Adjusting Installed Capacity Demand Curves to Account for Seasonal Variations in Installed Capacity Prices

NYISO Installed Capacity Working Group

Albany, NY

May 2, 2007

Presented by Michael Cadwalader

Agenda

- **Introduction**
- **Ensuring That ICAP Revenues Support Entry in the Short Term**
- **Evaluating the Long-Term Implications of Different Adjustment Procedures**
- **Consistency with the Rest of the Reset Process**
- **Assessing the Impact of Incorrectly Adjusting the Demand Curves**
- **Conclusion**

Seasonal Variations in ICAP Supply

The amount of UCAP that a generator can sell into the ISO's ICAP market in each capability period is proportional to its DMNC for that capability period.

- **During the summer capability period, the amount of UCAP that each generator can sell is based on the results of summer DMNC tests.**
- **During the winter capability period, the amount of UCAP that each generator can sell is based on the results of winter DMNC tests.**

Seasonal Variations in ICAP Revenues

Many generators can produce more energy under winter DMNC testing conditions. This will affect the net cost of entry for hypothetical entrant peakers, which is used to set the ICAP demand curves, in two ways.

- **It increases the amount of UCAP that each of these hypothetical entrant peakers can provide during the winter.**
  - ***This decreases the ICAP revenue per MW of UCAP provided by an entrant peaker during the summer that will be required to induce entry.***
- **It increases the amount of UCAP that other generators can provide during the winter, which will drive down the price of UCAP during the winter.**
  - ***This increases the ICAP revenue per MW of UCAP provided by an entrant peaker during the summer that will be required to induce entry.***

The ICAP demand curves must incorporate adjustments to reflect the net effect of seasonal variations in ICAP revenues on the net cost of entry.

Seasonal Variations in ICAP Prices

This presentation will focus on the second of these seasonal factors.

- **Specifically, it addresses the appropriate method for adjusting the ICAP demand curves to reflect seasonal variations in ICAP prices.**

To focus on this issue and no other complicating factors, I will:

- **Assume that the amount of capacity the hypothetical entrant peaker can sell is the same during the winter as during the summer.**
  - ***As a result, it will definitely be necessary to raise the ICAP demand curve in this example. The only question is, "By how much?"***
- **Assume ICAP-to-UCAP translation factors are constant.**
  - ***Variations in ICAP-to-UCAP translation factors are addressed through a separate adjustment the ISO performs before each capability period, and are not part of the ICAP demand curve reset process.***

ICAP Demand Curve Parameters

At the March 22 meeting of this working group, NERA discussed various approaches to determining the ICAP demand curve parameters.

- **One approach is to determine parameters that are intended to ensure that, on average, minimum ICAP requirements are met.**
  - ***That means that there is a 50 percent chance that minimum ICAP requirements will not be met.***
- **Another approach is to determine parameters that are intended to ensure that minimum ICAP requirements are met more than 50 percent of the time.**

The determination of the appropriate method for adjusting the ICAP demand curve to account for seasonal variations in ICAP revenue does not depend on which of these approaches is adopted.

- **Accordingly, I will define a new term, “target ICAP level,” for use in this presentation.**
  - ***The target ICAP level is the amount of ICAP that will be provided, on average.***
  - ***It can be equal to or greater than the minimum ICAP requirement.***

Single ICAP Demand Curve

Finally, the presentation will only discuss a single demand curve.

- **Therefore, it will not directly address the demand curves for New York City or Long Island.**
- **However, many of the points made herein also apply to those demand curves.**

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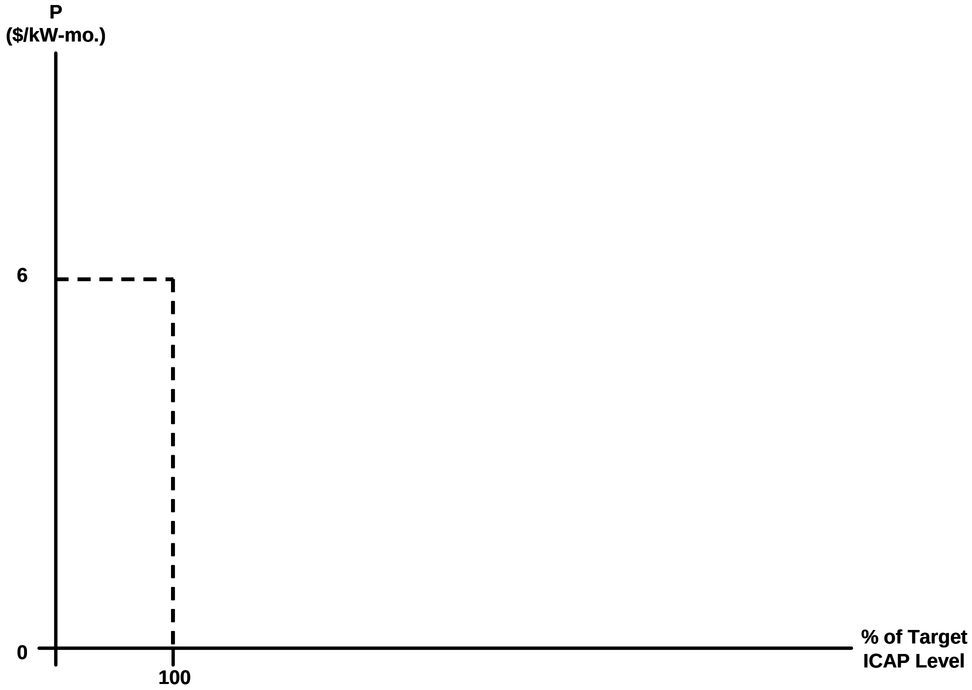
ICAP Demand Curve Before Adjustments

Assume that the net cost of entry for the hypothetical entrant peaker, evaluated at the target ICAP level, is $72/kW-year.

- **This is close to the value that was used in the last study for the ROS ICAP demand curves that are currently in effect.**

If the ICAP demand curve did not make any adjustment for seasonal variations in ICAP revenues, the net cost of entry at the target ICAP level would be $72/kW-yr. / 12 = $6/kW-mo.

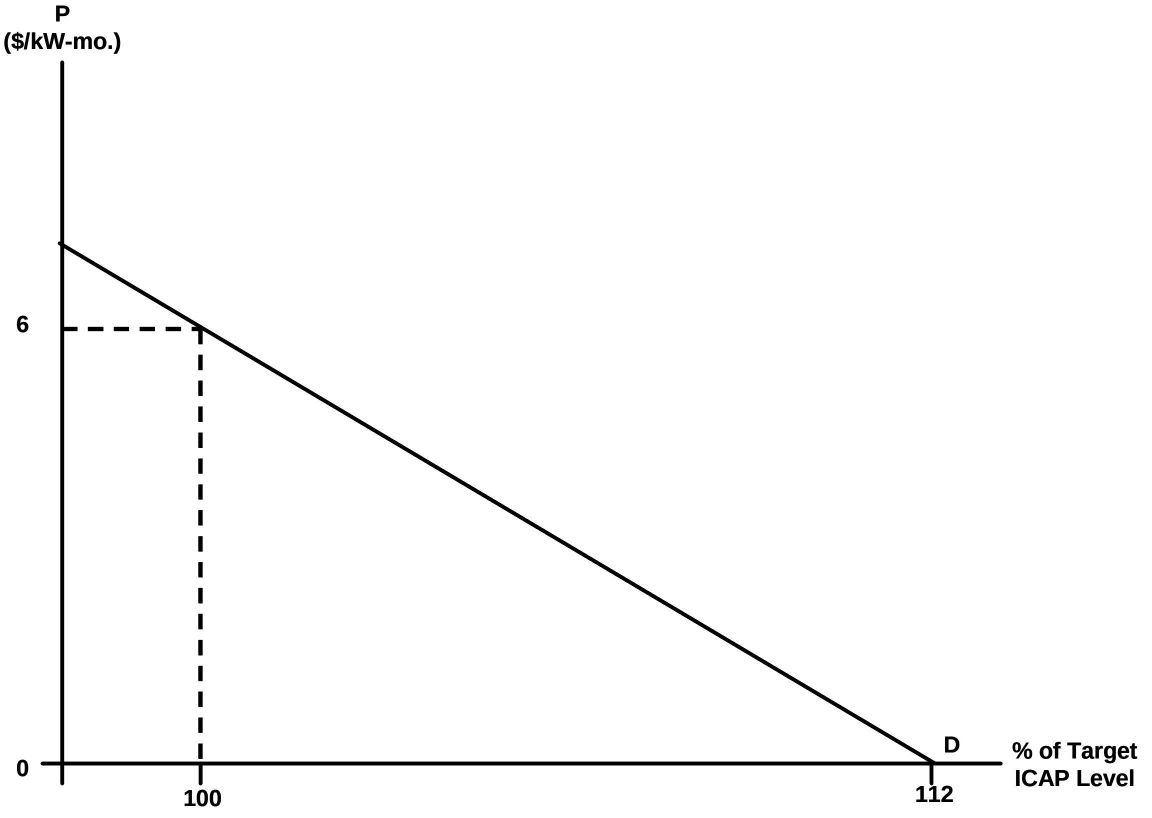
- **The ICAP demand curve would pass through a point whose x-coordinate is the target ICAP level and whose y-coordinate is $6/kW-mo.**



