



February 28, 2017

VIA ELECTRONIC FILING

The Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: ISO New England Inc., Docket No. ER17-____-000
Forward Capacity Auction Results Filing
April 14, 2017 COMMENT DATE REQUIRED BY REGULATION

Dear Secretary Bose:

Pursuant to Section 205 of the Federal Power Act (“FPA”)¹ and Section III.13.8.2 of the ISO New England Transmission, Markets and Services Tariff (the “Tariff”),² ISO New England Inc. (the “ISO”) submits this Forward Capacity Auction Results Filing (“FCA Results Filing”) for the eleventh Forward Capacity Auction (“FCA”).³ Section III.13.8.2 (a) of the Tariff requires the ISO to file the results of the FCA with the Federal Energy Regulatory Commission (“Commission” or “FERC”) as soon as practicable after the FCA is complete. The eleventh FCA was held on February 6, 2017 for the June 1, 2020 through May 31, 2021 Capacity Commitment Period. The ISO submits this filing in accordance with the Tariff.

Pursuant to Section III.13.8.2 (c) of the Tariff, any objection to the FCA results must be filed with the Commission within 45 days from the date of the FCA Results Filing. **Accordingly, any objections must be filed on or before April 14, 2017, and the ISO requests that the Commission issue a notice setting an April 14, 2017 comment date.** As discussed below, the ISO requests an effective date of June 28, 2017, which is 120 days from the date of this submission.

¹ 16 U.S.C. § 824d (2006).

² The rules governing the Forward Capacity Market (“FCM Rules”) are primarily contained in Section III.13 of the Tariff, but also may include other provisions, including portions of Section III.12.

³ Capitalized terms used but not otherwise defined in this filing have the meanings ascribed thereto in the Tariff, the Second Restated New England Power Pool Agreement and the Participants Agreement.

In accordance with Section III.13.8.2 of the Tariff, this submission contains the results of the eleventh FCA, including the Capacity Zones in the auction; the Capacity Clearing Price in each of those Capacity Zones; a list of which resources received Capacity Supply Obligations in each Capacity Zone; and the amount of those Capacity Supply Obligations. Pursuant to Tariff Section III.12.4, the Capacity Zones for the eleventh FCA were the Southeast New England (“SENE”) Capacity Zone, the Northern New England (“NNE”) Capacity Zone and the Rest-of-Pool Capacity Zone. The SENE Capacity Zone includes Northeastern Massachusetts/Boston, Southeastern Massachusetts, and Rhode Island. The NNE Capacity Zone includes Maine, New Hampshire and Vermont. The Rest-of-Pool Capacity Zone includes Connecticut and Western/Central Massachusetts.

The auction commenced with a starting price of \$18.624/kW-month and concluded for the SENE, NNE and Rest-of-Pool Capacity Zones after five rounds. Resources in those Capacity Zones will be paid at the Capacity Clearing Price set pursuant to the system sloped demand curve of \$5.297/kW-month.⁴ Imports over the New York AC Ties external interface, totaling 539.4 MW; imports over the Phase I/II HQ Excess external interface, totaling 441 MW; and imports over the Hydro-Quebec Highgate external interface, totaling 55 MW, will receive \$5.297/kW-month. Imports over the New Brunswick external interface, totaling 200 MW, will receive \$3.381/kW-month.

Section III.13.8.2 (b) of the Tariff requires the ISO to provide documentation regarding the competitiveness of the FCA. The documentation may include certification from the auctioneer and the ISO that: (i) all resources offering and bidding in the FCA were properly qualified in accordance with the provisions of Section III.13.1; and (ii) the FCA was conducted in accordance with the provisions of Section III.13. Pursuant to Section III.13.8.2 (b), the ISO has included the Testimony of Stephen J. Rourke, Vice President of System Planning at the ISO (“Rourke Testimony”), the Testimony of Robert G. Ethier, Vice President of Market Operations at the ISO (“Ethier Testimony”), the Testimony of Jeffery McDonald, Vice President of Market Monitoring and the Internal Market Monitor (“IMM”) at the ISO (“McDonald Testimony”), and the Testimony of Lawrence M. Ausubel, the auctioneer (“Ausubel Testimony”).

The ISO tenders the instant filing in compliance with Section III.13.8.2 of its Tariff pursuant to Section 205 of the FPA, and the ISO requests that the Commission find that the ISO conducted the eleventh FCA in accordance with its FERC-approved Tariff.

I. COMMUNICATIONS

All correspondence and communications in this proceeding should be addressed to the undersigned as follows:

⁴ Existing resources with multi-year obligations from previous auctions will be paid based on the Capacity Clearing Price in the auction in which they originally cleared. Self-supplied resources will not be paid through the FCM.

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II. STANDARD OF REVIEW

The ISO tenders the instant filing in compliance with Section III.13.8.2 of its Tariff and pursuant to Section 205 of the FPA.⁵ The ISO respectfully requests that the Commission find that the eleventh FCA Results Filing meets the standard of Section 205, in that the results are just and reasonable rates derived from the auction that was conducted in accordance with the ISO's FERC-approved Tariff. The attached testimonies support this conclusion, and provide the basis for the Commission to approve the resulting rates.

III. REQUESTED EFFECTIVE DATE

The ISO respectfully requests that the Commission accept the eleventh FCA Results Filing, confirming that the auction was conducted in conformance with the ISO's Commission-approved Tariff, to be effective June 28, 2017 which is 120 days after the date of submission. Under the Tariff, parties have 45 days to file with the Commission an objection to the FCA Results Filing.⁶ An effective date of 120 days from the date of submission gives interested parties an opportunity to respond to any objections and provides the Commission time to review the FCA Results Filing and associated pleadings.

IV. SPECIFIC FCA RESULTS

A. Capacity Zones Resulting From the Auction

Section III.13.8.2 (a) of the Tariff requires the ISO to provide the Capacity Zones resulting from the FCA. The Capacity Zones for the eleventh FCA were SENE, NNE and Rest-of-Pool. The Capacity Zones determined under Section III.13.2.3.4 of the Tariff are the same Capacity Zones that were modeled pursuant to Section III.12.4 of the Tariff.

⁵ It should be noted that the Commission has consistently held that the matters properly in dispute in the annual FCA results filing are the results of the FCA and not the underlying market design or rules. *See e.g., ISO New England Inc.*, 130 FERC ¶ 61,145 at P 33 (2010) (finding that challenges to the FCM market design are outside the scope of the proceeding evaluating the FCA results filing).

⁶ Tariff Section III.13.8.2 (c).

B. Capacity Clearing Price

The Tariff requires the ISO to provide the Capacity Clearing Price in each Capacity Zone (and, pursuant to Section III.13.2.3.3 (d), the Capacity Clearing Price associated with certain imports, if applicable).⁷ For the eleventh FCA, the descending clock auction starting price in each Capacity Zone was \$18.624/kW-month. As explained in the Ethier Testimony, the auction resulted in the same Capacity Clearing Price of \$5.297/kW-month for the SENE, NNE and Rest-of-Pool Capacity Zones.⁸

Imports over the New York AC Ties external interface, totaling 539.4 MW; imports over the Phase I/II HQ Excess external interface, totaling 441 MW; and imports over the Hydro-Quebec Highgate external interface, totaling 55 MW, will receive \$5.297/kW-month. Imports over the New Brunswick external interface, totaling 200 MW, will receive \$3.381/kW-month.⁹

C. Capacity Supply Obligations

The Tariff requires the ISO to specify in the FCA Results Filing the resources which received Capacity Supply Obligations in each Capacity Zone.¹⁰ This information is provided in Attachment A.

The Tariff also requires the ISO to list which resources cleared as Conditional Qualified New Generating Capacity Resources and to provide certain information relating to Long Lead Time Generating Facilities.¹¹ No resources cleared as Conditional Qualified New Generating Capacity Resources in the eleventh FCA. In addition, there were no Long Lead Time Generating Facilities that secured a Queue Position to participate as a New Generating Capacity Resource in the eleventh FCA; and as such, there were no resources with a lower queue priority that were selected in the FCA subject to a Long Lead Time Generating Facility with a higher queue priority.

D. De-List Bids Reviewed For Reliability Purposes

The Tariff requires the FCA Results Filing to enumerate any de-list bids rejected for reliability reasons.¹² No de-list bids were rejected for reliability reasons in the eleventh FCA.¹³

⁷ Tariff Section III.13.8.2 (a).

⁸ Ethier Testimony at 10.

⁹ *Id.* at 12-13.

¹⁰ Tariff Section III.13.8.2 (a).

¹¹ *Id.*

¹² *Id.*

¹³ Rourke Testimony at 6.

V. DOCUMENTATION OF COMPETITIVENESS

Section III.13.8.2 (b) of the Tariff requires the ISO to provide documentation regarding the competitiveness of the FCA. The documentation may include certification from the auctioneer and the ISO that: (i) all resources offering and bidding in the FCA were properly qualified in accordance with the provisions of Section III.13.1 of the Tariff; and (ii) the FCA was conducted in accordance with the provisions of Section III.13 of the Tariff. In this regard, the ISO has included the Rourke Testimony, the Ethier Testimony, the McDonald Testimony, and the Ausubel Testimony.

In his testimony, Mr. Rourke, who oversaw the qualification of resources, certifies that all resources offering and bidding in the eleventh FCA were qualified in accordance with Section III.13.1 of the Tariff.¹⁴ Mr. Rourke testifies that he oversaw the reliability review of all submitted de-list bids for the eleventh FCA and that no resources that submitted de-list bids were retained for reliability reasons.¹⁵

In his testimony, Dr. Ethier explains the prices resulting from the auction and how the prices were determined.¹⁶ Dr. Ethier also explains the prices over the external interfaces and why some of those prices were lower than for resources located in New England.¹⁷

Dr. McDonald explains that the IMM reviewed de-list bids from existing resources and offers from new resources submitted during the qualification process.¹⁸ Dr. McDonald testifies that he oversaw the IMM's review of these bids and offers and certifies that such review was performed in accordance with the provisions of Section III.13.1.¹⁹ Dr. McDonald also notes that the IMM's determinations with respect to the offers and bids were accepted by the Commission.²⁰

Dr. Ausubel, the auctioneer, and chairman and founder of Power Auctions LLC, the company that helped implement and administer the FCA, certifies that the auction was conducted in accordance with Section III.13.2.²¹ Dr. Ausubel's certification is based on his vast experience in conducting energy auctions.

VI. ADDITIONAL SUPPORTING INFORMATION

¹⁴ *Id.* at 3.

¹⁵ *Id.* at 3-6.

¹⁶ Ethier Testimony at 10-13.

¹⁷ *Id.* at 12-13.

¹⁸ McDonald Testimony at 2-3.

¹⁹ *Id.*

²⁰ *Id.* at 3.

²¹ Ausubel Testimony at 4.

The ISO tenders the instant filing in compliance with Section III.13.8.2 of its Tariff pursuant to Section 205 of the FPA.²² Section 35.13 of the Commission's regulations generally requires public utilities to file certain cost and other information related to an examination of cost-of-service rates.²³ However, the results of the FCA are not traditional "rates" and the ISO is not a traditional investor-owned utility. Therefore, to the extent necessary, the ISO requests waiver of Section 35.13 of the Commission's regulations. Notwithstanding its request for waiver, the ISO submits the following additional information in compliance with the identified filing regulations of the Commission applicable to Section 205.

35.13(b)(1) - Materials included herewith are as follows:

- a. This transmittal letter;
- b. Attachment A: List of Capacity Supply Obligations;
- c. Attachment B: Testimony of Stephen J. Rourke;
- d. Attachment C: Testimony of Robert G. Ethier
- e. Attachment D: Testimony of Jeffrey McDonald;
- f. Attachment E: Testimony of Lawrence M. Ausubel; and
- g. Attachment F: List of governors and utility regulatory agencies in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont to which a copy of this filing has been mailed.

35.13(b)(2) - The ISO respectfully requests that the Commission accept this filing to become effective on June 28, 2017, which is 120 days after the submission of this FCA Results Filing.

35.13(b)(3) - Pursuant to Section 17.11 (e) of the Participants Agreement, Governance Participants are being served electronically rather than by paper copy. The names and addresses of the Governance Participants are posted on the ISO's website at <https://www.iso-ne.com/participate/participant-asset-listings/directory?id=1&type=committee> . An electronic copy of this transmittal letter and the accompanying materials has also been emailed to the governors and electric utility regulatory agencies for the six New England states which comprise the New England Control Area, and to the New

²² As noted above, the Commission has consistently held that the scope of the proceeding evaluating the annual FCA results filing is limited to the results of the FCA. *See e.g., ISO New England Inc.*, 130 FERC ¶ 61,145 at P 33 (2010) (finding that challenges to the FCM market design are outside the scope of the proceeding evaluating the FCA results filing).

²³ 18 C.F.R. § 35.13 (2016).

England Conference of Public Utility Commissioners, Inc. The names and addresses of these governors and regulatory agencies are shown in Attachment F.

35.13(b)(4) - A description of the materials submitted pursuant to this filing is contained in the transmittal letter;

35.13(b)(5) - The reasons for this filing are discussed in this transmittal letter; and

35.13 (b)(7) - The ISO has no knowledge of any relevant expenses or cost of service that have been alleged or judged in any administrative or judicial proceeding to be illegal, duplicative, or unnecessary costs that are demonstrably the product of discriminatory employment practices.

VII. CONCLUSION

In this FCA Results Filing, the ISO has presented all of the information required by the Tariff. The ISO has demonstrated that the eleventh FCA was conducted in accordance with the Tariff, as found just and reasonable by the Commission. The ISO has specified the Capacity Zones that were used in the auction. The ISO has also provided the Capacity Clearing Price for each of the Capacity Zones and a list of resources that received Capacity Supply Obligations. Finally, the ISO has provided documentation in the form of testimony, regarding the outcome of the eleventh FCA. Accordingly, the ISO requests that the Commission accept the results of the eleventh FCA within 120 days of this filing.

Respectfully submitted,

By: /s/ Kevin W. Flynn

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cc: Governance Participants (electronically) and entities listed in Attachment F.

