

12/8/20

To: Mass EEAC

From: Hank Keating, AIA, President, Passive House Massachusetts

EEAC Three-Year Plan 2022-2024

Re: Passive House Retrofit Programs

The first two years of the Mass Save Passive House Incentive Program (PHIP) has been an unqualified success with over 75 projects including over 5400 units in the pipeline and there is another year to go in the current Three-Year Plan. The developers that follow through and complete certified passive house projects will produce buildings that will be healthy, durable, resilient, comfortable and extremely energy efficient. These buildings will not need the extreme retrofits that existing and current code buildings will require in the next 10 – 20 years to meet the State’s carbon reduction goals. But we also need to start retrofitting existing buildings in a deep way. Deep energy retrofits are very challenging – existing conditions vary widely, the building science can be complex, most will require occupied building retrofits and current costs are very high. These conditions are crying out for an incentive program: we have to begin this work as soon as possible. We are aware of and support the ambitious changes to the LEAN that have been submitted to the EEAC by Christina McPike and Darien Crimmin of the Winn Companies. This is a great proposal to facilitate the needed deep energy retrofits for affordable housing. To complement it we need two aggressive retrofit programs for market rate housing, one for one to 4 units and one for 5 or more units.

Retrofits can meet various passive house certification standards through PHIUS and PHI. Using the discipline of these standards provide critical QA/QC during the feasibility study, modeling, design and construction phases of a retrofit project. This assures that the resulting retrofit is healthy and durable while being energy efficient. Without this discipline, it is easy to imagine building science mistakes being made that could produce condensation and/or mold and less than predicted energy savings.

For the next Three-Year Plan we believe that the EEAC should work with Mass Save to create two Passive House Retrofit Incentive Programs (PHRIP) that includes full electrification and serious consideration of material decisions relative to embodied carbon. These PHRIPs should mirror the new construction Passive House Incentive Program for multifamily projects with 5 or more units. The incentive structures could be the same, but the incentive amounts per unit will have to be substantially higher as suggested below –

	5+ units	1-4 units
Feasibility Study - 100% reimbursement up to	\$10,000	\$7500
Modeling - 75% reimbursement up to	\$30,000	\$15000
Pre-certification reimbursement per unit	\$500	\$500
Certification reimbursement per unit	\$35,000	\$35,000

By way of example, and assuming that the Feasibility Study and Modeling reimbursements were maxed out, these values would result in total incentives of \$35,900 / unit for a 100 unit project and \$37,100 /unit for a 25 unit project. A 5 unit project that used all of the feasibility money and half of the maximum modeling funds would end up with a total incentive of \$40,100 / unit. A one unit project could get up to \$58,000 while a triple decker could get up to \$128,000.

These incentives are expensive, but we think that they are proportionally correct and of the order of magnitude necessary to incentivize early adopters to pioneer these critically needed types of retrofits. The goal of the PHRIP would be to get a few thousand units involved in finding cost effective ways to complete passive house retrofits during the next Three-Year Plan. This would develop the base of experience and knowledge that will be needed to convince the market that such retrofits are technically feasible. These efforts will determine exactly how much such retrofits really cost and how much energy / carbon / energy costs can be saved. With this knowledge, developed during the next Three-Year Plan, the EEAC / Mass Save / Non-profits / State and City governments can work to develop favorable financing programs for building owners to take on this work without the need for such a generous PHRIP.

Clearly, the cost / benefit ratios that the EEAC and Mass Save have typically used in the past to justify a program will not work for this PHRIP. It is time for the EEAC and Mass Save to add the language currently being considered in S-2500, An Act Setting the Next-Generation Climate Policy -

“...provided however that when determining cost-effectiveness, the calculation of benefits shall include calculations of the social value of greenhouse emissions reductions.”

Without this critical shift in perspective from saving money while saving energy to reducing carbon emissions, the State will never be able to meet its goals to mitigate the disastrous effects of climate change. Under separate cover we have submitted specific recommendations regarding revising the cost-effectiveness calculations.

The Energiesprong program in Europe is demonstrating that such deep energy retrofits are possible. The same approach is being tried in the State of New York through NYSERDA's very ambitious RetrofitNY Program which focuses on low to mid-rise, brick apartment buildings, a very common prototype in the NY market. The program is aiming to engage construction material suppliers and MEP supply companies in developing specific products to enable this energiesprong approach to be dramatically scaled up. RetrofitNY is projecting initial costs on the order of \$40,000 / unit.

Massachusetts has its share of 3 to 4 story brick apartment buildings which might fit the RetrofitNY model, but it also has many more diverse wood frame building types that form the critical mass of multifamily housing throughout our urban neighborhoods. These will require many varied solutions that the market can explore if there are these two PHRIPs to incentivize their efforts. Kick-starting these types of deep energy retrofits is probably the single most important effort that the Mass Save programs undertake to set the stage for the work needed to retrofit 10's of thousands of units across the Commonwealth over the next 10 to 20 years.

Passive House Massachusetts strongly urges the EEAC and Mass Save to seriously consider developing such Passive House Retrofit Incentive Programs for the next Three-Year Plan. It won't be easy, it won't

be simple, but it is necessary and the Passive House community is prepared to help in any way it can to design such a program for the 2022 – 2024 Three-Year Plan.