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.	)	

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

SEPTEMBER 29, 2010

1   *SECTION 1: INTRODUCTION*

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

3   A   My name is David McAdams. I am Associate Professor of Business Administration and

4   Economics at Duke University. My business address is Fuqua School of Business, Duke

5   University, Durham, NC 27708.

6   Q   IS THIS YOUR FIRST TESTIMONY IN THIS PROCEEDING?

7   A   No, I previously provided written testimony in this proceeding on July 1st, 2010 and on

8   September 1st, 2010.[1] I refer readers to that prior testimony, especially for the definition

9   of terms and for background discussion. As in my previous testimony, I will refer to the

10   APR proposed by ISO-NE in February as the "February APR" and the revised APR

11   proposed by ISO-NE in its Opening Brief on July 1 as the "July APR."[2]

12   Q   WHY ARE YOU SUBMITTING ANOTHER ROUND OF TESTIMONY?

13   A   This testimony responds to the deeply flawed testimony on the issue of benchmark prices

14   by a load-side expert, Mr. James Wilson.[3] While it would have been possible to

15   demonstrate and refute Mr. Wilson's errors one-by-one, they are more cogently

16   addressed as part of an exposition of a comprehensive theory of benchmark prices.

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[1]   Second Brief of the New England Power Generators Association, Inc. (Sept. 1, 2010) ("NEPGA Second Brief"), NEPGA Ex. 4, Testimony of David L. McAdams Ph.D. on Behalf of New England Power Generators Association (July 1, 2010) ("my First Testimony"); NEPGA Second Brief, NEPGA Ex. 7, Supplementary Testimony of David L. McAdams Ph.D. on Behalf of New England Power Generators Association (Sept. 1, 2010) ("my Supplementary Testimony").

[2]   The February APR 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 preliminarily 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).

[3]   The Joint Filing Supporters' Second Brief, Exhibit DPUC-27, Supplemental Testimony of James F. Wilson in Support of Second Brief of Joint Filing Supporters (Sept. 1, 2010) ("James Wilson Supplemental Testimony").

1   Correcting the record on this matter is essential, as <u>the success or failure of APR reform</u>

2   <u>hinges critically on getting benchmark prices right</u>.

3   In addition, the theory of benchmark prices developed here helps to resolve

4   certain ambiguities in the most recent testimony of the Internal Market Monitor (IMM),

5   Mr. LaPlante,[4] and avoid disastrous potential misconstruction.

6 Q   WHAT IS THE PURPOSE OF THIS SUPPLEMENTARY TESTIMONY?

7 A   There have been several rounds of exchanges between the parties to this proceeding.

8   Underlying the status quo is a proposal by ISO-NE to calculate an "APR Price" based on

9   the use of proxy or "Benchmark" offers for units that are determined to be out-of-market

10   ("OOM"). There has been controversy between the parties as to whether the ISO-NE's

11   characterization of the Benchmark is correct. The purpose of this testimony is to resolve

12   this controversy through formal economic analysis of each party's Benchmark proposal.

13 Q   PLEASE DESCRIBE THE BENCHMARK PROPOSALS THAT YOU WILL

14   ANALYZE IN THIS TESTIMONY.

15 A   ISO-NE has proposed a Benchmark ("ISO-NE Benchmark") for each OOM resource that

16   reflects the *annuity* payment (*i.e.*, the annual amount, to be received every year for that

17   resource's operational lifetime) that would generate a present value equal to the (net)

18   costs of new entry.

19   Load's expert Mr. James Wilson rejects the ISO-NE Benchmark, arguing instead

20   that any rational bidder will ignore its sunk costs and only offer into the auction at a price

21   that reflects its *annual* (*i.e.*, one-year) going-forward costs. Although Mr. Wilson does

22   not offer any specific proposal, his testimony supports the notion of Benchmark offers

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[4]   September 1, 2010 Brief of the Internal Market Monitor for ISO New England Inc. (Sept. 1, 2010) ("LaPlante Brief").

1   equal to going-forward costs at the time of the FCA ("Going-Forward Cost Benchmark").

2   NEPGA's expert Dr. Roy Shanker in turn rejected Mr. Wilson's preferred Going-

3   Forward Cost Benchmark. Dr. Shanker argued that the Going-Forward Cost Benchmark

4   will fail to achieve the APR's objective of correcting the price-suppressing effect of

5   OOM entry, since OOM resources will no longer be designated as OOM once they have

6   sunk enough costs to clear at going-forward cost. Dr. Shanker recommended the use of a

7   Benchmark based on the levelized cost of new entry, similar to the ISO-NE's annuity

8   value.

9   Finally, I will consider a "Total Cost Benchmark," in which OOM resources'

10   Benchmark offers reflect all costs of new entry, no matter whether incurred before or

11   after the FCA. The Total Cost Benchmark has not been proposed by any party to this

12   proceeding, as far as I am aware. However, the Total Cost Benchmark emerges from my

13   analysis as a credible candidate to achieve the objective of fully correcting (but not over-

14   correcting) for the price-suppressing effect of OOM entry.

15   Q   WHAT DO YOU MEAN BY "THE ISO-NE BENCHMARK"?

16   A   Formal economic analysis of any Benchmark proposal requires that the proposed method

17   of computing Benchmark offers be completely specified. Unfortunately, ISO-NE has not

18   provided complete details on its proposed Benchmark, leaving some specifics as "rules of

19   implementation." Thus, my analysis will be based on an *interpretation* of how ISO-NE

20   proposes to compute Benchmark offers. This interpretation is based on my reading of

21   ISO-NE's briefs, the September 1, 2010 comments of the Internal Market Monitor, and

22   input from counsel and other experts. In particular, my interpretation is that ISO-NE

23   proposes to use a "Levelized 40-Month Cost Benchmark." (Later, I will define the

1   meaning of "levelized costs" and "40-month costs.") If this interpretation is not correct,

2   then of course my formal analysis must be modified in order to reach valid conclusions

3   about the actual ISO-NE Benchmark. Bearing this in mind, I have written this testimony

4   with an eye to illustrating *principles* of Benchmark analysis that can be applied to any

5   Benchmark proposal.

6   Q   ON WHAT BASIS WILL YOU JUDGE EACH BENCHMARK PROPOSAL?

7   A   I will judge each Benchmark proposal on the basis of whether it corrects (but does not

8   over-correct) for the price-suppressing effect of OOM entry. In other words, when this

9   Benchmark is applied within the context of the July APR, will the resulting APR Price be

10   equal to the "Competitive FCA Price" that would have prevailed in a competitive market

11   absent OOM entry?

12   For a forceful and authoritative discussion of why it is essential that the APR fully

13   correct for the price-suppressing effect of OOM entry—even if some such OOM entry

14   provides efficiency benefits—see the collective September 1, 2010 testimony of

15   Professors Milgrom, Kalt, and myself.

16   Q   PLEASE DESCRIBE THE METHOD BY WHICH YOU WILL ANALYZE EACH OF

17   THESE PROPOSALS.

18   A   I will apply standard equilibrium analysis to a model of the Forward Capacity Auction

19   ("FCA"). Most other analyses of the FCA in this proceeding have been limited by their

20   *implicit assumption* that bidders' incentives in the FCA do not depend on the rules of the

21   FCA. My more complete analysis here will endogenize bidders' incentives in the FCA

22   by considering their *pre-auction* incentives to make investments and/or sign contracts

23   that cause them to incur (or commit to incur) some of the costs of new entry prior to the

1   FCA.   As I will show, this richer framework—with pre-FCA "investments" and

2   "commitments" as well as FCA bidding—is essential to sort through the (direct and

3   indirect) effects of different Benchmark proposals on market outcomes.

4   Q   PLEASE SUMMARIZE YOUR MAIN CONCLUSIONS.

5   A   Analysis of my model of the FCA leads to three main conclusions, which can be

6   summarized as follows:

7   1. *The Going-Forward Cost Benchmark proposed by load's expert egregiously fails*
8   *to fully correct for the price-suppressing effect of OOM entry.*

9   2. *The Levelized 40-Month Cost Benchmark proposed by ISO-NE can fully correct*
10   *(but not over-correct) for the price-suppressing effect of OOM entry, under*
11   *certain conditions.*

12   3. *The Total Cost Benchmark fully corrects (but does not over-correct) for the price-*
13   *suppressing effect of OOM entry.*

14   Q   WHAT DO YOU MEAN WHEN YOU SAY THAT THE GOING-FORWARD COST

15   BENCHMARK "EGREGRIOUSLY FAILS"?

16   A   One can imagine Benchmark Rules that are well-conceived conceptually, but that do not

17   *exactly* correct for the price-suppressing effect of OOM entry. In fact, it is reasonable to

18   expect that the ISO-NE Benchmark or the Total Cost Benchmark—although *in theory*

19   capable of fully and exactly correcting for the price-suppressing effect of OOM entry—

20   will in practice not perfectly correct the APR Price.

21   By contrast, the Going-Forward Cost Benchmark has *no hope* of fully correcting

22   the price-suppressing effect of OOM entry. Indeed, the Going-Forward Cost Benchmark

23   seems designed (i) to minimize the APR's correction of the price-suppressing effect of

24   OOM and (ii) to provide multiple avenues by which load can suppress the APR Price

25   *without violating the tariff.* Further, as I will explain, Mr. Wilson's reasoning in favor of

26   the Going-Forward Cost Benchmark depends on an implicit assumption that load will not

1   induce any resources to enter the FCM that would not have entered anyway in a

2   competitive market. However, since the states have argued that they have a vital public-

3   policy interest to induce certain new resources to enter the FCM that would not be able to

4   clear in the FCA, this assumption is demonstrably counterfactual.

