherwise available to meet the resource adequacy need.

The long-run levelized average cost of new entry is the reasonable expectation of the other market participants over time (and should be the reasonable long-run average expectation for an *economic* new entrant). This value makes perfect sense as a reasonable proxy to use to mitigate OOM supplies and to set the APR price for existing suppliers in the face of market power being exercised by buyers. The issue is not, as Mr. Wilson frames it—"what would people bid if they were engaging in normal economic/competitive behavior"—but rather: "what is the equitable way to structure pricing for existing resources to ensure the long-term sustainability of the market given that uneconomic new entry has been allowed to take place?" His question only makes sense if he is willing to bar uneconomic entry from participating in the markets in any way.

There are, of course, other mitigation options. We could simply exclude the OOM units from the auction entirely. That surely would not be acceptable to Mr. Wilson. Or we could allow OOM resource to bid only at their to-go costs, as is implicit in Mr. Wilson's testimony. This, however, would ignore the uneconomic entry and price these resources exactly the same as you would expect with no mitigation at all. Or we could mitigate at levelized average costs.

Among these alternatives (total exclusion, no mitigation, or use of an average) the use of levelized long-term net costs of new entry, similar to the pricing standards adopted in PJM and New York,[6] appears reasonable, particularly as a proxy for the rational expectation of all other participants. Under this approach, the price does not distort the long-run expectation of revenues. The use of the levelized proxy is indeed artificial in the sense that no individual would be expected to offer or receive exactly this bid, but it is also neutral because it reflects the average of expected results over time for the reconstructed mitigated price.

Another mitigation option would be a market design incorporating a sloped demand curve, as in the original proposed capacity design for ISO-NE. In fact, a sloped demand curve is in many ways a superior structure to mitigate uneconomic entry. Under such designs, the demand curve works as a dampening mechanism holding prices to within reasonable bounds near the long-run average. This reduction in variance, and the curve itself, make the adverse impact of uneconomic entry more transparent.

---

[6] Each of these markets, though, couples these standards with more rigorous and exclusory treatment for uneconomic entry.

Monopsonists have much less ability to deflate final clearing prices. A sloped demand curve also makes the proposed mitigation at the average long-run price, which corresponds to a target market quantity under the curve, a more obvious conclusion with respect to the "right" mitigation proxy.[7]

E. Capacity Zones

Q DO YOU AGREE WITH MR. WILSON'S CHARACTERIZATION OF THE PROPER ROLE OF CAPACITY ZONES AND HIS CONCLUSIONS DRAWN FROM THE PJM MARKET EXPERIENCE?

A No. There are numerous flaws in Mr. Wilson's arguments. When these are corrected, Mr. Wilson identifies no valid reason why locational constraints should not always be represented. Modeling a zone does not mean it will bind. That depends entirely upon system topology—the supply and location of capacity, the location and amount of load, and the level of available transmission and associated transfer constraints.

Most of Mr. Wilson's conclusions are based on a strained set of analogies to the PJM Reliability Pricing Model ("RPM") and associated RPM locational rules. In response, I explain some of the details of the RPM market where I believe Mr. Wilson has either a misunderstanding of its structure or has made an unwarranted or unsupported inference. Mr. Wilson also lodges numerous allegations that the PJM markets have been subject to rampant gaming and withholding, but the Commission has already rejected similar allegations.[8]

---

[7] In fact NYISO takes advantage of this demand-curve design benefit by defining economic anticipations in terms of forecasted future capacity prices. This process is in turn facilitated by the ability to link more easily forecasted quantities to future prices by just "looking up" the value on the demand curve. This in turn makes the decision whether to mitigate a proposed new entrant easier.

[8] *Md. Pub. Serv. Comm'n v. PJM Interconnection, L.L.C.*, 124 FERC ¶ 61,276 (2008), *reh'g denied*, 127 FERC ¶ 61,274 (2009) ("RPM Buyers' Order").

Q DOES IT EVER MAKE SENSE TO IGNORE LOCATIONAL CONSTRAINTS?

A No. The general notion that a material constraint should be ignored in price formation when it binds is illogical. FCM is designed to procure capacity when and *where* it is needed. Failing to model zones defeats this locational objective. As I previously stated, there may be legitimate concerns regarding appropriate mitigation, or even the complexity associated with the proper auction price determination process (whether to use a descending clock auction or something else). But these require actions regarding market mitigation, and possibly increased technical sophistication in the solution "engine." Neither consideration justifies not defining the right problem and solving it. Mr. Wilson is advocating that the wrong problem (e.g., one ignoring material transmission constraints) be formulated and solved, explicitly encouraging under-pricing within constrained areas. Paradoxically his proposed approach will actually lead to *higher* prices for market participants across the entire rest of New England.[9] That is what happens when locational constraints are ignored and locational costs are socialized across a broader region.

---

[9] If a binding constraint is eliminated from the formulation of a problem, all suppliers that can contribute to resolving the constraint are under paid, *but all other suppliers are over paid.* A simple example can demonstrate this: If additional supply is needed in a locality and added in response to the constraint, then that added capacity contributes to the region wide supply, obviating the need for an equal amount of the most expensive other capacity in the rest of the region (which is setting price). This result is often seen in PJM. Additional resources forced on in constrained locational deliverability areas ("LDA") have the effect of lowering the price in the much larger RTO. Total costs over the entire RTO may actually be reduced due to the need to add higher cost resources in a constrained zone. This is an empirical result based on the relative cost of marginal additions and the size of each area. For example, if one additional MW was required in a 5,000 MW constrained zone and raised prices $1/MW-day, the cost increase for the zone would be $5,000/MW-day. But that additional MW in the zone would reduce out of zone RTO demand by 1 MW and might allow a $0.10 per MW day reduction over the remaining 145,000 MW requirement, lowering prices for the rest of the RTO by $14,500 per day.

Q WOULD YOU EXPAND ON THE SPECIFIC ERRORS OR INACCURACIES ABOUT THE PJM CAPACITY MARKET MADE BY MR. WILSON?

A Mr. Wilson makes several errors in his analysis of the PJM RPM, the role of capacity zones within RPM, and the interaction of the RPM with the PJM regional transmission expansion planning process ("RTEP"). Mr. Wilson recognizes that the function of zonal pricing where supply is constrained is to both attract new *and retain existing* supply where it is needed. But Mr. Wilson criticizes the PJM zonal approach for failing to attract new capacity in zones without considering core elements of the overall market design that favor transmission solutions over generation for resolving locational constraints and that deflate price signals to existing supply.

Q IS THE PJM MARKET DESIGN "NEUTRAL" BETWEEN THE OBJECTIVES OF ATTRACTING NEW SUPPLY AND RETAINING EXISTING SUPPLY IN CONSTRAINED ZONES?

A No, decidedly not. The structure of the market explicitly favors the construction of a transmission solution when locational constraints are binding. PJM establishes a locational requirement for each LDA. The requirement reflects a targeted reliability standard. It includes the existing in-zone generation plus a required level of import capability, referred to as the Capacity Emergency Transfer Objective ("CETO"). The actual empirical transfer capability into an LDA is referred to as the Capacity Emergency Transfer Limit ("CETL"). Price separation can occur when (1) the CETL is less than the CETO, (2) access to cheaper resources in the rest of PJM is limited, and/or (3) more expensive in-zone resources are needed to meet zonal requirements.[10]

[10] Imports into a zone can exceed the CETO and price separation still occur simply because the in zone resources are more expensive. Assume the average net cost of new entry is $175 per MW-day. Assume that the CETO is

However, if PJM forecasts that CETL will be less than CETO, that constitutes an explicit reliability rule violation and *must be addressed by mandatory transmission upgrades*.[11] This will occur whether the deficiency is caused by generator retirement, load growth, or change in overall transmission topology. This determination is reached in the context of the RTEP, which has a five-year planning horizon in comparison to the three-year forward horizon of RPM. Thus there cannot be a persistent transmission basis for price separation under RPM because the RTEP process anticipates and remedies transmission needs long before the RPM auctions are held. Mandatory transmission upgrades will be planned for and built to prevent such separation, regardless whether these would be the lowest cost or most efficient means of resolving a constraint. Prices for generation resources can reflect locational differences in construction or other local costs, but there can be no expectation of a persistent locational premium due to transmission limitations.

Perhaps the only scenario where there would even be a chance of longer separation would be with respect to unexpected generation retirements. Empirically, however, this seems to work in the other direction, towards lower capacity pricing and more risk associated with the entry of new generation into an LDA. There are several

1000 into an LDA, the local gen is 4000, and thus the reliability target for the zone is 5000 MW. Assume that CETL is 2000 or twice as high as the minimum requirement. Assume that at a level of 2000 MW of imports into the LDA the price was $100 per MW-day for the RTO, but at that price only 2000 MW of internal resources were available. Even though the CETL was twice the CETO, separation occurs and 1000 MW of additional internal resources that are priced more than $100 would be required to meet the local requirement (e.g., Assume there were 1000 MW offered between $100-125. Then the LDA clearing price would be $125 (ignoring the declining demand curve in this simple example).). There is no shortage in the zone, prices need not reach levels necessary to support new entry, and separation occurs.

[11] In this situation, with the above example assume CETL was 800, not 2000 MW. Then the LDA would clear short of the reliability target unless there was new entry. The price would be set by the demand curve if the supply curve "stopped" short of intersecting, or by the intersection of supply and demand curves. In this situation PJM should have been planning or executing mandatory transmission actions to raise the 800 MW to exceed the CETO 1000 MW target.

reasons for this. First, such retirement announcements would still trigger mandatory additional transmission upgrades if needed. Second, such retirements may be addressed by RMR contracts, if necessary, to retain units until transmission catches up, if necessary.[12] Indeed that is exactly what happened with the recent retirement announcements of several facilities by Exelon.[13] In these situations the bias is potentially even worse, as the retained generation under RMR agreements may keep RPM prices lower until the transmission enhancement is in place, further eroding incentives for new entry as compared to retaining existing entrants.

Thus, any transmission-based premium has to be expected to disappear. Transfer capability will continually be expanded on a leading basis to assure that sufficient deliverability exists within the rest of PJM to meet the mandatory CETO requirement. Further, pending such transmission upgrades, it is very possible that RMR agreements will act to avoid reliability violations. This bias towards transmission is real, and reflects material risk for generation development in constrained LDAs.

---

[12] This accentuates a fundamental failing of the PJM capacity market. Many of the pricing mechanisms are predicated on allowing the market to go short, or for locality constraints to be temporarily violated to yield higher prices to offset periods of lower prices. But an overlay of reliability back-stops removes most these higher pricing opportunities where above average prices can offset the below average new entry costs periods associated with surplus. This also helps explain why Mr. Wilson has failed to see new entry. There are also other fundamental gaps in the PJM market design that systematically underpay supply and in turn may deter new entry. These flaws in design were further highlighted in recent presentation by the PJM Independent Market Monitor ("IMM") who estimated that because PJM has a must offer requirement for 100% of existing supply, but only clears against 97.5% of forecast load, payments to suppliers were depressed by approximately $2 billion in the last RPM auction. Monitoring Analytics, *Analysis of the 2013/2014 RPM Base Residual Auction* at 22-23 (July 14, 2010), *available at* http://www.monitoringanalytics.com/reports/Reports/2010/Analysis_of_2013_2014_RPM_Base_Residual_Auction_20100714.pdf.

[13] *See Exelon Generation Co.*, Docket No. ER10-1418-000 RMR Rate Schedule Filing (filed June 9, 2010).

Q DOES THE EXISTENCE OF A PREMIUM IN A LOCALITY INDICATE THAT THERE SHOULD BE NEW SUPPLY BUILT IN THE LOCALITY?

A No and this should be an obvious observation. The fact that prices have risen in an LDA above those in the rest of the market does not say anything about whether prices have risen *high enough to support new entry*. Mr. Wilson completely ignored this element in his analyses. In all of the tables he presents he never once indicated the expected average net cost of new entry or the anticipated margins that a new entrant might forecast. These factors are obviously the most relevant in trying to predict whether someone was being rational about a determination to build or not.

LDA prices may reflect a perceived premium to prices in the rest of PJM for any number of reasons. Perhaps the surplus in the LDA is smaller—CETL slightly greater than CETO—than the surplus prevailing in the rest of PJM. Or perhaps CETL is less than CETO but the requirement within the LDA is being met by existing resources with "to go" costs less than the cost of new entry.[14]

Regardless, the premium in and of itself does not constitute an incentive for new entry unless the absolute value of prices are expected to equal over an extended period at least the long run the average net cost of new entry. If prices in PJM as a whole are $25/MW-day, and $100/MW-day in an LDA, it still does not make sense to build new generation if the necessary long-run average price has to be $150/MW-day. All that is established is that there are sufficient internal resources in the LDA, at a price less than or equal to $100/MW-day, to meet the target requirements. Further, it does not make sense

[14] In general PJM has mitigated all supply offers to their avoidable cost rate ("ACR") which reflects short-term "to go" costs based on a failure to pass the three pivotal supplier test.

to build if anticipated premiums will be reduced by mandatory transmission or RMR contracts that further reduce premiums because reliability violations are not tolerated.

Q HAVE PRICES IN PJM BEEN SUFFICIENT FOR SIGNIFICANT NEW ENTRY AT REFERENCE PRICE LEVELS TO OCCUR?

A No. A cursory examination of historic prices and total net revenues for a new entrant in PJM demonstrates that absolute levels of revenues (capacity plus energy and ancillary service net payments) fall far short of supporting new reference entry. The PJM IMM regularly reviews the net revenues that might be earned by various new entrants in the PJM market. This is a very basic barometer of whether or not a new generation unit can earn back its investment based on total payments from the capacity and energy markets. Based on the State of the Market Report prepared by the PJM IMM, prices throughout PJM have rarely ever exceeded the levelized net cost of new entry anywhere in the market for the reference combustion turbine unit. Prices certainly have never reached the average net cost of new entry on anything near to approaching the continuous or sustained basis that would be required to support investing in new entry.[15]

While prices would reasonably be expected to rise and fall around the average, particularly with a demand curve in place, this simply has not yet been the case within PJM. In fact for the PJM market as a whole, for the past 11 years, the average net revenue for the reference peaking unit in PJM has amounted to only 43% of the levelized average cost of new entry over the same period. *Id.* at 161 (Table 3-23).[16] This means

[15] *See* Monitoring Analytics LLC, State of the Market Report for PJM, Vol. 2 at 133-34, 147-166 (Mar. 11, 2010) (New Entrant Revenues), *available at* http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2009/2009-som-pjm-volume2-sec3.pdf.

[16] Note that no LDA had net revenues of more than 84% during 2009. PJM average net revenues for a CT have risen since the commencement of RPM but averaged only 46% of the 20-year levelized rate for 2007-2009. *Id.* at 160 (Table 3-22).

that for the remaining nine years of a twenty-year investment made at the outset of PJM, the total net revenues would have to exceed 170% of the average (even ignoring the time value of money, which would drive the value much higher) in order for someone to have averaged the necessary net revenues over the first 20 years of PJM operations.[17] This is hardly the track record to induce investment and reflects the fact that there is still a pool-wide surplus. This is particularly true when one considers that the Variable Resource Requirement Curve is capped at 1.5 times the net cost of new entry in PJM,[18] the implications of sustained low prices and the opportunity to ultimately recover the acknowledged necessary average also may deter new entry.

No single snapshot is sufficient to induce investment, and these types of long-term results are directly at odds with Mr. Wilson's conclusion that higher price signals in LDAs are being ignored.

Q WHAT DO YOU CONCLUDE ABOUT THE AMOUNT OF NEW ENTRY IN THE PJM CAPACITY MARKET TO DATE?

A It appears fully rational that new entry in LDA's has been limited. The relative lack of new entry is unrelated to zones or conspiracy theories about supplier behavior. A better question would be what is justifying any new entry, absent site specific opportunities and conditions that may offer entry at lower than the calculated typical average costs?

Q DOES MR. WILSON ACKNOWLEDGE ANY OF THESE LIMITATIONS?

A Only implicitly. For example, he notes that LDA prices are volatile and recognizes that such price volatility related to income obviously is a relatively material and adverse

---

17 Ignoring interest, a twenty-year period with eleven years of payments at 43% of the average requires 170% of the average for the remaining nine years. ($11/20 \times 43\% + 9/20 \times 170\% \approx 100\%$).

18 PJM OATT, Attachment DD, § 5.10(a)(i).

consideration when investing in large, long-lived capital goods. He further attributes this to a failing in the accuracy of the PJM RPM representation of the system and model input data. Yet rather than investigate these specific problems as a potential cause for lack of investment, he leaps to the conclusion that the reflection of real locational constraints that are strictly enforced in the reliability planning procedures of PJM are causing a lack of investment.

Q DO YOU AGREE WITH MR. WILSON'S ASSESSMENT THAT IT APPEARS THAT GENERATION OWNERS IN PJM LDAS ARE EXERCISING MARKET POWER AND WITHHOLDING INCREMENTAL RESOURCES?

A No. His comments are pure speculation and ignore the underlying structural design and flaws that are actually driving these results. He notes that it is expensive to build in constrained areas and implies that all of the good sites for new generation are held by existing suppliers, inferring that their failure to add capacity is indicative of some form of withholding of incremental economic supply.

First, consider the fact that nowhere in his testimony does he demonstrate that it would actually be rational to conclude that it would be profitable to build within the constrained zones. He does acknowledge that these areas are among the most expensive areas in which to build. I find a major gap in his logic that existing suppliers are engaging in withholding by not building where all the available data shows that such entry will not be economic, mandatory rate-based transmission can pre-empt any locational benefit, real needs can be displaced by RMR contracts, costs are high, and siting is difficult. Finally, as I have stated, much of this argument regarding withholding has already been heard and rejected by the Commission. Further, the PJM IMM similarly submitted formal testimony rejecting these types of allegations.[19]

Q ARE THERE OTHER CONSIDERATIONS RELEVANT TO THE LIMITED AMOUNT OF NEW MERCHANT ENTRY?