ICAP Demand Curve Before Adjustments (cont.)

Also assume that the ICAP demand curve will be a straight line that reaches a price of zero at 112% of the target ICAP level.

- **Then, if there was no need to adjust the demand curve to account for seasonal variations in ICAP prices, it would appear as shown.**



ICAP Revenue if Demand Curve Is Not Adjusted

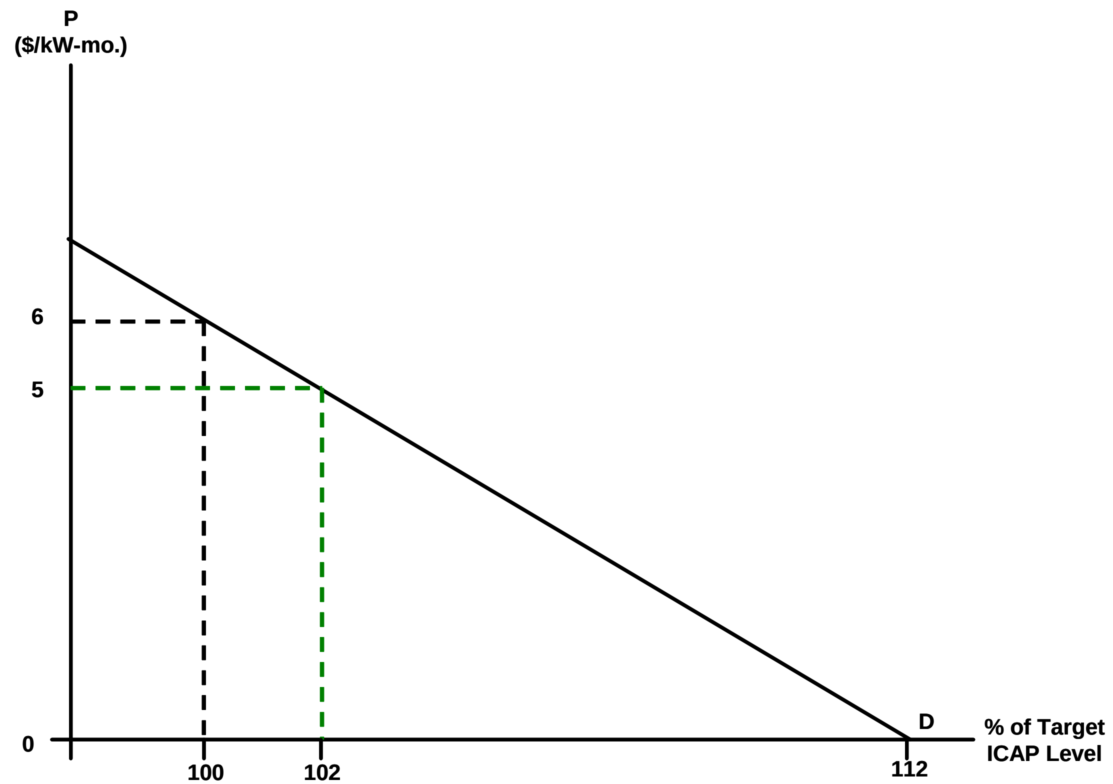
Finally, assume that the "winter-to-summer ICAP sales ratio" will be 1.02.

- **I will define this ratio as the ratio of the amount of ICAP that is sold in New York in the winter to the amount of ICAP that is sold in New York in the summer.**

Then, if the amount of ICAP supplied in New York in the summer is equal to the target ICAP level:

- **The price of ICAP during the summer would be \$6/kW-mo.**

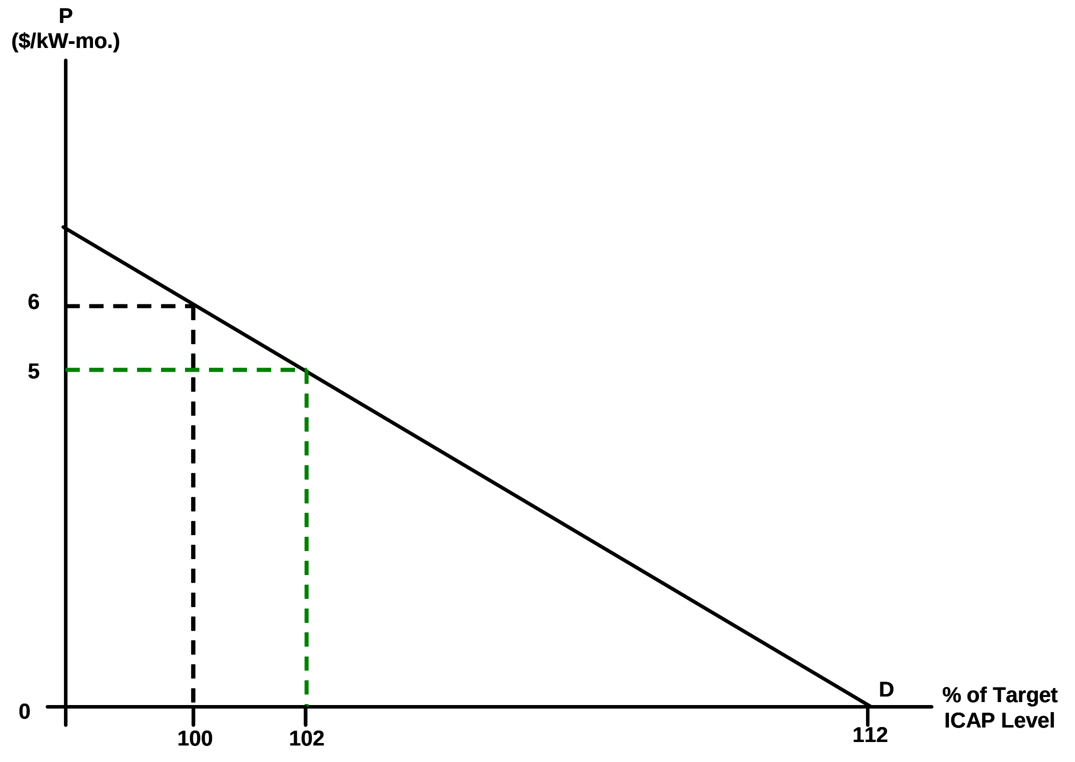
- **The price of ICAP during the winter would be \$6 x ((1.12 – 1.02) / (1.12 – 1)) = \$5/kW-mo.**



ICAP Revenue if Demand Curve Is Not Adjusted

Consequently, the hypothetical entrant peaker would receive a total of 6 x $6/kW-mo. + 6 x $5/kW-mo. = $66/kW-yr. in ICAP revenue, less than the $72/kW-yr. net cost of entry that I assumed.

