UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

RENEW Northeast, Inc. and the American Clean Power Association,	)	
Complainants,	)	
v.	)	
	)	**Docket No. EL22-___-000**
ISO New England Inc.,	)	
Respondent.	)	

COMPLAINT AND REQUEST FOR EXPEDITED CONSIDERATION

Pursuant to Sections 206 and 306 of the Federal Power Act ("FPA")[1] and Rule 206 of the Rules of Practice and Procedure of the Federal Energy Regulatory Commission[2] ("FERC" or "the Commission"), RENEW Northeast, Inc. ("RENEW") and the American Clean Power Association ("ACP") hereby submit this Complaint and Request for Expedited Consideration ("Complaint") asking the Commission to remedy undue preferences granted to gas-fired generation resources that have neither dual-fuel capability nor dedicated, firm natural gas supply arrangements ("gas-only resources"). Such undue preferences arise from the failure of the current ISO New England Inc. ("ISO-NE") rules and practices concerning capacity accreditation and operating reserve designation to take into account the uncertainty of natural gas supply in New England, particularly in winter peak conditions.

[1] 16 U.S.C. §§ 824e and 825e (2018).

[2] 18 C.F.R. § 385.206 (2021).

Problems associated with constraints on natural gas supply and delivery to generation resources in New England during severe weather conditions are not new, and are acknowledged by ISO-NE. Recent ISO-NE Winter Outlooks have raised concerns of heightened system risks heading into the winter season due to natural gas pipeline constraints.[3] Explaining these risks, Peter Brandien, ISO-NE Vice President of System Operations and Market Administration, warned that "if the region experiences an extended period of extreme cold weather, fuel supplies into the region could become constrained resulting in challenging system operation."[4] Today, ISO-NE seeks to manage these risks through information sharing, improved coordination with gas pipeline operators, and increased situational awareness.[5] However, the root problem remains—that is, pipeline constraints, the requirements of gas local distribution companies ("LDCs") holding firm pipeline capacity, and the physical requirements to maintain reliable pipeline operation can critically limit gas supplies available to gas-only resources.

The ISO-NE Tariff, rules and practices grant an undue preference to gas-only resources—to the detriment of both resources with known, dedicated fuel supplies (e.g., dual-fuel, oil, nuclear, pumped storage and pondage hydro) and intermittent generation (e.g., wind,

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[3] *See, e.g.,* 2021 Press Release, ISO New England, Harsh Weather Conditions Could Pose Challenges to New England's Power System This Winter (Dec. 6, 2021), *available at* https://www.iso-ne.com/static-assets/documents/2021/12/20211206_pr_winteroutlook2122.pdf (Stating that "For the past two decades, ISO New England has raised concerns about fuel supply issues and their impact on electricity supply during periods of extreme cold weather. Constraints on the natural gas pipeline system limit the availability of fuel for natural gas-fired power plants, as heating customers are served first through firm service contracts," and reporting that, during winter conditions "[n]atural-gas-fired generating capacity at risk of not being able to get fuel when needed: more than 3,700 MW."); 2020 Press Release, ISO New England, New England Expected to Have Sufficient Electricity Throughout Winter 2020-2021 (Dec. 8, 2020) ("2020 Press Release"), *available at* https://www.iso-ne.com/static-assets/documents/2020/12/20201208_pr_winteroutlook.pdf (Stating that "Consecutive days of extremely cold weather can reduce fuel availability for generating power due to regional natural gas pipeline capacity constraints," and reporting that, for winter 2020-21, "[n]atural-gas-fired generating capacity at risk of not being able to get fuel when needed: more than 4,000 MW.").

[4] 2020 Press Release, at 1.

[5] *See* Ex. A, Affidavit of Stephen J. Rourke at PP 12-15, 17 ("Rourke Aff.").

solar, and run of river hydro). In the case of capacity accreditation, ISO-NE assumes that fuel is always available to a natural gas resource, including a gas-only resource that is actually at significant risk from natural gas and pipeline availability limitations during cold weather winter conditions. By basing the capacity accreditation upon an assumption of 100% fuel availability, this approach improperly places gas-only resources on par with resources with known, dedicated fuel inventories. Conversely, intermittent resources have their capacity ratings significantly lowered because ISO-NE capacity ratings account for the energy input limitations experienced by solar, wind and run-of-river resources.

Another area in which an undue preference arises is in the designation of operating reserves. In this case, gas-only resources are afforded an undue preference because, unlike all other reserve resources, there is no pre-dispatch confirmation that a gas-only resource either has sufficient fuel on hand or otherwise has assumed an enforceable obligation to acquire sufficient fuel to meet a real-time operating reserve dispatch instruction.

For the reasons further set out in this Complaint, RENEW and ACP ("Complainants") ask the Commission to issue an order directing ISO-NE to promptly correct these undue preferences for gas-only resources relative to other resources.

I. EXECUTIVE SUMMARY

Under the FPA, public utilities' tariffs, rules and practices may not grant undue preferences. This Complaint identifies, and asks the Commission to remedy, undue preferences in ISO-NE's rules and practices concerning its accreditation of capacity resources and designation of operating reserves. As a class, New England's gas-only resources, i.e., natural gas-fired generators that do not have dual-fuel capability or dedicated, firm natural gas supply and delivery arrangements, total approximately 9,000 MW (winter). These gas-only resources are at significant risk of being unable to secure gas in severe cold weather conditions when the

limited pipeline capacity serving New England is largely committed to LDCs holding firm pipeline capacity to serve gas heating customers. While some individual gas-fired generators may make firm gas supply and transportation arrangements in advance, they are not obligated to make such advance arrangements under the Tariff.[6] In fact, gas-only resources do not have an obligation to acquire natural gas supplies to fulfill real-time dispatch beyond their day ahead generation schedule prior to a real-time dispatch instruction, and the failure to obtain sufficient fuel to meet a real-time dispatch instruction is not *per se* a Tariff violation. In contrast, resources such as dual-fuel, oil, nuclear and pondage hydroelectric resources all have dedicated near-term fuel input that can be measured and known, at the specific resource level, for purposes of real-time energy dispatch to honor their real-time energy offer. Yet, in capacity accreditation and the designation of operating reserves, the ISO-NE rules treat these dissimilarly situated, gas-only resources as having the same level of certainty in fuel input availability, under all conditions, as resources with known, dedicated fuel inventories.

The preferential treatment of gas-only resources within the ISO-NE rules and practices for capacity accreditation and operating reserve designation is in sharp contrast with the treatment of intermittent resources, such as wind, solar and run-of-river hydroelectric facilities.

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[6] The Commission has held that the ISO-NE Tariff does not obligate a gas generation resource to obtain, in advance, natural gas necessary to fulfill real-time dispatch beyond their day ahead generation schedule. *See New England Power Generators Association v. ISO New England Inc.*, Complaint and Request for Expedited Consideration of the New England Power Generators Association, Docket No. EL13-66-000 (filed May 17, 2013) ("NEPGA Complaint"); *New England Power Generators Ass'n, Inc. v. ISO New England Inc.*, 144 FERC ¶ 61,157 at P 47 (2013) ("NEPGA Complaint Order"), *on reh'g*, 145 FERC ¶ 61,206 at P 20 (2013) ("NEPGA Complaint Rehearing Order"). Instead, a gas-only generator is obligated to try to procure gas after it receives a real-time dispatch instruction, but is excused from any Tariff violation if gas in not available at that point.

Importantly, that 2013 complaint, and the resulting Commission orders, addressed the question of whether the Tariff should be interpreted to impose a firm fuel obligation on all resources with Capacity Supply Obligations through the Forward Capacity Market ("FCM"). This Complaint addresses a different matter–undue preference granted to gas-only resources in capacity accreditation and operating reserve designation procedures. These issues of undue preference <u>*were not*</u> raised or otherwise addressed in the 2013 NEPGA complaint proceeding.

For example, ISO-NE uses historical wind and solar power output in defined, season-specific reliability hours to set capacity ratings for these resources significantly below the resources' nameplate ratings. In other words, intermittent resources are measured against both their ability to convert their input energy source, when available, into electricity *and* the likelihood of their source of energy actually being available. For operating reserves, ISO-NE procedures require that all but one of the resource technologies[7] eligible for designation and dispatch as reserves have known and measurable fuel supply and a verifiable means of delivery for such fuel inventory in advance of designation and dispatch. The outlier is a gas-only resource, which can be designated and paid as real-time operating reserves without confirmation of availability of its fuel supply, even during winter peak conditions when there can be severe pipeline constraints.

The undue preferences being afforded to gas-only resources in the capacity accreditation and designation of operating reserves must be eliminated. Accordingly, as described in more detail in Section VI below, Complainants ask FERC to find undue preference for gas-only resources in ISO-NE's rules concerning capacity accreditation and operating reserve designation, and, consistent with the requirements of Section 206, direct ISO-NE to make timely changes to its rules to eliminate these undue preferences.

[7] ISO-NE does not recognize intermittent resources as eligible to provide operating reserves.

II. CORRESPONDENCE AND COMMUNICATIONS

Complainants request that all correspondence and communications regarding this filing be addressed to the following persons, who should be placed on the Commission's official service list in this proceeding:

Francis Pullaro
Executive Director
RENEW Northeast
PO Box 383,
Madison, CT 06443.
646-734-8768
fpullaro@renew-ne.org

Gabe Tabak, Counsel
Gene Grace, General Counsel
American Clean Power Association
1501 M St., N.W., Ste. 900
Washington, D.C. 20005
(202) 383-2500
gtabak@cleanpower.org
ggrace@cleanpower.org

III. DESCRIPTION OF COMPLAINANTS AND RESPONDENT

A. Complainants

RENEW Northeast, Inc. is a non-profit entity that advocates for the business interests of renewable power generators in New England. RENEW unites environmental advocates and the renewable energy industry to advance the goal of increasing environmentally sustainable energy generation in the Northeast from the region's abundant, indigenous renewable resources. RENEW members own, develop, and operate large-scale renewable energy projects, energy storage resources and high-voltage transmission facilities across the Northeast.

The American Clean Power Association is a national trade association representing a broad range of entities with a common interest in encouraging the expansion and facilitation of

wind, solar, energy storage, and electric transmission in the United States, including New England.[8]

B. Respondent

ISO-NE is the private, non-profit entity that serves as the regional transmission organization ("RTO") for the six New England states. ISO-NE plans and operates the New England bulk power system and administers New England's organized wholesale electricity markets pursuant to the ISO-NE Tariff. In its capacity as an RTO, ISO-NE also has the responsibility to protect the short-term reliability of the New England Control Area and to operate the system according to reliability standards established by the Northeast Power Coordinating Council ("NPCC") and the North American Electric Reliability Corporation ("NERC"). Of relevance to this Complaint, ISO-NE administers Qualified Capacity accreditation[9] and designation of operating reserves.[10]

IV. FACTUAL BASIS FOR COMPLAINT

The key facts underlying this Complaint are not complicated, and are acknowledged by ISO-NE, and are familiar to the Commission.

Natural gas pipeline capacity serving New England is limited. The firm capacity on those pipelines is held principally by LDCs, to support their service to heating customers on peak

[8] The views and opinions expressed in this filing do not necessarily reflect the position of each of ACP's or RENEW's individual members.

[9] *See* Tariff, Section III - Market Rule 1 ("Market Rule 1"), Sections III.13.1 and III.1.5; ISO-NE Manual M-20, Forward Capacity Market (FCM) (Oct. 4, 2019) ("ISO-NE Manual M-20"), *available at* https://www.iso-ne.com/static-assets/documents/2018/10/manual_20_forward_capacity_market_rev25_20181004.pdf.

[10] *See* Market Rule 1, Section III.1.7.17, https://www.iso-ne.com/participate/rules-procedures/tariff/market-rule-1; ISO-NE Operating Procedure No. 8 Operating Reserve and Regulation (Aug. 11, 2011) ("Operating Procedure No. 8"), *available at* https://www.iso-ne.com/static-assets/documents/rules_proceds/operating/isone/op8/op8_rto_final.pdf.

gas demand days in the winter.[11] As a result, ISO-NE has repeatedly warned that during cold-temperature conditions in the winter, the gas supply may not be available for some portion of the gas-fired generators to meet real-time dispatch instructions.[12] Notably, for this winter, ISO-NE estimated that 3,700 MW to 4,500 MW of gas-only resources in New England were at risk of not being able to be supplied with natural gas, and therefore unable to operate, at winter peak conditions.[13] However, the rules and practices of ISO-NE relating to capacity accreditation and operating reserve designations, as applied to gas-only resources, do not take appropriate account of these supply limitations and uncertainties.

A. Gas Supply for Gas-Only Resources in New England Is Constrained and Uncertain.

The Commission is well-aware of the realities of New England gas pipeline supply constraints. After years of ISO-NE warnings concerning the infrastructure constraints on supply and delivery of natural gas to power plants during high gas demand periods,[14] New England still faces considerable system operation challenges given its heavy reliance on gas-only resources. In response to earlier concerns, the Commission held multiple technical conferences, ordered Commission staff to prepare reports analyzing gas/electric coordination issues, and encouraged

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[11] *See* Rourke Aff. at P 10.

[12] *See* Ex. B, ISO-NE Key Grid and Market Stats, Resource (also accessible at https://www.iso-ne.com/about/key-stats/resource-mix). ("ISO-NE Resource Mix Statement"). ("As a result, we are finding that during severe winter weather, many power plants in New England cannot obtain fuel to generate electricity.").

[13] Rourke Aff. at P 10 (reporting the 50/50 and 90/10 winter peak demand risk scenarios for generators being unable to obtain fuel as detailed in the ISO-NE Winter Outlook for 2021-2022).

[14] *See, e.g.*, ISO News Wire, "Winter 2017/2018 Recap: Historic cold snap reinforces findings in Operational Fuel-Security Analysis" (Apr. 25, 2018), https://isonewswire.com/2018/04/25/winter-2017-2018-recap-historic-cold-snap-reinforces-findings-in-operational-fuel-security-analysis; ISO News Wire, "Oil inventory was key in maintaining power system reliability through colder-than-normal weather during winter 2013/2014" (Apr. 4, 2014), https://isonewswire.com/2014/04/04/oil-inventory-was-key-in-maintaining-power-system-reliability-through-colder-than-normal-weather-during-winter-2013-2014; ISO-NE, Outlook for Winter 2021/2022, https://www.iso-ne.com/markets-operations/system-forecast-status/seasonal-system-outlook (last visited Feb. 15, 2022).

regional stakeholder efforts to identify and propose reforms.[15] While gas/electric coordination has improved due to reforms after the 2004 Cold Snap event,[16] the problems run deeper. ISO-NE has repeatedly reported—including as recently as December 2021—that the gas transportation capacity available after meeting LDCs' retail gas demand is not sufficient to fuel the aggregate gas-only fleet.[17]

The limitations of the existing gas pipeline system and resulting effects on gas supply availability also have been recognized by the New England Power Generators Association ("NEPGA") for many years. In its 2013 complaint, NEPGA acknowledged the possibility that, at maximum nomination conditions, capacity may be unavailable to support gas delivery to meet real-time dispatch needs.[18] Even where gas supply might have been available if scheduled and nominated in advance, last-minute deliveries may not be possible due to pipeline scheduling or reliability considerations.[19]

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[15] *See, e.g.*, *Coordination Between Natural Gas and Electricity Markets*, Notice Assigning Docket No. and Requesting Comments, Docket No. AD12-12-000 (issued Feb. 15, 2012); *Coordination Between Natural Gas & Elec. Markets*, 141 FERC ¶ 61,125 (2012) (ordering further technical conferences and reports); *Coordination of the Scheduling Processes of Interstate Nat. Gas Pipelines & Pub. Utils.*, 146 FERC ¶ 61,201 (2014) (summarizing the extensive dialogue the Commission has engaged in with industry on gas-electric coordination issues, which included five regional conferences).

[16] ISO-NE, Final Report on Electricity Supply Conditions in New England During the January 14-16, 2004 "Cold Snap" (Oct. 12, 2004), *available at* https://www.iso-ne.com/static-assets/documents/2017/09/iso-ne_final_report_jan2004_cold_snap.pdf. In response to this event, ISO-NE developed procedures to help ensure system reliability during extreme cold weather conditions which were approved by FERC in 2006. *See ISO New England, Inc.*, 117 FERC ¶ 61,070 (2006), *reh'g granted in part*, 118 FERC ¶ 61,105, *reh'g denied*, 120 FERC ¶ 61,122 (2007).

[17] *See, e.g.*, Ex. C, Excerpts from Testimony of Peter Brandien on Behalf of ISO New England Inc. included as Att. I.-1b to ISO-NE Filing of Performance Incentives Market Rule Changes at 18, 53 ("Brandien Testimony"), Docket No. ER14-1050-000 (filed Jan. 17, 2014) (stating there is "simply not enough [pipeline capacity] to supply both generators and the LDCs."); ISO-NE, NEPOOL Participants Committee Report (Dec. 2021), *available at* https://www.iso-ne.com/static-assets/documents/2021/11/december-2021-coo-report.pdf.

[18] *See* NEPGA Complaint at 10 ("Intraday gas . . . may or may not be available depending on real time conditions affecting the availability of fuel and/or transportation.").

[19] NEPGA Complaint Order at P 33.

As explained in the attached affidavit of Stephen Rourke, given uncertainty about the ability of gas-only resources to obtain gas supply in the intraday market, and the absence of a Tariff requirement on gas-only resources to arrange gas supply and transportation before a real-time dispatch instruction,[20] ISO-NE has been forced to develop its own communication practices with the pipelines and now receives daily aggregate operational capability information from gas pipelines.[21] This aggregate information serves as a basis for further ISO-NE inquiry and actions to manage the reliable dispatch of its system, including addressing contingencies arising from the inability of individual gas-only resources to obtain sufficient fuel to meet real-time dispatch instructions.[22]

The constrained gas supply conditions in New England in the winter are increasingly acute, with increased gas demands (including from new gas-fired generation resources) and no foreseeable prospects for adding pipeline capacity.[23] In order to maintain winter electric reliability, ISO-NE has pursued multiple years of out-of-market payments to oil units to fill their tanks and coal units to build bigger coal piles to hedge against gas supply and transportation infrastructure limitations, and, in some of those programs, even offered subsidies for willing gas-only resources to add dual-fuel capability and paid resources to make advance Liquified Natural

[20] The "unavailability" reporting requirement is not triggered until the generator makes an unsuccessful attempt to purchase and schedule gas. For gas-only resources designated as Real Time Operating Reserves, there is no Tariff requirement to seek gas supply until a real-time dispatch instruction is received.