Attachment A

ID	Name	Type	Capacity Zone ID	Capacity Zone Name	State	Load Zone	Status	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21
464	LOST NATION	Generator	8505	Northern New England	NH	NH	Existing	13.979	13.979	13.979	13.979	13.979	13.979	13.979	13.979	13.979	13.979	13.979	13.979
465	DEERFIELD 2 LWR DRFIELD	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	19.275	19.275	19.275	19.275	19.275	19.275	19.275	19.275	19.275	19.275	19.275	19.275
467	MARBLEHEAD DIESELS	Generator	8506	Southeast New England	MA	NEMA	Existing	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000	5.000
468	MARSHFIELD 6 HYDRO	Generator	8505	Northern New England	VT	VT	Existing	4.380	4.380	4.380	4.380	4.380	4.380	4.380	4.380	4.380	4.380	4.380	4.380
472	M STREET JET	Generator	8506	Southeast New England	MA	NEMA	Existing	47.000	47.000	47.000	47.000	47.000	47.000	47.000	47.000	47.000	47.000	47.000	47.000
473	MCINDOES	Generator	8505	Northern New England	NH	NH	Existing	10.066	10.066	10.066	10.066	10.066	10.066	10.066	10.066	10.066	10.066	10.066	10.066
474	J C MCNEIL	Generator	8505	Northern New England	VT	VT	Existing	52.000	52.000	52.000	52.000	52.000	52.000	52.000	52.000	52.000	52.000	52.000	52.000
478	MIDDLETOWN 10	Generator	8500	Rest-of-Pool	CT	CT	Existing	15.515	15.515	15.515	15.515	15.515	15.515	15.515	15.515	15.515	15.515	15.515	15.515
480	MIDDLETOWN 2	Generator	8500	Rest-of-Pool	CT	CT	Existing	117.000	117.000	117.000	117.000	117.000	117.000	117.000	117.000	117.000	117.000	117.000	117.000
481	MIDDLETOWN 3	Generator	8500	Rest-of-Pool	CT	CT	Existing	233.679	233.679	233.679	233.679	233.679	233.679	233.679	233.679	233.679	233.679	233.679	233.679
482	MIDDLETOWN 4	Generator	8500	Rest-of-Pool	CT	CT	Existing	399.923	399.923	399.923	399.923	399.923	399.923	399.923	399.923	399.923	399.923	399.923	399.923
484	MILLSTONE POINT 2	Generator	8500	Rest-of-Pool	CT	CT	Existing	872.258	872.258	872.258	872.258	872.258	872.258	872.258	872.258	872.258	872.258	872.258	872.258
485	MILLSTONE POINT 3	Generator	8500	Rest-of-Pool	CT	CT	Existing	1225.000	1225.000	1225.000	1225.000	1225.000	1225.000	1225.000	1225.000	1225.000	1225.000	1225.000	1225.000
486	MILFORD POWER	Generator	8506	Southeast New England	MA	SEMA	Existing	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
487	MILLER HYDRO	Generator	8505	Northern New England	ME	ME	Existing	8.124	8.124	8.124	8.124	8.124	8.124	8.124	8.124	8.124	8.124	8.124	8.124
489	MERRIMACK 1	Generator	8505	Northern New England	NH	NH	Existing	108.000	108.000	108.000	108.000	108.000	108.000	108.000	108.000	108.000	108.000	108.000	108.000
490	MERRIMACK 2	Generator	8505	Northern New England	NH	NH	Existing	330.000	330.000	330.000	330.000	330.000	330.000	330.000	330.000	330.000	330.000	330.000	330.000
492	MONTVILLE 10 and 11	Generator	8500	Rest-of-Pool	CT	CT	Existing	5.296	5.296	5.296	5.296	5.296	5.296	5.296	5.296	5.296	5.296	5.296	5.296
493	MONTVILLE 5	Generator	8500	Rest-of-Pool	CT	CT	Existing	81.000	81.000	81.000	81.000	81.000	81.000	81.000	81.000	81.000	81.000	81.000	81.000
494	MONTVILLE 6	Generator	8500	Rest-of-Pool	CT	CT	Existing	405.050	405.050	405.050	405.050	405.050	405.050	405.050	405.050	405.050	405.050	405.050	405.050
495	MONTY	Generator	8505	Northern New England	ME	ME	Existing	28.000	28.000	28.000	28.000	28.000	28.000	28.000	28.000	28.000	28.000	28.000	28.000
496	MOORE	Generator	8505	Northern New England	NH	NH	Existing	189.032	189.032	189.032	189.032	189.032	189.032	189.032	189.032	189.032	189.032	189.032	189.032
497	MASS POWER	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	245.259	245.259	245.259	245.259	245.259	245.259	245.259	245.259	245.259	245.259	245.259	245.259
502	MYSTIC 7	Generator	8506	Southeast New England	MA	NEMA	Existing	570.800	570.800	570.800	570.800	570.800	570.800	570.800	570.800	570.800	570.800	570.800	570.800
503	MYSTIC JET	Generator	8506	Southeast New England	MA	NEMA	Existing	8.589	8.589	8.589	8.589	8.589	8.589	8.589	8.589	8.589	8.589	8.589	8.589
507	NEA BELLINGHAM	Generator	8506	Southeast New England	MA	SEMA	Existing	282.865	282.865	282.865	282.865	282.865	282.865	282.865	282.865	282.865	282.865	282.865	282.865
508	NEWINGTON 1	Generator	8505	Northern New England	NH	NH	Existing	400.200	400.200	400.200	400.200	400.200	400.200	400.200	400.200	400.200	400.200	400.200	400.200
513	NEW HAVEN HARBOR	Generator	8500	Rest-of-Pool	CT	CT	Existing	447.894	447.894	447.894	447.894	447.894	447.894	447.894	447.894	447.894	447.894	447.894	447.894
515	NORWICH JET	Generator	8500	Rest-of-Pool	CT	CT	Existing	15.255	15.255	15.255	15.255	15.255	15.255	15.255	15.255	15.255	15.255	15.255	15.255
527	OGDEN-MARTIN 1	Generator	8506	Southeast New England	MA	NEMA	Existing	39.529	39.529	39.529	39.529	42.386	42.386	42.386	42.386	42.386	42.386	42.386	42.386
528	OCEAN ST PWR GT1 GT2 ST1	Generator	8506	Southeast New England	RI	RI	Existing	277.762	277.762	277.762	277.762	277.762	277.762	277.762	277.762	277.762	277.762	277.762	277.762
529	OCEAN ST PWR GT3 GT4 ST2	Generator	8506	Southeast New England	RI	RI	Existing	278.308	278.308	278.308	278.308	278.308	278.308	278.308	278.308	278.308	278.308	278.308	278.308
531	PAWTUCKET POWER	Generator	8506	Southeast New England	RI	RI	Existing	52.954	52.954	52.954	52.954	52.954	52.954	52.954	52.954	52.954	52.954	52.954	52.954
532	PEJEPSCOT	Generator	8505	Northern New England	ME	ME	Existing	7.293	7.293	7.293	7.293	9.404	9.404	9.404	9.404	9.404	9.404	9.404	9.404
536	PERC ORRINGTON 1	Generator	8505	Northern New England	ME	ME	Existing	21.406	21.406	21.406	21.406	20.894	20.894	20.894	20.894	20.894	20.894	20.894	20.894
538	PINETREE POWER	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	15.783	15.783	15.783	15.783	15.783	15.783	15.783	15.783	15.783	15.783	15.783	15.783
539	PONTOOK HYDRO	Generator	8505	Northern New England	NH	NH	Existing	4.761	4.761	4.761	4.761	8.301	8.301	8.301	8.301	8.301	8.301	8.301	8.301
540	POTTER 2 CC	Generator	8506	Southeast New England	MA	SEMA	Existing	72.558	72.558	72.558	72.558	72.558	72.558	72.558	72.558	72.558	72.558	72.558	72.558
541	PROCTOR	Generator	8505	Northern New England	VT	VT	Existing	2.915	2.915	2.915	2.915	6.263	6.263	6.263	6.263	6.263	6.263	6.263	6.263
542	ECO MAINE	Generator	8505	Northern New England	ME	ME	Existing	11.094	11.094	11.094	11.094	10.470	10.470	10.470	10.470	10.470	10.470	10.470	10.470
546	RESCO SAUGUS	Generator	8506	Southeast New England	MA	NEMA	Existing	30.114	30.114	30.114	30.114	30.114	30.114	30.114	30.114	30.114	30.114	30.114	30.114
547	WHEELABRATOR NORTH ANDOVER	Generator	8506	Southeast New England	MA	NEMA	Existing	29.864	29.864	29.864	29.864	29.994	29.994	29.994	29.994	29.994	29.994	29.994	29.994
549	RUTLAND 5 GT	Generator	8505	Northern New England	VT	VT	Existing	7.919	7.919	7.919	7.919	7.919	7.919	7.919	7.919	7.919	7.919	7.919	7.919
555	SEABROOK	Generator	8505	Northern New England	NH	NH	Existing	1246.650	1246.650	1246.650	1246.650	1246.650	1246.650	1246.650	1246.650	1246.650	1246.650	1246.650	1246.650
556	SCHILLER 4	Generator	8505	Northern New England	NH	NH	Existing	47.500	47.500	47.500	47.500	47.500	47.500	47.500	47.500	47.500	47.500	47.500	47.500
557	SCHILLER 5	Generator	8505	Northern New England	NH	NH	Existing	42.594	42.594	42.594	42.594	42.594	42.594	42.594	42.594	42.594	42.594	42.594	42.594
558	SCHILLER 6	Generator	8505	Northern New England	NH	NH	Existing	47.820	47.820	47.820	47.820	47.820	47.820	47.820	47.820	47.820	47.820	47.820	47.820
559	SCHILLER CT 1	Generator	8505	Northern New England	NH	NH	Existing	17.621	17.621	17.621	17.621	17.621	17.621	17.621	17.621	17.621	17.621	17.621	17.621
561	SEARSBURG	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	4.755	4.755	4.755	4.755	4.755	4.755	4.755	4.755	4.755	4.755	4.755	4.755
562	SECREC-PRESTON	Generator	8500	Rest-of-Pool	CT	CT	Existing	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
563	SEMASS 1	Generator	8506	Southeast New England	MA	SEMA	Existing	46.955	46.955	46.955	46.955	50.184	50.184	50.184	50.184	50.184	50.184	50.184	50.184
564	SEMASS 2	Generator	8506	Southeast New England	MA	SEMA	Existing	22.500	22.500	22.500	22.500	22.500	22.500	22.500	22.500	22.500	22.500	22.500	22.500
565	SHELDON SPRINGS	Generator	8505	Northern New England	VT	VT	Existing	4.263	4.263	4.263	4.263	8.925	8.925	8.925	8.925	8.925	8.925	8.925	8.925
566	SHEPAUG	Generator	8500	Rest-of-Pool	CT	CT	Existing	41.511	41.511	41.511	41.511	41.511	41.511	41.511	41.511	41.511	41.511	41.511	41.511
567	SHERMAN	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	6.154	6.154	6.154	6.154	6.154	6.154	6.154	6.154	6.154	6.154	6.154	6.154
569	SKELTON	Generator	8505	Northern New England	ME	ME	Existing	21.600	21.600	21.600	21.600	21.600	21.600	21.600	21.600	21.600	21.600	21.600	21.600
570	SMITH	Generator	8505	Northern New England	NH	NH	Existing	9.263	9.263	9.263	9.263	13.645	13.645	13.645	13.645	13.645	13.645	13.645	13.645
572	SO MEADOW 11	Generator	8500	Rest-of-Pool	CT	CT	Existing	35.781	35.781	35.781	35.781	35.781	35.781	35.781	35.781	35.781	35.781	35.781	35.781
573	SO MEADOW 12	Generator	8500	Rest-of-Pool	CT	CT	Existing	37.649	37.649	37.649	37.649	37.649	37.649	37.649	37.649	37.649	37.649	37.649	37.649
574	SO MEADOW 13	Generator	8500	Rest-of-Pool	CT	CT	Existing	38.317	38.317	38.317	38.317	38.317	38.317	38.317	38.317	38.317	38.317	38.317	38.317
575	SO MEADOW 14	Generator	8500	Rest-of-Pool	CT	CT	Existing	36.746	36.746	36.746	36.746	36.746	36.746	36.746	36.746	36.746	36.746	36.746	36.746
580	SO MEADOW 5	Generator	8500	Rest-of-Pool	CT	CT	Existing	23.6											

ID	Name	Type	Capacity Zone ID	Capacity Zone Name	State	Load Zone	Status	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21
620	WILDER	Generator	8505	Northern New England	NH	NH	Existing	39.083	39.083	39.083	39.083	39.083	39.083	39.083	39.083	39.083	39.083	39.083	39.083
621	WILLIAMS	Generator	8505	Northern New England	ME	ME	Existing	14.900	14.900	14.900	14.900	14.900	14.900	14.900	14.900	14.900	14.900	14.900	14.900
622	WINGOSKI 1	Generator	8505	Northern New England	VT	VT	Existing	1.991	1.991	1.991	1.991	3.267	3.267	3.267	3.267	3.267	3.267	3.267	3.267
624	WMI MILLBURY 1	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	39.811	39.811	39.811	39.811	39.811	39.811	39.811	39.811	39.811	39.811	39.811	39.811
625	WEST MEDWAY JET 1	Generator	8506	Southeast New England	MA	NEMA	Existing	42.000	42.000	42.000	42.000	53.025	53.025	53.025	53.025	53.025	53.025	53.025	53.025
626	WEST MEDWAY JET 2	Generator	8506	Southeast New England	MA	NEMA	Existing	39.848	39.848	39.848	39.848	39.848	39.848	39.848	39.848	39.848	39.848	39.848	39.848
627	WEST MEDWAY JET 3	Generator	8506	Southeast New England	MA	SEMA	Existing	35.441	35.441	35.441	35.441	35.441	35.441	35.441	35.441	35.441	35.441	35.441	35.441
628	WOODLAND ROAD	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	15.808	15.808	15.808	15.808	15.808	15.808	15.808	15.808	15.808	15.808	15.808	15.808
630	WEST SPRINGFIELD 10	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	17.143	17.143	17.143	17.143	17.143	17.143	17.143	17.143	17.143	17.143	17.143	17.143
633	WEST SPRINGFIELD 3	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	94.276	94.276	94.276	94.276	94.276	94.276	94.276	94.276	94.276	94.276	94.276	94.276
636	WYMAN HYDRO 1	Generator	8505	Northern New England	ME	ME	Existing	28.500	28.500	28.500	28.500	28.500	28.500	28.500	28.500	28.500	28.500	28.500	28.500
637	WYMAN HYDRO 2	Generator	8505	Northern New England	ME	ME	Existing	29.866	29.866	29.866	29.866	29.866	29.866	29.866	29.866	29.866	29.866	29.866	29.866
638	WYMAN HYDRO 3	Generator	8505	Northern New England	ME	ME	Existing	26.520	26.520	26.520	26.520	26.520	26.520	26.520	26.520	26.520	26.520	26.520	26.520
639	YARMOUTH 1	Generator	8505	Northern New England	ME	ME	Existing	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
640	YARMOUTH 2	Generator	8505	Northern New England	ME	ME	Existing	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
641	YARMOUTH 3	Generator	8505	Northern New England	ME	ME	Existing	57.453	57.453	57.453	57.453	57.453	57.453	57.453	57.453	57.453	57.453	57.453	57.453
642	YARMOUTH 4	Generator	8505	Northern New England	ME	ME	Existing	602.050	602.050	602.050	602.050	602.050	602.050	602.050	602.050	602.050	602.050	602.050	602.050
715	ROCHESTER LANDFILL	Generator	8505	Northern New England	NH	NH	Existing	2.192	2.192	2.192	2.192	2.192	2.192	2.192	2.192	2.192	2.192	2.192	2.192
737	SIMPSON G LOAD REDUCER	Generator	8505	Northern New England	VT	VT	Existing	2.378	2.378	2.378	2.378	2.968	2.968	2.968	2.968	2.968	2.968	2.968	2.968
739	ROCKY RIVER	Generator	8500	Rest-of-Pool	CT	CT	Existing	28.383	28.383	28.383	28.383	28.383	28.383	28.383	28.383	28.383	28.383	28.383	28.383
754	BAR MILLS	Generator	8505	Northern New England	ME	ME	Existing	0.936	0.936	0.936	0.936	2.065	2.065	2.065	2.065	2.065	2.065	2.065	2.065
755	BONNY EAGLE W. BUXTON	Generator	8505	Northern New England	ME	ME	Existing	5.659	5.659	5.659	5.659	10.884	10.884	10.884	10.884	10.884	10.884	10.884	10.884
757	HARRIS 4	Generator	8505	Northern New England	ME	ME	Existing	1.249	1.249	1.249	1.249	1.249	1.249	1.249	1.249	1.249	1.249	1.249	1.249
759	MESSALONSKEE COMPOSITE	Generator	8505	Northern New England	ME	ME	Existing	2.117	2.117	2.117	2.117	5.287	5.287	5.287	5.287	5.287	5.287	5.287	5.287
760	NORTH GORHAM	Generator	8505	Northern New England	ME	ME	Existing	1.150	1.150	1.150	1.150	1.138	1.138	1.138	1.138	1.138	1.138	1.138	1.138
761	SHAWMUT	Generator	8505	Northern New England	ME	ME	Existing	5.922	5.922	5.922	5.922	6.970	6.970	6.970	6.970	6.970	6.970	6.970	6.970
766	CABOT TURNERS FALLS	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	67.881	67.881	67.881	67.881	67.881	67.881	67.881	67.881	67.881	67.881	67.881	67.881
767	SES CONCORD	Generator	8505	Northern New England	NH	NH	Existing	12.111	12.111	12.111	12.111	12.466	12.466	12.466	12.466	12.466	12.466	12.466	12.466
768	GARVINS HOOKSETT	Generator	8505	Northern New England	NH	NH	Existing	4.461	4.461	4.461	4.461	7.082	7.082	7.082	7.082	7.082	7.082	7.082	7.082
769	HADLEY FALLS 1&2	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	12.302	12.302	12.302	12.302	27.822	27.822	27.822	27.822	27.822	27.822	27.822	27.822
772	NEWPORT HYDRO	Generator	8505	Northern New England	VT	VT	Existing	1.456	1.456	1.456	1.456	1.906	1.906	1.906	1.906	1.906	1.906	1.906	1.906
774	LOWER LAMOILLE COMPOSITE	Generator	8505	Northern New England	VT	VT	Existing	15.800	15.800	15.800	15.800	15.800	15.800	15.800	15.800	15.800	15.800	15.800	15.800
775	MIDDLEBURY COMPOSITE	Generator	8505	Northern New England	VT	VT	Existing	5.678	5.678	5.678	5.678	5.678	5.678	5.678	5.678	5.678	5.678	5.678	5.678
776	N. RUTLAND COMPOSITE	Generator	8505	Northern New England	VT	VT	Existing	4.360	4.360	4.360	4.360	4.360	4.360	4.360	4.360	4.360	4.360	4.360	4.360
779	MIDDLESEX 2	Generator	8505	Northern New England	VT	VT	Existing	0.815	0.815	0.815	0.815	1.674	1.674	1.674	1.674	1.674	1.674	1.674	1.674
783	HIGHGATE FALLS	Generator	8505	Northern New England	VT	VT	Existing	3.376	3.376	3.376	3.376	7.807	7.807	7.807	7.807	7.807	7.807	7.807	7.807
786	KEZAR LEDGEMERE COMPOSITE	Generator	8505	Northern New England	ME	ME	Existing	0.468	0.468	0.468	0.468	1.018	1.018	1.018	1.018	1.018	1.018	1.018	1.018
789	CEC 002 PAWTUCKET US	Generator	8506	Southeast New England	RI	RI	Existing	0.168	0.168	0.168	0.168	0.570	0.570	0.570	0.570	0.570	0.570	0.570	0.570
792	CENTENNIAL HYDRO	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	0.160	0.160	0.160	0.160	0.544	0.544	0.544	0.544	0.544	0.544	0.544	0.544
793	METHUEN HYDRO	Generator	8506	Southeast New England	MA	NEMA	Existing	0.004	0.004	0.004	0.004	0.151	0.151	0.151	0.151	0.151	0.151	0.151	0.151
794	MINIWAWA	Generator	8505	Northern New England	NH	NH	Existing	0.142	0.142	0.142	0.142	0.528	0.528	0.528	0.528	0.528	0.528	0.528	0.528
795	RIVER MILL HYDRO	Generator	8505	Northern New England	NH	NH	Existing	0.000	0.000	0.000	0.000	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039
796	GOODWIN DAM	Generator	8500	Rest-of-Pool	CT	CT	Existing	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
797	CEC 003 WYRE WYND US	Generator	8500	Rest-of-Pool	CT	CT	Existing	0.493	0.493	0.493	0.493	1.129	1.129	1.129	1.129	1.129	1.129	1.129	1.129
798	COLEBROOK	Generator	8500	Rest-of-Pool	CT	CT	Existing	0.682	0.682	0.682	0.682	0.553	0.553	0.553	0.553	0.553	0.553	0.553	0.553
800	KINNEYTOWN B	Generator	8500	Rest-of-Pool	CT	CT	Existing	0.114	0.114	0.114	0.114	0.607	0.607	0.607	0.607	0.607	0.607	0.607	0.607
801	WILLIMANTIC 1	Generator	8500	Rest-of-Pool	CT	CT	Existing	0.046	0.046	0.046	0.046	0.127	0.127	0.127	0.127	0.127	0.127	0.127	0.127
802	WILLIMANTIC 2	Generator	8500	Rest-of-Pool	CT	CT	Existing	0.012	0.012	0.012	0.012	0.122	0.122	0.122	0.122	0.122	0.122	0.122	0.122
803	TOUTANT	Generator	8500	Rest-of-Pool	CT	CT	Existing	0.054	0.054	0.054	0.054	0.154	0.154	0.154	0.154	0.154	0.154	0.154	0.154
804	PUTNAM	Generator	8500	Rest-of-Pool	CT	CT	Existing	0.139	0.139	0.139	0.139	0.382	0.382	0.382	0.382	0.382	0.382	0.382	0.382
806	MECHANICSVILLE	Generator	8500	Rest-of-Pool	CT	CT	Existing	0.000	0.000	0.000	0.000	0.162	0.162	0.162	0.162	0.162	0.162	0.162	0.162
807	CEC 004 DAYVILLE POND US	Generator	8500	Rest-of-Pool	CT	CT	Existing	0.005	0.005	0.005	0.005	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052
808	SANDY HOOK HYDRO	Generator	8500	Rest-of-Pool	CT	CT	Existing	0.000	0.000	0.000	0.000	0.066	0.066	0.066	0.066	0.066	0.066	0.066	0.066
810	QUINEBAUG	Generator	8500	Rest-of-Pool	CT	CT	Existing	0.266	0.266	0.266	0.266	0.935	0.935	0.935	0.935	0.935	0.935	0.935	0.935
811	BANTAM	Generator	8500	Rest-of-Pool	CT	CT	Existing	0.026	0.026	0.026	0.026	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093
812	BEEBE HOLBROOK	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	0.066	0.066	0.066	0.066	0.066	0.066	0.066	0.066	0.066	0.066	0.066	0.066
813	TUNNEL	Generator	8500	Rest-of-Pool	CT	CT	Existing	0.360	0.360	0.360	0.360	1.147	1.147	1.147	1.147	1.147	1.147	1.147	1.147
814	PATCH	Generator	8505	Northern New England	VT	VT	Existing	0.006	0.006	0.006	0.006	0.054	0.054	0.054	0.054	0.054	0.054	0.054	0.054
815	CARVER FALLS	Generator	8505	Northern New England	VT	VT	Existing	0.082	0.082	0.082	0.082	0.958	0.958	0.958	0.958	0.958	0.958	0.958	0.958
816	CAVENDISH	Generator	8505	Northern New England	VT	VT	Existing	0.289	0.289	0.289	0.289	0.676	0.676	0.676	0.676	0.676	0.676	0.676	0.676
817	TAFTSVILLE VT	Generator	8505	Northern New England	VT	VT	Existing	0.012	0.012	0.012	0.012	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034
818	PIERCE MILLS	Generator	8505	Northern New England	VT	VT	Existing	0.091	0.091	0.091	0.091	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161
819	ARNOLD FALLS	Generator	8505	Northern New England	VT	VT	Existing	0.124	0.124	0.124	0.124	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140
820	PASSUMPSIC	Generator	8505	Northern New England	VT	VT	Existing	0.123	0.123	0.123	0.123	0.228	0.228	0.228	0.228	0.228	0.228	0.228	0.228
821	GAGE	Generator																	