- **As a result, it is necessary to raise the ICAP demand curve to ensure that the net cost of entry is covered when the amount of ICAP provided during the summer is the target ICAP level.**
- **But the procedure for adjusting the demand curve should only seek to offset the effect on ICAP revenues that results from lower winter prices.**



Calculating the Required Adjustment

In this case, the ICAP demand curve would have to be raised by a factor of 72/66 = 12/11, so that it would pass through a point whose x-coordinate is the target ICAP level and whose y-coordinate is $6 x 12/11 = $6.55/kW-mo.

- **Then, if the amount of ICAP supplied in New York in the summer is equal to the target ICAP level, the price of ICAP would be:**
  - ***$6.55/kW-mo. during the summer.***
  - ***$6.55 x ((1.12 – 1.02) / (1.12 – 1)) = $5.45/kW-mo. during the winter.***
- **The hypothetical entrant peaker would receive a total of 6 x $6.55/kW-mo. + 6 x $5.45/kW-mo. = $72/kW-yr. in ICAP revenue.**

Adjusting the Demand Curve Using a Different Winter-to-Summer ICAP Sales Ratio

Alternatively, suppose that the ISO's calculation of this adjustment does not reflect the winter-to-summer ICAP sales ratio that the NYISO expects to observe over the three-year lifespan of the demand curves.

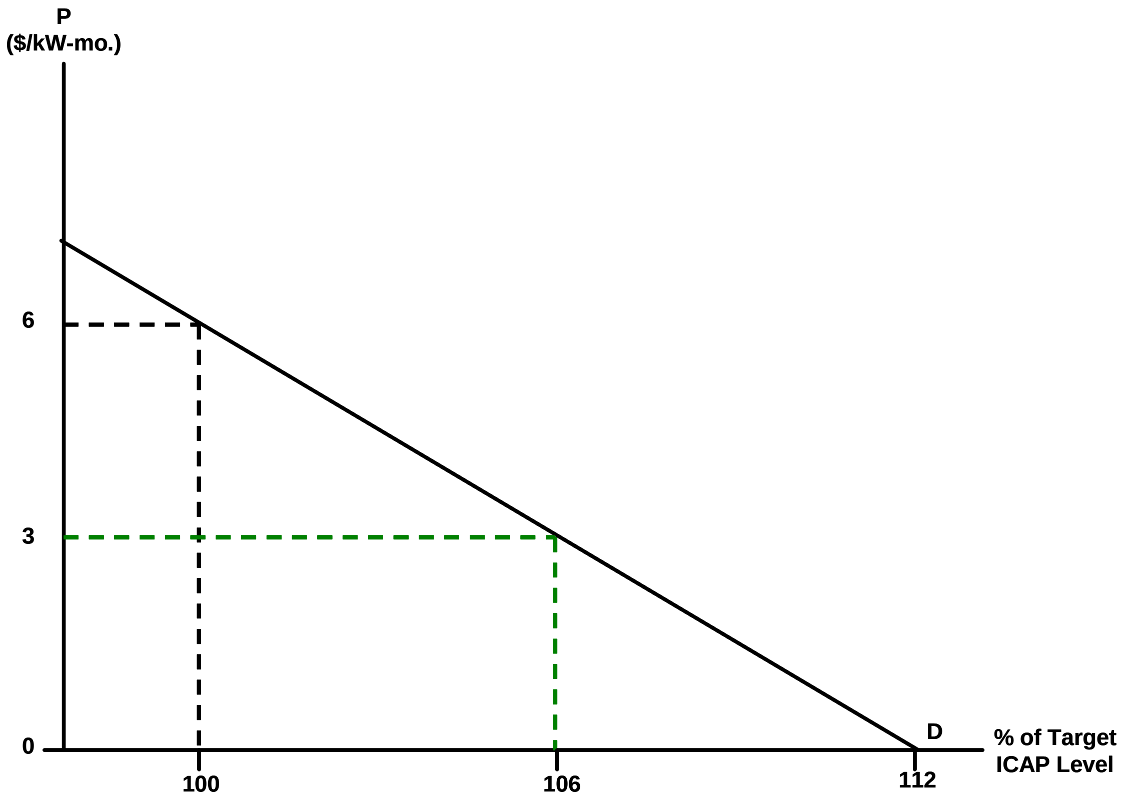
As this example will demonstrate:

- **If this adjustment instead assumes a higher winter-to-summer ICAP sales ratio than the ISO expects to observe, it will provide incentives for the development of more capacity than is needed to meet the target ICAP level.**
- **If this adjustment assumes a lower winter-to-summer ICAP sales ratio than the ISO expects to observe, it will not provide incentives for the development of enough capacity to meet the target ICAP level.**

Using Too High a Winter-to-Summer ICAP Sales Ratio

First, suppose that the ISO's adjustment to the ICAP demand curve to account for seasonal factors is based on a winter-to-summer ICAP sales ratio of 1.06, even though it (accurately) forecasts that ratio to be 1.02.

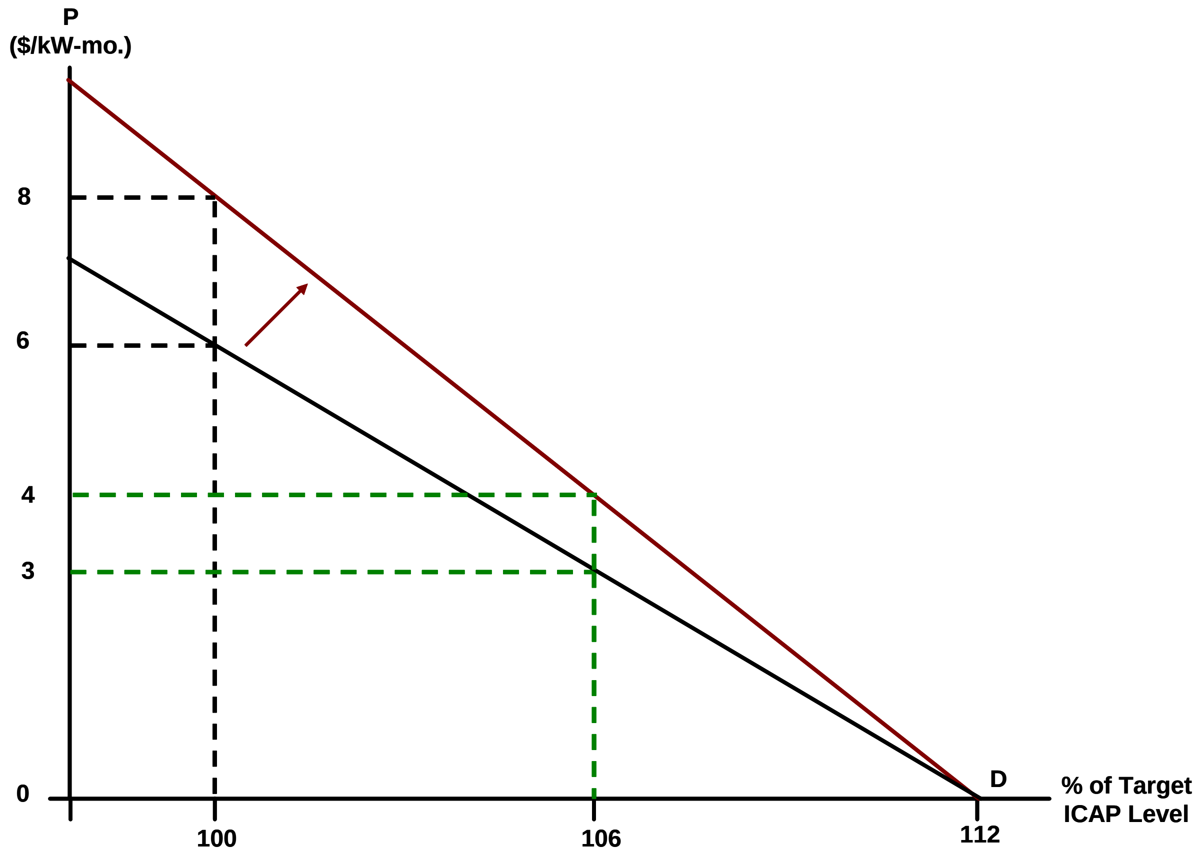
- **The ICAP demand curve adjustment would be calculated under the assumption that without an adjustment, if the target ICAP level is the amount supplied in the summer, the price of ICAP would be:**
  - ***\$6/kW-mo. during the summer.***
  - ***\$6 x ((1.12 – 1.06) / (1.12 – 1)) = \$3/kW-mo. during the winter.***