[21] Rourke Aff. at P 13.

[22] *Id.* at PP 12-17.

[23] *Id.* at PP 10, 14; ISO-NE Resource Mix Statement (". . . interstate pipeline infrastructure has only expanded incrementally over the last several decades, even as reliance on natural gas for home heating and for power generation has grown significantly. During cold weather, most natural gas is committed to local utilities for residential, commercial, and industrial heating. As a result, *we are finding that during severe winter weather, many power plants in New England cannot obtain fuel to generate electricity*." (emphasis added)).

Gas ("LNG") purchases.[24] Now, all but one of the New England coal units are retired. Currently, ISO-NE has natural gas resources with a winter rating of approximately 17,600 MW—including 6,700 MW of resources with dual-fuel capability; 1,700 MW of LNG-supported resources at Mystic;[25] and 9,200 MW of gas generation with neither oil backup nor committed LNG supply, vaporization and transportation. With limited exception, the 9,200 MW of gas-only resources are dependent upon a constrained gas pipeline system.[26]

An additional stressor is the fact that the New England region is in the midst of a major shift in its resource mix, with an increasing dependency upon a combination of existing natural gas resources and an expanding share of renewable generation.[27] One consequence of this transition will be that the ISO-NE system, operationally, will be even more dynamic in its real-time load and generation profiles. In turn, this will place an increased emphasis on ensuring the readiness of resources, particularly gas-only resources, to meet their real-time energy commitments, with minimal risk of non-performance.

B. Fuel Acquisition Obligation for Gas-Only Resources and the Realities of Fuel Supply in Winter Peak Conditions

Where a gas-only resource is not scheduled in the ISO-NE day-ahead market (or is asked in real-time dispatch to operate at levels above its day-ahead energy market schedule), the

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[24] Rourke Aff. at P 16.

[25] *See* ISO New England, 2021 CELT Report, 2021-2030 Forecast Report of Capacity, Energy, Loads, and Transmission, Tab 2.1, Generator List, 2021 Winter SCC *available at* https://www.iso-ne.com/system-planning/system-plans-studies/celt**.** There are only two gas-fired generators, Mystic 8 and 9, that are fueled directly from an LNG tank, the Distrigas LNG facility in Everett, MA. Both Mystic 8 and 9 are now scheduled to retire by June 1, 2024. *See* Memorandum from Brent Oberlin, ISO-NE Director of Transmission Planning, to Planning Advisory Committee and Qualified Transmission Project Sponsors (Jan. 13, 2020), *available at* https://www.iso-ne.com/static-assets/documents/2020/01/mystic-retirement-boston-2028-final.pdf.

[26] Rourke Aff. at P 10.

[27] *See* New England Power Grid Profile 2021-2022 *available at* https://www.iso-ne.com/static-assets/documents/2021/03/new_england_power_grid_regional_profile.pdf.

Commission has held that gas-only resources are not obligated under Market Rule 1 of the Tariff and accompanying ISO-NE procedures to actually obtain gas in support of real-time dispatch.[28] The Commission has explained that treatment of the inability to procure fuel for real-time dispatch is a fact-specific inquiry.[29] An economic choice not to procure fuel that is available in real-time would constitute a Tariff violation.[30] But, "if a capacity resource cannot procure fuel or transportation in real time in order to run at dispatch levels beyond its day-ahead commitment (or when not scheduled in the day-ahead market), then the resource is not physically available to perform for a reason beyond the resource's control for those additional hours and/or incremental MWs; thus the resource may be excused for nonperformance."[31] Because there is no obligation to obtain gas in support of energy it has offered into the real-time energy dispatch, the typical practice for gas-only resources is to wait until after receipt of a real-time dispatch signal to try to procure gas, relying on the intraday market to obtain fuel.[32]

C. Inadequate Resource-Specific Information on Real-Time Dispatch Capabilities of Gas-Only Resources Stresses System Operations.

Notwithstanding real-world concerns about whether gas-only resources will be able to obtain gas supply after receiving a real-time dispatch instruction, ISO-NE cannot preemptively

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[28] *See* NEPGA Complaint Rehearing Order at P 20 ("if a resource is asked to operate at levels above its day-ahead energy market schedule, it must do everything in its control to procure fuel for the additional request, *but it is not a Tariff violation if the resource is unable to obtain fuel or transportation using intra-day measures*. Similarly, we clarify that the Complaint Order did not require a capacity resource to guarantee fuel availability for the resource's entire Capacity Supply Obligation in real time when dispatch exceeds its day-ahead energy market schedule and fuel is unavailable." (emphasis added)).

[29] NEPGA Complaint Order at P 62.

[30] *Id.* at PP 58, 61-62.

[31] *Id.* at P 56.

[32] Rourke Aff. at P 35. *See also*, *New England Power Generators Association, Inc. v. ISO New England Inc.*, Complaint and Request for Expedited Consideration of the New England Power Generators Association at 4, Docket No. EL13-66-000 (filed May 17, 2013) ("NEPGA Complaint") (explaining that generators typically purchase gas "only after it becomes clear that they will be called upon and that gas will be needed.").

declare a gas-only resource unavailable for real-time dispatch absent information from or about the resource.[33] As a result, the system is at risk of situations where a gas-only resource that has received a real-time dispatch instruction cannot, after receipt of that instruction, obtain sufficient gas supply. Obviously, a failure of a resource to meet a real-time energy dispatch instruction can have critical implications, particularly in severe winter weather conditions. These stressors were explained in prior testimony by Peter Brandien, presently the Vice President of System Operations and Market Administration for ISO-NE:

> System operations – both operator actions and system dispatch software – are predicated on the ability to rely on the market and capability data submitted by resources. . . . During times of system stress, the data become even more suspect. This requires the system to be operated conservatively where possible, increasing costs and distorting market outcomes, which further blunts the price signals sent to the market in response to problems. Where it is not possible to operate the system conservatively, we must live with the heightened risk of reliability problems.[34]

Such stressors are heightened in winter peak conditions. As a practical matter, during winter peak conditions when there is high pipeline utilization, natural gas is often unavailable (or not available in sufficient quantities) in the intraday market to fuel all the real-time energy offers submitted by gas-only generators.[35] Indeed, ISO-NE has observed that "during severe winter weather, many power plants in New England cannot obtain fuel to generate electricity."[36] This risk is further confirmed by ISO-NE's modeling which has shown that the amount of gas-only generating capability that may be unable to obtain gas on a cold day, and therefore would be

[33] Rourke Aff. at P 29.

[34] Brandien Testimony at 51-52.

[35] Rourke Aff. at PP 10, 14, 34.

[36] *See* ISO-NE Resource Mix Statement.

unavailable for real-time dispatch, could be as much as 3,700 MWs.[37] This increases to over 4,500 MW when more severe "90-10" winter peak conditions occur.[38]

D. ISO-NE's Development of Work-Arounds to Manage Fuel Supply Uncertainties

To its credit, ISO-NE has responded to the uncertainty of fuel supplies by adding new monitoring tools to improve its understanding of the gas pipeline delivery limitations that gas-only resources may be facing.[39] However, this improved monitoring and outreach does not overcome the fact that gas-only resources typically will not seek gas in support of real-time dispatch until after receiving a dispatch instruction, when in constrained pipeline conditions, there is no certainty that gas will be available.[40]

These system operator practices, however well-intentioned and executed, have inherent limitations. First, such monitoring and outreach are administrative actions, taken within the system operator's discretion, but not reflected in its Tariff or operating procedures. Thus, while some individual gas-only resources may voluntarily report their fuel status or respond to ISO-NE's proactive inquiries prior to dispatch, they have no Tariff obligation to do so. Further, such work-arounds place additional stress and administrative burden upon the system operator that

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[37] ISO-NE, NEPOOL Participants Committee Report at 18 (Nov. 3, 2021), *available at* https://www.iso-ne.com/static-assets/documents/2021/11/november-2021-coo-report.pdf.

[38] Rourke Aff. at P 23.

[39] *Id.* at PP 29, 34. *See also* Ex. D, Remarks by Peter Brandien, Vice President, Operations, ISO New England at the October 20, 2016 FERC Panel Discussion regarding Winter 2016-2017 Operations and Market Performance in Regional Transmission Organizations and Independent System Operators at 3, Docket No. AD16-24-000 (filed Oct. 20, 2016) ("The ISO has increased information sharing and operational interfaces with the natural gas pipelines to improve communications with the natural gas industry and develop decision-support tools for our system operators. One such tool, called the Gas Usage Tool (or 'GUT') by our system operators, allows the ISO to estimate the amount of natural gas available for electric generation. This is accomplished by estimating the demand for gas by industrial and local gas distribution companies' customers, as well as gas-fired generators, compared to the capability of the natural gas pipeline system, including LNG injections into the regional gas pipelines.").

[40] Brandien Testimony at 52.

pull resources away from other critical and time-sensitive work necessary for real-time dispatch coordination.

E. Basis for Qualified Capacity Accreditations

A fundamental building block of the ISO-NE Forward Capacity Market ("FCM") is the accreditation of a resource's Qualified Capacity. Presently, ISO-NE's methodology for determining a unit's Qualified Capacity varies by resource type and season. A distinguishing characteristic in the reliable contribution of capacity to resource adequacy is the timing and certainty of input energy availability. With the notable exception of gas-only resources, ISO-NE differentiates its capacity accreditations on the basis of whether a generation resource's energy input is under the generator's control or subject to factors or conditions outside of its control. For resources that have control of their energy input (e.g., oil, dual fuel, pondage hydropower, energy storage),[41] ISO-NE bases capacity accreditations[42] on a seasonal audit demonstration of the ability to convert the input energy into electricity.

For intermittent resources such as wind, solar, and run-of-river hydro, input fuel availability is not within the full control of the resource owner. Solar resources are dependent on solar conditions, including the position of the sun and the cloud cover.[43] Wind resources rely

[41] Control over fuel inputs is inherent in the design and configuration of oil, dual fuel, pondage hydropower and energy storage resources. Oil-fired (including dual-fuel) units have stored oil inventory in their dedicated tank. Subject to adequate fill and refill of the inventory in the tank, the on-hand fuel supply at these resources is firm. Nuclear units are fueled by nuclear fuel in their reactor core. Pondage hydro facilities hold water behind their impoundment for conversion to electricity. Electric storage facilities hold energy in storage as either electrons (e.g., lithium ion), chemical potential (e.g., flow batteries), air, or water (pumped hydro storage). This control over fuel inputs provides firm access to known levels of stored energy in real-time dispatch. In addition, the use and replenishment of that stored energy is under ISO-NE oversight.

[42] The accreditation takes into consideration technical characteristic of the particular resource type. For example, ratings for hydro resources will consider hydraulics (e.g., Daily Cycle Hydro ratings) in the calculation of the actual rating.

[43] Solar only qualifies as a capacity resource in the summer period and receives a 0 MW capacity accreditation for the winter period.

upon wind intensity, which is a function of a series of meteorological conditions. Run-of-river hydropower resources rely upon natural river flows that can vary based on rainfall, upstream water use and releases, and other hydrological and meteorological factors. ISO-NE recognizes the contingent nature of energy scheduled from these types of units by adjusting its accreditation of Qualified Capacity for these types of resources to reflect actual energy output in certain historical periods.[44] The practical effect is that these resources receive Qualified Capacity designations that are discounted well below their nameplate ratings.[45]

The outlier in the ISO-NE capacity accreditation process is its treatment of gas-only resources. Gas-only resources depend upon a gas pipeline system for the delivery of timely and adequate fuel input, typically without firm transportation rights to such delivery and in all cases without having an obligation to make and retain advance arrangements for firm supply or transportation to fulfill real-time energy offers. Very few gas-only resources routinely contract in advance for firm transportation service and gas supply.[46]

As has been recognized by ISO-NE, New England generators, and the Commission, the New England gas pipeline system cannot meet all demands on winter peak days. In its 2013 Complaint proceeding, NEPGA explained that ". . . it currently is *impossible* for every gas-fired capacity resource to always have enough gas to operate at its full capacity supply obligation

[44] Rourke Aff. at P 24. *See also* ISO-NE, Intermittent Resource Review: Use of Median Output to Determine Qualified Capacity Values at 5 (Dec. 7, 2015), *available at* https://www.iso-ne.com/static-assets/documents/2015/12/vrwg_median_vs_mean_reliability_hours_final.pdf.

[45] *See* Rourke Aff. at P 24.

[46] *Id.* at P 10.

whenever called upon. There is not enough gas pipeline capacity . . . ."[47] ISO-NE has reported that unavailability of fuel can disrupt dispatch of gas generation resources:

> [G]as-fired generators are not procuring firm pipeline access to natural gas, of which there is simply not enough to supply both generators and the LDCs. These generators have limited access to alternatives like LNG. *Although the ISO's system operators are actively managing these issues, we have seen some sudden, sizeable reductions in generators' output as a result of gas supply interruptions*.[48]

Notwithstanding the known uncertainties with fuel availability for gas-only resources in winter peak conditions, ISO-NE treats a gas-only resource as equivalent to resources with dedicated, on-site fuel supplies for accreditation purposes, and merely requires a seasonal audit demonstration of the ability to convert input fuel into electricity in periods when that fuel *is* available.[49] While seasonal audits test a unit's performance at high and low ambient temperatures, these audits do not consider the ability of gas-only resources to obtain gas, individually or in aggregate, in peak winter conditions.

F. Similar Inconsistencies in the Treatment of Input Energy Availability in Operating Reserves Designations

Under the ISO-NE Tariff and implementing procedures, gas-only resources that have the capability to convert fuel, if available, into electricity within the relevant dispatch period (i.e., within 10 or 30 minutes) are considered fully available for designation and real-time dispatch as an operating reserve. The immediacy of the need and ability to have reliable dispatch of operating reserves to provide real-time energy is underscored in ISO-NE Operating Procedure

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[47] The New England Power Generators Association's Motion for Leave and Answer at 4, Docket No. EL13-66-000 (filed June 20, 2013); *see* ISO-NE, Addressing Gas Dependence at 4 (July 2012), *available at* https://www.iso-ne.com/static-assets/documents/committees/comm_wkgrps/strategic_planning_discussion/materials/natural_gas_white_paper_draft_july_2012.pdf (stating on "peak winter days, the pipelines are fully utilized with not enough infrastructure to meet the needs of the gas-fired fleet.").

[48] Brandien Testimony at 53 (emphasis added).

[49] Rourke Aff. at PP 20, 22, 24**.**

No. 8 ("OP-8"), which sets clear limitations on the capability designated as available to supply operating reserves. OP-8 provides: "Only that capability *that can actually supply MW in the applicable period* shall be classified as Operating Reserve. Operating Reserve, if activated, *shall be sustainable for at least one (1) hour from the time of activation* or the published NERC/NPCC criteria."[50] Further, from the system operations perspective, ISO-NE's dispatch of resources for operating reserves must "pay particular attention to temporary limitations and de-ratings."[51]

As explained in the Rourke Affidavit, the characteristics necessary for a generating resource to be available for dispatch as operating reserves are: (1) that the resource must have generating capacity that is not already committed or dispatched; (2) such capacity must be available; and (3) the resource must have the capability, including immediate fuel availability, to convert fully into energy within the 10 or 30 minute designation period.[52] In short, the system operator relies on the expectation that resources designated as operating reserves will provide in-time energy deliveries from idled capacity with fuel that is certain to be available.

Certainty in the availability of fuel for operating reserves is essential. Resources with dedicated fuel inputs that are known and measurable (e.g., oil stored on site) allow the system operator to evaluate a specific resource's capability and the sustainability (in dispatch hours) of any reserves being activated. In the case of a pumped storage project, energy storage is provided by the water held in the upper reservoir. ISO-NE monitors and has access to data on those

[50] ISO-NE Operating Procedure No. 8. Operating Reserve and Regulation (Aug. 11, 2011) ("Operating Procedure No. 8"), *available at* https://www.iso-ne.com/static-assets/documents/rules_proceds/operating/isone/op8/op8_rto_final.pdf (emphasis added). *See also* Market Rule 1, Section III.1.7.17.

[51] *Id*.

[52] Rourke Aff. at P 28.

storage levels[53]—to the point of having the water level for the two largest pumped storage facilities in New England, Northfield Mountain and Bear Swamp, as part of control room displays. Therefore, for pumped storage, ISO-NE has the ability to confirm that there is water available for immediate generation of energy under an operating reserve activation.

In contrast, gas-only resources have no Tariff obligation to obtain gas to fulfill real-time dispatch beyond their day ahead generation schedule—they need only "look for it" after they are dispatched. In severe winter weather conditions where pipeline capacity and overall natural gas availability may be constrained, this approach creates the false impression that there is an abundance of reserves available to the system.

This lack of assurances as to fuel supply for gas-only resources can push the ISO-NE operators to second guess the recommended results of the market dispatch software and make manual decisions to dispatch units out of market to ensure the secure operation of the system.[54] ISO-NE operators may be forced to administratively account, in real-time, for possible non-responsiveness of gas-only resources during anticipated pipeline constrained conditions.[55] In these situations, ISO-NE operators may choose to increase the reserve requirement to account for this uncertainty or activate additional resources outside of the software optimization (i.e., calling resources on-line "out of rate") that are more costly.[56] These practices may be overcompensating

[53] *Id.*

[54] *Id.* at PP 35-36.

[55] *Id.*

[56] *Id.* at P 37.

natural-gas only resources that cannot adequately provide real-time operating reserves,[57] while at the same time undercompensating other resources that can reliably provide such reserves.