ID	Name	Type	Capacity Zone ID	Capacity Zone Name	State	Load Zone	Status	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21
844	OTTAUQUECHEE	Generator	8505	Northern New England	VT	VT	Existing	0.429	0.429	0.429	0.429	0.733	0.733	0.733	0.733	0.733	0.733	0.733	0.733
845	SLACK DAM	Generator	8505	Northern New England	VT	VT	Existing	0.134	0.134	0.134	0.134	0.271	0.271	0.271	0.271	0.271	0.271	0.271	0.271
846	WINOOSKI 8	Generator	8505	Northern New England	VT	VT	Existing	0.299	0.299	0.299	0.299	0.396	0.396	0.396	0.396	0.396	0.396	0.396	0.396
847	WOODSIDE	Generator	8505	Northern New England	VT	VT	Existing	0.054	0.054	0.054	0.054	0.066	0.066	0.066	0.066	0.066	0.066	0.066	0.066
849	CRESCENT DAM	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	0.338	0.338	0.338	0.338	0.644	0.644	0.644	0.644	0.644	0.644	0.644	0.644
850	GLENDALE HYDRO	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	0.245	0.245	0.245	0.245	0.471	0.471	0.471	0.471	0.471	0.471	0.471	0.471
851	GARDNER FALLS	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	0.099	0.099	0.099	0.099	0.784	0.784	0.784	0.784	0.784	0.784	0.784	0.784
852	SOUTH BARRE HYDRO	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	0.032	0.032	0.032	0.032	0.140	0.140	0.140	0.140	0.140	0.140	0.140	0.140
853	WEBSTER HYDRO	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	0.000	0.000	0.000	0.000	0.043	0.043	0.043	0.043	0.043	0.043	0.043	0.043
854	ORANGE HYDRO 1	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	0.017	0.017	0.017	0.017	0.122	0.122	0.122	0.122	0.122	0.122	0.122	0.122
855	ORANGE HYDRO 2	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	0.075	0.075	0.075	0.075	0.152	0.152	0.152	0.152	0.152	0.152	0.152	0.152
856	HUNT'S POND	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	0.001	0.001	0.001	0.001	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009
857	OAKDALE HYDRO	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	2.681	2.681	2.681	2.681	0.475	0.475	0.475	0.475	0.475	0.475	0.475	0.475
859	BOATLOCK	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	1.482	1.482	1.482	1.482	2.041	2.041	2.041	2.041	2.041	2.041	2.041	2.041
860	BRIAR HYDRO	Generator	8505	Northern New England	NH	NH	Existing	0.968	0.968	0.968	0.968	2.863	2.863	2.863	2.863	2.863	2.863	2.863	2.863
861	CANAAN	Generator	8505	Northern New England	NH	NH	Existing	0.691	0.691	0.691	0.691	0.943	0.943	0.943	0.943	0.943	0.943	0.943	0.943
862	CHEMICAL	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	0.504	0.504	0.504	0.504	0.409	0.409	0.409	0.409	0.409	0.409	0.409	0.409
863	CLEMENT DAM	Generator	8505	Northern New England	NH	NH	Existing	0.429	0.429	0.429	0.429	0.550	0.550	0.550	0.550	0.550	0.550	0.550	0.550
864	DWIGHT	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	0.166	0.166	0.166	0.166	0.326	0.326	0.326	0.326	0.326	0.326	0.326	0.326
865	ERROL	Generator	8505	Northern New England	NH	NH	Existing	1.877	1.877	1.877	1.877	2.043	2.043	2.043	2.043	2.043	2.043	2.043	2.043
866	GREGGS	Generator	8505	Northern New England	NH	NH	Existing	0.421	0.421	0.421	0.421	1.212	1.212	1.212	1.212	1.212	1.212	1.212	1.212
867	INDIAN ORCHARD	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	0.278	0.278	0.278	0.278	0.867	0.867	0.867	0.867	0.867	0.867	0.867	0.867
868	MILTON MILLS HYDRO	Generator	8505	Northern New England	NH	NH	Existing	0.297	0.297	0.297	0.297	0.828	0.828	0.828	0.828	0.828	0.828	0.828	0.828
869	MINE FALLS	Generator	8505	Northern New England	NH	NH	Existing	0.543	0.543	0.543	0.543	1.379	1.379	1.379	1.379	1.379	1.379	1.379	1.379
870	PEMBROKE	Generator	8505	Northern New England	NH	NH	Existing	0.323	0.323	0.323	0.323	1.166	1.166	1.166	1.166	1.166	1.166	1.166	1.166
871	PENNAHOOK FALLS LOWER	Generator	8505	Northern New England	NH	NH	Existing	1.384	1.384	1.384	1.384	2.996	2.996	2.996	2.996	2.996	2.996	2.996	2.996
872	PENNAHOOK FALLS UPPER	Generator	8505	Northern New England	NH	NH	Existing	0.979	0.979	0.979	0.979	2.116	2.116	2.116	2.116	2.116	2.116	2.116	2.116
873	PUTTS BRIDGE	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	0.816	0.816	0.816	0.816	2.093	2.093	2.093	2.093	2.093	2.093	2.093	2.093
874	RED BRIDGE	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	0.578	0.578	0.578	0.578	1.392	1.392	1.392	1.392	1.392	1.392	1.392	1.392
875	RIVER BEND	Generator	8505	Northern New England	NH	NH	Existing	0.592	0.592	0.592	0.592	0.890	0.890	0.890	0.890	0.890	0.890	0.890	0.890
876	ROBERTSVILLE	Generator	8500	Rest-of-Pool	CT	CT	Existing	0.000	0.000	0.000	0.000	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018
877	SCOTLAND	Generator	8500	Rest-of-Pool	CT	CT	Existing	0.000	0.000	0.000	0.000	1.068	1.068	1.068	1.068	1.068	1.068	1.068	1.068
878	SKINNER	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	0.100	0.100	0.100	0.100	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
879	TAFTVILLE CT	Generator	8500	Rest-of-Pool	CT	CT	Existing	0.187	0.187	0.187	0.187	0.868	0.868	0.868	0.868	0.868	0.868	0.868	0.868
882	FRANKLIN FALLS	Generator	8505	Northern New England	NH	NH	Existing	0.415	0.415	0.415	0.415	0.514	0.514	0.514	0.514	0.514	0.514	0.514	0.514
883	SALMON FALLS HYDRO	Generator	8505	Northern New England	ME	ME	Existing	0.029	0.029	0.029	0.029	0.456	0.456	0.456	0.456	0.456	0.456	0.456	0.456
884	SWANS FALLS	Generator	8505	Northern New England	NH	NH	Existing	0.335	0.335	0.335	0.335	0.380	0.380	0.380	0.380	0.380	0.380	0.380	0.380
886	COCHECO FALLS	Generator	8505	Northern New England	NH	NH	Existing	0.082	0.082	0.082	0.082	0.296	0.296	0.296	0.296	0.296	0.296	0.296	0.296
887	CHINA MILLS DAM	Generator	8505	Northern New England	NH	NH	Existing	0.005	0.005	0.005	0.005	0.244	0.244	0.244	0.244	0.244	0.244	0.244	0.244
888	NEWFOUND HYDRO	Generator	8505	Northern New England	NH	NH	Existing	0.309	0.309	0.309	0.309	0.888	0.888	0.888	0.888	0.888	0.888	0.888	0.888
889	SUNAPEE HYDRO	Generator	8505	Northern New England	NH	NH	Existing	0.123	0.123	0.123	0.123	0.306	0.306	0.306	0.306	0.306	0.306	0.306	0.306
890	NASHUA HYDRO	Generator	8505	Northern New England	NH	NH	Existing	0.216	0.216	0.216	0.216	0.705	0.705	0.705	0.705	0.705	0.705	0.705	0.705
891	HILLSBORO MILLS	Generator	8505	Northern New England	NH	NH	Existing	0.006	0.006	0.006	0.006	0.147	0.147	0.147	0.147	0.147	0.147	0.147	0.147
892	LAKEPORT DAM	Generator	8505	Northern New England	NH	NH	Existing	0.220	0.220	0.220	0.220	0.223	0.223	0.223	0.223	0.223	0.223	0.223	0.223
893	WEST HOPKINTON HYDRO	Generator	8505	Northern New England	NH	NH	Existing	0.212	0.212	0.212	0.212	0.393	0.393	0.393	0.393	0.393	0.393	0.393	0.393
894	LISBON HYDRO	Generator	8505	Northern New England	NH	NH	Existing	0.238	0.238	0.238	0.238	0.288	0.288	0.288	0.288	0.288	0.288	0.288	0.288
895	LOWER ROBERTSON DAM	Generator	8505	Northern New England	NH	NH	Existing	0.314	0.314	0.314	0.314	0.550	0.550	0.550	0.550	0.550	0.550	0.550	0.550
897	OLD NASH DAM	Generator	8505	Northern New England	NH	NH	Existing	0.015	0.015	0.015	0.015	0.089	0.089	0.089	0.089	0.089	0.089	0.089	0.089
898	SUGAR RIVER HYDRO	Generator	8505	Northern New England	NH	NH	Existing	0.012	0.012	0.012	0.012	0.099	0.099	0.099	0.099	0.099	0.099	0.099	0.099
900	GREAT FALLS LOWER	Generator	8505	Northern New England	NH	NH	Existing	0.103	0.103	0.103	0.103	0.560	0.560	0.560	0.560	0.560	0.560	0.560	0.560
901	WATERLOOM FALLS	Generator	8505	Northern New England	NH	NH	Existing	0.004	0.004	0.004	0.004	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034
902	HOSIERY MILL DAM	Generator	8505	Northern New England	NH	NH	Existing	0.000	0.000	0.000	0.000	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048
903	WYANDOTTE HYDRO	Generator	8505	Northern New England	NH	NH	Existing	0.000	0.000	0.000	0.000	0.051	0.051	0.051	0.051	0.051	0.051	0.051	0.051
904	LOCHMERE DAM	Generator	8505	Northern New England	NH	NH	Existing	0.256	0.256	0.256	0.256	0.432	0.432	0.432	0.432	0.432	0.432	0.432	0.432
905	ASHUELOT HYDRO	Generator	8505	Northern New England	NH	NH	Existing	0.338	0.338	0.338	0.338	0.537	0.537	0.537	0.537	0.537	0.537	0.537	0.537
906	ROLLINSFORD HYDRO	Generator	8505	Northern New England	NH	NH	Existing	0.118	0.118	0.118	0.118	0.815	0.815	0.815	0.815	0.815	0.815	0.815	0.815
908	OTIS MILL HYDRO	Generator	8505	Northern New England	NH	NH	Existing	0.000	0.000	0.000	0.000	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009
909	STEELES POND HYDRO	Generator	8505	Northern New England	NH	NH	Existing	0.009	0.009	0.009	0.009	0.054	0.054	0.054	0.054	0.054	0.054	0.054	0.054
910	CAMPTON DAM	Generator	8505	Northern New England	NH	NH	Existing	0.101	0.101	0.101	0.101	0.127	0.127	0.127	0.127	0.127	0.127	0.127	0.127
911	KELLEYS FALLS	Generator	8505	Northern New England	NH	NH	Existing	0.021	0.021	0.021	0.021	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.130
913	GOODRICH FALLS	Generator	8505	Northern New England	NH	NH	Existing	0.147	0.147	0.147	0.147	0.268	0.268	0.268	0.268	0.268	0.268	0.268	0.268
914	CHAMBERLAIN FALLS	Generator	8505	Northern New England	NH	NH	Existing	0.000	0.000	0.000	0.000	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
919	HOPKINTON HYDRO	Generator	8505	Northern New England	NH	NH	Existing	0.094	0.094	0.094	0.094	0.163	0.163	0.163	0.163	0.163	0.163	0.163	0.163
922	NOONE FALLS	Generator	8505	Northern New England	NH	NH	Existing	0.000	0.000	0.000	0.000	0.069	0.069	0.069	0.069	0.069	0.069	0.069	0.069
925	OTTER LANE HYDRO	Generator	8505	Northern New England	NH	NH	Existing	0.008	0.008	0.008	0.008	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034
926	PETERBOROUGH LOWER HYDRO	Generator	8505	Northern New England	NH	NH	Existing	0.017	0.017	0.017	0.017	0.093	0.093						

