NEWS RELEASE

NEW YORK INDEPENDENT SYSTEM OPERATOR

FOR IMMEDIATE RELEASE

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EXPERTS FIND THAT "SOFT CAPS" WILL BOOMERANG:
NEW YORKERS' ELECTRIC BILLS WOULD RISE, NEW PLANTS COULD BE DISCOURAGED

January 11, 2001, Guilderland, NY…The New York Independent System Operator (NYISO), the entity charged with administration of the newly deregulated wholesale electricity markets and operation of the bulk power grid in New York State, today released a letter to New York State Public Service Commission (PSC) Chairman Maureen O. Helmer expressing reservations about a recommendation calling for a $150 per megawatt-hour "soft cap" on wholesale electricity prices. Prominent energy economists consulted by the NYISO Board have concluded that such a move would likely increase general price levels, significantly reduce incentives to invest in urgently-needed additional electric generating capacity in New York, and create an administrative morass that could impede the orderly workings of the state's energy market.

Two prominent energy economists, Professor William Hogan of the John F. Kennedy School of Government at Harvard University and Dr. David Patton of Capital Economics, determined that recent experience in the state of California supports the conclusion that the proposed $150 per megawatt-hour "soft cap" is more likely to become a price *floor*, since sellers would no longer have a strong competitive incentive to offer energy at prices close to their marginal costs. This would significantly undermine New York's wholesale electricity market, which is intended to provide sellers with an incentive to offer energy at a price close to marginal cost in order to maximize the likelihood that their offers will be accepted and that they will receive the market-clearing price. Thus, rather than moderating high prices, the "soft cap" would have the effect of increasing them, contributing to a market run amok, similar to California's. Instead, the NYISO proposes avoiding runaway energy prices through the implementation of more "market-friendly" mechanisms such as a market "circuit-breaker." Such a mechanism could keep price spikes in check by blocking any attempt to manipulate the energy market to cause or exacerbate sharp cost increases.

The entire text of the NYISO's letter to the Public Service Commission is attached, and includes the credentials of the energy economists cited above.

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NEW YORK INDEPENDENT SYSTEM OPERATOR

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January 11, 2001

Chairman Maureen O. Helmer
NYS Public Service Commission
3 Empire State Plaza
Albany, New York 12223

RE: Additional Response to PSC Report, Dated December 2000

Dear Chairman Helmer:

The purpose of this letter is to provide an additional response to the PSC Staff Report entitled, "Interim Pricing Report on the New York Independent System Operator," dated December 2000. As you know, the Interim Report already contains NYISO comments on most of the Report's recommendations, so there is no need to repeat those here. The main issue in this additional response letter is the $150 "soft cap" recommended in the Interim Report. The soft cap was not mentioned in the draft upon which your staff asked us to comment, and the importance of this issue prompted us to seek the counsel of recognized outside experts before responding.

The NYISO Staff and its Board of Directors appreciate the hard work and collegial approach taken by the PSC Staff in the development of the Report. The Report is noteworthy for the substantial amount of concurrence on most issues. This concurrence of views is all the more remarkable in light of the differing responsibilities of regulators and those charged with administering fair and efficient markets. We also appreciate the implicit observation in the Report that the corrections it recommends are principally related to the speed with which the NYISO corrects problems with the system it inherited.

The "Soft Cap"

The Interim Report recommends adoption of a so-called $150 "soft cap." Under this proposal, offers of energy at prices over $150 per megawatt-hour would no longer set the market-clearing price but, if accepted, would receive the amount of money contained in the offer, subject to cost justification. This proposal, like several others, is intended to control prices in the face of the expanded gap between the State's electric generating resources and its growing need for power.

The proposal, however, is a major departure from the economic fundamentals underlying the NYISO markets. The "soft cap" has recently been implemented in California, with FERC approval. Although the structure of the markets in California bears little resemblance to the markets established in New York, we believe it is instructive to determine the economic outcomes of its imposition there before adopting it in New York. We also believe that we should not implement such a fundamental change without availing ourselves of the best economic advice available on this subject, lest the change result in possibly adverse, unintended consequences.

For these reasons we sought the advice of Professor William Hogan, of the Kennedy School at Harvard University, and Dr. David Patton, of Capital Economics[1]. Professor Hogan is an eminent energy economist who developed the economic theories, now widely accepted, underlying the locational based marginal pricing which is used in the New York markets and in the other northeast ISOs. Dr. Patton is the Market Advisor to the Board of Directors of the NYISO. Prior to joining Capital Economics, Dr. Patton was a senior economist at the FERC, and has published and spoken on a broad array of topics related to emerging competitive electric markets, including transmission congestion and pricing, derivatives and risk management and market power in a deregulated electric industry. We have held discussions with both economists and have also appended their written responses to this letter.

In summary, Professor Hogan and Dr. Patton both conclude that the "soft cap" is likely to have the effect of increasing general price levels, reducing the incentive to invest in generating resources in New York and creating an administrative morass. In other words, they found that the "soft cap" would probably boomerang and yield the exact opposite of its intended effect.

They point out that the experience with the "soft cap" in California supports their conclusion. Instead of a *cap*, the California experience suggests that the $150 will tend to become a *floor*, since sellers no longer have a strong incentive to offer at prices close to their marginal costs.[2] Thus, rather than moderating high prices, the "soft cap" has the effect of increasing them, contributing to the misfortunes being experienced in California.