5   Q   WHAT ARE THE "CERTAIN CONDITIONS" UNDER WHICH THE ISO-NE

6   BENCHMARK FULLY CORRECTS (BUT DOES NOT OVER-CORRECT) FOR THE

7   PRICE-SUPPRESSING EFFECT OF OOM ENTRY?

8   A   The ISO-NE Benchmark can fully correct (but not over-correct) for the price-suppressing

9   effect of OOM entry, but only if load does not use out-of-market subsidies to induce what

10   I shall call "out-of-merit long-lead-time resources" to enter the FCM. So, the ISO-NE

11   Benchmark fully corrects for the price-suppressing effect of OOM entry if (i) there are no

12   out-of-merit long-lead-time resources or (ii) for some reason, load does not provide OOM

13   subsidies to such resources.

14   An "out-of-merit long-lead-time resource" is one for which (i) entry into the FCM

15   is *unprofitable on the basis of total cost* but (ii) entry requires that enough costs be sunk

16   prior to the FCA that, at the time of the FCA, entry is *profitable on the basis of the "40-*

17   *month cost"* that can be paid after the FCA (*i.e.*, during the 40-month forward period

18   between the FCA and the start of the obligation period). For this to occur, any out-of-

19   merit long-lead-time resource must employ a technology that requires significant lead-

20   time to develop, such that a material fraction of the costs must be invested more than 40

21   months prior to the commercial on-line date.

22   Out-of-merit long-lead-time resources would not enter the FCM in a competitive

23   market, because entry is unprofitable on a total-cost basis. Thus, if load can induce out-

1 of-merit long-lead-time resources to enter the FCM *without triggering the APR*, then load

2 will suppress the APR Price without violating the tariff. To see that such a scheme is

3 feasible under the ISO-NE Benchmark, suppose that load were to provide sufficient out-

4 of-market subsidies to induce an out-of-merit long-lead-time resource to sink the pre-

5 FCA costs required for entry. Since this resource finds entry to be profitable on the basis

6 of its *remaining* costs at the time of the FCA, its Benchmark offer under the ISO-NE

7 Benchmark (or under the Going-Forward Cost Benchmark) will be low enough for this

8 resource to clear *while evading OOM designation*.

9 Q WHY DOES THE TOTAL-COST BENCHMARK FULLY CORRECT (BUT NOT

10   OVER-CORRECT) FOR THE PRICE-SUPPRESSING EFFECT OF OOM ENTRY?

11 A Entry by a resource with out-of-market subsidies will suppress the price below the

12   competitive level, absent mitigation, if and only if that resource would not have cleared in

13   a competitive market absent OOM subsidies. In a competitive market absent OOM

14   subsidies, the only resources that clear are those that *profitably* clear, and the only

15   resources that profitably clear are those whose *total cost* is low enough for entry to be

16   profitable at the Competitive FCA Price. So, any resource that would have cleared in a

17   competitive market absent OOM subsidies must have a total cost of new entry—and

18   hence Total Cost Benchmark—less than the Competitive FCA Price. Thus, OOM

19   subsidies to *in-merit* resources, that would have entered the FCM even without OOM

20   subsidies, do not have any effect on which resources clear and hence do not affect the

21   market-clearing price. At the same time, since each such resource's Total Cost

22   Benchmark is less than the Competitive FCA Price, the Total Cost Benchmark will not

23   artificially inflate the APR Price by mistakenly designating an in-merit resource as OOM.

1   On the other hand, OOM subsidies to *out-of-merit* resources, that would not have

2   entered the FCM absent OOM subsidies, have the potential to lower the APR Price below

3   the price that would have prevailed in a competitive market absent OOM entry.

4   However, under the Total Cost Benchmark, entry by out-of-merit resources does not

5   suppress the APR Price. To see why, suppose that load were to induce some resource to

6   enter the FCM that would not have otherwise entered in a competitive market absent

7   OOM subsidies. Since this resource would not have entered competitively, its total cost

8   of new entry—and hence its Total Cost Benchmark—must exceed the Competitive FCA

9   Price. Thus, if such a resource is induced to bid less than the Competitive FCA Price and

10   enter the FCM, it will trigger the APR and be designated as OOM, and have its price-

11   suppressing effect fully corrected.

12 Q   PLEASE SUMMARIZE YOUR CONCLUSIONS ON THE THREE BENCHMARK

13   APPROACHES.

14 A   The Total Cost Benchmark, described in more detail below, is the benchmark that best

15   aligns the price outcome of the FCA with the price that would have occurred in a fully

16   competitive auction. ISO-NE's proposed Levelized 40-Month Cost Benchmark is a close

17   second by this standard, provided that there is little or no subsidization of out-of-merit

18   long-lead-time resources that would have a material fraction of their total costs incurred

19   more than 40 months ahead of the Commitment Period. In sharp contrast to these two,

20   the *only* condition under which Mr. Wilson's Going-Forward Cost Benchmark results in

21   an APR price matching the competitive clearing price is when there is no OOM entry—

22   that is, the Going-Forward Cost Benchmark will be entirely ineffective in its intended

23   role.

1   Q   HOW IS THE REST OF THIS TESTIMONY ORGANIZED?

2   A   Section 2 describes the model of the FCA that I will use in this testimony and defines

3   terms that will be needed in the analysis. Section 3 considers the baseline case of the

4   "Competitive FCA" absent OOM subsidies, in which all resources make competitive

5   investment and bidding decisions. Section 4 then provides my equilibrium analysis:

6   Section 4-A analyzes the ISO-NE Benchmark, while Section 4-B analyzes the Going-

7   Forward Cost Benchmark. Section 5 concludes with some other comments.

8   Q   PLEASE SUMMARIZE THESE OTHER COMMENTS.

9   A   In Section 5-A, I will argue that the APR can fully correct for the price-suppressing effect

10   of OOM entry without the need for the extensive exercise of IMM discretion. In Section

11   5-B, I will comment further on the testimony of Mr. Wilson. In Section 5-C, I conclude

12   with some further discussion of the model used here.

13   *SECTION 2: MODEL & DEFINITIONS*

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

15   A   This section describes in more detail the model of the FCA that I will use in later

16   analysis, and defines several terms.

17   *SECTION 2-A: DEFINITIONS*

18   Q   WHAT TERMS DO YOU NEED TO DEFINE?

19   A   Before describing the model in more detail, I will define and discuss several terms in

20   order to make my testimony as clear and precise as possible. These terms include:

21   1. "forward market;"

22   2. "deferrable costs;"

23   3. "40-month cost;"

24   4. "going-forward cost;"

1   5. "total cost;" and

2   6. "equilibrium bid in the FCA."

3   Other important terms will defined at the end of Section 2-B, including:

4   7. "equilibrium in the FCM;"

5   8. "Competitive FCA Price;"

6   9. "out-of-merit long-lead-time resource;" and

7   10. "price-suppressing effect of OOM entry."

8   Q   WHAT DO YOU MEAN BY "FORWARD MARKET"?

9   A   In a "forward market,"[5] transactions specify the terms of *future* trade. By contrast, in a

10   "spot market," transactions specify the terms of *immediate* trade. The time at which

11   forward contracts are signed in a forward market is the "forward contracting date." The

12   period of time between the forward contracting date and delivery is the "forward period."

13   The FCA is a "40-month-forward market," in which capacity supply obligations

14   ("CSOs") are procured 40 months prior to the start of the obligation period.[6]

15   Q   WHAT ARE A RESOURCE'S "DEFERRABLE COSTS"?

16   A   "Deferrable costs" are any costs that would, in the normal course of business, be incurred

17   after the FCA.

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[5]   In finance, the term "forward market" has the more specialized meaning of an over-the-counter financial market—as opposed to "futures markets" that are centralized exchanges—for contracts specifying terms of future trade.

[6]   The 40-month forward period of the FCA is designed to reduce the "sunk cost risk" that a resource may incur significant costs prior to the FCA but not be able to recover those costs, and to reduce the market-price volatility that tends to arise in the face of substantial sunk cost risk.

1   Q   WHAT IS A RESOURCE'S "40-MONTH COST"?

2   A   A potential new resource's "<u>40-month cost of new entry</u>" is its (net[7]) cost of new entry,

3   when accounting for all of its deferrable costs. Similarly, an existing resource's "<u>40-</u>

4   <u>month cost of continued operation</u>" is the expected unprofitability of continued

5   operations, again when accounting for all of its deferrable costs.

6   Q   WHAT IS A RESOURCE'S "LEVELIZED 40-MONTH COST OF NEW ENTRY"?

7   A   A resource's "<u>levelized 40-month cost of new entry</u>" is the *minimal annuity payment*[8]

8   that that resource demands at the time of the FCA in order to commit to provide capacity

9   reserves at the start of the obligation period, if it has not incurred (or committed to incur)

10   any deferrable costs prior to the FCA. In other words, a resource's levelized 40-month

11   cost of new entry is the minimal annual payment that it would demand *now and forever*

12   to enter the market through the FCM, whereas its (un-levelized) 40-month cost of new

13   entry is the minimal annual payment that it would demand *now*, given the expected

14   stream of auction payments in future years.

