CENTRAL MAINE POWER

April 9, 2020

Mr. Jay Clement
U.S. Army Corps of Engineers
Maine Project Office
442 Civic Center Drive, Suite 350
Augusta, ME 04330

RE: **New England Clean Energy Connect (NECEC) Project**
Responses to USACE March 3, 2020 Post-Public Hearing Data Request

Dear Mr. Clement:

Central Maine Power Company (CMP) is pleased to provide responses to the United States Army Corps of Engineers (USACE) March 3, 2020 request for information associated with the Department of the Army Permit application, number NAE-2017-01342, submitted by CMP on September 29, 2017 for the New England Clean Energy Connect (NECEC) Project. The responses to the specific information requested are attached hereto.

If you have any questions regarding these responses, please give me a call at (207) 629-9717 or email me at gerry.mirabile@cmpco.com.

Sincerely,

Gerry J. Mirabile
Manager – NECEC Permitting
AVANGRID Networks, Inc.

Enclosures

cc: Melissa Pauley & Julie Smith – DOE
Beth Alafat & Mike Marsh – EPA
Matt Manahan & Lisa Gilbreath – Pierce Atwood
Mark Goodwin – Burns & McDonnell
File: New England Clean Energy Connect

Response to the
March 3, 2020
USACE and DOE Information Request

New England Clean Energy Connect (NECEC)

Prepared for:
U.S. Department of the Army
New England District, Corps of Engineers
Application No. NAE-2017-01342
And
U.S. Department of Energy
Office of Electricity Delivery and Energy Reliability

April 9, 2020

ADDITIONAL INFORMATION REQUEST
March 3, 2020

1. **You are already aware that we require a copy of the state water quality certification from the Maine DEP. Please furnish us with a copy of the final signed document as soon as it becomes available.**

RESPONSE

CMP anticipates that the Maine Department of Environmental Protection (DEP) will issue a Department Order approving permits for the New England Clean Energy Connect (NECEC or Project) that will include the state water quality certification in April 2020. DEP issued a draft Order on March 13, 2020 and has established a comment deadline of April 10, 2020. We understand the United States Army Corps of Engineers (USACE) has received a copy of the draft DEP Order. CMP will forward a copy of the final DEP Order to the USACE upon its receipt.

2. **On January 23, 2020, the EPA and the Department of the Army finalized the Navigable Waters Protection Rule to define "waters of the United States" (WOTUS). The final rule will become effective 60 days after publication in the *Federal Register*. We advise you and your legal team to monitor this process relative to the timeline of your project. While many of the waters being affected by your project are likely to remain jurisdictional, I would be remiss if I didn't at least advise you of the potential change. Currently there is a signed Preliminary Jurisdictional Determination in the administrative record. There is no need to revisit this determination at this time. If the Rule is finalized without challenge we can have further discussions as to its implications for your project.**

RESPONSE

CMP agrees that the pendency of the Waters of the United States (WOTUS) Rule has no effect on the USACE's processing of the NECEC permit application for at least two reasons: (1) the Preliminary Jurisdictional Determination (PJD) does not make an official determination of jurisdictional aquatic resources, and thus is not impacted by a change in the WOTUS Rule, and (2) CMP has agreed that basing a permit authorization on a PJD could result in more compensatory mitigation being required, such that it has already accepted the risk of a decrease in USACE jurisdiction under a WOTUS rulemaking and can later request an Approved Jurisdictional Determination (AJD) to reduce compensatory mitigation if it so chooses.

First, permitting can move forward regardless of the status of the WOTUS Rule on the basis of the PJD, which the USACE issued for the NECEC instead of an AJD. This distinction is important, as the purpose of a PJD is to allow the USACE to make a broad determination of the presence of jurisdictional waters without making a final delineation regarding the specific extent of such jurisdictional waters. USACE regulations define an AJD as "a Corps document stating the presence or absence of waters of the United States on a parcel or a written statement and map identifying the limits of waters of the United States on a parcel. Approved JDs are clearly designated appealable actions and will include a basis of JD with the document." 33 CFR § 331.2. PJDs, by contrast, "are written indications that there may be waters of the United States on a parcel or indications of the approximate location(s) of waters of the United States on a parcel. PJDs are advisory in nature and may not be appealed." *Id.* (emphasis added). *See also*

Sisseton-Wahpeton Oyate of the Lake Traverse Reservation v. USACE, 2016 WL 5478428, at *13 (D.S.D. Sept. 29, 2016) (characterizing a PJD as a "working document").

Accordingly, as explained in USACE guidance, when the USACE issues a PJD, it makes "no legally binding determination of any type regarding whether jurisdiction exists over the particular aquatic resource in question" and "a recipient of a PJD can later request and obtain an AJD if that becomes necessary or appropriate during the permit process or during the administrative appeal process." *Regulatory Guidance Letter No. 16-01*, at 3 (October 2016). CMP's PJD states that it "does not make an official determination of jurisdictional aquatic resources." CMP PJD at 2. Rather, the "PJD finds that there may be waters of the U.S." within the Project area "and identifies all aquatic features in the review area that could be affected by the proposed activity." *Id.*

Through the PJD, the USACE made a non-binding determination that there are possibly jurisdictional waters that would be affected by the NECEC. As such, the uncertain status of the WOTUS Rule does not impact USACE's ability to issue a permit for the Project based on the existing PJD; while the revised WOTUS Rule could reduce the scope of the jurisdictional waters, it does not affect the PJD's general determination that there are waters affected. Therefore, the USACE can move forward with processing CMP's permit application.

Second, CMP is aware of the risk that the USACE's permitting decision based on the PJD may subject CMP to greater cost. USACE guidance explains that the danger for the permittee of relying on a general, non-binding PJD in the permitting process is that "for purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision made on the basis of a PJD will treat all aquatic resources that would be affected in any way by the permitted activity on the parcel as jurisdictional." *Regulatory Guidance Letter No. 16-01*, at 3 (October 2016). USACE guidance makes clear than an applicant has the option of moving quickly to permitting by requesting a PJD but may "later request and obtain an AJD if that becomes necessary or appropriate during the permit process or during the administrative appeal process." *Id.* By the terms of the PJD issued here, CMP agreed that it was made aware that it "has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions." CMP PJD at 2. Therefore, to the extent that the outcome of the WOTUS Rule affects CMP's final permit, CMP is aware of the risk of its reliance on the PJD in order to move expeditiously through the permitting process.

3. Please summarize how the project opponents' various legislative initiatives potentially affect the project schedule. Similarly, how might legal challenges affect the schedule?

RESPONSE

The NECEC schedule has not been impacted by the Project opponents' various legislative initiatives and is not expected to be so impacted. As such, the expected commercial operation date for the Project, as set forth in the Project's current schedule, remains December 13, 2022. To achieve commercial operation by this date, the Project schedule contemplates the commencement of construction in areas other than the border crossing upon issuance of the USACE permit and any applicable municipal permits. Construction in the area of the border crossing will not commence until the Presidential Permit is issued.

On March 17, 2020, the Maine Legislature adjourned sine die on account of Maine's state of emergency arising from the novel coronavirus. As a result of this adjournment, any bills related to the NECEC remaining before the Legislature during the current session have been tabled without action for possible consideration in the event the Legislature reconvenes in a special session later this year. It is unknown at this time whether, if at all, the Legislature will reconvene this year. In the event the Legislature does not reconvene this year, all bills before this Legislature, including those related to the Project, will expire without effect. A new Maine Legislature will convene in December 2020.

On March 4, 2020, the Maine Secretary of State certified that the proponents of a citizen's initiative referendum related to the NECEC had provided sufficient signatures of registered Maine voters to have the referendum placed on the November 2020 ballot. On March 13, 2020, the Secretary's certification was timely challenged in Maine Superior Court on the grounds that the Secretary erred in counting more than 17,000 signatures notarized by individuals expressly prohibited by Maine law from acting as a notary with respect to the referendum petition and in counting other invalid signatures. A copy of the petition initiating this challenge is provided as Attachment A. On March 24, 2020 the Maine Superior Court remanded the matter to the Secretary of State for consideration, and on April 1, 2020, the Secretary of State issued a decision concluding that the citizens' initiative effort retained enough valid signatures to move forward. In accordance with the Maine Constitution and Maine statute, this challenge must be decided by a final decision of the Maine Supreme Judicial Court by May 13, 2020, which mandatory decision date is before the USACE is expected to issue its permit.

Likewise, the other legal challenges related to the Project that have been asserted to date have had no impact on the Project schedule, including the commercial operation date. To date, opponents have filed appeals of the Maine Public Utilities Commission's (MPUC's) Certificate of Public Convenience and Necessity (CPCN) Order (MPUC Order), dated May 3, 2019 and attached hereto as Attachment B, and the Massachusetts Department of Public Utilities' (MA DPU) order approving the Power Purchase Agreements and cost recovery under the Transmission Service Agreements related to the NECEC, dated June 25, 2019 and attached hereto as Attachment C. In neither case did the appellant seek or obtain a stay of the applicable orders. On March 17, 2020 the Maine Supreme Judicial Court affirmed the CPCN; a copy of that decision is provided as Attachment D. Briefing before the Massachusetts Supreme Judicial Court (Mass SJC) on the appeal of the MA DPU order is complete, oral argument is scheduled for April 9, 2020, and it is expected that the Mass SJC will issue its decision by June 25, 2020.

It is impossible to know at this time whether Project opponents will appeal other permits and approvals obtained for the NECEC or pursue other legal challenges. As such, the Applicant cannot speak to any impacts on the Project schedule of any such legal challenges. However, the Applicant confirms its intention to move forward with the Project in order to achieve the agreed upon commercial operation date of December 13, 2022, unless a stay is put in place which blocks the effectiveness of the permits and approvals necessary for Project construction. CMP notes, however, that the burden to obtain such a stay is high; under Maine law, a stay may be granted only upon a showing of irreparable injury to the petitioner, a strong likelihood of success on the merits, and no substantial harm to adverse parties or the general public. 5 M.R.S. § 11004.

4. **A core determination that the Corps must make is, will the authorization of discharges of fill into the WOTUS be in the public interest or at least not contrary to the public interest. Prevailing public comments and hearing testimony received to date slants heavily toward project opponents. This is not uncommon though it seems particularly well organized for this project. Reportedly 26 or more towns along the corridor have voted in opposition to the project. While our public interest evaluation isn't a 'popularity contest', careful consideration must be given to our public interest review factors in view of the magnitude of public opposition. Toward that end we offer CMP the opportunity to update and enhance Section 7 and Table 9 of the draft Environmental Assessment. You may wish to greater emphasize the project benefits.**

RESPONSE

CMP intends to revise the entirety of the August 9, 2019 applicant-proposed draft Environmental Assessment (EA) to include Project modifications since the EA was first drafted, as well as incorporating the special conditions required in the DEP draft Order approving the Project. The revised EA will include the updated and enhanced Section 7 and Table 9 of the draft EA, provided as Attachment E, to include greater emphasis on the benefits of the Project. CMP intends to provide the revised applicant-proposed EA on or around May 1, 2020.

CMP also is availing itself of the opportunity USACE has provided, through this AIR Response, for CMP to respond to or rebut comments that were timely submitted to the USACE. CMP therefore will include an updated Table 4-1 in the revised draft EA with a description of its additional outreach to certain commenters, on which the USACE has been copied. Because numerous commenters raised similar issues in their comments, however, CMP also is providing here a comprehensive response to those comments. CMP is not specifically responding to or rebutting comments that were filed with the USACE after its January 6, 2020 deadline for submission of public comments,[1] and CMP hereby objects to inclusion of such late-filed comments in the USACE's administrative record, and asks that USACE exclude them from its record.

As the USACE is aware, USACE bases its decision on an evaluation of the probable impacts, including cumulative impacts, of the Project on the public interest. 33 CFR § 320.4(a). The record is replete with evidence demonstrating that the Project's benefits outweigh any reasonably foreseeable detriments, and that the Project reflects the national concern for protection and utilization of important resources. Nevertheless, as the USACE noted in this AIR, public opposition to the Project is vocal and active. Project opponents have suggested that the level of opposition warrants denial of CMP's application, or

[1] CMP is, however, including in this AIR Response, as part of its response to DOE Question 3, rebuttal to the Sierra Club's Wednesday, March 25, 2020 5:19 PM email to USACE's Jay Clement, and the Northridge Energy Partners study attached thereto, which the Sierra Club sent to USACE well beyond the January 6, 2020 closure of the public record. USACE forwarded this March 25, 202 email to CMP on March 26, 2020, with a suggestion that CMP address its contents in this AIR response. CMP is so doing, with minimal time to review and rebut its contents, but nevertheless objects to inclusion of this filing in the USACE's administrative record. Sierra Club has made no explanation of its tardy filing, nor a demonstration that it could not have filed this information prior to the close of the record. The USACE should reject the Sierra Club's delay, which amounts to an attempt to slow down the federal agencies' processing of CMP's applications.

warrants an EIS. Neither is correct, as the size of opposition to the Project does not speak to its substance. Where, as here, the record supports a FONSI and LEDPA determination by the USACE, the public opposition to the Project is not a bona fide controversy as to its environmental effects, and should not affect the USACE's permitting decision. Substantive issues raised in public comments are already addressed in the record, as discussed below, and will be carefully considered by the USACE.

I. General Environmental Concerns

A. Greenhouse Gas Emissions

A large number of public comments suggest that the Project will not reduce greenhouse gas (GHG) emissions, and might even result in an increase in emissions. The record demonstrates otherwise, and CMP is providing in this AIR its responses to the USACE's and DOE's questions on this issue. The GHG benefits of the Project are established in the numerous filings to the DEP and USACE, including:

- March 25, 2019 Comments of CMP Regarding Greenhouse Gas Emission Reductions;
- April 24, 2019 Supplemental Comments of CMP Regarding Greenhouse Gas Emissions Reductions;
- May 24, 2019 Response of CMP to Intervenor Group 4 May 9, 2019 Comments Regarding Greenhouse Gas Emissions;
- June 14, 2019 Responses to the USACE May 15, 2019 Data Request; and
- November 26, 2019 Supplemental Information in Response to October 29, 2019 Interagency Meeting.

These filings show that the Project will facilitate a significant reduction in GHG emissions across the northeast United States by creating a path for Hydro-Québec to export 9.45 terawatt hours (TWh) annually of new, clean, hydroelectric energy from its existing hydropower facilities to New England over a 20-year period.

These incremental exports to New England will displace fossil fuel-based generation in New England, and thus reduce overall GHG emissions. As CMP stated in its May 24, 2019 Response to Group 4's May 9, 2019 Comments Regarding Greenhouse Gas Emissions Reductions, three different experts, including CMP's expert Daymark Energy Advisors, the Generator Intervenors'[2] expert Energyzt Advisors, LLC (Energyzt), and the MPUC's independent expert London Economics International (LEI), presented reports in the CPCN proceeding that modeled the Project's regional GHG emissions impacts.[3] Additionally, NRCM, along with the Maine Renewable Energy Association (MREA) and the Sierra Club, retained Energyzt to produce an additional study of the NECEC's GHG impacts.[4] This study came to the

[2] The Generator Intervenors in the MPUC docket were Calpine Corporation, Vistra Energy Corporation, and Bucksport Energy LLC.

[3] Response of Central Maine Power Company to the Group 4 May 9, 2019 Comments Regarding Greenhouse Gas Emissions at 4-5 (May 24, 2019) (citing MPUC Order at 70).

[4] *Id.* at 5 (citing MPUC Docket No. 2017-00232 January 8, 2019 Hearing Transcript at 6:11-7:2 (Hearing Testimony of Generator Intervenor Witnesses Tanya Bodell and James Speyer acknowledging that they also worked on and produced the October 2018 GHG Report for NRCM, MREA and the Sierra Club). See the October 2018 Energyzt Report, "Greenwashing and Carbon Emissions: Understanding the True

same conclusions as the report conducted for the Generator Intervenors, but NRCM never directly submitted the study to the MPUC and did not submit the study to the DEP.[5]

Based on this evidence, which also is before the USACE, the MPUC concluded that "the NECEC will result in significant incremental hydroelectric generation from existing and new sources in Quebec and, therefore, will result in reductions in overall GHG emissions through corresponding reductions of fossil fuel generation (primarily natural gas) in the region." MPUC Docket No. 2017-00232, Public Utilities Commission Examiner's Report at 114 (Mar. 29, 2019).

The DEP deferred to this finding in its March 13, 2020 draft Order, noting that climate change "is the single greatest threat to Maine's natural environment." Draft Order at 103. The DEP explained that climate change "is already negatively affecting brook trout habitat, and those impacts are projected to worsen. It also threatens forest habitat for iconic species such as moose, and for pine marten, an indicator species much discussed in the evidentiary hearing. Failure to take immediate action to mitigate the GHG emissions that are causing climate change will exacerbate these impacts." *Id.* The need for this Project thus cannot be overstated – as we are in a "climate emergency"[6] – yet Project opponents nevertheless have taken a thoroughly hypocritical anti-development, yet pro-renewable energy stance.[7] Despite this predictable NIMBYism, the DEP found adverse effects of the Project "to be reasonable in light of the Project purpose and its GHG benefits." Draft Order at 103.

Furthermore, and contrary to opponents' claims, Hydro-Québec will not have to divert existing energy exports from other markets to supply the NECEC, as demonstrated by the full litigation of this issue before the MPUC, the record before the USACE, and CMP's responses to USACE question 11 and DOE questions 2-3 of this AIR. Hydro-Québec's May 20, 2019 letter to Governor Mills provides additional information regarding its available and projected energy supply. As demonstrated by the record, other markets will not see an increase in GHG emissions and there will not be an offset of the GHG emissions reductions attributable to the NECEC.