V. COMPLAINT

A. Standards for Evaluating Undue Discrimination or Preference

Section 206 of the FPA provides that undue discrimination or preference in FERC jurisdictional rates, terms or conditions, or rules or practices affecting those rates, terms or conditions, are contrary to federal law. In particular, if the Commission finds that

> any rate, charge, or classification, demanded, observed, charged, or collected by any public utility for any transmission or sale subject to the jurisdiction of the Commission, or that any rule, regulation, practice, or contract affecting such rate, charge, or classification is unjust, unreasonable, unduly discriminatory or preferential, the Commission shall determine the just and reasonable rate, charge, classification, rule, regulation, practice, or contract to be thereafter observed and in force, and shall fix the same by order.[58]

ISO-NE is a public utility. The ISO-NE Tariff provisions, Operating Procedures and practices related to capacity accreditation and operating reserve designation constitute classifications, rules, regulations and practices subject to FPA Section 206 review.[59]

Where a Commission-regulated rate or practice provides different treatment to classes of entities that are similarly situated or provides the same treatment to classes of entities that are not similarly situated, the Commission will consider whether the rate or practice is unduly discriminatory or preferential on a fact-specific basis.[60] The Commission's evaluation of

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[57] In addition, under the Tariff, a gas-only resource that encounters fuel unavailability still collects any non-zero real-time operating reserves payment based on its designation as an available operating reserve in intervals preceding the confirmation that it could not fuel its real-time dispatch activation—without any exposure to penalties for such non-performance.

[58] 16 U.S.C. § 824e(a).

[59] The Tariff, Manuals, Operating Procedures and practices individually and collectively constitute classifications, rules, regulations, and practices subject to FPA Section 206 review.

[60] *See, e.g., N.Y. Indep. Sys. Operator, Inc.*, 162 FERC ¶ 61,107 at PP 122, 126, 129, 140, 141, 142 (2018).

whether discrimination or preference is undue turns on whether the relevant classes of entities are similarly situated. The Commission explained that "[t]o say that entities are similarly situated does not mean that there are no differences between them; rather, it means that there are no differences that are material to the inquiry at hand."[61] "[E]ntities are similarly situated if they are in the same position with respect to the ends that the law seeks to promote or the abuses that it seeks to prevent, even if they are different in many other respects."[62] For instance, the Commission has determined that new and existing generators were similarly situated for "reactive power compensation purposes" because they were equally capable of providing that service, notwithstanding other significant differences.[63] Likewise, a practice or procedure that grants one entity a competitive advantage over another similarly situated entity may constitute undue discrimination or an undue preference.[64]

Where there is disparity in the treatment of similarly situated entities a valid reason for the disparity must be presented in order to show that the disparity is not unduly discriminatory or preferential. For example, in *Tenaska Clear Creek Wind, LLC v. Southwest Power Pool, Inc.*, the Commission held that that Southwest Power Pool, Inc's ("SPP") use of a 2019 planning model to conduct the restudies for a project while continuing to use a 2017 planning model for other similarly situated customers was unduly discriminatory or preferential.[65] In particular, the

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[61] *N.Y. Indep. Sys. Operator, Inc.*, 162 FERC ¶ 61,124 at P 10 (2018) (citing *Iberdrola Renewables, Inc. v. Bonneville Power Admin*., 137 FERC ¶ 61,185 at P 62 (2011), *reh'g denied*, 141 FERC ¶ 61,233 (2012)).

[62] *Id.* (citation omitted).

[63] *Id.* (citing *Calpine Oneta Power, L.P.*, 116 FERC ¶ 61,282 at P 36 (2006), *reh'g denied* 119 FERC ¶ 61,177 (2007); *see also Iberdrola Renewables, Inc. v. Bonneville Power Admin.*, 137 FERC ¶ 61,185 at P 62 (explaining that that "non-[f]ederal renewable resources are similarly-situated to [f]ederal hydroelectric and thermal resources for purposes of transmission curtailments because they all take firm transmission service.")).

[64] *N.Y. Indep. Sys. Operator, Inc.*, 162 FERC ¶ 61,107 at P 40.

[65] 177 FERC ¶ 61,200 at PP 62, 73 (2021).

Commission explained that SPP was obligated, and failed, to demonstrate that there was a legitimate factor justifying the disparate treatment between similarly situated customers.[66] In that instance, FERC concluded that SPP had no reasonable justification for applying different vintage of modelling data in the restudy of projects in the same study cluster.[67]

The Commission's analysis is similar where instead of undue preference among similarly situated entities, there is identical treatment of different entities that are not similarly situated with respect to the relevant considerations. In *Indianapolis Power & Light Co. v. Midcontinent Independent System Operator, Inc*., the Commission found the uniform treatment of entities to be unduly discriminatory or preferential because the uniform treatment failed to account for the unique characteristics of different types of resources.[68]

B. Undue Preference for Gas-Only Resources in Capacity Accreditation

Gas-only resources receive an undue preference by being treated the same way for capacity accreditation as generators with known, dedicated fuel supplies, in spite of uncertainties about the ability of gas-only generators to obtain gas supply in peak winter conditions. Further, by assuming that gas-only resources always have fuel availability for purposes of capacity accreditation, ISO-NE confers an undue preference upon gas-only resources as compared to other resources, such as wind, solar and run-of-river hydro, which are subject to a capacity accreditation that reduces their overall capacity ratings based upon input energy variability.

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[66] *Id.* at P 73.

[67] *Id.*

[68] 158 FERC ¶ 61,107 at PP 69-70 (2017).

1. Preferential Treatment in Capacity Accreditation

Under ISO-NE's rules and procedures, the Qualified Capacity rating for a gas-only resource is based solely upon a test that only confirms the physical ability of the resource to convert fuel into energy. This accreditation test assumes that each individual gas-only resource can always access fuel. The capacity accreditation audits do not consider pipeline limitations, the existence (or absence) of firm gas supply or delivery arrangements made by the generator, or the lack of any obligation that they hold such arrangements through real-time dispatch; they simply assess whether a gas-only resource can run as claimed to convert gas to electricity when gas *is* available.[69] This approach to capacity accreditation of gas-only resources is unduly preferential because it fails to properly capture a number of uncertainties for gas-only resources: (i) the uncertainty of a gas-only resource obtaining gas in an intraday market during winter peak and other extreme weather conditions constraining available supplies;[70] (ii) the absence of an obligation for a gas-only resource to secure gas prior to or even upon receipt of a real-time dispatch instruction;[71] and (iii) the fact that capacity ratings are conducted on a unit-by-unit basis without consideration of the total pipeline capacity to support multiple gas-only resources.

As explained by Mr. Rourke, a gas-only resource's ability to secure gas supplies in the intraday market for real-time dispatch is tied directly to the pipeline capacity and firm service reservations and nominations on the gas pipeline that serves that resource.[72] Subject to pipeline maintenance activities, the gas pipeline system is typically unconstrained in summer and

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[69] *Id.* at PP 33-36.

[70] *See* ISO-NE Resource Mix Statement ("During cold weather, most natural gas is committed to local utilities for residential, commercial, and industrial heating. As a result, *we are finding that during severe winter weather, many power plants in New England cannot obtain fuel to generate electricity*." (emphasis added)).

[71] *See* NEPGA Complaint Order at P 47; NEPGA Complaint Rehearing Order at P 20.

[72] Rourke Aff. at P 10.

shoulder seasons, providing fuel delivery access by all customers. In winter-peak conditions, however, the level of headroom (capacity less nominations by firm capacity holders) for gas pipelines in New England can be severely constrained.[73] For winter 2021/2022, ISO-NE estimated that 3,700 MW to 4,500 MW of gas-only resources would be at risk of being unable to run at winter peak conditions.[74] Further, ISO-NE has noted that, in high demand periods, the flexibility to make changes in off-take volumes within the Gas Day can be constrained, particularly where the pipeline declares an Operational Flow Order event.[75] This, in turn, means that gas-only resources face a higher risk of being unable to obtain fuel necessary to honor real-time dispatch instructions.

In addition, the winter capacity ratings for gas-only generators are determined without consideration of the total gas delivery constraints and generator demand across the supplying gas pipeline. There is no mechanism in the capacity accreditation process or capacity auction parameters that limits the qualification of gas-only resources in the FCA to reflect pipeline limitations. It is incorrect to presume, for example, that each new gas-only resource seeking entry in the FCA will be able to access additional fuel. In particular, even if there is sufficient headroom on the pipeline to serve one generator on a cold winter day, that same headroom

[73] *Id.* at PP 34-35.

[74] *Id.* at P 23 (discussing the 50/50 and 90/10 generation risk scenarios detailed in ISO-NE's 2021-2022 Winter Outlook).

[75] ISO-NE, ISO-NE Winter 2020/21 Review at 20 (Apr. 7, 2021), *available at* https://www.iso-ne.com/static-assets/documents/2021/04/2021-04-07-egoc-a3.1-iso-ne-winter-2020-2021-review.pdf (listing the 4-8 OFO events declared on each of the Algonquin Gas Transmission, Iroquois Gas Transmission System, Maritimes & Northeast Pipeline and Tennessee Gas Pipeline). An OFO is a measure taken by a gas pipeline operator to maintain the integrity of distribution systems in response to system conditions or supply constraints. OFOs impose tolerance band restrictions that attempt to tightly balance actual customer usage with scheduled usage and impose penalties for deviations outside such tolerance bands.

cannot be double counted (or more) as support of the capacity for multiple generators on the same pipeline.

These blind spots within the capacity accreditation regime improperly lead to the inclusion of more Qualified Capacity in the FCA for gas-only resources than can be simultaneously fueled in peak winter conditions—a point confirmed by NEPGA in its 2013 complaint.[76] There is simply not enough available gas pipeline capacity in the region to support the gas-only fleet if they were all called to run at the same time. Further, in light of the Commission's interpretation that the Tariff does not impose a real-time obligation to obtain gas (only an obligation to look for it, with no Tariff violation if there is none to buy), existing capacity rating practices can result in compensating gas-only resources collectively for levels of capacity that cannot be delivered in severe winter conditions. The end result is to cause the actual supply of capacity to be overstated, which in turn counterproductively incentivizes gas-only resources *not* to make investments necessary to assure their capacity is backed by firm gas supply and transportation or by an alternative fuel source (e.g., dual-fuel resources), and leads to capacity clearing prices below competitive levels.[77]

ISO-NE's assumption of fuel availability for gas-only resources fails to consider the impacts of critical severe winter weather conditions on the ability of such resources to obtain fuel. As a result, gas-only resources receive an undue preference in the capacity accreditation

[76] *See* NEPGA Complaint at 41.

[77] Pay for Performance penalties were intended in part to incentivize gas-only resources to acquire dual-fuel capabilities, s*ee ISO New England Inc.*, 147 FERC ¶ 61,172 at P 33 (2014), but many gas-only resources have not done so. The ineffectiveness of Pay for Performance partially results from the fact that these penalties only apply during capacity-scarcity conditions. A capacity scarcity condition occurs when one or more of the three reserve requirements is deficient and the reserve-constraint penalty factor is setting the real-time reserve price. To date, capacity scarcity events triggering Pay for Performance penalties have been very infrequent. Further, if a gas-only resource that could not obtain gas was nonetheless designated as real-time operating reserves in a scarcity event, it would be considered as "performing" with no penalty, and possibly receive a payment for over-performance, despite its inability to provide a real-time operating reserve activation.

process relative to other resource types that have a known, dedicated input energy supply (e.g., nuclear, pondage hydroelectric and oil facilities). Without documentation of a known, dedicated fuel source, a gas-only resource does not possess the same fundamental input energy certainty that nuclear, pondage hydroelectric and dual-fuel facilities provide to the ISO-NE system as capacity resources in critical, severe winter weather conditions. This preference is perhaps most starkly illustrated by comparing gas-only resources and dual fuel resources. These resources are treated identically for capacity rating purposes, even though the dual fuel resources have invested funds for the specific purpose of enhancing their dependability in the event of gas supply unavailability, while gas-only resources are exposed to fuel unavailability risk and are excused under the Tariff from any consequences for failing to run due to fuel unavailability.

The assumed availability of fuel for gas-only resources within the capacity accreditation test, counterproductively, acts as a disincentive for gas-only resources to make investments in firm gas supply and transportation or an alternative fuel source (e.g., dual-fuel resources). Simply, there is no benefit to a gas-only generator in securing a known, dedicated fuel supply when its capacity rating is the product of an accreditation test that assumes natural gas is always available in the first instance.

The inequity of the undue preference granted to gas-only resources is further demonstrated by the differing capacity accreditation test applied to intermittent resources, such as solar, wind and run-of-river hydro. These resources face varying degrees of variability in their real-time generation capabilities due to a lack of control over their energy inputs. The ISO-NE Tariff and rules apply an alternative "reliability hours" approach for the capacity accreditation test for solar, wind and run-of-river resources in order to take into account production uncertainty during the peak load condition. These alternative accreditation

procedures result in capacity ratings that can be a small fraction of nameplate capacity. This stands in stark contrast to gas-only resources—which are dependent upon conditions on the gas pipeline system that are wholly outside of the generators' control—yet are subject to a capacity accreditation test that assumes that fuel requirements will be fully met at all times.[78]

Gas-only resources that successfully acquire a Capacity Supply Obligation are being paid based upon a capacity rating that may not be reliably met during severe winter conditions that produce pipeline constraints or otherwise restrict gas supply availability. Such preferential overstatement of gas-only resources' ability to perform in winter peak conditions sends an incorrect signal within the FCM leading to clearing prices below competitive levels.

2. Timely Development and Implementation of an ELCC Methodology Is Potentially Helpful.

The undue preference being afforded to gas-only resources is an ongoing harm that must be timely resolved. Recently, ISO-NE committed to undertake a stakeholder process to develop potential improvements to capacity accreditation under its Effective Load Carrying Capability ("ELCC") project.[79] Complainants are hopeful that the ELCC project will, in fact, address the concerns detailed in this Complaint concerning the unduly preferential treatment of gas-only resources in capacity accreditation. A commitment by ISO-NE to timely take steps through ELCC implementation to set winter capacity ratings for gas-only resources consistent with the level that could be fueled on a cold winter day would be a positive step. However, as of the filing of this Complaint, there is no detail as to the nature of the changes that will be reflected in a new ELCC accreditation methodology.

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[78] Rourke Aff. at P 19.

[79] *See* ISO-NE, ISO-NE's 2022 Annual Work Plan at 5 (Oct. 8, 2021), *available at* https://www.iso-ne.com/static-assets/documents/2021/10/2022_awp_final_10_08_21.pdf.

Of further concern for Complainants is the matter of timing. ISO-NE currently plans to implement an ELCC methodology for FCA 19[80]—which, unequivocally is too late. Waiting until FCA 19 to apply an ELCC methodology would mean that the undue preference identified in this Complaint would not be addressed until June 1, 2028 at the earliest. While Complainants understand the potential complexities involved in such an ELCC effort, delaying relief until June 1, 2028 is not timely and would unacceptably allow the continuation of an undue preference for six more years.

C. Undue Preferences for Gas-Only Resources in Operating Reserve Designation Procedures

The undue preferences being afforded to gas-only resources are not limited to capacity accreditation—similar preferences exist in operating reserve designation. ISO-NE procedures require that all but one of the resource technologies eligible to supply real-time operating reserves have known and measurable fuel supply and a verifiable means of delivering such fuel inventory in advance of its operating reserve designation and real-time dispatch. In particular, pondage hydroelectric, oil, and dual-fuel facilities have unambiguous and dedicated fuel input that is known and measurable.[81] Also, the LNG-supplied Mystic 8 and 9 units have dedicated fuel inventory and a direct pipeline to transport vaporized LNG to those units that can serve as a reliable basis of a real-time energy dispatch for operative reserves.[82] This fuel certainty is critical to assure the resource will be able to timely respond to ISO-NE real-time dispatch as needed to address a system contingency.

[80] In January 2022, ISO-NE updated its target for ELCC implementation to FCA 19 (as compared to the initial plan for phased implementation between FCA 18 and FCA 19).

[81] *See* Rourke Aff. at P 25.

[82] *See id.* at P 9.

The outlier is again gas-only resources. They do not have on-site fuel supply. Following the issuance of day-ahead market dispatch instructions, these units have no obligation to arrange for gas supply prior to the receipt of a real-time dispatch instruction, and the failure to obtain fuel to meet a real-time dispatch instruction, once issued, is not a Tariff violation. In fact, under the Tariff, ISO-NE is required to designate and compensate operating reserves on gas-only resources even if they are later unable to obtain gas in real-time. Such payments, based upon a designation that precedes dispatch instructions, continue unless and until ISO-NE determines that the resource does not have fuel availability based on system operator outreach or based on a post-dispatch report by the generator that fuel could not be obtained. The cessation of payments only applies to prospective intervals.[83]

This current framework, in which a gas-only resource can be designated and paid as a real-time operating reserve without confirmation of the availability of its fuel supply, even in winter conditions when the gas pipeline system is severely constrained, provides an undue preference to gas-only resources relative to, for instance, gas-fired resources with dual fuel capability or LNG-based supply. Further, absent proactive information collection from gas-only resources, operators may be forced to administratively account for the possibility that some portion of gas-only generators designated as operating reserves will be unavailable in real time during cold weather, pipeline-constrained conditions, and to take mitigating measures, including

[83] The real-time operating reserve designation occurs through ISO-NE's energy dispatch system which assumes that open energy offers can be fueled. If, for example, a gas-only resource is designated and paid as a real-time operating reserve for the first 12 hours of a day, but cannot find gas when ultimately activated for reserve response in hour 13, the Tariff does not require the gas-only resource to repay the 12 hours of reserves it likely was unable to provide. It is simply derated from the failed response interval on a forward basis.

out-of-market actions, to address the risk of real-time non-performance due to natural gas unavailability.[84]

The current preferential treatment of gas-only resources in operating reserves designation undermines the efficient administration of ISO-NE's operating reserves market. First, the overstatement of the actual supply of operating reserves (via designation of gas-only resources without regard to fuel availability) mutes the appropriate price for real-time operating reserve resources that *can* actually physically deliver the energy upon real-time dispatch. Further, load is unjustly paying for the costs of such designated operating reserves even in the event that, upon dispatch, the resource reports its inability to obtain sufficient fuel. And, finally, the system operator's ability to timely and effectively respond to contingency losses is hampered by the additional stressors involved in monitoring and managing additional risks of gas-only resources being unavailable due to the failure to obtain fuel in response to a real-time dispatch instruction.