15 Q   WHAT IS A RESOURCE'S "GOING-FORWARD COST"?

16 A   A potential new resource's "<u>going-forward cost of new entry</u>" is its cost of new entry,

17   when accounting only for those costs that it has not actually incurred prior to the FCA.

18   Similarly, an existing resource's "<u>going-forward cost of continued operation</u>" is the

19   expected unprofitability of continued operations, again accounting only for those costs

20   that have not been incurred prior to the FCA.

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[7]   All cost measures (including total costs) that I discuss in this testimony are *net of expected earnings* from the sale of energy, ancillary services, and other non-capacity products.

[8]   An "annuity payment" is a fixed payment that is received every year during a resource's operational lifetime.

1   Q   WHAT IS A RESOURCE'S "TOTAL COST OF NEW ENTRY"?

2   A   A potential new resource's "<u>total cost of new entry</u>" is its cost of new entry, when

3   accounting for *all* costs, no matter when they may be incurred.

4   Q   WHAT ARE "EQUILIBRIUM BIDS" IN THE FCA?

5   A   The "<u>equilibrium bid</u>" of a potential new resource is its cost of new entry, when

6   accounting only for those costs that it has not actually incurred *or committed to incur*

7   prior to the FCA.[9] Similarly, the equilibrium bid of an existing resource is its cost of

8   continued operation, when accounting only for those costs that it has not actually incurred

9   *or committed to incur* prior to the FCA. Thus, for instance, a potential new resource that

10   has voluntarily incurred (or committed to incur) some deferrable costs of new entry prior

11   to the FCA will submit an equilibrium bid that is strictly less than its 40-month cost of

12   new entry. Similarly, any OOM resource that has committed to enter the FCM prior to

13   the FCA—but has not yet incurred any entry costs at the time of the FCA—will submit

14   an equilibrium bid that is strictly less than its going-forward cost of new entry.

15   *SECTION 2-B: MODEL DETAILS*

16   Q   PLEASE DESCRIBE YOUR MODEL OF THE FCA.

17   A   The FCA is a *bidding game*[10] embedded within the FCM. Thus, any complete model of

18   the FCA must also model the "larger game" of the FCM. I will model each period of the

19   FCM as a two-stage "FCM Game."

20   **Stage 1 of the FCM Game: Contracting / Pre-Investment**. At the beginning of

21   each period, before the FCA, every potential new resource has (i) the opportunity to

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[9]   In my First Testimony, I showed that each bidder has an incentive—technically, a "weakly-dominant strategy"—to submit such equilibrium bids in the FCA under the July APR. Furthermore, this conclusion applies regardless of the Benchmark Rule.

[10]   "Game" is the standard term in economics and applied mathematics to refer to any strategic interaction.

1   contract with load[11] and (ii) the opportunity to incur some of the costs of new entry ("pre-

2   investment"). Such a contract can serve to commit that resource to enter the FCM and/or

3   commit it to incur some of the costs of new entry prior to the FCA. Such a contract could

4   also specify what that resource will bid in the FCA but, to emphasize that load need not

5   control OOM bids in order to suppress such bids, I will restrict attention to contracts in

6   which each contracted resource is free to bid in the FCA according to its own self-

7   interest. Of course, such self-interest is shaped by the terms of the OOM contract that has

8   been signed.

9   *Incentives in the Contracting Stage*: A resource has an incentive to sign an OOM

10   contract with load exactly when such a contract *mutually* benefits itself and load, when

11   each subsequently acts in its rational self-interest. For example, since entry into the FCM

12   is unprofitable for *inefficient* OOM, such resources must be subsidized to enter.

13   However, load will be willing to provide such a subsidy, but only if such OOM entry

14   sufficiently suppresses load's auction payments. In other words, load is willing to induce

15   inefficient OOM to enter exactly when doing so is *mutually* profitable for load and that

16   inefficient OOM.

17   **Stage 2 of the FCM Game: FCA**. Each resource in the FCA decides what to

18   bid. The FCA Rules then determine (i) which resources clear, (ii) which resources are

19   designated as "OOM" (and "carried-forward OOM") for the purpose of computing prices

20   now and in future periods, and (iii) what each clearing resource is paid.

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[11] Other third-parties could also contract with some resources and influence their FCA bids. I focus on load (and allied interests) because I am unaware of any example of any other sort of third-party engaging in the FCM in this way.

1   *Rules in the FCA*: My analysis assumes that the Commission will adopt the July

2   APR; hence, that new resources will receive the FCA Clearing Price and that existing

3   resources will receive the APR Price.[12]   Within the context of the July APR, I will

4   consider the effect on equilibrium FCM outcomes of two Benchmark Rules: the "Going-

5   Forward Cost Benchmark Rule," in which each OOM resource's Benchmark is set equal

6   to its going-forward cost; and the "ISO-NE Benchmark," in which each OOM resource's

7   Benchmark is set equal to its levelized 40-month cost of new entry.

8   *Incentives in the FCA*: Regardless of the Benchmark Rule, each potential new

9   resource in the FCA has an incentive—more precisely, a "weakly-dominant strategy"—to

10   submit an equilibrium bid reflecting the costs of new entry that it has not yet incurred or

11   committed to incur. Similarly, each existing resource has an incentive to submit an

12   equilibrium bid reflecting the costs of continued operation that it has not yet incurred or

13   committed to incur. For this reason, it is straightforward to analyze how bidders will

14   behave in the FCA, *given* their decisions in the Contracting Stage. The real "action"

15   occurs *before* the FCA, in the Contracting Stage.

16   Q   WHAT DO YOU MEAN BY "EQUILIBRIUM IN THE FCM"?

17   A   In my analysis, I will assume that the players in the FCM Game—every potential new

18   resource, every existing resource, and load—will adopt strategies that constitute an

19   "equilibrium" of that game. In a single-stage game, players' strategies constitute a "Nash

20   equilibrium" when every player's strategy is a best response (*i.e.*, maximizes that player's

21   expected profit) given the strategies chosen by others. In a *multi-stage* game such as the

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[12]   In fact, ISO-NE has proposed that resources revert back to receiving the FCA Clearing Price after 20 years in
        the FCM. My analysis can be easily adapted to accommodate this detail, which I ignore here for the sake of
        simplicity.

1   FCM Game, the standard equilibrium concept is that of "subgame-perfect equilibrium."

2   In a subgame-perfect equilibrium, every player's strategy *in every stage of the game* is a

3   best response given the strategies chosen by others. [13]

4 Q   WHAT IS THE "COMPETITIVE FCA PRICE"?

5 A   The "<u>Competitive FCA Price</u>" is the equilibrium FCA price that would obtain in a

6   hypothetical scenario *without OOM contracts*, in which all resources decide, on a

7   merchant basis, (i) when to incur or commit to incur the costs of new entry (if new) or of

8   continued operation (if existing) and (ii) what to bid in the FCA. Throughout the

9   analysis, the Competitive Price will be denoted by P*. The Competitive FCA Price will

10   serve as my measure of whether a Benchmark Rule fully corrects (but does not over-

11   correct) for the price-suppressing effect of OOM entry.

12 Q   WHAT IS AN "OUT-OF-MERIT LONG-LEAD-TIME RESOURCE"?

13 A   An "<u>out-of-merit long-lead-time resource</u>" is any resource whose (i) total cost of new

14   entry is greater than P* but whose (ii) 40-month cost of new entry is less than P*. Absent

15   OOM subsidies, an out-of-merit long-lead-time resource would not competitively enter

16   the FCM. However, should it be induced to sink all pre-FCA investments that are

17   necessary to enter the FCM, such a resource will then have an incentive to enter the FCM

18   *at a loss*.

19 Q   WHAT IS THE "PRICE-SUPPRESSING EFFECT OF OOM ENTRY"?

20 A   Absent OOM entry, competitive resources decide whether to enter the FCA on the basis

21   of the presumption that other resources will only enter if entry is profitable. In particular,

22   anticipating the Competitive FCA Price P*, all resources with total cost less than P* will

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[13]   For more discussion and a formal definition of subgame-perfect equilibrium, see Andreu Mas-Colell, Michael Whinston & Jerry Green, Microeconomic Theory ch. 9.B (1995).

1   (in equilibrium) make the pre-FCA investments necessary to enter the FCM, and then bid

2   in the FCA so as to clear at P*. On the other hand, if competitive resources anticipate

3   that some OOM resources will be subsidized to enter the FCM unprofitably, their

4   subsequent competitive decisions (in equilibrium) will anticipate and generate an FCA

5   Clearing Price $P^{FCA} < P*$ paid to new resources and an APR Price P^{APR} paid to existing

6   resources. The equilibrium APR Price P^{APR} depends on the Benchmark Rule that is in

7   place and on the set of OOM resources. I will say that <u>a Benchmark "fully corrects (but</u>

8   <u>does not over-correct) for the price-suppressing effect of OOM entry" if $P^{APR} = P*$</u>

9   <u>*regardless* of which resources are induced to enter as OOM</u>. This is essential, since

10   subsidizing some particular type of resource could result in an APR Price $P^{APR} < P*$, then

11   load would have a perverse incentive to induce such resources to enter the FCM, in order

12   to suppress the APR Price.