Impacts of New England Clean Energy Connect," produced for NRCM, MREA, and the Sierra Club, available in the MPUC case management system (CMS) under Docket No. 2017-00232 at CMS entry 429). Both Energyzt reports are attached hereto as Attachment F.

[5] *Id.* (citing MPUC Docket No. 2017-00232, CMS entry 429, by which Carol Howard, a non-party to the MPUC proceeding who provided public witness testimony, submitted the Energyzt Report as Exhibit F to her testimony).

[6] *See, e.g.,* media coverage of climate change activists calling for immediate action in Maine and at the federal level (https://www.mainepublic.org/post/young-maine-activists-call-climate-council-make-zero-emission-goal-state; https://www.nytimes.com/2019/12/05/opinion/jane-fonda-climate-change.html?action=click&module=Well&pgtype=Homepage&section=Opinion), attached hereto as Attachments G and H.

[7] *See, e.g.,* media coverage of necessary climate change action being stymied by environmental advocates in siting, permitting, and legal proceedings (https://www.greentechmedia.com/articles/read/transmission-emerging-as-major-stumbling-block-for-state-renewable-targets#.Xh-Mx9rcPKU.email; https://www.forbes.com/sites/ellenrwald/2020/01/13/north-american-energy-trade-must-continue-to-improve/#3a99a470b3dd), attached hereto as Attachments I and J.

In short, the evidence shows that once the NECEC goes into service in late 2022, it will significantly advance Maine's progress toward meeting the long-term GHG reduction goals set forth in 38 M.R.S. § 576 by substantially reducing the emissions of carbon dioxide (CO2), a greenhouse gas, across Maine and New England, through the delivery of clean energy into the ISO-New England (ISO-NE) Control Area, that will displace fossil-fuel-fired generation.[8]

B. Environmental Impact of Hydropower

Some commenters suggested that hydropower is not "clean," and thus the environmental impact of the Project is understated, as it will transmit hydroelectric energy from Hydro-Québec's existing hydropower facilities to New England. As explained in response to USACE question 7 of this AIR, concern over the impact of methane, CO2, and methyl mercury discharges are overstated and unfounded.

C. Environmental Assessment

Numerous commenters have requested that the USACE conduct an Environmental Impact Statement (EIS) instead of an Environmental Assessment (EA) for the Project. As the USACE has explained in response, its regulations allow it to conduct an EA to determine whether an EIS is warranted. As CMP explained in its August 9, 2019 memorandum to the USACE, no EIS is required here because the evidence supports a FONSI. CMP is confident that the USACE is taking the requisite hard look at all of the evidence of record and will determine that the Project will not result in a significant impact to the environment.

D. Cumulative Impact

A number of commenters questioned whether the USACE could adequately analyze the cumulative impact of some future use of those portions of CMP's corridor that are undeveloped and are not a part of this Project, and suggested this Project would stimulate the development of wind energy projects in Western Maine. While such concerns are irrelevant to the USACE's review of the NECEC, because CMP has no current or future plans to develop the remaining corridor and thus any such development is speculative, as CMP explained in its November 26, 2019 filing with the USACE, there is insufficient remaining width needed to construct an additional transmission line. Furthermore, CMP's alternatives analysis included a comparison of southern and northern alignments on Segment 1 (filed with the DEP on March 29, 2018, with the DEP and USACE on May 4, 2018, and with the USACE on June 14, 2019) and concluded that the southern alignment was the least environmentally damaging practicable alternative.

Alternately utilizing the full width of the corridor to "zig-zag" to attempt to avoid impacts to waters of the United States was determined to be not practicable from both a cost and environmental impact perspective, as explained in CMP's November 26, 2019 filing with the USACE. Zig-zagging through the 300-foot-wide corridor would require at least three additional angle structures for each jog in the corridor, which would increase soil disturbance through larger site development and temporary impact areas, increasing the threat of erosion and sedimentation and the potential to directly impact protected natural resources. Also, zig-zagging throughout the corridor may not achieve the overall goal of

[8] March 25, 2019 Comments of CMP Regarding Greenhouse Gas Emission Reductions at 2-5 and attachments thereto.

avoidance and then minimization, since it may simply shift the impacts to other protected natural resource areas.

Thus, CMP's alignment on the southern side of Segment 1 is not intended to preserve the northern portion of the corridor for future use. Instead, the primary reason for siting the Project along the southern alignment of the Segment 1 corridor, and not zig-zagging throughout its entire width, was to avoid and minimize impacts while also considering cost.

Furthermore, development of the NECEC would not provide any impetus for or assistance in development of the northern portion of the corridor. Rather, such development would be entirely unrelated to the NECEC and could occur regardless of the NECEC, as long as CMP has property rights to any undeveloped corridor of at least 150 feet in width. Development of the NECEC, in fact, makes development of an AC line for transmission of wind power less likely, because introduction to the grid of hydropower from Hydro-Québec makes additional wind power less attractive from an economic perspective (i.e., it would be cheaper power).

Nevertheless, in the event a co-located transmission line were constructed in the future by CMP or any other entity, the cumulative impacts of NECEC on the affected environment would not be significant because the NECEC will have been completed and permanently stabilized such that there are no ongoing adverse influences on the aquatic resources in the geographical scope of the NECEC, and the unavoidable impacts of the NECEC will have otherwise been mitigated or compensated for, as required by its permits.

II. Alternatives

The record shows that CMP analyzed alternatives to the Project, including a no-action alternative, alternative routes for the entirety of the new HVDC line, alternatives to crossing the five outstanding river segments that the Project as proposed will cross, undergrounding certain portions of the Project, as well as alternatives of taller poles and/or tapering to minimize visual impact and of taller poles and/or tapering to provide habitat connectivity. The issue of Project alternatives was fully addressed before the DEP, which concluded in its March 13, 2020 draft Order as follows:

> The hearings also focused on whether a practicable alternative exists to the applicant's chosen route and proposed design that would be less damaging to the environment. The evidence shows that it does not. The alternative routes potentially available are each problematic for their own reasons, including the need to cross or go around conservation lands such as the Bigelow Preserve, greater impacts to the Appalachian Trail, and an increase in cleared corridor area. Nor is the undergrounding alternative preferable. Record evidence supports the conclusion that undergrounding in Segment 1 may be so technically challenging as to be impracticable. Even if technically practicable, the trenching that undergrounding entails would result in greater impacts to natural resources such as wetlands. Undergrounding also would require a permanent clearing in Segment 1 that is 75 feet in width, almost 50% wider than the corridor clearing approved in this Order. [Draft Order at 2].

Accordingly, the DEP has preliminarily found CMP's Preferred Route to be "the least environmentally damaging alternative available." *Id.*

Nevertheless, a few public comments questioned whether alternatives to the Project, such as co-location of the Project along existing roadsides such as Spencer Road or Route 201, or undergrounding the Project, are reasonably available to CMP. The evidence shows that they are not.

The evidence shows that Spencer Road is not a public road, and its private owners specifically did not want a transmission line located along that road.[9] While Route 201 is a public road, "the Maine Department of Transportation [MDOT] will not allow the line to be built in the travel lanes and there is insufficient room alongside the travel lanes to actually install the line."[10] In other words, the evidence shows that Route 201 is unavailable due to lack of sufficient space within the highway limits,[11] the restrictions MDOT places on such burial and the installation of splicing vaults,[12] safety constraints with co-locating with the existing overhead distribution line,[13] and other cost, safety, and environmental issues of doing so.[14] The presence of the existing overhead distribution line in Route 201, "rather than indicating a potential pathway actually means much of the available space is currently occupied."[15]

Furthermore, the evidence shows that there is no other corridor available that connects to Québec in the upper Kennebec River area, other than the proposed route.[16] While there is a distribution line from Harris Dam to the village of Jackman (the Jackman Tie Line or JTL), the JTL does not connect to Québec.[17] The JTL instead terminates in Jackman about 16 miles from the Canadian border and would require new corridor through the towns of Jackman and Moose River as well as additional corridor along Route 201, a state and federally designated scenic byway, for the entire distance from Jackman to West Forks Plantation.[18] In addition, the JTL corridor between Harris Dam and Route 201 would need to be expanded to pass through two conservation easements and across the State-owned Cold Stream Forest.[19]

With regard to comments suggesting undergrounding, the evidence shows that undergrounding is not a less environmentally damaging practicable alternative to the proposed overhead transmission line.[20] It

[9] Freye Rebuttal at 5; Freye Supplemental at 5-6; Hearing Day 6 Transcript at 338:10-15 (Freye).

[10] Hearing Day 6 Transcript at 487:14-19 (Bardwell).

[11] Freye Supplemental at 4; Hearing Day 6 Transcript at 337:22-338:10 (Freye); Hearing Day 6 Transcript at 342:5-343:3, 487:1-19 (Bardwell).

[12] Bardwell Rebuttal at 10; Bardwell Supplemental at 12; Hearing Day 6 Transcript at 487:1-19 (Bardwell).

[13] Freye Supplemental at 5, 7-8.

[14] Freye Rebuttal at 7-8; Freye Supplemental at 5; Hearing Day 6 Transcript at 342:5-343:3 (Bardwell); Hearing Day 6 Transcript at 464:3-23 (Dickinson).

[15] Hearing Day 6 Transcript at 337:25-338:4 (Freye).

[16] Freye Supplemental at 2-4.

[17] Freye Rebuttal at 6.

[18] Freye Rebuttal at 7; Bardwell Supplemental at 12.

[19] Freye Rebuttal at 7.

[20] Bardwell Rebuttal at 2-3; Bardwell Supplemental at 2-13.

was so obvious that undergrounding would not meet the Project purpose or otherwise be practicable that CMP did not initially include it as an alternative in the application materials filed with DEP and LUPC.[21] In other words, had additional portions of the Project been buried, the Project would not have moved forward.[22]

Nevertheless, CMP conducted a thorough underground alternative analysis,[23] which showed that the extremely high cost, logistical difficulties, visual impact, negligible environmental benefits, increased risk and adverse impacts during construction, and potential adverse impacts during operation render any additional undergrounding not practicable.[24] This analysis was supported at the DEP hearing, at which numerous intervenor witnesses testified that undergrounding is not a preferred alternative due to their concerns with the environmental and visual impacts of undergrounding.[25] Crucially, burying any additional portion of the NECEC underground in the 54-mile new corridor of Segment 1 is not reasonable or feasible because the costs and logistics of doing so would defeat the purpose of the Project.[26] In other words, the alternative of burying the transmission line is not practicable because it would result in the NECEC not moving forward.[27]

The evidence further shows that undergrounding also is not practicable at the Appalachian Trail (AT) crossings. An underground alternative would require construction of termination stations within sight of the trail, along with a trenchless crossing of the AT, approximately 3,500 feet long, at a cost of approximately $28.9 million, $28 million of which would be an incremental additional cost to the Project when removing associated overhead transmission line costs.[28] Furthermore, construction activities would last approximately 10 months and would require HDD rigs powered by an external diesel-powered hydraulic power plant that generate noise of approximately 110 decibels continuously while in operation.[29] Additionally, the easement allowing the AT in CMP's corridor includes provisions for additional overhead lines, but does not contemplate underground installations, so CMP would need to

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[21] Bardwell Rebuttal at 3; Hearing Day 6 Transcript at 347:20-348:23 (Tribbet).

[22] Hearing Day 1 Transcript at 248:12-15 (Dickinson); Hearing Day 2 Transcript 146:8-150:7 (Dickinson); Hearing Day 6 Transcript at 441:15-442:5 (Dickinson).

[23] *See* Bardwell Rebuttal; Tribbet Rebuttal; Bardwell Supplemental.

[24] Bardwell Rebuttal at 3-16, 23-27; Tribbet Rebuttal at 5; Freye Rebuttal at 5-6; Bardwell Supplemental at 2-8; Hearing Day 1 Transcript at 265:16-266:12, 266:13-23, 289:20-290:9 (Mirabile); Hearing Day 3 Transcript at 192: 12-14 (Warren); Hearing Day 6 Transcript at 341:5-344:22, 431:7-432:4 (Bardwell); Hearing Day 6 Transcript at 346:23-347:1 (Tribbet); Hearing Day 6 Transcript at 432:5-12 (Achorn); Hearing Day 6 Transcript at 445:7-447:12 (Paquette); Exhibits CMP-11-A through CMP-11.1-G.

[25] Publicover Supplemental at 2-3; Hearing Day 5 Transcript at 94:13-95:14, 97:16-98:15 (Cutko); Hearing Day 6 Transcript at 61:4-25, 78:23 (Publicover); Hearing Day 6 Transcript at 72:12-14 (Reardon). *See also* Bardwell Rebuttal at 21-27.

[26] Dickinson Rebuttal at 2-3, 9-10, 13; Tribbet Rebuttal at 5; Tribbet Supplemental at 4-6; Hearing Day 1 Transcript at 285:13-287:3 (Dickinson).

[27] Dickinson Rebuttal at 13; Hearing Day 1 Transcript at 248:12-15 (Dickinson); Hearing Day 6 Transcript at 441:15-442:5 (Dickinson).

[28] Bardwell Rebuttal at 17-18; Exhibit CMP-11-E.

[29] Bardwell Rebuttal at 18.

seek such rights from the NPS to allow underground installation.[30] Given the presence of the existing transmission line corridor, the very high cost of undergrounding in this location, and the fact that the underground alternative would have additional environmental and public impacts, the evidence shows that undergrounding in this location is not practicable.

III. Scenic and Recreational Values

Numerous commenters alleged that the Project will adversely affect the scenic character and existing uses of the area around the Project. This is not supported by the evidence. CMP ensured that the Project fits harmoniously into the existing natural environment by siting it such that the Project's route and design avoids or minimizes potential visual and other environmental impacts on scenic and other natural resources,[31] including locating the intersection with the Appalachian Trail in an existing CMP corridor containing a 115kV transmission line,[32] undergrounding the crossing of the upper Kennebec River,[33] and re-routing the Project away from Beattie Pond.[34] CMP also employed numerous mitigation measures to avoid unreasonable adverse effects on existing uses and scenic character, including co-locating the majority (more than 70%) of the transmission line in current right-of-way (ROW), locating Segment 1 of the transmission line in private timberland that continues to be actively harvested, proposing self-weathering steel monopole structures to reduce visibility, proposing non-specular conductors at Rock Pond to reduce visibility, reducing structure heights near Moxie and Beattie ponds, maintaining vegetation at certain road crossings and river and stream crossings, developing buffer screening plans, and proposing tapered vegetation in certain locations.[35] Accordingly, the Visual Impact Assessment prepared by Terrence J. DeWan & Associates concluded that the Project will not unreasonably interfere with existing scenic and aesthetic uses of a scenic resource and will not have an unreasonable adverse effect on the scenic character of the surrounding area.[36] The evidence also shows that Project creates no interference with the recreational and navigational uses of the surrounding area.[37]

The DEP found in its draft Order that the Project will neither adversely affect scenic character nor unreasonably interfere with existing scenic and aesthetic uses, including at the Upper Kennebec River, Spencer Road, Coburn Mountain, No. 5 Mountain, Rock Pond, Old Canada Road Scenic Byway (Route 201), Moxie Pond, and the Appalachian Trail. Draft Order at 41-56. Likewise, the DEP found that the

[30] Bardwell Rebuttal at 18; Freye Rebuttal at 2-3; Hearing Day 6 Transcript at 396:10-19, 429:14-15 (Freye).

[31] Exhibit CMP-5-B; *see also* Hearing Day 3 Transcript at 191:1-12 (Christopher).

[32] Site Law Application § 25.3.1.3; Berube Direct at 15-16; Goodwin Direct at 9-10; Segal Direct at 32.

[33] *See* October 19, 2018 application amendment; draft Order at 71.

[34] *See* October 10, 2019 application amendment; draft Order at 71.

[35] Segal Direct at 22-27; Segal Rebuttal at 3.

[36] Site Law Application § 6.0; Hearing Day 1 Transcript at 298:2-299:6 (DeWan); Segal Direct; Segal Rebuttal; DeWan Supplemental; Exhibit CMP-5-B; Exhibit CMP-5-C; Exhibit CMP-5.1-A; Exhibit CMP-6.2-A. *See also* DEP draft Order at 104.

[37] CMP September 4, 2018 AIR Response; Dwyer Rebuttal at 2; Tribbet Rebuttal at 7; Group 4 Christopher Direct at 3; Group 4 Warren Direct at 3-4.

Project will not have an unreasonable adverse impact on existing uses, including recreational or navigational uses. *Id.* at 56-57, 104.

CMP expects that the final DEP Order will align closely with the vegetation management provisions in the draft Order, which "imposes substantial, additional conditions on the construction and maintenance of the Segment 1 corridor, for example, by requiring taller vegetation in 12 Wildlife Areas and tapering the entirety of Segment 1 outside of these areas." *Id.* at 4, 75-80, 107, Appendix C. The DEP found that "[t]he combined effect of these conditions is to shrink the footprint of the Project and reduce its overall impacts dramatically." *Id.* at 2. CMP accepts these provisions, and to the extent required, hereby amends its USACE application such that it reflects what is required by the final DEP Order when issued.