A level playing field for real-time operating reserves – one that does not result in undue preference to a single resource type – requires that all operating reserves have confirmed fuel availability prior to issuance of a dispatch instruction under OP-8. That requirement is already met for every resource type eligible to provide operating reserves other than gas-only resources.

VI. REQUESTS FOR RELIEF

As addressed above, gas-only resources (i.e., gas-fired generators that do not have dual fuel capability or pre-dispatch, dedicated firm natural gas supply and delivery arrangements) are afforded an undue preference in the existing ISO-NE Tariff and implementing procedures for: (1) the qualification and rating of capacity resources; and (2) the designation of operating

[84] Rourke Aff. at PP 36-37.

reserves. Accordingly, Complainants respectfully request that the Commission take the following actions:

1. With respect to qualification and accreditation of capacity resources:
    (a) find that the ISO-NE rules on qualification and accreditation of capacity resources provide an undue preference to gas-only resources in violation of FPA Section 206;
    (b) direct ISO-NE to make changes to its Tariff and implementing procedures, effective no later than FCA 18, that eliminate such undue preference by: (1) limiting the aggregate winter capacity qualification of gas-only resources to levels that can be simultaneously fueled and (2) establishing winter season capacity ratings that account for uncertainties in the availability of fuel during stressed winter conditions;[85] and
    (c) take such other remedial actions that the Commission deems necessary to confirm and ensure that the ISO-NE Tariff and implementing procedures for capacity accreditation are not unduly preferential or discriminatory.
2. With respect to real-time operating reserve designations:
    (a) find that the ISO-NE rules on eligibility and designation of real-time operating reserves provide an undue preference to gas-only resources, in violation of FPA Section 206; and
    (b) direct ISO-NE to promptly make changes to its Tariff and implementing procedures to eliminate this undue preference by limiting the designation of real-time operating reserves to situations where either: (i) resources

[85] An ELCC methodology could be one tool to accomplish this requested relief. *See supra* Section V.B.2.

have confirmed availability of sufficient fuel inventory in hand; or (ii) resources have voluntarily assumed an enforceable Tariff obligation to timely obtain fuel to meet a real-time reserve dispatch instruction consistent with real-time operating reserve designation; and

(c) take such other remedial actions that the Commission deems necessary to confirm and ensure that the ISO-NE Tariff and implementing procedures addressing designation and compensation of real-time operating reserves are not unduly preferential or discriminatory.

VII. EXPEDITIOUS ACTION IS MERITED BECAUSE THE MATERIAL FACTS ARE UNDISPUTED

Complainants respectfully request that the Commission act expeditiously on this Complaint. No hearing is needed. The Commission has held that "an evidentiary, trial-type hearing is necessary only where there are material issues of fact in dispute that cannot be resolved on the basis of the written record."[86] There are no disputes concerning the material facts. The factual predicates for this Complaint outlined in Section IV above, are well established, and previously have been acknowledged by Respondent ISO-NE. Moreover, Complainants do not wish for the pendency of this Complaint to get in the way of ISO-NE consulting with Commission Staff on the development and implementation of remedies to the issues raised herein. Accordingly, it is appropriate for the Commission to act upon this Complaint based on the pleadings – additional time and resources for an administrative hearing are not warranted.

[86] *Const. Pipeline Co., LLC*, 162 FERC ¶ 61,014 at P 10 (2018) (citing *Dominion Transmission, Inc.*, 141 FERC ¶ 61,183 at P 15 (2012)). *See S. Union Gas Co. v. FERC*, 840 F.2d 964, 970 (D.C. Cir. 1988); *Entergy Nuclear Operations, Inc. v. Consol. Edison Co. of N.Y., Inc.*, 110 FERC ¶ 61,312 at P 32 (2005) (citing *Texaco*, *Inc. v. FERC*, 149 F.3d 1091, 1100 (D.C. Cir. 1998)).

VIII. OTHER MATTERS

A. Rule 206(b)(1): Action or Inaction Alleged To Violate Statutory Standards or Regulatory Requirements

This Complaint addresses undue preferences arising under the ISO-NE Tariff, Market Rule 1, and implementing rules and procedures for capacity accreditation[87] and designation of operating reserves.[88] The continued application of these current rules, individually and collectively, to gas-only resources constitute an undue preference in violation of Section 206 of the FPA and Commission precedent.

B. Rule 206(b)(2): Legal Bases for Complaint

The legal bases for this Complaint are set forth in Section V of this Complaint.

C. Rules 206(b)(3) and 206(b)(4): Issues Presented As They Relate to the Complainants and Quantification of Financial Impact on Complainants

Accreditation of gas-only resources for winter capacity ratings of levels that cannot be confidently fueled in peak winter conditions overstates the actual level of capacity that can be supplied and deprives other types of generators, including RENEW and ACP members, of a reasonable compensation for the capacity they sell into the ISO FCM. Overstating gas-only capacity, and consequently distorting FCM prices, can raise barriers to new renewable resources, which remain subject to having their new capacity offers mitigated, if below administrative Offer Review Trigger Prices. Likewise, overstating the available supply of operating reserves suppresses both real-time reserve prices and real-time energy prices. RENEW and ACP members own, develop and operate renewable generators and electric storage resources. The

[87] *See* Market Rule 1, Sections III.13.1 and III.1.5; ISO-NE Manual M-20.

[88] *See* Market Rule 1, Section III.1.7.17; ISO-NE Operating Procedure No. 8.

latter rely on ISO energy and real-time reserve prices and the former rely on ISO energy prices as a critical part of supporting such investments.

D. Rule 206(b)(5): Nonfinancial Impacts Upon Complainants

The owners of existing resources and the developers of new generation resources in New England rely on well-structured and fair market rules to support their investments. Undue preferences in the capacity and operating reserves markets undermine fair market results.

E. Rule 206(b)(6): Other Proceedings

Pursuant to Rule 206(b)(6) of the Commission's Rules of Practice and Procedure,[89] Complainants state the issues presented in this Complaint are not pending before the Commission in any other proceeding.

F. Documents that Support the Complaint

Included in this Complaint are:

Exhibit A, Affidavit Stephen J. Rourke;

Exhibit B, ISO-NE Key Grid and Market Stats, Resource Mix;

Exhibit C, Excerpts from Testimony of Peter Brandien on Behalf of ISO New England Inc., included as Att. I.-1b to ISO-NE Filing of Performance Incentives Market Rule Changes, Docket No. ER14-1050-000 (filed Jan. 17, 2014);

Exhibit D, Remarks by Peter Brandien, Vice President, Operations, ISO New England at the October 20, 2016 FERC Panel Discussion regarding Winter 2016-2017 Operations and Market Performance in Regional Transmission Organizations and Independent System Operators, Docket No. AD16-24-000 (filed Oct. 20, 2016);

Attachment A, Notice of Complaint.

[89] 18 C.F.R. § 385.206(b)(6).

G. Negotiation among the Parties and Opportunities for Dispute Resolution

The issues related to increased reliance on gas-fired generation and capacity constraints on the pipelines serving New England are well known to ISO-NE and among stakeholders. Past efforts have been made to address these concerns. In fact, stakeholders have offered different approaches to address these gas-only resource concerns.[90] To date there is no specific commitment by ISO-NE to address these problems.[91]

In accordance with Rule 206(b)(9) of the Commission's Rule of Practice and Procedure,[92] Complainants state that the subject matter of this Complaint is not a matter within the purview of the Commission's Office of Enforcement.

H. Service and Form of Notice

In accordance with Rule 206(c) of the Commission's Rules of Practice and Procedure, Complainants are serving a copy of this Complaint on the respondent, ISO-NE. Further, pursuant to Rule 206(b)(1) of the Commission's Rules of Practice and Procedure, Attachment A to this Complaint contains a form of notice suitable for publication in the Federal Register.

IX. CONCLUSION

For the foregoing reasons, Complainants respectfully request that the Commission: (1) find that ISO-NE's current rules on capacity accreditation and operating reserve designation

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[90] *See* FirstLight, Connecting the Dots Between Fuel Security & Resource Adequacy (June 11, 2019), *available at* https://www.iso-ne.com/static-assets/documents/2019/06/a2b_5_firstlight_presentation_energy_security.pdf; FirstLight, Connecting the Dots Between Fuel Security & Resource Adequacy (July 10, 2019), *available at* https://www.iso-ne.com/static-assets/documents/2019/07/a4c_3_firstlight_presentation_energy_security.pdf.

[91] As discussed in Section V.B.2., ISO-NE has announced plans to work on development and potential adoption of an ELCC methodology. Depending on its scope and overall elements, ELCC may act to remove all or some elements of the undue preferences available to gas-only resources in the capacity accreditation process. While ISO-NE plans to pursue ELCC changes to capacity accreditation, the specifics of the ELCC methodology are not yet known. Further, waiting until FCA 19 for correction of the undue preferences presently granted to gas-only resources within the capacity accreditation process is not an adequate remedy.

[92] 18 C.F.R. § 385.206(b)(9).

provide undue preference to gas-only resources; (2) direct ISO-NE to take appropriate steps promptly to remedy that undue preference consistent with the specific Requests for Relief outlined in Section V.D; and (3) take such other steps necessary and appropriate to redress the matters set forth in this Complaint.

Respectfully Submitted,

Francis Pullaro
Executive Director
RENEW Northeast
646-734-8768
fpullaro@renew-ne.org

Gabe Tabak, Counsel
Gene Grace, General Counsel
American Clean Power Association
1501 M St., N.W., Ste. 900
Washington, D.C. 20005
(202) 383-2500
gtabak@cleanpower.org
ggrace@cleanpower.org

Dated: March 15, 2022

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing was served this 15th day of March 2022 in accordance with 18 C.F.R. § 385.206 upon the contacts for the respondent ISO New England Inc. as shown on the Commission's list of Corporate Officials posted on its website.

/s/ Gabriel Tabak

Gabe Tabak, Counsel
American Clean Power Association
1501 M St., N.W., Ste. 900
Washington, D.C. 20005
(202) 383-2500
gtabak@cleanpower.org

EXHIBIT A
Affidavit of Stephen J. Rourke

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

RENEW Northeast, Inc. and the American Clean Power Association,	)	
Complainants,	)	
v.	)	
	)	**Docket No. EL22-___-000**
ISO New England Inc.,	)	
Respondent.	)	

AFFIDAVIT OF STEPHEN J. ROURKE

1. My name is Stephen J. Rourke. I am an Advisor with Daymark Energy Advisors (Daymark). My business address is 370 Main Street, Suite 325 in Worcester, MA 01608.

2. I am providing this affidavit in support of RENEW Northeast, Inc. and the American Clean Power Association's complaint concerning undue preference for natural gas generators that do not have dual fuel capability or dedicated, firm natural gas supply and delivery arrangements[1] under ISO New England Inc.'s (ISO-NE) current procedures for accreditation of installed capacity and designation of operating reserves.

[1] For purposes of this affidavit, natural gas generators that do not have dual fuel capability or dedicated, firm natural gas supply and delivery arrangements are referred to as "gas-only resources."

Background

3. I have over 40 years of professional experience working in the electric power industry in New England. During that time, I have held various engineering, management and executive positions covering many aspects of bulk power system operations and planning, and wholesale power markets. In my current role with Daymark, I advise asset owners, developers, investors, and utilities on bulk power system operations and planning, and wholesale power market operations and administration. Prior to joining Daymark, I served as Vice President – System Planning for ISO-NE in Holyoke, MA from 2006 until 2019. I hold an MBA from Western New England University in Springfield, MA, and a Bachelor of Science in Electrical Engineering from Worcester Polytechnic Institute in Worcester, MA.

4. As Vice President – System Planning at ISO-NE, I led the department responsible for Resource Adequacy, Transmission Planning, Generator Interconnection, and various Regional and Inter-Regional studies, including development of the New England Regional System Plan. The Resource Adequacy function included establishing installed capacity requirements for the region as well as review of and qualification determination for resources (generation, demand, imports) seeking to participate in the New England Forward Capacity Market. The Transmission Planning function included detailed engineering analysis to identify any areas where system upgrades would be required to comply with transmission planning standards and criteria of North American Electric Reliability Corporation (NERC), Northeast Power Coordinating Council (NPCC), and ISO-NE (typically for facilities operating at 115 kV and above). The Generator Interconnection function carried out the Generator

Interconnection process for all generators in New England seeking to interconnect to the transmission system administered by ISO-NE. Other Regional and Inter-Regional studies included economic planning studies for New England, joint studies with other members of NPCC and studies of the Eastern Interconnection through participation in the Eastern Interconnection Planning Collaborative. Some of these studies included evaluation of natural gas system capabilities and limitations for supporting power generation in New England and across other parts of the Eastern Interconnection.

5. Earlier in my career, from 1986 – 1994, I was responsible for operations forecasting and scheduling, and control room operations at the New England Power Exchange (NEPEX), the predecessor organization to ISO-NE. The forecast and scheduling function developed the daily operations plan and resource commitment schedule to meet the hour-by-hour load and operating reserve requirements for New England. Control Room operations implemented the operating plan through minute-to-minute economic dispatch and commitment of resources and transmission security analysis. The NEPEX control room worked with other dispatch centers in New England and with neighboring Control Areas (New York, New Brunswick, Quebec) to address changing system conditions in real time, including activation of operating reserves for contingency losses in New England or to support a neighboring system.

6. While at NEPEX, the forecast office was responsible for coordinating and evaluating seasonal installed capacity demonstrations for each resource on the New England power system. This responsibility covered all resource types on the New England system.

7. While working for New England Power Company (now National Grid) from 1994 – 1998 and for Northeast Utilities (now Eversource) from 1998 – 2003, I was responsible for coordinating the seasonal audit demonstrations for each company's fossil, conventional hydro, pumped storage hydro and nuclear (Northeast Utilities) resources.

Overview of Generation Resources Participating in ISO-NE Markets

8. New England has a diverse mix of generating resources with various fuel types. These resources include nuclear, oil, coal, natural gas, dual fuel, conventional hydro, pumped storage hydro, biomass, solar, wind, battery storage, landfill gas and miscellaneous other small resources. Over the past 20 years, the generation mix in New England has evolved to have a significant amount of natural-gas-fired resources.

9. The natural gas plants in New England fall into three basic categories:

(i) Most of the natural gas plants in New England can only access natural gas through natural gas pipelines, with no back up fuel. Availability of natural gas to these facilities is entirely dependent on the availability of fuel from the regional and inter-regional pipeline system.

(ii) Some of the natural gas plants do have access to and are permitted to use a secondary liquid fuel, such as ultra-low sulfur diesel, for a limited number of hours per year under certain conditions. For these resources, the generator separately arranges for delivery and on-site storage of this secondary fuel.

(iii) The third category is plants that have direct access to a liquified natural gas (LNG) source, such as the Mystic Unit Nos. 8 & 9 at Mystic

> Station in Everett, MA, which is directly adjacent to the Everett LNG facility fueling those units. In this case, the generator owner/operator or their contracted LNG provider makes arrangements, in advance, for deliveries of LNG to the relevant LNG storage facility that provides its fuel supply. This is analogous to advance deliveries by an oil tanker to an oil storage tank farm that supplies an adjacent generating station.

In addition, there are some very small landfill gas and bio-gas plants, but they are not a significant portion of the large natural gas fleet in the region. There also are some primarily oil-fired generators that can co-fire with pipeline-supplied natural gas in the summer period to assist with emissions control.

10. New England has no indigenous source of natural gas. All natural gas is imported over five (5) inter-regional pipelines—two (2) from Canada to the north and three (3) through New York State to the west—or in liquid form by LNG tanker for deliveries through an LNG storage and vaporization facility connected to a pipeline. Once in New England, these five pipelines connect to a network of pipelines that run through much of New England. This system has been designed to support the firm service customers of local natural gas utilities, which are typically using the gas for residential heating and other commercial and industrial applications. These local distribution companies (LDCs) have contracted for firm transportation rights on the natural gas pipeline which align with the expected gas demand of their residential, commercial, and industrial customers. Few, if any, of the natural gas power plants connected to this pipeline network have contracted in advance for firm transportation service and gas supply. When the natural gas pipeline system is supporting peak

demand from firm customers during cold winter weather periods, much of the pipeline's finite capability is being used to support those firm customers. This leaves limited pipeline capacity available for transportation to power generators relying on interruptible service—which in turn affects potential availability of such generators for dispatch.[2] In its Winter Outlook for 2021/2022, ISO-NE has estimated that "more than 3,700 MW of natural gas-fired generating capacity is at risk of being unable to get fuel when needed."[3] There are approximately 9,200 MWs of pipeline supplied natural gas-fired generation in New England that do not have a secondary liquid fuel source. Under more extreme "90-10" winter peak conditions, as have been experienced in severe cold snap conditions in the past, this unavailability figure can be even higher. For January 2022, ISO-NE estimated that in "90-10" winter peak conditions over 4,500 MW of natural gas resources with a Capacity Supply Obligation in the Forward Capacity Market (FCM) were at risk of being unable to obtain natural gas.[4]

11. The severe Cold Snap of January 2004 highlighted New England's exposure to a shortfall in natural gas for power generation once all firm service gas customers have

[2] There are limited instances where gas supply arrangements are made in advance through LNG injections from a ship connected to a natural gas pipeline through a buoy off of the east coast of Massachusetts. Such LNG injections, while occurring during some winter seasons, have not been a regular mechanism for supplementing gas supplies in New England. Further, the ISO-NE Tariff does not require gas-only resources contracting for such LNG to retain that supply in support of reliable operation of their gas-only resources.

[3] ISO New England's 2021/2022 Winter Outlook (2021), *available at* https://www.iso-ne.com/static-assets/documents/2021/12/2021-22-winter-outlook.pdf.