ID	Name	Type	Capacity Zone ID	Capacity Zone Name	State	Load Zone	Status	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21
16713	Comverge CoolSentry 2	Demand	8500	Rest-of-Pool	CT	CT	Existing	1,072	1,072	1,072	1,072	1,072	1,072	1,072	1,072	1,072	1,072	1,072	1,072
16718	Comverge CoolSentry 4	Demand	8500	Rest-of-Pool	CT	CT	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
16737	DFC-ERG Hybrid Fuel Cell (3)	Generator	8500	Rest-of-Pool	CT	CT	Existing	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
16738	BFCP Fuel Cell	Generator	8500	Rest-of-Pool	CT	CT	Existing	13,054	13,054	13,054	13,054	13,054	13,054	13,054	13,054	13,054	13,054	13,054	13,054
16750	Norden #2	Generator	8500	Rest-of-Pool	CT	CT	Existing	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947
16752	Norden #3	Generator	8500	Rest-of-Pool	CT	CT	Existing	1,942	1,942	1,942	1,942	1,942	1,942	1,942	1,942	1,942	1,942	1,942	1,942
16790	WCMA Project E	Demand	8500	Rest-of-Pool	MA	WCMA	Existing	0,400	0,400	0,400	0,400	0,400	0,400	0,400	0,400	0,400	0,400	0,400	0,400
17321	RTEG 76 Springfield MA (7516)	Demand	8500	Rest-of-Pool	MA	WCMA	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
17359	Sugar River 2	Generator	8505	Northern New England	NH	NH	Existing	0,014	0,014	0,014	0,014	0,117	0,117	0,117	0,117	0,117	0,117	0,117	0,117
35442	Seaman Energy	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	0,285	0,285	0,285	0,285	0,326	0,326	0,326	0,326	0,326	0,326	0,326	0,326
35453	Efficiency Maine Trust	Demand	8505	Northern New England	ME	ME	Existing	11,136	11,136	11,136	11,136	11,136	11,136	11,136	11,136	11,136	11,136	11,136	11,136
35485	Fitchburg-FA-5	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	3,093	3,093	3,093	3,093	3,093	3,093	3,093	3,093	3,093	3,093	3,093	3,093
35555	GMCW	Generator	8505	Northern New England	VT	VT	Existing	0,814	0,814	0,814	0,814	2,753	2,753	2,753	2,753	2,753	2,753	2,753	2,753
35594	Spaulding Pond Hydro	Generator	8505	Northern New England	NH	NH	Existing	0,024	0,024	0,024	0,024	0,172	0,172	0,172	0,172	0,172	0,172	0,172	0,172
35656	Rainbow 2	Generator	8500	Rest-of-Pool	CT	CT	Existing	4,100	4,100	4,100	4,100	4,100	4,100	4,100	4,100	4,100	4,100	4,100	4,100
35657	Shrewsbury Diesels	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	13,650	13,650	13,650	13,650	13,650	13,650	13,650	13,650	13,650	13,650	13,650	13,650
35658	Rainbow 1	Generator	8500	Rest-of-Pool	CT	CT	Existing	4,100	4,100	4,100	4,100	4,100	4,100	4,100	4,100	4,100	4,100	4,100	4,100
35693	Spruce Mountain Wind	Generator	8505	Northern New England	ME	ME	Existing	2,302	2,302	2,302	2,302	6,452	6,452	6,452	6,452	6,452	6,452	6,452	6,452
35728	Moretown LG	Generator	8505	Northern New England	VT	VT	Existing	3,008	3,008	3,008	3,008	3,008	3,008	3,008	3,008	3,008	3,008	3,008	3,008
35979	Kingdom Community Wind	Generator	8505	Northern New England	VT	VT	Existing	8,773	8,773	8,773	8,773	20,083	20,083	20,083	20,083	20,083	20,083	20,083	20,083
37040	KENDALL STEAM	Generator	8506	Southeast New England	MA	NEMA	Existing	27,750	27,750	27,750	27,750	27,750	27,750	27,750	27,750	27,750	27,750	27,750	27,750
37050	Groton Wind Project	Generator	8505	Northern New England	NH	NH	Existing	5,100	5,100	5,100	5,100	10,884	10,884	10,884	10,884	10,884	10,884	10,884	10,884
37072	Beaver Ridge Wind	Generator	8505	Northern New England	ME	ME	Existing	0,436	0,436	0,436	0,436	1,187	1,187	1,187	1,187	1,187	1,187	1,187	1,187
37077	Woronoco Hydro LLC	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	0,490	0,490	0,490	0,490	1,157	1,157	1,157	1,157	1,157	1,157	1,157	1,157
37105	Blue Sky West	Generator	8505	Northern New England	ME	ME	Existing	42,270	42,270	42,270	42,270	87,300	87,300	87,300	87,300	87,300	87,300	87,300	87,300
37112	Efficiency Maine Trust FCA6	Demand	8505	Northern New England	ME	ME	Existing	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890
37120	Thundermist Hydropower	Generator	8506	Southeast New England	RI	RI	Existing	0,000	0,000	0,000	0,000	0,728	0,728	0,728	0,728	0,728	0,728	0,728	0,728
37917	RTDR 50744 Boston (7507) - Grp C	Demand	8506	Southeast New England	MA	NEMA	Existing	7,910	7,910	7,910	7,910	7,910	7,910	7,910	7,910	7,910	7,910	7,910	7,910
37918	RTDR 50744 Central MA (7515) - Grp A	Demand	8500	Rest-of-Pool	MA	WCMA	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
37919	RTDR 50744 Lower SEMA (7511) - Grp C	Demand	8506	Southeast New England	MA	SEMA	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
37920	RTDR 50744 North Shore (7508) - Grp C	Demand	8506	Southeast New England	MA	NEMA	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
37922	RTDR 50744 Northern CT (7501) - Grp B	Demand	8500	Rest-of-Pool	CT	CT	Existing	10,331	10,331	10,331	10,331	10,331	10,331	10,331	10,331	10,331	10,331	10,331	10,331
37924	RTDR 50744 SEMA (7512) - Grp C	Demand	8506	Southeast New England	MA	SEMA	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
37925	RTDR 50744 Springfield MA (7516) - Grp A	Demand	8500	Rest-of-Pool	MA	WCMA	Existing	1,380	1,380	1,380	1,380	1,380	1,380	1,380	1,380	1,380	1,380	1,380	1,380
37927	RTDR 50744 Western CT (7503) - Grp B	Demand	8500	Rest-of-Pool	CT	CT	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
37928	RTDR 50786 Boston (7507)	Demand	8506	Southeast New England	MA	NEMA	Existing	1,022	1,022	1,022	1,022	1,022	1,022	1,022	1,022	1,022	1,022	1,022	1,022
37929	RTDR 50786 Central MA (7515)	Demand	8500	Rest-of-Pool	MA	WCMA	Existing	0,924	0,924	0,924	0,924	0,924	0,924	0,924	0,924	0,924	0,924	0,924	0,924
37930	RTDR 50786 Eastern CT (7500)	Demand	8500	Rest-of-Pool	CT	CT	Existing	0,012	0,012	0,012	0,012	0,012	0,012	0,012	0,012	0,012	0,012	0,012	0,012
37935	RTDR 50786 Northern CT (7501)	Demand	8500	Rest-of-Pool	CT	CT	Existing	2,789	2,789	2,789	2,789	2,789	2,789	2,789	2,789	2,789	2,789	2,789	2,789
37936	RTDR 50786 Norfolk - Stamford (7502)	Demand	8500	Rest-of-Pool	CT	CT	Existing	0,043	0,043	0,043	0,043	0,043	0,043	0,043	0,043	0,043	0,043	0,043	0,043
37938	RTDR 50786 Rhode Island (7518)	Demand	8506	Southeast New England	RI	RI	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
37941	RTDR 50786 Springfield MA (7516)	Demand	8500	Rest-of-Pool	MA	WCMA	Existing	0,692	0,692	0,692	0,692	0,692	0,692	0,692	0,692	0,692	0,692	0,692	0,692
37943	RTDR 50786 Western CT (7503)	Demand	8500	Rest-of-Pool	CT	CT	Existing	0,309	0,309	0,309	0,309	0,309	0,309	0,309	0,309	0,309	0,309	0,309	0,309
37944	RTDR 50786 Western MA (7517)	Demand	8500	Rest-of-Pool	MA	WCMA	Existing	0,117	0,117	0,117	0,117	0,117	0,117	0,117	0,117	0,117	0,117	0,117	0,117
37990	RTEG 50017 Bangor Hydro (7504)	Demand	8505	Northern New England	ME	ME	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
37991	RTEG 50017 Boston (7507)	Demand	8506	Southeast New England	MA	NEMA	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
37993	RTEG 50017 Eastern CT (7500)	Demand	8500	Rest-of-Pool	CT	CT	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
37994	RTEG 50017 Lower SEMA (7511)	Demand	8506	Southeast New England	MA	SEMA	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
37995	RTEG 50017 Maine (7505)	Demand	8505	Northern New England	ME	ME	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
37996	RTEG 50017 New Hampshire (7509)	Demand	8505	Northern New England	NH	NH	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
37997	RTEG 50017 North Shore (7508)	Demand	8506	Southeast New England	MA	NEMA	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
37998	RTEG 50017 Northern CT (7501)	Demand	8500	Rest-of-Pool	CT	CT	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
37999	RTEG 50017 Northwest Vermont (7513)	Demand	8505	Northern New England	VT	VT	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
38001	RTEG 50017 Portland Maine (7506)	Demand	8505	Northern New England	ME	ME	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
38004	RTEG 50017 Seacoast (7510)	Demand	8505	Northern New England	NH	NH	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
38005	RTEG 50017 Springfield MA (7516)	Demand	8500	Rest-of-Pool	MA	WCMA	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
38006	RTEG 50017 Vermont (7514)	Demand	8505	Northern New England	VT	VT	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
38008	RTEG 50017 Western MA (7517)	Demand	8500	Rest-of-Pool	MA	WCMA	Existing	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
38057	Efficiency Maine Trust FCA6 B	Demand	8505	Northern New England	ME	ME	Existing	68,720	68,720	68,720	68,720	68,720	68,720	110,790	110,790	110,790	110,790	68,720	68,720
38078	NFM Solar Power, LLC	Generator	8500	Rest-of-Pool	MA	WCMA	Existing	0,507	0,507	0,507	0,507	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
38089	Footprint Combined Cycle	Generator	8506	Southeast New England	MA	NEMA	Existing	674,000	674,000	674,000	674,000	674,000	674,000	674,000	674,000	674,000	674,000	674,000	674,000
38114	East Bridgewater Solar Energy Project	Generator	8506	Southeast New England	MA	SEMA	Existing	0,850	0,850	0,850	0,850	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
38115	Harrington Street PV Project	Generator	8500	Rest-of-Pool	MA	WCMA	Existing												

ID	Name	Type	Capacity Zone ID	Capacity Zone Name	State	Load Zone	Status	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21
38787	CT On-Peak Solar	Demand	8500	Rest-of-Pool	CT	CT	New	5.400	5.400	5.400	5.400	5.400	5.400	0.000	0.000	0.000	0.000	5.400	5.400
38789	NEMA ActiveLM	Demand	8506	Southeast New England	MA	NEMA	New	1.080	1.080	1.080	1.080	1.080	1.080	1.080	1.080	1.080	1.080	1.080	1.080
38791	Branch Solar	Generator	8506	Southeast New England	MA	SEMA	New	0.633	0.633	0.633	0.633	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
38800	DRCR_Western MA_2016	Demand	8500	Rest-of-Pool	MA	WCMA	New	14.000	14.000	14.000	14.000	14.000	14.000	14.000	14.000	14.000	14.000	14.000	14.000
38801	DRCR_Western CT_2016	Demand	8500	Rest-of-Pool	CT	CT	New	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
38802	DRCR_Vermont_2016	Demand	8505	Northern New England	VT	VT	New	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
38803	DRCR_Springfield MA_2016	Demand	8500	Rest-of-Pool	MA	WCMA	New	5.300	5.300	5.300	5.300	5.300	5.300	5.300	5.300	5.300	5.300	5.300	5.300
38810	DRCR_Northern CT_2016	Demand	8500	Rest-of-Pool	CT	CT	New	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
38813	DRCR_New Hampshire_2016	Demand	8505	Northern New England	NH	NH	New	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000
38814	Burrillville Energy Center 4	Generator	8506	Southeast New England	RI	RI	New	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Attachment B

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

ISO New England Inc.

)

Docket No. ER17-___-000

TESTIMONY OF STEPHEN J. ROURKE

1 **Q: PLEASE STATE YOUR NAME, TITLE AND BUSINESS ADDRESS.**

2 A: My name is Stephen J. Rourke. I am Vice President of System Planning with ISO
3 New England Inc. (the "ISO"). My business address is One Sullivan Road,
4 Holyoke, Massachusetts 01040.

5

6 **Q: PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND**
7 **WORK EXPERIENCE.**

8 A: I have a B.S. in Electrical Engineering from Worcester Polytechnic Institute and a
9 M.B.A. from Western New England University. In my current position as Vice
10 President of System Planning, I am responsible for planning for a reliable New
11 England bulk power system according to prescribed reliability standards and
12 guidelines of the Northeast Power Coordinating Council ("NPCC") and the North
13 American Electric Reliability Corporation ("NERC"); overseeing development of
14 the Regional System Plan; analysis and approval of new transmission and
15 generation interconnection projects, including the approval of qualification of
16 generating capacity resources, demand resources, and import capacity resources

1 to participate in the Forward Capacity Auction¹ (“FCA”); implementing the
2 Federal Energy Regulatory Commission (“Commission” or “FERC”) approved
3 generator interconnection process; developing the ISO’s findings for
4 Transmission Cost Allocation; and supporting the capacity market in New
5 England.

6
7 Previously, I served as the ISO’s Director, Reliability and Operations Services. I
8 was also a former manager of the Rhode Island—Eastern Massachusetts—
9 Vermont Energy Control (“REMVEC”) center in Westborough, Massachusetts
10 and former manager of marketing operations for Northeast Utilities/Select Energy
11 Inc. in Berlin, Connecticut. I have over 35 years of experience in the operations
12 and planning of the New England bulk power system.

13
14 **Q: WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

15 A: The purpose of my testimony is to certify that resources participating in the
16 eleventh FCA, which was held on February 6, 2017, were properly qualified in
17 accordance with Section III.13.1 of the Tariff. Section III.13.8.2 (b) of the Tariff
18 requires that documentation regarding the competitiveness of the FCA be filed
19 with the Commission. Section III.13.8.2 (b) states that such documentation may
20 include a certification from the ISO that all entities offering and bidding in the
21 FCA were properly qualified in accordance with Section III.13.1 of the Tariff.

¹ Capitalized terms used but not otherwise defined in this testimony have the meanings ascribed thereto in the ISO’s Transmission, Markets and Services Tariff (the “Tariff”). Section III of the Tariff is Market Rule 1.

1 My testimony provides such certification.

2

3 **Q: WERE ALL RESOURCES OFFERING AND BIDDING IN THE**
4 **ELEVENTH FCA HELD ON FEBRUARY 6, 2017 PROPERLY**
5 **QUALIFIED IN ACCORDANCE WITH TARIFF SECTION III.13.1?**

6 A: Yes. Section III.13.1 of the Tariff sets forth the process for qualification in the
7 FCA. In my role as Vice President of System Planning, I was responsible for
8 overseeing the qualification of all resources in the eleventh FCA held on February
9 6, 2017. I certify that all resources offering and bidding in the eleventh FCA were
10 properly qualified in accordance with Section III.13.1 of the Tariff. In a
11 November 8, 2016 informational filing with the Commission, the ISO provided
12 resources qualified to participate in the eleventh FCA.² The Commission
13 approved the Informational Filing on December 6, 2016.³

14

15 **Q: WHAT WAS YOUR ROLE IN THE RELIABILITY REVIEW OF THE**
16 **VARIOUS DE-LIST BIDS?**

17 A: As the Vice President of System Planning, I oversaw the reliability review of all
18 submitted de-list bids.

19

20 **Q: What Types of De-list Bids did the ISO review?**

21

² *ISO New England Inc.*, Informational Filing for Qualification in the Forward Capacity Market, Docket No. ER17-321-000 (filed November 8, 2016) (“Informational Filing”).

³ Letter Order issued in Docket ER17-321-000 (December 6, 2016) (“Informational Filing Order”).

1 A: There are five different types of de-list bids that are reviewed for reliability.
2 Permanent, Priced-Retirement, Static, Export, and Dynamic De-list Bids. With
3 the exception of Dynamic De-list Bids, all de-list bids are submitted and reviewed
4 in advance of the FCA.

5
6 **Q: PLEASE DESCRIBE THE ISO’S REVIEW OF DE-LIST BIDS.**

7 A: Under the Tariff, all existing resources participate in the FCA, unless the resource
8 submits a de-list bid.⁴ There are two types of review performed by the ISO on the
9 de-list bids.

10

11 **Q: WHAT IS THE FIRST TYPE OF REVIEW?**

12 A: Pursuant to Section III.13.1.2.3.2 of the Tariff, prior to the auction, the ISO’s
13 Internal Market Monitor (“IMM”) reviews Export De-List Bids and Static De-List
14 Bids submitted above the Dynamic De-List Bid threshold of \$5.50/kW-month to
15 determine whether the bids are consistent with the resource’s net risk-adjusted
16 going forward and opportunity costs. This review is not performed for Dynamic
17 De-List Bids, which are submitted during the auction itself, if the price drops
18 below \$5.50/kW-month.

19 In addition, prior to the auction, the IMM reviews all submitted Permanent and
20 Retirement De-list Bids regardless of price, and a filing was made on July 15,
21 2016 (ER16-2215-000) indicating, on a confidential basis, (i) the IMM’s
22 determination with respect to each Permanent De-List Bid and Retirement De-List

⁴ Section III.13.2.3.2(c) of the Tariff.

1 Bid, (ii) supporting documentation for each determination, (iii) the capacity that
2 will permanently de-list or retire prior to the Forward Capacity Auction, and (iv)
3 whether capacity suppliers that submitted the bids have elected to conditionally or
4 unconditionally retire the capacity pursuant to Section III.13.1.2.4.1.⁵

5
6 **Q: WHAT IS THE OTHER TYPE OF REVIEW THAT THE ISO PERFORMS**
7 **WITH REGARD TO DE-LIST BIDS?**

8 A: Pursuant to Section III.13.2.5.2.5 of the Tariff and ISO Planning Procedure No.
9 10, the ISO reviews each Retirement De-List Bid, Permanent De-List Bid, Export
10 De-List Bid, Administrative Export De-List Bid, and Static De-List Bid to
11 determine if the capacity associated with the bid is needed for reliability during
12 the Capacity Commitment Period associated with the FCA. The Tariff provides
13 that capacity will be needed for reliability if the absence of that capacity would
14 result in violation of any NERC, NPCC, or ISO criteria.⁶ If the capacity
15 associated with the de-list bid is determined not to be needed for reliability, and
16 the auction price falls below the de-list bid price, the capacity associated with the
17 bid is removed from the auction.

18
19 **Q: FOR THE ELEVENTH FCA, HOW MANY DE-LIST BIDS DID THE ISO**
20 **REVIEW FOR RELIABILITY?**

21 A:

⁵ The Commission approved the filing in a Letter Order issued on August 8, 2016 in Docket No. ER16-2215-000.

⁶ Section III.13.2.5.2.5 of the Tariff.

1 The ISO reviewed two Retirement De-list Bids, totaling approximately 25 MW.
2 A total of 1,522 MW of pre-auction Static De-List Bids, were
3 submitted. However, pursuant to Tariff Section III.13.1.2.3.1.1., prior to the
4 auction, some participants elected to withdraw their Static De-list Bids. As a
5 result, a total of 243 MW of Static De-list Bids were reviewed for reliability. An
6 Export De-list bid for 100 MW was also reviewed for reliability. The auction
7 closing price was below \$5.50/kW-month (*i.e.*, the threshold for review of
8 Dynamic De-List Bids prescribed for the eleventh FCA), and as a result
9 approximately 250 MW of Dynamic De-List Bids were reviewed for reliability.
10 Finally, no Permanent De-list Bids were submitted for the eleventh FCA.