A Yes. The level of uncertainty is compounded by the potential for state sponsored out of market entry in PJM similar to the types of actions that have been taken in New England. For example, in recommendations to the Maryland Public Service Commission it was explicitly identified that by increasing the size of the procurement the state could "save" more money by driving down capacity prices to all market participants.[20] The same study noted that this would need to be accomplished by use of out of market contracting.[21]

As Professors Kalt, Milgrom and McAdams explain at length in their testimony, "bad" procurement of uneconomic resources under bilateral agreements undermines the ability of the auction market to effectively work and support new entry. This is another layer of uncertainty that makes Mr. Wilson's observations regarding zones incorrect and unsupported.

---

[19] *See, e.g.*, RPM Buyers' Order, 124 FERC ¶ 61,276 at P 30 & n.42 (citing Declaration of Joseph Bowring, Attachment A to PJM Answer at 4 and analyses of the RPM auctions posted at http://www.pjm.com/markets/market-monitor/reports.html (MMU Reports)).

[20] *See* Levitan & Associates, Inc. & Kaye Scholer LLP, *Analysis of Resource and Policy Options for Maryland's Energy Future* (Dec. 1, 2008).

[21] *Id.* at 114.

Q IS THERE ANY MERIT TO MR. WILSON'S INFERENCE THAT SOMEHOW INCUMBENT SUPPLIERS ARE ERECTING BARRIERS TO ENTRY IN LDAS?

A No. A second component of Mr. Wilson's inference is that control of existing sites allows incumbent suppliers to somehow limit new entry. For this to be true, existing suppliers would have to control more than existing sites (which they do by tautology). They would have to control all sites or be able to block others from entry via site control or some other mechanism. Other than innuendo, Mr. Wilson presents no evidence that such barriers exist or even how such barriers could function. And absent such barriers, the logic that incumbents can exercise market power in this way fails.

Q DO INCUMBENTS HAVE AN INCENTIVE TO INVEST IN NEW ENTRY WHEN PROFITABLE ON A STAND-ALONE BASIS, EVEN IF IT REDUCES THE REVENUES FOR THE REST OF THEIR PORTFOLIO?

A Yes, so long as they can't block new entry by others. Consider the following hypothetical. Assume that it is profitable for someone to build a new generation unit in a zone. Assume further—as Mr. Wilson alleges—that the incumbent suppliers would prefer that it not be built, as it would reduce their current capacity earnings for their entire portfolio. Absent the ability to block the construction of the new unit, it is rational behavior for the incumbent to pursue constructing the new unit itself. If it does not build the unit, someone else will (in this example, it is assumed to be profitable), and the incumbent will lose this opportunity while incurring a portfolio loss. However, if the incumbent does build the new unit, it still suffers the same portfolio loss, but that loss is offset, at least to some degree, by the incremental benefit of the new unit (assuming it was truly economic to build in the first place). Thus, the explanation that Mr. Wilson gives regarding the incentive to incrementally withhold falls by the wayside, unless it is first established that the incumbents truly have the ability to block economic entry.

Q HAVE YOU SEEN MATERIAL BARRIERS CONTROLLED BY INCUMBENTS THAT WOULD LEAD YOU TO CONCLUDE THAT INCUMBENTS CAN BLOCK ALL NEW ENTRY?

A No. In fact, my own limited experience is quite to the contrary. Developers are quite adept at finding new locations for competitive supply. A good example is the development of the Bayonne Energy Center in New Jersey. *See, e.g.*, M. Griffin, *Bayonne power plant OK'd*, The Jersey Journal (Apr. 30, 2009), *available at* http://www.nj.com/news/jjournal/bayonne/index.ssf?/base/news-5/1241072776250700.xml&coll=3. An approximately 500-MW facility is being built on a relatively small tract at a refinery in New Jersey to serve New York City loads. New York City is one of the most constrained localities in the world, with highly concentrated ownership of generation and control of load. The same facility could easily have provided power into eastern PJM had the economics been favorable (and by doing so, could have avoided building an underwater cable from New Jersey to New York). Also, developers have been able to successfully build major transmission links to export power out of New Jersey into New York City and Long Island (e.g., the GE Variable Frequency Transformer ("VFT") project,[22] and Neptune DC transmission facilities). Development has taken place where the economic incentives ran in the right direction, and it was done by independent third parties, not PJM incumbents.

[22] *See* Press Release, GE Energy Financial Services, *GE to Auction Electric Transmission Capacity for New York City from Proposed NJ Transmission Project* (Oct. 17, 2006), *available at* http://www.geenergyfinance.com/press_room/press_releases/LindenVFT_10172006_Final.pdf.

Based on Mr. Wilson's logic, one should conclude that the Bayonne Energy Center, VFT and Neptune all should have been monopolized by incumbent suppliers in New Jersey in an effort to increase demand and prices in eastern PJM. This is not the case, as private development occurred in response to higher price incentives in New York. This occurred despite the difficult nature of transmission siting and development across bodies of water, and in expensive and difficult regulatory circumstances. The obvious conclusion is that all of those activities could have resulted in additional capacity in PJM, and could still, if dictated by economics. These facts certainly are at odds with any suggestion of control of new entry by incumbents.

This activity also points out—once again—that the price simply may not be high enough in PJM. If it was, third parties presumably would have either sold generation into the PJM market, developed two way transmission facilities, or used the transmission station locations to site new power generation for the PJM market. None of this happened.

Similarly, I am aware of other projects in New Jersey that would like to proceed. However, the combination of current surplus of supply, the absolute level of prices, the type of regulatory risk embodied by positions such as those advocated by Mr. Wilson that would even further erode future revenues, and interestingly the MOPR (indicative of low prices), all collectively make new entry unattractive. Certainly there is no shortage of sites for potential power plant development based on private inquiries I have received. For years there has been active third-party power development in eastern PJM and Virginia when the economics and regulatory environment have warranted.

Q HAS THE PJM IMM REPORTED ANY WITHHOLDING BY INCUMBENTS IN LDAS?

A No. The tariff requires the IMM to review and certify each base residual auction. The IMM has done this and certified the auction results without identifying any of the problems suggested or inferred to exist by Mr. Wilson. As Mr. Wilson's CV[23] indicates, he has presented these same theories in PJM. Thus, the market monitor is certainly aware of his concerns, but has not identified any actions that prevent him from certifying the auctions as competitive and in compliance with the tariff.

There is obviously high concentration of ownership in the capacity markets. However, this fact, in and of itself, is not probative because what is at issue is the locational requirement, not concentration of ownership. These are separate issues and should be addressed with separate solutions. Regarding concentration, there is significant mitigation and monitoring of supplier behavior in place. Existing resources are under a must-offer obligation. If the IMM finds concentration, all existing suppliers are generally subject to offer caps. Investments to improve existing plants that are allowed to be recovered in the market are reviewed by the IMM, as well as all components of their offer price unless default values are used. Suppliers face node-specific adjustments for energy and ancillary services in the calculation of the mitigated offer price of each generator. There has been no indication that local suppliers are able to exclude new entry by other parties. Further, as explained above, to the extent that such exclusion cannot occur, competitive pressures would force incumbents to support new entry when

[23] *See* Exhibit DPUC-2 to Motion to Answer and Answer of the Connecticut Department of Public Utility Control, the Vermont Public Service Board, the Vermont Department of Public Service and The Northeast Utilities Companies, *ISO New England Inc.*, Docket No. ER10-787-000, at 5-6 (filed Mar. 30, 2010).

profitable, even if the portfolio impact was adverse. Had any actions resulted in the exercise of market power or gaming by supply interests the IMM could have withheld certification, which he has not done. Again, these types of allegations have been affirmatively rejected by the IMM.[24]

Q DO YOU AGREE WITH MR. WILSON'S CONCLUSION THAT THE EXISTING MITIGATION IS INADEQUATE IN PJM WITH RESPECT TO LOCATIONAL REQUIREMENTS?

A No. As discussed above, the mitigation structure is extensive. Mr. Wilson ignores that fact. Instead, his entire argument rests on the material barriers to entry he has alleged exist—but did not demonstrate, coupled with the ability of the incumbent suppliers to exercise market power in the form of raising those alleged barriers. He continues to ignore the fundamental question: Do recent historic and forward prices and forecasts justify new investment?

Further, he totally ignores the other relevant factor I discussed above, the overall chilling effect that regulatory uncertainty and the potential exercise of buyer market power have on any new entry. Professor Milgrom discusses the corrosive impact of such potential future manipulation and uncertainty. Milgrom Test. at 7:4-22. Not only are the locational price signals transient for the most part by design, but the fact that Mr. Wilson and his clients in PJM complain about these issues, despite lack of proof, just adds to the uncertainty of such investments. In that sense his complaints about a lack of new entry may be self-fulfilling, but they fail to reflect anything about whether there should be sound locational pricing signals.

---

[24] *See* RPM Buyers' Order, *supra* note 8.

Q EVEN IF MR. WILSON WERE CORRECT, AND INCUMBENTS WERE SUCCESSFUL IN BLOCKING NEW ENTRY WOULD THE APPROPRIATE ACTION BE TO STOP REPRESENTING LOCATIONAL RELIABILITY ZONES?

A No. Even if his claims were correct, and there were exclusionary actions by incumbents, the solution is to take action to stop incumbents from limiting entry. In no event does it make sense to stop modeling real reliability constraints. Failing to model zones because of market power concerns would (1) force OOM actions such as RMR contracts, (2) under-pay infra-marginal units that are actually helping meet a locational requirement (thus raising the likelihood of uneconomic retirement), and (3) over-pay other suppliers who are outside of the constrained reliability area, and who otherwise might properly retire but for the implicit subsidy that occurs by ignoring a relevant reliability constraint.

In other words, his recommendation does nothing to fix his hypothetical problems; it just distorts the pricing. Ignoring real locational constraints just means that the wrong problem is being solved and the wrong prices paid. And in the end, despite his apparent reluctance to adopt the modeling of locational zones, he does ultimately appear to recognize the need. *See* James Wilson Test. at 46:3-4.

Q MR. WILSON SUGGESTS THAT RELIABILITY ZONES MAY BE DIFFICULT TO PROPERLY REPRESENT IN NEW ENGLAND (Q 73) AND APPEARS TO SUGGEST THAT THIS JUSTIFIES NOT RECOGNIZING THE ZONAL CONSTRAINTS EVEN WHILE ACKNOWLEDGING THEIR IMPORTANCE. DO YOU AGREE?

A There may be some potential modeling complexity in the current descending clock auction structure used in New England. As I stated in my previous testimony, it may not be possible with this mechanism to reflect all the locational requirements for New England. Shanker Test. at 15:10–19. Prof. Milgrom identifies a similar concern. Milgrom Test. at 16:15–17:2.

To the extent that this is a real problem, the solution is not to abandon zonal modeling but to modify the auction process. I am not aware of there being any modeling limitations of this type with a linear programming auction structure such as that used in PJM. Mr. Wilson's concern that transmission flows could reverse with respect to the adequacy requirements should be easily represented in a linear programming structure.[25] Certainly, this limitation should not be an excuse for failing to properly represent important locational requirements and facilitating the exercise of buyer market power.

III. COMMENTS OF DR. JOHN WILSON

A. Uneconomic Self Supply Suppresses Prices

Q DO YOU AGREE WITH DR. WILSON'S EXPLANATION REGARDING THE LACK OF ANY ADVERSE IMPACT FOR A PARTY ENGAGING IN SELF SUPPLY OF CAPACITY?

A No. Dr. Wilson appears to be arguing that there is no net impact to self-supply because there are offsetting adjustments to supply and demand. Dr. Wilson argues that under the tariff, the level of self-supply cannot exceed a participant's requirements, thus it should not matter how this supply is procured. John Wilson Aff. ¶¶ 9-13. In turn, he argues that self-supply should be removed from both supply and demand in the FCA process. *Id.* ¶¶ 11-14. This is simply wrong. The tariff section cited by Dr. Wilson, ISO-NE Tariff, § III.13.1.6 ("Self-Supplied FCA Resources") explicitly allows self-supply to be

[25] Professor Milgrom, one of the foremost authorities on auction design, reached a similar conclusion. Milgrom Test. at 16:15-17:2.

designated for either existing *or new* resources. The same tariff provision also appropriately recognizes that new self-supply is out of market.

For any given level of demand in the system, there is a discrete decision to make regarding how that demand for capacity will be met. There is no simultaneous or instantaneous appearance of offsetting supply and demand. It makes more sense to see this decision process as sequential, with anticipated actions or alternatives available to meet the load requirements via existing or new supply. Whether for existing or new, the alternative should always be to seek the lowest cost supply.

Dr. Wilson seems to suggest that as long as the self-supply procured equals or is less than demand, the fact that new resources can be used, even when there is a surplus, is irrelevant and has no impact on the rest of the market. That simply is not so. If the decision were to procure *new* uneconomic supplies bilaterally, when cheaper existing resources were available, the overall level of supply would be expanded, and prices, but for mitigation such as the proposed APR, would be artificially depressed.

Inherent in Dr. Wilson's analysis is the belief that the bilateral self-supply doesn't change the level of overall supply, but this is not necessarily true, and it is precisely when this is not true that is of concern in this proceeding. If the party engaging in self-supply procures additional OOM resources, such as a request for proposal for new-only generation, regardless of the cost of existing generation via the FCAs, then the overall supply is increased, and prices suppressed. Visually, this can be seen by comparisons to the equivalent of Dr. Wilson's curves by holding demand constant and shifting supply via the artificial price taking (e.g., zero) bid of the new, uneconomical, OOM resources. *See*

NEPGA Exhibit 8-A. Clearly the self-supply action in the face of excess existing resources suppresses prices.

Q IS THERE ANY REASON TO DIFFERENTIATE SUCH SELF-SUPPLY FOR MUNICIPALS OR OTHER PUBLIC AGENCIES?

A No. In fact, these are just the entities that are most able to distort market prices by supporting uneconomic entry. This is due to their ability to effectively tax their customers or others to recover the above-market costs of the uneconomic new entry. In turn, because of this ability to tax or assure cost recovery, the uneconomic supply does not create a competitive disadvantage for these parties exercising buyer market power, even when there are multiple buyers in the market. The same is generally true regarding the exercise of buyer market power by any state or state agent.

It should be clear that the recommendation of Dr. Wilson to remove both the self-supply and demand from the market process should not be allowed in any circumstances. John Wilson Aff. ¶ 12. All this does is mask the discriminatory impact of potentially out of market procurement.

Q HOW SHOULD PRICES BE SET IN THE FCA UNDER THE JULY APR FOR SELF-SUPPLY, AND WHAT CREDITING SHOULD OCCUR FOR PARTIES THAT HAVE SOME EXISTING SELF-SUPPLY.

A This is a very simple evaluation: if a municipality or other entity chooses a bilateral agreement with a new resource whose true cost is above the cost otherwise available in the market for a non-discriminatory procurement or via the FCA, then that supply is OOM and should be priced and recognized accordingly. Most importantly, it is vital that this *new self supply—and all existing OOM self-supply*—be reflected at an appropriate mitigated price in the determination of the TIER 1 APR calculation.

This does not necessarily mean that *existing* self-supply resources cannot be counted towards meeting self-supply requirements (and this may be allowed). What it does mean, however, is that the price-suppressing effect of the existing out of market self-supply should be eliminated. This could be accomplished by setting Tier 1 APR prices with a proxy prices substituted for all total self-supply resources, and the total self-supply load included in the demand.

Regardless of how you look at this, the determination has to be that if out of market new entry has occurred, it will suppress price. It does not matter whether it has been declared self-supply or not.

Q HOW WOULD NEW SELF-SUPPLY RESOURCES BE ADDRESSED?

A New self-supply would also be part of the mitigation process described just above and entered into the Tier 1 APR price determination at its proxy level. Further, new self-supply should not be allowed to offset capacity requirements after the determination of the Tier 1 price (as could be allowed for existing self-supply resources) *unless* the new self-supply's proxy price would clear the market at the Tier 2 FCA price. If the new resource at its proxy price cannot clear the market at the Tier 2 FCA price, then the party procuring these resources should not be allowed to offset its capacity requirements with these resources. The purchasing party should only receive a financial credit, based on the FCA clearing price (i.e., Tier 2 FCA price), for the self-supply quantity. It should not have its capacity requirement reduced by this additional new self-supply amount. An approach such as this effectively puts a cap on self-supply at existing levels, *unless* the incremental self-supply would clear at the Tier 2 FCA price.

Q HOW DOES THIS AFFECT BILATERAL AGREEMENTS FOR SELF-SUPPLY?

A This would be a function of the specific bilateral contract between the party purchasing the uneconomic new entry and the seller. The market recognition of the value of the uneconomic new entry would be at the lower FCA Tier 2 price—unless the resource could clear at the FCA Tier 2 price based on its proxy value. In that case, it would be allowed to offset the capacity requirements of the party claiming the resource as self-supply. How the parties partition the difference between the FCA Tier 2 price and the bilateral price and the overall obligations of the buyer in the capacity market would be a matter to be addressed in the contract between buyer and seller.

What is important is that such contracts, whenever they are for uneconomic new entry, should not be allowed to distort the pricing for other existing resources. If the municipality wishes to enter into any such new contracts it is free to do so, but the financial consequences have to be isolated to the municipality and the seller under the contract and should not distort the overall market. Presumably, this would not be a problem if the municipality procured in a non-discriminatory fashion from all alternatives. In a market with excess supply, that would mean procuring existing resources that would receive the APR price under the proposed APR. Similarly, when there is no intent to price discriminate, there would be no reason not to enter into bilateral agreements *after* the FCA. It would actually be expected that the FCA result, absent distortion, would actually support more efficient bilateral procurement. *See* Stoddard Supp. Test. at 9:3-8.

B. DR. WILSON'S TESTIMONY ON ZONAL REPRESENTATION

Q DO YOU AGREE WITH DR. WILSON'S CONCLUSIONS RECOMMENDING NOT MODELING LOCATIONAL ZONES AND REQUIREMENTS?