13   *SECTION 3: COMPETITION ABSENT OOM CONTRACTS*

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

15   A   In later analysis, I will judge the performance of each proposed Benchmark Rule on the

16   basis of whether it fully corrects for the price-suppressing effect of OOM entry, resulting

17   in an APR Price equal to the "Competitive FCA Price" of P*. In this section, I will

18   discuss the "competitive behavior" that determines P* within the context of my model.

19   First, it is helpful to provide some more general background discussion of *competitive*

20   forward markets.

21   Q   WHAT IS A "COMPETITIVE FORWARD MARKET"?

22   A   The activity surrounding any forward market can be viewed as unfolding in three phases:

23   (i) pre-market, (ii) market, and (iii) post-market. A "competitive forward market" is one

1   in which all investments in the pre-market and all transactions in the market are

2   competitive.

3   In the pre-market, each seller decides whether to make "investments" in

4   preparation for the forward market; at the time of the market, such investments are sunk

5   and hence at-risk if the forward market price is not high enough. A pre-market

6   investment is only "competitive" if it is profitable, *i.e.*, if the forward market price P is

7   *anticipated* to be high enough to cover the sunk cost of investment.

8   In the market, each seller decides whether to trade at the forward market price P.

9   A seller's decision to trade is only "competitive" if it is profitable on a going-forward

10   basis, *i.e.*, if P is high enough to cover that seller's *remaining un-incurred costs* of

11   meeting the terms of trade at the forward transaction date.[14]

12   In the post-market, any seller that chose to trade in the market will incur its

13   remaining un-incurred costs.

14   Q   HOW DOES THE FORWARD PERIOD AFFECT COMPETITIVE OUTCOMES?

15   A   Consider the extreme case of a spot market, in which the forward period has zero length.

16   To the extent that meeting the terms of trade requires sellers to make costly investments

17   prior to the forward transaction date, any seller will enter the spot market with substantial

18   "at-risk" sunk costs. In a competitive spot market, each seller's decision to incur such

19   costs would have been made competitively, on the basis of that seller's *expectations*

20   about what the spot-market price would be. However, if the spot-market price turns out

21   to be lower than expected, the seller will not be able to recover its sunk investment costs.

22   Because of this risk, sellers may only be willing to invest when the spot-market price is

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[14]   Such "remaining costs" account for the possibility that the seller may be able to "re-trade" and pay someone
       else to meet the terms of trade on its behalf.

1   expected to cover those sunk costs *and* offer a large enough premium to compensate for

2   spot-market price risk.

3   By participating in a forward market rather than a spot market, resources can

4   decide whether to trade at the forward transaction date *before* sinking all of their

5   investment costs. Furthermore, for resources that must decide whether to invest even

6   prior to the forward market, forward markets can serve to reduce the risk—relative to

7   spot markets—that the cost of such investments will not be recovered. This can reduce

8   the internal rate of return necessary to justify such investments.

9   In the FCM, the 40-month forward period provides ample time for at least some

10   resources (*e.g.*, "peakers" and demand-side resources) to incur essentially all of their

11   costs of new entry after the FCA. The flexible availability of such peakers in turn

12   reduces the risk faced by other, longer lead-time units (*e.g.*, a combined-cycle unit) when

13   deciding prior to the FCA whether to invest. In particular, the availability of peakers to

14   enter or exit the FCM dampens the effect of unexpected events on the FCA Price,

15   allowing longer lead-time units to more confidently assess the profitability of their *pre-*

16   *FCA* decision to enter the FCM. This can reduce the risk premium demanded by longer

17   lead-time units, reducing the total cost of meeting the Net ICR.

18   As discussed in Section 5-C, the analysis here abstracts from the possibility of

19   "unexpected events" between the FCA and a resource's (prior) decision to sink

20   investment costs. However, it is important to bear in mind that longer lead-time

21   resources can face substantial uncertainty about whether they will be able to recover their

22   full cost in the auction. The risk premia associated with such uncertainty are part of such

23   resources' "total cost of new entry."

1   Q   PLEASE ELABORATE. WHAT DO YOU MEAN BY "COMPETITIVE"?

2   A   My usage of the word "competitive" here is subtly different than its most common usage

3   in this proceeding. Typically, the phrase "competitive bidding" is used to describe bids

4   submitted *during the FCA* that are consistent with price-taking behavior. Perhaps the

5   most important point of my testimony is that the presence of "competitive bidding" does

6   *not* imply that the FCA is competitive! In fact, "competitive bidding" can be consistent

7   with a pattern of anti-competitive conduct perpetrated *before the FCA*.[15]

8   In my usage, the FCA is "competitive" only when bidders' decisions *before and*

9   *during* the FCA are consistent with individual profit-maximization. In particular, in the

10   (hypothetical) scenario that I shall refer to as the "Competitive FCA," (i) every resource

11   views itself as a price-taker in the FCA, when deciding both what to bid during the

12   auction and what costs to incur prior to the auction, and (ii) there are no out-of-market

13   subsidies.

14 Q   WHAT PRE-INVESTMENTS WILL RESOURCES *CHOOSE* TO MAKE PRIOR TO

15   THE AUCTION, IN THE "COMPETITIVE FCA"?

16 A   In the Competitive FCA, absent OOM entry, all clearing resources expect to be paid the

17   "Competitive FCA Price" of P*. Thus, any resource with *total* cost greater than P* will

18   choose not to make any costly investments prior to the FCA, since such investment

19   expenses would be unrecoverable. On the other hand, resources with total cost less than

20   P* expect to be able to recover all of their costs, whether these costs are incurred prior to

21   or after the FCA. In particular, (i) resources with total cost less than P* will incur all

22   costs that *must* be incurred prior to the FCA in order to provide reserve capacity during

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[15] *See infra* Section 4-A for a more in-depth discussion.

1   the obligation period and (ii) such resources may incur some (or all) costs that could be

2   deferred until after the FCA.

3   Q   HOW WILL RESOURCES BID IN THE FCA, ABSENT OOM CONTRACTS?

4   A   At the FCA, each resource will evaluate whether to commit to enter the FCM on the basis

5   of its *un-incurred* costs; any investment expenses are sunk and will be treated as such.

6   Thus, each resource in a Competitive FCM absent OOM contracts will bid according to

7   its "competitive going-forward cost."

8   Q   WHAT DO YOU MEAN BY "COMPETITIVE GOING-FORWARD COST"?

9   A   A resource's going-forward cost in the FCA depends on the investment decisions that it

10   made prior to the FCA. A resource's "competitive going-forward cost" is the going-

11   forward cost that it would have *if* it had chosen to make the same pre-FCA investments

12   that it would have made in a competitive market absent OOM entry. As I discussed

13   above, the only resources that will competitively invest to enter the FCM are those that

14   expect to be profitable at the Competitive FCA Price of P*. Such resources will have

15   competitive going-forward cost less than their total cost but—since both their competitive

16   going-forward cost and their total cost are less than P*—the price would remain P* if all

17   such resources bid their total cost instead of their going-forward cost.

18   *SECTION 4: BENCHMARK ANALYSIS*

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

20   A   In this section, I will analyze the Going-Forward Cost Benchmark advocated by

21   Mr. Wilson, the ISO-NE Benchmark proposed by ISO-NE, and the Total Cost

22   Benchmark.

1   *SECTION 4-A: GOING-FORWARD COST BENCHMARK*

2   Q   PLEASE SUMMARIZE THE FINDINGS OF THIS SECTION.

3   A   I demonstrate and discuss the failure of the "Going-Forward Cost Benchmark" to fully

4   correct for the price-suppressing effect of OOM entry.

5   Q   DOES THE GOING-FORWARD COST BENCHMARK ADVOCATED BY

6   MR. WILSON FULLY CORRECT FOR THE PRICE-SUPPRESSING EFFECT OF

7   OOM ENTRY?

8   A   No, it does not. Indeed, for reasons that I will explain, the Going-Forward Cost

9   Benchmark *egregiously fails* to correct for the price-suppressing effect of OOM entry.

10   Q   WHAT DO YOU MEAN WHEN YOU SAY THAT THE GOING-FORWARD COST

11   BENCHMARK "EGREGRIOUSLY FAILS"?

12   A   The Going-Forward Cost Benchmark has *no hope* of fully correcting the price-

13   suppressing effect of OOM entry. Indeed, the Going-Forward Cost Benchmark seems

14   *designed* (i) to minimize the APR's correction of the price-suppressing effect of OOM

15   and (ii) to provide multiple avenues by which load can suppress the APR Price *without*

16   *violating the tariff*.

17   Q   WHY DO YOU SAY THAT THE GOING-FORWARD COST BENCHMARK HAS

18   "NO HOPE" OF FULLY CORRECTING THE APR PRICE?

19   A   OOM entry can have a long-lasting price-suppressing effect. Indeed, an OOM resource

20   that has entered the FCM uncompetitively will suppress the FCA Clearing Price paid to

21   new resources *until such time as it would have* <u>*competitively entered*</u> *the FCM*. If this

22   price-suppressing effect is not corrected *for this full length of time*, such OOM resources

23   will also suppress the APR Price paid to existing resources. However, by design, the

24   Going-Forward Cost Benchmark only attempts to correct the price-suppressing effect of

1   an OOM resource *until such time as it would have <u>competitively continued to operate</u> in*

2   *the FCM*. Once a carried-forward OOM resource's going-forward cost of continued

3   operation (commonly called "to-go cost") falls below the FCA Clearing Price, it is no

4   longer designated as OOM. This essentially *guarantees* that the price-suppressing effect

5   of OOM entry will not be fully corrected!

