Advanced Heating and Hot Water Systems

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Public Comment on the Massachusetts ALTERNATIVE ENERGY PORTFOLIO STANDARD (APS)

Introduction: I am Randy Hagen, the National Sales Manager of the Solar Products Division of HTP, INC. HTP, INC is a Massachusetts Manufacturer based in New Bedford, MA. Established in 1974, HTP is a manufacturer of advanced heating and hot water systems, including solar thermal flat plate collectors and solar storage tanks. HTP Inc employes approximately 200 employees in its 2 Massachusetts facilities and distributes our products throughout North America and some export markets as well.

Please accept our following comments on the proposed amendment to the Massachusetts ALTERNATIVE ENERGY PORTFOLIO STANDARD (APS), specifically the GUIDELINE ON METERING AND CALCULATING THE USEFUL THERMAL OUTPUT OF ELIGIBLE RENEWABLE THERMAL GENERATION UNITS – PART 1.

Our specific recommendation is to change the basis of the energy calculation from SRCC's OG100 Category "D" to SRCC's OG100 Category "C."

The current language and formula for the energy calculation is below:

1) Standard Equation for Calculating AEC Output for Small Solar Thermal RTGUs
The AECs from Small Solar Thermal RTGUs, both domestic hot water systems and combined domestic hot water and space heating systems are calculated by using the annual energy estimate provided by the Solar Rating and Certification Corporation (SRCC) OG-100 Solar Collector Rating (or equivalent entity). The calculation of AECs is based on the SRCC OG-100 Solar Collector Rating for Category D, Mildly Cloudy, and Medium Radiation. The equation for the calculation of small solar thermal AECs is as follows:

$$\mathrm{AECs/yr} = \frac{\mathrm{R}}{1,000} * \mathrm{C} * \mathrm{SOF} * \mathrm{S} * \mathrm{M} * \mathrm{t}$$

Where:

R = OG-100 Solar Collector Rating for Category D, Mildly Cloudy, Medium Radiation (kWh/panel/day)
C = Number of solar thermal collectors
SOF = Surface Orientation Factor, calculated based on the azimuth and tilt of the solar thermal collectors, see section below
S = Annual, average solar access, as determined by a Solar Pathfinder or comparable device
M = the appropriate multiplier for Solar Thermal Hot Water RTGUs in the Department's *Guideline on AEC Multipliers for Renewable Thermal Generation Units*
t = Time, 365 days

Our specific recommendation is to change the basis of the energy calculation from SRCC's OG100 Category "D" to SRCC's OG100 Category "C."

The purpose of this "Guideline" is to ensure uniform, accurate, reliable, and verifiable measurements of RTGU performance for determination of Alternative Energy Portfolio Standard (APS) benefits, as appropriate to RTGU size and expense. The use of Category "C" more closely represents the overall year round conditions experienced in Massachusetts than does Category "D." These SRCC categories are intended to provide users with an instantaneous energy output number for varying climates. Use of Category "D" assumes that the average air temperature is 90 degrees F cooler than the solar collector (Ti-Ta), while Category "C" assumes that average air temperature is 36 degrees F cooler than the solar collector (Ti-Ta). The year round weather in Massachusetts is more closely aligned with Category "C" than Category "D." The use of Category "D" creates an unfair advantage for evacuated tube technology over flat plate technology. When performance is properly compared under Category "C," the year round performance of flat plate and evacuated tube collectors are nearly equal.

HTP, Inc. sells both types of solar collectors, flat plates and evacuated tubes, but we manufacture flat plate collectors. There are no evacuated tube collectors manufactured in United States. Since we handle and sell both technologies, we can speak from experience about the comparable performance. Flat plate collector technology should not be penalized by applying the wrong Category when determining the useful thermal output of these renewable thermal generation units.

There are many third party solar thermal evaluation services that support the fact that Category C is more appropriate than Category D in determining system performance in Massachusetts. Modeling companies such as RetScreen, T-Sol and F-Chart allow users to compare system performance in various locations. Running these simulation software models proves that the performance of flat plate collectors and evacuated tubes are nearly identical in Massachusetts for year round applications. This is further supported by the SRCC when calculating a solar system's energy performance using their OG300 rating system and selecting Massachusetts as the installation location. Using the SRCC's OG300 annual rating numbers, an average flat plate system installed in Massachusetts can produce 15,324 Kbtus annually while an average evacuated tube system produces 15,358 Kbtus annually which is nearly identical performance. If, on the other hand, Category "D" is used which doesn't recognize the actual weather in Massachusetts, the same evacuated tube system is shown to produce nearly 40% more energy year round than a flat plate collector. The use of Category "D" is not correct and disproportionately favors one technology over another.

In conclusion, I am overall supporting the language in the **ALTERNATIVE ENERGY PORTFOLIO STANDARD (APS),** with the recommendation of changing the basis of the energy calculation from SRCC's OG100 Category "D" to SRCC's OG100 Category "C" in the GUIDELINE ON METERING AND CALCULATING THE USEFUL THERMAL OUTPUT OF ELIGIBLE RENEWABLE THERMAL GENERATION UNITS – PART 1.

Respectfully submitted,

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