As has been noted both by the PSC and the NYISO, price spikes can and frequently do contribute significantly to the general cost of electric energy. In seeking means of addressing the problem of price spikes, the NYISO is faced with the difficulty of distinguishing between the normal price fluctuations, which are to be expected in a free market, and spikes attributable to the exercise of market power in varying durations. As you know, the NYISO is proposing to address this problem through the development of a so-called "circuit breaker" that should identify the potential for even the temporary exercise of market power to cause or exacerbate price spikes, and hopes to have the new protection in effect by the coming summer.

[1] See attached letters inviting advice.

[2] The system of locational based marginal prices adopted in New York is intended to provide sellers with an incentive to bid close to marginal cost in order to maximize the likelihood that their offers will be accepted and they will receive the market clearing price.

The "soft cap" also could have the effect of discouraging investment in new generating facilities in New York State. Decisions to build power plants are no longer made solely on the narrow basis of assuring reliability. These decisions are now made by private investors seeking to achieve a return on their investments. The imposition of devices such as the "soft cap" may well encourage investors to build elsewhere.

Finally, the requirement of cost justification for offers over $150 would create a severe administrative problem that the NYISO and/or the FERC could handle, if at all, only with significant additional personnel. First, the NYISO would have to determine the rules and guidelines for determining cost. Then the NYISO would have to acquire and evaluate cost data for each supplier. Such evaluation might require a degree of due process, resulting in contentious proceedings. The result could be similar to the situation of wellhead regulation of natural gas under the old Federal Power Commission, resulting in the "area rate cases" and the near destruction of the natural gas industry. This situation is entirely antithetical to the objectives for which the NYISO was created.

For these reasons, the NYISO Board of Directors cannot endorse the adoption of the "soft cap" at this time. If events prove that this analysis is incorrect, the matter can be reconsidered.

The Keys to Lower Prices

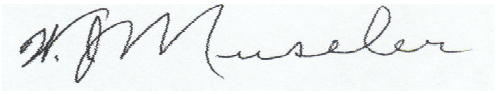
As the Interim Report acknowledges, the fundamental cause of price increases in New York's wholesale electricity markets is growing demand in the face of almost totally constrained supply. The laws of supply and demand cannot be repealed. Prices will increase as demand outstrips supply. While the process of perfecting the New York markets is not complete by any means, the residual problems in the New York markets do not loom nearly as large as the problem of getting power plants built in New York.

The NYISO has found little, if any, price elasticity of demand in New York's wholesale electric markets. The NYISO has set in motion a process to introduce this essential component of a properly functioning marketplace. The details of the necessary measures are likely to be closely linked to commercial relationships at the retail level, and the cooperation of the Public Service Commission and Load Serving entities will be essential.

As has already been stated, the development and imposition of some form of circuit breaker is important to cope with the transitory market power situations that are present as a result of the tightening supply situation. This mechanism, along with expanded price correction authority and other market improvements planned for summer 2001, should ensure that prices will reflect competitive conditions and not be unnecessarily high when the market is not workably competitive.

As stated above, the Interim Report already contains responses to most of its recommendations. Of the 39 Interim Report recommendations with which we agree, 29 are either complete or will be completed before the summer, and 10 are under study or will be completed shortly thereafter.

Sincerely,



William J. Museler
President & CEO

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Attachments

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NYISO Board of Directors

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January 4, 2001

Mr. William J. Museler
President and Chief Executive Officer
New York Independent System Operator
3890 Carmen Road
Schenectady, New York 12303

Dear Bill:

I write in response to your letter of December 20, 2000, in which you requested my advice on the adoption of the so-called "soft price cap" similar to the type recently imposed in California as part of the Federal Energy Regulatory Commission's Order of December 15, 2000, on the California market. You described a proposal "whereby the implementation of the single clearing price would be capped at $150.00 per megawatt hour and offers could be accepted in excess of $150.00 per megawatt hour provided they are cost justified."

This "soft price cap" proposal combines two defective approaches for dealing with market power and high prices: hard price caps and pay-as-bid auctions. I won't rehearse here the familiar arguments about the defects of (low) hard price caps. I will address the more novel features of the proposal for bids above the soft cap. On balance, the soft cap proposal retains the defects of both approaches and will not be likely to achieve its intended objectives. In California, the early evidence is that imposition of the "soft price cap" increased market chaos and was followed by higher, not lower, overall prices. If the problem is controlling market power, other mechanisms such as bid caps would be preferred. With the accumulating evidence, I expect the "soft price cap" will be seen in retrospect as just another in a series of magic bullets that ignore the fundamentals of a market; it is a shot fired in California that the New York Independent System Operator should duck.

My colleagues and I have commented on the proposal in California, and considered related arguments in the context of New York. The soft price cap idea imposed in California is novel and raises many issues. It did not appear in the FERC staff report on California and there was little critical analysis of the implications, other than the discussion of Commissioner Hébert in his concurrence to the California order. Essentially the soft price cap appears to be an attempt to straddle two auction price regimes, with market-clearing prices applying below $150 and pay-as-bid systems applying above $150. Below $150 it would seem that any price would be acceptable. Above $150, there would at least be requirements for further review by the FERC and possible refunds.