6 Q   WHY DO YOU SAY THAT THE GOING-FORWARD COST BENCHMARK

7   "PROVIDES MULTIPLE AVENUES BY WHICH LOAD CAN SUPPRESS THE APR

8   PRICE WITHOUT VIOLATING THE TARIFF"?

9 A   *First*, under the Going-Forward Cost Benchmark, OOM entry will have a price-

10   suppressing effect on the APR Price. The reason for this was explained in the last Q&A:

11   <u>the price-suppressing effect of OOM is only corrected for a *portion* of the period in</u>

12   <u>which prices are suppressed</u>. This is the most obvious avenue by which the Going-

13   Forward Cost Benchmark allows load to suppress the APR Price without violating the

14   tariff. *Second*, load has a perverse incentive to induce resources to undertake inefficient

15   investments that will *shrink the window of time* in which the APR is triggered.   In

16   particular, <u>load stands to gain by signing OOM contracts that induce resources to incur</u>

17   <u>costs earlier than is most efficient</u>. For example, if load induces a potential new resource

18   to break ground on its facility prior to the FCA, then any costs that become sunk by virtue

19   of this early activity will not be included in its Going-Forward Cost Benchmark. If

20   enough such deferrable costs are incurred prior to the FCA, an out-of-merit resource

21   sponsored by load can thereby escape detection as OOM and evade all correction of its

22   price-suppressing effect.

1   Q   ON WHAT BASIS DID LOAD EXPERT MR. WILSON ADVOCATE THE GOING-

2   FORWARD COST BENCHMARK?

3   A   While Mr. Wilson did not advance any specific proposal regarding how to compute

4   benchmark prices, his comments can be interpreted as endorsing the Going-Forward Cost

5   Benchmark:

> 6   [E]ven merchant capacity resources that receive no subsidies and have no
> 7   bilateral contracts may nevertheless be offered into the FCA at low prices.
> 8   For instance, a resource that is already under construction at the time of
> 9   the FCA may rationally, competitively, and legitimately stay in the
> 10 descending clock auction at prices down to the level of its net going-
> 11 forward or opportunity cost.[16]

12   Q   IS MR. WILSON'S REASONING HERE CORRECT?

13   A   The reasoning here is incomplete and Mr. Wilson's basic conclusions fail to hold up

14   under closer inspection. Before proceeding, I should make it clear that Mr. Wilson's goal

15   with this quote was to argue *against* the ISO-NE Benchmark, which is based on the

16   (levelized) 40-month cost of new entry. After all, since he claims that a bidder who—for

17   some mysterious, unspecified reason—had chosen to incur before the FCA some costs

18   that might have been deferred until afterwards might *then* "rationally, competitive, and

19   legitimately" bid lower than the ISO-NE Benchmark *in the FCA*, he contends that the

20   ISO-NE Benchmark must be uncompetitively high. In fact, upon closer inspection, the

21   example advanced in this quote strengthens the case *in favor* of using Benchmarks based

22   on the levelized 40-month cost of new entry. The easiest way to make this point is with a

23   simple numerical example.

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[16]   James Wilson Supp. Test. at 10:7–12.

1   **Simple Example**: Consider a potential new resource having 40-month cost equal

2   to $12[17] that needs to bid less than P to clear. Suppose that, prior to the FCA, this

3   resource decides to start construction and sinks $6. In the FCA itself, this resource's

4   competitive bid will be $12 - $6 = $6. There are three possibilities for what could happen

5   next, depending on the clearing price P:

6   *Unprofitable, not in FCM*. If P is less than $6, the resource will fail to clear and

7   lose its sunk cost of $6.

8   *Unprofitable, in FCM, designated as OOM*. If P is between $6 and $12, the

9   resource will clear and be designated as OOM but wish that it had not started

10   construction early. (It loses $12 – P whereas, if it had not started construction

11   early, it would have bid $12, not cleared, and lost nothing.)

12   *Profitable, in FCM, not designated as OOM*. If P is greater than $12, the resource

13   will clear at its bid of $6 but also would have cleared with a bid equal to its 40-

14   month cost of $12. The resource earns profits of P - $12 and is not designated as

15   OOM. Note that, in this case, the resource's Benchmark is irrelevant.

16   In this example, Benchmarks equal to the 40-month cost of new entry (i) have no effect

17   when this resource's decision to start construction early is rational but (ii) perfectly

18   correct for the price-suppressing effect of this decision when it is irrational—and

19   potentially anti-competitive—to begin construction ahead of the FCA.

20   Put differently, <u>this example illustrates the essential point that so-called</u>

21   <u>"competitive bids" can be part of an anti-competitive pattern of conduct</u>. True, it is

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[17]   For purposes of exposition here, I use small, unqualified dollar values. The actual figures for capital
       expenditures are of course many orders of magnitude larger and must be converted to per-kW-month figures for
       purposes of bidding. This shorthand has no effect on the generality of the results that I derive.

1   rational and competitive *in the FCA* to ignore costs already sunk at the time when

2   formulating one's bid. However, it is not rational and competitive *in the FCM as a whole*

3   to sink costs when doing so will induce one to enter at a loss. For this reason,

4   Mr. Wilson's attempted assault on 40-month cost not only misses the mark—it

5   boomerangs back to undermine his own central premise that it is rational to bid less than

6   40-month cost. Indeed, the only time that it is rational to incur *deferrable* costs prior to

7   the FCA, that induce one to bid less than one's 40-month cost of new entry, is when a bid

8   equal to that 40-month cost would also have cleared!

9 Q   PLEASE ELABORATE.   HOW CAN SO-CALLED "COMPETITIVE BIDS" BE

10   CONSISTENT WITH A PATTERN OF ANTI-COMPETITIVE CONDUCT?

11 A   The FCA is a bidding game, and resources' *equilibrium* bids in that game are

12   "competitive" in a certain sense. However, the FCA is just one element of the FCM, and

13   competitive bids in the FCA can arise from anti-competitive conduct *outside* of the

14   auction. For example, consider a resource that has signed a bilateral OOM contract with

15   load that effectively commits it to enter the FCM. Such a resource's equilibrium bid—

16   what load interests might describe as "rational" and "competitive"—is zero! Indeed,

17   since this resource is committed to incur all its 40-month costs, some might even argue

18   that this zero bid reflects the "reasonably considered incremental"[18] costs that the IMM

19   has been proposed to use as benchmark price.[19]

20   Of course, this line of reasoning is absurd and I do not suggest that Mr. LaPlante

21   meant to interpret his proposed "reasonable incremental costs" standard in this obviously

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[18]   LaPlante Brief at 21.

[19]   "[The IMM proposes] to use an incremental project cost standard instead of a total project cost standard in those circumstances in which a participant submitting a below-the-benchmark offer believes such an offer is appropriate." LaPlante Brief at 22.

1   perverse manner.   However, if one accepts the wrong and deeply flawed notion that

2   competitive *bidding* alone equals competitive conduct, there is no reason to stop short of

3   this absurdity. A new resource's competitive bid in the FCA will be based on something

4   less than its total cost whenever it has *already incurred or committed to incur* some of its

5   40-month costs. If one wrongly equates competitive bidding with competitive conduct,

6   then it is equally appropriate to lower a nuclear power plant's Benchmark to reflect its

7   already-sunk construction costs at the time of the FCA, as it is to lower the Benchmark of

8   an OOM resource because its OOM contract commits it to enter the FCM!

9   A fundamental error of Mr. Wilson's reasoning in support of the Going-Forward

10   Cost Benchmark is to assume that all costs borne prior to the *actual* FCA would have

11   been borne prior to a Competitive FCA. In other words, Mr. Wilson's argument only

12   makes sense under the assumption that load will not induce any resources to enter the

13   FCM that would not have entered anyway in a competitive market. Given load's active

14   and clearly-stated interest in sponsoring and continuing to sponsor new resources that

15   would not have otherwise cleared in the FCA,[20] this assumption is demonstrably

16   counterfactual.

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[20]   The states have argued that they have a vital public-policy interest to induce certain new resources to enter the FCM that would not be able to clear in the FCA. While the states have advanced this public-policy argument as if it supports their "right" to insist that the FERC not correct the price-suppressing effects of state-sponsored OOM, this argument actually underscores the urgent necessity of APR reform—and of getting benchmark prices right. (See Professor Milgrom's testimony for a particularly clear discussion of this essential point. NEPGA Second Brief, NEPGA Ex. 5, Testimony of Professor Paul R. Milgrom, Ph. D. on Behalf of New England Power Generators Association at 9.)

1   *SECTION 4-B: TOTAL COST BENCHMARK*

2   Q   PLEASE SUMMARIZE THE FINDINGS OF THIS SECTION.

3   A   I will prove and discuss why a Total Cost Benchmark fully corrects (but does not over-

4   correct) for the price-suppressing effect of OOM entry, a result that I will formulate as

5   the "Total Cost Benchmark Theorem."