11

12 **Q: DID THE ISO REVIEW SHOW THE NEED TO RETAIN FOR**
13 **RELIABILITY ANY RESOURCES THAT SUBMITTED DE-LIST BIDS**
14 **FOR THE ELEVENTH FCA?**

15 A: No. The ISO did not reject any de-list bids that it studied for the eleventh FCA.

16

17 **Q: DOES THIS CONCLUDE YOUR TESTIMONY?**

18 A. Yes.

1 I declare that the foregoing is true and correct.

2

3

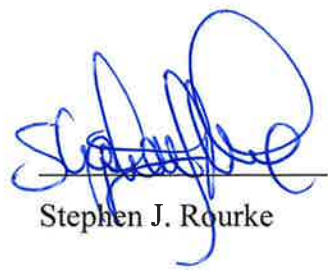
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6

7

8 February 28, 2017



Stephen J. Rourke

Attachment C

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

ISO New England Inc.

)

Docket No. ER17-___-000

**TESTIMONY OF ROBERT G. ETHIER
ON BEHALF OF ISO NEW ENGLAND INC.**

1 **Q: PLEASE STATE YOUR NAME, TITLE AND BUSINESS ADDRESS.**

2 A: My name is Robert G. Ethier. I am employed by ISO New England Inc. (the
3 “ISO”) as Vice President of Market Operations. My business address is One
4 Sullivan Road, Holyoke, Massachusetts 01040.

5

6 **Q: PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND**
7 **WORK EXPERIENCE.**

8 A: I have a Bachelor of Arts degree in Economics from Yale University, a Masters in
9 Resource Economics from Cornell University, and a Ph.D. in Resource
10 Economics from Cornell University. Since 2000, I have worked at the ISO in
11 various roles. I was responsible for Market Monitoring for nearly four years and
12 Resource Adequacy for more than two years before becoming Vice President of
13 Market Development in July 2008. In July 2014, I took on my current role as
14 Vice President of Market Operations. Before 2000, I was a Senior Associate at
15 Stratus Consulting with responsibility for energy market modeling.

16

17 **Q: WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

18 A: My testimony explains the auction prices resulting from the recently conducted

1 eleventh Forward Capacity Auction (“FCA”). The eleventh FCA was held on
2 February 6, 2017.

3
4 **Q: WHAT WAS YOUR ROLE IN THE DEVELOPMENT OF THE LIST OF**
5 **RESOURCES THAT RECEIVED CAPACITY SUPPLY OBLIGATIONS**
6 **IN THE ELEVENTH FCA?**

7 A: Section III.13.8.2 (a) of the ISO’s Transmission, Markets and Services Tariff
8 (“Tariff”), requires the ISO to provide a list of resources that received Capacity
9 Supply Obligations in each Capacity Zone and the size of the Capacity Supply
10 Obligations. The ISO has provided this information in Attachment A to this
11 filing. As the Vice President of Market Operations, Attachment A was developed
12 under my supervision and direction.

13

14 **Q: WHAT CAPACITY ZONES WERE MODELED IN THE ELEVENTH**
15 **FCA?**

16 A: The ISO modeled three Capacity Zones in the eleventh FCA: The Southeastern
17 New England (“SENE”) Capacity Zone, the Northern New England (“NNE”) Capacity
18 Zone and the Rest-of-Pool Capacity Zone. The SENE Capacity Zone
19 includes Northeastern Massachusetts/Boston, Southeastern Massachusetts, and
20 Rhode Island. The NNE Capacity Zone includes Maine, New Hampshire and
21 Vermont. The Rest-of-Pool Capacity Zone includes Connecticut and
22 Western/Central Massachusetts. As detailed in the ISO’s Informational Filing for
23 the eleventh FCA, the Local Sourcing Requirement for the import-constrained

1 SENE Capacity Zone is 9,810 MW.¹ For the export-constrained NNE Capacity
2 Zone, the Maximum Capacity Limit is 8,980 MW.² Under Section III.13.2.2 of
3 the Tariff, the total amount of capacity cleared in the auction is determined using
4 the System-Wide Capacity Demand Curve and Capacity Zone Demand Curves.

5
6 **Q: PLEASE DESCRIBE THE METHODOLOGY USED FOR**
7 **CALCULATING THE MRI CURVES FOR THE ELEVENTH FCA.**

8 A: Pursuant to Sections III.13.2.2.1, III.13.2.2.2 and III.13.2.2.3 of the Tariff, to
9 calculate the System-Wide Capacity Demand Curve, the Import-Constrained
10 Capacity Zone Demand Curve for SENE, and the Export-Constrained Capacity
11 Zone Demand Curve for NNE for the eleventh FCA, the ISO used the MRI
12 methodology. The MRI methodology measures the marginal reliability impact
13 (*i.e.*, the MRI), associated with various capacity levels for the system and the
14 Capacity Zones.

15
16 To measure the MRI, the ISO uses a performance metric known as “expected
17 energy not served” (or “EENS,” which can be described as unserved load). EENS
18 is measured in MWh per year and can be calculated for any set of system and
19 zonal installed capacity levels. The EENS values for system capacity levels are
20 produced by the GE MARS model,³ in 10 MW increments and applying the same

¹ Informational Filing for Qualification in the Forward Capacity Market at page 8, filed on November 10, 2016 in Docket No. ER16-308-000.

² *Id.*

³ The GE MARS model is the same simulation system that is already used to develop the
Installed Capacity Requirement and other values that specify how much capacity is required for
(continued...)

1 assumptions used in determining the Installed Capacity Requirement. These
2 system EENS values are translated into MRI values by estimating how an
3 incremental change in capacity impacts system reliability at various capacity
4 levels, as measured by EENS. An MRI curve is developed from these values with
5 capacity represented on the X-axis and the corresponding MRI values on the Y-
6 axis.

7
8 MRI values at various capacity levels are also calculated for the SENE import-
9 constrained Capacity Zone and the NNE export-constrained Capacity Zone using
10 the same modeling assumptions and methodology as those used to determine the
11 Local Resource Adequacy Requirement and the Maximum Capacity Limit for
12 those Capacity Zones, with the exception of the modification of the transfer
13 capability for the SENE import-constrained Capacity Zone as described in more
14 detail below. These MRI values are calculated to reflect the change in system
15 reliability associated with transferring incremental capacity from the Rest-of-Pool
16 Capacity Zone into the constrained capacity zone.

17

18 **Q: PLEASE EXPLAIN THE TRANSITION METHODOLOGY USED TO**
19 **DEVELOP THE SYSTEM-WIDE CAPACITY DEMAND CURVE FOR**
20 **THE ELEVENTH FCA.**

(...continued)

resource adequacy purposes from a system planning perspective. For the development of the MRI Curves, the GE MARS model is used to calculate reliability values using 10 MW additions above and 10 MW deductions below the calculated requirements until a sufficient set of values that covers the full range necessary to produce the MRI-based Demand Curves is determined.

1 A: The MRI transition period aims to provide a transition from the linear system-
2 wide capacity demand curve methodology used in the ninth and tenth FCAs to the
3 MRI-based system-wide capacity demand curve methodology. This transition
4 seeks to provide a relatively stable and consistent market signal and balance
5 stakeholder interests while moving to a curve that more accurately reflects
6 efficient trade-offs between costs and reliability. The transition period begins
7 with the eleventh FCA and may last no longer than three FCAs. If certain
8 conditions relating to net Installed Capacity Requirement growth are met, the
9 transition period will end earlier, pursuant to Section III.13.2.2.1 of the Tariff.
10 During the MRI transition period, the System-Wide Capacity Demand Curve is
11 represented as a hybrid of the previous linear demand curve design and the new
12 MRI-based demand curve design.

13
14 During the MRI transition period, the System-Wide Capacity Demand Curve for
15 the eleventh FCA shall consist of the following three segments:

- 16 (1) at prices above \$7.03/kW-month and at or below the Forward Capacity
17 Auction Starting Price, the System-Wide Capacity Demand Curve shall
18 specify a price for system capacity quantities based on the product of the
19 system-wide Marginal Reliability Impact value, calculated pursuant to Section
20 III.12.1.1, and the scaling factor specified in Section III.13.2.2.4 of the Tariff;
21 (2) for prices below \$7.03/kw-month, the System-Wide Capacity Demand Curve
22 is represented by a linear segment that runs from a price of \$7.03 and a

1 capacity quantity of 35,437 MW to a price of \$0 and a capacity quantity of
2 37,053 MW; and
3 (3) a horizontal line at a price of \$7.03/kw-month which connects segments (1)
4 and (2) specified above.⁴

5
6 **Q: PLEASE PROVIDE ADDITIONAL DETAILS REGARDING THE**
7 **DEVELOPMENT OF THE IMPORT-CONSTRAINED CAPACITY ZONE**
8 **DEMAND CURVE FOR THE SENE CAPACITY ZONE.**

9 A: For import-constrained Capacity Zones, the Local Resource Adequacy
10 Requirement and Transmission Security Analysis Requirement values both play a
11 role in defining the MRI-based demand curves, just as they do in setting the Local
12 Sourcing Requirement. Under III.12.2.1.3 of the Tariff, prior to each FCA, the
13 ISO must determine the MRI value of various capacity levels for each import-
14 constrained Capacity Zone. For purposes of these calculations, the ISO applies the
15 same modeling assumptions and methodology used to determine the Local
16 Resource Adequacy Requirement except that the transfer capability between the
17 Capacity Zone under study and the rest of the New England Control Area is
18 reduced by the greater of: (i) the Transmission Security Analysis Requirement
19 minus the Local Resource Adequacy Requirement, and; (ii) zero. By using a
20 transfer capability that accounts for both the Transmission Security Analysis and
21 the Local Resource Adequacy Requirements, the ISO applies the same “higher
22 of” logic used in the Local Sourcing Requirement to the derivation of sloped
23 zonal demand curves. Using the values calculated pursuant to Section III.12.2.1.3

⁴ Section III.13.2.2.1 of the Tariff.

1 and the scaling factor specified in Section III.13.2.2.4 of the Tariff, the ISO must
2 determine each Import-Constrained Capacity Zone's Demand Curve pursuant to
3 Section III.13.2.2.2 of the Tariff. For the eleventh FCA, the only import-
4 constrained Capacity Zone is SENE and, therefore, there is only one Import-
5 Constrained Capacity Zone Demand Curve.

6

7 **Q: PLEASE PROVIDE ADDITIONAL DETAILS REGARDING THE**
8 **DEVELOPMENT OF THE EXPORT-CONSTRAINED CAPACITY ZONE**
9 **DEMAND CURVE FOR THE NNE CAPACITY ZONE.**

10 A: Under Section III.12.2.1.3 of the Tariff, prior to each FCA, the Export-
11 Constrained Capacity Zone Demand Curve is calculated using the same modeling
12 assumptions and methodology used to determine the export-constrained Capacity
13 Zone's Maximum Capacity Limit. Using the values calculated pursuant to
14 Section III.12.2.2.1 and the scaling factor specified in Section III.13.2.2.4 of the
15 Tariff, the ISO must determine each Export-Constrained Capacity Zone's
16 Demand Curve pursuant to Section III.13.2.2.3 of the Tariff. For the eleventh
17 FCA, the only export-constrained Capacity Zone is NNE and, therefore, there is
18 only one Export-Constrained Capacity Zone Demand Curve.

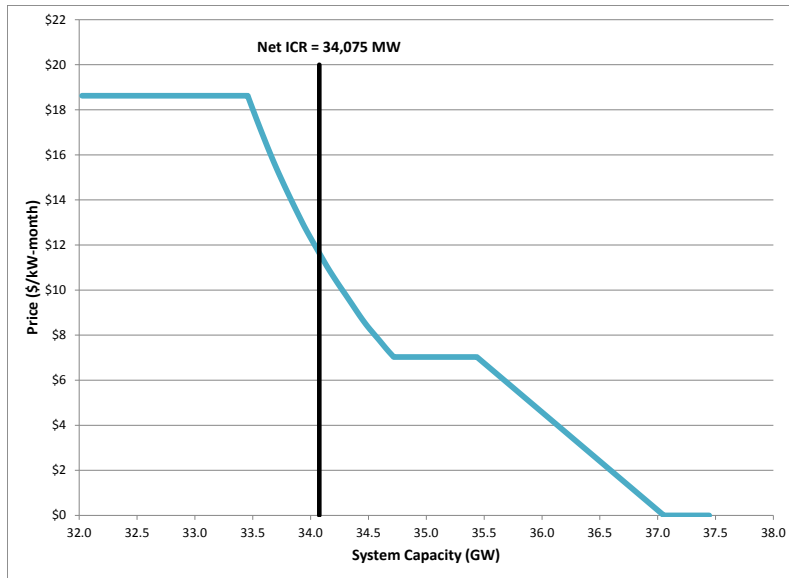
19

20 **Q: WHAT DEMAND CURVES HAS THE ISO CALCULATED FOR THE**
21 **ELEVENTH FCA?**

22 A: As required under Section III.12 of the Tariff, the ISO calculated the following
23 Demand Curves for the eleventh FCA:

24

25 1. System-Wide Capacity Demand Curve

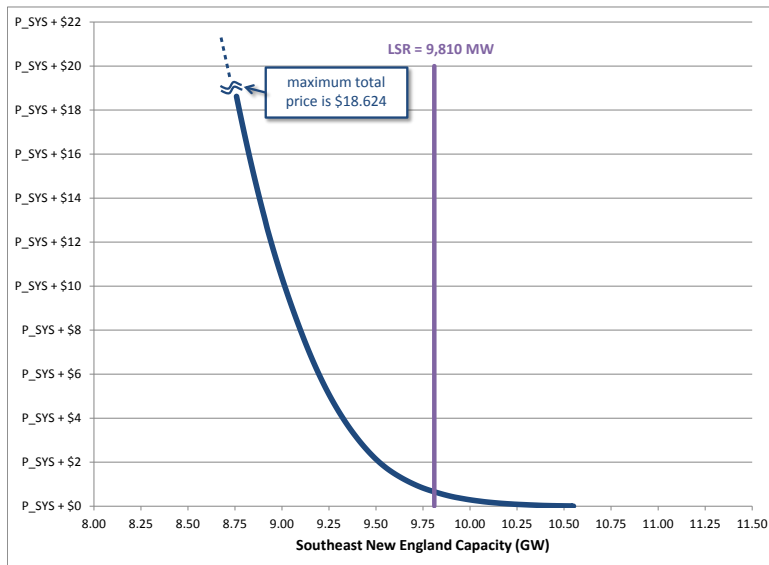


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3. 2. Import-Constrained Capacity Zone Demand Curve for the SENE Capacity

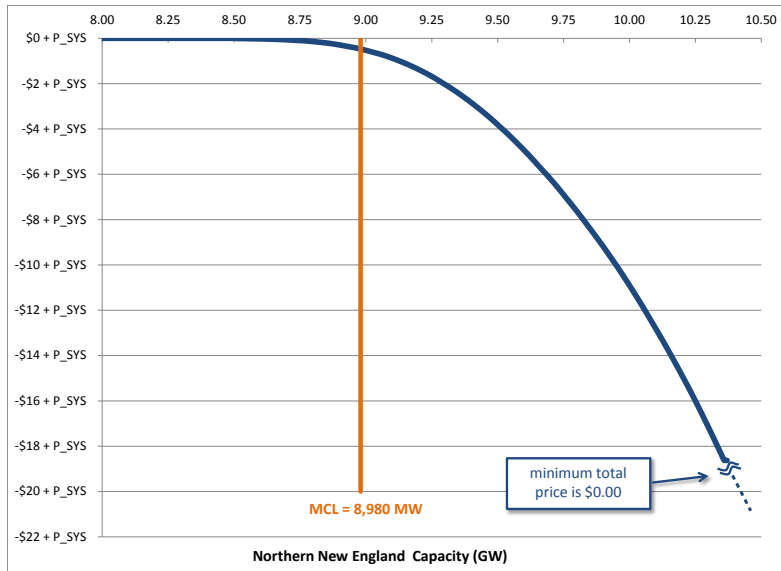
4. Zone



5

6

7. 3. Export-Constrained Capacity Zone Demand Curve for the NNE Capacity Zone

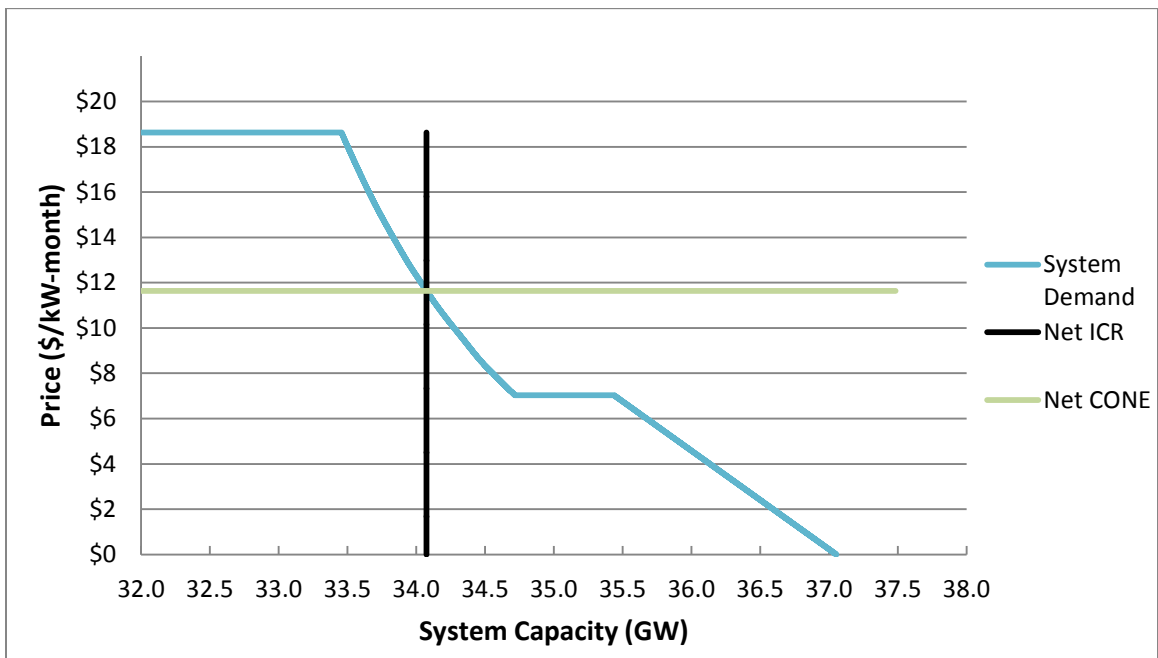


1

2

3 **Q: CAN YOU PROVIDE A GRAPH OF THE SYSTEM-WIDE SLOPED**
 4 **DEMAND CURVE ALONG WITH THE NET ICR AND NET CONE FOR**
 5 **THE ELEVENTH FCA?**

6 **A: Yes. Below is a graph of the system-wide sloped demand curve, Net CONE, and**
 7 **NICR beginning at 32,000 MW:**



8

9

1 **Q: WHAT CAUSED THE DESCENDING CLOCK AUCTION TO CLOSE?**

2 A: The auction bound system-wide in the fifth round of the auction and at a price
3 below the Dynamic De-List Bid Threshold when a Dynamic De-List Bid resulted
4 in system-wide supply falling short of system-wide demand. One additional
5 round was conducted for the New Brunswick external interface because at the
6 \$4.000/kW-month end-of-round price of the fifth round, supply over the New
7 Brunswick external interface continued to exceed the interface's Capacity
8 Transfer Limit.