It is uncertain what is intended. One possibility is that the FERC intends to require and enforce cost justification for all bids in excess of $150. If this is the intent, the proposal in effect lowers the previous existing price cap and formalizes the practice of making out-of-market

purchases in order to obtain supplies available only at prices above the price cap.[1] In this case, the regulators and the NYISO should recognize that requiring cost justification of generator bids, particularly under a pay-as-bid system, will impose substantial burdens on you that would rival those under wellhead price controls used during the 1970s in the natural gas industry. Some of the issues that would have to be addressed include:

- Would fuels be priced based on their acquisition price or their current market price?
- Would emission allowances be priced based on their acquisition cost or their current market price, and how would market prices be determined?
- Would firm transportation charges be included in costs, and if so how, or only interruptible (and thus avoidable) gas transportation charges?
- How would the cost justification account for start-up and no-load costs?
- How would the opportunity costs of limited energy resources such as pondage hydro be measured?
- How would expected ancillary services prices be evaluated in measuring opportunity costs?
- How would imports and exports be priced?

Moreover, even if this regime were successfully applied the price discrimination and price averaging implicit in the pay-as-bid market structure would likely deter, rather than promote, forward contracting. Finally, such a cost based approach would appear to deter investments in new capacity, improved heat-rate performance, and reduced emissions, all of which will not be made unless they earn more than their short-run costs.

Alternatively, the soft price cap might be truly soft and not really enforce cost justification. Hence, there would be no price cap for any entity that is willing to file a report to the regulators and face the possibility of a refund. If this is the result, there might be little impact on consumer prices (particularly if the principal sources of those high prices are high costs and regional capacity shortages rather than the exercise of market power). Even so, the proposal might serve to deter entry and new investments, thus combining the worst of both worlds, high consumer prices and little or no new investment.

As with any price cap, the incentives run against the operation of markets and make the mechanism a source of complication in achieving a transition to a more market-like mechanism. It would be especially problematic for prospective new entrants. Consider a competitive existing generator with production costs below but opportunity costs above $150. The opportunity costs

[1] Commissioner Hébert for one is concerned that this requirement would act as a *de facto* price cap at $150. See Federal Energy Regulatory Commission, "Order Proposing Remedies for California Wholesale Electric Markets," Concurring Opinion of Commissioner Hébert, Docket No. EL00-95-000, Washington, DC, November 1, 2000.

should set a floor on its bid in a competitive market. Under a truly "soft" price cap, the risk for such an entity of bidding above $150 would be limited to the cost of filing and review by the FERC, plus the possibility that a refund may be required to return its short-run operating profits in excess of $150. There would be no rational reason not to bid the supplier's opportunity costs, as the worst case outcome would be no worse than if it did not try to capture its opportunity costs in its bid. By contrast, consider the new generator that needs a significant number of hours with revenue above $150 to justify the fixed costs of building a plant and entering the market. No matter what the regulators say now, the new generator (or the generator contemplating closing a plant, or a generator contemplating an investment to improve generating performance or reduce emissions) would face a larger maximum risk and would have to evaluate the chance that it would make a cash investment and then not recover its required return. In this case, it is not simply a matter of failing to capture its opportunity costs and being no worse off than if it had not tried, because the ability to capture opportunity costs may have provided the basis for an investment that would be sunk and would fail to recover its cost of capital. It is easy to imagine that this soft price cap would have almost the same effect as a hard price cap for such entrants, namely discouraging new entry. Given the short supply situation in New York, this would be just the wrong incentive.

In addition, a soft price cap would face the same problems of any pay-as-bid market. Electricity markets that rely on uniform price auctions to clear markets exploit a simple argument based on the law of one price. The law of one price says that in a decentralized market for a homogeneous commodity, trade will tend to converge towards a common market-clearing price. In the case of electricity, where decentralized trading is foreclosed in the final day-ahead and real-time markets, this convergence is not possible and the simple approach is to use what the market would produce if only there were enough time and no transaction costs.

Whenever these uniform price electricity markets encounter trouble for any reason, someone notices that market participants are responding to the incentives of the uniform price auction by bidding something below the market-clearing price. They then leap to the *non sequitur* that paying the bid rather than the market-clearing price would somehow reduce average prices. A moment's reflection would suggest that the same market participants who respond to the incentives of the uniform price auction would also respond to the incentives of the pay-as-bid auction. Now the incentive would be to bid the market-clearing price.

As a FERC staff report summarizes, the results would be the same price and revenue flows as under the uniform price auction.[2] This assumes, however, that there would be no

[2] Federal Energy Regulatory Commission, "Staff Report to the Federal Energy Regulatory Commission on Western Markets and the Causes of the Summer 2000 Price Abnormalities," Part 1 of Staff Report on U.S. Bulk Power Markets, November 1, 2000, p. 5-15.

uncertainty and no transaction costs. In the presence of uncertainty and transaction costs, there will be errors in the bids. The one sure thing that these errors will produce will be higher true costs through inefficient choices in the ultimate dispatch. There is no available evidence that the result would be lower prices. There are studies that suggest that both costs and prices would be higher.[3]

This general observation applied to any commodity auction applies with special force to something as complicated as the bids for a security-constrained economic dispatch. We saw what could happen in such a market when California operated fully separate energy, reserve and ancillary services markets.[4] In effect, this was an approximate prototype of a full pay-as-bid market. It was a stunning failure, the first in a line of special California problems. To cite another complication, consider the problems of transmission congestion management if everyone is bidding to make sure that the bid is close to the market-clearing price. For example, in New York the presence of transmission congestion can change the market value of generation by an order of magnitude. Every generator would be compelled to consider the likelihood of transmission congestion in each interval, and change its bids accordingly.