6   **Total Cost Benchmark Theorem:** *Under the Total Cost Benchmark, the equilibrium*

7   *APR Price equals the Competitive FCA Price, i.e., $P^{APR} = P*$.*

8   Q   HAVE YOU PROVIDED A PROOF OF THIS RESULT?

9   A   Yes. The proof is included in NEPGA Exhibit 10-A.

10   Q   CAN YOU PLEASE PROVIDE AN INTUITIVE SKETCH OF THE PROOF?

11   A   Yes.   The Theorem can be broken down into two parts.   Under the Total Cost

12   Benchmark, the APR Price is (i) not "too high" (*i.e.*, the equilibrium APR Price is not

13   inflated above the Competitive FCA Price) and (ii) not "too low" (*i.e.*, the equilibrium

14   APR Price is not suppressed below the Competitive FCA Price).

15   *First*, consider whether the Total Cost Benchmark could lead to an APR Price that

16   exceeds the Competitive FCA Price. Such price-inflation could happen under the Total

17   Cost Benchmark only if (i) some resource would have bid less than P* in the Competitive

18   FCA but (ii) that resource has a Total Cost Benchmark greater than P*. Entry into the

19   FCM is only profitable—and hence only competitive—if the entering resource expects to

20   be paid enough in the FCA to cover its *total* cost of new entry. Thus, any resource that

21   would have bid less than P* in the Competitive FCA must have total cost less than P*. If

22   one were to replace such a resource's competitive bid (less than P*) with its total cost of

23   new entry (also less than P*), doing so will therefore *not* artificially inflate the market-

24   clearing price. Since this reasoning applies to all in-merit resources that would have

1   cleared in the Competitive FCA, we conclude that the Total Cost Benchmark will not

2   artificially inflate the equilibrium FCA Price.

3   *Second*, consider whether the Total Cost Benchmark could lead to an APR Price

4   that is less than the Competitive FCA Price. Such price-suppression could happen under

5   the Total Cost Benchmark only if (i) some resource would have bid more than P* in the

6   Competitive FCA but decides to bid less than P* in the actual FCA (because of an OOM

7   contract) and (ii) that resource has a Total Cost Benchmark less than P* so that its price-

8   suppressing effect is not corrected. Consider any resource that would have bid more than

9   P* in the Competitive FCA. Such *failure* to enter the FCM is only competitive if that

10   resource's total cost of new entry is greater than P*. In particular, such a resource must

11   have Total Cost Benchmark greater than P*. Thus, if it were to enter the FCM on the

12   basis of out-of-market subsidies, then the price-suppressing effect of its OOM entry

13   would be corrected by under the Total Cost Benchmark.

14   All together, we conclude that the Total Cost Benchmark fully corrects (but does

15   not over-correct) for the price-suppressing effect of OOM entry.

16 Q   DO ANY OTHER BENCHMARK RULES FULLY CORRECT (BUT NOT OVER-

17   CORRECT) FOR THE PRICE-SUPPRESSING EFFECT OF OOM ENTRY?

18 A   Surprisingly, no. Any other Benchmark Rule will sometimes induce an equilibrium APR

19   Price that is either higher or lower than the Competitive FCA Price. Suppose first that

20   the Benchmark for a resources is greater than its Total Cost. If the Competitive FCA

21   Price P* lies between the Benchmark and Total Cost, then entry is competitive for this

22   resource, since P* is greater than Total Cost. However, because the Benchmark is greater

23   than P*, this resource would be incorrectly categorized as OOM and the resulting APR

1   Price would be artificially inflated above P*. Suppose next that the Benchmark is less

2   than Total Cost. If the Competitive FCA Price P* lies between the Benchmark and Total

3   Cost, then entry is uncompetitive for this resource since P* is less than Total Cost.

4   However, because the Benchmark is less than P*, any uncompetitive entry by this

5   resource would evade categorization as OOM. Thus, load has an incentive to provide

6   out-of-market subsidies to this resource that induce it to enter the FCM at a loss, since

7   doing so will suppress the APR Price below P*.

8   *SECTION 4-C: ISO-NE BENCHMARK*

9   Q   PLEASE SUMMARIZE THE FINDINGS OF THIS SECTION.

10   A   I will prove and discuss why the ISO-NE Benchmark can, under certain conditions, fully

11   correct (but not over-correct) for the price-suppressing effect of OOM entry. I will

12   formulate this result as the "ISO-NE Benchmark Theorem."

13   **ISO-NE Benchmark Theorem:** *Suppose that there are no out-of-merit long-lead-time*

14   *potential resources[21] in the FCM. Then, under the ISO-NE Benchmark, the equilibrium*

15   *APR Price equals the Competitive FCA Price.*

16   Q   HAVE YOU PROVIDED A PROOF OF THIS RESULT?

17   A   Yes. The proof is included in NEPGA Exhibit 10-B.

18   Q   PLEASE PROVIDE INTUITION FOR THE ISO-NE BENCHMARK THEOREM.

19   A   There are two important steps to the reasoning behind this result.

20   1.   The ISO-NE Benchmark, based on each resource's *levelized* 40-month cost of

21   new entry, induces the same equilibrium APR Price as a 40-Month Cost

22   Benchmark based on *un-levelized* 40-month costs of new entry.

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[21]   *See supra* at 6 (definition of an "out-of-merit long-lead-time resource.")

1   2.   The 40-Month Cost Benchmark induces the same equilibrium APR Price as

2   the Total Cost Benchmark.

3   In light of the Total Cost Benchmark Theorem (discussed earlier), these steps

4   together establish that, if there are no out-of-merit long-lead-time resources, the ISO-NE

5   Benchmark fully corrects (but does not over-correct) for the price-suppressing effect of

6   OOM entry. I will focus here on providing intuition for the second step. (The first step,

7   relating levelized and un-levelized costs, is more technical.) So, for the rest of the

8   discussion here, suppose that each resource's Benchmark is equal to its (un-levelized) 40-

9   month cost of new entry.

10   *First*, if there are out-of-merit long-lead-time resources, such a 40-Month Cost

11   Benchmark may not fully correct for the price-suppressing effect of OOM entry. By

12   definition, an out-of-merit long-lead-time resource is one whose (i) total cost of new

13   entry exceeds P*, so that it would not competitively enter the FCM, but whose (ii) 40-

14   month cost of new entry is less than P*, so that it would have an incentive to bid less than

15   P* and enter the FCM *after* incurring the sunk cost of the pre-FCA investments that are

16   necessary to enter the FCM. Load can induce out-of-merit long-lead-time resources to

17   enter the FCM by providing OOM subsidies that cover the cost of their pre-FCA

18   investments. Further, if load were to do so, the 40-Month Cost Benchmark would fail to

19   categorize these resources as OOM, thereby providing no correction whatsoever of their

20   price-suppressing effect. This is why the ISO-NE Benchmark Theorem only holds under

21   the extra assumption that there are no out-of-merit long-lead-time resources in the FCM.

22   *Second*, suppose now that there are no out-of-merit long-lead-time resources. In

23   this case, any resource that is unprofitable on the basis of total costs will also be

1   unprofitable on the basis only of 40-month costs. Consequently, subsidizing a resource's

2   pre-FCA investments is not enough to induce it to enter the FCM. Furthermore, since

3   every out-of-merit resource that would not have entered in the Competitive FCA has 40-

4   month-cost greater than P*, any out-of-merit resource that is induced to enter the FCM on

5   the basis of out-of-market subsidies will be correctly categorized as OOM, and its price-

6   suppressing effect on the APR Price will be fully corrected.

7   *SECTION 5: OTHER COMMENTS*

8   *SECTION 5-A: ON IMM DISCRETION*

9   Q   WHAT DO YOU MEAN BY "IMM DISCRETION"?

10   A   The IMM "lacks discretion" if its method to compute a resource's benchmark price

11   depends on objective, context-independent characteristics of that resource.   In its

12   comments, the IMM proposes to give itself substantial discretion when determining

13   benchmark prices.

14   [The IMM proposes] to use an incremental project cost standard instead of
15   a total project cost standard *in those circumstances in which a participant*
16   *submitting a below-the-benchmark offer believes such an offer is*
17   *appropriate.*[22]

18   In other words, the IMM proposes to invite bidders to make a case that it is

19   "appropriate" for benchmark prices to reflect only those remaining costs that those

20   resources have not already incurred—or committed to incur—prior to the FCA. Under

21   such a discretionary rule, market outcomes could depend dramatically on the quality of

22   the IMM's judgment.

23   For instance, an (admittedly absurd but ultimately economic) case could be made

24   that it is "appropriate" for OOM resources to have benchmark prices equal to zero, since

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[22]   LaPlante Brief at 22 (emphasis added).

1   such resources have committed to enter the FCM and hence have "competitive bids"

2   equal to zero. Even if the IMM is wise enough to reject such arguments, it may be very

3   difficult to divine which (say) decisions to *start construction early* were driven by

4   legitimate considerations of cost savings, and which were driven by a desire to lower

5   auction payments by lowering benchmark prices.

6   In this testimony, I have established that the <u>exercise of such discretion is</u>

7   <u>unnecessary</u>. In fact, one of the most attractive features of the ISO-NE Benchmark—or,

8   even more so, the Total Cost Benchmark—is that it limits the need for the IMM to

9   exercise discretion.   Under the Going-Forward Cost Benchmark, the IMM must

10   determine what costs are "reasonably incremental," a standard that requires inspection of

11   the circumstances of each individual resource.   Under the ISO-NE Benchmark, by

12   contrast, the IMM needs only to determine what costs are "deferrable" *in principle*—even

13   if such costs are not always deferred in practice.