IV. Wetlands

Some commenters expressed concern with the Project's avoidance of wetlands and mitigation of its wetlands impact. As the evidence demonstrates, CMP located and designed the Project to avoid as many wetlands as possible, but because of the pervasive nature of wetlands in Maine, the NECEC Project unavoidably crosses wetlands. Some unavoidable fill of wetlands (ranging from approximately 30 to 185 square feet of permanent fill per structure for those structures unavoidably located in wetlands) will result from structures, soil mounding associated with pole placement, and, where necessary, concrete foundations.[38] This small loss of wetland area from the structure fill (approximately 0.150 acre in total) equates to a negligible loss of wetland functions and values relative to the remaining wetland area at each structure site.[39] While CMP proposes to directly alter 4.124 acres of freshwater wetland and to indirectly alter 105.55 acres of forested wetland by converting it to shrub-scrub wetland, the DEP has preliminarily found such impact to be the "minimum amount necessary" in its draft Order, and ordered preservation of lands of comparable habitat to compensate for permanent fill within wetlands. Draft Order at 86-88.

V. Fish and Wildlife

Public comments to the USACE concerning impact to brook trout habitat, habitat fragmentation, and cold water fisheries ignore the extensive consultations and coordination that CMP initiated with the Maine Department of Inland Fisheries and Wildlife (MDIFW), to the satisfaction of that agency.[40] The

[38] Goodwin Direct at 25.

[39] Goodwin Direct at 25-26.

[40] Johnston Rebuttal at 7-9; Exhibit CMP-4.1-A. This comprehensive consultation process allowed MDIFW to provide final comments on the NECEC Project Compensation Plan, in response to a March 11, 2019 email and attachments from CMP requesting "that MDIFW confirm that the attached clarification materials address all of MDIFW's remaining concerns, and that MDIFW is satisfied that the latest (January 30, 2019) NECEC Project Compensation Plan, as supplemented by these attached clarifications, provides satisfactory mitigation of the NECEC Project's impacts." In its March 18, 2019 response, DIFW thanked CMP "for the March 11 email as a follow-up to address the Department remaining resource impact concerns for the NECEC project," and noted DIFW's appreciation for CMP's "willingness to work with us to finalize the complex fish and wildlife resource issues." DIFW said that CMP's response and explanations were "sufficient to allow DEP to apply applicable natural resource law to the permitting process." Exhibit CMP-4.1-A.

evidence shows that CMP avoided and minimized, and then developed proposed compensation and mitigation to address, impacts to brook trout habitat, that CMP avoided, minimized, and compensated for habitat fragmentation, and that CMP proposed adequate buffer strips around cold water fisheries.[41] Similarly, CMP's vegetation management practices make appropriate provision for the maintenance of wildlife travel lanes and connectivity of adjacent habitats; are consistent with techniques promoted by the United States Environmental Protection Agency and other federal agencies to minimize impacts to wildlife and habitat; and will not result in unreasonable disturbance or harm resulting from habitat fragmentation.

The evidence shows that brook trout are pervasive in the Project area, that the populations in some of the streams over which the Project passes are natural and self-supporting,[42] and that the Project will have no direct impact (i.e., in-stream construction) on brook trout habitat.[43] Nevertheless, and despite the pervasiveness of this cold water species and the evidence of a *de minimis* impact to brook trout habitat,[44] CMP proposed widened riparian buffers of 100 feet for all cold water fishery streams (as determined by MDIFW), which include brook trout habitat,[45] and has proposed to use no herbicides within the Segment 1 corridor[46], and hereby proposes to use no herbicides in the vicinity of the Appalachian Trail [consistent with the portion of ROW where vegetation will be tapered at this location], as well as additional protective measures that ensure no unreasonable disturbance or harm to this habitat.[47] CMP's commitment to apply 100-foot riparian buffers applies to <u>all</u> brook trout streams.[48] The record thus is replete with evidence that the Project will not unreasonably affect brook trout habitat, and adequate provision has been provided for buffer strips around cold water fisheries.

Additionally, in its draft Order the DEP identified areas where taller vegetation is appropriate to support wildlife and reasonably achievable in light of existing topography or by using taller poles, and ordered that a minimum vegetation height of 35 feet must be maintained in those areas. Draft Order at 77-80, 107, Appendix C. Such vegetation management "will reduce habitat impacts" and "the Project will result in adequate provision for the protection of wildlife." *Id.* at 80. These requirements provide even further protection for fisheries and wildlife, including for listed species such as lynx and northern long-eared bats. CMP's proposed Construction Vegetation Clearing Plan further specifies restrictive vegetation management requirements for sensitive areas within the proposed Project area including perennial streams within designated Atlantic salmon habitat, including when installing the additional culverts being required by the DEP. *Id.* at 84.

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[41] Mirabile Direct at 9; Goodwin Direct at 11.

[42] Goodwin Direct at 14. Of the 743 water bodies located within the NECEC corridor, MDIFW identified 223 as containing brook trout (*Salvelinus fontinalis*). Mirabile Direct at 10; Goodwin Direct at 13.

[43] Goodwin Direct at 14.

[44] Goodwin Direct at 14; Johnston Rebuttal at 2-4.

[45] Mirabile Direct at 10; Johnston Rebuttal at 4-5.

[46] Mirabile Supplemental at 5; Hearing Day 6 Transcript at 327:18-328:17 (Mirabile).

[47] Mirabile Direct at 10-11.

[48] Hearing Day 6 Transcript at 308:18-310:3, 324:19-325:14 (Goodwin); Johnston Rebuttal at 7-8.

Similarly, the evidence shows that CMP minimized and avoided habitat fragmentation impacts by co-locating the majority (more than 70%) of the transmission line within existing corridors and locating the remainder of the transmission line primarily within areas already subject to and fragmented by intensive industrial forestry practices.[49] The evidence demonstrates that maintained transmission line ROWs are compatible with, coexist with, and support healthy and productive habitat such as significant vernal pools, [50] and do not result in fragmentation that would adversely affect "umbrella species" such as the pine marten.[51]

Nevertheless, CMP has taken mitigating steps to address any fragmenting effects of the Segment 1 corridor, including implementing vegetation management practices that are wildlife-friendly and promote early successional habitat throughout its corridors, and allowing for taller vegetative growth to be maintained in select locations of the NECEC ROW to address species-specific concerns.[52] CMP's vegetation management practices will avoid the hard edge impact generally associated with habitat fragmentation and negative impacts on species resiliency by creating a soft edge that maintains landscape permeability and establishes areas of dense shrubby vegetation and taller vegetation where topographic conditions allow (e.g., steep ravines), thereby providing a vegetation bridge for wildlife movement across the NECEC corridor.[53] Further, CMP's integrated vegetation management (IVM) practices require riparian buffers, ranging from 75 to 100 feet in width measured from the top of bank, to be maintained on both sides of all stream crossings in a manner that will allow taller non-capable vegetation to persist, promoting the movement of wildlife across the corridor and increasing habitat connectivity in these areas.[54]

In addition to the minimization and avoidance of habitat fragmentation through co-location and IVM practices, CMP will retain and maintain taller vegetation in select locations to address habitat fragmentation concerns identified through consultation with MDIFW and the DEP, and will taper vegetation in the remainder of Segment 1, as ordered by the DEP. Draft Order at 1-4, 75-80, 107, Appendix C.[55]

VI. Energy Needs

Contrary to public comments asserting that the Project will somehow weaken electric reliability and grid stability, or hinder the development of other renewable energy projects, the evidence shows that the

[49] Mirabile Direct at 11; Goodwin Direct at 15-16; Goodwin Rebuttal at 3-4; Giumarro Supplemental at 11-12.

[50] Goodwin Rebuttal at 5-6; Emond Rebuttal at 4-6; Exhibit CMP-12-B.

[51] Giumarro Supplemental; Hearing Day 6 Transcript at 236:6-23 (Giumarro).

[52] Goodwin Direct at 15-16.

[53] Mirabile Direct at 12; Goodwin Direct at 17; Goodwin Rebuttal at 18; Emond Rebuttal at 8-9.

[54] Goodwin Direct at 17; *see also See* CMP Response to DEP May 9, 2019 Additional Information Request Attachment B, Cross-Section Typical Wildlife Travel Corridor.

[55] *See also* Goodwin Direct at 19; Goodwin Rebuttal at 14-15; Exhibit CMP-3-G; Exhibit CMP-3-H; *See* CMP Response to DEP May 9, 2019 Additional Information Request Attachment B, Cross Section Typical Wildlife Travel Corridor; Hearing Day 6 Transcript 325:15-326:15 (Mirabile).

Project instead strengthens those essential components of U.S. energy systems, as further explained in response to USACE AIR question 8.

In brief, the Project will not result in harm to Maine energy generators, or any associated loss of jobs and tax revenues in the State. In its MPUC Order (Attachment B), the MPUC stated that it "does not find that the NECEC will result in the adverse effects on Maine generators … [and] that, because of the already low capacity factors and energy revenues of these [generators], reductions in energy market prices are unlikely to be material for them." MPUC Order at 43. It further found that "the NECEC and associated upgrades will increase the reliability of the Maine transmission system." MPUC Order at 39.

Nor will the Project harm new renewable energy generators in Maine. While some commenters suggested that development of the NECEC will hinder the development of other renewable energy projects, the MPUC analyzed and rejected this assertion:

> The Commission also finds little merit to the concerns regarding the extent to which the NECEC may frustrate Maine-based renewables development by absorbing 'headroom' on the transmission system. First, as noted above, there is more than 750 MW of new, renewable capacity in Maine ahead of the NECEC in ISO-NE's interconnection queue. Second, as also noted above, the Surowiec-South interface must be upgraded to accommodate 1,200 MW of capacity in order for the NECEC to meet the CCIS. If, as some parties argue, the level of NECEC-enabled capacity will be less than 1,200 MW, the available headroom at the interface may be substantially greater than the 200 MW that currently exists. Moreover, for the reasons expressed by CMP and the IECG, the Commission finds that 'preserving' headroom for potential future competing projects at the expense of a project in development is poor public policy, as well as being wholly inconsistent with the ISO-NE interconnection rules and processes. [MPUC Order at 43-44.]

In sum, "the Commission finds little merit to the concerns that the NECEC would frustrate Maine-based renewable energy development by absorbing 'headroom' on the transmission system. Accordingly, the Commission concludes that NECEC will not hinder Maine in making progress towards meeting its statutory renewable portfolio requirements and the goals under the Maine Wind Energy Act and Maine Solar Energy Act. . . . The Commission notes that the NECEC could facilitate renewable generation in Maine in that it will provide for additional transfer capacity at no cost to future generation developers if, as argued by several parties, the NECEC does not qualify in the FCM, or qualifies less than 1,200 MW. In addition, as described in Section II(C) above, the NECEC requires construction of several reinforcements to the transmission system south of Larrabee Road, including a parallel 345 kV line between the Coopers Mills Road Substation and the Maine Yankee Substation. The ISO-NE has identified certain of these upgrades, including the new Coopers Mills line, as necessary to the interconnection of new renewable generation in western and northern Maine. Because the costs of these reinforcements will be borne by the NECEC, future renewable generation projects may benefit from the fact that they already exist at the time their projects seek to interconnect." MPUC Order at 73-74.

VII. Environmental Justice

Certain public comments addressed the impact of Canadian hydropower dams on indigenous Canadian populations. Putting aside the fact that the Corps does not have jurisdiction to address potential impacts in Canada, the record demonstrates that the Project would not directly or through contractual or other arrangements, use criteria, methods, or practices that discriminate on the basis of race, color,

or national origin nor would it have a disproportionate effect on minority or low-income communities, in accordance with Title III of the Civil Rights Act of 1964 and EO 12898. The lower electric rates, and increased jobs and access to broadband infrastructure that will be realized from the development of the Project will benefit low-income residents.

Furthermore, as evidenced in CMP's GHG filings noted herein, as well as Hydro-Québec's May 20, 2019 letter to Governor Mills regarding its available and projected energy supply, the Project will not require the construction of new dams in Canada, so the transmission line has no further effect on indigenous Canadian populations.[56] Even if new dams were required for the Project, impacts on Canadian populations are beyond the jurisdiction of the USACE to consider, and should be left to the federal and provincial Canadian governments, for the sake of comity.

VIII. Safety

Some commenters expressed concern with fire danger and adequacy of fire response in the Project area. Please see CMP's response to USACE AIR question 9, as well as its December 2, 2019 Responses to the Maine State Federation of Firefighters' February 12, 2019 Letter to Governor Janet Mills. In brief, the evidence shows that questions of fire, health, and safety were litigated in the MPUC's CPCN proceeding and are addressed in the final MPUC Order, which finds that "the NECEC does not pose a threat to public health and safety." MPUC Order at 50.

IX. Criticism of CMP

Despite numerous comments criticizing CMP and raising unrelated litigation in which CMP has been involved, the evidence shows that CMP has both the technical ability and financial capacity to construct the Project. In its draft Order, the DEP found that:

> The applicant has a long history of operating and maintaining an electrical grid and the associated infrastructure. CMP is the largest transmission and distribution utility in Maine and serves 615,000 customers in southern, western, and central Maine. CMP currently operates and maintains over 2,536 miles of transmission lines and 254 substations, 63 of which are administered by ISO-NE. Over the last 10 years, CMP has constructed approximately 500 miles of new transmission facilities in Maine. [Draft Order at 15-16]

So too does the record contain both resume information for key persons involved with the Project and a list of projects CMP has successfully constructed. CMP also retained the services of Burns & McDonnell, Boyle Associates, TJD & Associates, Search, Inc., MCBER, Daymark, Power Engineers, TetraTech, Gilman and Briggs, and Dirigo Partners, Ltd., all of which are professional firms with expertise in various areas appropriate for this Project, to assist in the design and engineering of the Project.

The record further demonstrates that CMP and its parent companies AVANGRID, Inc. (AVANGRID) and Iberdrola SA will be able to attract the capital needed to finance the NECEC Project on financially viable and favorable terms. CMP Group, Inc. owns 100 percent of outstanding shares of CMP's common stock.

[56] *See also* comments of Hydro-Québec, noting that it has worked closely with indigenous peoples in Québec, and no Québec tribe has objected, at: https://bangordailynews.com/2019/11/26/politics/canadian-tribal-members-tour-maine-to-oppose-cmp-corridor-as-referendum-bid-ramps-up/.

CMP Group, Inc. is a wholly-owned subsidiary of Avangrid Networks, Inc., which in turn is a wholly-owned subsidiary of AVANGRID, a New York corporation listed on the New York Stock Exchange (NYSE: AGR). AVANGRID is a diversified energy and utility holding company with more than $30 billion in assets and operations in more than 27 states across the United States. Accordingly, the record shows CMP to have the requisite expertise and ability to construct the NECEC.

Nevertheless, a number of commenters criticized CMP because Iberdrola SA is a Spanish company, and because Hydro-Québec is a provincially-owned Canadian company. Neither is relevant to the USACE's review considerations. Rather than consider the ownership of an applicant or of the source of product it will deliver, particularly in today's global economy, USACE instead considers whether the proposed project is "economically viable," and CMP's ownership structure renders it more economically viable, not less. 33 CFR § 320.4(q).

X. Economics

Building on the criticism of foreign ownership, other commenters allege that the Project will result in no economic benefit to Maine. The evidence, however, shows that the Project in fact will provide significant employment and economic development benefits to Maine and the rest of New England.[57]

5. Testimony and a comment letter pointed to "Project Labor Agreement" as a means by which CMP's projections for construction and other jobs creation could more assuredly benefit Maine citizens. Please discuss the feasibility of such an agreement and/or CMP's general policies for hiring Maine contractors.

RESPONSE

CMP is proud that NECEC will support more than 1,600 jobs during its development, primarily in western Maine counties where jobs are most needed. Moreover, we are honored to have the support of the International Brotherhood of Electrical Workers (IBEW) Local 104 for the transmission line from Québec to Maine.

CMP has been working throughout the Project's development with labor partners in the State to ensure that the Project remains committed to local labor, highly skilled professionals, good wages and benefits, and workplace safety. To that end, we reached an agreement with IBEW Local 104 that establishes a project labor agreement in the form of the Framework for Labor Wage Preference (the "Agreement"). The basic principles provided in the Agreement include:

- CMP and Local 104 recognize that the construction of the NECEC will provide significant, direct and indirect job opportunities for electrical and construction workers in the State of Maine and will contribute to Maine's economy, increasing the State's gross domestic product.
- CMP and Local 104 share the following common principles: (1) ensuring that workers from Maine will have significant opportunities to work on the construction of the NECEC, and (2) ensuring that workers from Maine receive appropriate wages for their work on the NECEC.

[57] Site Law Application Section 1.6.

Moreover, CMP commits in the Agreement that, all other factors being equal, and consistent with applicable law and other applicable labor agreements, the NECEC Project entity and its contractors working on the construction of the NECEC will give preference to hiring Maine workers. The commitments made in the Agreement go above and beyond those of traditional project labor agreements.

Additional efforts were made to reach a similar agreement with the Maine State Building & Construction Trades Council (MSBCTC). These conversations are ongoing, and we remain committed to ensuring that Maine receives significant labor opportunities and that unions are included in the process.

Most recently, the NECEC Project announced $300 million worth of contracts to build and upgrade transmission lines and provide land clearing for the project. The construction team will include Cianbro, based in Pittsfield, Maine, along with Irby Construction, Sargent Electric and Northern Clearing Inc. who all have a significant presence in Maine. At peak construction, these contracts will provide 705 jobs between the four companies. Of those jobs, 502 will be union jobs. That equates to 71% of the jobs being filled by union labor and 29% by non-union labor. Maine workers will be given first preference to fill these positions in every instance.

The NECEC Project has also awarded three contracts for production of a total of 30,000 timber mats to three Maine companies, valued at a total award amount of $12,000,000. The balance of the timber mats required for the NECEC HVDC line construction, which are an additional 17,000 mats, will also be awarded to other Maine mat manufacturers in the coming weeks.

