

**STATE OF MAINE  
PUBLIC UTILITIES COMMISSION**

<b>MAINE PUBLIC UTILITIES COMMISSION</b>	)	<b>COMMENTS OF</b>
Notice of Inquiry into the Determination	)	<b>Natural Resources Council of Maine</b>
of the Value of Distributed Solar Energy	)	
Generation in Maine	)	
<b>Docket No. 2014-00171</b>	)	<b>July 28, 2014</b>

NRCM appreciates the chance to file comments in response to the Commission's June 10, 2014 Notice of Inquiry, and the extended time made available for these initial comments. As a general matter, we support the proposed structure and process for the Commission's study as outlined in the Inquiry. We specifically support holding at least one in-person meeting to discuss a proposed methodology. It may be helpful at this meeting for the Commission or its consultant to present a methodological approach and engage in discussion with stakeholders, and then to release a draft methodology for formal comment soon thereafter. We also suggest that, after finalizing the methodology, the Commission hold a specific period where it invites submission of data and data sources that will be useful for the consultant to develop its quantitative draft findings.

The following are NRCM's responses to the specific questions, including, where appropriate, in response to comments filed to date by other parties.

Response to Question 1 – Definition of Distributed Generation

Other commenters have proposed sensible and generally consistent definitions of distributed solar, with the exception of what the size threshold should be. We do not believe the Commission needs to limit the size to the current net-metering limit of 660 kW because a) this threshold could easily change (a change to 1 MW was passed and vetoed last session), and b) although there is a relationship between "net-metering" and "distributed generation", the latter suggests a broader category. We recommend the Commission use a definition similar to ISO-NE in its ongoing analysis of distributed generation capacity, i.e. up to around 5 MW. For practical purposes, the Commission may find that distributed generation at the kW level and the MW+ level have different characteristics that are worth distinguishing, but we believe both sizes could fall within the definition of distributed generation.

Question 2 – Published Studies for Consultation

Previous commenters have provided an excellent list of published materials that may be of use to the Commission. Although valuation of benefits and costs is only one of the subjects it addresses, the Commission may also find useful:

National Renewable Energy Labs (U.S. DOE). "Regulatory Considerations Associated with the Expanded Adoption of Distributed Solar." November 2013. ([www.nrel.gov/publications](http://www.nrel.gov/publications))

### Question 3 ó Factors Within Value of Solar

Again, prior commenters have provided a relatively comprehensive and consistent list of the factors that should be considered. The Public Advocate and others made particular note of the fuel price hedge factor, and we believe this is indeed an important factor to consider. Analytical considerations and information gathered by the Commission for other cases (e.g. 2014-00071) regarding future prices of natural gas may be useful in this study.

Avoided transmission and distribution costs are also clearly an important factor and of considerable interest in Maine. As has been pointed out many times, T&D costs are largely fixed in the short-term but can and do rise over time, so the analysis must consider potential or likely longer-term costs that may be avoided. And unlike estimates used in examining Non-Transmission Alternatives, this obviously must also include future *distribution* infrastructure costs, which are larger than is sometimes understood.

Regarding location-specific values, NRCM agrees with the Public Advocate that it may be difficult or costly to conduct a comprehensive (e.g. circuit by circuit) assessment in this case. However we believe it would be very useful for the Commission to examine and report on the likely ranges of values that distributed generation may have when those can vary by location. The statute refers to a potential "adder" and this may be a useful methodological approach – an added value or range of values for certain locations.

CMP claims that impacts of distributed solar on distribution networks have ranged from "beneficial to detrimental". It is unclear whether CMP is referring to location as a determinative factor. We believe CMP's claim should be examined by the Commission, because it is somewhat counter to experience reported elsewhere, such as California, where solar integration costs have been negligible to non-existent even at relatively high penetration rates. As such, we are skeptical that many specific locations where distributed solar will have negative impacts on distribution networks, but we know from experience – such as in the Boothbay non-transmission alternatives pilot – that distributed solar added in critical load pockets can have considerable positive value. Although the overall focus of the Commission's analysis should not be location-specific, information on the range of these values would likely be of considerable use in regulatory and policy proceedings.

### Question 4 ó Deregulated Market

NRCM believes that most of the differences between deregulated and integrated utility markets should not have significant bearing on the calculation of the value of solar per se, although they potentially have a greater meaning regarding specific policy or regulatory measures designed to capture those benefits and/or assign any costs to different market participants. Therefore we expect the various studies and methodologies from elsewhere will have considerable value to the Commission. The nature and availability of data may be the biggest difference, as TASC suggests.

In both kinds of market system, different value categories may accrue to different market participants. As discussed further under Question 6, the use of a societal benefits framework where all costs and benefits are included avoids some need to track all costs and benefits in an overly complex way, and helps assure that solar is a good deal (at a given price) for society and the economy as a whole. That said, we believe it is legitimate for the Commission to note how benefits and costs can flow to different market segments.