14   *SECTION 5-B: ON OTHER COMMENTS BY MR. WILSON*

15   Q   WHAT   ADDITIONAL   COMMENTS   DO   YOU   HAVE   ON   MR. WILSON'S

16   TESTIMONY?

17   A   In his supplemental testimony, Mr. Wilson offered several attempted criticisms of my

18   First Testimony.   There is little need to respond on a point-by-point basis, but some

19   general comments may be helpful to readers trying to sort through Mr. Wilson's attacks.

20   *First*, Mr. Wilson argues that I did not consider certain perverse incentives that

21   might arise under the July APR. Indeed, in my First Testimony, I was clear to state that

22   my focus was on (hypothetical) scenarios in which all bidders lack market power. Thus,

23   it is somewhat disingenuous for Mr. Wilson to criticize my testimony on the basis that I

24   did not consider market-power issues. Many sorts of *conceivable* inefficient behaviors

1   can arise as a result of the exercise of market power, especially in complex markets such

2   as the FCM. Thus, Mr. Wilson's list of strange behaviors that might conceivably arise—

3   such as generators seeking to *suppress* the FCA Clearing Price[23]—should not surprise or

4   especially concern the Commission. As far as I am aware, none of Mr. Wilson's

5   hypothetical scenarios has any demonstrable connection to the real world. Should such

6   behaviors someday arise as a practical concern, then market-mitigation measures can and

7   should be developed to address them. In the present context of this proceeding, therefore,

8   I view such examples as unhelpful distractions that seek to create concerns on the basis of

9   hypothetical scenarios with no basis in observed practice. (By contrast, the issue of

10   OOM entry and its price-suppressing effect is demonstrably real.)

11   *Second*, Mr. Wilson argues that, in my First Testimony, I did not adequately

12   support the contention that the July APR is "sound and sensible." For example,

13   Mr. Wilson critiques my July discussion of OOM subsidies by noting that Prof.

14   McAdams "does not recognize that these incentives and payments may be serving a

15   legitimate economic function, and one that should be reflected in the auctions."[24] This is

16   a valid point. In my First Testimony, my focus was on the bidding incentives of

17   resources in the FCA, not on the incentives of the third-parties (such as load) that might

18   seek to influence those bidding incentives. However, please note that my Supplementary

19   Testimony—submitted on September 1, 2010, before I became aware of Mr. Wilson's

20   criticisms—is almost entirely devoted to this issue. That Supplementary Testimony (i)

21   builds on the foundation laid by my First Testimony, (ii) fully recognizes the potential

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[23]   James Wilson Supp. Test. at 43:19–44:12.

[24]   James Wilson Supp. Test. at 61:20–22.

1   value of public policies that promote certain types of resources, and (iii) supports the

2   contention that the February APR creates *inefficient, unbalanced incentives* when it

3   comes to sponsoring OOM. By contrast, the July APR creates efficient incentives for

4   load to sponsor OOM when doing so provides great enough un-priced benefits to be

5   efficient.

6   *Finally,* Mr. Wilson argues that the ISO-NE Benchmark is incorrect. This Second

7   Supplementary Testimony directly confronts this contention, and *proves* it to be without

8   merit. All together, then, my Supplementary Testimony and this Second Supplementary

9   Testimony strengthen—and provide more detailed support for—the conclusion of my

10 First Testimony that the July APR is "sound and sensible."

11   *SECTION 5-C: DISCUSSION OF THE MODEL USED IN THIS TESTIMONY*

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

13 A   The model of the FCA that I have employed in this testimony serves as an objective

14   vehicle by which to evaluate each of the Benchmark Rule proposals. However, like any

15   model, this model is not a complete representation of reality. To complete my testimony,

16   I would like to discuss some of the most important abstractions inherent in the model,

17   related to (i) market power, (ii) uncertainty, and (iii) long-term trends.

18 Q   HOW DOES THE MODEL ABSTRACT FROM "MARKET POWER"?

19 A   The model abstracts from seller-side market power, since every resource is assumed to

20   have no unilateral effect on the auction price. My rationale for focusing on this baseline

21   scenario is that, if an auction design does not function well when all bidders lack market

22   power, then there is something seriously wrong with that design. Conversely, if an

23   auction design does function well when bidders lack market power, then there is at least

1   hope that the auction design will function well *when paired with well-conceived market-*

2   *power mitigation measures.*

3   Obviously, some bidders may possess market power in practice. As discussed in

4   Section 5-B, many sorts of *conceivable* inefficient behaviors can arise as a result of the

5   exercise of market power by bidders, especially in complex markets such as the FCM. It

6   is therefore important to pair a well-conceived APR Rule—including a well-conceived

7   Benchmark Rule—with other well-conceived measures to mitigate the exercise of seller

8   market power.

9   Q   HOW DOES THE MODEL ABSTRACT FROM "UNCERTAINTY"?

10   A   In the model, each resource can *correctly* anticipate the FCA Clearing Price P^{FCA} and the

11   APR Price P^{APR} that will ultimately prevail in the FCA, when deciding in Stage 1

12   whether to sign an OOM contract and/or to make investments that will enable it to enter

13   the FCM. Of course, "unexpected events" can be important in practice and can create

14   substantial risk for longer lead-time resources that must decide whether to sink

15   substantial investments prior to the FCA. Indeed, in practice, such resources will

16   typically only incur such investments if they will generate a sufficiently large expected

17   profit to compensate for this risk. This "risk premium" is an important element of the

18   "total cost of new entry" of longer lead-time resources. However, the analysis and the

19   main qualitative findings developed in this testimony still apply, once each resource's

20   "costs" are appropriately modified to account for uncertainty. [25]

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[25]   Resources' 40-month cost and going-forward cost will also typically incorporate a risk premium, as well as an
       adjustment based on the option value associated with retaining the option to enter and/or to exit the FCM.

1   Q   HOW DOES THE MODEL ABSTRACT FROM "LONG-TERM TRENDS"?

2   A   In the model, the Competitive FCA Price P* is assumed not to change over time. In

3   practice, one may expect the Competitive FCA Price to fall over time because of

4   technological development or other factors. Since resources entering the FCM today

5   expect to receive lower future payments under such a long-term downward trend, the

6   presence of such a trend will tend to increase the minimal auction payment that they

7   demand today to enter the FCM. In other words, a downward price trend increases each

8   resource's going-forward cost (and its 40-month cost of new entry and its total cost of

9   new entry) by the expected present value of future decreases in the Competitive FCA

10   Price. However, most[26] of the analysis and the qualitative findings developed in this

11   testimony still apply, once each resource's "costs" are appropriately modified to account

12   for lower future auction payments.

13   Q   DOES THIS CONCLUDE YOUR TESTIMONY?

14   A   Yes.

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[26]   If there is a long-term downward trend in auction prices, then the *levelized* 40-month costs that ISO-NE proposes to use as benchmark offers will tend to be too low, leading to incomplete correction of the price-suppressing effect of OOM entry. (See proof of the ISO-NE Benchmark Theorem, NEPGA Exhibit 10-B, for further discussion.)

1   *APPENDIX A: PROOF OF THE TOTAL COST BENCHMARK THEOREM*

2   I will establish the Total Benchmark Theorem by what one might a "Goldilocks proof:"

3   the Total Cost Benchmark is neither "too high," nor "too low," but "just right."

4   Under the Total Cost Benchmark, each OOM resource's Benchmark is equal to its total

5   cost of new entry. If these Benchmarks are "too high" for some resources, then the resulting

6   APR Price could be *higher* than P* even if all resources bid as if in a Competitive FCA. On the

7   other hand, if the Benchmarks are "too low" for some resources, then load could profitably

8   suppress the APR Price by signing OOM contracts that induce those resources to bid less than in

9   a Competitive FCA.

10   **Part One: Total Cost Benchmark is not "too high."** A resource's Benchmark is "too

11   high" if replacing its Competitive FCA bid with its Benchmark will artificially inflate the APR

12   Price. To be concrete, suppose that some resource has equilibrium bid P' in the Competitive

13   FCA, but its Benchmark is P'' > P'. Replacing its bid of P' with the Benchmark of P'' will

14   artificially inflate the APR Price if and only if (i) P' < P* so that that resource clears at the

15   Competitive FCA Price P* and (ii) P'' > P* so that the APR Price is computed on the faulty

16   assumption that that resource would not have cleared competitively. So, to establish that the

17   Total Cost Benchmark is not "too high," I need to show that the Total Cost Benchmark is less

18   than P* for every resource that would have bid less than P* in the Competitive FCA.

19   My proof will focus on a generic "Resource X."

20   Suppose that Resource X would have bid less than P* in the Competitive FCA. Bidding

21   less than P* causes Resource X to clear in the Competitive FCA. For this to be profitable, P*

22   must be large enough to cover its total cost of new entry. Thus, its Total Cost Benchmark is less

23   than P*, as desired.

1   **Part Two: Total Cost Benchmark is not "too low**." A resource's Benchmark is "too

2   low" if load can artificially suppress the APR Price by inducing that resource to bid less than it

3   would have bid in the Competitive FCA. To be concrete, suppose that some resource has

4   equilibrium bid P' in the Competitive FCA, but its Benchmark is P'' < P'. If load were to induce

5   this resource to bid less than P'', then the APR Price would be computed on the basis of the

6   Benchmark P'' rather than the "competitive bid" P'. This will artificially suppress the APR

7   Price if and only if (i) P'' < P* so that that resource would clear in the Competitive FCA with a

8   bid equal to its Benchmark and (ii) P' > P* so that that resource would not have cleared in the

9   Competitive FCA without the benefit of OOM subsidies. (If the resource would have cleared

10   anyway, any suppression of its *inframarginal* bid will not suppress the market-clearing price.)