Finally, CMP and NECEC LLC will continue to look for other opportunities to give preference to hiring Maine workers for the construction of the NECEC Project and for contractors working on the construction of the NECEC to do the same.

The foregoing efforts are consistent with CMP's general policies for hiring Maine contractors.

6. CMP has committed to no pesticide or herbicide use in Section 1. Public concerns apparently still remain for such use in the other sections. Is CMP able to make the same commitment within the other segments in light of the public interest?

RESPONSE

CMP has committed to not using pesticides or herbicides in Segment 1 and, as noted above, in the vicinity of the Appalachian Trail crossings during NECEC construction and for the life of the NECEC Project. CMP further avoids herbicide use in site-specific locations through restrictions associated with surface waters (i.e., 25-foot setback), water supplies, rare species, and through no-spray agreements with various parties throughout its transmission system.

CMP has a long history of safely and successfully managing its transmission line rights of way through the control of vegetation using a combination of both mechanical methods and herbicide use, and CMP intends to continue these practices, with the exception of the restriction committed to in Segment 1 of the Project and in the vicinity of the Appalachian Trail crossings. CMP uses only herbicides and surfactants approved by the United States Environmental Protection Agency (USEPA). These approved herbicides and surfactants have low potential for mobility and persistence in the environment when

applied by trained applicators in accordance with both USEPA label requirements and regulations. When applied under the supervision of supervisors licensed by the Maine Board of Pesticides Control, the use of herbicides and surfactants is a safe and effective method of managing vegetation. These stringent regulations render a prohibition on pesticides and herbicides unnecessary, but CMP nevertheless agreed to the prohibition in Segment 1 and in the vicinity of the Appalachian Trail to address concerns raised by the public and during agency consultations. Furthermore, a prohibition on pesticide or herbicide use across wide swaths of the Project area, or the entirety of the Project, would be unreasonably expensive, particularly given the lack of environmental harm from the proper use of herbicides and surfactants.

CMP nevertheless stands by its commitment to study whether the use of mechanical methods only in Segment 1 of the Project and in the vicinity of the Appalachian Trail can be accomplished in a cost-effective manner and to evaluate whether it can be reasonably applied to other segments, even though the proper application of herbicides as described above mitigates the risk to the environment. After completion of this evaluation CMP will consider whether mechanical-only and/or other vegetation management methods should be applied to other NECEC Project segments.

7. **Starting sometime before our hearing and certainly at the hearing and since, there is increasing public scrutiny and concern about hydropower as a "clean" or "green" energy source. Methane and CO2 emissions from impoundments along with methyl mercury tainted discharges to downstream receiving waters are raised as key issues of concern in numerous letters and testimony. Mr. Kasprzak continues to express very well documented concerns for the effects of warm water discharge from Hydro Quebec impoundments into the Gulf of Maine. Such allegations detract from one of the reported primary benefits of the project. With the assistance of Hydro Quebec and perhaps even the State of Massachusetts, please summarize best available technical information to rebut these allegations.**

RESPONSE

Public scrutiny and concern about hydropower as a clean or green energy source not only is overstated and unfounded, but also is largely irrelevant to the NECEC, as the Project will not require the construction of new dams that would create new reservoirs in Canada. In addition to the narrative response below and referenced studies in the attached summaries, please also see the table included in the response below to DOE / GHG question 3, which includes references to publicly available resources regarding GHG emissions (methane) and methyl-mercury related to Hydro-Québec impoundments, as well as "warm" water inflows into the Gulf of Maine and their environmental implications.

Leading scientific evidence, as summarized in Attachment K ("Understanding Québec Hydropower: Among the Lowest Greenhouse Gas Emissions of All Electricity Generation Options"), demonstrates that all forms of electricity generation emit greenhouse gases over the course of their lifespan. GHG emissions for hydropower are temporary, as they result from decaying vegetation in flooded land, and northern reservoirs such as those in Québec emit little methane due to sparse vegetation, run-off that is very low in organic matter and in nutrients, and cold water temperatures. Based on a life cycle analysis, net GHG emissions from Québec hydropower are significantly lower than electricity generation from natural gas and coal, and are on par with wind. In fact, Hydro-Québec's studies show that emissions

peak immediately after reservoir creation, and decline to natural lake levels within five to ten years.[58] And because the Project will not require the construction of new dams in Canada it will not result in any incremental CO2 or methane emissions.

So too are concerns over methyl mercury-tainted discharges to downstream receiving waters unfounded, as summarized in Attachment L ("Understanding Québec Hydropower: Mercury in reservoirs: A Temporary, Well-Known and Well-Managed Phenomenon"). Leading scientific evidence demonstrates that levels of organic mercury in fish rise for several years after reservoir creation, reach a peak after 4 to 14 years (depending on the species) when compared with fish from surrounding natural lakes, and then gradually decline until they return to levels found in fish in natural lakes after about 10 to 35 years. Again, the Project will not require construction of any new dams in Canada and thus will have no impact on levels of organic mercury in fish. In any event, Hydro-Québec has comprehensively evaluated mercury impact during the provincial environmental impact assessment phase, and monitoring and mitigation measures are an integral part of Hydro-Québec's project authorizations.

With regard to Mr. Kasprzak, who has articulated the theory that because Hydro-Québec's dams hold back large quantities of water they starve Gulf of Maine fisheries of silica and other nutrients, CMP submitted into the record a March 27, 2019 Bangor Daily News article titled "No evidence hydropower for CMP project would disrupt Gulf of Maine food chain, scientists say." This article reports that scientists who study the Gulf of Maine say the data show no evidence that Canadian rivers are a major source of silicates for diatoms in the Gulf of Maine, and further notes that Mr. Kasprzak is "willing to defer to the credentialed scientists on the details" of the issue, who have referred to Mr. Kasprzak's theory as "pseudoscience."[59] Further, as noted below in the table included in the response to DOE / GHG question 3, through impact assessments and environmental follow-ups Hydro-Québec has shown that freshwater flow changes related to the creation of reservoirs are usually limited to the mouth of the river area, as freshwater is usually rapidly mixed with salt waters.

8. Another reported project benefit is increased reliability and grid stability. Please explain how this is occurring when the primary project component is a single devoted HVDC line.

RESPONSE

As made clear in CMP's applications for an USACE permit and a Presidential Permit, in addition to the HVDC line the NECEC includes network upgrade facilities in the form of transmission line upgrades and substation upgrades to the New England transmission system.[60] These network upgrade facilities are

[58] *See also Letter to the editor: Hydropower key part of cleaner electricity system, Hydro-Québec scientist says*, Portland Press Herald (Dec. 29, 2019), attached hereto as Attachment M and available at: https://www.pressherald.com/2019/12/29/letter-to-the-editor-hydropower-key-part-of-cleaner-electricity-system-hydro-quebec-scientist-says/, and studies cited therein.

[59] Attachment N (2019-05-03 CMP letter and attached article).

[60] The NECEC transmission line upgrades consist of the following upgrades: (i) new 26.5-mile 345 kV AC transmission line from the existing Coopers Mills Road Substation in Windsor to the existing Maine Yankee Substation in Wiscasset (Section 3027); (ii) new 0.3-mile 345 kV AC transmission line from the existing Surowiec Substation in Pownal to a new substation on Fickett Road in Pownal (Section 3005);

necessary parts of the overall Project to ensure that it satisfies both Section I.3.9. and the Capacity Capability Interconnection Standard of the ISO-NE Tariff, and ISO-NE will be determine the Project's compliance with these provisions through its applicable study processes.

The entirety of the NECEC, including the network upgrade facilities, ensure reliability and improve grid stability in the ISO-NE region. The network upgrade facilities are beyond the direct scope of the Presidential Permit application, which is limited to the border crossing facilities and consideration of the facilities through the Larrabee Road Substation. As discussed in more detail below, both the MA DPU and the MPUC found that the NECEC, including the network upgrade facilities, will improve the reliability of the transmission system in Maine and New England and enhance the fuel security for the ISO-New England region. In addition, ISO-NE has now issued the NECEC System Impact Study (SIS) in draft, and that draft study identifies the network upgrades that must be included for the Project to meet the "no significant adverse impact" test within Section I.3.9 of the ISO-NE Tariff. ISO-NE's studies with respect to the Capacity Capability Interconnection Standard (CCIS) are ongoing and are expected to identify additional network upgrades that are needed to permit the NECEC to meet the CCIS. All of these network upgrades along with the HVDC line connecting the Quebec and New England systems will provide significant reliability benefits, as found by both the MA DPU and MPUC.

I. MA DPU

The MA DPU found that the hydroelectricity delivered via the NECEC Project will provide enhanced electricity reliability within the Commonwealth, stating as follows:

> The Department relies on the Northeast Power Coordinating Council/North American Electric Reliability Council definition of reliability and has defined "reliability" as the ability to contribute to system resource adequacy and system security. D.P.U. 18-76 through D.P.U. 18-78, at 29;

(iii) rebuild of 9.3-mile 115 kV Section 62 AC transmission line from the existing Crowley's Substation in Lewiston to the existing Surowiec Substation; (iv) rebuild of 16.1-mile 115 kV Section 64 AC transmission line from the existing Larrabee Road Substation to the existing Surowiec Substation; (v) partial rebuild of 0.8 mile each of 115 kV Sections 60 and 88 AC transmission lines outside of the Coopers Mills Substation; (vi) Partial rebuild of 0.3 mile of 345 kV Section 392 AC transmission line between the Coopers Mills Substation and the Maine Yankee Substation and approximately 3.5 miles of reconductor work on existing double circuit lattice steel towers outside of the Maine Yankee Substation; (vii) partial rebuild of 0.3 mile of 345 kV Section 3025 AC transmission line between the Coopers Mills Substation and the Larrabee Road Substation; and (viii) partial rebuild of 0.8 mile of 34.5 kV Section 72 AC transmission line outside of the Larrabee Road Substation. The NECEC substation upgrades consist of the following upgrades: (i) replace existing Larrabee Road 345/115 kV 448MVA autotransformer with a 600MVA autotransformer; (ii) additional 345 kV AC transmission line terminal at the existing Maine Yankee Substation; (iii) additional 345 kV AC transmission line terminal and 115 kV switch replacements at the existing Surowiec Substation; (iv) 115 kV switch and bus wire replacements at Crowley's Substation; (v) new 345 kV Fickett Road Substation with 345 kV +/-200MVAR Static Compensator (STATCOM); (vi) additional 345 kV AC transmission line terminal and additional 345 kV +/- 200MVAR STATCOM (+/-400MVAR total with the +/-200MVAR existing) at the existing Coopers Mills Substation; and (vii) additional 345/115 kV 448MVA autotransformer, associated 115kV buswork and termination of existing 115 kV Sections 164, 164A, and 165 into 3 new breaker-and-a-half bays at the existing Raven Farm Substation. MPUC Order at 8-9.

D.P.U. 17-117 through D.P.U. 17-120, at 32; D.P.U. 13-146 through D.P.U. 13-149, at 34; D.P.U. 11-05 through D.P.U. 11-07, at 21; D.P.U. 10-54, at 181. NECEC will deliver hydroelectric generation over firm transmission service into the New England transmission system at the Larrabee Road substation in Lewiston, Maine (Exhs. JU-4-A at 67; JU-4-B at 67; JU-4-C at 67). In addition, NECEC will interconnect under the Capacity Capability Interconnection Standard and provide transmission system upgrades to allow for firm deliveries into New England at that location (Exhs. JU-1, at 40; EDC-RB-1, at 41-42, 46-48). The Department has found that, because Massachusetts is part [of] the ISO-NE regional electric system, an improvement in reliability in one area of the regional system will help to bolster the reliability of the system as a whole and this will provide enhanced electricity reliability in Massachusetts. D.P.U. 18-76 through D.P.U. 18-78, at 31; D.P.U. 17-117 through D.P.U. 17-120, at 33-34; D.P.U. 13-146 through D.P.U. 13-149, at 34-35. Here, because Maine is part of the New England regional interconnected electric system, the Department finds that an improvement in reliability in this area of the system will support the reliability of the system as a whole and, thereby, contribute to system resource adequacy and system security support in Massachusetts (Exh. JU-1, at 40). In addition, the Department has found that resources that contribute to fuel diversity in the region also serve to enhance electricity reliability in Massachusetts. D.P.U. 18-76 through D.P.U. 18-78, at 30-31; D.P.U. 17-117 through D.P.U. 17-120, at 4; D.P.U. 13-146 through D.P.U. 13-149, at 34-35. As a provider of hydroelectric generation, the Department finds that NECEC Hydro will contribute to fuel diversity in New England, thereby enhancing resource adequacy and system security in the region as well as Massachusetts (Exh. EDC-RB-1, at 38).[61]

II. MPUC

The MPUC similarly found that the NECEC will increase the reliability of the transmission system and the fuel security of the ISO-NE region. Specifically, the MPUC stated in its Order:

> The Commission finds that the NECEC and associated upgrades will increase the reliability of the Maine transmission system. As noted above, because of the requirement that the Project meet the CCIS,[62] the overlapping impact test requires that the NECEC must not erode the capacity deliverability of other resources in the Maine Zone. Because the overlapping impact test requires all of the generators with a CSO in the same zone to be "turned on" at their full output before the impact of the NECEC is modeled, any system upgrades necessary to ensure that the NECEC, as well as all of the other resources with CSOs in Maine, can operate at full output without being curtailed are the responsibility of the NECEC. Because, in reality, the system rarely operates this way, the system upgrades required by (and provided by) the NECEC will provide extra redundancy and reliability to the Maine system during normal operations modes.
>
> The Commission finds that NextEra's assertions about the potential adverse impacts of the NECEC 5-10 years in the future is not persuasive. As noted above, NextEra's position reflects its assumed retirement of one or more Maine generators, the retirement of which is not indicated

[61] MA DPU Order at 89-91.

[62] The "CCIS" is the Capacity Capability Interconnection Standard requiring that the capacity from an elective transmission upgrade can be delivered into the relevant zone without relying on the system delivery capability being used by other resources in the zone that already have a capacity supply obligation (CSO). MPUC Order at 31.

by the modeling done by LEI or Daymark.[63] Moreover, the Commission notes that the NextEra witnesses admitted that NECEC system upgrades would resolve the N-1 reliability problems their study revealed. Hearing Tr. at 71-74 (Oct. 22, 2018).

The Commission notes, further, that seven Maine generation facilities totaling 1,370 MW in capacity, including those cited by GINT and NextEra as "at risk" due to the NECEC, had already submitted de-list bids in FCA 13 that were accepted by the ISO- NE.22 Had the de-listing of any of these facilities created the type of reliability problem that is here asserted by NextEra, these de-list bids would never have been accepted by the ISO-NE.[64]

The MPUC further observed that the NECEC has significant reliability benefits in the form of fuel security, stating:

With respect to "fuel security," the Commission concludes that the addition of this interconnection to Québec, and the substantial amounts of baseload hydroelectric energy it will enable, will enhance supply reliability and supply diversity in Maine and the region. The Commission notes that there are significant challenges to siting new energy infrastructure in the region, as is evidenced by local opposition to natural gas pipeline and electric transmission projects. At the same time, natural gas supplies from remaining gas fields offshore of Nova Scotia have diminished, and most of the supply from that region is expected to be gone by 2020. CMP Exh. NECEC 45 at 23.[65]

Finally, as noted above, fuel security has been a growing issue in the ISO-NE region such that it has become a subset of system reliability as viewed by ISO-NE and the FERC. The Commission points to the Operational Fuel Security Analysis provided by ISO-NE in January 2018. This analysis was later adopted by FERC in its fuel security order. *Order Denying Waiver Request,* FERC Dockets ER18-1509-000, EL18- 182-000 (July 2, 2018). The study conclusions state: "The study indicates that over the next several decades, New England's power system will largely depend on the availability of two key elements, sufficient injections of LNG and electricity imports from neighboring regions." The Commission recognizes that there may be challenges associated with depending on imports, but given the difficulty that the region faces in terms of siting any energy infrastructure, the ISO NE's conclusions regarding the future are compelling. Thus, in this case, the Commission is presented with a transmission line that will provide a pathway to import up to 1,200 MW at no cost to Maine and will provide significant mitigation for the issues identified in Operational Fuel Security Analysis. Because fuel security, through FERC jurisdiction and its ruling on the Mystic Units, has been determined to be a regional issue and, thus, the costs to address it are socialized across the region, if a significant import line is not built now, it will likely be built later, the costs for which are likely to be treated in a way that is much less favorable to Maine than the NECEC.[66]

[63] LEI is the MPUC's independent expert, London Economics International, LLC (LEI). Daymark is CMP's expert, Daymark Energy Advisors (Daymark).

[64] MPUC Order at 39.

[65] MPUC Order at 39-40.

[66] MPUC Order at 41.

In coming to its decision, the MPUC considered substantial evidence in the record and extensive expert witness testimony addressing the impacts of the NECEC on the reliability of the transmission system and fuel security.

Specifically, the MPUC considered two transmission studies submitted by CMP which identified the system upgrades needed for the NECEC that were proposed as part of the Project.[67] These studies were accompanied by expert witness testimony establishing that the NECEC would provide transmission reliability benefits to Maine and the region by providing important redundancy between the Québec and New England systems, which will better protect the region in the event of the loss of the existing Phase II intertie, one of the largest possible losses of supply in New England.[68] These studies were included as Exhibit K to CMP's Presidential Permit application.

