August 7, 2017

Samantha Meserve
Department of Energy Resources
100 Cambridge Street
Boston, MA 02114

Dear Ms. Meserve and Department of Energy Resources,

I write to you as an urban planning student and advocate who wants to see rapid decarbonization of MIT, Cambridge, and Massachusetts. I applaud the efforts of DOER to promote new renewable thermal technologies, and I generally think that the draft regulations will help to accelerate heat pumps and solar thermal within Cambridge.

My one comment regards an assumption on page 10 of the intermediate/large metering guide, which states that the calculations assumes that all electricity is non-renewable:

> "All electricity supplied by the ISO-NE grid to a RTGU including any auxiliary systems is considered to be non-renewable fuel and must be subtracted from the net useful heat generated. The amount of non-renewable source fuel per MWh of grid electricity consumed by a RTGU is equal to the MWh electricity consumed at the site divided by the most recently published ISO-NE marginal grid efficiency, which at the date of this version of this Guideline is 0.44 MWh source fuel/MWh electricity delivered."

This assumption shows up later in the calculation of useful renewable thermal for several heat pump technologies, such as direct expansion air source heat pumps on (page 32):

3) Formula for Intermediate, DX ASHPs

$$E_{net,\,out} = ((COP_{OAT} * G) - G/0.44)$$

Note: All terms are the cumulative as-metered values. Unless otherwise indicated, all units in MWh

Where:

$E_{net,\,out}$ = Net thermal energy output equivalent

COP_{OAT} = The book value of the coefficient of performance at the outside air temperature as measured at the RTGU.

G = Grid supplied electrical energy

Conversion of site to source nonrenewable fuel per MWh grid electricity = G / (0.44)

This is a significant assumption. Taking the formula as is and assuming a COP of 3, if you use 1 MWhr of electricity you get 3 * 1 – 1/0.44 = 3 -2.72 = 0.28 MWhr of useful renewable thermal energy. But if you assume the electricity you are using is completely renewable, you get 3 * 1 = 2 MWhr of useful renewable thermal energy. After also including the multiplier of 3 for air source heat pumps, you would receive 0.84 Alternative Energy Credits, when a fully renewable electric system should receive a 9 AECs.

As written, this formula disincentivizes efforts to combine renewable thermal technologies with bulk clean energy purchasing, which we are pushing MIT and other institutions to pursue. I would suggest that rather than assume that all electricity is generated from fossil sources, the formula should adjust based on the emissions mix of electricity purchased for the building. This would create a strong incentive to pair renewable thermal technologies with clean electricity procurement. If you are concerned that accurately accounting for marginal emissions is important, you could also adjust the formula based on locally-generated renewables that are used to partially or fully power the heating equipment.

Thank you for consideration of my comments.

Sincerely,
Adam Hasz