A No. His logic is flawed. Basically, he argues that zones are unnecessary because transmission investments have been very significant. He states:

> It is not intuitively obvious why, in the face of such a massive investment in regional transmission (funded, of course, by massive charges to transmission customers), the New England transmission system in its current state should confront any transmission constraints of sufficient consequence to justify the creation of separate "zones" for the purchase of capacity.

John Wilson Aff. ¶ 20. If this is his position, the answer should be obvious: Allow for zonal separation and, if Dr. Wilson is correct, it just won't occur. Thus, at worst, the zonal separation constraint in the market settlement would turn out to be superfluous. However, if separation does occur, as manifest recently by rejected de-list bids, the zonal representation is needed to provide the necessary locational capacity and pricing that truly reflects system conditions. The conclusion should be clear that you always model the zones.

In reality, his comments are based on nothing more than the belief that small zones may be subject to the exercise of market power. To whatever extent this is true, the solution lies in the mitigation of any such market power, not ignoring legitimate constraints reflecting the need for locational capacity resources.

Indeed, if anything, the continued conflation of these two concepts suggests that the true objective *is* to maintain price discrimination and lower prices in constrained areas (even though it results in increased prices elsewhere) and to continue solving the wrong auction formulation, rather than addressing the exercise of market power.

Q DOES THIS CONCLUDE YOUR SUPPLEMENTARY TESTIMONY?

A Yes.

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

ISO New England Inc. and New England Power Pool	))	Docket No. ER10-787-000
New England Power Generators Association Inc. v. ISO New England Inc.	)))))	Docket No. EL10-50-000
PSEG Energy Resources & Trade LLC, PSEG Power Connecticut LLC, NRG Power Marketing LLC, Connecticut Jet Power LLC, Devon Power LLC, Middletown Power LLC, Montville Power LLC, Norwalk Power LLC, and Somerset Power LLC v. ISO New England Inc.	)))))))))	Docket No. EL10-57-000

I, Roy J. Shanker, being duly sworn, depose and state that the contents of the foregoing Supplementary Testimony on behalf of the New England Power Generators Association is true, correct, accurate and complete to the best of my knowledge, information, and belief.

Roy Shanker

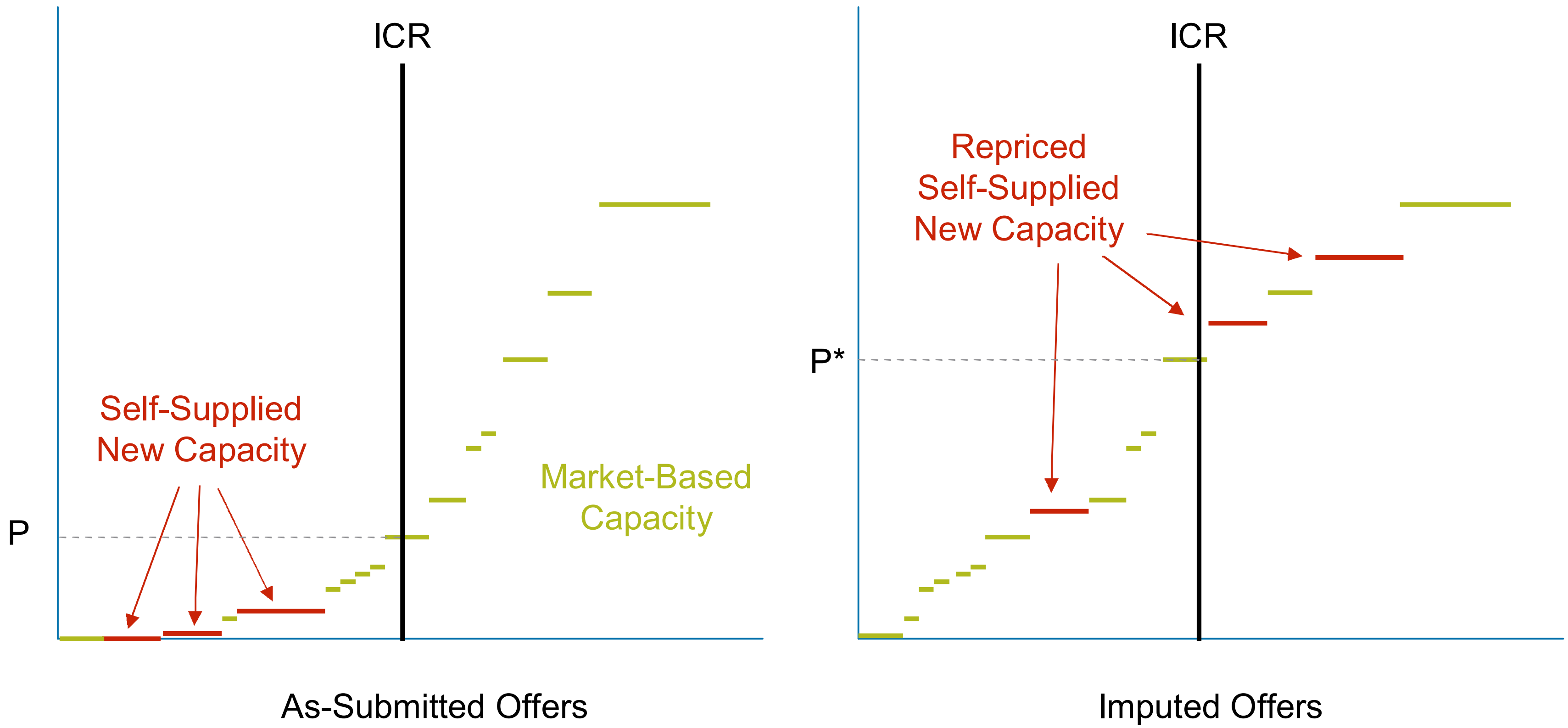
SUBSCRIBED AND SWORN to before me this 31 day of August 2010.

Linda Nowicki
(Notary Public)

My commission expires: Feb. 7, 2010

LINDA NOWICKI
Commission # 1835485
Notary Public - California
Monterey County
My Comm. Expires Feb 7, 2013

Graphical Example of How Uneconomic Self-Supply Suppresses FCA Clearing Price



NEPGA Exhibit 9

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

ISO New England Inc. and New England Power Pool	)	Docket No. ER10-787-000
New England Power Generators Association, Inc.	)	
	)	
v.	)	Docket No. EL10-50-000
	)	
ISO New England Inc.	)	
PSEG Energy Resources & Trade LLC, *et al.*	)	
	)	
v.	)	Docket No. EL10-57-000
	)	
ISO New England Inc.	)	

SUPPLEMENTARY TESTIMONY OF ROBERT B. STODDARD
ON BEHALF OF NEW ENGLAND POWER GENERATORS ASSOCIATION

SEPTEMBER 1, 2010

I. INTRODUCTION AND QUALIFICATIONS

Q PLEASE STATE YOUR NAME, TITLE, AND BUSINESS ADDRESS.

A My name is Robert B. Stoddard. I am a Vice President and the leader of the Energy & Environment Practice of Charles River Associates ("CRA") in its offices at 200 Clarendon Street, T-33, Boston, Massachusetts 02116.

Q ARE YOU THE SAME ROBERT B. STODDARD WHO PROVIDED TESTIMONY ON JULY 1, 2010?

A Yes, my testimony on July 1 was filed in support of the initial brief of the New England Power Generators Association, Inc.[1]

Q WHAT IS THE PURPOSE OF YOUR TESTIMONY TODAY?

A My testimony today has three principal purposes. First, I will update the record to reflect additional facts available about the performance of the Forward Capacity Market ("FCM") to include the results of the fourth Forward Capacity Auction ("FCA"), conducted in August, 2010. Second, I discuss the specific proposal set forth by ISO New England ("ISO-NE") in its July 1, 2010, filing; although the Stoddard July Testimony correctly anticipated the major elements of ISO-NE's proposal, there are some additional facets of their design that deserve comment. Third, I rebut specific points raised by other parties in their July 1, 2010, filings.

II. CONCLUSIONS

Q WHAT ARE YOUR PRINCIPAL CONCLUSIONS?

A As I discuss in more detail below, I reach the following conclusions:

---

1 *ISO New England Inc.*, Docket Nos. ER10-787-000, *et al.*, Opening Brief of the New England Power Generators Association, Inc. ("NEPGA First Brief"), NEPGA Exhibit 2, Testimony of Robert B. Stoddard on Behalf of the New England Power Generators Association ("Stoddard Test.") (July 1, 2010).

Results from the most recent FCA reinforce my earlier conclusion that, unless corrected, the FCM market has material flaws that will prevent it from being sustainable and ensuring reliability—its core purpose—over the long term. Thus, prompt remediation is required. The excess capacity supply continues to grow, as a result at least in part from the entry of additional out-of-market ("OOM") new resources.[2] Moreover, ISO-NE continues to reject de-list bids in local areas for reliability reasons at the same time that the capacity price remains uniform across the region.[3]

ISO-NE's general approach as outlined in its first brief[4] to the Alternative Pricing Rule ("APR") is sound and has been improved by ISO-NE's proposal to use the full benchmark price in restating the offers from OOM new resources to calculate the APR Price. The novel "sunsetting" provision, however, is contrary to sound policy, inasmuch as it creates a clear market flaw at the time it will be implemented; moreover, it fundamentally confuses which of the two prices in the proposed design is the "right" price for nearly all purposes.

ISO-NE's logic for excluding OOM resources cleared in earlier FCAs from the Carried Forward Excess Capacity is fatally flawed. ISO-NE argues that it should not include Historic OOM in the calculation of the APR Price going forward because those resource owners may have chosen instead to offer competitively (or not at all) had they understood that mitigation could persist as long as prices are suppressed by OOM entry.

---

2 ISO-NE classified 1,527 MW of new entry offers as OOM for FCA #4, as well as an additional 1,213 MW of new resources qualified to bid below 0.75 times CONE. *ISO New England Inc.*, Docket No. ER10-1185-000, Informational Filing for Qualification in the Forward Capacity Market, Attachment D at 1 (May 4, 2010).

3 *See* Press Release, ISO New England Inc., Fourth Forward Capacity Market Auction Secures Power System Resources for 2013-2014 (Aug. 6, 2010), http://www.iso-ne.com/nwsiss/pr/2010/final_fca4_release_08062010.pdf.

4 *ISO New England Inc.*, Docket Nos. ER10-787-000, *et al.*, First Brief of ISO New England Inc. (July 1, 2010) ("ISO-NE First Brief").

Only those controlling resources offered with the intent to suppress future capacity prices might both have changed their behavior and now be concerned with the application of the APR to Historic OOM.

ISO-NE's proposal for zonal issues remains insufficient to credibly reduce the reliance on paying resources needed for reliability amounts above the FCA price. ISO-NE's general intent to model all zones all the time, however, better complements its overall system planning activities, contrary to views expressed by other parties.

ISO-NE's new proposal for mitigation of de-list bids from existing suppliers threatens to undermine the long-run viability of the FCM. The mitigation rules for de-list bids established in the FCM Settlement Agreement, and supported by ISO-NE's expert, remain relevant benchmarks in any bid mitigation scheme going forward, even under rules that appropriately allow for more frequent zonal price separation. ISO-NE now seeks to eliminate any meaningful use of dynamic and static de-list bids, without record support or any analysis of the impact of this radical change on the market rules on the ability of the FCM to perform its core functions. These changes would markedly increase the sensitivity of FCA clearing prices to economically unimportant changes in market conditions. This, in turn, will undermine investors' ability to rely on FCA prices alone for investing in the New England market.

A fundamental paradigm shift in the FCM is warranted, particularly if the Commission adopts ISO-NE's reshaping of de-list bids. Although a demand curve is not strictly required in theory, it now appears that, in practice, a demand curve is the only plausible means of both moderating price volatility and ensuring just and reasonable prices in the New England capacity markets, given the other structural proposals that have been offered by ISO-NE.

III. REVIEW OF FCA #4 RESULTS

Q SINCE YOU FILED TESTIMONY ON JULY 1, HAS ISO-NE CONDUCTED AN ADDITIONAL FCA?

A Yes. ISO-NE conducted FCA #4 in early August and announced preliminary results on August 6.[5] The press release is attached as NEPGA Exhibit 9-A. ISO-NE released the detailed results of FCA #4 on August 30; I have only had time for a cursory review of this information.

Q PLEASE SUMMARIZE THE RESULTS OF THIS AUCTION.

A ISO-NE set out to obtain 32,127 MW of capacity required in the region, effectively flat from the previous three FCAs' net installed capacity requirement ("NICR") of 32,305 MW, 32,528 MW and 31,965 MW for FCAs #1, #2, and #3, respectively. FCA #4 cleared once again at the price floor: $2.951/kW-month. Notwithstanding this flat price, the total excess supply increased by 343 MW, driven by an increase in cleared Demand Resources of 394 MW and in imports of 92 MW; cleared internal generation also increase slightly, by 19 MW.[6] The higher excess supply caused the prorated price to fall from $2.54/kW-month in FCA #3 to $2.52/kW-month.[7]

---

[5] *See* Press Release, *supra* note 3.

[6] Press Release, *supra* note 3. It is unclear from ISO-NE documents whether this 143 MW includes resources whose de-list bids were rejected for reliability reasons.

[7] Resources in Maine face a further pro-ration because of limitations on the export capability from Maine to the Rest of Pool; consequently, the prorated prices for resources in Maine fell from $2.47 to $2.34/kW-month.

Q DID ISO-NE SUCCESSFULLY MEET ITS INSTALLED CAPACITY REQUIREMENT?

A Yes, with a substantial excess. Excess supply at the floor price was 5,374 MW, up from the 5,061 MW surplus in FCA #3. Absent retirements, this surplus would take approximately 19 years of load growth to absorb, at an average annual growth of 290 MW.[8]

Q ARE THERE ANY OTHER NOTEWORTHY TRENDS IN FCA RESULTS?

A Yes, two trends are noteworthy in the context of this testimony. First, on the self-supply front, self-supply rose markedly, from 1,935 MW in FCA #3 to 2,699 MW in FCA #4, an increase of 39%. This large increase in the use of this "opt-out" mechanism is not an encouraging sign, but neither is it surprising. With the substantial amount of surplus remaining at the floor price, each MW of priced capacity in the market receives a discounted price or, similarly, quantity pro rationing. Self-supplied MWs are exempt from pro-rationing, however, and so effectively are worth more in the market. This sharp increase in self-supply highlights that the self-supply option can be used not only for hedging by loads, but also to respond to incentives created by the FCA market rules. As Prof. Kalt points out, self-supply capacity effectively "depresses prices and squeezes out some amount of competitively offered capacity that would otherwise be supplied."[9]

Second, ISO-NE continues to reject de-list bids for reliability. As in FCA #3, ISO-NE has rejected the Static De-List Bids from two of the Salem Harbor units, in part because no new units had been offered and contractually committed that could have

---

[8] *ISO New England Inc.*, Docket No. ER10-787-000, Various Revisions to FCM Rules Related to FCM Redesign, Attachment 3, Prepared Testimony of Robert G. Ethier at 10 n.2 (Feb. 22, 2010) ("Average projected Installed Capacity Requirement growth from the 2010/2011 Power Year through the 2018/2019 Power Year was approximately 290 MW per year, based on Table 4-2 in R[egional] S[ystem] P[lan] 09.").

[9] *See Testimony of Professor Joseph P. Kalt, Ph.D. On Behalf of New England Power Generators Association*, NEPGA Exhibit 6 at 15:17–19.

allowed the older Salem Harbor resources to de-list.[10] This outcome is hardly surprising because, as I discuss later, with no price signal that would allow a resource to earn a premium by displacing Salem Harbor, a market solution is unlikely to be forthcoming. The trend, however, is in the increase in number of MWs held on for reliability, because ISO-NE also rejected the Dynamic De-list Bid of the Vermont Yankee Nuclear Station, for approximately 604 MW at $3.933/kW-month, notwithstanding the fact that the unit's current operating license expires in March 2012.[11] As ISO-NE acknowledges, "the Vermont Load Zone [is] an area of limited capacity resources,"[12] and consequently there are not enough resources in the Vermont Load Zone to serve load with Vermont Yankee out of service under an N-1-1 contingency, resulting in "voltage violations in Vermont and southwest New Hampshire in addition to thermal overloads in southwestern New Hampshire with transmission lines out-of-service."[13] Again, ISO-NE is studying upgrades on the transmission system in Vermont and New Hampshire, but not, apparently, potential solutions from proposed new resources in that area. These rejected de-list bids sharply underscore the need for more detailed and consistent modeling of zones in the FCAs going forward.

---

[10] *ISO New England Inc.*, Docket No. ER10-2477-000, Forward Capacity Auction Results Filing ("FCA #4 Results Filing"), Attachment B, Testimony of Stephen J. Rourke ("Rourke Test.") at 16:9–13 (Aug. 30, 2010).

[11] *Id.* at 24:18-19.

[12] FCA #4 Results Filing at 3.

[13] Rourke Test. at 32:17-19.

IV. THE "COMPREHENSIVE APR" PROPOSAL OF ISO-NE IS FUNDAMENTALLY SOUND, BUT REQUIRES FURTHER REFINEMENTS

A. The Two-Tiered Approach of the Comprehensive APR is Sound

Q WHAT CHANGES HAS ISO-NE PROPOSED FOR THE APR?

A As expected based on its June stakeholder presentation, ISO-NE proposed a comprehensive and much-needed reform of the APR in its July 1st filing. In short, ISO-NE proposes to run the FCA by taking offers of new capacity and Dynamic De-list Bids as submitted, but mitigating Static and Permanent De-list Bids from existing suppliers. The resulting "FCA Price" would be used to clear all new and imported supply resources; that is, only those new and imported resources that offered at or below the FCA Price would receive a Capacity Supply Obligation ("CSO"), and those resources would be paid the resulting FCA Price.