Using Too High a Winter-to-Summer ICAP Sales Ratio (cont.)

This would yield just 6 x $6/kW-mo. + 6 x $3/kW-mo. = $54/kW-yr. in ICAP revenue for the hypothetical entrant peaker.

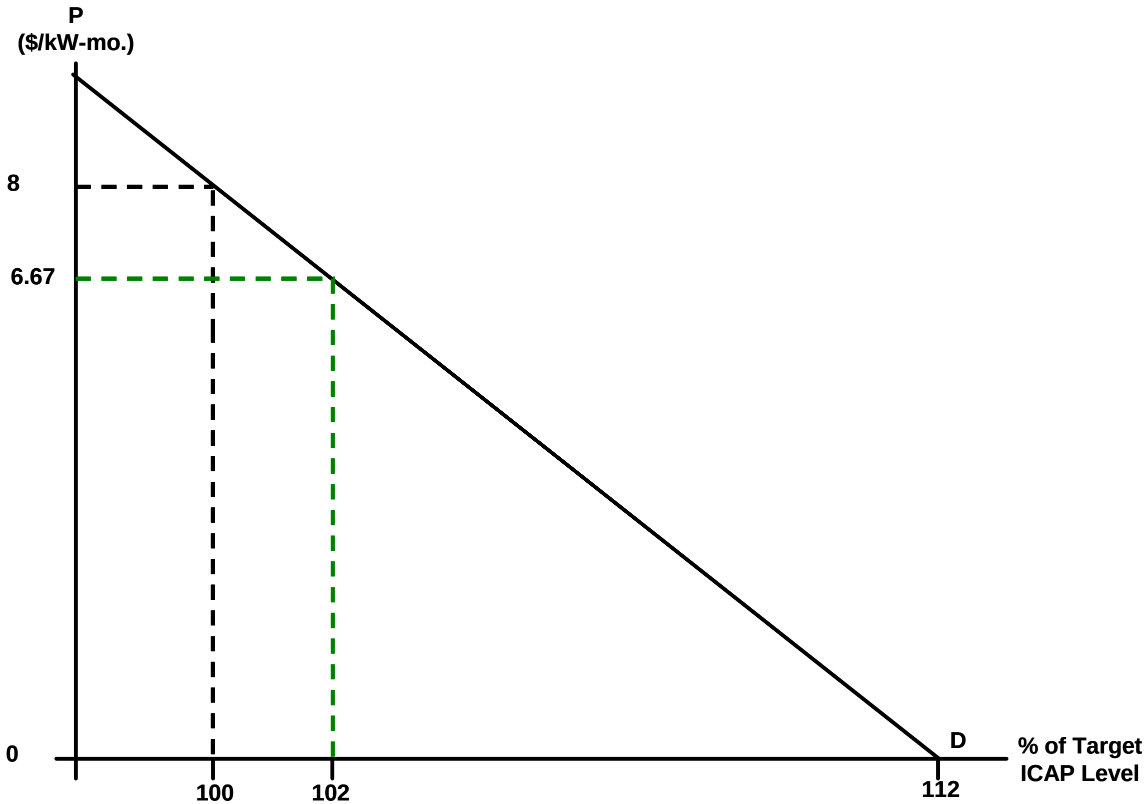
- **Consequently, the ICAP demand curve would be raised by a factor of 72/54 = 4/3.**
- **It would now pass through a point whose x-coordinate is the target ICAP level and whose y-coordinate is $6 x 4/3 = $8/kW-mo.**



Using Too High a Winter-to-Summer ICAP Sales Ratio (cont.)

But if the target ICAP level is provided during the summer, and the "winter-to-summer ICAP sales ratio" is 1.02, as anticipated, the hypothetical entrant peaker would receive much more than is needed to induce entry.

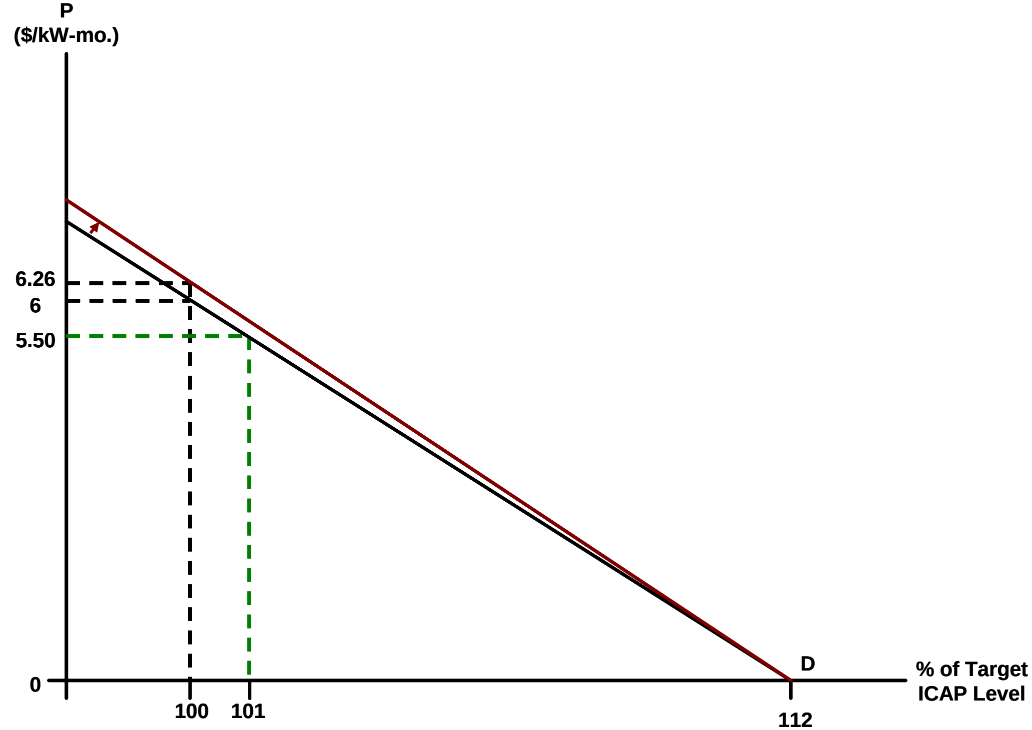
- **The price of ICAP would be:**
  - ***$8/kW-mo. during the summer.***
  - ***$8 x ((1.12 – 1.02) / (1.12 – 1)) = $6.67/kW-mo. during the winter.***
- **The hypothetical entrant peaker would receive 6 x $8/kW-mo. + 6 x $6.67/kW-mo. = $88/kW-yr. in ICAP revenue, far above the $72/kW-mo. net cost of entry.**



Using Too Low a Winter-to-Summer ICAP Sales Ratio

Next, suppose that the ISO's ICAP demand curve adjustment is based on a winter-to-summer ICAP sales ratio of 1.01 instead.