An embrace of a pay-as-bid rule would be a nightmare for the system operator and the competitive bidder, but a godsend for any supplier who wished to cloak the exercise of market power. If an entity is exercising market power, it can bid all of its resources in at a high price under as pay-as-bid system and it will receive the high price on all of its resources that clear in the market, and its high bid price will serve to withhold resources from the market so as to exercise market power. A competitive firm, on the other hand, will not be paid the high prices unless it bids like the firm with market power. This requires that the competitive firm bid above its costs, and it is likely that it would sometimes bid too high. A pay-as-bid system is therefore likely to reduce the impact of any competitive fringe in undermining market power.

The need for competitive firms to guess and bid the market clearing price in order to be paid the market clearing price is an important disadvantage of a pay-as-bid pricing system because generators do not have perfect foresight. In the real-world, generators will make mistakes, which will result at times in inefficiently high cost generation being used to meet load, even in circumstances in which there is no market power. In a world with market power, competitive firms trying to capture high prices under a pay-as-bid system will likely take themselves out of the market at times through mistaken high bids. The New York Public Service Commission staff report notes that this element of a pay-as-bid pricing system will make it

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[3] John Bower and Derek W. Bunn, "Model-Based Comparisons of Pool and Bilateral Markets for Electricity," Energy Journal, Vol. 21, No. 3, pp. 1-29.

[4] Scott M. Harvey and William W. Hogan, "Issues in the Analysis of Market Power in California," October 27, 2000. (available at ksgwww.harvard.edu/people/whogan).

nearly impossible to identify which firms are bidding competitively and which firms are seeking to exercise market power. However, the report fails to note the likelihood that pay-as-bid pricing will actually reduce the supply offered by the competitive fringe at prices less than or equal to the market price. Overall, I do not think that the PSC's reasoning justifies the statement that "the payment of a market-clearing price may increase the incentive to abuse market power and exacerbate the consequences of such abuse."[5] The reverse is a much more defensible statement.

In New York, a further problem with a pay-as-bid pricing system is that it is inconsistent with three part bids and simultaneous optimization of energy and ancillary services. This is such a critical deficiency that a pay-as-bid pricing system may be inconsistent with the maintenance of competitive energy markets, and it certainly would have had very adverse consequences for the New York energy markets in the winter of 1999-2000.

An important and extremely well performing feature of the New York energy market is the simultaneous optimization of energy and reserves. It is recognized to be functioning well, and it is evident from market participant bids that ancillary service providers are confident that Security Constrained Unit Commitment will correctly optimize the scheduling of resources between the supply of energy and ancillary services. As a result, most market participants (i.e. other than those occasionally seeking to exercise market power) bid most of their resources into the markets at cost reflective prices, allowing SCUC to allocate capacity between energy and ancillary services, and are confident that they will be paid the market clearing price.

It is essential in this regard to recognize that the supply curve for ancillary services depends not only on reserve availability bids, but also on the start-up and minimum load costs of units committed to provide ancillary services. Units with low availability bids may have high costs of supplying ancillary services if their minimum load block is uneconomic in the energy market. Indeed, while the price of ancillary services is nominally set in SCUC by the availability bid of some supplier, the price is usually defined by the trade-offs between minimum load, start-up and availability bid costs. Under the current market pricing system with simultaneous optimization, the least cost schedule also maximizes the profits of each supplier, given the market prices. This encourages suppliers to submit extremely flexible bids to the NYISO. Under a pay-as-bid pricing system, suppliers may not find it profitable to submit such flexible supply offers, instead trying to bid the market clearing price for certain products, and the NYISO ironically may find the market more vulnerable to the exercise of market power, not less.

Another issue the possible impact of a soft-price cap on exports demand as well as supply. If a pay-as-bid pricing system works as intended, it will hold the price at which power

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[5] New York Public Service Commission, " Interim Pricing Report On New York State's Independent System Operator," December 2000, p. 27.

can be purchased from NYISO below the levels in adjacent control areas, increasing demand and causing higher priced New York generation to be dispatched to support export load, because the expensive generation is cheap when averaged with a $150 charge for infra-marginal generation. Indeed, the NYISO might be forced to dispatch high cost, emission limited turbines to support power sold at subsidized prices.

Related to this issue is the problematic effect of such a pay-as-bid system on the determination of locational energy prices and charges for transmission service. If generator and load prices are capped at $150 throughout the state, with any residual payments to generators recovered through uplift, the locational signals used to manage congestion will be distorted. Hence, the transmission usage charge for wheeling through service from HQ, PJM or Ontario to NEPOOL would likely be understated, as it would not reflect the high incremental payments to generators East of Central East when Central East is constrained, which I understand has been true in almost all high-priced hours. Thus, New York customers would end up subsidizing customers in NEPOOL. Second, Western New York customers would likely incur substantial uplift payments for energy consumer by customers in Eastern New York. Further, a low transmission charge from transmission service from Western New York to NEPOOL could cause Western New York generators to self-schedule bilateral sales into NEPOOL in excess of the ability of the NYISO to manage congestion. It is not apparent how reliability could be managed under such a pay-as-bid system without largely abandoning the current market mechanisms and developing a new transmission tariff, which might or might not be accepted by FERC.

