

Good Afternoon,

My name is Betsy Harper, and I'm the fourth – and last – speaker who is a member of the Passive House MA board. My comments today are those of my own and do not represent in any way the opinions or policy of my state agency employer.

My role is to be inspirational to you, Council members, in pushing the PAs a bit beyond what they have committed to date to in supporting Passive House.

Building on ever expanding levels of success in Europe, the Passive House movement in the US started in 2003. It was at first a design and construction method used on single family homes. The cost of construction WAS at a premium. Owners were early adopters or retiring folks who built dream houses with several goals – that of personal CO2 reduction, a lifestyle of comfort, improved IAQ, and a huge leap in durability. Since then, several geographic markets such as the Pacific Northwest, Chicago, PA, and NYC have seen dramatic adoption – first by single family homeowners, and now by Low Income MF developers. And the price has come down – dramatically. We can now say that that a LI MF developer can design and build on budget a building *without any cost premium to a comparable building*. In fact, because of the low surface to volume ratio, PH is a *natural fit* for low budget, LI MF developments.

Again, my role today is to convince you that the inflection point for MA is NOW. Please look at the graph that I handed out. You can quickly see the dramatic growth nation-wide. In business school, we called this the hockey stick effect. Once you get past an inflection point – in our case, 2016 – growth can and will become *exponential*. (As a footnote, this chart depicts approximately 75% of the projects in the US, so it is *understated* by approximately 25%.)

Where does MA sit in this graph? Admittedly to date in MA, there have only been few single family homes and a few modest MF developments which have achieved PH certification. But we have under development a very large scale Winthrop Square mixed use development which will be PH for the commercial portion. And the contractor for 240 units of LI MF housing has broken ground on Concord Ave in Cambridge – a beautiful location overlooking Fresh Pond.

I'm here to encourage each one of you to take this opportunity to *dramatically* save both fossil fuel emissions and kWh. A single family home of 2,300 SF can be heated with the kWh used by a hair dryer. This isn't a 20% improvement opportunity. This is an opportunity for a 70% reduction of heating energy. As a result, PH has now been given extensive financial incentives in several European countries.

In my last minute, I'm going to tell a personal story. I've bought an oil-heated 2-family in a modest community in Cambridge. I specified to my realtor that the existing house *had* to be oil-heated because I was looking to dramatically reduce the CO2 footprint of the house. I will have to tear it down because I'm creating a dry, conditioned basement. And I will use a panels made in a factory – with insane insulation layers and high quality control. I have a budget, and I'll keep it, as I'm re-building a 2-family rental for moderate income renters. The first floor will be "Accessible" for a renter with a disability. And the crowning touch is that the envelope will be all PH until you get to the exterior shell. The exterior details will create a small but gracious

Victorian with historically accurate details. PH doesn't have to be boxy and ugly. I and others are proving that PH can be expressed in a myriad of architectural styles.

But as proud and excited as I am about my little personal project of a 2-family house, single or 2-families is not how MA will achieve critical scale. Other 1-4 unit developers will not accept the cost premium that small scale PH buildings (1-4 units) still experience. The PAs have the opportunity and should be required to support developers of both single and MF housing, with specific commitments to increasing incentive levels in the Three Year Plan. There is *no* other solution that will enable such a dramatic savings in both therms and kWh. We currently are facing some bumps in the road wherein the PAs algorithms don't match the extensive modeling that PH requires. The PAs will continue to use their standard eQuest model, but they need to work closely with PH modelers to understand the deep savings that eQuest doesn't identify. Thank you in advance for this hard work! It will need to be an iterative process that continues throughout the three year plan. A commitment to this work needs to be specifically called out in the Three-Year Plan.

Passive House WILL ultimately become as well-accepted as LEED in the US. *You* have the opportunity to require the PAs to work hand-in-hand with PH professionals to *create* that change. Thank you.

Betsy Harper

Passive House MA Board Member