In parallel, ISO-NE would impute a competitive benchmark price for all new capacity deemed to be OOM. This benchmark would be set at the IMM's estimate of the annual levelized cost of development less net revenues from the sale of outputs (other than capacity); benchmarks would be technology-specific, much as they are in the PJM Interconnection's Reliability Pricing Model ("RPM"). With these OOM offers repriced at their respective benchmarks, ISO-NE would determine an "APR Price" that would have prevailed in the market had all new OOM resources—and all OOM resources that were in excess of supply requirements and that entered after FCA #3—been offered at their benchmark prices. All existing internal generation offered at or below this APR Price would clear in the auction at that price.

Q DID ISO-NE GET THIS RIGHT?

A Yes, in broad strokes. This Comprehensive APR proposal is fundamentally the same design that NEPGA sponsored in its July filing and is largely the same as the design that the other NEPGA experts, Prof. David McAdams and Dr. Roy Shanker, and I had arrived at independently. At first blush, the two-tiered pricing seems inconsistent with a fundamental design element of nearly all other market designs approved by the Commission, namely the "single clearing price" property. This property is a hallmark of efficient market design, and deviation from this principle leads, in nearly all cases, to inefficient, costly outcomes.[14] However, as I explain in detail below, given the flaws inherent in the current market design and the results to date that they have produced, a two-price approach is now required in this limited and specific circumstance to correct for these flaws and to allow the New England capacity markets to be sustainable over the long run.

Q IF THE SINGLE CLEARING PRICE PROPERTY IS CENTRAL TO COMPETITIVE MARKETS, WHY IS DEVIATING FROM THAT PRINCIPLE REASONABLE IN THIS SPECIFIC CIRCUMSTANCE?

A I can support the limited departure from the single clearing price principle given these specific circumstances because the alternatives—paying all capacity the APR Price, or paying all capacity the FCA Price—will not produce a sustainable market over the long term.

Paying all capacity the FCA Price would gut the APR rule entirely. As I discussed in my earlier testimony, there is a compelling need for the APR. The APR

[14] *See, e.g.*, Ross Baldick, Single Clearing Price in Electricity Markets (Feb. 18, 2009), http://www.competecoalition.com/resources/single-clearing-price-electricity-markets.

serves as the sole means in the FCM market design to mitigate *buyer side* market power that could (and has) been used to suppress capacity market prices by sponsoring the entry of excess, uneconomic generation. The APR also serves to prevent large mismatches between the "spot" forward capacity price set in the FCA for all existing supply and the forward price otherwise embedded in bilateral contracts for new capacity. The APR, therefore, not only mitigates market power but facilitates economic bilateral contracting by sending more accurate price signals of the competitive market price of resources used for resource adequacy.

Conversely, paying all capacity the APR Price could lead to the procurement of newly constructed capacity even when that capacity is not needed to meet the minimum reliability requirements. The APR Price is higher than the FCA Price, so some proposed new resources may have dropped out of the FCA between these two prices. However, additional new supply was not needed to meet the minimum reliability requirement. If all resources were paid the higher APR Price, though, these new "between" resources would clear, leading to the expenditure of large sums to build these new resources even when they are not yet required to meet the minimum reliability requirements. Given the very high capital cost of new generating capacity, often exceeding $1,000/kW, it is a sensible goal to encourage further new capacity construction only if required to meet (at bid cost) the applicable reliability requirements. Hence, even though the APR Price is the best available proxy for the competitive price outcomes that would result from the FCA, *but for* the price-suppressing effect of OOM resources, there is a compelling economic rationale for not constructing all the costly new capacity available at the higher APR Price.[15]

Q WHY NOT SIMPLY CLEAR THE ENTIRE MARKET BASED ON THE MITIGATED OFFER CURVE, USING MITIGATED BIDS FROM ALL NEW RESOURCES?

A If new resources were required to participate in the FCM based on their mitigated offers, rather than their submitted offers, new resources already secured by load serving entities ("LSEs") by contract or ownership to meet their future capacity obligation would have a material chance of not clearing the market. This outcome may be exactly right, especially in cases where the relevant LSEs clearly possess substantial market power, because requiring that all resources clear based on their economic merit should be self-reinforcing, i.e., it should result in the least-cost means of meeting reliability requirements. Against this argument, however, is the question of whether ISO spot markets should second-guess the intent of purchasing decisions of LSEs. On balance, it is my view given the situation in New England that preserving the ability of parties to contract without potential preemption by the ISO markets is more important than the potential efficiency gains of *not* clearing higher-cost OOM resources as long as it does not otherwise undercut the competitive market price. In particular, some New England states have set out aggressive mandates for developing renewable generation resources and have explicitly allowed utilities to enter into long-term contracts for renewable power.[16] Not allowing such contracts to clear in the FCA could undermine the policy

---

15 This approach is consistent with capacity markets that use demand curves. Those markets are designed to secure sufficient new capacity when needed for reliability (by setting the demand curve to CONE near the reliability requirement), while recognizing the reliability and economic benefits of securing supply obligations from existing capacity on the system, potentially in excess of the minimum resource adequacy targets.

16 I have offered testimony support for the Power Purchase Agreements between Cape Wind and National Grid before the Massachusetts Department of Public Utilities (docket number 10-54).

objectives of the states to encourage the development of renewable resources. At the same time, however, the Commission should not allow state-sponsored resources to undermine the effectiveness of the wholesale markets, in particular the FCM.

Herein lies the challenge: how can we provide for bilateral contracting to allow States to pursue their public policy goals without artificially suppressing the market clearing price? The two-tiered approach of the Comprehensive APR reform proposed by ISO-NE and NEPGA addresses both needs, as discussed in NEPGA's experts' July testimony and by ISO in its First Brief.[17]

Q IN NEPGA'S MARCH 2010 INTERVENTION, YOU SPONSORED A DIFFERENT WAY OF ADDRESSING THE DEFICIENCIES OF THE CURRENT APR. DO YOU STILL SUPPORT THAT APPROACH?

A No. As I discussed in my July testimony, there were certain weaknesses in the approach I sponsored in March that result in skewed incentives for competitive offers.[18] Consequently, the other NEPGA witnesses and I developed a two-tiered approach which is functionally identical to the Comprehensive APR now proposed by ISO-NE.

---

[17] Stoddard Test. at 17:14–26:18; NEPGA First Br., NEPGA Exhibit 4, Testimony of David L. McAdams on Behalf of New England Power Generators Association at 20:5–25:18; NEPGA First Br., NEPGA Exhibit 1, Testimony of Roy J. Shanker on Behalf of New England Power Generators Association at 49:9–51:7; ISO-NE First Br. at 23-28.

[18] Stoddard Test. at 19:8–21:4.

B. Setting the APR Benchmark Offers

Q HOW DOES ISO-NE PROPOSE TO IMPUTE COMPETITIVE OFFERS FOR OOM RESOURCES?

A ISO-NE proposes to calculate the APR Price by setting the offers from OOM resources to the full benchmark offer determined by the IMM. The benchmark will be technology specific.

Q IS IT APPROPRIATE TO USE THE FULL BENCHMARK IN THIS ROLE, RATHER THAN SOME DISCOUNTED LEVEL?

A Yes. There is no sound rationale for setting these offers to any discount from, or premium to, the expected competitive offer for the purpose of computing the APR Price. A key presumption in the underlying FCM auction design that was approved by the Commission in 2006 is that the competitive bidding process would price all capacity from bids made by new capacity. But if this presumption is not realized, the FCM included a set of rules, including the APR, to address and remedy competitive failures. As I've described, these market rules have proved wholly inadequate. ISO-NE's approach to modifying the pricing of OOM resources is reasonable.

ISO-NE's mitigation approach is different than in other markets, but the difference is well founded. In the capacity markets of the NYISO and PJM, new resource offer prices are mitigated upwards to a discount from the benchmark, but then that mitigated offer becomes the resource's bid, i.e., it is used to decide whether that resource clears the market. In the proposed Comprehensive APR, however, the question whether a resource clears is decided based on its as-submitted offer, not the mitigated offer. There is no reason, therefore, to use a biased estimate of the OOM resource's competitive offer in setting the APR Price; the resource supplier is, or should be, indifferent to the level of its mitigated offer (unless, of course, the supplier was intending to suppress capacity prices paid to other resources).

To the contrary, shading down the mitigated OOM offer below the best estimate of its competitive offer level will systematically bias the FCM to return less than the expected cost of new entry, on average over time. If several years go by when new entry is needed and supplied entirely by contracted new resources, the capacity prices should reflect the cost of that new entry. If it were to equal only, say, 80 percent of the actual cost, the FCM would not return sufficient money to support new entry, and the FCA clearing prices would systematically fall short of bilateral prices, undercutting the use of the FCA to support new entry and therefore requiring further rounds of bilaterals to support needed entry. Dr. Shanker also discusses the importance of the property that the FCM needs to pay, on average over time, the net cost of new entry.[19]

Q IS THE ISO'S PROPOSAL TO USE TECHNOLOGY-SPECIFIC BENCHMARKS REASONABLE?

A Yes. PJM currently uses technology-specific estimates for the Avoidable Cost Rate ("ACR"),[20] and I understand that PJM and ISO-NE intend to collaborate on developing technology-specific Cost of New Entry ("CONE") estimates.[21] As applied in the load-side mitigation context, this approach is a substantial improvement over the current practice of applying a single value of CONE to all resource types, which will necessarily be wrong for all but one of the resource technologies. Moreover, the perfect solution— a

---

[19] *See Supplemental Testimony of Roy J. Shanker on Behalf of New England Power Generators Association*, NEPGA Exhibit 8 at 22:10–23:14.

[20] PJM OATT § V.115.

[21] ISO-NE First Br. at 30.

determination by the Internal Market Monitor ("IMM") of a competitive offer for each specific OOM resource—is not plausible. Such a case-by-case approach would be time-consuming and burdensome to both the developer and ISO-NE. It also would require a great many judgment calls by the IMM and therefore not necessarily achieve any greater accuracy than the technology-specific estimates.

C. The Sunsetting Provision Is Neither Needed Nor Desirable

Q HAS ISO-NE PROPOSED A CAP ON THE NUMBER OF YEARS THAT AN EXISTING RESOURCE WILL BE ELIGIBLE TO RECEIVE THE APR PRICE?

A Yes. ISO-NE proposes that existing resources would be eligible to receive the APR Price for 20 years, starting with the first commitment year in which the resource cleared an FCA in which this rule is in effect.

Q DO YOU AGREE THAT THIS RULE SHOULD BE INCLUDED IN THE MARKET DESIGN?

A No. This sunset provision fundamentally confuses which price *ought* to pertain in the market: (1) the price that has been suppressed through non-competitive offers, or (2) the price established after appropriate price mitigation is applied to both sides of the market (i.e., supply and demand). It is the mitigated price, i.e., the APR Price, that should remain the default price in the market. ISO-NE implicitly acknowledges that the FCA Price is the "special case" price; it states that paying the higher APR Price to *all* resources would engender unneeded and socially costly investment, and "[s]uch excess new entry is a significant inefficiency that diverts capital away from other more productive uses and should be avoided to the extent possible."[22] But maintaining older, existing resources

[22] *Id.* at 25.

does not constitute a significant diversion of capital; to the contrary, it would be inefficient to drive older but still viable resources out of the market, only to replace them with costly new resources that, facing the prospect of future capacity prices set at the APR Price, could out-bid the existing resources. By putting these two on different footing, the sunset provision creates precisely the sort of inefficiency that the Comprehensive APR was intended to remove. Consequently, there should be no sunset provision.

The sunset provision is indeed somewhat ironic. Through the fiat of a market rule, rather than competitive forces, the ISO assumes that neither capacity pricing support nor the underlying capacity will be needed 20 years hence. Yet, as I note above, were these very same resources not to retire, the current level of excess capacity would take approximately 19 years of load growth to absorb.

Moreover, the sunset rule sets up a problematic situation as the 20-year mark approaches. All of the resources that clear in FCA #5 will be sunsetted out of the APR Price for FCA #25. Assuming a low level of retirement, this could be a substantial fraction of the existing resources in the auction. Thus, loads will once again find it profitable to overbuild the market with OOM resources to suppress the capacity prices in FCA #25, knowing that this tranche of older resources will be exposed to the resulting price suppression effect. It would be inappropriate to plant this time bomb in the FCM design.

D. Self-Supply under the Comprehensive APR

Q MAY AN LSE STILL SELF-SUPPLY RESOURCES UNDER THE COMPREHENSIVE APR DESIGN?

A The ISO has not proposed to remove this option, but if the self-supply option is continued in its current form, some limitations will be needed to ensure that the results remain reasonable for all market participants. The current FCM design has provisions to allow self-supplied resources to offset an LSE's *megawatt* capacity obligation. Because self-supplied resources receive an offset to the capacity supply obligation and not a capacity payment, they also are exempt from the PER adjustment, and the corresponding load obligation does not receive any PER payments. The ISO's First Brief did not propose to remove these provisions, but it does make clear that, for the purposes of determining the APR Price, self-supplied new resources will be considered OOM. I agree that self-supplied new resources should be considered OOM. With the Comprehensive APR proposal, however, this form of self-supply raises potentially serious issues and so, if this provision remains, some limitations on its use would be appropriate.

Q WHY DO YOU BELIEVE THAT SOME LIMITATIONS ON SELF-SUPPLY ARE NEEDED?

A Under the Comprehensive APR proposal, the FCA may procure more than the ICR, and the total cost of procurement—including the capacity above the ICR—would be shared amongst all load purchasing through the FCA. But depending upon exactly how the market rules are written, self-supplied MWs may not carry a pro rata portion of the cost associated with incremental procurement, which could lead to an inequitable allocation of total regional reliability costs. In FCA #4, there were 2,699 MWs of self-supplied capacity, 8.2% of the total ICR; at this level of self-supply, the increase in cost shifted from self-supply to market MWs may not yet be overly burdensome to other market participants. The fraction of self-supply is rising, however, and as the proportion of self-supply increases, the LSEs that remain in the auction pay an increasing share of any incremental procurement. Allowing an unchecked expansion of self-supply could therefore result in clearly inequitable cost allocation. As it stands now, with a vast majority of the load buying through the market, the cost of incremental procurement would be spread broadly and would therefore cause only a small (but positive) increase in capacity charges to load. In order to avoid this relatively small charge, some LSEs that otherwise would simply buy through the market might instead seek to self-supply, and in so doing shift their share of the incremental procurement to other LSEs. As more LSEs self-supply, the incentive for further self-supply increases. This incentive produces no societal benefit, however, and may lead to higher total cost to serve load—unless LSEs can reproduce the efficiencies of the centrally cleared FCA, which is doubtful.

Q WHAT CHANGES DO YOU SUPPORT REGARDING SELF-SUPPLY?

A If the Commission were to maintain the self-supply option, I would advocate that it make either (or both) of two changes, which have similar but somewhat complementary effects.

First, I would limit the designation of new resources as self-supply to only those new resources whose competitive offer price, determined by the IMM for use in the APR, is below the FCA Price, while grandfathering all current self-supply designations of resources made by LSEs as of FCA #4. This set of changes would avoid disturbing self-supplypurchasing decisions that LSEs already have made, while allowing economic additions to qualify as self-supply. Additional capacity offered as self-supply would only qualify as self-supply if it is economic, i.e., if its competitive offer price, determined by the IMM for use in the APR, is below the FCA Price. If the offered capacity is *not* economic by this measure, the resource would still clear the FCA, but it would be treated just like any other OOM resource, settling financially rather than as a quantity offset to the LSE's Capacity Load Obligation.[23] This limitation would simultaneously limit both the construction of uneconomic resources and the associated cost-shifting.

Second, I would modify the market rules to ensure an equitable allocation of the net FCM costs. The needed rule changes have two parts:

(1) adjust the calculation of the Capacity Requirement to equal the level of Capacity Supply Obligation that exists before ISO sales of surplus in the Third Reconfiguration Auction plus Hydro Quebec Interconnection credits ("HQICCs"), and

(2) change the denominator of the Net Regional Clearing Price from "the sum of all Capacity Supply Obligations (except for resources clearing as Self-Supplied FCA Resources) assumed by resources in the zone" to "the sum of all Capacity Load Obligations in the Capacity Zone."

These changes would ensure that LSEs electing self-supply would share in the net cost of procuring the megawatts both below the APR Price and above the FCA price. If these additional megawatts were ultimately deemed necessary for reliability and not sold in the Third Reconfiguration Auction, the Self-Supply would work as it does today. If some or all of the additional megawatts were sold off as surplus in the Third Reconfiguration Auction, the portion of the sum of the ICR and additional procurement not Self-Supplied would remain as a Capacity Load Obligation charged the Net Regional Clearing Price.

---

[23] Likewise, these uneconomic resources would not be exempt from the Peak Energy Rent ("PER") adjustment, but the LSE would be eligible to receive the PER revenues for those MWs. These offsets may not align, however, because some classes of resources (particularly Demand Response) are not subject to the PER adjustment.

V. *CLASSIFICATION AND TREATMENT OF HISTORIC AND CARRIED-FORWARD OOM*

A. *Classification of OOM*

Q WHAT IS "HISTORIC OOM"?

A Historic OOM refers to the new resources that have already cleared in FCA #1, FCA #2, or FCA #3 (and, presumably FCA #4) with unjustified offers that were more than 25 percent below the then-current value of CONE. A narrow use of the term refers only to those cleared new resources that were tagged by the IMM as OOM in the FCA in which they first cleared. A fuller understanding of the term, however, would include a broader range of resources that have cleared in the first three FCAs and contributed to the 5,061 MW of excess supply cleared in that auction:

(1) Resources deemed as OOM when first cleared: 1,450 MW;[24]

(2) New resources treated as existing in FCA #1: 586 MW;[25]

(3) Generating Resources that were not deemed OOM but, under a technology-specific CONE, would be OOM; and

(4) Demand resources not deemed OOM because of inappropriate benefits measures by the IMM, up to 2,554 MW.[26]

I discussed these categories in some detail in my July testimony.[27]

---

[24] This number includes 1,310 MW of OOM new capacity cleared in FCA #1 and FCA #2, plus 575 MW of OOM new capacity cleared in FCA #3, less 435 MW of repowered capacity associated with one of the OOM offers cleared in FCA #3. *See ISO New England Inc.*, Docket No. ER10-787-000, Motion to Intervene and Protest of the New England Power Generators Association ("NEPGA Protest"), NEPGA Exhibit 3, Affidavit of Robert B. Stoddard on Behalf of New England Power Generators Association at ¶¶ 16-18 (Mar. 15, 2010).