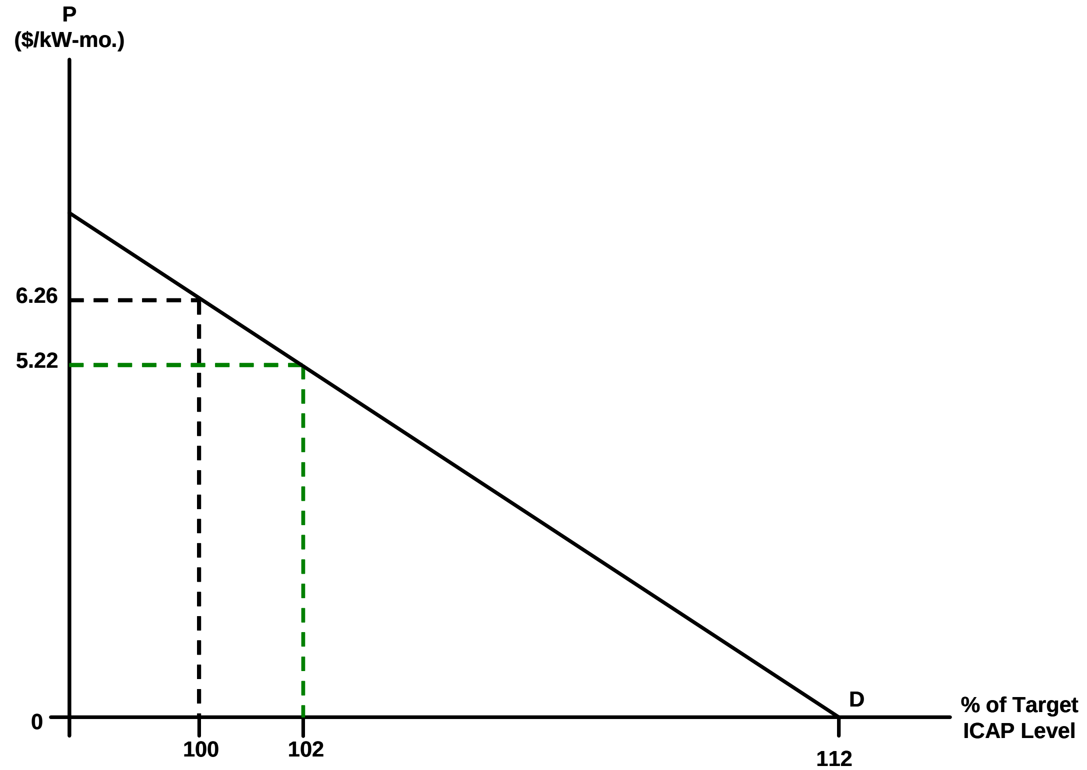
- **Then the ICAP demand curve adjustment would be calculated under the assumption that without an adjustment, if the target ICAP level is the amount supplied during the summer, the winter ICAP price would be \$6 x ((1.12 – 1.01) / (1.12 – 1)) = \$5.50/kW-mo.**
- **This would yield annual ICAP revenues of 6 x \$6/kW-mo. + 6 x \$5.50/kW-mo. = \$69/kW-yr., so the ICAP demand curve would be raised by 72/69.**
- **The price that corresponds to the target ICAP level then would be \$6/kW-mo. x 72/69 = \$6.26/kW-mo.**



Using Too Low a Winter-to-Summer ICAP Sales Ratio (cont.)

Then, if the target ICAP level is provided during the summer, and the "winter-to-summer ICAP sales ratio" is 1.02, as anticipated, the hypothetical entrant peaker would receive a smaller payment than is needed to induce entry.

- **The price of ICAP would be $6.26/kW-mo. during the summer, and $6.26 x ((1.12 – 1.02) / (1.12 – 1)) = $5.22/kW-mo. during the winter.**
- **The entrant peaker would receive a total of 6 x $6.26/kW-mo. + 6 x $5.22/kW-mo. = $68.87/kW-yr. in ICAP revenue, below the $72/kW-mo. net cost of entry.**



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Long-Term Incentives for Development

The preceding analysis only considers short-term incentives.

- **Any impact that the 2008-11 ICAP demand curves have on current development decisions will be relatively small, because most of the ICAP revenues that new resources will earn will be determined using later ICAP demand curves.**

- **Consequently, those ICAP demand curves will have a more significant role in determining whether investors proceed with development.**

This is correct—but the findings from the preceding analysis continue to hold.

Three-State Model

Suppose there are three possible states of the ICAP market.

- **In State 1, the ISO expects the amount of ICAP supplied in New York over the next three years to be three percent above the target ICAP level.**

- **In State 2, the ISO expects the amount of ICAP supplied in New York over the next three years to be equal to the target ICAP level.**

- **In State 3, the ISO expects the amount of ICAP supplied in New York over the next three years to be three percent below the target ICAP level.**

Ideally, States 1 and 3 will be equally likely to occur. Then the amount of ICAP supplied will, on average, be equal to the target ICAP level, as intended.

Adjustment Procedure that Does Not Reflect the Anticipated Winter-to-Summer ICAP Sales Ratio

Also suppose that in both States 2 and 3, the ISO expects the winter-to-summer ICAP sales ratio to be 1.06.

- **But in State 1, when there is a surplus of ICAP relative to the target ICAP level, suppose that the ISO expects the winter-to-summer ICAP sales ratio to be 1.02.**

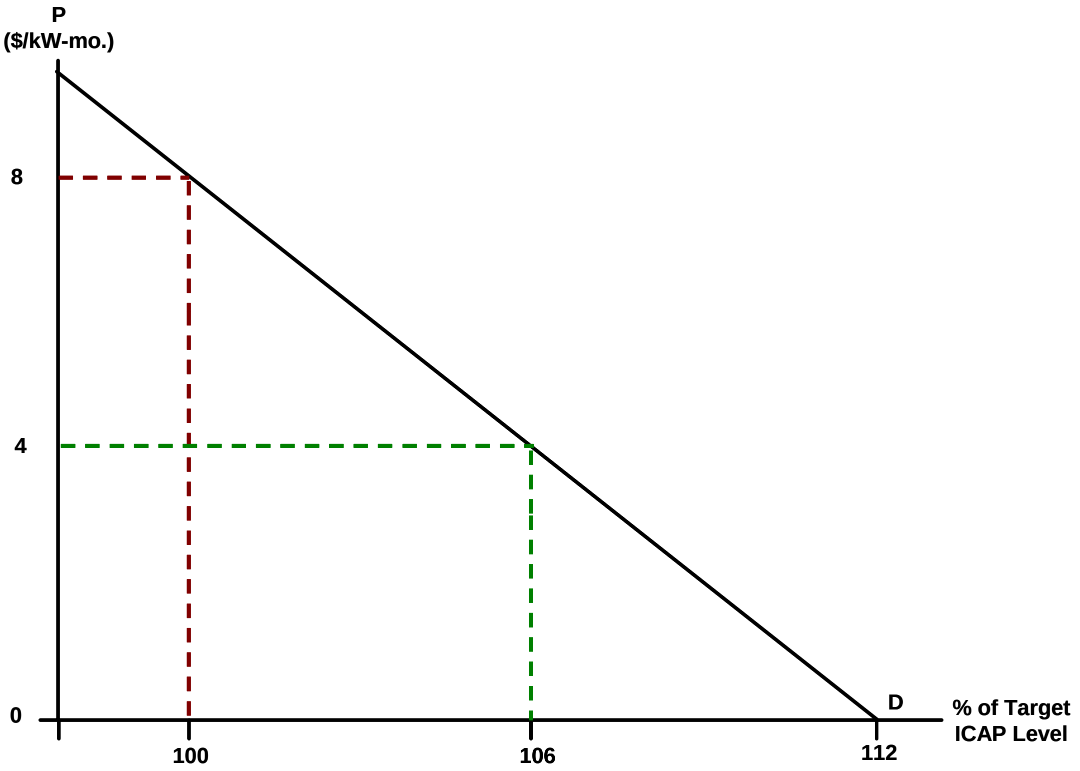
Finally, suppose that the ISO always adjusts the ICAP demand curve under the assumption that the winter-to-summer ICAP sales ratio will be 1.06, as it is in State 2 (when the amount of ICAP supplied in New York over the next three years to be equal to the target ICAP level).