9
10 **Q: WHAT WERE THE PRICES FOR THE CAPACITY ZONES?**

11 A: The auction commenced with a starting price of \$18.624/kW-month and
12 concluded for the SENE, NNE and Rest-of-Pool Capacity Zones after five rounds.
13 Resources in those Capacity Zones will be paid at the Capacity Clearing Price set
14 pursuant to the system-wide sloped demand curve, which was \$5.297/kW-month.⁵

15
16 **Q: WHY WAS THE CAPACITY CLEARING PRICE \$5.297/KW-MONTH IN
17 THE SENE, NNE AND REST-OF-POOL CAPACITY ZONES?**

18 A: Under the rules for the FCA, a de-list bid represents the price at which a resource
19 wishes to withdraw from the auction; so to retain a resource with a submitted
20 delist bid, the auction price must be strictly above the bid price. In the eleventh
21 FCA, a Dynamic De-List Bid was submitted for an Existing Capacity Resource at
22 \$5.296/kW-month. At prices above \$5.296/kW-month, this capacity was offered

⁵ Existing resources with multi-year obligations from previous auctions will be paid based on the Capacity Clearing Price in the auction in which they originally cleared. Self-supplied resources will not be paid through the FCM.

1 and would be included in the capacity procured by the auction. Above
2 \$5.296/kW-month, system-wide supply exceeded system-wide demand.
3 However, at prices at and below \$5.296/kW-month, the capacity withdrawn by
4 the Existing Capacity Resource with the Dynamic De-List Bid was not offered
5 and system-wide supply was less than system-wide demand. Therefore, the
6 Dynamic De-List Bid was marginal and set the price of \$5.297/kW-month.
7 However, the entire quantity of the Dynamic De-List Bid was not needed to meet
8 the quantity demanded at the price which cleared the FCA. Dynamic De-List
9 Bids are able to be rationed, which means that they can be taken all or in part. To
10 allow supply to precisely match demand, the price-setting de-list bid in the
11 eleventh FCA was rationed to a withdrawal quantity that resulted in system-wide
12 supply meeting system-wide demand at \$5.297/kW-month. This quantity
13 maximizes social surplus. The Existing Capacity Resource received a Capacity
14 Supply Obligation for the de-list bid's remaining quantity. The Capacity Clearing
15 Price was \$5.297/kW-month because this was the lowest price at which the
16 Existing Capacity Resource was willing to accept a Capacity Supply Obligation.
17 The marginal Dynamic De-List bid set the Capacity Clearing Prices in the SENE,
18 NNE and Rest-of-Pool Capacity Zones at \$5.297/kW-month.

19

20 **Q: WHY WERE THE PRICES FOR THE SENE AND NNE CAPACITY**
21 **ZONES THE SAME AS THE PRICE FOR THE REST-OF-POOL**
22 **CAPACITY ZONE?**

23 A: Although the SENE Capacity Zone was modeled as an import-constrained zone,
24 at the Capacity Clearing Price for the Rest-of-Pool Capacity Zone of \$5.297/kW-

1 month, there were sufficient resources to meet the zone's demand. An import-
2 constrained zone's demand curve is the *minimum* amount of capacity that must be
3 electrically located within the zone and is binding at all prices at which zonal
4 supply *is less than or equal* to zonal demand. It is specified at price *premiums* to
5 the Capacity Clearing Price for the Rest-of-Pool Capacity Zone. The Capacity
6 Clearing Price in the SENE Capacity Zone is the same as that in the Rest-of-Pool
7 Capacity Zone because at the Capacity Clearing Price for the Rest-of-Pool
8 Capacity Zone, which is the *maximum* quantity demanded for the import-
9 constrained zone, the import-constrained zone's demand was not binding.
10 Although the NNE Capacity Zone was modeled as an export-constrained zone, at
11 the Capacity Clearing Price for the Rest-of-Pool Capacity Zone of \$5.297/kW-
12 month, zonal supply did not exceed zonal demand. An export-constrained zone's
13 demand curve is the *maximum* amount of capacity that can be electrically
14 transferred from the export-constrained zone to the Rest-of-Pool Capacity zone
15 and is binding at all prices at which zonal supply *exceeds* zonal demand. It is
16 specified at price *discounts* to the Capacity Clearing Price for the Rest-of-Pool
17 Capacity Zone where the discounts are non-positive values. The Capacity
18 Clearing Price in the NNE Capacity Zone is the same as that in the Rest-of-Pool
19 Capacity Zone because at the Capacity Clearing Price for the Rest-of-Pool
20 Capacity Zone, which is the *minimum* quantity demanded for the export-
21 constrained zone, the export-constrained zone's demand was not binding.

22
23 **Q: WHAT WERE THE PRICES ON THE EXTERNAL INTERFACES?**

1 A: Imports over the New York AC Ties external interface, totaling 539.4 MW,
2 imports over the Phase I/II HQ Excess external interface, totaling 441 MW, and
3 imports over the Hydro-Quebec Highgate external interface, totaling 55 MW, will
4 receive \$5.297/kW-month. Imports over the New Brunswick external interface,
5 totaling 200 MW, will receive \$3.381/kW-month.

6

7 **Q: WHY WAS THE CAPACITY CLEARING PRICE FOR THE NEW**
8 **BRUNSWICK EXTERNAL INTERFACE LOWER THAN THE OTHER**
9 **CAPACITY CLEARING PRICES?**

10 A: The associated Capacity Zone for the New Brunswick external interface in the
11 eleventh FCA was the NNE Capacity Zone. At the \$5.297/kW-month Capacity
12 Clearing Price for the NNE Capacity Zone, the New Brunswick external interface
13 had a greater amount of capacity offered than the interface's capacity transfer
14 limit allowed. Accordingly, pursuant to Section III.13.2.3.3 (d) of the Tariff, this
15 external interface was treated in the auction as if it comprised a separately
16 modeled export-constrained capacity zone. Therefore, a sixth round of bidding
17 was required and a separate Capacity Clearing Price was determined for the New
18 Brunswick external interface.

19

20 **Q: DOES THIS CONCLUDE YOUR TESTIMONY?**


21 A: Yes.

1 I declare that the foregoing is true and correct.

2

3

4

A handwritten signature in black ink, appearing to read 'R. Ethier', is written over a horizontal line.

5

Robert G. Ethier

6

7 February 28, 2017

Attachment D

1 UNITED STATES OF AMERICA
2 BEFORE THE
3 FEDERAL ENERGY REGULATORY COMMISSION
4

5)
6 ISO New England Inc.)

Docket No. ER17-___-000

7)
8 TESTIMONY OF JEFFREY MCDONALD, PhD
9

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

11 A: My name is Jeffrey McDonald. I am Vice President of Market Monitoring within
12 ISO New England Inc. (the "ISO"), where I perform the role of the Internal
13 Market Monitor ("IMM"). My business address is One Sullivan Road, Holyoke,
14 Massachusetts 01040.

15
16 Q: PLEASE DESCRIBE YOUR WORK EXPERIENCE AND EDUCATIONAL
17 BACKGROUND.

18 A: I have a Bachelor of Science degree in Agriculture and Managerial Economics
19 from the University of California, Davis ("UC Davis"); a Masters of Science
20 degree in Natural Resource Economics from the University of Massachusetts-
21 Amherst; and a Ph.D. degree in Agriculture and Natural Resource Economics
22 from UC Davis. Before joining the ISO in April 2014, I worked at the California
23 ISO as Manager of Market Analysis and Mitigation in the Market Monitoring
24 Department. In the fourteen years I worked at the California ISO, I held positions
25 of increasing responsibility within the Department of Market Monitoring.
26 Before the California ISO, I worked for the State of California as a Staff
27 Economist in the Department of Industrial Relations and the Department of
28 Transportation.
29

1 **Q: WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

2 A: The purpose of my testimony is to certify that all offers and bids in the eleventh
3 Forward Capacity Auction (“FCA”)¹ that were required by the applicable
4 provisions of the Tariff to be reviewed by the IMM were in fact properly
5 reviewed and whether the outcome of the eleventh FCA was the result of a
6 competitive auction. Section III.13.8.2 (b) of the Tariff requires that, after each
7 FCA, documentation regarding the competitiveness of the FCA be filed with the
8 Commission.

9

10 **Q: WERE ALL DE-LIST BIDS FROM EXISTING RESOURCES AND**
11 **OFFERS FROM NEW RESOURCES PROPERLY REVIEWED BY THE**
12 **IMM AND QUALIFIED IN ACCORDANCE WITH SECTION III.13.1 OF**
13 **THE TARIFF PRIOR TO THE ELEVENTH FCA CONDUCTED ON**
14 **FEBRUARY 6, 2017?**

15 A: Yes. Section III.13.1 of the Tariff sets forth the process for qualifying resources
16 to participate in the FCA. Section III.13.1.2.3.2 of the Tariff requires that the
17 IMM review each Static De-List Bid, Export De-List Bid and Permanent De-List
18 Bid above \$5.50/kW-month to determine whether the bid is consistent with the
19 resource’s net risk-adjusted going forward costs and opportunity costs.
20 Additionally, pursuant to Section III.A.21.2 of the Tariff, the IMM reviews
21 requests submitted by each New Capacity Resource to offer in the FCA below the
22 Offer Review Trigger Price for the applicable resource type. If the IMM
23 determines that the requested offer price is inconsistent with the IMM’s capacity
24 price estimate, then the resource’s New Resource Offer Floor Price is set to a
25 level that is consistent with the capacity price estimate, as determined by the
26 IMM.

27

28 As Vice President of Market Monitoring, I am responsible for overseeing the
29 review of all of these bids and offers, and I certify that such review was

¹ Capitalized terms used but not defined in this testimony have the meanings ascribed to them in the ISO New England Transmission, Markets and Services Tariff (the “Tariff”).

1 performed in accordance with the provisions of Section III.13.1 of the Tariff. The
2 IMM's determinations with respect to these bids and offers were filed with the
3 Commission in Docket No. ER17-321-000, and were accepted by the
4 Commission on December 6, 2016.²

5
6 **Q: WAS THE OUTCOME OF THE ELEVENTH FCA CONDUCTED FOR**
7 **THE 2020-2021 CAPACITY COMMITMENT PERIOD THE RESULT OF**
8 **A COMPETITIVE AUCTION?**

9 **A:** Yes. The outcome of the eleventh FCA was the result of a competitive auction.
10 System-wide there were sufficient existing resources to meet the Net Installed
11 Capacity Requirement. The IMM performed the Pivotal Supplier Test³ and found
12 that there were no pivotal suppliers that also had active Static De-List Bids or
13 Offers from New Import Capacity Resources. Therefore, it was not necessary to
14 apply market power mitigation to these resources. Under the Tariff, new
15 resources, with the exception of New Import Capacity Resources, can leave the
16 auction at any price at or above their New Resource Offer Floor Price, which is a
17 product of the IMM's mitigation review when a price below the Offer Review
18 Trigger Price is requested by the participant. There were sufficient existing and
19 new resources in the eleventh FCA that the outcome of the auction was
20 competitive. I base this conclusion on the rigorous qualification requirements
21 including application of mitigation rules, the extent to which existing supply that
22 is subject to mitigation review was in excess of the Net Installed Capacity
23 Requirement, and the volume of capacity from new resources that offered into the
24 auction at prices materially below the auction starting price and not below a
25 competitive price established through the mitigation process.

26

² Letter Order issued in Docket ER17-321-000 (December 6, 2016). In addition, the IMM's determinations with respect to Permanent De-List Bids and Retirement De-List Bids that were submitted prior to the Existing Capacity Qualification Deadline were detailed in a confidential filing to the Commission on July 15, 2016. The Commission accepted the filing in a Letter Order issued in Docket No. ER16-2215-000 on August 8, 2016.

³ Section III.A.23 of the Tariff.

1 Q: WHAT ARE THE “RIGOROUS QUALIFICATION REQUIREMENTS” YOU
2 REFERENCE IN THE PREVIOUS ANSWER?

3 A: During qualification, the IMM review of de-list bids above the Dynamic De-List
4 Bid Threshold and new capacity offers that request to submit an offer below the
5 relevant Offer Review Trigger Price and the mitigation that may result from this
6 review ensures that bids and offers submitted during qualification are consistent
7 with each resource’s costs.

8
9 Q: DOES THIS CONCLUDE YOUR TESTIMONY?

10 A: Yes.

11

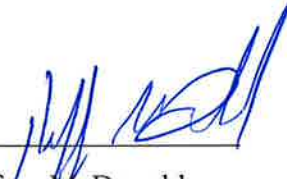
12 I declare that the foregoing is true and correct.

13

14

15

16



Jeffrey McDonald.

17

18 February 28, 2017

19

Attachment E

1 UNITED STATES OF AMERICA
2 BEFORE THE
3 FEDERAL ENERGY REGULATORY COMMISSION
4

5
6)
7 ISO New England Inc.) Docket No. ER17-__-000
8)
9

10 TESTIMONY OF LAWRENCE M. AUSUBEL

11
12 Q. PLEASE STATE YOUR NAME, TITLE AND BUSINESS ADDRESS.

13 A. My name is Lawrence M. Ausubel. I am the Founder and Chairman of Power
14 Auctions LLC, the company that has helped to design, implement, and administer
15 the Forward Capacity Auction (“FCA”) for ISO New England Inc. (the “ISO”).
16 I am also a Professor of Economics at the University of Maryland. My business
17 address is 3333 K St. NW Suite 425, Washington, DC 20007.

18
19 Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND
20 WORK EXPERIENCE.

21 A. I have an A.B. in Mathematics from Princeton University, an M.S. in
22 Mathematics from Stanford University, an M.L.S. in Legal Studies from Stanford
23 University, and a Ph.D. in Economics from Stanford University.
24 I am the Chairman of Power Auctions LLC, a provider of auction implementation
25 services and software worldwide. I was also the President of Market Design Inc.,
26 an economics consultancy that (until its dissolution in 2016) offered services in
27 the design of auction markets. In recent years, I have played a lead role in the
28 design and implementation of: electricity auctions in France, Germany, Spain,

1 Belgium and the US; gas auctions in Germany, France, Hungary and Denmark;
2 the world's first auction for greenhouse gas emission reductions in the UK; and a
3 prototype airport slot auction in the US. I have advised the US Federal
4 Communications Commission, Industry Canada and the Australian
5 Communications and Media Authority on spectrum auctions. I have also advised
6 BOEM (the US Bureau of Ocean Energy Management) and ICANN (the Internet
7 Corporation for Assigned Names and Numbers) on auction design. I hold 22 U.S.
8 patents related to auction technology and I have published numerous articles on
9 auction design, bargaining, industrial organization and financial markets. My
10 curriculum vitae, which includes a list of publications and other experience, is
11 attached.

12
13 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

14 A. The purpose of this testimony is to certify that the recently concluded FCA was
15 conducted in accordance with the relevant filed market rules. Section
16 III.13.8.2(b) of the ISO New England Transmission, Markets and Services Tariff
17 (the "Tariff") requires that after each FCA, documentation regarding the
18 competitiveness of the FCA be filed with the Federal Energy Regulatory
19 Commission ("Commission"). Section III.13.8.2(b) states that such
20 documentation may include certification from the auctioneer that the FCA was
21 conducted in accordance with the provisions of Section III.13 of the Tariff.
22 Section III.13.2 of the Tariff provides the rules relating to the mechanics of the
23 FCA. My testimony certifies that the FCA was conducted in accordance with

1 Section III.13.2.

2
3 **Q. PLEASE DESCRIBE POWER AUCTIONS LLC**

4 A. Power Auctions LLC designs, implements and conducts high-stakes electronic
5 auctions utilizing proprietary software, processes, and other intellectual property.
6 The PowerAuctions software platform designed by Power Auctions LLC has been
7 used to implement over 200 auctions worldwide in the electricity, gas and
8 resource sectors. In the electricity sector, the software platform was used to
9 operate 42 quarterly EDF Generation Capacity Auctions in France. It was also
10 used for the Endesa-Iberdola Virtual Power Plant Auctions in Spain, the
11 Electrabel Virtual Power Plant Auctions in Belgium and the E.ON Virtual Power
12 Plant Auction in Germany. Currently, our software platform is also used for
13 implementing the UK's Capacity Market auctions and for implementing the
14 US Department of Interior's auctions of offshore wind energy tracts. Further,
15 Power Auctions LLC is part of the team that the Federal Communications
16 Commission has assembled to design and implement incentive auctions for the
17 United States, and is the prime contractor to the Governments of Australia and
18 Canada for implementation of spectrum auctions.
19 Power Auctions LLC worked with the ISO to design and implement (on the
20 PowerAuctions platform) the previous FCAs held on February 4-6, 2008;
21 December 8-10, 2008; October 5-6, 2009; August 2-3, 2010; June 6-7, 2011;
22 April 2-3, 2012; February 4-5, 2013; February 3, 2014; February 2, 2015; and
23 February 8, 2016.