#### Question 5 ó Comparison to Avoided Cost Studies

As noted by some commenters, at modest levels of solar penetration, distributed solar may share many characteristics with energy efficiency and the AESC study will have some significant parallels with the valuation study. Of course the specific factors used by the Commission should come from its statutory direction, aided by its own data and analysis as well as that of stakeholders. Those include most of the factors in the Synapse study, but may also extend beyond it.

In contrast to the suggestion of some commenters, the statute directing this study does not identify it as a "cost-benefit study", but a study of the "value" of distributed solar generation. While the difference may be nuanced, it wouldn't be unreasonable to characterize "value" as net-benefit, we see any distinction with "avoided cost" as nuanced as well. The economic "value" of a good implies a price or cost up to which it would be beneficial to pay for that good. That is generally the purpose of calculating an "avoided cost" as well. As others have said, energy efficiency and distributed solar do not have identical characteristics and that must be accounted for, even as the Commission makes use of the excellent AESC analysis.

#### Question 6 ó Societal Value of Environmental Benefits

We agree with TASC that the "societal value" of reduced environmental impacts is clearly to be distinguished from avoided utility-system compliance costs. As evident on plain reading, "societal value" is broader than the value to utility participants, and the legislature inserted these words into the original bill specifically to clarify what it meant by reduced environmental impacts. Societal value has a relatively well defined economic meaning, and it refers to the fullest accounting of benefits and costs of society as a whole without regard to transfers among groups. Although the legislature did not use the terms "societal benefits test" in this law, the use of the "societal value" language is consistent with the use of that cost-effectiveness framework.

The Public Advocate suggests a useful, but overly simplistic method of calculating actual environmental benefits of solar. Like other value of solar studies, the Commission should consider the typical load curve (or range of load curves) of distributed solar generation in Maine in order to estimate how that generation would offset energy, capacity, transmission and distribution costs. It should, therefore, not be necessary to simply compare solar with an assumed marginal generation resource.

Although there are several important sub-categories of environmental benefit noted by CMP, TASC and others, it is likely that avoided air emissions, including CO<sub>2</sub>, will have relatively larger significance, and indeed more research has been done to quantify them. The societal value of

reduced CO2 emissions is estimated by considering the full costs that are likely to accrue to society for every unmitigated ton of emissions (discounted to a present value).

We disagree with Emera that any environmental costs of disposing of solar panels should be considered. The only fair way to include these costs would be to compare them to the disposal or other life-cycle costs of alternative sources of generation as well as transmission and distribution equipment, and we believe that would be beyond the Commission's scope. As TASC and the Public Advocate commented, the Commission is unlikely to be able to include a life-cycle comparison of environmental costs of distributed solar in comparison to alternatives. Similarly, we believe it would be difficult for the Commission to fairly and reasonably assign avoided land-use costs to distributed solar generation, again in comparison to alternatives. We believe this is likely another positive benefit for distributed solar, which (especially in the case of rooftop or brownfield solar) can help avoid the land-use environmental costs of utility-scale generation and of transmission and distribution infrastructure. The Commission's study should note benefits like this, even when they may be beyond its capacity to quantify at this time.

#### Question 7 ó Unit vs. Aggregate/Potential

This is a very important question that may deserve further discussion. In general we believe the legislature intended the study to primarily focus on a unit basis. There is no indication that the legislature intended the Commission to estimate the total achievable potential of distributed solar in Maine. Such an undertaking would be significant, and would ideally involve additional direction from the legislature about the kinds of scope, purpose and approach for such a potential study. A maximum achievable cost-effective potential study also presumes that you have an avoided cost value with which to evaluate potential energy resources – that is clearly not possible until the solar valuation study is complete!

However if resources permit, it may be worth considering more than one scenario under which a solar value is calculated. For example a baseline at approximately current levels of development, and a medium-term scenario of relatively robust build-out. The purpose of that approach would not be to predict how much solar will be built (which is heavily dependent on the policy context, which is evolving rapidly in Maine) nor presume the right amount, but to illustrate how (or whether) the value of distributed solar might change.

Perhaps at least as important as considering some build-out of distributed solar in Maine, is considering the likely amount of distributed solar in ISO-NE as an input to the incremental/unit analysis. (The ISO-NE Distributed Generation Forecast Working Group has put out an initial set of estimates that, while flawed, provide some useful direction.)

The Commission may want to consider the extent to which distributed solar generation in other ISO-NE states without matching capacity growth here could shift costs to Maine ratepayers through changes in proportion of load. The Vermont solar study identified such as cost shift, to the benefit of Vermont ratepayers.

## Question 8 ó Reliability

TASC provided an excellent summary of what "reliability" can mean in this context, as well as citations to several useful studies. We believe CMP's comments exaggerates the degree to which distributed solar is new and/or not well understood from a reliability perspective. Although transmission systems in different jurisdictions have important differences, the reliable performance of distributed solar can be evaluated using places with much longer experience than our own, and at levels of solar penetration much higher than Maine is likely to experience in the next five or even ten years. Furthermore, given the ongoing maturation of PV technology from a performance perspective, past experience is likely to under-estimate reliability of distributed solar.

This concludes our comments at this time and we look forward to additional opportunities to provide input to the Commission on this important study.

Respectfully submitted,



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