[4] ISO New England's Winter Outlook 2021-2022, Electric Gas Operations Committee, at 7, *available at* https://www.iso-ne.com/static-assets/documents/2021/12/2021-12-02-egoc-a3.1-iso-ne-winter-2021-2022-outlook.pdf

been satisfied. That event and continuing concerns in subsequent years led directly to numerous studies of the problems being faced in New England.[5]

12. The ISO-NE operations team has done some remarkable work since that time to develop and maintain relationships with the natural gas industry. This work has led directly to improved communications, better access to data on the natural gas system, increased situational awareness, maintenance coordination between the two industries, notifications of operational flow orders and other limitations on the natural gas system, and sharing of operational information on expected electric and gas schedules. This information assists ISO-NE operators in evaluating how pipeline capacity constraints and limited availability of natural gas supply can impact fuel availability for natural gas generation and consequently impact power system operation in New England. Similar practices have been put in place to maintain situational awareness on LNG facilities and to gather fuel inventory and delivery information for oil plants (including dual fuel gas plants) and coal plants to assist in determining winter energy availability conditions.

13. This information and other analysis help ISO-NE system operators understand the level of restrictions on natural gas facilities based on the severity of the winter

[5] *See, e.g.*, ISO-NE, Final Report on Electricity Supply Conditions During the January 14-16, 2004 "Cold Snap" (Oct. 12, 2004), *available at* https://www.iso-ne.com/static-assets/documents/2017/09/iso-ne_final_report_jan2004_cold_snap.pdf; ISO-NE, 2016 Economic Study Results: Peak-Gas-Day/Hour Capacity & Energy Analysis (May 25, 2017), available at https://www.iso-ne.com/static-assets/documents/2017/08/a3_2016_economic_study_natural_gas_capacity_and_energy_analysis_rev1.pdf Eastern Interconnection Planning Collaborative, Phase 2 Report: Interregional Transmission Development and Analysis for Three Stakeholder Selected Scenarios and Gas-Electric System Interface Study, Volume 7, Section 9 (July 2, 2015), available at https://static1.squarespace.com/static/5b1032e545776e01e7058845/t/5cb374540d929797d53ae506/1555264603155/08+Phase+II.pdf.

weather conditions, which in turn allows them to reflect these restrictions in the daily forecast of available capability. The daily aggregate operational capability information is shared with the region through the ISO-NE Morning Report and other communications, as required. If natural gas availability conditions are severe enough to potentially cause significant limitations on the aggregate gas-fired generation availability, this can lead to the declaration of a Power Watch or Power Warning by ISO-NE, indicating that the region may experience a shortage of capacity to serve expected electrical load and operating reserve requirements. If these conditions occur as part of real-time operations, the system operator will be required to take all actions necessary to maintain power system reliability. Based on the severity of the capacity shortfall, these necessary actions can include emergency purchases from neighboring Control Areas, voltage reduction, appeals for customer demand reduction, and, in extreme cases, shedding of firm customer load.

14. ISO-NE's efforts on information sharing, improved coordination between gas and electric operators, and increased situational awareness does not increase the physical capability of the natural gas pipeline delivery system in New England. The pipeline capacity constraint leads to situations that result in limited availability of natural gas supply to support power generation from natural gas only generation under severe winter weather conditions. In this context, severe winter weather conditions are periods of sustained (multi-day) very cold temperatures, typically with very high, sustained winds, that result in seasonal peak demand conditions on both the natural gas system and the electric power system. These peak demand conditions on the natural gas system limit the amount of natural gas available for power generation to

support the seasonal peak demand conditions on the electric power system. When the availability of natural gas to fuel gas-only generation is so limited, it places greater reliance on the other capacity resources with available fuel that can be scheduled to meet the power system needs.

15. ISO-NE has put in place business practices and operating procedures to prepare for potential energy and capacity shortfalls, typically focused on the winter period. Each fall, ISO-NE holds winter readiness workshops for power plant personnel to ensure proper maintenance has taken place to support plant operation through extremely cold weather. They stress the importance of having oil, LNG, or coal inventory (as applicable) built up prior to the winter season to be available in the event of a sustained cold weather event. Oil, LNG and coal resources would be called upon to have substantial run hours to fill the void left by the limited ability to use pipeline-supplied natural gas for power generation. Protocols for communications with state agencies and Market Participants are refreshed to make sure any severe, emerging conditions are communicated as far in advance as possible.

16. For a number of winters, ISO-NE has made out-of-market payments to oil- and coal-fired resources to increase on-site fuel inventory levels and provide funding for adding oil-fired back-up capability at some gas-fired resources.

17. In the winter, ISO-NE's forecasting practices provide information daily regarding the estimated number of MW of gas-fired generation capability (typically resources supplied by the natural gas pipeline system only) they believe will not be available to operate due to extremely cold weather conditions and associated gas supply limits. For example, under ISO-NE Operating Procedure No. 21 - Energy Inventory

Accounting and Actions During an Energy Emergency, ISO-NE may poll all resource owner/operators to gather information on anticipated fuel inventory, arrangements for alternate liquid fuel or advance firm supply arrangements to natural gas plants, and winter readiness of all technology types including wind and solar. This information helps inform the system operator of energy availability and anticipated response to extreme cold winter weather events. It does not, however, change the underlying pipeline capacity constraints, the firm transportation rights and needs of gas LDCs, or the extent of unavailability of intra-day gas supply in winter peak conditions. These factors continue to result in the unavailability of, or non-performance by, gas-only resources, for lack of fuel availability to support real-time dispatch.[6]

ISO-NE Procedures for Capacity Accreditation

18. There are two steps in this process for resources that seek to participate in the FCM. When a new resource wants to participate in an upcoming Forward Capacity Auction (FCA), it submits a package of information to ISO-NE that will support its qualification for that FCA. ISO-NE reviews that information, performs any necessary analysis, and ultimately determines if the resource is qualified, or not, to participate in the subsequent FCA. Further, as part of the qualification process, each resource is given both a summer and winter installed capacity rating for use in the

[6] Unavailability and non-performance are similar but distinct circumstances from an operations perspective. For example, gas limitations may prevent off-line resources from coming on-line (i.e., unavailability of non-spinning reserves), or they can prevent on-line gas generators from increasing their output in response to a dispatch signal (e.g., non-performance of a spinning reserve that cannot increase its real-time dispatch to fully meet the signal).

FCM. This two-rating approach is necessary because weather conditions vary significantly between summer and winter periods in New England, and many resources on the New England system are subject to limitations based on the prevailing ambient weather conditions and temperatures.

19. An objective of the accreditation process is for ISO-NE to determine the MW value that would be assigned to a new resource's capacity qualification. The accuracy of this accreditation is important because the unit's qualified capacity is a material element of its FCA bid and ISO-NE's running of the auction—in which there is a balancing of qualified capacity resources required to meet regional and sub-regional needs across peak conditions. The qualified capacity rating for natural gas-fired resources is based on expected operations, assuming availability of fuel to support such rating. The current process for determining winter ratings does not attempt to consider limitations on natural gas availability during winter peak conditions.

20. Once the new resource has been constructed and begins operation on the system, there is a periodic process to have each resource demonstrate its actual summer and winter installed capacity rating through a capability audit. Summer capability demonstrations typically occur between June and September to capture ambient summer weather conditions. Winter installed capacity ratings can be demonstrated through audits during much of the winter season. While these seasonal audits have temperature requirements (summer at 80 degrees Fahrenheit or above; winter at 32 degrees Fahrenheit or below), they do not have to be performed at the time of extreme cold weather conditions (e.g., approaching or below 0 degrees Fahrenheit). For natural gas plants, the resource must run at its rated capability for a period of

consecutive hours in an audit performed in each of the summer and the winter periods to demonstrate its seasonal claimed capability.

21. These audits are performed on a resource-by-resource basis such that the ability of the pipeline system to support the aggregate of winter ratings for all gas-only resources on a pipeline is not evaluated. Most gas resources are combined cycle gas turbines, so their output is adjusted for changes in machine efficiency (based on an ambient air temperature curve and ratings adjusted to their expected output at 90 degrees Fahrenheit (summer) and 20 degrees Fahrenheit (winter)). These tests can be run at times when natural gas supply from pipelines is not an issue, and therefore do not capture the impact of limited natural gas availability under winter peak conditions.

22. For natural gas resources that are served from the pipeline system, there is no requirement for purposes of capacity accreditation to demonstrate a dedicated, firm fuel supply, commitment to retaining any advance contracted gas supply (e.g., LNG ship on offshore buoy) or provide evidence of a secondary liquid fuel back up. By comparison, other types of new resources, such as run of river hydro, wind and solar, must provide enough information about seasonal median flows in the watershed area, wind availability during seasonal peak periods, or solar intensity and site-specific orientation toward the sunlight to support an analytical process to determine each resource's seasonal capacity value.

23. A key aspect and limitation of the current ISO-NE capacity accreditation process for gas-only resources is that gas availability during severely cold winter weather conditions is not factored into the capacity accreditation process. For new gas turbine

resources, the winter seasonal rating is based on their expected output at 20 degrees Fahrenheit ambient air temperature conditions. The winter capacity audit process is not designed to capture the real-world natural gas supply uncertainty during the severe cold weather conditions that will drive peak natural gas demand. Furthermore, the winter audits for individual units do not reflect the pipeline capacity constraints on how much of the aggregate gas-only fleet could obtain fuel to support their capacity-rated output in severe winter conditions. For winter 2021/2022, ISO-NE estimates that at least 3,700 MW of natural gas only resources were at risk of not being able to acquire necessary fuel in the intraday market necessary to meet a dispatch instruction.[7] ISO-NE has also indicated that the unavailability level increases to over 4,500 MW at "90-10" winter peak conditions. Both scenarios reflect gas-only resource unavailability at levels significantly above the expected forced outage rates for these capacity supply obligation resources.

24. Under ISO-NE practices, seasonal fluctuations in energy availability can impact the capacity rating in either the winter or the summer for some types of generation. Wind resources tend to have lower summer ratings due to less windy conditions across the region in the summer versus the winter. Solar resources are set to 0 MW in the winter period because capacity accreditation measures their output during the winter reliability hours of 1800 and 1900, the daily peak hours in the winter season, which occur well after sunset. Run of river hydro tends to have lower summer ratings due to less flow across the watershed area as compared to the winter. No similar construct

[7] ISO New England's 2021/2022 Winter Outlook (2021), *available at* https://www.iso-ne.com/static-assets/documents/2021/12/2021-22-winter-outlook.pdf.

exists for natural gas only units to estimate their capability constraints due to limited fuel supply during periods of extremely cold weather in the winter when the region needs the assurance that capacity resources can operate to support reliability of the system.

25. Dual fuel natural gas, LNG supplied gas, oil, coal, pumped storage hydro, conventional hydro with pond storage, and nuclear units all have fuel sources that are stored nearby or on-site and can be tracked and evaluated by the system operator. In that way, these resources, particularly during the winter period, are different from the pipeline-supplied natural gas only generators.

26. As the New England system experiences the installation of more renewable and intermittent resources, it will be even more important to assure capacity accreditation methods accurately reflect the availability of energy to support summer and winter peak demand conditions. Depending on the details, the incorporation of a metric for Effective Load Carrying Capability (ELCC) into these calculations should help to more accurately capture the real capacity value contributions of the pipeline-supplied, natural gas only resources in New England.[8]

Overview of Operating Reserves Market

27. There are three types of operating reserves that together make up the Operating Reserve Requirement for New England: Ten Minute Spinning Reserve, Ten Minute

[8] At a high level, ELCC evaluates the ability of the aggregate of a resource class (e.g., gas-only resources) to meet peak load requirements, accounting for the fact that either the resource cannot provide output in certain hours (e.g., solar output is not possible at night) or some resources could not all provide output at the same time (e.g., if gas-only resources are fueled off the same common pipeline, their cumulative contribution to meeting peak load may be lowered by available pipeline capacity).

Non-Spinning Reserve, and Thirty Minute Operating Reserve. Ten Minute Spinning Reserve must be provided from resources that are on-line providing energy but have additional headroom to increase their output at the request of the system operator. The amount of Ten Minute Spinning Reserve is limited by the resource's physical headroom available and "ramp rate" or ability to move upward within 10 minutes. Ten Minute Non-Spinning Reserve is provided by on-line resources with headroom or off-line resources that are capable of starting and synchronizing with the system and delivering the associated output within 10 minutes. In New England, 10 Minute Non-Spinning Reserves are typically provided from conventional hydro, pumped storage hydro, or quick start fossil fuel resources such as simple cycle gas turbines or diesels. Thirty Minute Operating Reserves are provided by on-line resources with headroom but slower ramp rates and from offline resources that are capable of synchronizing with the system and providing associated output within 30 minutes.

Procedures for Eligibility, Designation and Dispatch of Operating Reserves

28. To be eligible to provide operating reserves, a resource must be physically available to operate; have capability that is not already committed or dispatched for energy that can be activated for dispatch; and have the ability to convert that available capability into energy within the requisite 10 or 30 minutes and sustain that activation for at least one hour.[9]

[9] *See* ISO New England Open Access Transmission Tariff, Market Rule 1, Section III.1.7.17; ISO-NE Operating Procedure No. 8 Operating Reserve and Regulation (Aug. 11, 2011) ("Operating Procedure No. 8"), *available at* https://www.iso-ne.com/static-assets/documents/rules_proceds/operating/isone/op8/op8_rto_final.pdf.

29. Accounting for operating reserves takes place within the Energy Management System at ISO-NE. This real-time system is monitoring the output of all resources, and, based on information available, is maintaining all appropriate operating limits and conditions that define how much reserve and what classification of reserve(s) can be counted from each resource. For most resource types, energy availability information provided by the resource owner/operator is known on a resource-by-resource basis, allowing for proper setting by the system operator of resource operating limits that are used to calculate reserve availability. Current tariff provisions do not require such energy availability information to be provided to the system operator in advance for natural gas only resources. To the extent this information is missing and natural gas system conditions are of concern, the system operator needs to take pre-emptive action to collect this information on a resource-by-resource basis to identify any gas-only sources of operating reserve, establish appropriate operating limits, and as a result, improve situational awareness. [10]

30. Operating reserves are designated and purchased through the real-time market and scheduled in the real-time dispatch. All resources that are indicated as available, capable of meeting the response time criteria, and have valid energy offers in the real-time market are generally designated as providing reserves. The real-time market jointly optimizes the provision of energy and reserves. The software compares the pool of resources eligible to provide the three reserve categories to the operating

[10] Coordination with pipelines may allow system operators to make an assessment of the extent to which the aggregate of gas-only resources served off a pipeline might be able to pull gas off the pipeline without violating pipeline operating criteria.

reserve requirements. If there is more capability available than required, the software solves for the lowest cost energy dispatch and the reserve prices are zero. However, if there is a very close match between the capability of available resources and the total electrical load and operating reserve requirements, the dispatch system will find an optimized solution to satisfy both load and operating reserve. This approach seeks the least cost, optimized solution, which can result in some resources providing operating reserve, rather than providing energy.

31. All resources designated as providing real-time operating reserves are paid the relevant reserve clearing price. Further, a gas-only resource receives such payments irrespective of whether such resource is able to obtain sufficient gas to respond to a dispatch instruction from the system operator. The only outcome of a resource's non-performance in response to a real-time dispatch instruction is that the resource is not paid for energy and ISO-NE would modify its operating limits for more accurate dispatch in subsequent intervals. At that point, the resource already has been paid for operating reserve in prior intervals, irrespective of its ultimate ability to obtain gas to provide actual performance.

32. Except in a period of scarcity (i.e., when the reserve requirement cannot be met), real-time operating reserves are paid based on lost opportunity costs up to a price cap. Where the redispatch can meet the energy and operating reserve need, the resulting lost opportunity costs in the energy market for the marginal resources held back for operating reserve become the operating reserve prices.[11] In all cases, the operating

[11] Operating reserve prices are calculated on a zonal basis.

reserve prices cascade down from highest quality product (e.g., Ten-Minute Spinning Reserves) to lowest quality product and are capped by the Reserve Constraint Penalty Factors.

33. ISO-NE determines the availability of fuel supplies for resources that may be designated as operating reserves through procedures which vary by resource type. Some resources such as nuclear units, run of river hydro, wind, and solar typically run at their full output capability to produce energy. As such, they have no "headroom" left over that would be available for activation if use of reserves were needed, so they are not designated as providing reserves. ISO-NE monitors fuel inventory for oil- and coal-fired resources, particularly during the winter period, and knows when any of these resources might be limited due to fuel availability. A similar approach applies to LNG supplied resources where LNG inventory at directly fed units (i.e., Mystic 8 & 9) can be tracked, and to dual fuel natural gas units where the liquid fuel inventory can also be tracked. While uncommon, actions can be taken to reduce operating limits used for reserve designation on these resources if fuel inventory is low and must be maintained for load serving in future periods. Pumped storage hydro plants provide real-time information on the inventory in their storage reservoirs so that ISO-NE operators know exactly how much energy is left and how long that energy can be sustained. Conventional hydro resources with storage typically provide hourly energy limits through the energy market system used by ISO-NE.

34. The significant exception in the ability to track fuel available for operating reserve activation on a resource-by-resource basis is for natural gas only resources supplied

from the natural gas pipeline system. The limits on ISO-NE operator insight into natural gas availability can be particularly problematic during periods of severe, cold winter weather when LDCs and other pipeline customers with firm transportation rights are using most of the natural gas system's capabilities.

35. Under severe cold winter weather conditions, limitations can exist to prevent any additional supply of natural gas above pre-arranged day-ahead commitments. The unavailability of natural gas supply to support an activation of reserves (i.e., respond to dispatch instructions) should be reported to ISO-NE by the resource owner/operator. The current rules do not require that gas-only resources seek to acquire gas prior to dispatch and, if taken to conclusion (with no intervention by the system operator), they would not have to report insufficient fuel until after they have sought to make such arrangements, following the receipt of a dispatch instruction. This is too late in the process to allow for efficient scheduling of real-time operating reserves and risks over-estimating the actual supply of operating reserve preceding the attempted activation. As such, the system operator must take pre-emptive action and gather any missing gas availability information available on a resource-by-resource basis in order to establish proper operating limits and allow for better informed scheduling of real-time operating reserves.