CMP also submitted evidence that the AC upgrades required by the NECEC will increase the transfer limits at the Surowiec-South interface from 1,600 MW to 2,600 MW, the new 345 kV line between the Coopers Mills Substation and the Maine Yankee Substation (Section 3027) and the rebuilding of the 115 kV lines (Sections 62 and 64) out of Larrabee Road will add redundancy and additional transmission capacity to the transmission system across central Maine, and the additional transformer at Raven Farm will improve reliability in the greater Portland area.[69] In fact, even one opponent's expert witness, Stephen Whitley, acknowledged the reliability benefits of the additional intertie with Québec and the addition of the Raven Farm Autotransformer.[70]

CMP submitted evidence that the NECEC will provide significant fuel security benefits by delivering clean baseload hydropower to replace retiring resources in the region and by reducing the region's dependence on natural gas fired generation.[71] CMP also provided evidence that this supply of hydropower will help mitigate the cost of any new fuel security market mechanism adopted by ISO-NE by increasing the supply of fuel-secure, non-natural gas fired energy in New England.[72]

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[67] CMP submitted two transmission studies in the MPUC proceeding: The "New England Clean Energy Connect (NECEC) Project Analysis and Technical Report," and the "New England Clean Energy Connect Surowiec-South Interface Limits and Overlapping Impacts Study." As the MPUC described in its Order, "the Project Analysis and Technical Report was conducted pursuant to the ISO-NE I.3.9 process. The I.3.9 process ensures that any changes to the system, such as generator additions, do not have an adverse impact on the system. The Overlapping Impacts Study examines the NECEC to ensure that, along with identified upgrades, it would meet the CCIS. These studies identify the system upgrades needed for the NECEC." MPUC Order at 37. *See* Application for Presidential Permit, Exhibit K.

[68] July 13, 2018 CMP Rebuttal Testimony of Christopher Malone, Scott Hodgdon and Justin Tribbet at 15 ("Malone, Hodgdon and Tribbet Rebuttal"), MPUC Docket No. 2017-00232 Case Management System ("CMS") Item No. 210.

[69] September 27, 2017 CMP Petition for a Certificate of Public Convenience and Necessity for the New England Clean Energy Connect Transmission Project, Volume I at 65-66, CMS Item No. 8.

[70] June 14, 2018 MPUC Technical Conference Transcript at 150:8-20 (intertie) and October 22, 2018 MPUC Hearing Transcript at 73:3-15.

[71] February 1, 2019 CMP Post-Hearing Brief at 83-93.

[72] January 10, 2019 MPUC Hearing Transcript at 141:15-142:23 (Hearing Testimony of Daniel Peaco, Daymark Energy Advisors), CMS Item No. 535.

Importantly, the Maine Supreme Judicial Court (the "Law Court") has affirmed the MPUC's Order on appeal. In its decision, the Law Court concluded that the MPUC's finding that the NECEC would result in "enhancements to transmission reliability and supply reliability and diversity" was "supported by significant record evidence."[73]

III. ISO-NE

In accordance with Attachment K of ISO-NE's Open Access Transmission Tariff (OATT),[74] ISO-NE is now including the NECEC transmission facilities and 1,090 MW of energy deliveries over the line in the transmission planning base cases it is using to identify future system reliability needs in New England and to assess the reliability impacts of proposed generation retirements.[75] As such, ISO-NE is relying on the NECEC to go into service to improve and maintain the reliability of the New England Transmission system under the applicable planning criteria of the North American Electric Reliability Corporation (NERC), the Northeast Power Coordinating Council (NPCC), and ISO-NE itself.

In addition, on March 11, 2020 the ISO-NE issued the (non-public) NECEC SIS in draft to CMP. The draft study has been provided to DOE for review. The draft SIS concludes: "The QP639 ETU Project with all proposed upgrades and the proposed voltage control strategy, when interconnected to the New England transmission system, will not cause significant adverse impact on the reliability or operating characteristics of the Transmission Owner's transmission facilities, the transmission facilities of another Transmission Owner, or the system of a Market Participant."

9. Dot Kelly from the Sierra Club continues to raise very detailed concerns and questions about fire risk. A table is provided, allegedly derived from the Forest Service, noting the number of power line related fires in Maine. Does CMP have alternative records or additional perspective on the table? What exactly is the fire risk of an HVDC line on a monopole at the height you propose based on industry safety standards? How does this risk compare to the risk posed by existing transmission lines along the project corridor? By all means reference other unmitigated threats along the corridor. What is the suite of available best management practices for minimizing fire risk from a project such as yours? Discuss whether they're available or practicable in this case after clarifying the actual risk. What actions has CMP considered to bolster local/regional fire monitoring, fighting and emergency response capacity? A fire protection/response plan, similar to plans you've developed for vegetation management, invasive species control, etc, would demonstrate to the public and review agencies that CMP takes this issue seriously. We strongly recommend that CMP engage the Maine Federation of Firefighters on the issue of fire risk and remediation, and if you do not, why not? Is there additional industry technical information or peer review literature available that would further address or rebut Ms. Kelly's concerns?

RESPONSE

[73] *NextEra Energy Resources, LLC v. Maine Public Utils. Comm'n,* 2020 ME 34, ¶ 30 (Mar. 17, 2020).

[74] ISO-NE OATT, Attachment K, §4.1(f).

[75] *See, e.g.,* ISO Transmission Planning, Memorandum to ISO-NE Planning Advisory Committee re Update to the Upper Maine (ME) 2029 Needs Assessment Assumption and Study Files (Sep. 24, 2019).

CMP is including in this response, as Attachment O, its letter in response to the comments of Ms. Kelly as well as Sierra Club representatives Ms. Elliot, Mr. Schweisberg, and Mr. Cassidy. The concerns of Ms. Kelly outlined in this AIR also are specifically responded to below.

Table on Power Line Fires

Dot Kelly and the Sierra Club provided data from the 2016 and 2018 Annual Report of the Maine State Fire Marshal. This dataset lists "Powerlines," which is a nondescript cause for wildfires. Ms. Kelly and the Sierra Club are focusing on these data without any consideration as to how they do not discern between roadside distribution wires and transmission lines. Fires from "Powerlines" could mean anything from car accidents to treefalls, or squirrel damage anywhere on the distribution system, which is entirely different from the transmission line system. Ms. Kelly and the Sierra Club also reference the 2016 Mount Abraham fire in Quebec, Canada and the 2018 Kennebunk, Maine forest fire, both of which were not started by transmission lines. The 2016 Mount Abraham fire was started by a lightning strike[76] and the 2018 Kennebunk fire originated from a permitted burn.[77] Furthermore, the fact that the media did not suggest that transmission lines in these areas acted as a beneficial fire break is irrelevant.

Risk of Power Line Fires

The leading contributing factor to wildfires of an HVDC transmission line on a monopole at the height CMP proposes based on industry standards is maintenance failure. The HVDC transmission line is proposed to be constructed of steel, so maintenance failure is less of a concern. Further, the implementation of the vegetation management plan and routine inspection of the lines further reduce the risk of fire. With that being said, the latest version (2018) of the USDA Forest Service Wildfire Hazard Potential Map depicts that the majority of the right of way is classified as "Very Low" risk of wildfires.

The risk posed by the HVDC transmission line on a monopole at the height CMP is proposing is no different than any other transmission lines along the Project corridor, and all required code clearances are met on each of CMP's lines. The primary causes of fire in the ROW result from individuals using the corridor for recreational purposes and from fires started outside the ROW. In the latter case, authorities can use the ROW as a potential fire break. All required code clearances are met on all of CMP's lines; energized conductor clearances are designed to satisfy the requirements of the NESC code. CMP's vegetation conductor clearance zone is defined and maintained through the vegetation management program to ensure proper clearances are adhered to such that the clearance requirements of FAC-003-4 are satisfied. This plan also reduces fire fuel loads (i.e., biomass) available in the transmission right of way and creates a natural fire break. In addition to CMP's vegetation management program, the following inspection program is performed on the company's overhead transmission line:

- Twice-annual (spring and fall) helicopter patrols of the entire transmission system.

[76] http://www.dailybulldog.com/db/features/fire-on-mt-abram-continues-to-burn-for-fourth-day/

[77] https://www.pressherald.com/2018/05/09/forest-rangers-say-kennebunk-man-who-had-a-burn-permit-started-fire-that-burned-314-acres-in-york-county/

- Inspection by infrared equipment of 25% of the system annually for a complete system inspection on a 4-year cycle.

All patrols provide assessments of the conditions of all structures and equipment, vegetation in the right of way, encroachments, and any other unauthorized uses of activities in the right of way.

The HVDC line is a very robust design; the use of v-string suspension insulators that connect to the steel arm at two points (increasing reliability) minimizes conductor blowout (i.e.. outward cable displacement due to wind) to the right of way while also keeping proper clearances to the structure itself. The steel poles also provide the added benefit of giving any potential lightning strikes a better path to ground. HVDC lines are not interconnected at short distances like HVAC lines and are very long, so the fault energy (i.e., abnormal electric current) is very low and the associated energy that the line is able to impart to a fault such as a tree on the line will be much lower. This reduces the probability of a forest fire during any potential tree contact. In addition, the converter station has various elements that will further limit the available HVDC fault duty, such as the converter transformer and several reactors. HVDC lines also don't reclose (i.e., when fault or abnormal electric current is detected the line shuts down and then opens again after a certain period of time) with full energy capability like HVAC lines. In fact, HVDC lines slowly charge through pre-insertion resistors that further limit the fault energy. During the recharge sequence the HVDC convertor will automatically sense the presence of any object on the conductor (i.e., tree on wire) and stop the restart sequence.

The design process and standards ensure the structural integrity and safe operation of the transmission line:

- Determine optimal line voltage from transmission planning.
- Determine insulation levels to address lightning and electrical parameters.
- Select optimal conductor size and bundle configuration to meet the electrical requirements.
- Determine optimal circuit configuration (vertical, delta horizontal, etc.) and preferred line tensions – this considers environmental, electrical, and ROW limits as well as required clearances, as determined by NESC and FERC requirements.
- Use client-specific weather cases, which incorporate code requirements (e.g., NESC 2017 and guidelines from RUS 1724E-200), spot structures and determine heights to maintain required clearances.
- Develop structural loads and provide them to steel pole vendors if custom poles are required (loads and design of steel in accordance with codes such as ASCE 48, 72).
- Perform subsurface investigation to understand soil parameters.
- Determine required foundation type for the structure to account for the known soil parameters as well as the known baseline reactions for the structure, and design accordingly (if concrete caisson design using codes such as ACI 318).

Best Management Practices for Minimizing Fire Risk

The largest mitigation step that is taken with CMP's transmission lines for fire protection is the Vegetation Management Plan. This plan reduces fire fuel loads available in the transmission line right of way and creates a natural fire break. The Mount Abraham fire article referenced by Ms. Kelly and the Sierra Club listed access as a difficulty in fighting the fire. With the NECEC transmission line in place it will in many areas improve access to remote areas. Part of the requests that have been sent out to

bidding contractors requires that a fire prevention plan be submitted to CMP for review and approval prior to significant construction activities.

The fire prevention plan submitted by the contractor will be evaluated against the four standards listed below.

- NFPA 1: The Fire Code
- NFPA 1141: Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas
- NFPA 1142: Standard on Water Supplies for Suburban and Rural Fire Fighting
- NFPA 1143: Standard for Wildland Fire Management

This plan will also be compared to plans for similar projects. We will also engage with the Maine Forest Service for a review of the fire prevention plan to ensure that we are meeting the best practices for wildland fire prevention. In addition, as a conservative and cautious measure, CMP can compare the fire prevention plans against the recommendations of the California Department of Forestry and Fire Protection, which has the best fire prevention for wildland fire incidents in the country. These recommendations do not provide an exact comparison to Maine because the state's weather and fuel loads differ and because Maine does not have the same risk factors as California or fires that reach the size or severity of a California-type conflagration, but the best practice principles are applicable.

During construction the contractor will follow established construction best management practices with regard to fire hazards as appropriate to the various components of the NECEC, in addition to the contractor-submitted and CMP-approved fire prevention plan.

Contract specifications include specific provisions for fire safety for all work sites and all phases of construction. These include activities such as machinery operations, fueling and fuel management, and hot-work. Specific contractor requirements include:

- Contractor responsible for providing all necessary fire-fighting equipment on the Project site to employees.
- Contractor must train all personnel on fire emergency measures.
- Smoking not allowed in CMP corridor. Restricted to access roads, or other approved smoking areas.
- All internal combustion engines operating in ROW must be equipped with federally-approved spark arresters (other than passenger vehicles with unaltered mufflers).
- Equipment parking areas must be cleared of all flammable material.
- All motor vehicles and equipment must carry at least 1 long-handled (48-inch minimum), round-point shovel; a double-bit axe or Pulaski axe (3.5 pounds or larger); and one dry chemical fire extinguisher (with an Underwriters Laboratories [UL] rating of at least 5B or C). Individuals using power saws and grinders must have a shovel as described above, and an 8-ounce capacity fire extinguisher immediately available. All equipment must be kept in a serviceable condition and readily available.
- Fuel trucks must have a large fire extinguisher charged with the appropriate chemical to control electrical and gas fires. The extinguisher must be a minimum size 35-pound capacity with a minimum 30 BC rating. Power-saw refueling must be done in an area that has first been cleared of material that could catch fire.

- Contractor personnel are prohibited from burning slash, brush, stumps, trash, explosives storage boxes, or other Project debris unless specifically contracted to do so.
- The contractor must restrict or cease operations in specified locations during periods of high fire danger, at the direction of the land-management agency's closure order.
- Daily work site briefings are required to review all hazards, including fire risks, specific to the time, place, personnel, and construction activities.
- As a condition of approval from the MPUC, the company must provide annual reports to the MPUC detailing CMP's ongoing outreach and communications with the host communities regarding: (1) fire and medical support issues in comparable rural areas of its system; and (2) plans to address fire and medical support issues related to the construction and operation of the NECEC. As part of that process, CMP will prepare a survey of the available fire, public safety, and emergency medical services in the host communities. This will include interviews with public safety officials in each of the communities to identify their specific resources and needs. The results of the survey will be considered in the preparation of bid specifications, with particular care to address provisions for fire and EMS in rural and remote portions of the corridor. This will include requirements for communication with and close coordination with the Maine Forest Service and the Town of Jackman in northern Somerset and Franklin counties.

The fire mitigation after construction for all of CMP's transmission lines for fire protection is the vegetation management program in addition to the regular inspection of transmission lines for failures and defects, which are both discussed above. The latest version (2018) of the USDA Forest Service Wildfire Hazard Potential Map shows that approximately half of the right of way is classified as "Very Low" risk of wildfires and the remainder is classified as "Low" risk of wildfires.

CMP's Actions to Bolster Local/Regional Fire Monitoring, Fighting, and Emergency Response Capacity

The major factor that limits response capacity in rural areas is the lack of trained firefighters. If a community has a particular need for a specific resource concerning the Project, CMP will discuss this with individual towns or departments. To gauge the readiness and capacity of local/regional response, CMP met with fire and EMS officials in each of the host communities, plus the towns of Eustis and Jackman, as well as the emergency management agencies in Somerset and Franklin Counties, and the Maine Forest Service. These meetings included 24 fire chiefs serving all of the host towns and townships plus 22 additional personnel representing local, regional, and state emergency services. CMP incorporated numerous suggestions from these meetings into project specifications and developed protocols to ensure close communication and coordination with state and local emergency response agencies. Fire and emergency response officials in the host communities do not view the construction of the NECEC as a fire or public safety risk based on more than 1,000 years of collective experience with transmission lines in the communities they serve. In their view, the additional line in the existing corridors will add minimal new demand on local fire response resources.

The new corridor runs through communities served by the Maine Forest Service and fire departments in Eustis, Jackman, and West Forks. The MFS has primary responsibility for forest fires in the region. The Maine Forest Service and the fire departments in Eustis, Jackman, and West Forks did not identify any serious present or future deficiencies in their resources related to the NECEC, although a water tank for the West Forks utility terrain vehicle (UTV) would improve the town's first-response capability.

Throughout the planning, construction and operation phase of this Project, CMP will continue to work with communities and the state to ensure that fire protection and emergency response is resourced appropriately.

Fire Protection/Response Plans

When an actual event occurs along the corridor the method as to how to respond to an incident lies with the Maine Forest Service or the local fire chief. In the event of fire, under Maine law the fire chief essentially takes possession of the property during the event. It is not in CMP's power to dictate how fire departments and the Maine Forest Service respond to incidents. What we can do, however, is assist these agencies in preparing response plans to these areas, including county and local emergency management agencies with which CMP already works. In addition, as noted above, CMP requires the contractor to prepare and submit a fire prevention plan for review and approval, complying with the four standards listed above.

Maine State Federation of Firefighters

The Maine State Federation of Firefighters has been engaged on two occasions. Representatives of CMP met with the MSFFF in June 2019 to discuss the Project and concerns about fire protection and potential equipment needs. More recently, in December 2019, CMP provided a response to the MSFFF's February 12, 2019 letter to Governor Janet Mills regarding fire, health, and safety concerns related to the Project. Although no formal response to CMP's letter has been received, CMP continues to engage with the MSFFF to address any concerns it may have, and CMP will be meeting with MSFFF and local fire chiefs in May or early June. Due to current social distancing precautions and response needs resulting from COVID 19, an immediate meeting is not possible. The MSFFF preference would be an in-person meeting, but CMP will make an alternate arrangement should this not be possible, with video or audio conferencing.

In addition, local fire departments have been engaged, as described above and as outlined in the letter written to the MSFF. With that being said, the MSFF is an association that represents firefighters at a political and policy level, and it is not the authority having jurisdiction in these areas. The letter sent to the MSFF was attached to CMP's December 4, 2019 response to the Sierra Club's comments on the USACE's public notice of the Project. A copy of this response was provided to the USACE on December 4, 2019.

