

**MEMORANDUM**

TO: Thomas Pappas

FROM: Sam Newell/Jurgen Weiss

SUBJ: Explanation of differences in MOPR Calculation

DATE: November 1, 2017

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The Subcommittee asked us on Friday, October 27, to investigate the reasons for the difference in the minimum offer price for NPT under the MOPR rule estimated by LEI and by Brattle in its scenario where capacity can be provided from existing year-round surplus and no clean energy credits are earned by NPT.<sup>1</sup> As we explained during our live testimony, LEI's estimated MOPR value did not account for the costs of new transmission facilities in Quebec attributable to Northern Pass Transmission and adding those costs would increase the LEI value by about [REDACTED] to [REDACTED].<sup>2</sup> This is [REDACTED] than the comparable value we calculated in our Supplemental Report (\$4.4/kW-mo). The Subcommittee asked us to explain that difference.

The primary cause of this difference is the different assumptions Brattle and LEI used regarding NPT's future energy revenues. Our calculation assumed very similar energy revenues as LEI through 2030, but we assumed [REDACTED] revenues than LEI thereafter. Specifically, we assumed that energy market revenues between 2030 and 2060 would continue to grow at the same [REDACTED] [REDACTED] that both Brattle and LEI assumed between 2020 and 2030 (*i.e.*, [REDACTED]). LEI assumed instead [REDACTED] nominal escalation between 2030 and 2060 (*i.e.*, [REDACTED]). Applying LEI's assumed escalation rate of [REDACTED] to the estimated revenues for 2030 to 2060 in our analysis yields a [REDACTED] MOPR value of [REDACTED], explaining [REDACTED] of the [REDACTED] difference in MOPR values.

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<sup>1</sup> It is important to note that this is only one of several possible scenarios Brattle presented in Table 1 of its Supplemental Testimony. As shown in the table, NPT's minimum offer price could increase if the IMM included the cost of new hydro (or other complementary resources); the minimum offer price could decrease if the IMM credited NPT for its clean energy attributes.

<sup>2</sup> As in our Supplemental Report, we estimated that the new transmission facilities in Quebec would increase the MOPR value by [REDACTED] by assuming the same total cost (including ongoing costs and all other aspects of revenues requirements) per dollar of capital spent. We assumed the Quebec transmission would cost \$600 million CAD (at a \$0.75 CAD/USD exchange rate at the time of our report) versus \$1.6 billion for the U.S. portion.

The small remaining difference reflects small differences in transmission costs,<sup>3</sup> energy opportunity costs, capacity performance revenues, and the assumed commercial online date.<sup>4</sup>

Our differences in assumptions reflect the fact that projecting distant future revenues is inherently challenging. To the best of our knowledge, the market monitor has not provided specific guidance for projecting long-term energy revenues. There are multiple approaches for forecasting prices far in the future that are reasonable and the IMM could likely choose any number of approaches, so both LEI's approach and our approach would likely be considered legitimate. As we stated during our testimony, we do not know (and neither can LEI) which approach the IMM would choose. Consequently, a simple extension of assumed near-term trends is a reasonable approach and the one we chose. On the other hand, there are good reasons why electric energy prices may not keep increasing in real terms (even if natural gas does) as rising penetration of zero-variable-cost clean resources puts downward pressure on prices, which is the approach LEI used.

Our assumptions about the growth of energy market revenues results in a somewhat [REDACTED] estimated minimum offer price (\$4.4/kW-mo) since [REDACTED] energy market revenues lead to a [REDACTED] minimum offer price and hence a [REDACTED] chance of clearing the capacity auctions. If, on the other hand, LEI's assumption were considered more realistic in light of continued regional decarbonization goals, the estimated minimum offer price would be [REDACTED], resulting in a [REDACTED] likelihood of NPT clearing in the capacity auctions, or [REDACTED].

We illustrate the reason why relatively small differences in assumptions about future energy market prices have a substantial impact on the resulting mitigated offer price in **Figure 1** below. The first column shows the total levelized costs (expressed in \$/kW-mo) of Northern Pass we used in our analysis, including the energy opportunity costs (\$19/kW-mo), the U.S. transmission costs (\$14/kW-mo), and the Quebec transmission costs (\$4/kW-mo). The two gray columns show that energy market revenues represent by far the largest source of revenues covering these costs: the first column represents our assumption of energy revenues growing at a rate of [REDACTED] per year between 2030 and 2060; the second column represents LEI's assumption of [REDACTED] per year growth over this time. The difference in the total costs to be recovered (horizontal dark blue dashed line) and the energy market revenues represents the additional revenues that would

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<sup>3</sup> We relied on the revenue requirements confidentially provided by the Applicants since all costs associated with the transmission line would be recovered through the revenue requirement, including capital costs and other on-going costs (such as O&M costs, lease costs, and property taxes). LEI's analysis provides specific values for capital costs and on-going costs, which were not previously provided to us.

<sup>4</sup> LEI assumes NPT will begin earning energy and capacity revenues in [REDACTED]. We assume they will begin to earn these revenues in June 2021.

be necessary from the capacity market to fully recover the transmission and energy costs and thus represent an estimate of the minimum offer price (shown as red gap above the gray columns). While the change in the height of the two gray columns is relatively small, *i.e.*, energy market revenues do not change very much in percentage terms, the red gap between the gray bars and the horizontal dark blue dashed line, that is the estimated minimum offer price,

[REDACTED]