11   So, to establish that the Total Cost Benchmark is not "too low," I need to show that the Total

12   Cost Benchmark is greater than P* for every resource that would have bid more than P* in the

13   Competitive FCA.

14   Suppose now that Resource X would have bid more than P* in the Competitive FCA.

15   Bidding more than P* causes Resource X not to clear in the Competitive FCA. This means that

16   entry into the FCM at price P* must be unprofitable for Resource X, *i.e.*, its total cost of new

17   entry must be greater than P*. Thus, its Total Cost Benchmark is greater than P*, as desired.

18   Having shown that the Total Cost Benchmark is neither "too high" nor "too low," we

19   conclude that, as Goldilocks might say, the Total Cost Benchmark is "*just right*." By neither

20   artificially inflating the APR Price nor allowing load to artificially suppress the APR Price, the

21   Total Cost Benchmark fully corrects (but does not over-correct) for the price-suppressing effect

22   of OOM entry. Q.E.D.

1   *APPENDIX B: PROOF OF THE ISO-NE BENCHMARK THEOREM*

2   I will establish the ISO-NE Benchmark Theorem by what one might a "Goldilocks

3   proof:" under the maintained assumption that there are no out-of-merit long-lead-time resources,

4   the ISO-NE Benchmark is neither "too high," nor "too low," but "just right."

5   Under the ISO-NE Benchmark, each OOM resource's Benchmark is equal to its levelized

6   40-month cost of new entry. If these Benchmarks are "too high" for some resources, then the

7   resulting APR Price could be *higher* than P* even if all resources bid as if in a Competitive FCA.

8   On the other hand, if the Benchmarks are "too low" for some resources, then load could

9   profitably suppress the APR Price by signing OOM contracts that induce those resources to bid

10   less than in a Competitive FCA.

11   **Part One: ISO-NE Benchmark is not "too high."** A resource's Benchmark is "too

12   high" if replacing its Competitive FCA bid with its Benchmark will artificially inflate the APR

13   Price. To be concrete, suppose that some resource has equilibrium bid P' in the Competitive

14   FCA, but its Benchmark is P'' > P'. Replacing its bid of P' with the Benchmark of P'' will

15   artificially inflate the APR Price if and only if (i) P' < P* so that that resource clears at the

16   Competitive FCA Price P* and (ii) P'' > P* so that the APR Price is computed on the faulty

17   assumption that that resource would not have cleared competitively. So, to establish that the

18   ISO-NE Benchmark is not "too high," I need to show that the ISO-NE Benchmark is less than P*

19   for every resource that would have bid less than P* in the Competitive FCA.

20   My proof will focus on a generic "Resource X." As shorthand, let "LEVEL" denote

21   Resource X's levelized 40-month cost of new entry and let "UNLEVEL" denote Resource X's

22   (un-levelized) 40-month cost of new entry.

23   Suppose that Resource X would have bid less than P* in the Competitive FCA. Bidding

24   less than P* causes Resource X to clear in the Competitive FCA. For this to be profitable, P*

1   must be large enough to cover Resource X's total cost of new entry and hence also its (un-

2   levelized) 40-month costs of new entry. Thus, <u>UNLEVEL is less than P*</u>. By definition, a

3   resource's (un-levelized) 40-month cost of new entry in the Competitive FCA[1] is the minimal

4   auction payment *now* that this resource requires to enter the FCM, given that it expects to receive

5   the Competitive FCA Price P* in future years.[2] In other words, the present value of the stream

6   of annual auction payments

7   (UNLEVEL, P*, P*, …)

8   must be just enough to make Resource X indifferent to committing to enter the FCM. Similarly,

9   a resource's levelized 40-month cost of new entry is the minimal *annuity* payment that this

10   resource requires to enter the FCM. In other words, the present value of the stream of annual

11   auction payments

12   (LEVEL, LEVEL, LEVEL, …)

13   must also be just enough to make Resource X indifferent to committing to enter the FCM. Both

14   of these streams of auction payments must therefore generate the same present value:

15   (UNLEVEL, P*, P*, …) = (LEVEL, LEVEL, LEVEL, …).

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[1]   A potential new resource's (un-levelized) 40-month cost of new entry depends on the expected stream of future auction payments. Within the context of the Competitive FCA, as considered here, "40-month cost of new entry" is defined relative to an expected stream of P* every period. By contrast, a resource's *levelized* 40-month cost of new entry is not context-dependent in this way. In particular, conclusions about Resource X's levelized 40-month cost of new entry derived in the context of the Competitive FCA still apply in the FCM Game should load actively sign resources to OOM contracts.

[2]   The argument here can be easily adapted to account for the fact that, under ISO-NE's proposal, new resources receive the "Year 1 FCA Clearing Price" for multiple years. In particular, a resource's decision whether to enter the FCM will be based on the present value of the stream (UNLEVEL,…,UNLEVEL,P*,P*,…), where "UNLEVEL" is appropriately re-defined, and the key conclusion still holds that LEVEL lies between UNLEVEL and P*.

1 Thus, <u>LEVEL must lie *strictly between* P* and UNLEVEL</u>.[3] Since we have previously shown

2 that UNLEVEL is less than P*, we conclude that <u>LEVEL is less than P*</u>.

3   So far, we have proven that any resource that would have bid less than P* in the

4 Competitive FCA must have levelized 40-month cost of new entry (*i.e.*, ISO-NE Benchmark)

5 less than P*. That is, we have established that <u>the ISO-NE Benchmark is not "too high."</u>

6   **Part Two: ISO-NE Benchmark is not "too low**." A resource's Benchmark is "too low"

7 if load can artificially suppress the APR Price by inducing that resource to bid less than it would

8 have bid in the Competitive FCA. To be concrete, suppose that some resource has equilibrium

9 bid P' in the Competitive FCA, but its Benchmark is P'' < P'. If load were to induce this

10 resource to bid less than P'', then the APR Price would be computed on the basis of the

11 Benchmark P'' rather than the "competitive bid" P'. This will artificially suppress the APR

12 Price if and only if (i) P'' < P* so that that resource would clear in the Competitive FCA with a

13 bid equal to its Benchmark and (ii) P' > P* so that that resource would not have cleared in the

14 Competitive FCA without the benefit of OOM subsidies. (If the resource would have cleared

15 anyway, any suppression of its *inframarginal* bid will not suppress the market-clearing price.)

16 So, to establish that the ISO-NE Benchmark is not "too low," I need to show that the ISO-NE

17 Benchmark is greater than P* for every resource that would have bid more than P* in the

18 Competitive FCA.

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[3] This step of the proof relies on the assumption that the Competitive FCA Price does not change over time. Suppose instead that the Competitive FCA Price T years in the future is expected to be P^T, where these prices are decreasing over time, *i.e.*, $P^* > P^1 > P^2 > \ldots$ Now, by definition of levelized and unlevelized 40-month cost, both streams of auction payments (UNLEVEL, P^1, P^2, …) and (LEVEL, LEVEL, LEVEL, …) must provide the same present value. In particular, for the marginal resource that sets the Competitive FCA Price (and has un-levelized 40-month cost UNLEVEL = P*), both streams (P*, P^1, P^2, …) and (LEVEL, LEVEL, LEVEL, …) must provide the same present value. When $P^* = P^1 = P^2 = \ldots$, we conclude that the marginal resource also has *levelized* 40-month cost LEVEL = P*, so that Benchmarks equal to levelized 40-month cost result in an APR Price equal to P*. However, if $P^* > P^1 > P^2 > \ldots$, then LEVEL < P* for the marginal resource. In this case, Benchmarks equal to levelized 40-month cost result in an *APR Price that is systematically lower than P*.*

1   Suppose now that Resource X would have bid more than P* in the Competitive FCA.

2   Bidding more than P* causes Resource X not to clear in the Competitive FCA. This means that

3   entry into the FCM at price P* must be unprofitable for Resource X, *i.e.*, its total cost of new

4   entry must be greater than P*. By assumption, Resource X is not an out-of-merit long-lead-time

5   resource. Thus, its (un-levelized) 40-month cost of new entry must also be greater than P*. In

6   other words, using the notational shorthand from Part One, UNLEVEL is greater than P*.

7   However, I proved in Part One that LEVEL lies strictly between P* and UNLEVEL. Thus,

8   LEVEL is greater than P*.

9   So, we have now also proven that any resource that would have bid more than P* in the

10   Competitive FCA must have levelized 40-month cost of new entry (*i.e.*, ISO-NE Benchmark)

11   greater than P*. That is, we have established that the ISO-NE Benchmark is not "too low."

12   Under the maintained assumption that there are no out-of-merit long-lead-time resources,

13   we conclude that the ISO-NE Benchmark is "*just right*."

14   By neither artificially inflating the APR Price nor allowing load to artificially suppress

15   the APR Price, the ISO-NE Benchmark fully corrects (but does not over-correct) for the price-

16   suppressing effect of OOM entry. Q.E.D.