Additional Industry Technical Information and Peer Review Literature

Additional technical information regarding fire safety can be found in the MPUC's review of the potential fire hazards associated with the Project, Docket # 2017-00232, as potential fire hazards related to the construction and operation of the NECEC facilities were considered by the MPUC in its review of the Project. In the MPUC Order approving the CPCN, the Commission noted "that ensuring public safety with respect to public utility operations is a central purpose of the Commission outlined in Section 101 of Title 35-A. …The above ground HVDC line is designed by professional engineers who by the nature of their training and licensure requirements attest to safety when final stamping of the design occurs. …The Commission finds that, with respect to the safety concerns raised by Caratunk, Ms. Kelly, and several public witnesses relating to the availability of fire protection and other emergency response services in the proposed transmission corridor, the record reflects that CMP has adequately addressed such safety concerns throughout other remote areas of its existing transmission system. The

Commission, therefore, finds that the NECEC does not pose a threat to public health and safety." MPUC Order at 50.

An excerpt of the MPUC Examiner's Report was not included in our original response to the Sierra Club's comments on the USACE public notice of the Project. However, Ms. Kelly was an active participant in the MPUC process and should be fully aware of the MPUC's conclusion regarding fire safety and emergency response. In addition, a summary of the meetings CMP hosted with communities, of which fire safety was a topic, was attached to CMP's December 4, 2019 response to the Sierra Club's comments on the USACE's Public Notice of the Project.

CMP's Commitment and Experience

CMP is committed to fire protection and life safety. CMP's parent company AVANGRID has individuals dedicated specifically to fire and life safety within its physical and cyber security division. One of these individuals from the fire protection group is assigned to CMP. Lance Sanborn, CMP Corporate Fire Security, is assigned to this area and is a lifelong Maine resident. He has been in the fire service since 1994 and holds two college degrees in fire related fields. He is also certified in fire protection disciplines by the International Code Council, National Fire Protection Association, National Professional Qualifications Board, International Association of Arson Investigators, and is a Licensed Paramedic in the State of Maine. The manager of AVANGRID Fire Protection is also based in Maine. In addition, the Safety and Environmental Manager for CMP is a retired deputy chief from the City of Portland, and the manager for CMP is also a retired Chief of the South Portland Fire Department.

10. In a series of emails on January 6, 2010, the comments of the Town of New Gloucester and Mr. Wilcox relative to the Surowiec Substation were conveyed to the CMP team. While stormwater and flooding issues are more the responsibility of the DEP and town to address, they are none-the-less also public interest factors that the Corps must consider. Please furnish the town and Mr. Wilcox with rebutting information to demonstrate that the project related work in that area will improve existing conditions or at least not further adversely affect stormwater management. Please copy the Corps on this correspondence. CMP should be reminded that they will eventually have to obtain a Flood Hazard Prevention Permit from the town for work in this area.

RESPONSE

While the USACE's request specifically references the Surowiec Substation, Mr. Wilcox's comments refer to the Fickett Road Substation proposed by CMP in relation to the Surowiec Substation, Runaround Brook, and his concerns regarding stormwater and flooding. The following information regarding stormwater and flooding, summarized below, was provided to the Town of New Gloucester and Mr. Wilcox on April, 9, 2020 (see Attachment P).

CMP submitted applications to the DEP in September of 2017 for permits under the Natural Resources Protection Act (NRPA) and the Site Location of Development Act (Site Law) and for water quality certification under the federal Clean Water Act (CWA). These applications were accepted by the USACE for the purposes of its consideration of a Department of the Army Permit under Section 404 of the CWA.

The Site Law application included a Fickett Road Substation Stormwater Management Study (the "Study") for the DEP's review under the Maine Stormwater Management Law. Since the filing of the

original applications, CMP has responded to multiple requests for additional information from DEP and the USACE. This included review and comment by DEP Stormwater Engineer, Kerem Gungor, and subsequent modifications by CMP to the Study to address DEP's concerns. The DEP's draft Order approving CMP's application to construct the Project concludes that CMP has made adequate provision to ensure that the Project will meet the general and the phosphorus standards contained in Chapter 500, § 4(C) and the flooding standard contained in Chapter 500, § 4(F) for peak flow from the Project site, and channel limits and runoff areas.

The CWA application package referenced in Mr. Wilcox's comment letter was prepared in July 2019 at the request of EPA to consolidate the supplemental information that had been provided to the DEP and USACE since the original application filing, to facilitate EPA's review of CMP's proposal. Attachment M of the CWA application package contains the Study for the Fickett Road Substation, which includes the pre- and post-development plans for the site.

The Study for the Fickett Road Substation and associated DEP review comments and CMP responses and supplemental materials, available on the DEP NECEC Project Page,[78] are signed and sealed by a Maine licensed professional engineer and address the Basic, Phosphorus, and Flooding standards of the DEP's Chapter 500 rules. Additionally, the Fickett Road Stormwater Management Plan includes runoff mitigation measures. The Study concludes that the Basic, Flooding, and Phosphorus standards as described in DEP Chapter 500 will be met.

Similarly, and contrary to Mr. Wilcox's contention that no runoff mitigation measures were implemented at Surowiec Substation for the Maine Power Reliability Program (MPRP), a stormwater management study, including runoff mitigation measures, was prepared for the expansion of the Surowiec Substation and submitted as part of the MPRP Site Law application. The DEP's findings in the permit issued for the MPRP concluded: *"The applicant submitted a stormwater modeling analysis that indicates that peak runoff rates from the site for the 2-year, 10-year, and 25-year storms will decrease as a result of substation expansion. DWM concurs with this analysis."* Further, the relocation and restoration of Runaround Brook was part of the approved compensation plan for the MPRP. The compensation plan required that fifty feet of land on either side of the location of the stream restoration project, except for a portion of land lying 25 feet as measured perpendicularly from the Surowiec Substation fence line, was protected in perpetuity with a deed restriction, preventing further development in that area.

The runoff mitigation measures implemented at Surowiec Substation as part of the MPRP and those proposed in the Fickett Road Substation Study address concerns regarding flooding and commuters proximal to Runaround Brook and provide evidence that upgrades to local road culverts as a result of the construction Fickett Road Substation are unwarranted.

The DEP must issue a CWA Section 401 Water Quality Certification (WQC) for the NECEC Project to proceed. With respect to concerns regarding Chandler River and the estuaries of the Royal River and Casco Bay, the WQC issued by the DEP will certify that CMP's proposal will comply with all applicable water quality standards, limitations, and restrictions.

[78] https://www.maine.gov/dep/land/projects/necec/

Flood zone determinations were derived from Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) data. Flood zone mapping was included in Attachment 4 of CMP's Site Law application. None of the transmission line structures associated with the rebuilds of Section 62 and Section 64 transmission lines is located in the flood zone of Runaround Brook. Less than 2,000 square feet of the site development (i.e., substation gravel pad) associated with Fickett Road Substation is located within FEMA Flood Zone B associated with Runaround Brook. CMP will apply for a Flood Hazard Development Permit from the Town of Pownal, and any other towns in which such a permit is required. A Flood Hazard Development Permit is not required from the Town of New Gloucester because no Project component is located within its municipal boundaries.

11. Since the regional benefits from reduced greenhouse gas (GHG) emissions are reportedly cornerstone of the project's benefits and critical to the public interest review, the Corps and the Department of Energy (DOE) Office of Electricity have collaborated on how best to address the conflicting positions in this matter. We have reviewed the studies conducted on the NECEC Project, written testimonies, transcripts, and other material CMP filed as part of the state proceedings before the Maine Public Utilities Commission (Maine PUC). CMP consolidated this information and provided it to the Corps and DOE in a Supplemental Information Response dated November 26, 2019. Opposing findings, testimony, and material have also been reviewed. DOE has identified gaps in the assumptions and analysis that limited their ability to fully vet the results of the studies and understand the drivers underpinning the stated reductions in GHG emissions. It is therefore very important that CMP work directly with the DOE team and the Corps to furnish best available information to fill the identified gaps.

RESPONSE

As noted above in response to USACE AIR number 4, the GHG benefits of the Project are established in the numerous filings to the DEP and USACE, including:

- March 25, 2019 Comments of CMP Regarding Greenhouse Gas Emission Reductions;
- April 24, 2019 Supplemental Comments of CMP Regarding Greenhouse Gas Emissions Reductions;
- May 24, 2019 Response of CMP to Intervenor Group 4 May 9, 2019 Comments Regarding Greenhouse Gas Emissions;
- June 14, 2019 Responses to the USACE May 15, 2019 Data Request; and
- November 26, 2019 Supplemental Information in Response to October 29, 2019 lnteragency Meeting.

These filings show that the Project will facilitate a significant reduction in GHG emissions across the northeast United States by creating a path for Hydro-Québec to export 9.45 terawatt hours (TWh) annually of new, clean, hydroelectric energy from its existing hydropower facilities to New England over a 20-year period. In the CPCN proceeding, MPUC concluded that "the NECEC will result in significant incremental hydroelectric generation from existing and new sources in Quebec and, therefore, will result in reductions in overall GHG emissions through corresponding reductions of fossil fuel generation (primarily natural gas) in the region." MPUC Docket No. 2017-00232, Public Utilities Commission Examiner's Report at 114 (Mar. 29, 2019). Nevertheless, CMP has worked with Hydro-Québec to develop thorough and complete responses to the DOE's questions in the following section of this response.

ADDITIONAL INFORMATION REQUEST - DOE AND GHG ISSUES
March 3, 2020

1. **Please provide DOE with an Update (one clean version and one track changes version) of Sections 2 and 3 of the DOE Presidential permit application dated July 26, 2017 that reflect the current project description and associated environmental conditions and impacts. These revisions should include revisions to the existing text, as well as additional text, as needed, to capture changes that have been made to the project since the application was submitted in 2017. DOE understands that this information is available on various state dockets and in permit application submissions to the Corps. However, for purposes of DOE's administrative record, DOE requests that the Presidential permit be updated to reflect present-day conditions.**

RESPONSE

The revised Sections 2 and 3 of the DOE Presidential permit application are provided in Attachment Q, in both redlined and clean format. Please note that we have not attached to these updated Presidential Permit application materials the updated exhibits that were included with our July 2019 revised CWA application, to avoid unnecessary duplication, but we incorporate those updated exhibits herein by reference.

2. **Please explain if there is a capability for tracking the provenance of the power being supplied through the NECEC. Such a method may be available through data managed by ISO-NE or evidenced through transmission service agreements, power purchase agreements/contracts, or other commitments. We recognize that this information may be business confidential. However, having a clearer understanding will help the Corps and DOE address concerns that a variety of stakeholders have expressed in this regard, specifically the concern that Hydro Quebec will simply divert energy from other markets, such as New York, Ontario and New Brunswick, forcing them to rely on other sources of energy, including coal or oil, to make up the difference, thereby compromising the net benefit of the project.**

RESPONSE

Yes, there is a capability for tracking the provenance of the power being supplied through the NECEC. Under the terms of the applicable Power Purchase Agreements (PPAs) between the Massachusetts Electric Distribution Companies (MA EDCs) and H.Q. Energy Services (U.S.), Inc. (HQUS), the 1,090 MW of energy delivered over the NECEC for sale to the MA EDCs on an hourly basis during the 20-year term of the PPAs must be sourced from one of 62 Hydro-Quebec hydroelectric power generation resources and this unit-specific sourcing must be traced by use of the NEPOOL Generation Information System (GIS) system. A copy of one of the PPAs is provided as Attachment R for reference.

Specifically, the PPAs require HQUS to sell "Qualified Clean Energy." The definition of Qualified Clean Energy in the PPAs specifies that Qualified Clean Energy must come from "Hydro-Quebec Power Resources" and states that "[t]his energy must be tracked in the GIS to ensure a unit-specific accounting of the Delivery of Qualified Clean Energy to enable the Massachusetts Department of Environmental Protection to accurately account for such Qualified Clean Energy in the state greenhouse gas emissions inventory . . . ." Exhibit A to the PPAs sets forth the specific list of Hydro-Quebec Power Resources that must be used for sourcing the "Qualified Clean Energy" sold through the PPAs. The GIS is defined in the

PPAs as the "generation information database and certificate system, operated by NEPOOL, its designee or successor entity, that accounts for generation attributes of electricity generated or consumed with the New England Control Area.

In its June 25, 2019 order approving the PPAs, the MA DPU in turn found the following with respect to the tracking of energy under the PPAs:

- "The NEPOOL GIS tracking system is a well-established power generation and associated attribute tracking system used in the New England region."
- "The PPAs require HQUS to create, track, record and transfer all environmental attributes associated with contract energy to the [MA EDCs], in compliance with all relevant NEPOOL GIS operating rules."
- "These protections will ensure that the [MA EDCs] purchase clean energy generation as defined by [applicable Massachusetts] statute, and not system energy that contains non-clean energy generation."

MDPU Order at 57-58.

In short, there is a capability for tracking the provenance of the power being supplied through the NECEC. See the response to question 3 below for an explanation of why Hydro-Québec will not have to divert exports from other energy markets such as New York, Ontario, and New Brunswick to supply clean energy to New England over the NECEC transmission line (as previously discussed in CMP's November 26, 2019 filing with the Corps and DOE, at pp. 11-12, 92-96, and 302-343 of the PDF document).

3. GHG emissions evaluation. CMP has stated that Hydro-Quebec (HQ) has sufficient energy and capacity to meet the supply contracted to NECEC over a 20-year period, but none of the studies included an analysis of Hydro-Quebec's supply and demand dynamics that validate this conclusion. As described by the applicant, "the energy product offered by HQ Production pursuant to the terms of the PPAs with the Massachusetts EDCs is the firm delivery of 1,090 MW of hydroelectric energy in all hours of the year, which is very similar to a capacity product and arguably requires capacity in order to perform under the building agreement."[79] CMP further states that market conditions "indicate that HQ Production is not building new generation for the NECEC, but in the absence of the NECEC, HQ Production would sell its energy to other markets."[80]

If new capacity is not built for NECEC, an evaluation of the effect of NECEC on GHG emissions will require a comparison of a scenario with NECEC in-service to one that examines the outlook for Hydro-Quebec's supply if NECEC is not built.

CMP also states that "NECEC will provide 1,090 MW of hydroelectric power, backed by HQ Production's extensive reservoir system, in all hours of the year for 20 years starting in late

[79] Central Maine Power, Post Hearing Brief, February 1, 2019, page 46.

[80] Id, page 56.

2022."[81] It is not clear if the studies analyzed the supply and demand dynamics for Hydro-Quebec for these two scenarios, i.e. with or without NECEC project, over the 20-year operating period. DOE and the Corps are therefore requesting that the applicant provide the following list of data items that would help fill the gaps.

<u>Hydro-Quebec Operations – Reference Case without NECEC and Project Case with NECEC</u>

a. For the Reference Case (without NECEC) and the Project Case (with NECEC), please provide the following:

1) Assumptions and analysis used to calculate Hydro-Quebec's energy demand, peak demand, and reserve margin requirements over the 20-year contract period.

2) Assumptions and analysis used to calculate Hydro-Quebec's capacity and energy imports and exports over the 20-year contract period.

3) Assumptions and analysis used to calculate Hydro-Quebec's generation capacity and dispatch used to meet Hydro-Quebec's energy demand, peak demand, reserve margin requirements, and exports over the 20-year contract period.

4) Assumptions regarding Hydro-Quebec's new generation builds and upgrades over the contract period.

5) Assumptions regarding Hydro-Quebec's hydro storage additions and expansion over the contract period.

6) Sensitivity cases analyzed to assess Hydro-Quebec's ability to meet NECEC supply requirements over the 20-year contract period under different hydrological conditions.

7) Assumptions about Hydro-Quebec's precipitation levels over the 20-year contract period.

b. The applicant stated that 'LEI concluded that it "believes that HQP would have sufficient capacity to fill the 1,090 MW capacity on NECEC without having to forego capacity sales to other markets."[82] Please explain whether this conclusion is based on the results of the modeling of the Reference Case and Project Case. If so, please provide analysis of Hydro-Quebec dispatch, imports, exports, and other relevant information for the Reference and Project cases showing that Hydro-Quebec would have sufficient capacity to fill the 1,090 MW capacity on NECEC without having to forego capacity sales to other markets over the 20-year contract period. Include details of Hydro-Quebec's capacity sales in the absence of NECEC.

c. The applicant state that "Quebec has experienced increasing precipitation in recent years" and "forecasts of further precipitation increases in the coming years due to the impacts of climate change on Canada."[83] Please provide assumptions regarding Hydro-Quebec's precipitation levels over the contract period as used in the study.

<u>Geographic Scope of Greenhouse Gas Emissions Impact Assessment</u>

a. Describe Maine utility Commission (MPUC)'s definition of the geographic boundary for GHG emissions accounting.

[81] Id, pages 92-93.

[82] Id, page 47.

[83] Id, page 11-115.

b. If the MPUC did not provide a definition, describe the geographic boundary that Hydro-Quebec defined for GHG emissions accounting. Explain why Hydro-Quebec selected this boundary.

c. Provide calculations of GHG emissions impact in regions outside New England, and the net emissions within the boundary for the following cases:

1) The Reference Case without NECEC

2) The Project Case with NECEC

RESPONSE

Applicant responds to this information request as follows. First, in Section A, the response addresses the GHG modeling and analyses that have been prepared to date for the NECEC and the study work assumed by this request. Second, in Section B, the response provides a listing in tabular form of publicly available information that supports the assumptions in the modeling that has been performed. Third, in Section C, the response provides a rebuttal to the Northbridge Energy Partners study that was recently submitted to the USACE. Finally, in Section D, the response provides references where responsive information to each of the subparts of this request can be found.