[25] This exemption was allowed pursuant to ISO-NE Tariff § III.13.1.1.1.1(b).

[26] Total Demand Resources cleared in FCA #3, calculated from ISO New England Inc., FCA 2012-2013 Obligations (Nov. 25, 2009), http://www.iso-ne.com/markets/othrmkts_data/fcm/cal_results/ccp13/fca13/fca3_monthly_ob_v2.xls.

[27] Stoddard Test. at 38:4–43:7.

Q HAVE YOU ADVANCED YOUR DETERMINATION OF HOW MANY RESOURCES WOULD BE INCLUDED IN THE THIRD AND FOURTH CATEGORIES?

A No. Since the submission of my prior testimony, the Commission has ruled that these matters are outside the scope of the paper hearing, a ruling that I understand NEPGA has appealed to the D.C. Circuit.

Some of the work I did in connection with these matters is, however, of continued relevance to the remaining question whether and how to mitigate Historic OOM (and new OOM). Specifically, I refer to an interesting pair of documents[28] from Synapse Energy Economics prepared on behalf of the Avoided-Energy-Supply-Component ("AESC") Study Group that also call into question whether Demand Response sold in the earlier FCAs should have properly been designated as OOM. This group is composed of a remarkably broad cross-section and substantial number of LSEs, state regulatory bodies, and other load interests.[29] The report coins the term Demand Response Induced Price Effect ("DRIPE") to describe the effect on prices created by additional Demand Response

---

[28] Rick Hornby *et al.*, Avoided Energy Supply Costs in New England: 2007 Final Report (Jan. 3, 2008), http://www.synapse-energy.com/Downloads/SynapseReport.2007-08.AESC.Avoided-Energy-Supply-Costs-2007.07-019.pdf ("2007 Report"); Rick Hornby *et al.*, Avoided Energy Supply Costs in New England: 2009 Report (Oct. 23, 2009), http://www.synapse-energy.com/Downloads/SynapseReport.2009-10.AESC.AESC-Study-2009.09-020.pdf ("2009 Report").

[29] The original 2007 Report's sponsors include Berkshire Gas Company, KeySpan Energy Delivery New England (Boston Gas Company, Essex Gas Company, Colonial Gas Company, and EnergyNorth Natural Gas, Inc.), Cape Light Compact, National Grid USA, New England Gas Company, NSTAR Electric & Gas Company, New Hampshire Electric Co-op, Bay State Gas and Northern Utilities, Northeast Utilities (Connecticut Light and Power, Western Massachusetts Electric Company, Public Service Company of New Hampshire, and Yankee Gas), Unitil (Fitchburg Gas and Electric Light Company and Unitil Energy Systems, Inc.), United Illuminating, Southern Connecticut Gas and Connecticut Natural Gas, the State of Maine, and the State of Vermont. The following agencies or organizations are represented in the Study Group: Connecticut Energy Conservation Management Board, Massachusetts Department of Public Utilities, Massachusetts Division of Energy Resources, Massachusetts Low-Income Energy Affordability Network (LEAN) and other Non- Utility Parties, New Hampshire Public Utilities Commission, and Rhode Island Division of Public Utilities and Carriers. The sponsors to the 2009 Report were substantially the same.

resources. The reports clearly state that the capacity cost savings due to DRIPE should be calculated for all load in the jurisdiction, sweeping in not only the direct but the indirect benefits of DRIPE to the cost-benefit calculation of supporting additional Demand Resources:

> An electric energy efficiency program that enables a retail customer to reduce his or her annual electricity use has a number of key energy cost benefits. The benefits from those reductions include some or all of the following avoided costs:
>
> * * *
>
> - Avoided electric capacity costs due to a reduction in the price of electric capacity that is acquired to serve remaining load, because that remaining load will be met at prices set by less expensive capacity resources. This reduction is referred to as capacity DRIPE;[30]

The reports' authors go on to say:

> We recommend that program administrators include DRIPE values in their analyses of demand side management (DSM), unless specifically prohibited from doing so by state or local law or regulation.[31]

Q IS "CAPACITY DRIPE" REAL?

A Absolutely. It should not, however, be used as a rationale for paying Demand Resources prices above market rates, i.e., the subsidization of OOM Demand Resources through state programs. The *direct* "price-based" capacity cost savings are a legitimate value to be considered, as are the numerous other direct values of Demand Resources or other specialized supply. But "Capacity DRIPE" is just a fancy term for the exercise of buyer market power, where the benefit to the portfolio exceeds the cost of the particular action. This may occur through the use of *incentive-based* demand response programs, i.e., contractual arrangements designed by state policymakers for use by utilities and LSEs to

---

[30] 2009 Report at 1-3.

[31] *Id.* at 1-12.

elicit demand reductions from customers at critical times. These programs give participating customers financial incentives to reduce load that are separate from, or additional to, those customers' retail electricity rate. These same incentive payments then have a multiplying price impact on the outcome of FCAs because they allow certain Demand Resources to underbid their true costs.

A If, reversing roles, a capacity supplier were to economically withhold resources to increase the capacity price and, therefore, increase the total capacity payments it receives, such reliance on a portfolio effect would clearly be tagged as an abuse of market power. Had a supplier coalition, such as NEPGA, commissioned a report that invited such behavior from all its members, it would risk allegations of collusion. Collusion on the buyer side is just as detrimental to markets in the long run as is collusion on the supplier side.

Q IS THIS "DRIPE" EFFECT LIMITED TO THE SUBSIDIZED ENTRY OF DEMAND RESOURCES?

A No, the same concept holds with equal force for *any* uneconomic entry. Whether the "induced price effect" was explicitly a rationale for subsidizing uneconomic new entry—as in the case of the Connecticut RFP—or not, these additions have the potential to suppress capacity prices for years unless the Commission includes Historic OOM in the Carried Forward Excess Capacity. So long as two equally sized resources (i.e., one that reduces load and another that increases supply) essentially result in the same ICR, there is no justification for not treating each resource on a comparable and not unduly preferential basis.

B. Treatment of Historic OOM

Q HOW HAS ISO-NE PROPOSED TO TREAT HISTORIC OOM?

A ISO-NE proposes in its July filing to classify all Historic OOM (by any definition) as existing resources. Consequently, any mitigation of the future auction prices would not properly account for the initial entry of these resources below the competitive cost for new entry, and the substantial suppressing effect of these surplus capacity resources will continue indefinitely. Simply put, the DRIPE effect of that uncompetitive entry would continue to be permitted to extend forward in all future auctions.

Q DO YOU AGREE WITH ISO-NE'S RATIONALES FOR TREATING OOM RESOURCES CLEARED IN THE FIRST THREE FCA'S DIFFERENTLY THAN IT WILL TREAT OOM RESOURCES CLEARED IN SUBSEQUENT FCA'S?

A No. ISO-NE provides two rationales for this decision, neither of which are sufficient to warrant allowing buyer behavior to artificially suppress prices in FERC-jurisdictional markets below levels that are neither consistent with competitive behavior nor sustainable over the long run.

The first rationale is that this treatment would be "retroactive" and "create significant market uncertainty."[32] Including Historic OOM in the Carried Forward Excess Supply would not retroactively change any rate already set through FCA #4; instead, it would prospectively address the adverse effect on prices created by uneconomic contract purchases by load and other sources of OOM surplus. ISO-NE and every other RTO frequently changes market rules that have material effects on the value of a supplier's investment—such as the imposition of energy offer caps by ISO-NE in

[32] ISO-NE First Br. at 22.

2000. There is always a degree of regulatory uncertainty facing investors in this industry. The "certainty" that the Commission and ISO-NE should be seeking to provide is not unchanging *rules* but a consistent adherence to markets that create just and reasonable rates, reflecting competitive supply and demand forces and relatively untainted by the exercise of market power by either sellers or buyers. Allowing a "hangover" from the binge of OOM entry indulged in by LSEs during the first three FCAs to suppress the FCM capacity prices for the foreseeable future is inconsistent with this goal, and will lead to a market structure that is not sustainable, notwithstanding the other well-designed improvements that are being developed in these proceedings. The level of excess is simply far too large and will substantially, adversely affect the capacity markets on whole for far too long.

The second rationale is that Commission precedent precludes counting these resources in the Carried Forward Excess Supply. However, as NEPGA demonstrated in its First Brief, this precedent is not applicable, given that the Comprehensive APR would still allow these Historic OOM resources to clear as capacity resources.

Q ISO-NE ALSO ASSERTS THAT THE AMOUNT OF HISTORIC OOM "MAY HAVE BEEN QUITE DIFFERENT HAD DIFFERENT RULES BEEN IN EFFECT."[33] IS THIS A SOUND RATIONALE FOR ISO-NE'S PROPOSED TREATMENT OF HISTORIC OOM?

A No, this argument does not withstand scrutiny. There are only two ways that the quantity of Historic OOM would be different had the Comprehensive APR been in effect (or,

---

[33] *Id.*

more narrowly, if suppliers knew that Historic OOM would be included in Carried Forward Excess Supply):

Suppliers of the OOM resources might have sought to avoid the OOM designation by more aggressive presentation of data to the IMM or by other regulatory avenues. But, if an OOM resource were in fact economic new entry, its designation as Historic OOM would have no effect. Recasting this in-merit resource's offer to its competitive level will leave the resource inframarginal and therefore will not cause a gap between the FCA Price and the APR Price. It is only when cleared OOM resources are *more costly* at their mitigated level than the marginal existing resource that the APR has an effect.

Suppliers of the OOM resources were willing to pay out-of-market rates to a new resource because of the dampening effect such entry would have on the capacity price; and but for this willingness to subsidize new entry to achieve the "Capacity DRIPE" effect, the entry would not have occurred. If this is the category ISO-NE is referring to in its statement quoted above, I agree that this new entry would not have occurred but for the significant gap in the APR, but I disagree that this entry should be allowed to continue to fulfill its mission of price suppression. The proposed Comprehensive APR does not disturb that offeror's ability to rely on the asset as a capacity resource; it only prevents that uneconomic entry from artificially suppressing the market clearing price.

VI. MITIGATION OF EXISTING CAPACITY RESOURCES

A. The $1 Threshold for Dynamic De-list Bids is Not Reasonable

Q WHAT IS A DYNAMIC DE-LIST BID?

A A Dynamic De-list Bid is a price bid to de-list an existing qualified capacity resource, i.e., to allow the resource to exit the FCA. Unlike a Static De-list Bid, a Dynamic De-list Bid is entered during the course of the descending clock auction FCA. Moreover, unlike other de-list bids, a Dynamic De-list Bid is neither reviewed by the IMM nor included in the qualification filing made in advance of the FCA to the Commission. A Dynamic De-list Bid cannot be priced above 0.8 times CONE, however; this level is the "threshold price" for Dynamic De-list Bids.

Q WHAT CHANGE TO DYNAMIC DE-LIST BIDDING DOES THE ISO-NE NOW PROPOSE?

A ISO-NE proposed in its July filing to change the threshold price for Dynamic De-list Bid to $1/kW-month "to assure that all auction outcomes will be competitive."[34]

Q WHAT BASIS DOES ISO-NE RELY ON TO CONCLUDE THAT $1/KW-MONTH IS A REASONABLE PRICE THRESHOLD?

A ISO-NE looked at the clearing prices in the last three Annual Reconfiguration Auctions, which have cleared at $1.50, $1.43, and $1.00. It then chose the *lowest* clearing price as the new price threshold.

Q DO YOU AGREE WITH THIS NEW PRICE THRESHOLD?

A No; it is flawed in both concept and its particulars.

Q IN WHAT PARTICULAR WAYS IS THIS $1 PRICE THRESHOLD FOR DYNAMIC DE-LIST BID FLAWED?

A First, the idea that the Annual Reconfiguration Auction clearing prices provide a good proxy for a reasonable price threshold is flawed. These Reconfiguration Auctions differ fundamentally from the Forward Capacity Auction. They have a shorter forward procurement period than the FCA. Suppliers therefore face different opportunity costs, fewer options, and less uncertainty as to unit performance and potential energy market

[34] *Id.* at 50.

earnings. The combination of these factors drives a lower price for this short-term obligation.

Second, Reconfiguration Auctions are intended to take into account multiple externalities and auction decisions that are in the sole control of the ISO. Thus, for example, due to the recession, load growth has been minimal at best. If, however, the ICR approved for use in the underlying FCA significantly underestimated load growth, then the prices in the Reconfiguration Auctions might be significantly higher than in the ISO's small sampling of recession affected clearing prices.

Furthermore, the volumes of capacity traded in these Reconfiguration Auctions are miniscule as compared to those that clear the FCA. Table 1 summarizes the volumes of offers, bids, and cleared capacity in each of the three Annual Reconfiguration Auctions that have been held to date:

Table 1

Auction	Commitment Period	Total Supply Offers Submitted (MW)	Total Demand Bids Submitted (MW)	Total Supply Offers Cleared (MW)	Clearing Price ($/kW-month)
Annual Reconfiguration Auction 2	2010-2011	914.99	6626.473	197.613	1.50
Annual Reconfiguration Auction 3	2010-2011	2893.623	7736.939	444.412	1.43
Annual Reconfiguration Auction 2	2011-2012	2013.658	7616.951	187.892	1.00

Counter-intuitively, what is "demand" in a Reconfiguration Auction is "supply" in the FCA. In Reconfiguration Auctions, demand bids are submitted by entities that have a resource qualified to be a capacity supply resource but did not receive a Capacity

Supply Obligation in the FCA or did not receive a CSO for the full qualified capability of the resource in the FCA because of pro-rationing at the price floor.

With that in mind, I note two facts about the $1 clearing price that ISO-NE proposes as a reasonable *cap* on the Dynamic De-List Bid price. Most obviously, it is the *lowest* of the clearing prices in the three auctions; turning this *lowest* of clearing prices into the *highest* allowable offer is bizarre. Moreover, even though the auction cleared at $1, we cannot infer that that is a representative offer price. To the contrary, the $1 price reflects the offer price of the *lowest-priced* 188 MW from a total supply stack (of demand bids) of 7,617 MW—just 2% of the total supply, implying that 98% of the offered, available resources required *more* than $1/kW-month to take on a capacity supply obligation. The same story plays out in the other two Reconfiguration Auctions: the clearing price is set by a tiny fraction of the total supply at a price lower than the vast majority of the remaining supply was willing to accept.

When the clearing price is set by a very thin fringe, the clearing price simply does not provide relevant information as to a reasonable competitive offer for typical resources—even accepting *arguendo* that Reconfiguration Auctions provide information about what reasonable bids in the FCA should be in the first place. The cost of supplying capacity differs among resource types, and individual suppliers' perceptions about those future costs can range widely. For example, Demand Resources do not have any deduct from the PER charge, which is currently about $0.50/kW-month. Leaping to conclusions from 2% of the data is simply not reasonable. ISO-NE states that "[a] competitive level for de-list bids is one that reflects a resource's going forward or opportunity costs,"[35] but

[35] *Id.*

these costs cannot be measured for all, or even most, resources by looking at the offers from the lowest-priced 2% of the market.

Some might argue that these results are informative, despite being drawn from a tiny fringe, because the fringe that is left in a Reconfiguration Auction already excludes the least-cost resources, which would have cleared in the FCA. This line of reasoning is flawed in at least two ways. First, because the price floor stopped the FCA's downward movement, with substantial surpluses in every FCA held to date, more resources remained at the price floor than were needed to meet the minimum reserve requirement. In most cases, resource owners had the option to de-list a *pro rata* share of this surplus from their resources and receive the full clearing price for the remaining, committed resources. Therefore, some of the existing resources submitting demand bids in these Reconfiguration Auctions almost certainly had cleared the FCA; moreover, the cost of taking on the CSO for de-listed fractional portions of resources with capacity obligations for part of their capacity imposes less risk and fewer costs than offering capacity from an otherwise uncommitted resource. Therefore, we cannot infer that resources offered in the Reconfiguration Auction are uniformly more costly than resources with Capacity Supply Obligations, nor can we learn much about the marginal cost of taking on a CSO from these offers in the Reconfiguration Auctions. Second, the incremental demand bids may have come from newly qualified supply, such as uprates to existing resources, that were not available in the FCA and that may have very low costs, compared on a relative basis, to take on a Capacity Supply Obligation. Therefore, I cannot agree that the resources available in these Reconfiguration Auctions accurately represent the costs of marginal resources, and their bids thus cannot provide a good benchmark for the Dynamic De-list Bid price threshold.

Q DO YOU HAVE ANY DIRECT INFORMATION ABOUT THE RANGE OF NET GOING-FORWARD COSTS OF SUPPLY RESOURCES?

A Yes, I have examined cost data that can be gleaned from RMR filings in New England.

Q WHAT INFORMATION CAN YOU GATHER FROM RMR FILINGS THAT HAVE BEEN MADE FOR NEW ENGLAND RESOURCES?

A The level of the Dynamic De-list Bid price threshold proposed by ISO-NE is so low that, based on public data on resource costs, it would seriously under-compensate many baseload and intermediate resources for the direct O&M costs they require. I have examined the RMR filings made by New England generators from 2006 to 2009, and assembled the fixed O&M items for those resources in NEPGA Exhibit 9-B. The plants show a wide range of technologies and age, and so they serve as a reasonable cross-section of the New England fossil-fueled fleet. As the table and chart in that exhibit show, taking into account the publicly available data alone, the fixed O&M costs of these 11 plants ranged from $3.16 to $7.45/kW-month, with a median of $3.85/kW-month and a capacity-weighted average of $4.11/kW-month. And this is just part of the picture. These costs exclude not only all debt coverage and equity return, but also taxes, insurance, and other non-discretionary operating items that are not available in public data.