36. The lack of assurances as to fuel supply for gas-only resources has the potential to significantly affect ISO-NE scheduling and dispatch decisions and causes ISO-NE to take preemptive mitigating actions. Severe weather from hurricanes in the summer/fall, Nor'easters, and other similar climatic events will cause different types of uncertainty for ISO-NE system operations. In the case of winter peak conditions,

severe weather presents uncertainty as to gas supply availability for real-time dispatch. In response, the system operators will take actions to ensure they have the flexibility and the time required to adjust to these uncertainties as they play out in real-time operations. These actions may be taken outside the context of the market system and may not always reflect the most economic set of actions in retrospect; rather they are taken because the operators have confidence that the actions will allow them to continue to operate the system securely. This typically results in the commitment of additional resources, based on either location or fuel type to provide additional energy and operating reserves. It can impact the scheduling of maintenance outages and result in work being deferred to address the uncertain nature of system conditions. Often arrangements are made with neighboring Control Areas to line up their assistance if conditions deteriorate.

37. Supply uncertainty in the intraday gas market for gas-only resources can impact the operating reserves market in a number of ways. If the operators dispatch a gas-fired resource which does not respond to dispatch instructions in the case of a contingency on the system, the operators must choose to activate additional resources to avoid a circumstance in which insufficient resources actually respond resulting in a NERC criteria violation. For example, assume that there is a system contingency (e.g., loss of a transmission line or large generator) of 1,300 MW. The market software would dispatch up to 1,300 MW of gas-fired resources in response to the contingency because they appear to be the most economic given their energy offer prices. If some of those resources are unable to ramp up (spinning reserve) or to start (non-spinning reserve) because of yet to be identified fuel constraints, operators must call on

additional resources that are not gas pipeline dependent in order to respond to the contingency, even if dispatching these resources is more costly. These additional resources can be called on-line manually, meaning that they are not selected by the dispatch algorithm and, thus, are being dispatched out of economic merit order (i.e., "out of rate"). Such out of rate actions come with economic consequences. They do not set price, but they result in an uplift charge. And, perversely, for the time they are on-line, they may have the effect of suppressing energy prices during a contingency event. Further, under pre-contingency operating conditions, if the market software is accounting for operating reserves on resources that truly cannot access gas, even though the reserve requirement is apparently met, the true supply is a lesser quantity. Under this condition, the overstatement of reserve capability may lead to an overstatement of reliability and an understatement of the actual cost of maintaining sufficient reserves on the system. In all such cases, (1) the operators are required to second guess the market and may make decisions out of market to ensure the secure operation of the system; (2) reserve prices do not fully reflect the true state of the system; and (3) the supply of resources to securely operate the system is misstated and the market signals are distorted.

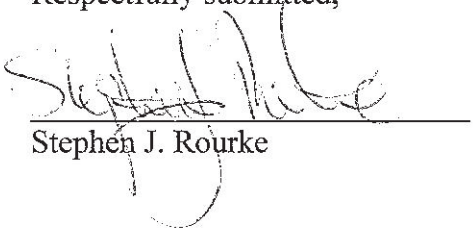
38. Ultimately, there is a distinction in the timing and adequacy of operating information on fuel availability for activation of operating reserve from gas-only resources served off a pipeline system as compared to other resource types. As an example, pumped storage hydro plants provide real-time, telemetered information to ISO-NE on how much energy is stored in their upper reservoir. When inventory in the upper reservoir is depleted to the point that the station would not be able to sustain its full output for

one hour, its upper operating limit is reduced, and the amount of operating reserve credit is decreased. A natural gas only resource may sit for hours or days getting full credit for operating reserve, only to find out upon a request for fuel availability status from the system operator, or upon receipt of a dispatch instruction to activate the operating reserve, that no additional energy is available. Most other resource types provide the system operator with the information they need to determine fuel availability in support of reserve activation, and do not require the system operator to take pre-emptive operating actions to solicit this energy availability information.

39. Natural gas plants that have a back-up liquid fuel or that are served by dedicated LNG supply have fuel sources that can be readily tracked by the system operator and appropriate operating limits can be established based on fuel availability. This allows for an accurate reflection of how much operating reserve is being provided by these resources to support system reliability and avoids price distortions in the operating reserve markets.

This concludes my affidavit.

Respectfully submitted,[1]



Stephen J. Rourke

[1] *Executed in accordance with* Extension of Non-Statutory Deadlines, Supplemental Notice Waiving Regulations, Docket No. AD20-11-000 (filed Dec. 8, 2021) (extending through March 31, 2022 the waiver of Commission requirements that certain filings with the Commission be notarized).

EXHIBIT B

ISO-NE Key Grid and Market Stats, Resource Mix

Resource Mix

For nearly 25 years, New England's wholesale electricity markets have attracted billions of dollars in private investment in some of the most efficient, lowest-emitting power resources in the country—providing reliable electricity every second of every day, lowering wholesale prices, shifting costly investment risk away from consumers, and reducing carbon emissions. Because private firms make this investment and not public utilities, consumers are shielded from the investment risks they had been exposed to before the introduction of competitive markets.

Sources of Electricity Used in 2021

Here's the breakdown of the amount of electricity produced by generators in New England and imported from other regions to satisfy all residential, commercial, and industrial customer demand during 2021. This is called net energy for load (NEL).

Note: **Data is preliminary, pending a resettlement period.** (Last update: 01/18/2022.) For the most current information, download the Net Energy and Peak Load by Source spreadsheet in ISO Express.

Fast Stats

350 dispatchable generators

About 32,700 MW of generating capability (seasonal claimed capability)

99.3% of the region's electricity in 2021 was provided by natural gas, nuclear, imported electricity (mostly hydropower from Eastern Canada), renewables, and other low- or non-carbon-emitting resources

About 30,000 MW of new generating capacity, mostly wind, proposed to be built, though many projects ultimately withdraw (source: January 2022, ISO Interconnection Queue)

Roughly 7,000 MW of generation have retired since 2013 or will retire in the next few years, with another 5,000 MW from coal- and oil-fired plants at risk of retirement in the coming years

Over 3,900 MW of active demand response (DR) and energy efficiency and other passive demand resources are registered in New England (December 2021 DRWG monthly statistics)

16% of the region's energy needs were met by imports in 2020

About 230,000 solar power installations totaling about **4,400 MW** (nameplate), with most connected "behind the meter"

	GWH (a)	% OF GENERATION	% OF NEL
Total Generation (b)	101,640	100.0%	84%
Gas	54,227	53%	46%

(a) GWh stands for gigawatt-hour.

(b) As of January 2016, this chart approximates the amount of generation by individual fuels used by dual-fuel units, such as natural-gas-fired generators that can switch to run on oil and vice versa.

Nuclear	27,074	27%	23%
Renewables	12,133	12%	10%
Wind	3,611	4%	3%
Refuse	2,984	3%	3%
Wood	2,416	2%	2%
Solar	2,648	3%	2%
Landfill Gas	435	0.4%	0.4%
Methane	39	0.04%	0.03%
Steam	0	0.0%	0.0%
Hydro **(c)**	7,345	7%	6%
Coal	559	0.5%	0.5%
Oil	228	0.2%	0.2%
Price-Responsive Demand	31	0.03%	0.03%
Other **(d)**	43	0.04%	0.04%
Net Flow over External Ties (e)	18,718		16%
Québec	13,617		
New Brunswick	2,607		
New York	2,494		
Pumping Load (f)	-1,696		-1.4%
Net Energy for Load (g)	118,662		100.00%

Previously, the report attributed generation from such units only to the primary fuel type registered for the unit. The new reporting flows from changes related to the Energy Market Offer Flexibility Project implemented December 2014. See the notes in the Net Energy and Peak Load by Source Report for more details.

(c) Hydro is not included in the renewables category primarily because the various sources that make up hydroelectric generation (i.e., conventional hydroelectric, run-of-river, pumped storage) are not universally defined as renewable in the six New England states.

(d) "Other" represents resources using a fuel type that does not fall into any of the existing categories. Other may include new technologies or new fuel types that come onto the system but are not yet of sufficient quantity to have their own category.

(e) Tie lines are transmission lines that connect two balancing authority areas. A positive value indicates a net import; a negative value represents a net export.

(f) The energy used to operate pumped storage plants.

(g) Generation + net interchange - pumping load.

Lower-Emitting Resources Supply Most of the Region's Electricity

In 2021, natural-gas-fired generation, nuclear, other low- or no-emission sources, and imported electricity (mostly hydropower from Eastern Canada) provided of the region's electricity.

When the wholesale markets opened to competition, private companies invested billions of dollars in the development of natural-gas-fired power plants because they used advanced technology that made them run efficiently; were relatively inexpensive to build, site, and interconnect; and their lower carbon emissions compared to coal and oil helped the region meet state environmental policies. As nearby shale gas emerged as an inexpensive and plentiful fuel resource in the 2008 timeframe, natural gas generators became the go-to resource for New England, clearing as the largest resource type in the market year after year. Nearly half of the region's electric generating capacity uses natural gas as its primary fuel (about 15,000 MW), and natural-gas-fired

power plants produce about nearly half of the grid electricity consumed in a year.

Markets Respond to Changing Times: Resources on the Way OUT

In contrast, aging coal-fired, oil-fired, and nuclear power plants have been closing largely because their operating, fuel, and environmental-compliance costs make them too expensive to compete against lower-cost resources. Since 2013, roughly 7,000 MW of mostly coal, oil, and nuclear generation have retired or have announced plans for retirement in the coming years. Another 5,000 MW of oil and coal, which now run only during peak demand or periods of gas pipeline constraints, are likely to retire soon. (The region's remaining two zero-carbon-emitting nuclear facilities, Millstone and Seabrook, supply a quarter of the electricity New England consumes in a year and will be critical components of a reliable clean-energy grid because they are carbon free and have a dependable, on-site fuel supply). Competition in the markets brought about this change at a faster pace than under the traditional industry model. Under wholesale markets, private companies have carried the risks of uneconomic investments, not utilities and their customers. Consumers have benefited from this least-cost resource mix created through competitive markets.

Notable exits include:

- Brayton Point Station (1,535 MW from oil and coal)
- Salem Harbor Station (749 MW from oil and coal)
- Pilgrim Nuclear Station (677 MW from nuclear power)
- Vermont Yankee (604 MW from nuclear power)
- Bridgeport Harbor Station (564 MW from coal)
- Norwalk Harbor Station (342 MW from oil)

Mount Tom Station (143 MW from coal)

Nuclear, oil, and coal generators are critical on the coldest winter days when natural gas supply is constrained (as shown below). Coal- and oil-fired resources also make valuable contributions on the hottest days of summer when demand is very high or major resources are unavailable. As more and more conventional, thermal generation that store fuel on site retire, the system is increasingly made up of generating facilities that run on just-in-time energy sources: natural gas (from pipelines and LNG deliveries), wind, and solar energy.

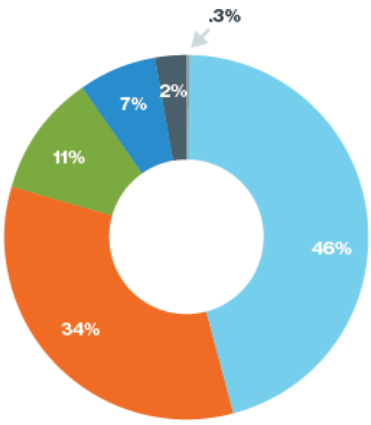
With limited options for storing natural gas, most natural-gas-fired plants rely on just-in-time fuel delivered to New England through interstate pipelines. However, interstate pipeline infrastructure has only expanded incrementally over the last several decades, even as reliance on natural gas for home heating and for power generation has grown significantly. During cold weather, most natural gas is committed to local utilities for residential, commercial, and industrial heating. As a result, we are finding that during severe winter weather, many power plants in New England cannot obtain fuel to generate electricity. Liquefied natural gas (LNG), brought to New England by ship from overseas, can help fill the gap—but regional LNG storage and sendout capability is limited, and its timely arrival depends on long-term weather forecasts, global market prices, and other logistical challenges.

Winter also imposes the most challenges for solar output in New England due to snow, clouds, and shortened daylight hours. In addition, shortened winter days means consumers use the most electricity after sunset, and therefore solar doesn’t reduce winter peak demand. While offshore wind experiences its highest production during winter, winter storms that limit solar power can also significantly limit the output of wind generation if high wind speeds force plant operators to shut down in order to protect equipment. . This type of variability is a n understandable challenge in meeting the states’ decarbonization goals through greater renewable, weather-dependent technologies, and it poses new technical challenges to the grid’s reliability.

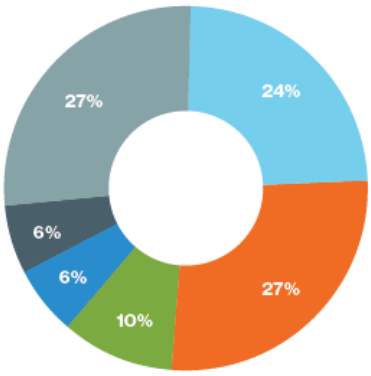
Oil Generation is High During Extreme Winter Cold

Oil generation was 27% of the regional fuel mix during the cold spell of winter of 2017/2018 compared with 0.3% for most of the month of December.

- Natural Gas
- Nuclear
- Renewables
- Hydro
- Coal
- Oil



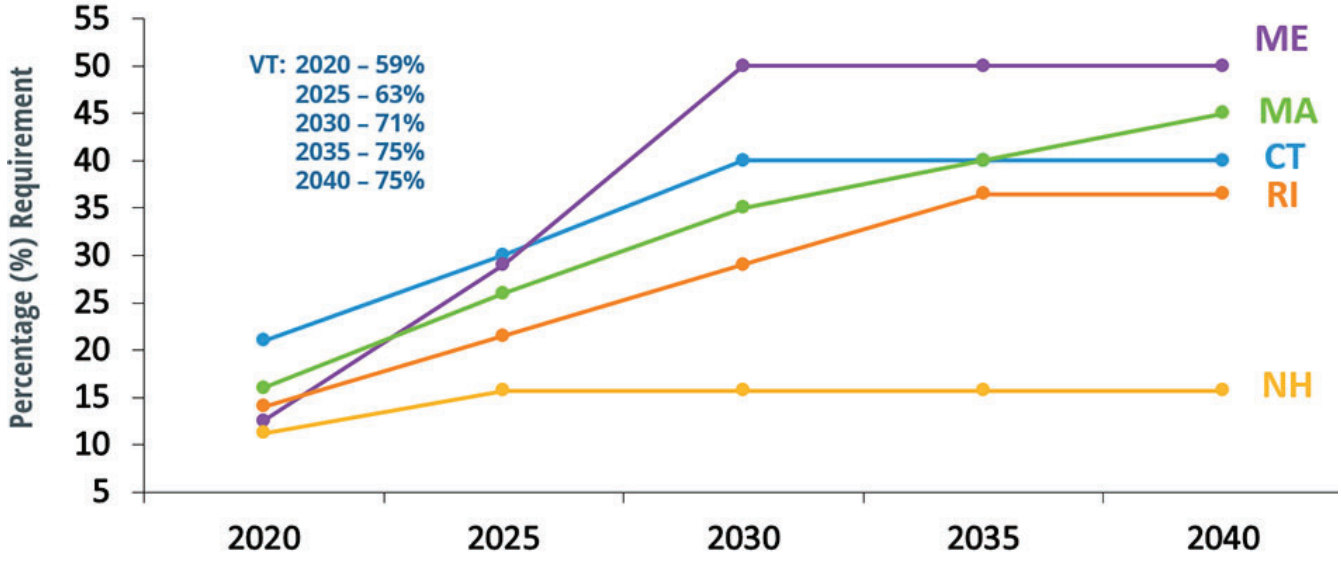
Average Fuel Mix for Most of December 2017 (Dec. 1–26, 2017)



Average Fuel Mix for Extreme Cold Spell (Dec. 26, 2017 to Jan. 9, 2018)

Tomorrow's Energy Mix: Resources on the Way IN

All six New England states have renewable energy standards, which require electricity suppliers to provide customers with increasing percentages of renewable energy to meet state requirements.



Notes: State RPS requirements promote the development of renewable energy resources by requiring electricity providers (electric distribution companies and competitive suppliers) to serve a minimum percentage of their retail load using renewable energy. Connecticut's Class I RPS requirement plateaus at 40% in 2030. Maine's Class I/IA RPS requirement increases to 50% in 2030 and remains at that level each year thereafter. Massachusetts' Class I RPS requirement increases by 2% each year between 2020 and 2030, reverting back to 1% each year thereafter, with no stated expiration date. New Hampshire's percentages include the requirements for both Class I and Class II resources (Class II resources are new solar technologies beginning operation after January 1, 2006). New Hampshire's Class I and Class II RPS requirements plateau at 15.7% in 2025. Rhode Island's requirement for 'new' renewable energy plateaus at 36.5% in 2035. Vermont's 'total renewable energy' requirement plateaus at 75% in 2032; it recognizes all forms of new and existing renewable energy and is unique in classifying large-scale hydropower as renewable.