A. GHG Modeling and Analysis:

At the outset, we believe it important to address the apparent confusion among stakeholders over what is meant when we state that Hydro-Québec has sufficient resources to increase its exports of hydropower via the NECEC to meet its commitments to the Massachusetts Electric Distribution Companies (MA EDCs). For the purposes of understanding Hydro-Québec's obligations with respect to energy, Hydro-Québec is best viewed as three separate entities:

(1) Hydro-Québec TransEnergie (HQT), which builds and maintains transmission – HQT is the entity responsible for constructing and operating the transmission facilities in Québec that will interconnect the NECEC to the existing Québec transmission system;

(2) Hydro-Québec Distribution (HQD), which is responsible for serving the load in Québec; and

(3) Hydro-Québec Production (HQP), which has a long-term obligation to serve a portion (165 TWh) of HQD load but which is otherwise responsible for developing and maintaining generation to maximize the value of its assets, as is any other generation company.

A more detailed explanation of this structure and the separation of functions within Hydro-Québec is provided below. Importantly, the contractual arrangement between the MA EDCs and Hydro-Québec is with HQP, through Hydro-Québec's U.S.-based affiliate H.Q. Energy Services (U.S.) Inc. (HQUS). HQP has the resources to meet this obligation in a manner that will produce the broad array of benefits that the Applicant has presented, including the significant reduction in GHG emissions across New England and the northeast region as a whole.

As discussed in more detail below, significant and detailed modeling has been conducted which quantifies the GHG emissions reductions expected from the NECEC. This modeling was reviewed in detail by the MPUC as part of its determination that a CPCN was appropriate for the NECEC, and forms

the basis for the MPUC's conclusion that the NECEC will result in an annual reduction in carbon emissions of 3 to 3.6 million metric tons in New England.

On its face, this information request appears to seek the assumptions, analyses, and results from a security-constrained production cost model employing a detailed representation of Québec loads, capacity expansion, detailed hydrologic forecasts (with sensitivities), and dynamic reservoir storage operations over the 20-year study period, as part of a broader model that includes a representation of much of the eastern interconnect, including all markets into which Hydro-Québec, through HQP, exports energy. Neither the Applicant, the MPUC's consultant, London Economics Inc. (LEI), nor any other party, to Applicant's knowledge, including Hydro-Québec, and the opponents to the NECEC, have completed such a wide ranging and complex modeling exercise with respect to the NECEC. In fact, the Applicant understands from its production cost modeling experts at Daymark Energy Advisors (Daymark) that simply developing a model, with appropriate supply and demand assumptions, market rules and functions, hydrologic sensitivities, reservoir operations, and interface operating rules and configurations, to conduct a 20-year analysis of the market and operational dynamics for generation within this broad geographic region, including Québec and all of the markets into which it may export energy, would take at least 6-9 months. Conducting the modeling, with appropriate sensitivity cases, would thereafter take a similar duration. As such, the Applicant is not in a position to provide information based on such modeling.

That said, such additional modeling is not necessary to find that the NECEC will result in significant reductions in carbon emissions across New England and the entire northeast region. The modeling conducted by Daymark on Applicant's behalf, LEI on the MPUC's behalf, and even Energyzt Advisors (which submitted modeling results in the MPUC proceeding on behalf of Project opponents Calpine, Vistra, and Bucksport Generation), consistently show that in all model runs where Hydro-Québec's exports of energy over the NECEC are assumed to be incremental to its existing exports to adjoining energy markets and its domestic load, that the deliveries of energy over the NECEC will reduce the carbon emissions from the energy sector in New England (and in turn the northeast region on an incremental basis) by approximately 3 to 3.6 million metric tons per year. This modeling forms the basis for the MPUC's findings in this regard in its MPUC Order and is documented in the reports of Daymark and LEI and Daymark's rebuttal testimony, all submitted in the MPUC proceeding, copies of which are provided as Attachments S, T and U.

The geographic scope of the LEI and Daymark modeling, which analyzed a reference case without the NECEC and a project case with the NECEC for 15 years in the case of LEI and 20 years in the case of Daymark, is as follows: Daymark modeled ISO-NE, NYISO, PJM, MISO, SERC, and the eastern provinces of Canada, and LEI modeled New England zones, with shaped imports/exports from New York, Québec, and the Maritimes. The MPUC relied on the results of Daymark and LEI models in reaching its conclusions regarding the carbon reduction benefits of the energy deliveries facilitated by the NECEC transmission line. The Daymark and LEI models did not specifically quantify the carbon reductions in regions outside of New England. However, if either model had been expanded to include such quantification, they would have necessarily included the GHG reduction goals of all adjacent areas, meaning that the models would have included assumptions for increased clean energy resource build-outs consistent with these goals. Given that the NECEC energy is incremental and given the GHG reduction goals of all adjacent regions, the only reasonable conclusion is that including a larger region in the quantification of carbon reductions would produce a conclusion of regional reductions of a similar scale to the conclusions those models did produce.

The assumption that Hydro-Québec will be able to increase its total exports to deliver an incremental 9.45 TWh of hydropower to New England annually is reasonable for the following reasons. As the Applicant explained on pages 10-11 of its November 26, 2019 Supplemental Information in Response to October 29, 2019 Interagency Meeting, Hydro-Québec has been pursuing a long-range plan of investment in clean energy generation to increase its existing hydropower capacity, including the addition of the 395 MW Romaine 3 unit that went into service in 2017 and the completion of the 245 MW Romaine 4 unit expected in service in 2021 and on-going capacity upgrades at existing hydro facilities (such as replacement of aging turbines with more efficient, new equipment), which are expected to increase Hydro-Québec's capacity by at least 500 MW by 2025. As noted below, Hydro-Québec, in fact, has over 1,200 MW of such upgrades in its interconnection queue at this time.

With its existing hydroelectric generation capacity, including these capacity expansions, Hydro-Québec has sufficient excess generation capacity to generate energy for delivery to New England over the NECEC without diverting electricity currently exported to other markets. In fact, in a December 14, 2018 letter from Hydro-Québec submitted by CMP in the MPUC proceeding, a copy of which is provided as Attachment V, Hydro-Québec stated that in 2017 and 2018 it spilled substantial amounts of water due to lack of economic transmission. Specifically, Hydro-Québec stated that it spilled 4.5 TWh of energy in 2017 due to lack of economic transmission and that in 2018 it spilled water equaling approximately 10.4 TWh of energy for that same reason. Hydro-Québec also stated in the letter that it expects that, without additional transmission export capability, the quantity of spilled water in future years will be comparable to the quantity of spilled water in 2018 under comparable market and operational conditions.

The 10.4 TWh worth of energy that Hydro-Québec did not generate due to lack of economic transmission is more energy than the 9.45 TWh of energy required to supply the NECEC. This additional clean energy, currently being wasted, could be used to serve New England load through deliveries over the NECEC, as purchased by the MA EDCs, thereby displacing fossil-fuel-fired generation in New England without the need for the construction of any additional generation resources in Québec.

Hydro-Québec's reference to "a lack of economic transmission" in its December 14, 2018 letter is noteworthy. As evidenced by its spillage of vast quantities of water in recent years, Hydro-Québec could generate more energy to sell to its export markets, but the existing transmission capacity into New England will not permit such increased exports into the region, as the direct interties between Québec and New England as well as the paths into New England through New York or New Brunswick generally operate at or near capacity. In fact, the 745 MW of additional Hydro-Québec generation capacity discussed above will be capable of generating 3.8 TWh of additional energy per year on top of the 10.4 TWh of energy that Hydro-Québec expects to continue to have to waste, through spilled water, unless additional transmission capacity to New England, like the NECEC, is developed. This is a driving reason for Hydro-Québec's long-standing interest and efforts to support the development of an additional transmission link to New England.

The importance of sufficient transmission capacity to permit Hydro-Québec to increase its exports on an economic basis also explains the statement excerpted in part from page 56 of CMP's Post Hearing Brief as part of this request. The quoted statement in its entirety reads:

> CMP agrees with LEI and NextEra that the energy opportunity cost approach is the appropriate methodology to reflect the energy costs associated with the NECEC capacity resource because it is the most accurate representation of the true energy costs of the

> resource, particularly in light of market conditions, which indicate that HQ Production is not building new generation for the NECEC, but in the absence of the NECEC, HQ Production would sell its energy to other markets (***subject to available transmission and sufficient demand in those markets***). [Emphasis added.]

As a rational economic actor, Hydro-Québec will try to maximize its sales of energy to other markets in the absence of the NECEC, but its ability to do so will continue to be impeded by the lack of sufficient transmission capacity to permit those increased exports to the New England market, which is Hydro-Québec's export market most in need for deliveries of clean, baseload hydropower.

For the foregoing reasons, detailed modeling of Québec capacity, electric demand, hydrologic conditions, and reservoir operations is not necessary to justify the assumption that the energy delivered over the NECEC is incremental to current exports to New England. Hydro-Québec expects to continue to spill water due to a lack of economic transmission, and will be adding significant incremental capacity in the coming years, further exacerbating the excess. The detailed modeling sought in this request was not conducted in support of this Project because it is unnecessary to confirm that the injection of power enabled by the NECEC will reduce regional GHG emissions.

The foregoing discussion also demonstrates that the stated concern of some NECEC Project opponents that GHG emissions will not be reduced because of supply diversion by Hydro-Québec is unfounded. Opponents of the NECEC argue that some sort of "additionality test" should be applied before the Project should be permitted to move forward. They argue that without such a requirement Hydro-Québec will simply shift energy from one market to the contracting market. They further claim that the shifted energy will be replaced by fossil-based generation and therefore will not result in net carbon reduction between the two regions. This argument fails to take into account, as noted above, that Hydro-Québec's major export markets all have aggressive clean energy targets/goals (and in some regions, including Québec, programs to price carbon) which require that any reduction in uncontracted clean energy deliveries from Hydro-Québec, must be replaced in kind with alternative clean energy supply in order to meet these objectives. References for these clean energy targets/goals are provided below.

Moreover, and in any case, supply prices in the northeast are generally correlated with lower emission generation on the margin. This means that even if Hydro-Québec were to reduce its uncontracted spot market sales in one market to deliver energy to another market over a new transmission line (which is not expected for the reasons discussed above) it would be financially motivated to reduce sales first from the lowest priced market. In turn, these reduced sales would be from markets with lower marginal emissions which largely displace competing clean resources (such as wind and nuclear) in order to instead displace higher emitting generation in constrained regions with less access to clean energy, which can be achieved both regionally (shifting from Ontario to New England) and across time (off-peak to on-Peak) and season (shoulder to peak periods).

B. Publicly Available Information Supporting Modeling Assumptions and Relating to Hydro-Québec Operations and Impoundments

The following table provides detailed publicly available source information describing: (i) Hydro-Québec's organizational structure and obligations to serve domestic Québec load; (ii) its buildout of generation capacity; and (iii) its inability to increase exports to its adjoining markets including New

England in recent years due to insufficient transmission capacity. These materials support the reasonableness of the conclusion that the deliveries of clean hydropower over the NECEC will be incremental over historical exports and, as a result, will reduce GHG emissions in New England and across the entire northeast region.

The table also includes publicly available resources regarding (i) Methyl-Mercury in/as a result of Hydro-Québec impoundments; (ii) GHG emissions (methane) from Hydro-Québec impoundments; and (iii) "warm" water inflows into the Gulf of Maine and their environmental implications.

Topic	Resources/Links	Notes
Hydro-Québec has increased, and likely will continue to increase, its generation capacity	Hydro-Québec Annual Reports: http://www.hydroQuébec.com/about/financial-results/annual-report.html Hydro-Québec Strategic Plan- Pages: #16-5000 MW build out #20- NB 2018 Sales 2.7TWh, Battery Resource #31-Promote exports/balancing to decease GHGs #34- Romaine #4 245MWs, Solar pilots, Future Projects http://www.hydroQuébec.com/data/documents-donnees/pdf/strategic-plan.pdf Hydro-Québec Upgrade queue: 1281 MW HQP upgrades http://www.oasis.oati.com/woa/docs/HQT/HQTdocs/List_Impact_Studies.pdf La Romaine: https://www.hydroQuébec.com/romaine/ Canadian Energy Regulator (Québec Energy Profile) https://www.cer-rec.gc.ca/nrg/ntgrtd/mrkt/nrgsstmprfls/qc-eng.html Additional Technical Energy Potential : Additional Inflows from Climate Change https://www.researchgate.net/profile/Catherine_Guay2/publication/280532669_A_global_portrait_of_hydrological_changes_at_the_2050_horizon_for_the_province_of_Québec/links/55b8f9a608ae9289a08fc8f2/A-global-portrait-of-hydrological-changes-at-the-2050-horizon-for-the-province-of-Québec.pdf?origin=publication_detail MA 83D RFP Bids (See GSPL and HQ Wind/Hydro Bids - 1600 MW of Québec Wind): https://macleanenergy.com/83d/83d-bids/	Hydro-Québec's annual reports and strategic plan describe its recent hydropower generation buildout which started in 2003 and will end with the completion of La Romaine 4 in 2021. This includes the addition of approximately 5,000 MW of new capacity. In addition, the annual reports detail the increased amount of storage in Hydro-Québec reservoirs over the years (up to 2017); which were then recorded at 140.5 TWh of potential energy. Further, while Hydro-Québec has undertaken a significant build-out in recent years the organization continues to invest in and analyze upgrades to its existing facilities in order to increase efficiency and maximize clean energy production. At the current time the Hydro-Québec's projects queue has approximately 1,300 MW of upgrades. Beyond Hydro-Québec's recent capacity additions and potential upgrades, the province has an enormous onshore wind resource which it has and will continue to tap into. The province is home to approximately 3,800 MW of wind generation, with capacity factors and production of over 11 TWh annually. According to several studies, including a wind integration study

	CanWEA Québec Wind Integration Study: https://canwea.ca/wp-content/uploads/2016/07/pcwis-fullreport.pdf MA Wind in 83D RFP: https://macleanenergy.files.wordpress.com/2016/12/83d-rfp-and-appendices-final_june-12-2017-conforming-changes-clean.pdf Energy Efficiency https://transitionenergetique.gouv.qc.ca/en/ https://www.hiloenergie.com/en-ca/ HQ Historic Energy Efficiency Numbers http://news.hydroQuébec.com/en/press-releases/1131/Hydro-Québec -anticipates-moderate-growth-in-electricity-demand-over-next-10-years/	completed by GE on behalf of CANWEA, the province could feasibly construct another 15 GW of wind generation. A number of these projects are advanced in their development and/or "shovel-ready" given that they recently submitted bids into the MA 83D RFP. Wind resources totaling approximately 1,600 MW submitted bids in the RFP. Additionally, Hydro-Québec has recently started two solar pilot projects in the province and additional capacity from solar generation can reasonably be expected in the future. Finally, Hydro-Québec has a history of undertaking robust energy efficiency measures in order to reduce overall consumption and "free-up" additional clean energy for exports into U.S. markets. Between 2003 and 2015, Hydro-Québec investment in energy efficiency yielded savings of 8.8 TWh of energy. Hydro-Québec has committed to increasing these energy efficiency efforts and has recently created a subsidiary focused on expanding the use of "smart home" technology to decrease peak demand and overall energy usage. In sum, Hydro-Québec has built substantial capacity (and storage) since 2003, Hydro-Québec continues to increase its capacity and production capabilities (without the need for additional hydro), the province of Québec has enormous clean energy potential, and programs in Québec to expand energy efficiency gains are underway. Given these supply

		dynamics, it is reasonable to conclude that Hydro-Québec has the excess supply necessary to maintain its current export levels and increase its deliveries into New England via the NECEC.
Hydro-Québec's increased capacity is not dedicated to domestic load (or otherwise spoken for) and would flow over NECEC	Hydro-Québec Heritage contract: Under the Act respecting the Régie de l'énergie, Hydro Québec Production is required to provide Hydro Québec Distribution with a base volume of up to 165 TWh of heritage pool electricity annually. It may also compete for contracts under Hydro Québec Distribution's open tendering process and sells electricity on wholesale markets as well. http://www.hydroQuébec.com/generation/profil.html Heritage Contract (165 TWH/Year) (The Act Respecting Le Regie (see 52.2)) http://legisQuébec.gouv.qc.ca/en/ShowDoc/cs/R-6.01 Explain functional separation (public) http://www.hydroQuébec.com/about/governance/ethics.html http://www.hydroQuébec.com/relations-investisseurs/pdf/18K-2018.pdf HQ Divisions (pg. 3): http://www.hydroQuébec.com/data/achats-electricite-Québec/pdf/electricity-supply-plan-2020-2029.pdf HQ Distributions Contracts in Effect : http://www.hydroQuébec.com/electricity-purchases-Québec/electricity-contracts.html	In order to participate in the deregulated wholesale markets in the U.S., beginning in 1997, Hydro-Québec began to functionally separate divisions of the company to prevent cross-subsidization and ensure fair access to the transmission system for all power producers within the province. Because of these efforts there are three separate and distinct entities in Québec that operate the province's electric system: (1) Hydro Québec TransEnergie (HQT) maintains the province's high voltage transmission system and operates under a strict code of conduct to prevent preferential treatment and cross subsidization; (2) Hydro Québec Distribution (HQD) manages the local distribution systems in the province, serves load, and manages the majority of retail energy sales in the province. HQD also contracts for energy with IPPs in the province to serve its demand; and (3) Hydro-Québec Production (HQP) manages and operates Hydro-Québec's 62 hydroelectric plants, produces energy for the province of Québec, and sell excess energy into the regional markets. Further, HQP's obligation to the Québec market (HQD) is capped at 165 TWh of energy annually (per the