Q WOULDN'T THESE RESOURCES BE ABLE TO EARN BACK THESE COSTS IN THE ENERGY MARKET?

A That is unlikely. Many of these RMR resources have historically operated with modest energy earnings (particularly with the low gas prices seen recently and expected going forward). To test this question, though, I have used CRA's detailed electricity models to forecast energy margins for various resource types representative of the range of RMR resources shown in the exhibit. The results are summarized in NEPGA Exhibit 9-C. The gap between the Fixed O&M costs approved in RMR rates and the forecast of total margin from sale of energy, ancillary services, and uplift ranges from \$0.96/kW-month to \$7.45/kW-month. The MW-weighted average of this net requirement is \$3.30/kW-month, and the average of the mean station net requirement is \$3.37/kW-month. Bear in mind, as well, that these Fixed O&M charges exclude relevant out-of-pocket costs, so even this \$3/kW-month mid-point likely understates the full net cash requirement, even excluding debt service or equity returns.

Q WHAT DO YOU CONCLUDE FROM THESE DATA?

A Based on these data from RMR filings, a dynamic delist bid price threshold much higher than \$1/kW-month is clearly required. At a \$1 price, it seems likely that many resources will not be able to support their cash costs of operating at that level and would choose to deactivate at higher prices. ISO's proposed changes to mitigation of de-list bids, however, would effectively preclude existing suppliers from reflecting these demonstrable out-of-pocket operating costs in their FCA bids.

Q IN WHAT CONCEPTUAL WAYS IS THE ISO'S PROPOSED DYNAMIC DELIST BID PRICE THRESHOLD FLAWED?

A Decreasing the price threshold to $1/kW-month represents a draconian decrease in the ability of the FCM to function as intended. First, it imposes substantial bid mitigation on suppliers without any demonstration that the suppliers even possess market power, much less that they are actually exercising it. Such across-the-board mitigation is over-reaching and is likely to result in over-mitigation of resources with no incentive or ability to exert market power. As a result, it will distort (downward) the FCA clearing price.

Moreover, every supplier with legitimate costs above this level will need to file Static De-list Bids with the IMM—and if the results of the RMR agreements and Reconfiguration Auctions are any guide, this would be over 95 percent of the existing resources. At that point, ISO-NE should simply shift to a sealed-bid FCA, like NYISO and PJM.

A more serious loss to the intended market design, though, would be the effective removal of an important price stabilization mechanism in the FCM. I discussed this point in my July testimony.[36] If mitigation rules allow few or no de-list bids priced above $1 in the FCA as ISO proposes, any surplus supply is likely to crash the market down to $1. How, then, can the FCM return an *average* price equal to the cost required by new entry? Each low-priced year would need to be offset by at least one high-priced year when prices range well above the (true) CONE value. That is a very unlikely result. While the 5-year price lock option for new resources somewhat insulates them from volatility in the early years, it does nothing to protect these new resources against non-compensatory

[36] Stoddard Test. at 46:9–47:2.

price in the long run. Give that investors look at a twenty-year (or longer) investment horizon, the threat of over-mitigation in future years makes new resources less likely to enter the market. Further, if low-priced years occur fairly often, say three years out of five, then the cap of 2 times CONE prevents the high prices from ever offsetting the low prices.[37]

Q WON'T RESOURCES WITH GOING-FORWARD COSTS SIMPLY SEEK IMM APPROVAL OF THOSE COSTS AND SUBMIT STATIC DE-LIST BIDS?

A There is nothing simple about the Static De-list Bid approval process. It is administratively burdensome, excludes cost categories that many suppliers consider to be going-forward or opportunity costs, and locks the supplier down months in advance of the auction to a particular bid price. Given the high costs of preparing such a bid, there is a significant danger that many suppliers, especially those with relatively small portfolios, will assume that other, similar suppliers will set a sufficiently high clearing price in the FCA for them to cover their costs, and not participate in the static de-list bid process themselves. If enough suppliers behave this way, however, there won't be enough Static De-list Bids to equilibrate supply and demand in the market, and the FCA will tick down quickly to the price threshold of $1. Further, if all suppliers file Static De-List requests, the large number of supply resources with costs above $1/kW-month will simply over-burden the IMM's ability to verify these costs, or impose excessive costs on the market to hire additional staff to process these requests.

---

[37] Suppose CONE equals $8. Two years at the cap of $16 followed by three years at the $1 price threshold yields only $35/kW over the five years, but $40/kW is required.

Q DO YOU HAVE ANY ALTERNATIVE PROPOSAL FOR MITIGATION OF DYNAMIC DE-LIST BIDS?

A As I stated in my July testimony, I do not believe that there is any problem with the current price threshold that needs to be addressed.[38] The only possible exception might be pivotal suppliers in import-constrained Capacity Zones. This market power may be adequately addressed by limiting the amount of information as to the location of qualified resources made public prior to the auction; given the large amount of Demand Resources that have entered, and can (apparently) enter easily, even suppliers with large shares of existing capacity may have considerable uncertainty as to whether they are actually pivotal.[39]

To the extent that the Commission were to consider a Dynamic De-list Bid price threshold for pivotal suppliers lower than the current standard, it should recognize the issues raised by that change. I concur with Dr. Bidwell's testimony that the Dynamic De-list Bid structure—including its mitigation threshold *even in the event* that a local area binds—is essential for the ability of the FCM to function properly in the long-term. Changing this mitigation level even for pivotal suppliers could easily disrupt the ability of the FCM to support market-based entry or to encourage economic investment in existing capacity resources. But if, notwithstanding these fundamental concerns, additional restrictions were to apply, then the Commission would need to squarely address two issues.

---

[38] Stoddard Test. at 48:10-13.

[39] The discussion above has considered only *import-constrained* zones. Nothing in the rule changes proposed by ISO-NE regarding zones changes the modeling of *export-constrained* zones, such as Maine, which are already modeled in all FCAs. I do not, therefore, propose nor think necessary any changes to the mitigation rules governing export-constrained zones.

First, what is a plausible threshold for the Dynamic De-list Bid mitigation for pivotal suppliers? The data cited above from RMR filings indicates that ISO's proposed $1 price threshold would unduly interfere with the ability of most resources to offer at competitive levels. I understand that Boston Generating will demonstrate that even current FCA prices put the Mystic station in a cash-negative position, notwithstanding the fact that these are some of the newest, most economic, and well-sited generators in the region. Consequently, not only is the $1 proposal seriously short, but any reasonable level would need to be significantly higher.

Second, the mitigation should be crafted narrowly to address structural market issues in a constrained zone. The challenge here—again, assuming *arguendo* that further restrictions are even warranted—would be to fashion a mitigation that reasonably limits a pivotal supplier's ability to cause an import constraint to bind uneconomically, without removing the ability of that same supplier to participate fully in the FCA price formation for the pool as a whole.

Solving both of the issues would be challenging—a challenge that need not be taken up at this time.

B. Proposed Changes to Static and Permanent De-list Bid Mitigation are Flawed

Q WHAT ARE STATIC AND PERMANENT DE-LIST BIDS?

A These are fixed price bids to de-list an existing qualified capacity resource that are pre-approved by the IMM and cannot be withdrawn once submitted for approval. Static De-list Bids are used to de-list a resource for one or more years, whereas Permanent De-list Bids, if accepted, disallow the resource from ever receiving capacity payments in the future (unless the facility re-qualifies as a new resource through a major repowering or similar capital expense).

Q WHAT IS THE CURRENT MITIGATION ON THESE DE-LIST BIDS?

A Any Static or Permanent De-List Bid must be submitted for IMM review if the de-list price is above 0.8 or 1.25 times CONE, respectively.[40] As ISO-NE explains, "[i]f the bid price is not consistent with the resource's net risk adjusted going forward and opportunity costs, then the bid will be rejected. However, a resource may elect to have the ISO-determined bid entered into the FCA."[41]

Q HOW WERE THESE THRESHOLDS OF 0.8 AND 1.25 TIMES CONE DETERMINED?

A The 0.8 times CONE level applicable to Static De-list Bids is, by design, the price threshold for Dynamic De-list Bids. Static and Dynamic De-List bids differ solely in the level of review by the IMM. Although it would be possible to submit a Static De-List Bid at or below 0.8 times CONE, the effect would be no different than simply using a Dynamic De-list Bid, not subject to IMM review. If Dynamic De-list Bids price threshold is changed, the threshold for Static De-list Bids should also be set at that level.

The 1.25 times CONE level applicable to Permanent De-list Bids is intentionally a fairly relaxed standard of review. The FCA was expected to be highly competitive with ample offers of new capacity—an expectation that has been met in all four FCAs to date. Consequently, a resource that is *permanently* stepping out of the capacity market can be readily replaced with new resources priced competitively, i.e., near the true value of CONE. The contestability of the market therefore limits any supplier's ability to exercise market power near price points at which new entry will discipline offers. The final check

---

40 ISO-NE Tariff § III.13.1.2.3.2.

41 ISO-NE First Br. at 52.

on exercising market power through Permanent De-list Bids is to make the exit from the capacity market permanent. Forever is a very long time, and the foregone capacity revenues from economically withholding through a Permanent De-list Bid would be very large. Given this belt, suspenders, and safety-pin approach to ensuring competitive outcomes, a high threshold for review by the IMM was deemed reasonable. Moreover, ISO's proposal to exclude these resources from the energy market, as well as the capacity market, is not needed as a further guard against economic withholding.

Q HAS ANYTHING CHANGED SINCE THE FCM SETTLEMENT TO CHALLENGE THE EFFECTIVENESS OF THIS BID MITIGATION APPROACH?

A No; to the contrary, as I noted above, the high levels of offers from new supply sources has borne out the assumption that the FCM would be highly contestable.

Q HAS ISO-NE NONETHELESS PROPOSED CHANGES IN THE BID MITIGATION STANDARDS FOR STATIC AND PERMANENT DE-LIST BIDS?

A Yes. There are two material changes. First, ISO-NE proposes to recast what costs and revenues it includes in determination of a reasonable bid level. Second, ISO-NE proposes to set the review threshold for both Static and Permanent De-list Bids at the Dynamic De-list Bid price threshold, i.e., \$1/kW-month.[42]

Q DOES ISO-NE PROVIDE ANY RATIONALE FOR CHANGING THE REVIEW THRESHOLDS?

A No, ISO-NE offers no explanation or evidence as to why all de-list bids should now be subject to IMM review. I agree that the Static De-list Bid review threshold should be equal to the Dynamic De-list Bid price threshold, although I disagree that any change is

---

[42] *Id.* at 54.

needed to either one of these thresholds. As I discuss above, however, the 1.25 times CONE review threshold for Permanent De-list Bids was a well-reasoned level, was agreed by stakeholders, and was accepted by the Commission as part of the FCM Settlement Agreement. I am not aware of any evidence that the review threshold has been abused or has been insufficient, and in light of the substantial surplus capacity and abundant offers of new capacity, I cannot construct a credible example in which a Permanent De-list Bid below 1.25 times CONE could be used to increase prices profitably to a supplier. I see no reason or rationale for a change in this rule.

Q WHAT CHANGES TO THE STANDARD OF REVIEW OF A DE-LIST BID DOES ISO-NE PROPOSE?

A ISO-NE proposes material changes to the net risk-adjusted going forward cost and opportunity cost standards of review in the Tariff currently.[43] The standard as currently written is intended to answer the question: "If you are a capacity resource, what is the lowest capacity price that you need to cover your expected out-of-pocket costs, net of expected earnings from the sale of energy and ancillary services?" ISO-NE now proposes to turn this question around, asking instead: "Given that you're already here, what costs could you save if you didn't take on a capacity supply obligation?"

Q IS THIS NEW QUESTION THE RIGHT ONE TO ASK?

A No. Capacity markets are intended to cover, at a minimum, the "missing money" between actual, out-of-pocket expenses and net revenue. The PJM market operates this way, as does the ISO-NE market currently. ISO-NE admits that, except in unusual

[43] ISO-NE Tariff §§ III.13.1.2.3.2.1.1, III.13.1.2.3.2.1.2.

circumstances, this new policy would have the effect of setting the allowed Static or Permanent De-list Bid at close to zero.

Q WHAT WOULD BE THE EFFECT ON THE MARKET IF STATIC AND PERMANENT DE-LIST BIDS WERE, FOR THE MOST PART, CAPPED AT ZERO?

A There are several adverse outcomes from that possibility. Capacity resources could be cash negative over the course of a year—even when only the narrowly defined category of "going forward" costs is considered, let alone debt service, depreciation, or any return on or of capital. These resources, nonetheless, are providing a year-round service to ISO-NE. This is not how other RTOs operate, nor is it sound policy.

Q AT WHAT LEVEL DOES PJM CAP EXISTING GENERATORS' CAPACITY SUPPLY OFFERS?

A Existing generators in PJM are capped at their Avoidable Cost Rate, net of historical energy and ancillary services earnings. This Avoidable Cost Rate, like the current standard in ISO-NE, includes the full range of out-of-pocket expenses that are required to operate the plant and could be avoided by mothballing the unit for one year. The Avoidable Cost Rate also includes an important element missing from the current standard in ISO-NE—a mechanism to allow amortization of certain capital expenses over multiple years for purposes of setting the bid caps, which is important for encouraging appropriate investment in the reliability of the fleet. Unlike ISO-NE's current proposal, there is no requirement to cease operations if this offer clears.

Q IN CALIFORNIA, HOW DOES THE ISO COMPENSATE RESOURCES UNDER ITS INTERIM CAPACITY PROCUREMENT MECHANISM?

A The ICPM payment rate of $41/kW-year (or $3.42/kW-month) is set to more than cover avoidable fixed costs of a resource during the time it is acting as a capacity resource to the California ISO. Resources also keep any earnings they may have in the energy or ancillary services markets.[44]

Q HOW IS THIS ISSUE ADDRESSED IN THE NYISO?

A In its capacity market, the NYISO does not mitigate the offer prices of any resource, with one narrow exception: pivotal suppliers in New York City with more than 500 MW of unforced capacity. If not previously sold, each pivotal supplier is required to offer its capacity in the monthly Spot Market Auctions at a price capped at the greater of its net going-forward cost or "the expected ICAP Demand Curve clearing price calculated on the assumption that all qualified UCAP in the in-City market were sold."[45] This restriction, however, needs to be understood in context. The NYISO monthly Spot Market Auctions clear a few days before each month for a commitment of only one month. Neighboring markets have longer term, forward capacity market structures. Installed resources that have not yet committed their capacity, therefore, have few options and little opportunity cost. Moreover, the NYISO capacity obligation does not impose the same level of penalty risks as the FCM.

---

[44] The California ISO's current proposal would increase this rate to $55/kW-year, consistent with current estimates of cash going-forward costs. California ISO, Capacity Procurement Mechanism, and Compensation Bid Mitigation for Exceptional Dispatch at 21 (Aug. 23, 2010), http://foliweb7.caiso.com/27f8/27f86b264ae70.pdf.

[45] *N.Y. Indep. Sys. Operator, Inc.*, 122 FERC ¶ 61, 211 at P 22, *order on reh'g*, 124 FERC ¶ 61,301 (2008).

Q EVEN IF THE NYISO'S AND PJM'S COMMISSION-APPROVED MITIGATION OF EXISTING SUPPLIERS' CAPACITY BIDS ALLOWS SUPPLIERS TO INCLUDE THEIR CASH OPERATING COSTS IN THEIR BIDS, IS ISO-NE'S WRONG?

A Yes, in this case, the consensus of the crowd is correct. Bidding at the demonstrable costs of providing a product should not be considered an exercise of market power. The Capacity Supply Obligation requires that a resource offer energy in all hours, and exposes the seller to various penalties and charges, and so it is reasonable to expect that the capacity payment will be sufficient to cover the expected out-of-pocket expenses associated with maintaining that level of service. As Dr. Patton states:

> The primary reason a supplier would not sell capacity is . . . the costs of *keeping the unit in operation* (i.e., the unit's going-forward costs). If a the [sic] revenues from the capacity, energy and ancillary services markets together are not sufficient to cover the going-forward costs of keeping the unit in operation, then it is rational for the supplier to retire the unit rather than selling its capacity. . . . The competitive offer price level [in market power mitigation] would be set at the higher of the price the supplier has the opportunity to receive in an external market or the resources net going forward cost (going forward costs less anticipated net revenues from energy and ancillary services).[46]

It may in fact be the case that suppliers would accept a lower payment because they can't pack up their asset and leave New England, but setting up a cash-negative situation in the capacity market is sure to discourage investors from building new assets in New England or continuing to make any further investment in the existing needed resources.

In short, ISO-NE proposes an over-thought, novel standard for bid mitigation that attempts to impose the lowest possible level of bid on each resource, rather than a bid that

---

[46] *Midwest Indep. Transmission Sys. Operator, Inc.*, Docket No. ER08-394-007, Compliance Filing of the Midwest ISO's Independent Market Monitor at 4-5 (Nov. 19, 2008) (emphasis added).

is directly linked to a conservatively low measure of the actual total costs of maintaining a resource so that it can operate reliably. Stripping suppliers of the right to bid these actual costs also is not sustainable over the long term.

Q DOESN'T YOUR CONCERN THAT RESOURCES MAY BE CASH-NEGATIVE OVERLOOK THE OPTION FOR RESOURCES TO AGREE TO SHUT DOWN FOR THE PERIOD THAT THEY ARE NOT A CAPACITY RESOURCE?

A No, I have taken that choice into account. There is more than a little irony in ISO-NE's requirement that any resource seeking to bid their cash going-forward costs mandatorily cease operation if their bids clear (i.e., if the unit does not receive a Capacity Supply Obligation). It was ISO-NE that fought tooth-and-nail to require that non-CSO resources be required to offer into the energy market whenever they could; now, it seeks to prohibit them from doing so.