The soft price cap is not magic. It should not work in theory, and the early evidence is that it is not working in California. The alternative to the flawed theory of the soft price cap would be to pursue initiatives already underway in New York. Increased demand side response, development of a demand curve for reserves, and bid caps for generators with market power are among the initiatives that focus on the problem but work within the fundamental framework of the market design. This is the direction that we have recommended for California, advice not followed, to their detriment. The same advice applies to New York, which starts with the advantage of a much better fundamental market design.

Best regards,

William W. Hogan

CAPITAL ECONOMICS

PRIVILEGED AND CONFIDENTIAL

MEMORANDUM

TO: New York ISO Board
William Museler

FROM: David B. Patton

DATE: January 4, 2001

RE: Soft Bid-Cap Proposed by the New York Public Service Commission

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In its recently released pricing report, the New York Service Commission ("NYPSC") asserted that the New York electric markets are not yet fully competitive, although the report provides no substantive evidence to support this assertion. On this basis, the NYPSC recommends the application of multiple price controls to the New York markets, including:

1) the current $1000 bid cap,
2) retroactive price revision/rebate authority to reduce prices deemed to be increased by market power, and
3) the $150 soft price cap proposed by FERC as a remedy for the California market.

In addition to these controls, the NYPSC supports the development of the "circuit breaker" that would allow automatic mitigation of withholding behavior during periods when the market is particular vulnerable to market power abuses. This memo provides an assessment of the $150 "soft" price cap proposed by the NYPSC and briefly comments on the other price controls.

SUMMARY

I recommend that the NYISO not adopt the $150 soft-cap based on my conclusions that the soft-cap will likely result in higher energy prices in New York and may compromise the reliability of supply in New York. These conclusions are derived from my assessment that the soft-cap will:

- Provide an incentive for suppliers to raise their offers (i.e., removes the incentive for generators to offer their resources at their marginal cost) during periods of tight supply to obtain a market price for their resources;
- Reduce the economic efficiency of the dispatch as errors in anticipating the market price will cause some less expensive generators to submit offer prices that are too high;
- Not be effective in constraining prices from rising as suppliers will likely be able to circumvent the cap depending how it is implemented;

- Provide a substantial incentive to make sales outside of New York, causing exports to rise and imports to fall during periods when power is needed the most in New York;

- Reduces the incentive for generators to offer their most expensive output (e.g., emergency levels) to the extent that they do not believe that they can justify their true marginal cost for this output.

- Reduce the incentive for loads to contract forward to the extent that they perceive that the soft cap is reducing prices in the day-ahead market; and

- Increase the potential for market power abuses since long-term forward contracting substantially mitigates a supplier's incentive to withhold its resources;

Although the primary effect of these factors would be higher prices or a less efficient dispatch, the real reduction in supply available to New York could critically threaten reliability during peak periods. This is an increasingly important concern over time as load continues to grow in New York and barriers to new generation prevent significant new generation from being sited. California's recent reliability problems should serve as evidence to the fact that price controls will tend to reduce the supply available to the market.

For these reasons, ensuring that market power abuses are mitigated prospectively through the current mitigation measures and the circuit breaker provision is far superior to the price controls proposed by the NYPSC. The mitigation measures do not artificially constrain prices when supplies become scarce, which can discourage suppliers from selling power in New York -- resulting in higher electric costs to consumers and decreased reliability.

DISCUSSION

The $150 "soft" price cap is a combination of two pricing provisions, one that applies below $150 per MWh and another that applies above $150. When prices are below $150, the prices would be set at market clearing levels that are location-based prices ("LBMPs") just as they are currently. When market clearing prices are above $150, the prices would be capped at $150 for loads and for generators offering below the cap while suppliers dispatched with offers above this level paid the price that they offer. This aspect of the proposal (paying the generators what they offer) is commonly referred to in the auction literature as the "pay-as-bid"[1] model and has some well-known attributes.

One important aspect of the soft-cap proposal is that offers accepted from a generator above $150 per MWh must be justified *ex post* by the generator on a cost basis. This cost basis will either include opportunity costs facing the generator, or will include only the generator's variable costs. As I will explain, these two options result in significantly different incentives for the generator and different market outcomes.

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[1] The economic literature on auctions, economists, and policy-makers in the electric industry generally refer to supply offers as bids.

Lastly, one general observation about the soft-cap is that it will only be active under relatively tight or transmission constrained conditions. Therefore, any beneficial or adverse consequences of the soft cap provision will occur during the periods of greatest reliability concern.

The following sections explain each of the important attributes or potential effects of the soft-cap proposal that I listed above in the summary section.

1. The soft cap will provide an incentive for generators to raise their offer prices.

One of the principle advantages of a market clearing price system is that generators have a strong incentive to offer their resources at short-run marginal costs if they do not have market power (i.e., their offer does not affect the price). This incentive is removed in a pay-as-bid system. At best, the two systems result in the same market outcome – this property is called the revenue equivalence theorem in the auction literature. This result is shown in figures 1 and 2.

