

## The American Gas Associations (AGA) Reasons for the approval of Addendum aj to the ASHRAE 189.1 -2020

AGA believes that it is premature to adopt Addendum aj as a jurisdictional option along with normative Appendix M. If adopted by an AHJ, this section would supplement Section 7.5.2.1 and allow the electricity greenhouse gas emissions of both the proposed design and the baseline building to be calculated using long-run marginal emission rates (LRMER). The LRMER data in normative Appendix M is derived from the Cambium database developed and supported by the National Renewable Energy Laboratory. In reviewing the NREL Cambium database, we have identified a number of reasons and concerns that need to be addressed by NREL before the LRMER data is considered for inclusion into the 189.1 document. These are as follows:

- The Cambium database draws from the use of weather data from only 2012. For modeling space heating, the 2012 winter heating season was amongst the warmest compared to the 30-year average in the last decade (2012 had a national heating degree day or “HDD” value of 4144 vs. the 30-year HDD average of 4734). In addition, the average time spent below freezing was far shorter in climates east of the Rocky Mountains that year which would substantially underestimate the average demand from all types of electric space heating, especially heat pumps. Additional weather years should be used to allow for studies where winter temperatures reach and exceed average temperatures.
- Time of day and time of year can also have an impact on emissions rates compared to the annual averages. In the northwest, where the average generation emissions rate is already low, the 2021 long-term marginal rate for the entire year was .44 lbs/kWh. In the month of January, when space heating demand is at its highest, the average long-term marginal rate is .61 lbs/kWh and can be as high as .71 lbs/kWh. The evaluation of any appliance would require special marginal rates to fit its typical use pattern for each local climate.

- The Cambium database includes total state end-use demand by 2050 for any given hour for that year. The model was only stressed tested based on a simple 10% increase to this demand forecast. Depending on the climate, time of use, and weather year, this level of stress test does not consider full or partial-scale electrification.
- The Cambium model allows for the maximum amount of energy resources of any type to be built given it fits within a range of expected operating costs and policy constraints. Land use is not a major factor, which can result in an overestimation of renewable generation being incorporated into the forecast either at a higher level than currently possible or faster than it may likely be implemented.
- The model also assumes full compliance with any lawful state low-carbon policies. This means there is zero tolerance for setbacks or failure to execute any policies over time. While it is very important to evaluate what is possible, the baseline assumes the national average grid mix will decarbonize by half in 2030 (seven years from now). The newest NREL model starts in 2024, dropping to 330 kg/MWh and 156 kg/MWh in 2030. The 2020 EPA eGrid database reports current emissions for that year averaged 374 kg/MWh.
- While the NREL ReEds model is not new, the public use of the model after running it through a separate model called PLEXOS is new and should be evaluated over time for predictive accuracy before use. Three years of data, while factoring in a global pandemic, changes in low-carbon policy, and fluctuating weather is not enough to show a reliable method for estimating current or future marginal emissions rates. Running the model either retrospectively or waiting for more data to be reported in real time may help assess the model's real-world accuracy.

In addition to these concerns with the requirements listed in Addendum aj, NREL itself, also list a number of short comings in Section 7.5.2.2 of the Version 2021 of the Cambium Documentation that reports on their own view of short comings and qualifications of the data that its program produces. These short coming need to be addressed before information and data produced by NREL is to be included as a requirement for code compliance.

Finally, using the LRMER for electricity but keeping the historical factors for natural gas, propane and other fossil fuels is not appropriate. Comparisons all energy sources need to be made on an equal basis.

For the above reasons, AGA opposes the adoption of proposed Addendum aj.