24

1 **Q. WHAT WAS POWER AUCTIONS LLC'S ROLE IN THE FORWARD**
2 **CAPACITY AUCTION HELD ON FEBRUARY 6, 2017?**

3 A. The ISO retained Power Auctions LLC as the independent auction manager
4 (“Auction Manager”) for the tenth FCA. As the Auction Manager, Power
5 Auctions LLC worked with the ISO to design and implement the FCA in
6 conformance with the Tariff. By design, the Auction Manager conducted the
7 auction independently, with limited involvement by the ISO. The auction was
8 implemented using the PowerAuctions software platform.

9
10 **Q. WAS THE FCA HELD ON FEBRUARY 6, 2017 CONDUCTED IN**
11 **ACCORDANCE WITH SECTION III.13.2 OF THE TARIFF?**

12 A. Yes. In accordance with Section III.13.8.2(b) of the Tariff, I certify that, to the
13 best of my knowledge, the FCA of February 6, 2017 was conducted in
14 conformance with the provisions of Section III.13.2 of the Tariff.

15
16 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

17 A. Yes.

18
19 I declare that the foregoing is true and correct.

20
21 Executed on February 21, 2017

22 

23
24 Lawrence M. Ausubel

25

Curriculum Vitae

LAWRENCE M. AUSUBEL

Address

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Personal

Year of Birth: 1959
Place of Birth: New York City

Education

Ph.D. (1984) Stanford University, Economics
M.L.S. (1984) Stanford Law School, Legal Studies
M.S. (1982) Stanford University, Mathematics
A.B. (1980) Princeton University, Mathematics

Honors: Fellow of the Econometric Society
Phi Beta Kappa
Sigma Xi
Magna cum laude in mathematics
Stanford University Economics Department, graduate fellowship, 1982
Stanford Law School, fellowship in law and economics, 1983

Fields of Concentration

Microeconomic Theory and Game Theory
Auctions and Bargaining
Market Design
Credit Cards, Bankruptcy and Banking
Industrial Organization
Law and Economics

Professional Experience

Professor of Economics, University of Maryland (August 1992 – present).

Chairman and Founder, Power Auctions LLC (2003 – present).

Power Auctions LLC has been a technology provider of auction design, auction software, implementation services and intellectual property since 2003. The PowerAuctions™ software platform has been used for more than 200 high-stakes auctions on six continents, with total transaction values approaching \$100 billion.

President, Market Design Inc. (2003 – 2016).

Until its dissolution in 2016, Market Design Inc. was a consultancy of leading economists and game theorists (Al Roth, Peter Cramton, R. Preston McAfee, Paul Milgrom, Robert Wilson, et al) that worked with governments and companies worldwide to design and implement state-of-the-art auctions and markets.

Assistant Professor of Managerial Economics and Decision Sciences, Kellogg School, Northwestern University (September 1984 – August 1992).

Visiting Assistant Professor, New York University (January 1990 – May 1990).

Recent Consulting Experience

Provided expert bidding advice to bidders in more than a dozen large spectrum auctions, including Bharti Airtel in India's 900/1800 MHz auction, Orange in Slovakia's Multi-Band spectrum auction, Three (Hutchison) in the UK 4G auction, Eircom in Ireland's 800/900/1800 MHz auction, Aircel in India's 3G/BWA auctions, Spain's Telefónica in the UK, German, Italian and Austrian UMTS/3G spectrum auctions, Ericsson in the US PCS spectrum auctions, MTN in the Nigerian spectrum auctions, MCI in the US Direct Broadcast Satellite auction, US Airwaves in the US C-Block Auction, Mobile Media in the US Narrowband Auction, and other confidential clients.

Advisor to the US government (Federal Communications Commission) on the design and implementation of incentive auctions for spectrum, 2011 – present.

Advisor to the Canadian government (Industry Canada) on the design and implementation of the 700 MHz and 2.5 GHz spectrum auctions, 2010 – present.

Advisor to the Australian government (ACMA) on the design and implementation of the Australian Digital Dividend auction and future spectrum auctions, 2011 – present.

Provided auction design advice to the IDA Singapore on their Auction of Public Cellular Mobile Telecommunication Services Spectrum Rights, 2007 – 2008.

Design and implementation of the Trinidad and Tobago GSM auction, 2005.

Design and implementation of the UK Capacity Market auction (electricity, 2014 – present).

Design and implementation of auctions for offshore wind energy tracts for the Bureau of Ocean Energy Management (BOEM), US Department of Interior (2010 – present).

Design and implementation of the Forward Capacity Auction for ISO New England (electricity, 2007 – present).

Design and implementation of the quarterly Electricité de France generation capacity auctions (2001 – 2011) and Long-Term Contract auctions (2008 – 2009).

Design and implementation of the quarterly Spanish Virtual Power Plant (VPP) auctions (electricity, 2007 – 2009).

Design and implementation of the E.ON VPP auction in Germany (2007).

Design and implementation of the quarterly Electrabel Virtual Power Plant (VPP) auctions in Belgium (2003 – 2005).

Design and implementation of auctions for new gTLDs for ICANN (Internet Corporation for Assigned Names and Numbers (2008 – present).

Design and implementation of rough diamond auctions for Okavango Diamond Company, Botswana (2013 – present).

Design and implementation of rough diamond auctions for BHP Billiton/Dominion Diamonds (2007 – 2014).

Design and implementation of the annual E.ON Földgáz Trading gas release programme auction in Hungary (2006 – 2013).

Design and implementation of the annual Danish Oil and Natural Gas (DONG Energy) gas release programme auction (2006 – 2011).

Design and implementation of the annual E.ON Ruhrgas gas release programme auction in Germany (2003 – 2008, 2010).

Design and implementation of the Gaz de France gas storage auction (2006).

Design and implementation of the Gaz de France gas release programme auction (2004).

Design and implementation of the Total gas release programme auction (2004).

Design and implementation of the UK Emissions Trading Scheme auction to procure greenhouse gas emission reductions for the UK Government (2002).

Design and implementation of a demonstration auction of landing and takeoff slots for LaGuardia Airport, for the US Federal Aviation Administration (2005).

Teaching

Econ 456	Law and Economics (Undergraduate; Maryland)
Econ 603	Microeconomic Analysis (Ph.D.; Maryland)
Econ 661	Industrial Organization (Ph.D.; Maryland)
Econ 704	Advanced Microeconomics: Market Design (Ph.D.; Maryland)
Mngl Econ D30	Intermediate Microeconomics (M.B.A.; Northwestern)
Mngl Econ D45	Regulation and Deregulation (M.B.A.; Northwestern)

Publications

“Efficient Procurement Auctions with Increasing Returns” (with Oleg V. Baranov, Christina Aperjis and Thayer Morrill), *American Economic Journal: Microeconomics*, forthcoming, 2017.

“A Practical Guide to the Combinatorial Clock Auction” (with Oleg V. Baranov), *Economic Journal*, forthcoming, 2017.

“An Experiment on Auctions with Endogenous Budget Constraints” (with Justin E. Burkett and Emel Filiz-Ozbay), *Experimental Economics*, forthcoming, 2017.

“Demand Reduction and Inefficiency in Multi-Unit Auctions” (with Peter Cramton, Marek Pycia, Marzena J. Rostek and Marek Weretka), *Review of Economic Studies*, Vol. 81, No. 4, pp. 1366-1400, October 2014.

“Sequential Kidney Exchange” (with Thayer Morrill), *American Economic Journal: Microeconomics*, Vol. 6, No. 3, pp. 265-285, August 2014.

“Market Design and the Evolution of the Combinatorial Clock Auction” (with Oleg V. Baranov), *American Economic Review: Papers & Proceedings*, Vol. 104, No. 5, pp. 456-451, May 2014.

“Common-Value Auctions with Liquidity Needs: An Experimental Test of a Troubled Assets Reverse Auction” (with Peter Cramton, Emel Filiz-Ozbay, Nathaniel Higgins, Erkut Ozbay and Andrew Stocking), Chapter 20 of *Handbook of Market Design* (Nir Vulkan, Alvin E. Roth, and Zvika Neeman, eds.), Oxford University Press, 2013.

“Non-Judicial Debt Collection and the Consumer’s Choice among Repayment, Bankruptcy and Informal Bankruptcy” (with Amanda E. Dawsey and Richard M. Hynes), *American Bankruptcy Law Journal*, Vol. 87, pp. 1-26 [lead article], March 2013.

“Virtual Power Plant Auctions” (with Peter Cramton), *Utilities Policy*, Vol. 18, No. 4, pp. 201-208, December 2010.

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- “An Efficient Dynamic Auction for Heterogeneous Commodities,” *American Economic Review*, Vol. 96, No. 3, pp. 602-629, June 2006.
- “An Efficient Ascending-Bid Auction for Multiple Objects,” *American Economic Review*, Vol. 94, No. 5, pp. 1452-1475, December 2004.
- “Dynamic Auctions in Procurement” (with Peter Cramton), Chapter 9 of *Handbook of Procurement* (N. Dimitri, G. Piga, and G. Spagnolo, eds.), pp. 220-245, Cambridge: Cambridge University Press, 2006.
- “The Lovely but Lonely Vickrey Auction” (with Paul Milgrom), Chapter 1 of *Combinatorial Auctions* (P. Cramton, Y. Shoham, and R. Steinberg, eds.), pp. 17-40, Cambridge: MIT Press, 2006.
- “Ascending Proxy Auctions” (with Paul Milgrom), Chapter 3 of *Combinatorial Auctions* (P. Cramton, Y. Shoham, and R. Steinberg, eds.), pp. 79-98, Cambridge: MIT Press, 2006.
- “The Clock-Proxy Auction: A Practical Combinatorial Auction Design” (with Peter Cramton and Paul Milgrom), Chapter 5 of *Combinatorial Auctions* (P. Cramton, Y. Shoham, and R. Steinberg, eds.), pp. 115-138, Cambridge: MIT Press, 2006.
- “Auctioning Many Divisible Goods” (with Peter C. Cramton), *Journal of the European Economics Association*, Vol. 2, Nos. 2-3, pp. 480-493, April-May 2004.
- “Vickrey Auctions with Reserve Pricing” (with Peter C. Cramton), *Economic Theory*, 23, pp. 493-505, April 2004. Reprinted in Charalambos Aliprantis, et al. (eds.), *Assets, Beliefs, and Equilibria in Economic Dynamics*, Berlin: Springer-Verlag, 355-368, 2003.
- “Auction Theory for the New Economy,” Chapter 6 of *New Economy Handbook* (D. Jones, ed.), San Diego: Academic Press, 2003.
- “Ascending Auctions with Package Bidding” (with Paul Milgrom), *Frontiers of Theoretical Economics*, Vol. 1, No. 1, Article 1, August 2002.
<http://www.bepress.com/bejte/frontiers/vol1/iss1/art1>
- “Bargaining with Incomplete Information” (with Peter Cramton and Raymond Deneckere), Chapter 50 of *Handbook of Game Theory* (R. Aumann and S. Hart, eds.), Vol. 3, Amsterdam: Elsevier Science B.V., 2002.
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- “Implications of Auction Theory for New Issues Markets,” *Brookings-Wharton Papers on Financial Services*, Vol. 5, pp. 313-343, 2002.
- “Synergies in Wireless Telephony: Evidence from the Broadband PCS Auctions” (with Peter Cramton, R. Preston McAfee, and John McMillan), *Journal of Economics and Management Strategy*, Vol. 6, No. 3, Fall 1997, pp. 497-527.

- “Credit Card Defaults, Credit Card Profits, and Bankruptcy,” *American Bankruptcy Law Journal*, Vol. 71, Spring 1997, pp. 249-270; recipient of the Editor's Prize for the best paper in the *American Bankruptcy Law Journal*, 1997.
- “Efficient Sequential Bargaining” (with R. Deneckere), *Review of Economic Studies*, Vol. 60, No. 2, April 1993, pp. 435-461.
- “A Generalized Theorem of the Maximum” (with R. Deneckere), *Economic Theory*, Vol. 3, No. 1, January 1993, pp. 99-107.
- “Durable Goods Monopoly with Incomplete Information” (with R. Deneckere), supercedes “Stationary Sequential Equilibria in Bargaining with Two-Sided Incomplete Information,” *Review of Economic Studies*, Vol. 59, No. 4, October 1992, pp. 795-812.
- “Bargaining and the Right to Remain Silent” (with R. Deneckere), *Econometrica*, Vol. 60, No. 3, May 1992, pp. 597-625.
- “The Failure of Competition in the Credit Card Market,” *American Economic Review*, Vol. 81, No. 1, March 1991, pp. 50-81; reprinted as Chapter 21 in *Advances in Behavioral Finance* (D. Thaler, ed.), Russell Sage Foundation, 1993.
- “Insider Trading in a Rational Expectations Economy,” *American Economic Review*, Vol. 80, No. 5, December 1990, pp. 1022-1041.
- “Partially-Revealing Rational Expectations Equilibrium in a Competitive Economy,” *Journal of Economic Theory*, Vol. 50, No. 1, February 1990, pp. 93-126.
- “A Direct Mechanism Characterization of Sequential Bargaining with One-Sided Incomplete Information” (with R. Deneckere), *Journal of Economic Theory*, Vol. 48, No. 1, June 1989, pp. 18-46; reprinted as Chapter 15 in *Bargaining with Incomplete Information* (P. Linhart, R. Radner, and M. Satterthwaite, eds.), Academic Press, 1992.
- “Reputation in Bargaining and Durable Goods Monopoly” (with R. Deneckere), *Econometrica*, Vol. 57, No. 3, May 1989, pp. 511-531; reprinted as Chapter 13 in *Bargaining with Incomplete Information* (P. Linhart, R. Radner, and M. Satterthwaite, eds.), Academic Press, 1992.
- “One is Almost Enough for Monopoly” (with R. Deneckere), *Rand Journal of Economics*, Vol. 18, No. 2, Summer 1987, pp. 255-274.

Patents

- “System and Method for an Auction of Multiple Types of Items” (with Peter Cramton and Wynne P. Jones), U.S. Patent Number 8,762,222, issued June 24, 2014.
- “System and Method for the Efficient Clearing of Spectrum Encumbrances” (with Peter

- Cramton and Paul Milgrom), U.S. Patent Number 8,744,924, issued June 3, 2014.
- “System and Method for a Dynamic Auction with Package Bidding” (with Paul Milgrom), U.S. Patent Number 8,566,211, issued October 22, 2013.
- “System and Method for an Efficient Dynamic Multi-Unit Auction,” U.S. Patent Number 8,447,662, issued May 21, 2013.
- “System and Method for a Hybrid Clock and Proxy Auction” (with Peter Cramton and Paul Milgrom), U.S. Patent Number 8,335,738, issued December 18, 2012.
- “System and Method for a Hybrid Clock and Proxy Auction” (with Peter Cramton and Paul Milgrom), U.S. Patent Number 8,224,743, issued July 17, 2012.
- “System and Method for the Efficient Clearing of Spectrum Encumbrances” (with Peter Cramton and Paul Milgrom), U.S. Patent Number 8,145,555, issued March 27, 2012.
- “Computer Implemented Methods and Apparatus for Auctions,” U.S. Patent Number 8,065,224, issued November 22, 2011.
- “Ascending Bid Auction for Multiple Objects,” U.S. Patent Number 7,966,247, issued June 21, 2011.
- “System and Method for an Auction of Multiple Types of Items” (with Peter Cramton and Wynne P. Jones), U.S. Patent Number 7,899,734, issued March 1, 2011.
- “System and Method for an Efficient Dynamic Multi-Unit Auction,” U.S. Patent Number 7,870,050, issued January 11, 2011.
- “Computer Implemented Methods and Apparatus for Auctions,” U.S. Patent Number 7,774,264, issued August 10, 2010.
- “System and Method for a Hybrid Clock and Proxy Auction” (with Peter Cramton and Paul Milgrom), U.S. Patent Number 7,729,975, issued June 1, 2010.
- “System and Method for an Efficient Dynamic Multi-Unit Auction,” U.S. Patent Number 7,467,111, issued December 16, 2008.
- “System and Method for an Efficient Dynamic Multi-Unit Auction,” U.S. Patent Number 7,343,342, issued March 11, 2008.
- “Ascending Bid Auction for Multiple Objects,” U.S. Patent Number 7,337,139, issued February 26, 2008.
- “Computer Implemented Methods and Apparatus for Auctions,” U.S. Patent Number 7,249,027, issued July 24, 2007.
- “System and Method for an Efficient Dynamic Multi-Unit Auction,” U.S. Patent Number 7,165,046, issued January 16, 2007.

“System and Method for an Efficient Dynamic Multi-Unit Auction,” U.S. Patent Number 7,062,461, issued June 13, 2006.

“System and Method for an Efficient Dynamic Auction for Multiple Objects,” U.S. Patent Number 6,026,383, issued February 15, 2000.

“Computer Implemented Methods and Apparatus for Auctions,” U.S. Patent Number 6,021,398, issued February 1, 2000.

“Computer Implemented Methods and Apparatus for Auctions,” U.S. Patent Number 5,905,975, issued May 18, 1999.

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“Credit Cards,” *McGraw-Hill Encyclopedia of Economics*, McGraw-Hill, 1994.

“Book Review: The Credit Card Industry, by Lewis Mandell,” *Journal of Economic Literature*, Vol. 30, No. 3, September 1992, pp. 1517-18.

“Credit Cards,” *New Palgrave Dictionary of Money and Finance*, Stockton Press, 1992.

Working Papers

“The Combinatorial Clock Auction, Revealed Preference and Iterative Pricing” (with Oleg V. Baranov), February 2014.

