

Comments of Lawrence G. Spielvogel, PE on DSM/EE Working Group Proposal

Docket Number M-00051865

May 8, 2005

Following please find my comments on this proposal in response to the request by Carrie Beale in her email of May 2, 2005.

The “Technical Reference Manual” (TRM) you propose to adopt is fundamentally flawed, not economically or technically justified, practically naïve, and is a disservice to the ratepayers and taxpayers of Pennsylvania. I happen to know something about these issues, having served on and chaired for more than half of the past 30 years the committee that is responsible for setting the national energy efficiency standards for buildings and equipment referenced in the 1992 Federal Energy Policy Act and now adopted and in effect in Pennsylvania.

Unfortunately, it appears that you are getting all of your input from biased, self-serving, and unknowledgeable sources, and have made little or no attempt to independently verify or justify what is being proposed. There does not appear to be any effort made to seek input from (1) those entities that will be forced to pay for these measures, and (2) those entities that have independent knowledge of the issues covered. The advice and recommendations you have received so far appears to be worth about what you paid.

Who determines what are “proven existing methodologies and assumptions?” What are “best practices for existing equipment?”

Where are the engineering, technical, and economic analyses to support every one of these measures for all ratepayers in all locations in Pennsylvania?

It is not possible to accurately or adequately measure or even estimate savings, since you cannot measure what is not used.

For example, will you accept a premium high efficiency 100 horsepower motor installed on (1) a fire pump, or (2) on a spare pump? Both applications are very common in commercial buildings. Nevertheless, common sense says that high efficiency motors for these applications are a waste of money and resources. These commonly used motors do not operate for the 4,500 hours per year you assume.

Many of the measures proposed are no-brainers in some applications, and at the same time are not justified in other applications. For example, high efficiency lighting in apartment house corridors is usually worthwhile, but the same high efficiency lighting in apartment house storage areas is not usually worthwhile. Will you provide the same incentive for both?

Measurement or estimation of distributed generation “savings” is not nearly as simple as you think. The customer side of the billing meter with distributed generation usually includes substantial (1) parasitic loads, and (2) changes in the way energy is used, such as the use of waste heat from generation.

Assumptions about how much electricity might have been used in a demand response program are not usually reasonable or realistic, since what is being used is usually a collection of many constantly varying loads. For example, someone could claim to use an electric steam boiler to serve an absorption chiller, and then when a demand event occurs, they would switch to an electric chiller, and still get credit.

Depreciation and useful life are also very nebulous terms. Some equipment has a useful life that is much shorter or much longer than anything you assume.

Meters do not measure “any decline in the performance of the equipment.” They measure what is used or what is produced, and many types of equipment require multiple types of meters. In addition, since the output of the equipment often varies over time, measurements of performance decline cannot be accomplished accurately or reliably, and even if they are, who is going to interpret and review the results for the life of the measure?

It is obvious to me that most of the assumptions and data used have been “cherry picked” without regard to and deliberately ignoring generally accepted engineering practice and published authoritative data.

Residential Technologies

The assumption that higher efficiency air conditioning units will be downsized and used for fewer hours is not realistic or reasonable. If anything, the opposite will be true.

While heat pumps are included for commercial and industrial buildings, they are not included for residential buildings, despite their high degree of saturation and use in residential construction here.

While the Efficiency Vermont basis for savings has not been evaluated, I doubt that it has been independently verified or has been evaluated for Pennsylvania conditions or pricing.

Commercial and Industrial Technologies

For commercial HVAC systems, and especially for the three phase units commonly used in commercial buildings there are no Federal SEER or HSPF standards, contrary to the proposal.

If residential HVAC (for buildings usually occupied around the clock) is assumed to operate 600 hours per year, then the assumption that commercial HVAC (for buildings usually occupied about one quarter to one third of the time) operates for 1,000 hours per year does not make much common sense.

The HVAC EER’s for unitary equipment shown in the proposal that are claimed to be based on Pennsylvania Code (IECC 2003) are simply not shown correctly, and then only apply to air cooled, but not water cooled HVAC.

Similarly, the performance data for larger HVAC equipment attributed to the Pennsylvania Code (IECC 2003) is neither correct nor complete.

The increased cost per ton shown for HVAC equipment does not reflect the marketplace today, especially with the recent rapid increases in the cost of raw materials.

In addition, the basic performance and efficiency rating standards for commercial HVAC units referenced in IECC 2003 are no longer used, and the equipment manufactured and sold today is rated on different standards. Thus, it is not possible to compare or evaluate these proposals.

The assumption that all electric motors operate 4,500 hours per year is absurd. The efficiency also varies with the loading on the motor, which can and will change considerably over time.

The increased cost for electric motors does not reflect the marketplace today, especially with the recent rapid increases in the cost of raw materials.

The allowable Lighting Power Densities in the 2003 IECC and ASHRAE/IESNA 90.1-2001 differ by more than 20%, and are not the same, as implied by the proposal for commercial lighting.

The assumption that lamps and ballasts last for 20 years is not realistic. The assumption that office lighting operates for more hours than retail lighting does not make sense. The lighting hours of operation shown for various building types bear no relation to generally accepted engineering practice or published authoritative data.

The assumptions about waste heat factor (WHF) for lighting are simply not correct. The heat from lights reduces the amount of heat required in winter. The heat from lights that enters the conditioned space varies depending on the type and location of fixtures. Much of the heat from lights also does not become a cooling load because Pennsylvania Code (IECC 2003) and just plain customary practice requires the use of economizer cycles, which rejects much of the heat from lights without the use of cooling energy. In addition, of course, this proposal mistakenly assumes that all space that is lighted is also air-conditioned, which is not always correct. Finally, ASHRAE does not have a lighting waste heat factor, nor is an article in the ASHRAE Journal an authoritative reference.

Summary

An in-depth and independent evaluation would show many, many more flaws in your proposal.

Many of the measures, procedures, and protocols you propose will create multiple schemes and opportunities for gaming the system.

It is also obvious that neither the PUC nor the “Working Group” have paid much attention to the published and unpublished autopsies of other similar DSM and efficiency programs in other states that show these programs are not as successful as the advocates and promoters would have you believe.

In summary, considerably more effort and evaluation is required if you are going to responsibly implement this program. **Please do not help us any more!**

Respectfully submitted,

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