But even taking into account this provision, the future option value of the ability to produce power is an important element of value in a power plant. De-list bids for an FCA must be filed almost four years in advance of the commitment period, and actual conditions can change sharply in that time. Maintaining the option to operate in the future, should conditions warrant, is of value—a value created by the enormous capital investment required to build power generation. Asking suppliers to surrender this value in order to be able to bid their costs into the capacity market is unreasonable and could raise costs to consumers (if they are required to purchase from higher cost resources in the Reconfiguration Auctions, where 100% of the actual ICR must ultimately be purchased).

C. A Pivotal Supplier Test, Properly Designed, May Have an Appropriately Limited Role in the FCM Design

Q IN YOUR JULY TESTIMONY YOU PROVIDED LIMITED SUPPORT FOR A PIVOTAL SUPPLIER TEST, PROVIDED THAT IT WAS CORRECTLY CONSTRUCTED. PLEASE SUMMARIZE THOSE VIEWS.

A In smaller Capacity Zones, there is greater risk that seller (or buyer) market power will influence the clearing price. In most instances, the contestability of the market through competitive entry, in combination with the role of the IMM currently laid out in the FCM rules, renders the abuse of this market power quite unlikely. However, I conceded that in periods of surplus (when new entry is unlikely to mitigate local market power), a pivotal supplier in an import-constrained zone may have a degree of market power that would be appropriate to mitigate more assertively. I concurred with the Joint Filing that a pivotal supplier test could be appropriate, provided that the test included *all* qualified supply in the FCA, rather than just the *existing* supply as proposed. There is no reason to exclude one sort of supply from the test, inasmuch as all the supply is equally capable of meeting demand. I also proposed that a *de minimis* threshold apply, so that relatively small suppliers are not subject to mitigation because they cannot exercise market power to any significant degree.

Q HAS ISO-NE DROPPED ITS PROPOSAL FOR A PIVOTAL SUPPLIER TEST?

A Yes. ISO-NE has instead proposed a sweeping expansion of bid mitigation from existing generation. Rather than applying a structural test and then mitigating bids from entities with structural market power, ISO-NE now proposes an “all mitigation, all the time” approach.

Q DO YOU AGREE WITH ISO-NE'S DECISION?

A If the Commission were to adopt the expansive mitigation plan proposed by ISO-NE, I agree that a pivotal supplier test would be superfluous. I disagree with the expanded bid mitigation, however, which goes far beyond what is needed to meet the limited scope established for this hearing—namely, to make those changes in the bid mitigation necessary to allow modeling of Capacity Zones at all times.[47] A limited expansion of bid mitigation, more closely tailored to the specific need to ensure competitive pricing in import-constrained Capacity Zones, would still warrant a pivotal supplier test.

Q IS YOUR VIEW THAT A PIVOTAL SUPPLIER TEST IS WARRANTED SUPPORTED BY OTHER WITNESSES?

A Yes. Joint Filing Supporter's witness Dr. Seth Blumsack acknowledges that

> efficient capacity price formation requires that these excluded de-list bids represent competitive actions (*e.g.*, where the capacity clearing price is insufficient to cover the delisting generation resource's going forward costs) and not an attempt to manipulate the FCA. For this reason, ISO-NE and NEPOOL reasonably concluded that a pivotal supplier test for the FCM is required to detect suppliers who have the ability to trigger the creation of a Capacity Zone through uncompetitive de-list bidding.[48]

---

[47] *See Edison Mission Energy v. FERC*, 394 F.3d 964, 968-70 (D.C. Cir. 2005) (describing "Commission's contradiction of its prior rulings acknowledging the potential ill effects of forcing down prices absent structural market distortions [and yet still imposing seller market power mitigation as] the epitome of agency capriciousness"); *Midwest Indep. Transmission Sys. Operator, Inc.*, 111 FERC ¶ 61,043 at P 78 (2005) (noting appellate court's "concerns with mitigation plans that mitigate workably competitive markets, suppress prices and deter market entry.").

[48] *ISO New England Inc.*, Docket Nos. ER10-787-000, *et al.*, The Joint Filing Supporters' First Brief, Exhibit DPUC-23, Direct Testimony of Seth Blumsack, Ph.D on Behalf of First Brief of the Joint Filing Supporters at 6:13-19 ("Blumsack Test.") (July 1, 2010).

Q DOES DR. BLUMSACK BELIEVE THAT MITIGATION OF BIDS FROM PIVOTAL SUPPLIERS IS SUFFICIENT TO PREVENT THE EXERCISE OF MARKET POWER BY THEM?

A No. He asserts that "a pivotal supplier may profitably exercise market power by de-listing at any price level, not simply a price level above the resource's competitive offer."[49] Later he states that "simply ensuring that FCM pivotal suppliers make cost-competitive offers is not sufficient to prevent the exercise of market power by FCM pivotal suppliers."[50]

Q DO YOU AGREE WITH DR. BLUMSACK ON THIS POINT?

A No, I do not. Submitting cost-based supply offers cannot be considered the use of market power. Indeed, the remedy the Commission applies in all markets when a supplier has market power is to require the supplier's bid to default back to cost-based bidding. Dr. Blumsack's conclusion that a supplier's profit rises when it de-lists a resource if the capacity payment is lower than the cost of that resource is hardly a surprise; it is basic economics. Bidding resources in a way that is exactly consistent with an atomistic supplier is not an exercise of market power.

---

49 *Id*. at 13:6-7.

50 *Id*. at 20:12-14.

Q DR. BLUMSACK ALSO SUGGESTS THAT "THE EXERCISE OF MARKET POWER BY JOINTLY PIVOTAL SUPPLIERS COULD OCCUR WITHOUT ANY EXPLICIT COORDINATION OR COLLUSION,"[51] AND THAT THEREFORE DYNAMIC DE-LIST BIDS SHOULD NOT BE ALLOWED TO TRIGGER CREATION OF ZONES. DO YOU AGREE?

A No, I do not. I will discuss Dr. Blumsack's ill-founded objections to use of all de-list bids in creating Capacity Zones below. With respect to Dr. Blumsack's "tacit collusion" point, his argument is uncompelling.[52] The FCA is conducted annually, and the mix of resources changes in complex and unforeseeable ways from one year to the next, and consequently the competitive dynamics of each auction are unique as many relevant factors, such as new entry, plant retirements, energy margin forecasts, transmission, and loads, change each year. Moreover, the modified descending clock auction format used by the Auction Manager of the FCA presents very little information to suppliers very infrequently, providing little opportunity to use the inter-round auction reports as a means to signal behavior

Q DR. BLUMSACK ALSO PROPOSES THAT ALL PIVOTAL SUPPLIERS BE MITIGATED, REGARDLESS OF THEIR MARKET SHARE.[53] DO YOU AGREE?

A No. Dr. Blumsack ignores several relevant factors.

The single piece of literature cited by Dr. Blumsack to support this idea is again from a "repeated game" scenario, the energy markets—and, more particularly, simulated energy markets, where the real-life swirl of confounding factors can be neatly excised.

[51] *Id.* at 21:8-13.

[52] *Id.*

[53] *Id.* at 25:11-14.

Even presuming that this laboratory environment is informative for rapidly repeated, static markets, it is surely uninformative about the competitive dynamics of the FCA. The FCA, being an annual market, is much less susceptible to potentially risky "trial and error" approaches to testing the bounds of one's market power, because the "game" is not really "repeated" and because mistakes are costly. The competitive landscape from one FCA to another can change markedly, as new resources enter and market conditions evolve, whereas the energy market on one day is generally very similar to the market the next day; when participants and their incentives change in each auction, the stability of the laboratory "repeated game" is not present. Further, in the energy markets, if a strategy of withholding fails—either because the IMM catches the ploy or the withholding fails to increase profits to the supplier—the stakes are far smaller than in the capacity market. One days' energy margin is likely less than one percent of a year's capacity payment. Where a supplier might risk a day's margins in search of a higher payoff, it would be very unlikely to risk a full year's capacity revenues by deviating from the competitive supply offer.

Second, Dynamic De-list Bids, although not reviewed by the IMM, are capped at a price threshold. Consequently, in Dr. Blumsack's example, where a 5 MW supplier is pivotal in a market with 100 MW of supply and a Local Sourcing Requirement of 95 MW or higher, the highest that the pivotal supplier could bid is currently 0.8 times CONE. In a market that is 5 MW from being deficient, a price that is at a 20 percent discount to the equilibrium price is not unreasonable. Indeed, the Commission has approved the use of demand curves in both PJM and NYISO that recognize that small surpluses should only result in small decrements in the capacity price.

Third, Dr. Blumsack confuses the ability to affect prices with the ability to exercise market power. He does not take into account the profitability of the withdrawal strategy necessary for a pivotal supplier to exercise market power successfully. If a supplier would have to withhold four-fifths of its available supply in order to raise the price, the price received by the remaining fifth would have to be five times higher than the competitive price. Regardless of size, this would be an unlikely scenario for any supplier (especially considering that Dynamic De-list Bids are capped at 80 percent of CONE). But for small suppliers, this situation is even less likely. Suppose the LSR in our hypothetical Capacity Zone was 99 MW. By withdrawing 4 MW of its 5 MW supply, the small pivotal supplier could stop the auction at 80 percent of CONE. Alternatively, it could leave all 5 MW in the auction and let de-list bids from other suppliers stop the auction. But 4 MW is not very much that needs to be de-listed, and, as the chart of the PJM supply stack demonstrates, there are many resources with relatively high going-forward costs. It therefore seems more likely than not that the clearing price will be set somewhere above 16 percent of CONE, in which case the profits to the small pivotal supplier are higher if it keeps all its capacity in the market. In light of, *inter alia*, this profitability (or non-profitability) of withholding factor, the Commission approved a 500 MW threshold for the Pivotal Supplier definition in New York City in the In City ICAP Proceeding[54] and a 500 MW threshold for determining physical withholding in the Midwest ISO's Voluntary Capacity Auction.[55]

---

[54] *See New York Indep. Sys. Operator, Inc.*, 122 FERC ¶ 61,211 at P 64, *order on reh'g*, 124 FERC ¶ 61,301 (2008), *order on reh'g and clarification*, 131 FERC ¶ 61,170 (2010); *New York Indep. Sys. Operator, Inc.*, Docket No. ER10-2210-000, Compliance Filing at 15-16 (Aug. 12, 2010) (demonstrating that the 500 MW threshold remains appropriate).

[55] Midwest ISO Open Access Transmission, Energy and Operating Reserve Markets Tariff § 64.1.1(d)(i).

Q DO YOU HAVE A SOLUTION TO THE "SMALL PIVOTAL SUPPLIER" APPROACH THAT IS SUPERIOR TO MITIGATION?

A Yes. Consider Dr. Blumsack's example above, in which the 5 MW supplier knows that there is 100 MW of total supply in a Capacity Zone to meet a Local Sourcing Requirement of at least 95 MW. The only reason that the supplier can know this critical information that there is 100 MW of supply is because ISO-NE published it; ISO-NE is privy to all new capacity qualified. While some of this information may be known publicly, such as the development of a major new generator, an important "competitive fringe" of new supply from Demand Resources, Energy Efficiency, and small renewables has consistently qualified as new capacity resources in each of the FCAs to date. If our small pivotal supplier knew only that there was 95 MW of *existing supply* in its Capacity Zone, and that there was 2,000 MW of *new supply* located somewhere in the region, it would be unable to establish whether it was pivotal. While typically it is the case that full information improves the efficiency of markets, in this case limiting information to the market can improve its competitiveness.

VII. MODELING OF ZONES

A. Rejected De-List Bids should trigger the creation of appropriate capacity zones

Q WHAT PROPOSAL DOES ISO-NE MAKE WITH RESPECT TO DE-LIST BIDS REJECTED FOR RELIABILITY?

A ISO-NE has retracted its proposal to include rejected de-list bids as OOM capacity and, consequently, such bids would no longer be allowed to set the capacity price paid to any other capacity resource.

Q WHAT RATIONALE DOES ISO-NE PROVIDE FOR THIS RETRACTION?

A ISO-NE avers that, with the (potentially) smaller zones that may now be modeled in the FCA, these small zones will "naturally capture the sorts of transmission constraints that currently lead to de-list bids being rejected for reliability."[56] ISO-NE goes on to acknowledge that there "may be unique, unit-specific constraints that lead to the rejection of de-list bids even under the new proposed design, but in those cases it would not be appropriate to adjust the zonal price to reflect this."[57]

Q DO YOU AGREE WITH THIS REASONING?

A For the most part, yes, but I believe that there is an important gap in ISO-NE's reasoning that needs to be addressed. Modeling smaller zones all the time will address some of the issues flagged by de-list bids that have been rejected in past FCAs; for example, in FCA #1, had Connecticut been modeled, then the rejected de-list bids from NRG's Norwalk Harbor units would not have been cleared and therefore would have set the zonal clearing price rather than being rejected. The assumption that all sub-zonal reliability issues are necessarily unit-specific, however, lacks foundation. For example, ISO-NE proposes that Connecticut be one of the modeled Capacity Zones.[58] Southwestern Connecticut and Norwalk/Stamford are identified as relevant planning sub-areas in the *2009 Regional System Plan*.[59] Presumably, notwithstanding the recent upgrades to the transmission system in Connecticut, these sub-areas remain as potentially

---

56 ISO-NE First Br. at 38.

57 *Id.*

58 *Id.* at 44.

59 ISO New England Inc., 2009 Regional System Plan at 20 (Oct. 15, 2009), http://www.iso-ne.com/trans/rsp/2009/rsp09_final.pdf.

relevant geographies that could, under some scenarios, lead ISO-NE to reject de-list bids for reliability. ISO-NE does not cover this middle ground at all, leaping straight from energy zones to unit-specific needs.

Q WHY DOES A MARKET-BASED APPROACH TO IDENTIFYING SMALL ZONES MATTER?

A When there exists unmodeled but relevant zones, simply rejecting a de-list bid and washing one's hands of the matter is not sufficient; that approach fails on both efficiency and equity grounds.

On the matter of equity, resources that are providing the same service should receive the same payment. This principle is the foundation for the Standard Market Design in New England, which replaced region-wide pricing augmented by unit-specific congestion payments with locational marginal pricing. If Resource A and Resource B both serve the same reliability role in the FCA, they also ought to receive the same capacity payment, barring extraordinary efficiency considerations such as those I discussed above in support of the two-tiered capacity price.

On the matter of efficiency, failure to model a relevant subzone removes the price signal needed to find a market-based solution to the reliability issue. Simply paying an existing resource its de-list bid, while paying directly comparable resources a lower price, thwarts competitive entry that could allow the must-run resource to retire.

Q WHAT ALTERNATIVE HAVE YOU PROPOSED?

A In my July testimony, I supported the concept of potentially creating sub-zones when a de-list bid is rejected for reliability. Following an FCA in which a de-list bid was rejected for reliability, ISO-NE would identify the largest sub-zone possible of resources that serve a comparable reliability function. In all subsequent FCAs, this sub-zone would be modeled. In the Commitment Period covered by that FCA, however, these comparable resources would receive only their FCA clearing price, not the price of the rejected de-list bid.

Q HOW DOES YOUR APPROACH MESH WITH ISO-NE'S PROPOSAL?

A My proposal is a natural extension of the ISO-NE proposal. If a constraint is truly unit-specific, then the largest sub-zone of comparable units contains only that unit, and so my proposal reduces to ISO-NE's. If ISO-NE's assumption that all sub-zonal constraints are unit-specific is false, however, my proposal ensures an equitable and efficient outcome.

Q DOES YOUR PROPOSAL ALLOW FOR NEW ENTRY AGAINST THE RESOURCE WHOSE DE-LIST BID WAS REJECTED FOR RELIABILITY?

A It could and should. ISO-NE should identify the sub-zone by indicating not only what *existing* resources are within the sub-zone, but also what points of interconnection would put a new resource in the sub-zone.

B. Do Not Address Market Power by Ignoring Zones

Q DO YOU AGREE WITH ISO-NE'S POSITION THAT ALL CAPACITY ZONES SHOULD BE MODELED ALL THE TIME?

A Yes. Just as ISO-NE includes all monitored transmission limits in its energy model in all hours—regardless of supply and demand conditions—it should also model the complete set of known capacity transfer limits in all FCAs.

Q PUBLIC SYSTEMS ARGUE AGAINST "ANY PERCEIVED IMPERATIVE TO CHANGE THE FCM MARKET RULES RADICALLY IN AN EFFORT TO ENSURE THAT ZONAL CAPACITY PRICES SEPARATE."[60] DO YOU SUPPORT SUCH A CHANGE?

A The changes in the market rules that I support are not "an effort to ensure" zonal price separation. Public Systems correctly note that billions of dollars have recently been invested in transmission upgrades throughout New England to address reliability concerns. Good market design will reflect the additional reliability benefits of those upgrades, and indeed the Local Sourcing Requirements for each Capacity Zone are set by ISO-NE based on a detailed examination of the system. If recent transmission upgrades have eliminated constraints, ISO-NE's examination will reflect that fact. Therefore, nothing about the proposal to model all Capacity Zones, all the time, diminishes the value of the transmission investment made in the region. To the extent, though, that local reliability issues remain, it is important that capacity prices reflect the need to carry location-specific capacity to address those issues.

Appropriate modeling of capacity zones is not merely reactive, however; it can aid the planning process by appropriately valuing transmission upgrades. Some reliability needs can be addressed more economically by generation than by transmission, so a policy that builds out transmission to address all local reliability needs may be unnecessarily expensive. A locational capacity market, with properly modeled zones, may avoid or defer transmission upgrades by identifying lower-cost, market-based

[60] *ISO New England Inc.*, Docket Nos. ER10-787-000, *et al.*, First Brief of the Connecticut Municipal Electric Energy Cooperative, Massachusetts Municipal Wholesale Electric Company, and New Hampshire Electric Cooperative, Inc. ("Public Systems") at 22 (July 1, 2010).

solutions from generation or Demand Resources. On the other hand, if a transmission solution is a more efficient response, the locational capacity market is likely to prompt its construction.