Figure 1
Supply Offers in a Market Clearing Price Model

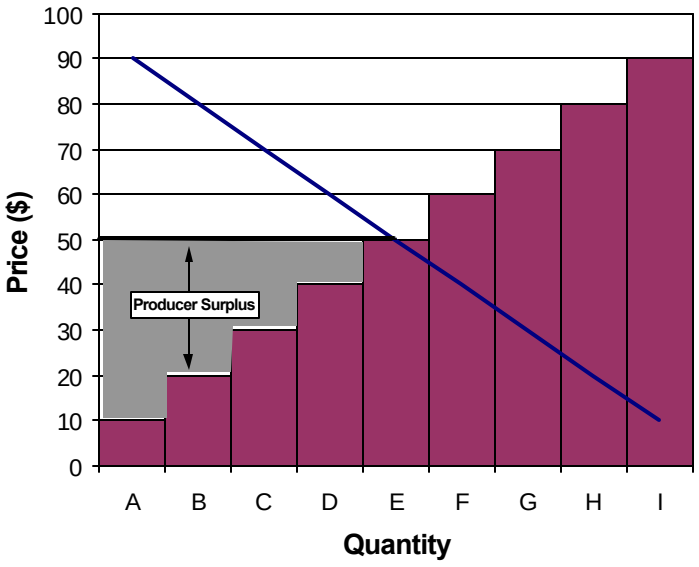


Figure 2
Supply Offers in a Pay-As-Bid Model

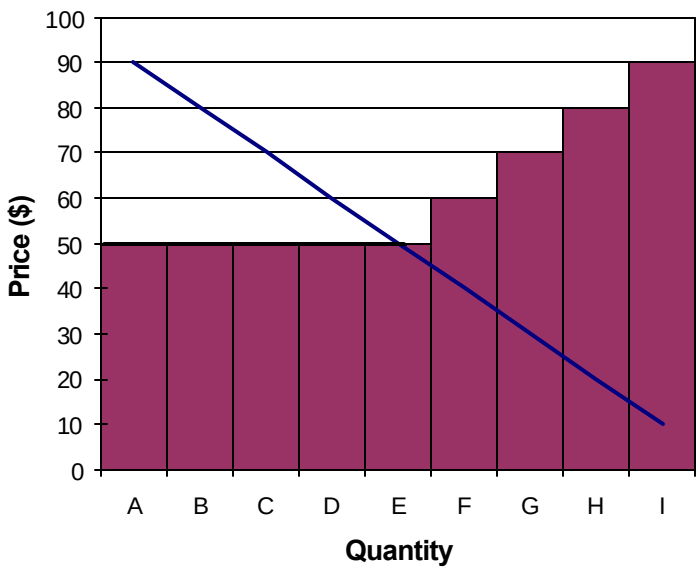


Figure 1 is the market clearing price system showing generators (A through I) with various cost profiles offering at their marginal cost level and paid the market clearing price. The area under the clearing price and above the marginal costs of the generators is known as "producer surplus" and is short-term profit that accrues to the owners of the generation. An attempt to transfer this surplus from producers back to consumers is typically the motivation behind the pay-as-bid model. Hence, generator A would be paid $10 rather than $50 in a pay-as-bid model. However, this objective can only be accomplished if generators continue to offer at their marginal costs, which they will not in a pay-as-bid model.

Figure 2 shows how the offers would change under a pay-as-bid model where suppliers have perfect foresight regarding the true market-clearing price. In this case, each supplier would raise its offer to that price and receive the full producer surplus obtained in the market-clearing model. This is the conclusion of the revenue equivalence theorem – that the revenue received by

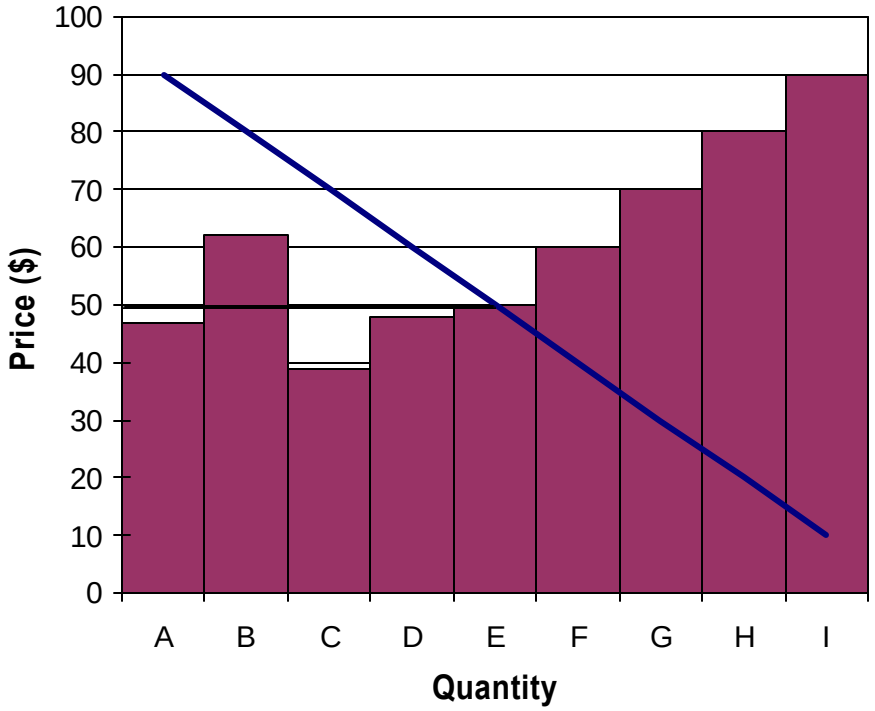
suppliers in the two cases are the same. Even if suppliers have to justify their offers, the offers in figure 2 can be justified on the basis of opportunity costs. Opportunity costs are typically defined as the value of the next best use of the resources, which in these cases would likely be a very short-term bilateral internal sale or an export to a neighboring market at prices close to the true market clearing price in the internal spot market.