		Act respecting the Régie de l'énergie). To the extent that HQD's demands for energy exceeds this 165 TWh, HQD is required to issue calls for tender to meet the demand. This structure is intended to foster free competition and development of clean energy resources beyond HQP's hydropower resources. To date, HQD has spurred the development of approximately 3,800 MW of wind (11 TWh) in Québec. Further, HQD has contracts with over 1,500 MW of independent clean energy production in the province and has access to addition supply when/if necessary. As stated above, HQP's obligation, per statute, to HQD is 165 TWh per year. HQP is able to, but not obligated to, participate in the calls for tender HQD issues for the demand over this figure. HQP's decisions to do so are a function of the market opportunities in the region (including Québec). In this sense, HQP's excess energy and increase capacity are not owned and/or committed to HQD.
Hydro-Québec has been unable to deliver this additional energy in recent years due to a lack of sufficient transmission into neighboring markets	Spilling Testimony – MUC 2017- 4.5 TWh 2018- 10.4 TWh Forecasted 12% Increase in inflows https://mpuc-cms.maine.gov/CQM.Public.WebUI/DataRequest/QuestionAndResponsePopUp.aspx HQ Annual Reports-Storage 2017 140.5TWh 2016 138.2TWh 2015 126.9TWh http://www.hydroQuébec.com/about/financial-results/annual-report.html	As demonstrated in the letter filed with the MPUC during the NECEC CPCN hearings, Hydro-Québec has spilled approximately 15 TWh of energy between 2017 and 2018 which could have otherwise served the region's demand for clean energy. In 2018 alone, the quantity of energy spilled would have exceeded the annual obligation to the MA EDCs under HQUS's PPAs. Further, as demonstrated by Hydro-Québec's annual reports, Hydro-Québec has demonstrated record levels of reservoirs storage in recent years. This likely indicates that

		Hydro-Québec stored energy it would have otherwise delivered into the region had it had sufficient economic transmission capacity to do so. In recent years, as storage availability has become scarce, Hydro-Québec has spilled energy as part of its water management and planning regime, which would have otherwise been available for export. With the addition of NECEC, Hydro-Québec will be able to increase overall exports across the region by discontinuing the economic spilling of water and operating its reservoirs at more appropriate levels. Further, it should be noted that several environmental studies indicate that Northern Québec, where the majority of Hydro-Québec's storage capacity is located, is expected to experience increased precipitation as a result of currently expected levels of climate change. This increased precipitation will result in increased inflows into Hydro-Québec's reservoirs and increased availability of water for energy production.
Methyl-Mercury in/as a result of Hydro-Québec impoundment	HQ Mercury Page: https://www.hydroQuébec.com/sustainable-development/specialized-documentation/mercury.html HQ Mercury one pager : https://www.hydroQuébec.com/data/developpement-durable/pdf/mercury-in-reservoirs.pdf Full report Evolution of Mercury in HQ Reservoirs (La Grande): https://www.hydroQuébec.com/data/developpement-durable/pdf/evolution-fish-mercury-levels.pdf The Northern Fish Nutrition Guide – James Bay Region:	The methylation of inorganic mercury by bacteria in water bodies is a natural process. This explains why all fish naturally contain different levels of mercury. After reservoir impoundment, inorganic mercury in submerged soil and vegetation is transformed into methylmercury. It then enters the food chain and ultimately reaches reservoir fish. Depending on reservoir fish species, it takes 10 to 35 years before the methylmercury levels return to those measured in the natural environment.

	https://www.hydroQuébec.com/data/developpement-durable/pdf/northern_fish_nutrition_guide_james_bay_en.pdf	The issue of mercury in hydroelectric reservoirs is a well-known and temporary phenomenon. Over the past 35 years, Hydro-Québec has carried out extensive monitoring and has incorporated this issue into the environmental impact assessment and public hearings process for all its generation projects. Hydro-Québec manages a robust educational and monitoring program, in collaboration with public health agencies and First Nations. To date, there is no record of mercury poisoning in individuals in proximity to Hydro-Québec's reservoirs.
GHG emissions (methane) from Hydro-Québec impoundments	HQ General GHG web page https://www.hydroQuébec.com/sustainable-development/specialized-documentation/ghg-emissions.html HQ one-page comparison of resources : https://www.hydroQuébec.com/data/developpement-durable/pdf/ghg-emissions.pdf HQ Réservoir emissions page : https://www.hydroQuébec.com/sustainable-development/specialized-documentation/ghg-reservoir.html Press Herald Article by François Bilodeau et Alain Tremblay: https://www.pressherald.com/2019/01/15/scientific-knowledge-about-Québec-hydropower-must-not-be-overlooked/. and Press Herald LTE by Alain Tremblay: https://www.pressherald.com/2019/12/29/letter-to-the-editor-hydropower-key-part-of-cleaner-electricity-system-Hydro-Québec -scientist-says/	Hydro-Québec's reservoirs are frequently compared to reservoirs in warmer tropical climates which are biologically more active and therefore produce more frequent and significant methane emissions. By comparison, Hydro-Québec's reservoirs are in Northern Québec, a cold boreal climate, which is a far less active biological ecosystem, and which has waters which are far more oxygenated. This leads to a smaller production of methane; and CO2 levels which are consistent with natural ecosystems of that region (lakes, rivers, streams). Additionally, Hydro-Québec's reservoirs are usually built in remote and sparsely populated areas, away from farming operation runoff and other anthropogenic sources of nutrients which may lead to emissions in reservoirs. In summary, while Hydro-Québec reservoir emissions rise after impoundment, the bulk of these are

		CO2 emissions (not methane). After 4-8 years, these CO2 emissions lower and reach levels consistent with natural lake ecosystems. Overall, GHG emissions from reservoir hydro are very small in comparison with thermal power plants but similar to those of renewable energies.
"Warm" water inflows into the Gulf of Maine and their environmental implications	https://bangordailynews.com/2019/03/27/news/state/no-evidence-hydropower-for-cmp-project-would-disrupt-gulf-of-maine-food-chain-scientists-say/ http://www.gmri.org/news/blog/gulf-maine-explained-warming-gulf-maine https://journals.ametsoc.org/doi/full/10.1175/JCLI3440.1	Through impact assessments and environmental follow-ups, Hydro-Québec has shown that freshwater flow changes related to the creation of reservoirs are usually limited to the mouth of the river area as freshwater is usually rapidly mixed with salt waters.
Additional Information on other regions' goals, policies, and best use of HQ resources in system decarbonization	Regional (state by state GHG reduction goals): https://www.c2es.org/document/greenhouse-gas-emissions-targets/ Canada's GHG Goals https://www.international.gc.ca/country_news-pays_nouvelles/2018-03-23-germany-allemagne.aspx?lang=eng Ontario's GHG Goals : https://www.ontario.ca/page/climate-change New York's Climate Leadership and Community Protection Act: https://www.nortonrosefulbright.com/en/knowledge/publications/72358fcf/new-york-states-climate-leadership-act-presents-new-challenges-and-opportunities-for-agriculture https://www.nysenate.gov/legislation/bills/2019/s6599 LEI Testimony in the MPUC hearing on NY and OT carbon intensity and goals (Pg. 12) https://mpuc-cms.maine.gov/CQM.Public.WebUI/DataRequest/ViewQuestion.aspx Increased negative pricing and wind curtailments in NYISO : https://www.nyiso.com/documents/20142/11452204/2019%20NYCA%20Renewables%20Presentation%20FINAL.pdf/051c94d2-026a-fbd6-b7ad-ee1a2dc8a3d7 NY Power Trends 2019 (Pg. 45)	Regional goals for carbon reduction should not be focused on simple "additionality" of Hydro-Québec flows into the region. Doing so disregards the complex and evolving nature of regional markets, state policies to spur development of domestic clean energy generation, and numerous studies on how to achieve the regions goals effectively. 1. Other jurisdictions (NY and Canada) have clean energy and climate goals which will require substitution of any reduction in Hydro-Québec energy in kind. This will result in no net GHG emissions increase. 2. Increased negative and zero pricing events in regions like upstate New York will result in decreased Hydro-Québec deliveries. At these hours zero carbon resources are usually at the margin (nuclear/wind). Hydro-Québec's deliveries would hurt the continued operation of

	https://www.nyiso.com/documents/20142/2223020/2019-Power-Trends-Report.pdf/0e8d65ee-820c-a718-452c-6c59b2d4818b MIT Study on Regional Decarbonization http://ceepr.mit.edu/files/papers/2020-003-Brief.pdf Deep Decarbonization in the Northeastern United States and Expanded Coordination with Hydro-Québec https://irp-cdn.multiscreensite.com/be6d1d56/files/uploaded/2018.04.05-Northeast-Deep-Decarbonization-Pathways-Study-Final.pdf	these resources and regional GHG objectives. These instances will be exacerbated by the robust number of clean energy projects NYSERDA has contracted for in the upstate region. Hydro-Québec will need to provide balancing services in this region and will have additional energy to sell elsewhere as a result. 3. Studies by MIT and a deep decarbonization study of the Northeast indicate that increased transmission into the Northeast (not necessarily energy deliveries) will enable the most cost effective and robust decarbonization of the region. This will allow Hydro-Québec to act as battery to the region, unlocking the potential of renewables, complimenting their operations, and reducing the cost to decarbonize.

C. Response to Northbridge Energy Partners Report:

A report was recently issued by NorthBridge Energy Partners attempting to demonstrate that Hydro-Québec does not have the ability to supply export energy over the NECEC (to serve the contractual commitment of 9.45 TWh of annual clean energy to the MA EDCs), plus an announced agreement with New Brunswick Power (NB Power) and a hypothetical supply commitment over the Champlain Hudson Power Express (CHPE) project, without having to either 1) construct new hydropower projects in Québec or 2) reduce non-contracted export volumes.

This report uses a very simplistic analysis to account for future supply and demand for Hydro Quebec hydro resources. This simple accounting makes a number of questionable assumptions, which, when corrected, actually demonstrate that the report's quantity of excess Hydro-Québec energy is sufficient to meet both the NECEC contractual obligation plus existing exports, measured using Hydro-Québec's 2019 net exports of 33.7 TWh, which together total 43.15 TWh.

Most important to correct, the report represents theoretical Hydro-Québec deliveries over the proposed CHPE as a current obligation, instead of a speculative opportunity. Hydro-Québec has pursued numerous opportunities for the development of new transmission lines between Québec and neighboring markets, including CHPE, the Northern Pass project in New Hampshire, the New England Clean Power Link project in Vermont, and several others. These projects are in various stages of development, and represent potential future opportunities where the commercial details and any associated energy supply commitment are not contracted and are undefined. Further, arbitrarily

assuming that any Hydro-Québec supply commitment over a new project will be a baseload commitment at the Project's full capacity is unfounded, especially considering the growing consensus that new transmission may be better utilized by providing additional access to Québec's vast storage capability, in order to help neighboring regions better match intermittent renewable supply with regional demand and achieve full decarbonization. Developing a project for this type of purpose would result in deliveries being substantially lower than what is assumed for CHPE in the report. Therefore, it is unreasonable to include any theoretical future projects or assumed supply commitment in the calculation of Hydro-Québec's total annual demand.

Removal of the assumed 10.38 TWh annual energy commitment for the CHPE project from NorthBridge's calculations results in Hydro-Québec's 53 TWh of annual supply (based on NorthBridge's own assumptions) being more than sufficient to meet the remaining 45.5 TWh supply test. Furthermore, the NB Power announced agreement represents an action by NB Power to lock in historical levels of Hydro-Québec deliveries into the province, and does not represent an incremental commitment for Hydro-Québec above what was included in the 2019 net exports calculated by NorthBridge. This correction would further reduce Hydro-Québec's total annual demand to 43.15 TWh.

On the Hydro-Québec supply side, the NorthBridge report notes on page 3 that Hydro-Québec is committed by law to supply 165 TWh per year to meet domestic demand. As discussed above, Québec law also dictates that any demand in Québec beyond this 165 contract must be procured under a competitive solicitation, where Hydro-Québec's production division, HQP, can, but is not obligated to, participate. In fact, Hydro-Québec's domestic utility, HQD, has more recently relied on contracts with independent wind producers and demand side measures to meet growing needs in Québec. The Northbridge report, however, assumes that load growth in Québec will likely offset the Hydro-Québec supply additions from hydropower refurbishments. The appropriate assumption would be to limit Hydro-Québec's obligation to serve Québec load at its contractual limit (not speculative future activities). This results in 53 TWh of excess energy being made available for export to Hydro-Québec. The report also seems to completely discount the availability of excess energy represented by spilled energy in past years, which the NECEC Project could make use of. This spilled energy would further increase Hydro-Québec's energy available for export.

Lastly, the Report references the impact of variability in precipitation in Québec on Hydro-Québec's ability to supply energy on a continuous basis, without noting Hydro-Québec's vast system of reservoirs with multi-year storage. This variability, however, is the reason several parties have created a historical average when establishing a historical baseline which Hydro-Québec deliveries over a new line must exceed. In contrast, NorthBridge chooses to use a single year (2019). If a 5-year average of Hydro-Québec's net exports were used instead of simply the previous year, Hydro-Québec's baseline for existing exports would decrease by 0.5 TWh.

Taken together, these points demonstrate that by making appropriate corrections to NorthBridge's assumptions, NorthBridge's calculations demonstrate Hydro-Québec's capability to provide fully incremental energy deliveries over the NECEC Project in addition to historical deliveries.

But even if new supply were to be developed in Québec, NorthBridge's assumption that it would need to come from new hydropower is incorrect, as HQD has recently pursued the development of a variety of resources (including wind, solar, and demand side measures). These alternative clean resources all have unique characteristics and values which are considered as part of Hydro-Québec's development decisions, including their impact on Québec's portfolio, interconnection costs, development timelines,

and project economics. It would be difficult for Northbridge (or any third party) to accurately determine how Hydro-Québec would weight these various factors in determining future clean energy development projects, but the assumption that any new projects must come from new hydropower is inaccurate.

D. Specific Responses to Subparts of Request:

Hydro-Québec Operations – Reference Case without NECEC and Project Case with NECEC
a. For the Reference Case (without NECEC) and the Project Case (with NECEC), please provide the following:

1) Assumptions and analysis used to calculate Hydro-Québec's energy demand, peak demand, and reserve margin requirements over the 20-year contract period.

Please see Sections A, B and C above and Attachments S through V of this response.

2) Assumptions and analysis used to calculate Hydro-Québec's capacity and energy imports and exports over the 20-year contract period.

Please see Sections A, B and C above and Attachments S through V of this response.

3) Assumptions and analysis used to calculate Hydro-Québec's generation capacity and dispatch used to meet Hydro-Québec's energy demand, peak demand, reserve margin requirements, and exports over the 20-year contract period.

Please see Sections A, B and C above and Attachments S through V of this response.

4) Assumptions regarding Hydro-Québec's new generation builds and upgrades over the contract period.

Please see Sections A and B above.

5) Assumptions regarding Hydro-Québec's hydro storage additions and expansion over the contract period.

Please see Sections A and B above.

6) Sensitivity cases analyzed to assess Hydro-Québec's ability to meet NECEC supply requirements over the 20-year contract period under different hydrological conditions.

Please see Section A above and Attachments S, T and U of this response.

7) Assumptions about Hydro-Québec's precipitation levels over the 20-year contract period.

Please see Section B above for citations to studies forecasting increased precipitation in northern Quebec where most of Hydro-Quebec's hydropower reservoirs are located.

b. The applicant stated that 'LEI concluded that it "believes that HQP would have sufficient capacity to fill the 1,090 MW capacity on NECEC without having to forego capacity sales to other markets."' Please explain whether this conclusion is based on the results of the modeling of the Reference Case and Project Case. If so, please provide analysis of Hydro-Québec dispatch, imports, exports, and other relevant information for the Reference and Project cases showing that Hydro-Québec would have sufficient capacity to fill the 1,090 MW capacity on NECEC without having to forego capacity sales to other markets over the 20-year contract period. Include details of Hydro-Québec's capacity sales in the absence of NECEC.

Please see Sections A and B above and Attachments S through V of this response.

c. The applicant stated that "Québec has experienced increasing precipitation in recent years" and "forecasts of further precipitation increases in the coming years due to the impacts of climate change on Canada." Please provide assumptions regarding Hydro-Québec's precipitation levels over the contract period as used in the study.

Please see Section B above for citations to studies forecasting increased precipitation in northern Quebec where most of Hydro-Quebec's hydropower reservoirs are located.

Geographic Scope of Greenhouse Gas Emissions Impact Assessment
a. Describe Maine Public Utility Commission (MPUC)'s definition of the geographic boundary for GHG emissions accounting.

As discussed in Section A above, the MPUC concluded that GHG emissions in New England should be reduced by 3 to 3.6 million metric tons annually as a result of the NECEC and the modeling supporting this conclusion is premised on the assumption that Hydro-Quebec will continue exporting energy to other markets consistent with historical levels, such that the NECEC-related GHG reductions will be incremental over those experienced across the entire northeast region from Hydro-Quebec energy sales. As discussed in Section C above, once corrected, NorthBridge Energy Partners' analysis supports this assumption.

b. If the MPUC did not provide a definition, describe the geographic boundary that Hydro-Québec defined for GHG emissions accounting. Explain why Hydro-Québec selected this boundary.

Not applicable.

c. Provide calculations of GHG emissions impact in regions outside New England, and the net emissions within the boundary for the following cases:

1) The Reference Case without NECEC

2) The Project Case with NECEC

Please see Section A above.