

EEAC 6/27 Public Comment Session

My name is Hank Keating, I'm an architect and multi-family housing developer, recently retired from Trinity Financial. I've been studying Passive House for over 10 years and have three significant experiences with it. I designed my own Passive House which I've occupied through 3 winters without ever needing to turn on the heat. I've overseen the Passive House inspired design and construction of 160 affordable rental units in Taunton and, after 3 years of monitoring, demonstrated that they require on average 85% less heating energy than comparable LEED Gold projects in this State. And I'm currently consulting back to Trinity on the design of a 277 unit, 25 story, affordable, mixed-use rental project in New York City. Our current Utility Analysis Report shows the Passive House design reducing electric consumption by over 1.7M KWh and reducing operating costs by over \$400,000 per year. So I am a believer – Passive House is truly the paradigm shift we need across the country.

I have reviewed the Draft 3 Year Plan, the 6/20/18 Consultant Team comments and the Program Administrator Response to the Draft Plan, I am very encouraged by the emerging commitments to include programs that incentivize Passive House buildings. I realize that much remains to be done to develop the details of the proposed programs supporting

Early Design Charrettes,

Design Team Incentives,

Cost-Share Building Modeling and Technical Assistance,

Design Savings Based Performance Incentives for Building Owners

Monitoring Based Commissioning and Retro-commissioning Incentives

and Passive House training programs for designers and contractors

The very good news is that these are the right program categories. The challenge will be to develop the individual program details so that they will be available for customer use in the first quarter of 2019.

I'm going to offer some detailed comments that I think should be addressed during final program design.

First, I concur with the Program Administrator's recommendation that the focus should be on new multi-unit and mixed-use projects because PH metrics can be achieved more cost effectively on larger facilities. One caution on mixed-use projects – these often include retail spaces that do not have a tenant at the time of design and may not for months after construction – could be a clothing store, a restaurant, or a grocery store with dramatically different energy requirements. In this situation it makes sense to carve out these spaces from within the Passive House envelope and PHIUS has recognized this approach.

Many of these multi-unit, mixed-use projects will fall into the High-Rise Pathway. In several places the Draft Plan implies that these projects must be “master-metered”. I've gathered that this may be an indirect way of saying that these cannot be condominium buildings where each unit is owned by an individual and therefore an incentive program would need to be administered with each owner. That clearly is unworkable. But, the High-Rise Pathway must recognize the typical multi-family residential rental building where each unit has at least its own electric meter (as is required by most affordable housing financing programs) and market-rate units are often sub-metered for all utilities. Regardless of the metering configuration, the developer should get an incentive payment calculated by the difference between the Passive House modeled energy performance and the “average” comparable building in Massachusetts.

This raises 2 questions – how will the projected energy use be modeled? For Passive House projects, the modeling will have to be either PHIUS+ WUFI or PHIs PHPP. Is that the intent? Then, how will the “average comparable building” energy use be determined? Will that be provided by the Project Administrators or will it require additional modeling of different building envelopes and systems determined by who and modeled in what program? These details will determine how customer friendly the incentive program will be.

The Draft Plan envisions that the Low-Rise Path will have a HERS rater working with the owner / builder to make energy efficiency choices. For the High-Rise Path the owner / builder will be assigned a “program account manager” and work with the Joint Management Committee. The important thing here is that for a Passive House project, these people must be well trained CPHCs or their

equivalent. If not, then another layer of consultants will have to be added to the team.

This is a good segway to training. The Draft Plan speaks regularly to the need for “education and training” to support Passive House new construction. The Project Administrators Response suggests that the required training is readily available and duplication efforts should be avoided. We wish this were the case. Currently training falls into 3 categories - Certified Passive House Designer/ Consultant (CPHC), Builder training, or Rater/Verifier training. Variations are offered by PHIUS and PHI but to date they are never frequent and often in another state. There is a clear need for more CPHC training for professionals such as architects and mechanical engineers. Not everyone on the project team needs to be a CPHC but they do need to understand what Passive House is, how it works, and the critical differences between it and current building practices. For example, structural engineers need to understand that many of their typical details create significant thermal bridges that must be minimized in a Passive House building. They need to learn to think differently about their details from the beginning of the design process to avoid costly changes later in the design process.

General Contractors and key subcontractors need Passive House training as well. Without it, they may submit artificially high bids because they are trying to protect themselves against something new and unknown. On the other hand they may look at the building plans and not see dramatic differences and under-bid and then look for change orders during the project, or worse, simply not achieve the Passive House metrics and fail certification. Current builder trainings tend to be too far and few between and tend to be oriented toward single family Passive Houses not multi-family. Multifamily Passive House can really take off with the properly design incentives in the next 3 Year Plan, but readily available training for the contracting community will be a critical component of its success.

Early Design Charrettes Incentives are a very valuable tool to get the entire design team and, if at all possible, the general contractor at the table at the beginning of the design process. If these participants come to the table with some Passive House training, all the better, but at least the Charrette offers a chance to describe the Passive House goals to the entire team and get buy in.

The Program Administrators response calls for Design Team Incentives to motivate architects and engineers to take the time to integrate efficiency into building plans. I'm not sure what this means, but it would be good to recognize that architects and engineers do need to spend more time designing a Passive House project. Hopefully by the end of the 3 Year Plan this time premium will not be necessary, but early on it might make sense offer some supplemental design fees to the architects and HVAC engineers.

Monitoring Based Commissioning Incentives are critical for Passive House projects. The systems need not to be complex, but they need to run properly. In addition, the entire industry needs long term monitoring of Passive House projects to clearly demonstrate the modeled savings. Affordable housing agencies and lenders will not vary rent allowances or underwrite lower operating costs until they see real multi-year data. Projects should be funded upfront to pay for monitoring equipment and secure 5 years of monitoring.

There are many details to work out to create viable Passive House incentives programs, but it will be more than worth the effort. The 50-60% energy savings that multi-family Passive House offers will be a game changer, the paradigm shift that the 3 Year Plan calls for. No other single approach can offer these savings. The LISC proposal asks for \$5m for affordable Passive House projects over the 3 Year Plan. Subsequently \$5m for market-rate Passive House has been suggested. If these are the funding levels adopted in the Final Plan, I believe that the Program Administrators will have missed a major opportunity, leaving millions of KWH of savings "on the table". I believe that these numbers could easily be tripled to \$15m for both affordable and market-rate multi-family projects.

It is my hope that we, the Passive House Massachusetts community, can help the program managers develop Passive House Incentive Programs that will attract the attention of developers, lenders, designers and contractors and lead the way to thousands of Passive House units across the Commonwealth.

Thank you for your attention to the potential of Passive House to dramatically reduce the energy we consume and the greenhouse gases we emit from the building sector in this State .

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