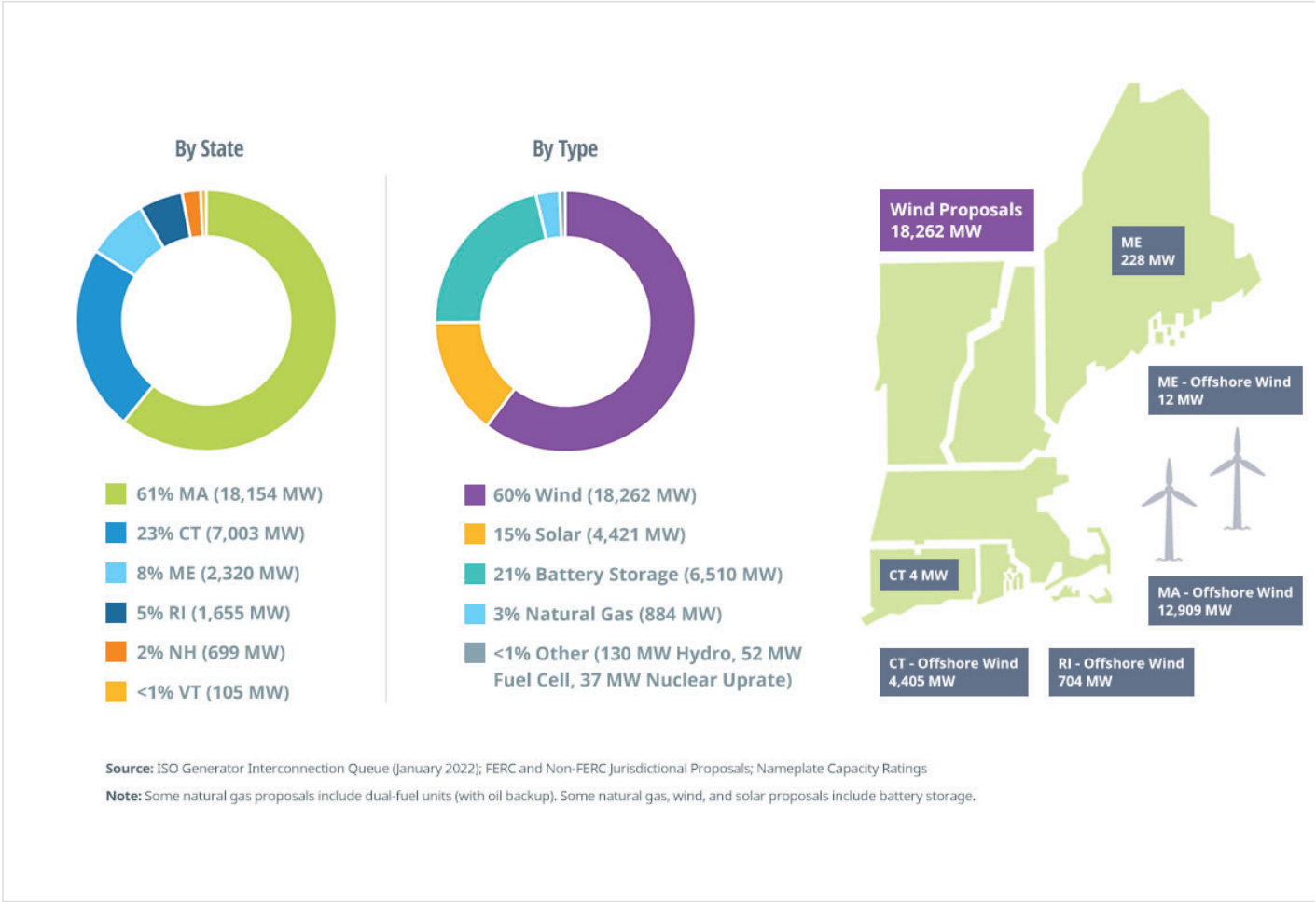
The New England states are also promoting greenhouse gas (GHG) reductions on a state-by-state basis and at the regional level, through a combination of legislative mandates and aspirational goals.

With deadlines looming, the states are eager for the quicker transformation of the power grid to renewables and for electrification of the broader economy. Because large-scale renewable resources typically have higher up-front capital costs and different financing opportunities than more conventional resources, they have had difficulty competing in the wholesale markets. Therefore, the New England states are promoting, at varying levels and speed, the development of specific clean-energy resources to meet their public policy goals.

Several states have established public policies that direct electric power companies to enter into rate-payer-funded, long-term contracts for large-scale carbon-free energy that would cover most, if not all, of the resource's costs. Long-term contracts carry risk given the rapid development and falling costs of new technologies—and this risk of stranded costs is placed back on consumers. As policymakers seek to

convert the transportation and heating sectors to carbon-free electricity to fully meet climate goals, this public policy trend is expected to continue.

Developers of clean-energy resources are taking advantage of state incentives, declining technology costs, and revenues from the wholesale markets. About 95% of resources currently proposed for the region are grid-scale wind, solar, and battery projects. As of January 2022, about 30,000 MW have been proposed in the ISO Generator Interconnection Queue.



Source: ISO Generator Interconnection Queue (January 2022); FERC and Non-FERC Jurisdictional Proposals; Nameplate Capacity Ratings

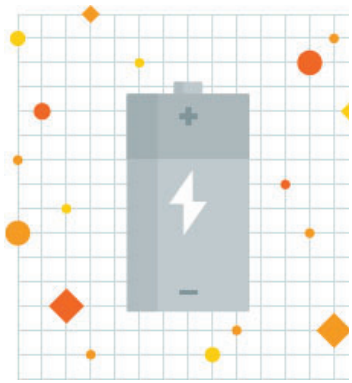
Note: Some natural gas proposals include dual-fuel units (with oil backup). Some natural gas, wind, and solar proposals include battery storage.

Wind power dominates new resource proposals. ISO New England has more than 18,000 MW of wind interconnections under study, which is by far the largest group of resources seeking to connect to the region's electricity grid (as of January 2022). The New England coast offers prime conditions for offshore wind, and about 18,000 MW of proposed wind is located offshore of Massachusetts, Rhode Island, Connecticut, and Maine, with most of the remaining located onshore in Maine. In 2016, the wind turbines at the Block Island Wind Farm began putting power onto the electricity grid, making the 30 MW project the first offshore

wind farm in the United States. Learn more about transmission needed to support a hybrid grid.

Solar power now ranks second in the ISO Interconnection Request Queue, surpassing natural gas. Most solar power in New England is connected to local distribution utilities or "behind the meter" directly at retail customer sites. Because such projects do not follow the ISO interconnection process, they aren't reflected in the ISO Queue numbers above. The ISO must still track solar power's growth in the region for forecasting and planning purposes, however, since it reduces demand on the grid; the region had about 230,000 solar power installations as of August 2021with a combined nameplate generating capability of approximately 4,400 MW. In fact, New England experienced a historic dip in midday demand from record-high solar power output on May 2, 2020. Behind-the-meter solar reduced grid demand by more than 3,200 MW, underscoring the need for ISO's leading efforts in forecasting long-term solar growth in the region.

Read more about solar power in New England—its growth, locations, and effects on the system, as well as how the ISO is handling related challenges.



Energy storage is "charging" ahead and now ranks third in the ISO Interconnection Request Queue, also surpassing natural gas. For more than 40 years, New England has enjoyed the benefits of two large-scale pumped-hydro energy- storage facilities that can supply almost 2,000 MW of capacity within 10 minutes. Now, new storage technologies are emerging, driven by technological advances, falling costs, and support from the states, as well as changes to the markets that enable storage participation. About 20 MW of grid-scale battery-storage projects have come on line since 2015; roughly 6,500 MW of grid-scale stand-alone energy-storage projects are requesting interconnection (January 2022). Most recently, more than 630 MW of new plus existing battery storage was secured in Forward Capacity Auction 15, for 2024-2025. Grid-scale and behind-the-meter energy storage can contribute a number of benefits:

- Provide grid operators with short-term reliability services
- Maximize the output from wind and solar resources by storing their excess energy
- Defer transmission and distribution system upgrades when strategically placed
- Shave the peak during times of high system demand
- Provide backup power during localized power outages
- Enable the development of microgrids

Region will need investment in the superhighway for moving clean energy

Even with substantial investment made to modernize the transmission system and enable the free flow of low-cost power, additional transmission (and distribution) system upgrades will be needed to accommodate large amounts of diverse clean-energy sources—from large-scale offshore wind, remote Canadian hydropower, and hundreds of thousands of distributed solar and storage sources. Think of the grid as the superhighway for moving the clean energy that ultimately will be fundamental to reliably converting millions of vehicles and heating systems in buildings to electricity.

ISO New England has no authority over siting processes or permits, and because of local opposition and other factors, transmission investments can take a long time to come to fruition in New England. To achieve decarbonization goals, the region must be proactive in developing infrastructure that aligns with supply growth and is available when needed. Regional coordination may not alleviate local opposition but may help make the siting process more successful.

Storage also consumes energy and may not provide assistance once depleted. Energy-storage resources draw electricity from the power system or directly from a generating resource (such as a colocated solar or wind facility) as they “stockpile” energy and then send electricity to the grid at a later time. Overall, they consume more energy than they supply, as operations and losses during energy conversion consume some of their “inventory” of stored energy. If these resources are already depleted during a system emergency, they would not be able to provide help but would instead sit idle, making their “inventory management” and optimization a key technical challenge for the grid’s reliability.

In addition, **energy efficiency** (EE) measures can reduce electricity demand from New England’s power grid. New England states invest billions of dollars on EE programs that promote the use of energy-efficient appliances and lighting and advanced cooling and heating technologies (nearly $5.8 billion on EE programs from 2015–2020 and another $11.9 billion between 2021 and 2030). Massachusetts, Rhode Island, Connecticut and Vermont rank among the top 10 states in energy efficiency in the US, according to the American Council for an Energy-Efficient Economy's 2020 rankings.

Unlike EE and behind-the-meter PV, which are *passive demand resources*, *active demand resources* (also known as demand-response resources) can be dispatched by the ISO. Demand-response resources can reduce their electricity consumption from the regional grid “on demand,” by powering down machines (load management), by switching to an on-site generator (distributed generation), or by switching to a storage device (batteries). Since June 1, 2018, ISO New England has deployed demand-response resources as part of the energy dispatch and reserve-

designation process along with generating resources. Active demand response accounted for 31 GWh of reduced system demand in 2021.

Read about solar power in New England—its growth, locations, and effects on the system, as well as how the ISO is handling related challenges.

Learn about how ISO New England is actively pursuing innovations to help create a more efficient, responsive, reliable system that can handle expanded renewable generation and smart grid technology.

EXHIBIT C

Excerpts from the
Testimony of Peter Brandien

Attachment I-1b

Testimony of Peter Brandien on behalf of the ISO

C. Causes of Gas Reductions

Q: Beyond the imbalance between supply and demand, what specifically is causing gas reductions?

A: Gas reductions can occur as a result of procurement problems or pipeline problems. Procurement problems occur when a generator hasn't procured enough gas. This issue generally arises when the ISO directs the generator to produce electricity in an amount that exceeds the unit's day-ahead commitment because load is greater than expected or there is a contingency on the system. Generators are required to produce this energy; as affirmed by the Commission, generators must offer into both the day-ahead and real-time energy markets a MW amount equal to or greater than its Capacity Supply Obligation when the resource is physically available. The Commission has agreed with the ISO that generators must respond to the ISO's directives to start, shutdown or change output levels, and must keep their supply offers open throughout the operating day.[10] Pipeline problems refer to the pipeline's inability to deliver gas to generators as a result of pressure problems, fuel quality problems, maintenance, or operational flow orders brought on by high demand during times of peak residential consumption. These types of operational issues are to be expected; much like electric power system operators, natural gas pipeline operators must balance

[10] *See New England Power Generators Association, Inc. v. ISO New England Inc*., 144 FERC 61,157 (2013) at P 49.

injection and withdrawals to maintain reliable operations and may, at times, be required to interrupt operations at different locations to protect the system.

Q: Please discuss the nature of procurement problems.

A: Natural gas is sold through brokered markets, and, in a separate transaction, is transported through an interstate pipeline system. The pipelines offer a number of transportation services that vary in priority (and expense). Historically, the companies that distribute natural gas to home heating customers (Local Distribution Companies or "LDCs") purchase most of the pipelines' highest priority, most expensive "firm" (non-interruptible) pipeline capacity. (In fact, these purchase commitments are the de facto financing that pipelines rely on to build and expand their infrastructure.) The capacity that is not utilized by the LDCs and other firm customers is available for purchase by generators.

As indicated by the ICF study discussed above, there is insufficient pipeline capacity to supply both the LDC loads and electric generation during times of peak gas usage, which generally occurs on cold winter days. The issue also arises when pipelines schedule major maintenance or construction outages, which the pipelines coordinate with their firm customers (i.e., not generators).

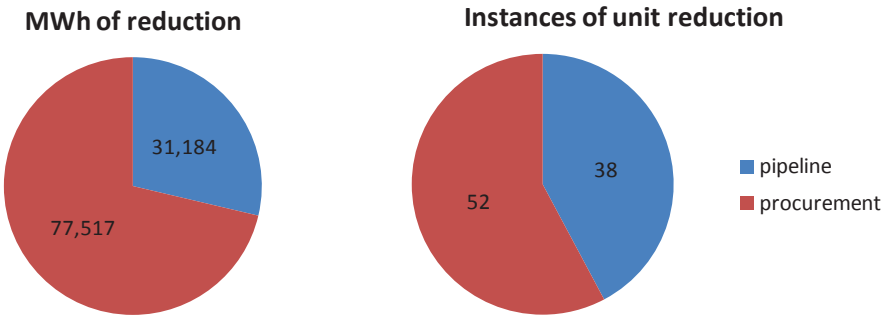
Accordingly, if generators have not made arrangements for fuel in advance, they often may not be able to secure gas transportation when the ISO schedules them beyond their day-ahead commitment. (As discussed above, generators are obligated to produce energy in excess of their day-ahead commitment if the

requested amount is less than their offer.) The challenge of rapidly securing additional gas transportation can be exacerbated by timing issues and high prices during periods of peak gas demand.

Q: What is the relative frequency of procurement problems?

A: The ISO has classified gas reductions as either procurement problems or pipeline problems. Since the classification of these events began, most events and MWhs of unit reduction (computed as average event reduction multiplied by hours of event duration) have resulted from procurement issues. The breakdown for 2013 is displayed in **Figure 3**.

Figure 3: Gas Reductions as a Result of Procurement v. Pipeline Issues



Q: Can you give examples of procurement problems?

A: We investigated events between January 4, 2012 and September 28, 2012 in which generators failed to follow dispatch instructions due to gas availability issues. In each case, the generators were asked to run within the parameters of their offers, but failed to do so because they did not have adequate fuel arrangements. These events involved 13 unique units. Although the performance issues occurred throughout the study period, there were concentrations in June,

July and September, with six different failures in June and September and seven in July. The following are examples of these events:

- In January, a unit decreased its offer price for the next day during the reoffer period, after which it was committed. The ISO called the unit and the unit confirmed that it had gas ("gas is yes"). Three hours into the operating day, the ISO received a call from the unit that it would be coming offline because it had "used up all [its] gas for the gas day." When the ISO operator asked what had happened, he was told "you guys called, we have it logged. You guys called numerous times making sure we had gas for the day … and each time we call them [the participant's dispatch desk] they say, 'yes, tell them yes' and that's what we told you guys. I … you know, I'm just the middle guy. I don't know what to tell you." In later conversations, the participant attributed the incident to confusion caused by the differences in the gas and electric days.

- In June, the ISO committed a unit in the day-ahead market, after which the unit increased the price of its offer. The ISO called the unit to verify that it had nominated and scheduled gas. On the operating day, during its start up, the unit called the ISO and said that it was having trouble getting gas. It subsequently failed to generate in accordance with its offer.

- In June, a unit received a day-ahead commitment, after which the ISO called to confirm that the unit had procured and scheduled gas. On the morning of the operating day, the ISO received a call from the unit's supplying gas pipeline, which expressed concern about the lack of gas scheduled for three units, including the committed unit. The ISO contacted all three plants to confirm they had gas, but did not hear back from the committed unit. A few hours later the unit called and reported "gas constraints" that required it to reduce its output.

- In September, a participant submitted offers and was not committed day-ahead. When it was committed in the Reserve Adequacy Assessment process to satisfy operating reserve requirements, the unit stated that it could not procure enough fuel to make the run for operating reserves as committed, and its alternate fuel (oil) was unavailable as well. Later, the unit indicated that it could have burned the alternate fuel but chose not to because its offer did not reflect the higher fuel cost.

- In September, after offering for each hour, a unit received a day-ahead commitment for all but the first six hours of an operating day. When the unit was contacted to run in those first six hours for reliability reasons, the unit stated that it had not procured enough fuel.

Unfortunately, these incidents – in which generators dispatched in accordance with their offers renege because they haven't procured gas – have become commonplace. System operators can no longer be assured that offers are accurate, or that generators will perform when needed.

D. The Systemic Risk Problem

Q: What is the significance of pipeline problems?

A: As noted above, pipeline problems refer to the pipeline's inability to deliver gas to generators as a result of pressure problems, fuel quality problems, maintenance, or operational flow orders. While pipeline problems account for fewer reductions than procurement problems, the problems are potentially much more severe because of the possibility that they will affect multiple units that simultaneously draw from the pipeline. In other words, pipeline problems are a "systemic risk" because they could lead to a correlated outage involving multiple generators (including reserve units) simultaneously. To illustrate this problem, consider that a single pipeline can supply generators representing thousands of MW of electricity. Accordingly, this systemic risk can lead to serious reliability issues in the New England region.

As an example, a pipeline could have a compression problem or a segment of pipe that must be isolated, thereby restricting throughput. When this happens, gas pressure can drop, resulting in the requirement that multiple units reduce their gas

Obligations.[25] However, as discussed further below, these examples are included to illustrate that generators' existing incentives are leading them to make decisions that are consistent with their economic self-interest but do not facilitate regional reliability.

E. Observations

Q: Are there any commonalities among these performance issues?

A: Yes. There are two. First, a number of these performance issues indicate that the ISO is not receiving accurate information from generators about their resources' ability to operate. This is evident in cases where generators do not have gas or oil to operate, despite having offered into the markets. As we saw with oil and coal units, it is also clear that some generators' start and notification times may not be accurate. Finally, units are representing themselves as available when they do not have staff on hand to operate.

System operations – both operator actions and system dispatch software – are predicated on the ability to rely on the market and capability data submitted by resources. In general, these data have become less reliable, as detailed in my testimony. During times of system stress, the data become even more suspect.

[25] *See New England Power Generators Association, Inc. v. ISO New England Inc*., 144 FERC 61,157 (2013).

This requires the system to be operated conservatively where possible, increasing costs and distorting market outcomes, which further blunts the price signals sent to the market in response to problems. Where it is not possible to operate the system conservatively, we must live with the heightened risk of reliability problems.