- **Then the price that corresponds to the target ICAP level on each ICAP demand curve will be $8/kW-mo., as demonstrated previously.**
- **For simplicity, I will assume that the net cost of entry does not change over time.**

ICAP Revenues in State 2

In State 2, 100 percent of the target ICAP level would be provided during the summer, and 106 percent of the target ICAP level would be provided during the winter.

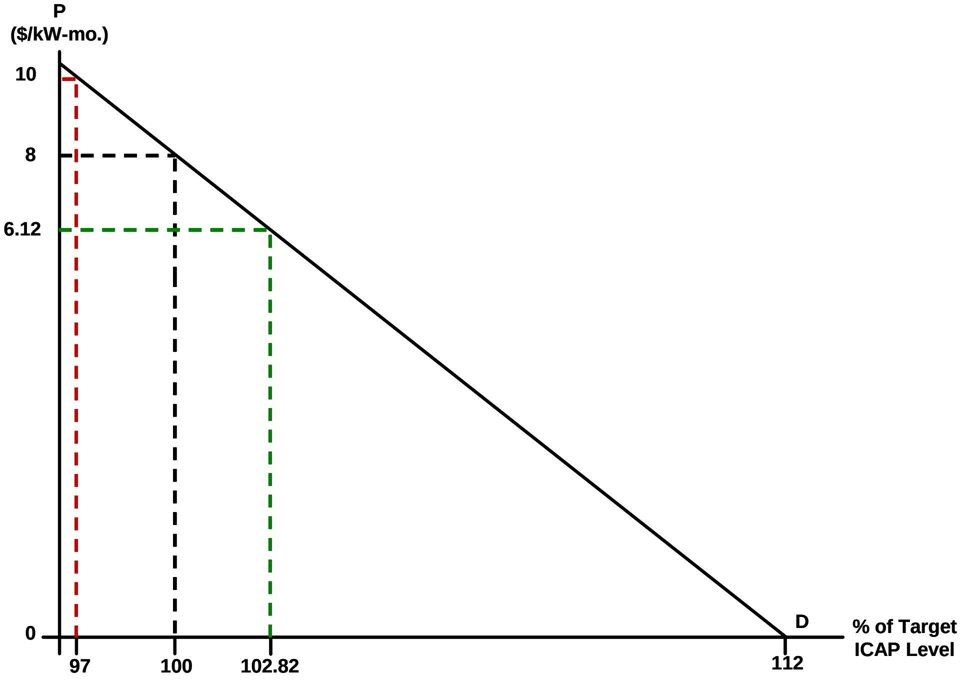
- **The ICAP price would be $8/kW-mo. during the summer and $8 x ((1.12 – 1.06) / (1.12 – 1)) = $4/kW-mo. during the winter, as previously shown.**
- **The hypothetical entrant peaker would receive 6 x $8/kW-mo. + 6 x $4/kW-mo. = $72/kW-yr. in ICAP revenues.**



ICAP Revenues in State 3

In State 3, 97 percent of the target ICAP level would be provided during the summer, and 97% x 106% = 102.82 percent of the target ICAP level would be provided during the winter.

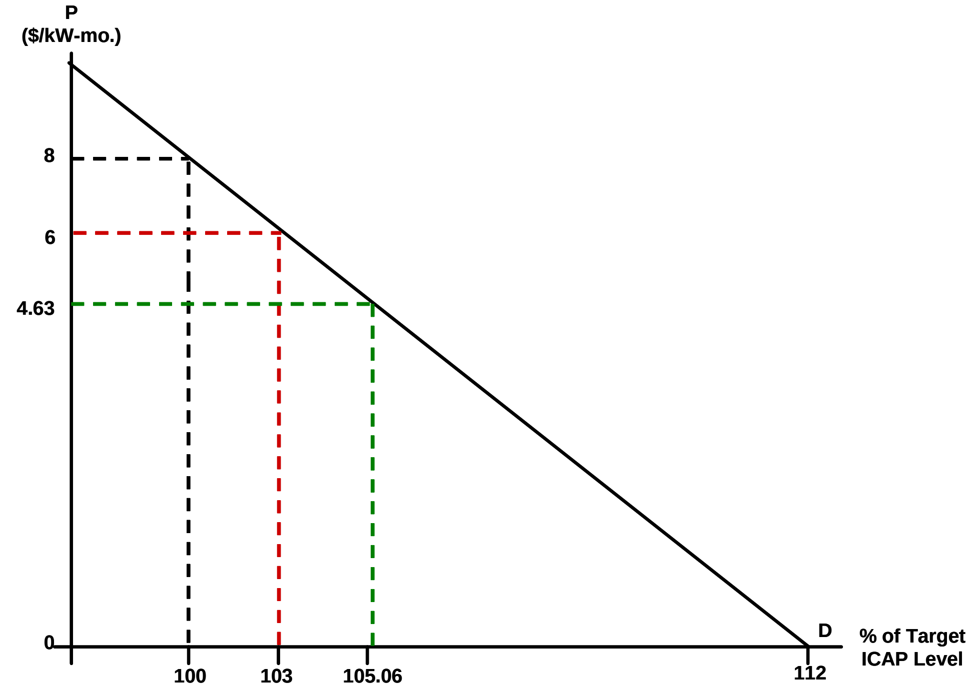
- **The ICAP price would be \$8 x ((1.12 – 0.97) / (1.12 – 1)) = \$10/kW-mo. during the summer.**
- **The ICAP price would be \$8 x ((1.12 – 1.0282) / (1.12 – 1)) = \$6.12/kW-mo. during the winter.**
- **The hypothetical entrant peaker would receive 6 x \$10/kW-mo. + 6 x \$6.12/kW-mo. = \$96.72/kW-yr. in ICAP revenues.**



ICAP Revenues in State 1

In State 1, 103 percent of the target ICAP level would be provided during the summer, and 103% x 102% = 105.06 percent of the target ICAP level would be provided during the winter.

- **This reflects the lower winter-to-summer ICAP sales ratio expected for State 1.**
- **ICAP prices would be:**
  - ***$8 x ((1.12 – 1.03) / (1.12 – 1)) = $6/kW-mo. during the summer.***
  - ***$8 x ((1.12 – 1.0506) / (1.12 – 1)) = $4.63/kW-mo. during the winter.***
- **The hypothetical entrant peaker would receive 6 x $6/kW-mo. + 6 x $4.63/kW-mo. = $63.76/kW-yr. in ICAP revenues.**



Consequences of This Adjustment Procedure

The ICAP price in State 3 is $24.72/kW-mo. above the net cost of entry at the target ICAP level, while the ICAP price in State 1 is only $8.24/kW-mo. below the net cost of entry at the target ICAP level.

