

Senator Lawrence, Representative Berry, Members of the Joint Standing Committee on Energy, Utilities and Technology, my name is Thomas Welch, and I live in Hancock, Maine. I served as Chairman of the Maine Public Utilities Commission from 1993 to 2005, and again from 2011 through 2014. I am here to testify in favor of LD 1710.

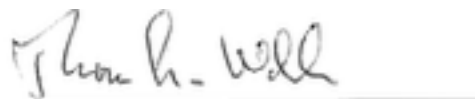
Last August, I prepared an analysis (set forth below) describing the difficulties in building the needed connections between the renewable resources in northern Maine and the major Maine and New England markets. In that analysis I concluded that it would be good policy to find a way to build transmission with sufficient capacity to "unlock" a significant amount of renewable generation in Maine.

In particular, I noted the likelihood that a transmission line with substantial capacity, serving several northern Maine renewable energy projects, would have the more favorable economics -- i.e., would be significantly less expensive for developers and customers -- than any one or two projects standing alone, each with the need to build stand-alone transmission connections. But because renewable energy projects are, for good reasons, required to compete with one another, and because the timing of various projects may be difficult to coordinate, it is unlikely that the market alone will support the financing and construction of that optimal major transmission line. Moreover, smaller projects standing alone, because they cannot share in the scale efficiencies of a high capacity transmission line with a high load factor, are likely to be priced out of the market.

LD 1710 would address the problem I noted in my August analysis directly: it would in essence permit the kind of beneficial aggregation of interest needed to build the requisite transmission, and would also support the development of the renewable generation resources that would make use of that line. Moreover, I believe it does so with sufficient safeguards of customer interests. It is appropriately agnostic about who should build what, but allows the kind of aggregation of interest that the market seems unlikely to achieve.

I respectfully ask the Committee to vote "ought to pass" on LD 1710.

Thomas L Welch
May 18, 2021

A handwritten signature in cursive script that reads "Thomas L. Welch". The signature is written in dark ink and is positioned above a horizontal line.

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I has come to my attention that the Public Utilities Commission is currently considering a variety of proposals for renewable energy (under 35-A Section 3510(G), and is expected to begin developing and negotiating term sheets for approval by the commissioners relatively soon. I also understand, through conversations with some of the developers, that at least some of the proposals would, if selected, include building substantial new transmission that would provide a path from the wind resource rich areas of northern Maine.

It appears to me that there is an opportunity in the context of this proceeding to reduce the long term cost of meeting Maine's renewable energy objectives and related infrastructure needs. While I think the Commission may already have the authority to take advantage of that opportunity, some action might be warranted in either the administrative or legislative process to encourage the best outcome.

In brief, I understand that there may be projects before the Commission that involve building relatively extensive new transmission in Maine in order to connect the new renewable resources to the New England grid, and that the transmission involved would be built with substantial capacity available for additional projects. The Commission may also have under consideration projects that involve less transmission, perhaps only enough for the immediate project. This creates the obvious problem of how to evaluate the relative cost of various projects: the project with the larger transmission requirement will likely have a higher near term cost but, if additional projects in fact take advantage of the new transmission, the long term cost could (and is likely to be) substantially lower than a series of projects, each with its own associated new transmission.

The following hypothetical highlights the risk and opportunity. Posit that the annual cost of a 1000 MW capacity transmission line is \$100 million, and the cost of a line with 400 MW capacity is \$50 million. Posit further that wind projects can sell their energy for \$30/MWh, and that the projects can produce, on average, 3000 MWhs for each installed MW per year (a capacity factor of about 35%). How, in this case, should a 400 MW project requiring a 1000 MW line be compared to a 300 MW project requiring a 400 MW line? If no further projects are contemplated, the per/MWh costs would appear as follows:

The cost of the 1000 MW line would be spread over 1.2 million MWhs (400 x 3000), with a per/MWh transmission cost of \$83.3/MWh, and thus a total price of \$113.3/MWh. The cost of the 400 MW line, on the other hand, would be spread over 900,000 MWhs, with a per/MWh transmission cost of \$55/MWh, and thus a total price of \$85/MWh. In this construct, the smaller project with the smaller line appears the better buy.

If, however, additional projects are brought forward, a different picture emerges. Posit that another 600 MW of wind (again with 35% capacity factor) is built in the area served by the new lines. The per/MWh cost of the 1000 MW line would then be \$33.3/MWh, with the total price for wind served by that line of \$63.3/MWh. On the other hand, the smaller line would be able to accommodate another 100 MW, with an "all in" price of \$71.6/MWh (based on \$41.6/MWh for transmission), making the smaller option more expensive. Further, in that case, the opportunity to serve the additional wind projects without building another transmission line would be lost. These numbers are merely illustrative; I strongly suspect, however, that the actual relative costs of transmission would show an even greater advantage to building the larger project.

This is just another example of the difficulties in dealing with the "lumpiness" of substantial infrastructure investment, and suggests that policy makers (including the administration and the Commission) should, at least, take into account the possibility that supporting a major investment now will be better for Maine's electricity costs, and its ability to reach its renewable energy goals, than a succession of small incremental projects.

During my own tenure at the Commission, I encountered at least two analogous problems. One involved water main extension cases, where the homeowner whose property first needed the extension would be liable for the entire cost, creating the likelihood of "free riders" who build subsequently and could use the same line. This issue was addressed by requiring contribution by those subsequent customers that would have the effect of reducing the payments by the first. The relevance to the project cost evaluation issue is that the first homeowner would, rationally, consider the probable future contribution from future homeowners in evaluating whether to seek the line extension: it would be a poor economic choice, both for the homeowner and society in general, to consider only "first" or near term cost, as that approach would lead to no one joining the water system (each owner would choose to dig a well, for example), with total costs higher and benefits lower. I do not suggest that the contribution rules for water line extensions could or should be applied to transmission projects (though that might warrant further study); but the underlying logic does suggest that we should, if at all possible, try to capture the value of the larger transmission line supporting many projects (including likely future projects) where that value may exceed the near term apparent price advantage of a project with an associated smaller line.

The second problem involved the attempt to bring additional natural gas capacity into New England. The basic difficulty is that the people who would benefit the most -- electricity consumers (more than, for example, the gas LDCs who would ordinarily purchase capacity on behalf of gas customers) -- had no mechanism by which to finance the necessary expansion. In

Maine, the legislature saw fit to address the issue by giving the Commission explicit authority to require the purchase of such capacity by electric utilities; the failure of sufficient other New England jurisdictions to follow suit doomed the effort, but in Maine, at least, the legislature recognized the importance of overcoming the disconnect between the ultimate beneficiaries of a major infrastructure project and the readily available mechanisms for achieving sufficient financing. The analogy to the transmission/renewable project situation Maine now faces is that while the totality of likely (indeed, in light of the wind resource and Maine's carbon reduction targets, virtually certain) development of new renewable generation would make building a large transmission line from northern Maine a "first best" economic choice, it may be difficult, if not impossible, for any one generation project to compete on price if it alone is required to incorporate the full cost of such a major line into its proposal.

Tom Welch