Therefore, if suppliers have perfect foresight and can justify their offers on the basis of opportunity cost, the soft-cap proposal will have no effect on the costs of electricity to spot market purchasers. It would, however, make market power monitoring much more difficult and less effective. Because the soft -cap requires suppliers to raise their offer prices to obtain the market-clearing price, it would be difficult or impossible to differentiate between pro - competitive offers seeking the market value for a resource from economic withholding intended to raise the market price.

2. The soft cap will result in economic inefficiencies and higher costs because suppliers do not have perfect foresight.

The prior section assumed that suppliers have perfect foresight, which is not true. When uncertainty is introduced, suppliers make errors in their offers that remove the assurance that the market design will result in an economic dispatch of the generating units. Figure 3 illustrates how this would happen.

Figure 3
Effects of Uncertainty on Supply Offers



If the owner of a higher cost resource forms a lower expectation of the market clearing price tha n the owners of some of the lower cost resources, than the lower cost resources may not be dispatched by the ISO when they are the most economic alternative. Figure 3 shows a case where generator B bids too high and generator F would be dispatched in its place. In addition to the efficiency cost this imposes on the market (higher production costs), auction research has shown that the pay-as-bid model often results in higher total payments to suppliers than the market clearing price model.

Lastly, one might question the extent of suppliers' uncertainty regarding the true market clearing price level. Figure 4 is a typical supply curve for New York, which is relatively flat at most load levels and very steep at high load levels. When loads are in normal ranges on the flat portion of the supply curve, suppliers price expectations will be subject to less uncertainty. However, at the high load levels when the soft-cap would be activated, the uncertainty will be considerable.

Figure 4
Supply Curve for Day-Ahead Energy
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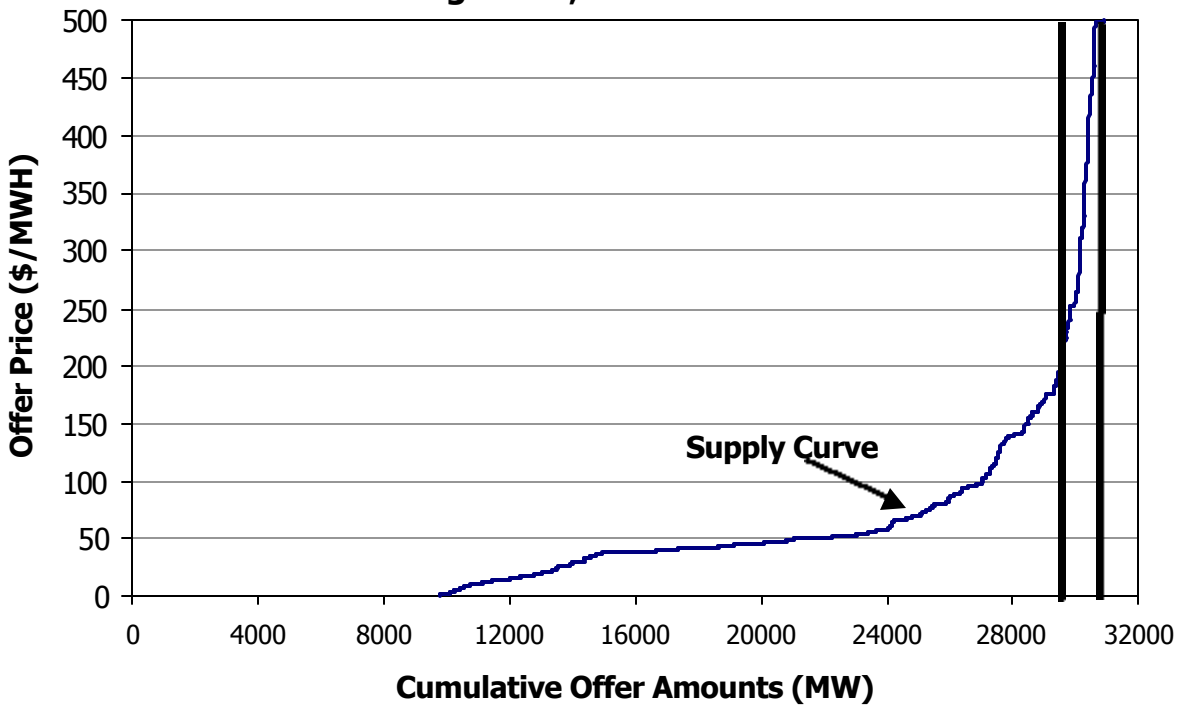

The amount of resources shown in figure 4 between $200 and $1000 is approximately 1200 MW or less than 4 percent of the total resources. Now, consider that the uncertainty in load forecasts can be as high as 2 to 3 percent due to variations in weather and other factors, not including uncertainty associated with unit outages and transmission constraints. Therefore, under high priced market conditions, accurately estimating prices may be very difficult and subject to significant errors. Therefore, the inefficiencies described above associated with price uncertainty (resulting in errors in offer prices) would be magnified under the tight conditions when the soft-cap would be applicable.