Q DR. BLUMSACK TESTIFIES THAT THE APPROPRIATE MEANS OF MITIGATING MARKET POWER IS TO IGNORE BIDS IN SETTING CAPACITY ZONES.[61] DO YOU AGREE?

A No. As I stated in my July testimony, the market design should not be compromised because of abstract concerns over market power. First, implement a sound market design. Second, develop market power mitigation rules that complement that market design. Any other path will guarantee that markets will fail to produce the required results.

Q SPECIFICALLY, DR. BLUMSACK TAKES THE POSITION THAT DYNAMIC DE-LIST BIDS SHOULD NOT BE ALLOWED TO CREATE ZONAL PRICE SEPARATION BECAUSE THEY HAVE NOT BEEN REVIEWED BY THE MARKET MONITOR.[62] DO YOU AGREE?

A No. A bid does not have to be reviewed by the market monitor in order for it to be competitive. In a well-designed market, the primary "market monitoring" is the competitive dynamic of the market itself. The IMM and direct mitigation of bids should serve as a backstop, not the default.

Competitive de-list bids, or de-list bids reviewed by the IMM, should be allowed to create zonal price separation. This is the standard in the energy markets, and there is

---

[61] Blumsack Test. at 21:3-13.

[62] *Id.* at 21:5-7.

no rationale for deviating from this standard in the capacity markets. Dr. Blumsack does not consider the consequences of failing to allow zonal price separation because of some real or imagined market power issue. Genuine cost difference in meeting the reliability needs of different zones cannot simply be wished away. Suppose that, as the auction price ticks down, the price falls to a point where the capacity remaining in a zone equals the LSR, but there is a surplus in the Rest of Pool region. If the auction price is allowed to tick down further in the constrained Capacity Zone, additional capacity may de-list and the LSR will not be met. Dr. Blumsack would have ISO-NE ignore this fact if the marginal de-list bid is either a Dynamic De-list Bid or a Static De-list Bid from a pivotal supplier.[63] But what is ISO-NE supposed to do then? Presumably he would have ISO-NE reject those de-list bids for reliability reasons, pay the marginal resources their bids, and continue to tick down the auction until the Rest of Pool surplus equals zero. But this approach is exactly parallel to the pre-SMD energy market design, where NEPOOL established a single regional price and paid as-bid for congestion relief. This "pay as bid" congestion management was correctly discarded. Likewise, the Commission has already determined that a locational capacity market is required in New England.[64] Ignoring genuine cost differences reflected in competitive or properly mitigated de-list bids is directly counter to the proper development of a locational capacity market.

---

[63] *Id.* at 20:8-19.

[64] *See Devon Power LLC*, 113 FERC ¶ 61,075 (2005), *order approving settlement*, 115 FERC ¶ 61,340 (2006).

VIII. COST OF NEW ENTRY ISSUES

Q ISO-NE PROPOSES TO ELIMINATE THE USE OF CONE FROM MANY MARKET FUNCTIONS. HAS THIS NEW PROPOSAL ADDRESSED YOUR CONCERNS ABOUT THE CURRENT LEVEL OF CONE?

A No, although my remaining concerns are relatively minor.

The central issue remains that the administratively set value of CONE has now radically departed from any plausible estimate of the cost to develop a new generation resource.[65] While some may argue that Demand Resources are the most economical means of meeting capacity requirements today, they generally reflect an agreement to release generator and import capacity sources for use by others, not a source of system accessible energy to service load's needs. As prices increase, more customers may be willing to forego the firm service and defer their demand. You can't go out and build new Demand Resources when and where they are needed, however; by contrast, a peaker can be added relatively quickly as needed. For some purposes, therefore, CONE should reflect the cost of building a peaker.

Moreover, there is an independent value in setting a clear marker for both loads and suppliers about where the FCM is expected to clear, on average over time. Loads that can reduce peak usage economically will make plans to do so, and suppliers can gauge the likelihood of success of their development projects. Even if the administrative roles of CONE is reduced—a move I support—that does not entirely remove the rationale for having an accurately derived level of CONE available as a reference price to the market.

---

[65] Stoddard Test. at 82:3–83:4.

Q WHAT USES OF CONE REMAIN UNADDRESSED?

A The price paid to existing resources in the event of Inadequate Supply or Insufficient Competition was set at a modest premium—110% of CONE.[66] We intentionally set this value above the expected price at which new entry could occur to ensure that this administrative cap did not interfere with market entry. If CONE is materially too low, as it now is, the 110% cap in these situations is also too low.

ISO has proposed that CONE be replaced in this rule by "the existing capacity clearing price from the last competitive FCA."[67] This replacement is not adequate for several reasons. First, the FCA Price from the last competitive FCA may have been suppressed by OOM capacity and, consequently, not reflected competitive cost levels. The replacement price should therefore be set, at a minimum, at the APR Price from the last competitive FCA. Even this is problematic. Supply and demand conditions may have been quite different in the prior FCA. If there was a surplus of capacity offered, for example, even the APR Price might not reflect the cost of bringing competitive supplies of new capacity resources into the market.

Q WHAT REMEDY WOULD YOU PROPOSE?

A ISO-NE has stated that it intends to calculate a benchmark cost of entry for a range of specific technologies, including peakers. Peakers are the "resource of last resort" for meeting reliability needs—consider the addition of peakers into New York City by the New York Power Authority,[68] or into Long Beach by Southern California Edison[69]—it

---

66 ISO-NE Tariff §§ III.13.2.8.1, III.13.2.8.2.

67 ISO-NE First Br. at 61.

68 New York Power Authority, 2002 Annual Report at Section 7, http://www.nypa.gov/ar02/annual02web/pages/pg7_1.htm (stating "NYPA completed the installation of small, clean gas-fired power plants at six locations in the city and another on Long Island to avert threatened blackouts."). The total cost of these peakers was about $650

would be appropriate to use that benchmark to replace CONE in the calculation of the Inadequate Supply / Insufficient Competition price. Peaking units are also used as the proxy unit to set the Net CONE in regions that use the demand curve structure in their capacity markets.[70]

Q DOES THIS CONCLUDE YOUR TESTIMONY AT THIS TIME?

A Yes.

---

million, or $1,444/kW, according to the report 2001-S-64 by the New York State Office of the Comptroller. New York Power Authority Power Generation in the New York City Area at 20 (May 12, 2004), *available at* http://www.osc.state.ny.us/audits/allaudits/093004/01s64.pdf.

[69] *Application of Southern California Edison Company (U338-E) for Recovery of Peaker Costs*, Cal. Pub. Util Comm'n Application 07-12-029, Decision Granting Recovery of Peaker Costs to Southern California Edison Company at 4 (2007), *available at* http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/117553.pdf (whereby the California Public Utility Commission "$260.121 million [$1,067/kW] in costs to acquire and install the four units to be reasonable.").

[70] *See, e.g.*, NYISO Market Administration and Control Area Services Tariff § 5.14.1.2.

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

ISO New England Inc. and New England Power Pool	)	Docket No. ER10-787-000
New England Power Generators Association, Inc.	)	
	)	
v.	)	Docket No. EL10-50-000
	)	
ISO New England Inc.	)	
PSEG Energy Resources & Trade LLC, *et al.*	)	
	)	
v.	)	Docket No. EL10-57-000
	)	
ISO New England Inc.	)	

I, Robert Stoddard, being duly sworn, depose and state that the contents of the foregoing supplementary testimony on behalf of the New England Power Generators Association is true, correct, accurate and complete to the best of my knowledge, information, and belief.

Robert Stoddard

SUBSCRIBED AND SWORN to before me this 31st day of August 2010.

Suzanne M. Walsh
(Notary Public)

My commission expires: 2/25/11

SUZANNE M. WALSH
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
February 25, 2011

ISO new england

press release

FOR IMMEDIATE RELEASE

Contact:
Ellen Foley, ISO New England Inc. (413) 535-4139
Marcia Blomberg, ISO New England Inc. (413) 540-4555

Fourth Forward Capacity Market Auction Secures Power System Resources for 2013–2014

More than 40,000 Megawatts of Resources Competed to Meet the Region's Capacity Needs

Holyoke, MA—August 6, 2010—The fourth Forward Capacity Market (FCM) auction administered by ISO New England Inc. concluded successfully this week, with preliminary results showing the auction attracted sufficient generation and demand-side resources to meet the region's future reliability needs.

More than 40,400 megawatts (MW) of resources from new and existing demand- and supply-side resources qualified to compete Monday and Tuesday to provide the 32,127 MW needed for reliability in the 2013 to 2014 timeframe. The auction started at a price of nearly $9.84 per kilowatt-month (kW-month). Bidding in the final, seventh round reached the floor price for this auction at $2.95 per kW-month. Preliminary results show 32,247 MW of generating resources cleared the auction along with 3,261 MW of demand resources and 1,993 MW of imports. These early results indicate approximately 5,374 MW of excess supply was remaining.

Several existing power plants and demand resources submitted "delist" bids in advance of and during the auction and most were allowed to withdraw from the auction. A few others were retained in areas that otherwise would have insufficient resources to ensure the reliable operation of the power system. When a resource is retained for reliability purposes, the ISO works to seek alternate solutions that could allow the resource to withdraw from the market as requested. The resource would be allowed to withdraw if one or more solutions were proposed and can be implemented to meet the reliability requirements within the required timeframe. Compensation for resources that are retained for reliability purposes is subject to review and approval by the Federal Energy Regulatory Commission (FERC). Finalized auction results, including the names of individual units retained for reliability, will be included in an upcoming filing with FERC.

The final step in the four-year project to implement the FCM occurred June 1, 2010, when ISO New England cut over to systems that integrated this new market into existing processes. To procure the resources for this first year of the FCM, from June 1, 2010, through May 31, 2011, an auction was held in February 2008.

The new market has spurred investment in power system resources and encouraged significant growth of demand resources (DR). The table below shows that each of the first three auctions concluded at the floor price with surplus capacity. The result has been lower, prorated capacity prices as well as the assurance that the region will have sufficient resources to meet demand.

AUCTION[1]	Total Qualified (MW)	Cleared Genrtn (MW)	Cleared DR[2] (MW)	Cleared Imports (MW)	Total Capacity Acquired (MW)	Capacity Required (MW)	Floor Price[3]	Excess Supply (MW)	Prorated Price[4]
FCA-1 (2010/11)	39,165	30,865	2,279	933	34,077	32,305	$4.50	1,772	$4.25
FCA-2 (2011/12)	42,777	32,207	2,778	2,298	37,283	32,528	$3.60	4,755	$3.12
FCA-3 (2012/13)	42,745	32,228	2,867	1,901	36,996	31,965	$2.95	5,031	$2.54[5]
FCA-4 **(Initial Results)** (2013/14)	40,412	32,247	3,261	1,993	37,501	32,127	$2.95	5,374	$2.52[6]

The Forward Capacity Market was developed by ISO New England, the six New England states, and industry stakeholders to promote investment in demand- and supply-side resources. Under FCM, ISO New England projects the needs of the power system three years in advance and then holds an annual auction to purchase the power resources that will satisfy the future regional requirements. To enhance the efficiency of the new market, ISO New England is expected to file proposed rule changes with FERC in September.

These preliminary results are subject to certification by ISO New England and its auction contractor, Power Auctions LLC. Final results will be filed with FERC within the month.

[1] Initial results from each auction; amounts will change with monthly and annual reconfiguration auctions.

[2] Demand resource totals include a 600 MW cap on real-time emergency generation resources.

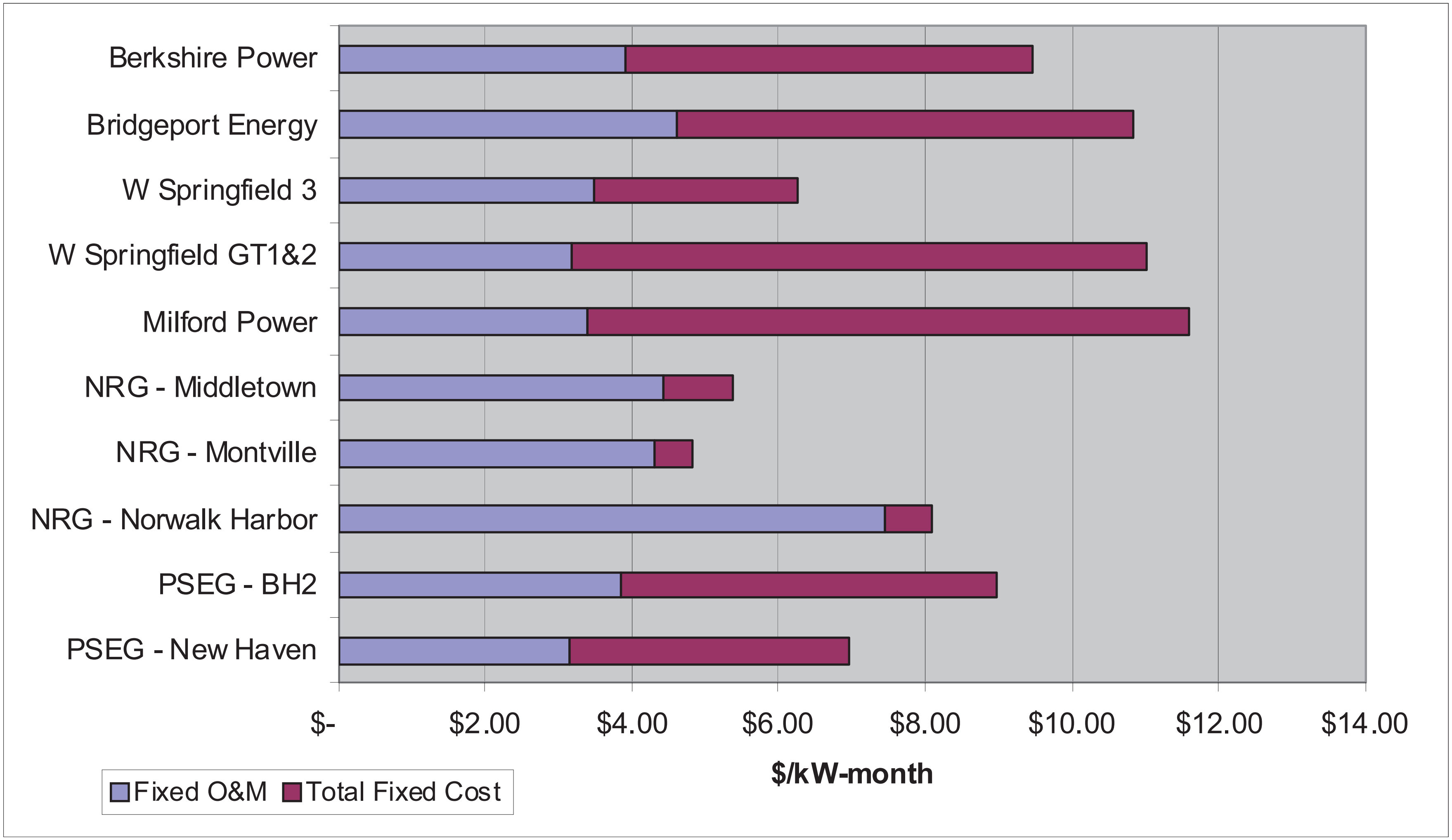
[3] Floor price is per kilowatt-month.

[4] Prorated price is per kilowatt-month.

[5] Prorated price in Maine for 2012/2013 is $2.47/kW-month.

[6] Prorated price in Maine for 2013/2014 is $2.34/kW-month.

Fixed O&M and Total Fixed Costs of New England RMR Resources



Source: Approved RMR filings of subject generators.

Estimated Net Fixed O+M Requirement of New England Generating Facilities

GE-MAPS Production Cost Simulations for 2015

Name	Type	Summer Capacity (MW)	Generation (GWh)	Total Margin ($K)	Total Margin (kW-month)	Capacity Factor	Fixed O&M ($/kW-month)	Shortfall: Fixed O&M net of Total Margin ($/kW-month)
BERKSHIRE POWER	CC	229	592	6,954	2.35	27.5%	3.91	1.56
BRIDGEPORT ENERGY 1	CC	448	2,713	20,005	3.16	58.7%	4.62	1.46
WEST SPRINGFIELD 3	STgo	94	20	533	0.44	2.2%	3.48	3.03
W SPRINGFIELD GT 1	GT	37	3	178	0.32	0.7%	3.18	2.86
W SPRINGFIELD GT 2	GT	37	3	171	0.30	0.7%	3.18	2.88
MILFORD POWER 1	CC	239	773	7,682	2.40	33.0%	3.41	1.01
MILFORD POWER 2	CC	253	894	7,710	2.23	35.5%	3.41	1.18
MIDDLETOWN 2	STgo	117	30	779	0.54	2.8%	4.44	3.90
MIDDLETOWN 3	STgo	236	79	1,822	0.62	3.7%	4.44	3.83
MIDDLETOWN 4	STgo	400	-	-	-	0.0%	4.44	4.44
MIDDLETOWN 10	GT	17	0	1	0.00	0.0%	4.44	4.44
MONTVILLE 10 and 11	IC	5	0	1	0.02	0.0%	4.32	4.30
MONTVILLE 5	STgo	81	6	299	0.31	0.9%	4.32	4.01
MONTVILLE 6	STgo	407	-	-	-	0.0%	4.32	4.32
NORWALK HARBOR 1	STgo	162	-	-	-	0.0%	7.45	7.45
NORWALK HARBOR 2	STgo	168	-	-	-	0.0%	7.45	7.45
BRIDGEPORT HARBOR 2	STgo	130	-	-	-	0.0%	3.85	3.85

Source: Charles River Associates.

Note: Estimates are not those of the generation owner.

Average of Station Average	**$**	**3.30**
Weighted Average	**$**	**3.37**