“Core-Selecting Auctions with Incomplete Information” (with Oleg V. Baranov), working paper, University of Maryland, August 2010.

“Penalty Interest Rates, Universal Default, and the Common Pool Problem of Credit Card Debt” (with Oleg V. Baranov and Amanda E. Dawsey), mimeo, University of Maryland, June 2010.

“A Troubled Asset Reverse Auction” (with Peter Cramton), working paper, University of Maryland, October 2008.

“Time Inconsistency in the Credit Card Market” (with Haiyan Shui), mimeo, University of Maryland, January 2005.

- “Informal Bankruptcy” (with Amanda E. Dawsey), mimeo, University of Maryland, April 2004.
- “Adverse Selection in the Credit Card Market,” mimeo, University of Maryland, June 1999.
- “The Credit Card Market, Revisited,” mimeo, University of Maryland, July 1995.
- “Walrasian Tâtonnement for Discrete Goods,” mimeo, University of Maryland, July 2005.
- “Bidder Participation and Information in Currency Auctions” (with Rafael Romeu), Working Paper WP/05/157, International Monetary Fund, 2005.
- “A Mechanism Generalizing the Vickrey Auction,” mimeo, University of Maryland, September 1999.
- “The Ascending Auction Paradox” (with Jesse Schwartz), mimeo, University of Maryland, July 1999.
- “The Optimality of Being Efficient” (with Peter Cramton), mimeo, University of Maryland, June 1999.
- “Sequential Recontracting Under Incomplete Information” (with Arijit Sen), mimeo, University of Maryland, June 1995.
- “Separation and Delay in Bargaining” (with Raymond Deneckere), mimeo, University of Maryland, April 1994.
- “A Model of Managerial Discretion and Corporate Takeovers,” mimeo, University of Maryland, March 1993.
- “Rigidity and Asymmetric Adjustment of Bank Interest Rates,” mimeo, University of Maryland, August 1992.
- “Oligopoly When Market Share Matters,” mimeo, Stanford University, May 1984.
- “Partially-Revealing Equilibria,” Stanford University, Department of Economics, August 1984. Dissertation committee: Mordecai Kurz (principal advisor); Peter J. Hammond; Kenneth J. Arrow.

Works in Progress

- “The Hungarian Auction” (with T. Morrill)
- “Bargaining and Forward Induction” (with R. Deneckere)

Op-Eds

“Making Sense of the Aggregator Bank” (with Peter Cramton), *Economists’ Voice*, Vol. 6, Issue 3, Article 2, February 2009.

“No Substitute for the ‘P’-Word in Financial Rescue” (with Peter Cramton), *Economists’ Voice*, Vol. 6, Issue 2, Article 2, February 2009.

“Auction Design Critical for Rescue Plan” (with Peter Cramton), *Economists’ Voice*, Vol. 5, Issue 5, Article 5, September 2008.

Research Grants

Principal Investigator, “Common-Value Auctions with Liquidity Needs” (with P. Cramton, E. Filiz-Ozbay and E. Ozbay), National Science Foundation Grant SES-09-24773, September 1, 2009 – August 31, 2013.

Principal Investigator, “Dynamic Matching Mechanisms” (with P. Cramton), National Science Foundation Grant SES-05-31254, August 15, 2005 – July 31, 2008.

Co-Principal Investigator, “Slot Auctions for U.S. Airports” (with M. Ball, P. Cramton and D. Lovell), Federal Aviation Administration, September 1, 2004 – August 31, 2005.

Co-Principal Investigator, “Rapid Response Electronic Markets for Time-Sensitive Goods” (with G. Anandalingam, P. Cramton, H. Lucas, M. Ball and V. Subrahmanian), National Science Foundation Grant IIS-02-05489, Aug 1, 2002 – July 31, 2005.

Principal Investigator, “Multiple Item Auctions” (with P. Cramton), National Science Foundation Grant SES-01-12906, July 15, 2001 – June 30, 2004.

Principal Investigator, “Auctions for Multiple Items” (with P. Cramton), National Science Foundation Grant SBR-97-31025, April 1, 1998 – March 31, 2001.

Co-Principal Investigator, “Auctions and Infrastructure Conference” (with P. Cramton), National Science Foundation, April 1, 1998 – March 31, 1999.

Principal Investigator, “Bargaining Power, Sequential Recontracting, and the Principal-Agent Problem” (with A. Sen), National Science Foundation Grant SBR-94-10545, October 15, 1994 – September 30, 1997.

Principal Investigator, “Insider Trading and Economic Efficiency,” The Lynde and Harry Bradley Foundation, May 15, 1989 – May 14, 1992.

Principal Investigator, “Bargaining with One- and Two-Sided Incomplete Information” (with R. Deneckere), National Science Foundation Grant SES-86-19012, June 1, 1987 – May 31, 1989.

Principal Investigator, “Information Transmission in Bargaining and Markets” (with R. Deneckere), National Science Foundation Grant IST-86-09129, July 1, 1986 – June 30, 1987.

Conference Presentations

“On Generalizing the English Auction,” Econometric Society Winter Meetings, Chicago, January 1998.

“The Optimality of Being Efficient,” Maryland Auction Conference, Wye River, May 1998.

“Adverse Selection in the Credit Card Market,” Western Finance Association, Monterey, June 1998.

“The Optimality of Being Efficient,” Econometric Society Summer Meetings, Montreal, June 1998.

“Bargaining and Forward Induction,” Northwestern Summer Microeconomics Conference, Evanston, IL, July 1998.

“Predicting Personal Bankruptcies,” National Conference of Bankruptcy Judges, Dallas, October 1998.

“Adverse Selection in the Credit Card Market,” NBER Behavioral Macroeconomics Conference, Boston, December 1998.

“The Ascending Auction Paradox,” Econometric Society Summer Meetings, Madison, June 1999.

“Adverse Selection in the Credit Card Market,” Econometric Society Summer Meetings, Madison, June 1999.

“Predicting Personal Bankruptcies,” Meeting of the National Association of Chapter Thirteen Trustees, New York, July 1999.

“The Ascending Auction Paradox,” Southeast Economic Theory Conference, Washington DC, November 1999.

“Adverse Selection in the Credit Card Market,” Utah Winter Finance Conference, Salt Lake City, February 2000.

“An Efficient Dynamic Auction for Heterogeneous Commodities,” Conference on Auctions and Market Structure, Heidelberg, Germany, July 2000.

“An Efficient Dynamic Auction for Heterogeneous Commodities,” Conference on Multiunit Auctions, Stony Brook, NY, July 2000.

- “A Mechanism Generalizing the Vickrey Auction,” Econometric Society World Congress, Seattle, August 2000.
- “Auctions for Financial E-Commerce,” New York Federal Reserve Bank Conference on Financial E-Commerce, New York, February 2001.
- “An Efficient Dynamic Auction for Heterogeneous Commodities,” NSF General Equilibrium Conference, Providence, RI, April 2001.
- “An Efficient Dynamic Auction for Heterogeneous Commodities,” NSF/NBER Decentralization Conference, Evanston, IL, April 2001.
- “Informal Bankruptcy,” Association of American Law Schools Workshop on Bankruptcy, St. Louis, MO, May 2001.
- “An Efficient Dynamic Auction for Heterogeneous Commodities,” Econometric Society Summer Meetings, College Park, MD, June 2001.
- “Ascending Auctions with Package Bidding,” FCC, SIEPR and NSF Conference on Combinatorial Auctions, Wye River, MD, October 2001.
- “The Electricité de France Generation Capacity Auctions,” CORE-ECARES-LEA Workshop on Auctions, Brussels, Belgium, November 2001.
- “Informal Bankruptcy,” Utah Winter Finance Conference, Salt Lake City, February 2002.
- “Defictionalizing the Walrasian Auctioneer,” Conference on Market Design in Honor of Robert Wilson, Stanford, CA, May 2002.
- “Adverse Selection in the Credit Card Market,” Conference on the Economics of Payment Networks, Toulouse, France, June 2002.
- “Ascending Auctions with Package Bidding,” Econometric Society Summer Meetings, Los Angeles, June 2002.
- “An Efficient Dynamic Auction for Heterogeneous Commodities,” Conference in Honor of Mordecai Kurz, Stanford, CA, August 2002.
- “Adverse Selection in the Credit Card Market,” Conference on Credit, Trust and Calculation, San Diego, November 2002.
- “Package Bidding for Spectrum Auctions,” American Economic Association Meetings, Washington, DC, January 2003.
- “Auctioning Many Divisible Goods,” invited session, European Economic Association Meetings, Stockholm, August 2003.
- “Spectrum Auctions with Package Bidding,” TPRC Research Conference on Communication, Information and Internet Policy, Arlington, VA, September 2003.

- “Defictionalizing the Walrasian Auctioneer,” invited lecture, Conference on Auctions and Market Design: Theory, Evidence and Applications, Fondazione Eni Enrico Mattei, Milan, September 2003.
- “Clock Auctions, Proxy Auctions, and Possible Hybrids,” Workshop on Auction Theory and Practice, Pittsburgh, PA, November 2003.
- “Clock Auctions, Proxy Auctions, and Possible Hybrids,” FCC Combinatorial Bidding Conference, Wye River, MD, November 2003.
- “Time Inconsistency in the Credit Card Market,” Utah Winter Finance Conference, Salt Lake City, February 2004.
- “The Clock-Proxy Auction: A Practical Combinatorial Auction Design,” Conference on Auctions and Market Design: Theory, Evidence and Applications, Consip, Rome, Italy, September 2004.
- “Bidder Participation and Information in Currency Auctions,” Conference on Auctions and Market Design: Theory, Evidence and Applications, Consip, Rome, Italy, September 2004.
- “The Clock-Proxy Auction: A Practical Combinatorial Auction Design,” Market Design Conference, Stanford University, December 2004.
- “Dynamic Matching Mechanisms,” Econometric Society World Congress, London, August 2005.
- “The Clock-Proxy Auction, with Recent Applications,” SISL Workshop, Caltech, October 2005.
- “Dynamic Matching Mechanisms,” Conference on Matching and Two-Sided Markets, University of Bonn, May 2006.
- “The Hungarian Auction,” DIMACS Workshop on Auctions with Transaction Costs, Rutgers University, March 2007.
- “The Hungarian Auction,” PSE Lecture at the Paris School of Economics, June 2007.
- “Time Inconsistency in the Credit Card Market,” John M. Olin Conference on Law and Economics of Consumer Credit, University of Virginia, February 2008.
- “The Hungarian Auction,” 6th Annual International Industrial Organization Conference, Arlington, VA, May 2008.
- “The Hungarian Auction,” Frontiers of Microeconomic Theory and Policy, Symposium in Honour of Ray Rees, University of Munich, July 2008.

- “Common-Value Auctions with Liquidity Needs: An Experimental Test of a Troubled Assets Reverse Auction,” 2009 CAPCP Conference on Auctions and Procurement, Penn State University, March 2009.
- “Market Design for Troubled Assets,” NBER Workshop on Market Design, Cambridge, MA, May 2009.
- “Market Design for Troubled Assets,” Madrid Summer Workshop on Economic Theory, Universidad Carlos III de Madrid, June 2009.
- “Virtual Power Plant Auctions,” (with Peter Cramton), Workshop: Designing Electricity Auctions, Research Institute of Industrial Economics, Stockholm, Sweden, September 2009.
- “Using Forward Markets to Improve Electricity Market Design,” (with Peter Cramton), Workshop: Designing Electricity Auctions, Research Institute of Industrial Economics, Stockholm, Sweden, September 2009.
- “Virtual Power Plant Auctions,” (with Peter Cramton), Market Design 2009 Conference, Stockholm, Sweden, September 2009.
- “Using Forward Markets to Improve Electricity Market Design,” (with Peter Cramton), Market Design 2009 Conference, Stockholm, Sweden, September 2009.
- “Auctions with Multiple Objects,” 2009 Erwin Plein Nemmers Prize in Economics, Conference in Honor of Paul Milgrom, Northwestern University, November 2009.
- “Penalty Interest Rates, Universal Default, and the Common Pool Problem of Credit Card Debt” (with Oleg V. Baranov and Amanda E. Dawsey), Credit, Default and Bankruptcy Conference, University of California - Santa Barbara, June 2010.
- “Core-Selecting Auctions with Incomplete Information” (with Oleg V. Baranov), World Congress of the Econometric Society, Shanghai, China, August 2010.
- “Core-Selecting Auctions with Incomplete Information” (with Oleg V. Baranov), NBER Workshop on Market Design, Cambridge, MA, October 2010.
- “Core-Selecting Auctions with Incomplete Information” (with Oleg V. Baranov), NSF/CEME Decentralization Conference, Ohio State University, April 2011
- “Penalty Interest Rates, Universal Default, and the Common Pool Problem of Credit Card Debt” (with Oleg V. Baranov and Amanda E. Dawsey), Centre for Financial Analysis & Policy Conference on Consumer Credit and Bankruptcy, University of Cambridge, UK, April 2011.
- “Core-Selecting Auctions with Incomplete Information” (with Oleg V. Baranov), Center for the Study of Auctions, Procurements and Competition Policy Conference, Penn State University, April 2011.

- “Design Issues for Combinatorial Clock Auctions” (with Oleg V. Baranov), Annual Meeting of the Institute for Operations Research and the Management Sciences (INFORMS), Phoenix AZ, October 2012.
- “An Enhanced Combinatorial Clock Auction” (with Oleg V. Baranov), SIEPR Conference on the FCC Incentive Auctions, Stanford University, February 2013.
- “Enhancing the Combinatorial Clock Auction” (with Oleg V. Baranov), Ofcom Conference, Combinatorial Auctions for Spectrum, London School of Economics, September 2013.
- “The Combinatorial Clock Auction, Revealed Preference and Iterative Pricing” (with Oleg V. Baranov), NBER Workshop on Market Design, Stanford University, October 2013.
- “Market Design and the Evolution of the Combinatorial Clock Auction” (with Oleg V. Baranov), invited session in honor of the Nobel Prize in Economics awarded to Market Design, American Economic Association meetings, Philadelphia, January 2014.
- “Revealed Preference in Bidding: Empirical Evidence from Recent Spectrum Auctions” (with Oleg V. Baranov), NBER Market Design Conference, Palo Alto, CA, June 2014.
- “Enhancing the Combinatorial Clock Auction” (with Oleg V. Baranov), Industry Canada Retrospective on the Canadian 700 MHz Spectrum Auction, Ottawa, Canada, November 2014.
- “Efficient Procurement Auctions with Increasing Returns” (with Oleg V. Baranov, Christina Aperjis and Thayer Morrill), Annual Meeting of the Institute for Operations Research and the Management Sciences (INFORMS), Philadelphia PA, November 2015.
- “Efficient Procurement Auctions with Increasing Returns” (with Oleg V. Baranov, Christina Aperjis and Thayer Morrill), Workshop on Auction Design, University of Vienna, August 2016.
- “Vickrey-Based Pricing in Iterative First-Price Auctions” (with Oleg V. Baranov), Workshop on Auction Design, University of Vienna, August 2016.
- “Efficient Procurement Auctions with Increasing Returns” (with Oleg V. Baranov, Christina Aperjis and Thayer Morrill), NBER Market Design Conference, Palo Alto, CA, October 2016.

Professional Service

Member of working group for the design and implementation of incentive auctions for the US Federal Communications Commission, 2011–present.

Advisor to Industry Canada and the Australian Communications and Media Authority for the design and implementation of 700 MHz and 2.5 GHz spectrum auctions, 2011–present.

Congressional Briefing on “How Fundamental Economic Research Improves People’s Lives,”

Rayburn House Office Building, March 2010.

Testified before the Committee on Banking, Housing and Urban Affairs of the US Senate, Hearing on “Modernizing Consumer Protection in the Financial Regulatory System: Strengthening Credit Card Protections,” February 12, 2009.

Testified before the Subcommittee on Financial Institutions and Consumer Credit of the US House of Representatives, Hearing on “The Credit Cardholders’ Bill of Rights: Providing New Protections for Consumers,” March 13, 2008.

Member, National Science Foundation Economics Panel, 2004–2005.

Associate Editor, *Berkeley Electronic Journals of Theoretical Economics*, 2004–present.

Guest Associate Editor, *Management Science*, issue on Electronic Auctions, 2003.

Program Chair of the 2001 North American Summer Meeting of the Econometric Society (with Peter Cramton), University of Maryland, June 21–24, 2001.

Program Committee of the North American Summer Meeting of the Econometric Society, UCLA, June 2002, and University of Pennsylvania, June 1991.

Organized Maryland Auction Conference (with Peter Cramton), Wye River Conference Center, May 1998, sponsored by the National Science Foundation, the World Bank, and the University of Maryland.

Spoke at a Forum on Bankruptcy of the Financial Services Committee of the United States House of Representatives, February 28, 2001.

Testified before the Subcommittee on Commercial and Administrative Law of the United States House of Representatives, Hearing on the Consumer Bankruptcy Issues in the Bankruptcy Reform Act of 1998, March 10, 1998.

Testified before the Subcommittee on Financial Institutions and Regulatory Relief of the United States Senate, Hearing on Bankruptcy Reform, February 11, 1998.

Testified before the National Bankruptcy Review Commission, January 1997.

Referee for: *American Economic Review*, *Econometrica*, *European Economic Review*, *Games and Economic Behavior*, *International Journal of Game Theory*, *International Journal of Industrial Organization*, *Journal of Banking and Finance*, *Journal of Business*, *Journal of Economic Theory*, *Journal of Financial Intermediation*, *Journal of Political Economy*, *Quarterly Journal of Economics*, *Rand Journal of Economics*, *Review of Economic Studies*, and the National Science Foundation.

Professional Organizations

American Economic Association
Econometric Society

Attachment F

New England Governors, State Utility Regulators and Related Agencies

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New England Governors, Utility Regulatory and Related Agencies

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