3. The soft-cap is likely to be ineffective under most circumstances

As I described above, most of the soft-cap proposals require that offers higher than $150 per MWh be justified on some basis. The most reasonable approach is to allow participants to justify these offers based on estimated opportunity costs. The alternative is to justify offers only on the basis of variable costs that would cause more significant adverse effects on the New York markets that are described below.

By allowing opportunity cost justifications, the value of short-term bilaterals or prices in external markets could be used to justify the offers and both of these values should be highly correlated with the true market price in New York. Therefore, all of the suppliers in New York would have the ability to seek out the true market price above $150 per MWh. Hence, the soft-cap will be effective in constraining prices only under one condition – when the prices in the external markets are substantially less than true price in New York.

Regardless of the standards used to justify internal bids (opportunity costs vs. variable costs), opportunity costs would have to apply to external resources for two reasons. First, the external bid may not be linked to a specific unit – marketers importing into New York, for example, may have a portfolio of resources from which they make sales. Second, New York cannot pay less than the price in the neighboring market and expect that any supplier in that market will be willing to export power to New York.

Given this fact, suppliers within New York will have the ability to export power from New York and import power simultaneously back into New York to ensure that they will be paid opportunity costs. This strategy could involve sales and resales involving multiple entities making it even more difficult to detect. Because the physical rights method of scheduling transactions from neighboring control areas prevents the interfaces from being fully utilized, this strategy could preclude other imports into New York and result in a net decrease in supplies to the New York market.

4. Provide an additional incentive to make sales outside of New York, causing exports to rise and imports to fall during periods when power is needed the most in New York;

The most important effect of the soft-cap is its effect on suppliers' incentives to sell power in New York. Even providing for opportunity cost justifications, the *ex post* process of justifying the offer and trusting that the explanation will be accepted introduces substantial risk for the suppliers. The perceived risk may be enhanced to the extent that suppliers do not trust that the regulatory agencies reviewing the offers will be objective in their review. The costs associated with this risk will increase suppliers' incentives to sell power in neighboring markets rather than in New York.

Alternatively, opportunity cost justifications may not allowed (only variable costs allowed) in order to make the soft-cap more effective in controlling prices. In this case, the disincentive to sell power in New York would grow considerably larger. As discussed above, the market value of power produced from a given unit depends on market conditions rather than the variable costs of the unit. Generation owners constrained to their variable costs when the market value of their

value is far higher will naturally pursue more profitable opportunities to sell outside of New York. Even low cost resources whose variable costs are far less than $150 per MWh will seek to export their resources when market prices are above $150. In addition, resources located outside of New York will not be willing to offer power in New York when the price in their market is higher than $150.

In the extreme, rather than importing up to 4000 MW from PJM and New England during tight conditions, the NYISO could be exporting 4000 MW – a net difference of 8000 MW, roughly 25% of New York's peak load. Not only will this substantially increase payments to high cost resources that must be taken to meet the load, but it could seriously threaten reliability in a market with very low excess capacity resources.

Lastly, to the extent that the NYISO employs it recall authority to maintain reliability under these conditions, the $150 soft-cap will ultimately provide a substantial disincentive for suppliers to offer their resources in the ICAP markets causing prices to rise in that market as well.

5. New York would likely realize a reduction in resources offered in the New York electric markets

In addition to the incentive to export power out of New York created by the soft-cap, it would likely result in a significant reduction in "emergency" power. A considerable amount of power is available today to the NYISO at very high price levels corresponding to the emergency output ranges on many of the State's large steam units. These blocks of output have high marginal costs due to their effects on the O&M of the unit, the effect on the efficiency entire unit, and the increase in the forced outage probability. These costs cannot be translated into a traditional variable cost estimate that could be used to justify the offer in the context of the soft-cap.

If suppliers do not trust that their estimated full marginal costs for these blocks of output will be recovered, they're most logical course of action is not to offer the blocks. Of course, this would further decrease system reliability and would not lower power costs for consumers in New York.

6. The soft-cap may also provide a disincentive for forward contracting, resulting in a larger threat of market power abuses in the spot market.

Despite the arguments above that the soft-cap will not be effective at controlling costs, it may reduce the incentive of load-serving entities ("LSE") to engage in forward contracting to the same extent that they do today. This would result if the LSE's perceive a degree of price protection in the spot market that they are not afforded in the forward markets.

Forward contracting is valuable in these markets because it serves to decrease the volatility of prices seen by consumers and decreases suppliers' incentives to withhold resources from the day-ahead and spot markets. Generation that has been sold in long-term forward contracts cannot benefit from higher prices in the NYISO spot markets. The decision by such a generator is whether to generate to supply the forward contract or to purchase from the NYISO spot market to supply the contract. An offer at marginal cost will ensure that the generator makes the most profitable choice.

Hence, to the extent that the soft-cap would shift more purchases and sales from the forw ard markets into the spot market, the potential for market power abuses and higher overall costs to consumers would increase.

Conclusion

On the basis of the potential effects described in this memo, I recommend that the NYISO Board reject the proposal of the NYPSC to adopt a soft-cap in New York. Continued development and implementation of the "circuit-breaker" provision and additional price-sensitive load will be more effective means of ensuring that consumers in New York have access to competitively priced electricity.

Please contact me if you have any questions or comments regarding this assessment of the soft-cap proposal or any other proposals made by the NYPSC in its recent pricing report

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