- **As a result, In equilibrium, the hypothetical entrant peaker's revenue will be equal to its net cost of entry.**
- **Therefore, in equilibrium, the probability of being in State 1 must be considerably above the probability of being in State 3.**
- **State 1 is the state in which the amount of ICAP supplied in New York over the next three years is three percent above the target ICAP level.**
- **Therefore, the amount of ICAP supplied, on average, would exceed the target ICAP level.**

Adjustment Procedure that Reflects the Anticipated Winter-to-Summer ICAP Sales Ratio

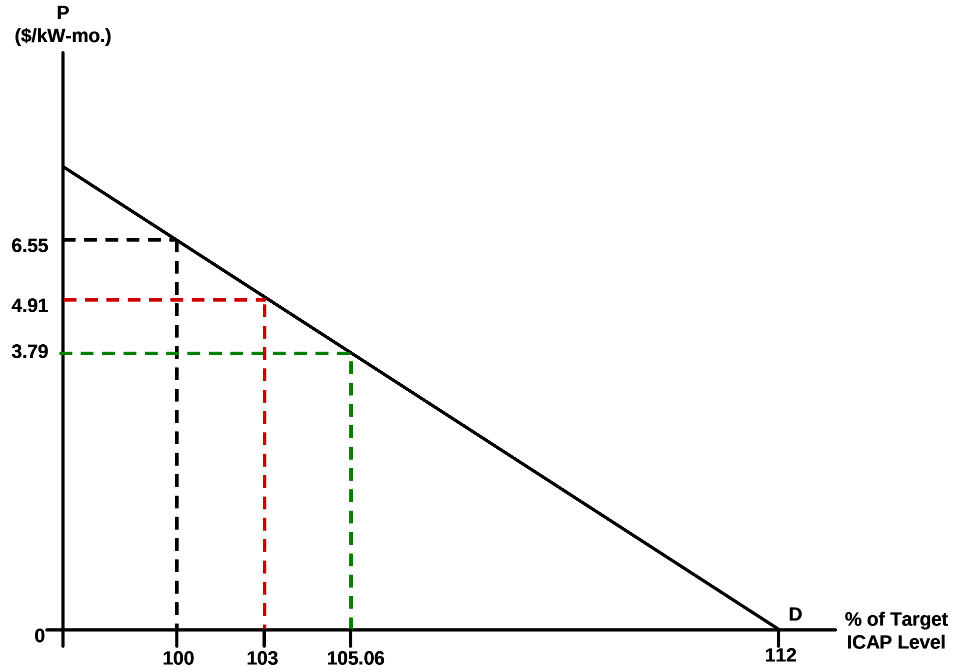
Now suppose that the ISO's adjustment of each ICAP demand curve is based on its expectations for the winter-to-summer ICAP sales ratio over the next three years.

- **This would not affect the preceding calculations for States 2 or 3, but it would affect State 1.**
- **In State 1, the price of ICAP at the ICAP target level would only be \$6.55/kW-mo., as less of an adjustment is needed due to the smaller winter-to-summer ICAP sales ratio in State 1. (See slide 12.)**

ICAP Revenues in State 1

In State 1, 103 percent of the target ICAP level still would be provided during the summer, and 103% x 102% = 105.06 percent of the target ICAP level still would be provided during the winter.

- **ICAP prices would be:**
  - ***$6.55 x ((1.12 – 1.03) / (1.12 – 1)) = $4.91/kW-mo. during the summer.***
  - ***$6.55 x ((1.12 – 1.0506) / (1.12 – 1)) = $3.79/kW-mo. during the winter.***
- **Therefore, this generator would receive 6 x $4.91/kW-mo. + 6 x $3.79/kW-mo. = $52.17/kW-yr. in ICAP revenues.**



Consequences of This Adjustment Procedure

By decreasing ICAP revenues in State 1 to reflect the lower winter-to-summer ICAP sales ratio that is anticipated in State 1, this procedure decreases the incentive to develop more capacity than is required to meet the target ICAP level.

Even this approach is not perfect:

- **The ICAP price in State 1 is now $19.84/kW-mo. below the net cost of entry at the target ICAP level.**
- **But the ICAP price in State 3 is still $24.72/kW-mo. above the net cost of entry at the target ICAP level.**
- **Consequently, in the long run, this approach would also cause the amount of ICAP supplied, on average, to exceed the target ICAP level slightly (in this example).**

But it is much closer to the objective of the adjustment procedure, which is to adjust the ICAP demand curve to account for seasonal variations in ICAP prices without inducing development of more or less capacity than the target ICAP level.

Comparing the Adjustment Procedures

If each of the three-year ICAP demand curves is adjusted to reflect the winter-to-summer ICAP sales ratio that it anticipates it will observe over the lifespan of that demand curve, it should support entry when needed.

- **Of course, this depends upon whether the ISO accurately forecasts the winter-to-summer adjustments, but this is no more dependent on that than any other aspect of the ICAP demand curves.**

Alternatively, if the ISO's adjustment of the three-year demand curves does not reflect the winter-to-summer ICAP sales ratio that it anticipates it will observe over the lifespan of that demand curve, then the ISO will over-adjust some of these demand curves, and under-adjust others.

- **These effects could balance out exactly—but that is unlikely.**

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Procedure Used in ICAP Demand Curve Study

The ICAP demand curve study that NERA and Sargent & Lundy are performing has been based on costs that they expect to observe over the lifespan of the demand curves, even if the expected costs that one might observe in the long-run equilibrium differ.

As Gene Meehan said in his presentation at the Jan. 18 meeting of this Working Group (at slide 18):

- **"It is possible that certain non equilibrium transitory conditions may apply for reset period–e.g., labor premium, equipment premium or discount."**
- **"It is necessary to recognize these conditions to avoid results that attract too much or too little capacity."**

Effect of Short-Term Disequilibrium in Market for Generating Equipment

Suppose that generating equipment is expected to be relatively cheap over the next three years, due to a glut.

- **NERA's approach recognizes that, if the ICAP demand curves are set using the long-term expected price of generating equipment, which is higher, too much ICAP will be developed in the short run.**

Alternatively, suppose that we anticipate that generating equipment will be unusually expensive over the next three years.

- **NERA's approach recognizes that, if the ICAP demand curves are set using the long-term expected price of generating equipment, which is lower, not enough ICAP will be developed in the short run.**

Comparing the Effects of Short-Term Disequilibria

Whether the ISO should adjust the ICAP demand curves using the winter-to-summer ICAP sales ratio that it expects to observe over the next three years, or using an estimate of the long-term equilibrium value for that ratio instead, is exactly the same issue that NERA addressed.

- **Suppose that the winter-to-summer ICAP sales ratio that the ISO expects to observe over the next three years is less than the expected long-term equilibrium value for that ratio.**
  - ***Also suppose that the ISO nevertheless uses the expected long-term equilibrium value for the winter-to-summer ICAP sales ratio when adjusting the ICAP demand curves.***
  - ***This will have exactly the same effect as using expected long-term equilibrium prices for generating equipment when developing those demand curves, if those prices exceed the prices the ISO expects to see over the next three years.***
  - ***Either provides short-run incentives for the development of more than the target level of ICAP.***
- **The reverse is also true.**

Need for a Consistent Approach

The answers to these questions must be consistent. Suppose that:

- **The winter-to-summer ICAP sales ratio that the ISO expects to observe over the next three years is less than the expected long-term equilibrium value for that ratio.**
- **Prices for generating equipment that the ISO expects to see over the next three years are higher than expected long-term equilibrium prices.**

In this case, the effect of using a short-term value for the winter-to-summer ICAP sales ratio and the effect of using a short-term price for generating equipment would offset.

- **Using the winter-to-summer ICAP sales ratio that the ISO expects to observe over the next three years would lead to a lower demand curve than using the expected long-term equilibrium value for that ratio.**
- **Using generating equipment prices that the ISO expects to observe over the next three years would lead to a higher demand curve than using expected long-term equilibrium generating equipment prices.**

Improper Incentives Result from Inconsistency

But deciding whether to use short-term values or long-term values based on the impact they will have on the demand curve will bias the demand curve.