Second, it is clear that many of the generators' actions – whether failure to keep oil in the tank or to staff their units – are consistent with their economic self-interest but are not aligned with regional reliability. In another example of this behavior, a number of generators regularly modify their start and notification times when they do not receive a day-ahead commitment. In fact, as recently as December 17, 2013, a fast-start unit changed its operating parameters to include a six-hour start time when in reality it is a ten-minute unit, and, on January 8, four fast-start units changed their start times to 90 minutes. Whether these changes are justified by a lack of staff at the plants or difficulty in getting fuel on short notice, the point is the same; unlike in the current paradigm, generators must have incentives that cause them to take actions that contribute to, rather than detract from, the reliability of the bulk power system.

VI. CONCLUSION

Q: How would you characterize the performance issues discussed above?

A: I would characterize them as pervasive. My testimony has shown that the problems are evident in each significant category of generation. Specifically, gas-fired generators are not procuring firm pipeline access to natural gas, of which there is simply not enough to supply both generators and the LDCs. These generators have limited access to alternatives like LNG. Although the ISO's system operators are actively managing these issues, we have seen some sudden, sizeable reductions in generators' output as a result of gas supply interruptions.

The oil and coal generators we rely on when gas-fired generators are unavailable have their own set of problems. They are the biggest contributors to underperformance relative to their Capacity Supply Obligations, reducing their ecomax during peak hours on peak days more than any other category of generator. They have trouble starting on time (or at all), and their rate of unplanned outages is the highest among the fleet, such that they are unavailable on an unplanned basis more than 15% of the time that they are needed.

While gas, oil and coal units are significant proportions of the fleet, they are not alone in experiencing performance problems. These problems are truly fleet-wide. When we have asked generators to respond to a contingency, the average

response rate is only 71%. Nearly every category of generator is experiencing increasing rates of unplanned outages, with the overall rate more than doubling since 2007. Generators of different types are failing to staff their units and, as a result, are unable to respond in a contingency. Absent out-of-market action, oil units are keeping their fuel tanks only about one-third full, and dual fuel units are mothballing their ability to switch fuels.

Q: Do these pervasive performance issues need to be addressed?

A: I believe that they do. Even if the region's gas supply problems were solved, we have a system that is dependent on gas and will be vulnerable to gas supply interruptions. This "systemic risk" may be realized in the event of one of a number of pipeline problems, which include maintenance, pressure problems, fuel quality problems, or operational flow orders during periods of high demand. During one of these events, multiple units that simultaneously draw from the pipeline could be affected, causing a correlated outage of multiple generators (including reserves). The scope of the potential problem is illustrated by the fact that a single pipeline can supply generators representing thousands of megawatts of electricity. In other words, given the systemic risk, all generators need to perform.

Q: How would these pervasive performance issues be addressed?

A: Gas-fired generators could invest in sufficient firm gas and/or back-up LNG. Generators of various types could invest in, maintain and test dual fuel capability

and keep their alternate fuels on hand. They could also adjust maintenance practices and operations. Ultimately, the region will need investment in new resources and we will need those resources to operate reliably. With the recent announcement of generator retirements, we are reaching that point now and the market needs to work to incent investment in the resources the region needs. These decisions are the generators' prerogative. The ISO's role, and that of the markets we administer, is to give these generators the appropriate incentives to ensure that decisions are made that are both profitable and conducive to the reliable operation of the bulk power system.

Q: Does this conclude your testimony?

A: Yes.

I declare, under penalty of perjury, that the foregoing is true and correct.

Executed on January 17, 2014.

Peter Brandien

Vice President – System Operations

EXHIBIT D

Remarks of Peter Brandien

Federal Energy Regulatory Commission (FERC) Panel Discussion

Winter 2016-2017 Operations and Market Performance in Regional Transmission Organizations and Independent System Operators (Docket No. AD16-24-000)

October 20, 2016

Remarks by Peter Brandien, Vice President, Operations, ISO New England

Introduction

My name is Peter Brandien. I am Vice President of Operations for ISO New England. I am pleased to be here to provide information on ISO New England's preparations for the upcoming winter season. ISO New England is the not-for-profit Regional Transmission Organization responsible for overseeing the day-to-day operation of New England's bulk power system, administering the region's competitive wholesale electricity markets, and planning to ensure the future reliability of the system.

The New England system consists of approximately 9,000 miles of high-voltage transmission lines and roughly 350 generators with a total generating capacity of around 31,000 megawatts (MW). In 2015, New England produced 49% of its electricity using natural gas, up from 15% in 2000. Because so much of the region's electricity is sourced by natural gas, the price of this fuel sets the price for wholesale electricity about 70% of the time. Consequently, availability of natural gas for power generation has a profound impact on grid reliability and production costs in New England.

New England has limited natural gas pipeline infrastructure serving the region, and these pipes have reached their maximum capacity, especially during the winter months when demand for natural gas to heat homes is at its highest.

January 2004 "Cold Snap"

ISO New England's attention to and concerns surrounding winter preparedness predate the 2014 Polar Vortex. A decade earlier, during the January 2004 "Cold Snap," New England experienced extremely low temperatures and particularly high demand for electricity, prompting concern about market and system performance during severe cold weather conditions. The 2004 "Cold Snap" revealed vulnerabilities of the New England bulk power system, especially with regard to capacity limitations on the natural gas pipeline system and the availability of gas transportation for non-firm customers like gas-fired generators within New England.

After the 2004 "Cold Snap," ISO New England developed new operating procedures designed to improve information on generator availability during cold weather conditions, requiring generators to report their anticipated availability to ISO New England, including details on their ability to procure fuel and any physical limitations of their generating units. The ISO also enhanced communications with the regional gas industry to improve the ISO's ability to detect conditions on the gas system that could affect the availability of gas-fired generators. These procedures are still in effect today.

Recent Winter Reliability Programs

Winter operational concerns regarding fuel adequacy returned during the 2012/2013 winter. Extreme cold weather led to constraints on the natural gas pipeline system, the inability of gas-fired generators to procure fuel, and an increased reliance on oil-fired generation. Because of their infrequent dispatch, oil-fired generators entered the winter with low fuel inventories. Complicating matters were the challenges associated with replenishing oil inventories once the winter season began. Had cold weather persisted, the region may not have had enough fuel to meet the demand for electricity.

These operational challenges prompted the ISO to take out-of-market action to mitigate the reliability risks associated with inadequate fuel supplies during the 2013/2014 winter. The ISO developed a temporary winter reliability program to provide incentives to oil-fired generators to firm up their fuel supplies before the start of the winter. The program also included a demand response component and incentives for gas-fired generators to invest in dual-fuel capability. The generators that participated in the program procured roughly 4 million barrels of oil (the equivalent of nearly two million megawatt-hours (MWh) of energy), almost all of which was needed that winter. The program proved invaluable to power system operations during extreme cold weather conditions, particularly during the Polar Vortex, because generators had the fuel they needed to run when called on by the ISO.

To improve fuel neutrality, the winter program was expanded to include a liquefied natural gas (LNG) component during the 2014/2015 winter. Compensation under the program was also modified. Rather than paying for inventory upfront, payments were made to offset some of the costs associated with unused oil inventories and unused LNG contract volumes at the end of the season. Demand response and incentives for gas-fired generators to invest in dual-fuel capability remained components of the program. Indeed, more than 1,000 MW of dual-fuel capability have been commissioned through the winter programs.

In September 2015, the Federal Energy Regulatory Commission (FERC) approved a winter reliability program to be used during the next three winters (the 2015/2016 winter, the 2016/2017 winter, and the 2017/2018 winter). These programs, in addition to the two that preceded them, serve as a stop-gap measure until longer-term capacity market design changes, called “Pay for Performance,” go into effect on June 1, 2018.

2016/2017 Winter Reliability Program

Consistent with prior years’ programs, the 2016/2017 winter program is intended to mitigate the reliability risks associated with inadequate fuel supplies during severe cold weather conditions. The program will run from December 1, 2016 to February 28, 2017 and include an oil inventory component, an LNG component, and a demand response component. Requests to participate in these three components of the program were due to ISO New England by October 1, 2016. The ISO reserves the right to reject any notice of proposed participation on any grounds, including the ISO’s concerns about the deliverability of the fuel or the past performance of the asset.

Generators participating in the oil inventory component must notify the ISO of their expected level of oil inventory by December 1, 2016. The ISO will evaluate the generator's inventory on December 1 and deem eligible for compensation the amount of usable oil inventory that meets or exceeds the lesser of: (i) 85% of the usable fuel storage capability and (ii) supply sufficient to operate the generator for 10 days at full load based on the generator's winter Seasonal Claimed Capability.

Generators participating in the LNG component must present their executed LNG contracts to the ISO by December 1, 2016, along with a certificate demonstrating that the contracts include a "take-or-pay" construct, a term that spans December 1 through the end of February, the pipeline delivery point name and gas meter number of the participating generator, and pipeline transportation to the meter of the generator. Contracts that do not include one or more of these terms will be rejected.

Assets participating in the demand response component must have additional capacity beyond their obligations in the Forward Capacity Market, be registered with the ISO, have meters installed and operational, and otherwise be fully ready to respond by December 1, 2016.

Generators participating in the program may not sell the fuel or fuel rights, or take any other action that is inconsistent with ensuring the availability of the fuel for energy production and use in New England. The program will go a long way toward ensuring New England has adequate fuel supplies to meet the demand for electricity this winter.

Market Enhancements to Increase Market Efficiency and Improve Gas-Electric Coordination

In addition to three winter reliability programs, the ISO has taken major steps to increase market efficiency and improve gas-electric coordination to address the challenges posed by the region's constrained natural gas pipeline system.

The ISO has increased information sharing and operational interfaces with the natural gas pipelines to improve communications with the natural gas industry and develop decision-support tools for our system operators.

One such tool, called the Gas Usage Tool (or "GUT") by our system operators, allows the ISO to estimate the amount of natural gas available for electric generation. This is accomplished by estimating the demand for gas by industrial and local gas distribution companies' customers, as well as gas-fired generators, compared to the capability of the natural gas pipeline system, including LNG injections into the regional gas pipelines.

In addition, the ISO has shifted the day-ahead energy market timeline to better align the electricity and natural gas markets to give generators more time to procure the gas they need to run. The ISO now closes the day-ahead market offer and bid period at 10 am (as compared to 12 pm under the former rules), and publishes the results by 1:30 pm (as compared to 4 pm under the former rules), giving generators more time to nominate the gas they need to run the following operating day.

The ISO has implemented energy market offer-flexibility enhancements to allow participants to update their offers to supply electricity in real-time to reflect changing fuel costs, improving market pricing and incentives to perform.

The ISO has tightened the shortage event trigger in the Forward Capacity Market and increased payments to resources providing reserves during scarcity conditions to give resources better incentives to perform when they are needed the most.

The ISO has improved scheduling of wholesale electricity sales between New York and New England through a project called Coordinated Transaction Scheduling (CTS). CTS makes more efficient use of the transmission lines connecting New York and New England by allowing bidding and scheduling in 15-minute intervals. These changes enable the scheduling of the most economic transactions between New York and New England, enhancing the efficient flow of electricity over the ties.

Finally, longer-term market enhancements, called "Pay for Performance," effective June 1, 2018, will provide strong incentives for resources to invest in operational improvements and secure fuel arrangements to ensure resource performance.

Further Preparations for Winter Coordination and Communications

In terms of further preparations for winter coordination and communications, ISO New England conducts regular conference calls with the Reliability Coordinators within the Northeast Power Coordinating Council (NPCC), including the New York ISO, the Ontario Independent Electricity System Operator, the New Brunswick Power Corporation, and Hydro Québec. These calls provide an opportunity for system operators to share timely information about the outlook for operating conditions in nearby regions. As an example, if one or more regions anticipate reliability concerns, the calls provide advanced warning that other areas may need support from, or may be unable to provide support to, interconnected power systems.

ISO New England is in regular communication with the gas pipeline companies to exchange information relating to weather conditions, posted notices, equipment-related restrictions on the delivery of gas, and overall capacity requirements to serve electricity demand in New England. These communications are daily if not hourly on high gas demand days.

ISO New England is also in regular contact with the region's coal-, oil-, and gas-fired generators to monitor and confirm their fuel arrangements throughout the winter. Monthly fuel surveys are sent to coal- and oil-fired generators to monitor their inventories. These surveys can be sent weekly and daily, if necessary. For gas-fired generators, the ISO confirms each day that generators have nominated sufficient volumes of gas to meet their day-ahead obligations.

Operating Procedures to Maintain Reliability

In planning for the winter season, ISO New England takes into account a number of outage scenarios, including the potential for some natural gas-fired generators to be temporarily unavailable during extreme cold weather conditions. However, should unexpected generator or transmission line outages

occur, the ISO has procedures in place to maintain reliability during a capacity deficiency (known as Operating Procedure No. 4, *Action During a Capacity Deficiency*). These procedures allow the ISO to take a number of actions, including calling on demand-response resources to reduce their energy use, importing emergency power from neighboring regions, and asking businesses and residents to voluntarily conserve electricity. In total, the ISO can obtain approximately 3,000 MW of relief through 11 action steps of Operating Procedure No. 4.

Practical Implications and Challenges for this Winter

With the winter reliability program in place, ISO New England expects to have adequate electricity supplies to meet consumer demand this winter. While natural gas pipeline constraints continue to be a concern, increased pipeline capacity resulting from Spectra Energy's Algonquin Incremental Market (AIM) project, scheduled to be in service by November 2016, will provide temporary relief this winter. The project expands the pipeline capacity of the existing Algonquin Gas Transmission system by roughly 340,000 dekatherms of natural gas per day. This relief will be short-lived as non-gas resources retire and gas-fired generation takes their place. In fact, more than 1,500 MW of non-gas units, namely Brayton Point Power Station in Southeast Massachusetts, will retire by June 1, 2017.

New England has benefited from the availability of LNG resources in prior winters, but there is no guarantee that those same shipments will arrive this winter. New England is served by three primary LNG facilities – Distrigas in Everett, Massachusetts, Canaport in Saint John, New Brunswick, and the Northeast Gateway facility off the coast of Boston, Massachusetts. LNG is supplied to these facilities by tankers that sell on the world market. These ships may elect to go elsewhere depending on prices.

Non-gas resources will continue to play a vital role in maintaining reliability when there are constraints on the natural gas pipeline system. But, as I noted, these resources are retiring. More than 4,200 MW of generating capacity has retired or announced plans for retirement over the next few years. This includes coal, oil, and nuclear power plants. Another 6,000 MW of older coal- and oil-fired resources are at risk of retirement in the coming years. The region's pipeline infrastructure will face continued constraints as heating demand grows and gas-fired generation replaces retiring units.

Notwithstanding our winter preparedness efforts to date, the biggest challenge we see going into this winter—what keeps me up at night—is an extended cold snap when non-gas fuel inventories are depleted, or an operating day in which New England is primarily utilizing nuclear, coal, and oil resources and we suddenly lose a large non-gas resource. The region has adequate electric generating capacity to serve the load under these conditions, but our ability to meet electric energy needs is at risk if the natural gas infrastructure serving the region is unable to supply fuel to gas-fired generators. New England has ties to neighboring power systems, but those systems may not have excess supply to send into our region if they are experiencing similar cold weather conditions. Under these conditions, our system operators may need to rely on emergency actions to maintain operating reserves and meet the region's demand for electricity reliably.

Thank you for the invitation to share information on ISO New England's winter preparedness efforts.

Attachment A

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

RENEW Northeast, Inc. and the American Clean Power Association,	)	
Complainants,	)	
v.	)	Docket No. EL22-___-000
ISO New England Inc.,	)	
Respondent.	)	

NOTICE OF COMPLAINT

( )

Take notice that on March 15, 2022, RENEW Northeast, Inc. ("RENEW") and the American Clean Power Association ("ACP") filed a formal complaint against ISO New England Inc. ("ISO-NE") pursuant to Sections 206 and 306 of the Federal Power Act ("FPA")[1] and Rule 206 of the Rules of Practice and Procedure of the Federal Energy Regulatory Commission[2] ("FERC" or "the Commission"), asking the Commission to remedy undue preferences granted to gas-fired generation resources that have neither dual-fuel capability nor dedicated, firm natural gas supply arrangements ("gas-only resources"), arising from the failure of the current ISO-NE rules and practices concerning capacity accreditation and operating reserve designation to take into account the uncertainty of natural gas supply in New England, particularly in winter peak conditions.

RENEW and ACP certify that copies of the complaint were served on the contacts for ISO-NE as listed on the Commission's list of Corporate Officials.

Any person desiring to intervene or to protest this filing must file in accordance with Rules 211 and 214 of the Commission's Rules of Practice and Procedure (18 CFR 385.211 and 385.214). Protests will be considered by the Commission in determining the appropriate action to be taken, but will not serve to make protestants parties to the proceeding. Any person wishing to become a party must file a notice of intervention or motion to intervene, as appropriate. The Respondent's answer and all interventions, or protests must be filed on or before the comment date. The Respondent's answer, motions to intervene, and protests must be served on the Complainants.

The Commission encourages electronic submission of protests and interventions in lieu of paper using the "eFiling" link at http://www.ferc.gov. Persons unable to file electronically

[1] 16 U.S.C. §§ 824e and 825e (2018).
[2] 18 C.F.R. § 385.206 (2021).

should submit an original and 5 copies of the protest or intervention to the Federal Energy Regulatory Commission, 888 First Street, NE, Washington, DC 20426.

This filing is accessible on-line at http://www.ferc.gov, using the "eLibrary" link and is available for review in the Commission's Public Reference Room in Washington, DC. There is an "eSubscription" link on the web site that enables subscribers to receive email notification when a document is added to a subscribed docket(s). For assistance with any FERC Online service, please email FERCOnlineSupport@ferc.gov, or call (866) 208-3676 (toll free). For TTY, call (202) 502-8659.

Comment Date: 5:00 pm Eastern Time on (insert date).

Kimberly D. Bose,
Secretary.