- **In this example, the ICAP demand curve increases if the ISO uses the expected long-term winter-to-summer ICAP sales ratio and generating equipment prices that the ISO expects to observe over the next three years.**
  - ***But this ICAP demand curve would provide short-run incentives for the development of more than the target level of ICAP.***
- **Similarly, in this example, the ICAP demand curves decrease if the ISO uses the winter-to-summer ICAP sales ratio that the ISO expects to observe over the next three years and expected long-term generating equipment prices.**
  - ***But those ICAP demand curves would not provide short-run incentives for the development of the target level of ICAP.***

The Consistent Approach to Adjusting ICAP Demand Curves

If the answers to these questions are to be consistent, then the adjustment to reflect seasonal variations in ICAP prices should also reflect expectations over the next three years.

- **The rest of the demand curve analysis is based on expectations of prices and costs over the next three years.**
- **No market participants indicated any objections to this approach.**

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Potential Impact of Other Adjustment Procedures

As we showed earlier, the adjustment of these ICAP demand curves should be based on the winter-to-summer ICAP sales ratio that the ISO expects to observe over the lifespan of the demand curves.

- **During the last ICAP demand curve reset, the ISO performed this adjustment under the assumption that the winter-to-summer ICAP sales ratio would reflect the ratio of the sum of the winter DMNCs of non-SCR resources in the NYCA to the sum of summer DMNCs of non-SCR resources in the NYCA.**
  - ***I will call this ratio the "winter-to-summer Gold Book ratio."***
- **The ISO then incorporated a "winter revenue benefit," reflecting that the winter-to-summer ICAP sales ratio that would be realized over the lifespan of the demand curves likely would not be equal to this winter-to-summer Gold Book ratio.**

Actual Winter-to-Summer ICAP Sales Ratios

Using the winter-to-summer Gold Book ratio to adjust the ICAP demand curves could have a significant effect on the ICAP demand curves, as there have been substantial and persistent differences between the winter-to-summer Gold Book ratio and the winter-to-summer ICAP sales ratio.

- **During the four capability years that the demand curves have been in effect, the winter-to-summer ICAP sales ratio has always been less than 1.02.**

	Capability Year			
	2003-04	**2004-05**	**2005-06**	**2006-07**
Average for Months in Summer Capability Period				
Minimum UCAP Requirement (MW)	35,303.5	35,584.5	35,799.2	37,154.2
Amount of UCAP Procured (MW)	37,623.4	39,017.1	39,240.0	39,802.8
Excess Supply of UCAP Above Minimum (MW)	2,319.9	3,432.6	3,440.8	2,648.6
Average for Months in Winter Capability Period				
Minimum UCAP Requirement (MW)	35,203.4	35,515.9	35,761.5	37,319.2
Amount of UCAP Procured (MW)	38,146.4	39,476.0	39,447.1	40,647.5
Excess Supply of UCAP Above Minimum (MW)	2,943.0	3,960.1	3,685.6	3,328.3
Difference	623.1	527.6	244.8	679.7
Winter-to-Summer ICAP Sales Ratio	1.0177	1.0148	1.0068	1.0183

- **So the 1.02 value used in the example as the short-term expected value for the winter-to-summer ICAP sales ratio in State 1 was actually slightly higher than any of the winter-to-summer ICAP sales ratios observed thus far.**

Actual Winter-to-Summer Gold Book Ratios

While the winter-to-summer Gold Book ratios are currently only available for three of those capability years, each of those ratios is significantly above the actual winter-to-summer ICAP sales ratios for those years.

	Capability Year		
	2003-04	**2004-05**	**2005-06**
Summer DMNCs of non-SCR Resources in the NYCA (MW)	38,110.8	37,547.6	38,956.5
Winter DMNCs of non-SCR Resources in the NYCA (MW)	39,654.8	41,255.9	41,706.1
Difference	1,544.0	3,708.3	2,749.6
Winter-to-Summer Gold Book Ratio	1.0405	1.0988	1.0706

The 1.06 value used for State 2 in the example was actually slightly lower than the average of these winter-to-summer Gold Book ratios.

Likelihood that These Differences Will Persist

There is reason to believe that the historical difference between the winter-to-summer Gold Book ratio and the winter-to-summer ICAP sales ratio will persist, due to changes in the New England and PJM ICAP markets.

- **In the past, New York has been a much more attractive market for sellers of ICAP than New England or PJM.**
- **Those advantages will be reduced, and may disappear entirely, as a result of these changes. Therefore:**
  - ***ROS resources will be more interested in selling ICAP into New England's or PJM's markets.***
  - ***Resources in New England and PJM will be less interested in selling into the New York ICAP market.***

Seasonal Variations in ICAP Supply in Adjoining Markets

One of the most significant differences between these markets and the New York market pertains to seasonal variations in the amount of UCAP each resource can provide.

- **In New England and PJM, the amount of UCAP that each resource can provide in each month—in both the summer and the winter—depends upon its summer DMNC.**
- **Therefore (ignoring the effects of other markets), their prices should be relatively constant over the year.**

But in New York, the amount of UCAP that resources can supply varies seasonally.

Seasonal Swings in Net Imports of ICAP

As a result, we may see significant seasonal swings in net imports of ICAP.

- **Putting aside the other differences between the markets, suppose that New York's, New England's and PJM's ICAP markets each were intended to provide roughly the same total amount of compensation to ICAP providers under current conditions.**
  - ***Then ICAP prices, measured over the course of the year, would be about the same in each market.***
- **Adding the fact that prices are expected to be much lower in the New York market during the winter than during the summer would:**
  - ***Induce resources in New England and PJM to sell into New York during the summer.***
  - ***Induce resources in New York to sell into New England or PJM during the winter.***
- **Such seasonal swings in net imports would reduce the winter-to-summer ICAP sales ratio.**
  - ***The winter-to-summer Gold Book ratio ignores imports and exports altogether, so it would not reflect these swings.***

Potential Consequences of Adjustments Based on Gold Book Data

As the example showed, using a 1.06 winter-to-summer ICAP sales ratio when a 1.02 ratio is appropriate would cause the demand curve to be raised by a factor of 4/3, instead of the appropriate factor of 12/11.

- **Therefore, it causes the ICAP demand curve to be too high, by a factor of (4/3) / (12/11) – 1 = 22%.**

This may understate the likely impact of performing the wrong adjustment.

- **Actual winter-to-summer ICAP sales ratios have been less than 1.02, while winter-to-summer Gold Book ratios have averaged more than 1.06 thus far.**

- **These calculations assumed that the ICAP demand curve would intersect the x-axis at 112% of the target ICAP level.**
  - ***NERA's preliminary findings are that "a crossing point beyond 112% does little to reduce carrying charges" (3/22/07, slide 15), so this point is unlikely to increase.***
  - ***But it could decrease. If the ICAP demand curve were to intersect the x-axis at 110% of the target ICAP level, instead of 112%, the ICAP demand curve would be 29% too high in this example.***

Agenda

- Introduction
- Providing the Correct Short-Term Incentives
- Providing the Correct Long-Term Incentives
- Assessing the Impact of Incorrect Adjustments
- Conclusion

Conclusion

The ISO should base its demand curve adjustment on its expectations regarding the amount of UCAP that will be sold into the its markets during the winter, as compared to the summer, over the three-year lifespan of each set of demand curves, for the following reasons:

- **This approach will provide the correct short-term incentives, because it will ensure that payments made to generators are sufficient to induce entry when entry is needed, while guarding against inducing entry that is not needed.**
- **It will provide the correct long-term incentives, because each short-term ICAP demand curve will be adjusted appropriately to reflect the conditions expected to apply during its lifespan.**
- **It will be consistent with the remainder of the demand curve study, avoiding problems with cherry-picking results that happen to favor one group of MPs or the other that will bias the final demand curve.**
- **The errors that would result from using alternative measures (such as the winter-to-summer Gold Book ratios) to perform these adjustments could be significant.**