

# Harvard's HouseZero Project Will Turn Old Homes into The Eco-Friendly Digs of The Future

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As charming as an ornate Victorian or funky mid-century home can be, their aging windows and old-fashioned insulation can wreak havoc on your energy bills. The problem is that there are a lot of decades-old houses out there, and it's too expensive just to tear them all down and start fresh. A group at Harvard University is trying to do the next best thing: their HouseZero project aims to retrofit old homes to be the ultra-efficient, eco-friendly dwellings of the future — starting with their own headquarters.



*HouseZero was designed to use reclaimed white cedar shingles, ash and birch interior finishes, ultra high-slag concrete, natural clay plaster, and reclaimed brick and granite, all of which are high performance and locally available. [Image: Snøhetta/Plompmozes](#)*

[The Harvard Center for Green Buildings and Cities](#) claims that their project targets “the most rigorous efficiency standards ever achieved by a building retrofit.” And boy, are they rigorous. In the retrofitting of their pre-1940s house in Cambridge, Massachusetts, they plan to achieve 100 percent natural ventilation and daylight autonomy, near-zero energy use for heating and cooling, and zero carbon emissions — including in the materials they use.

What does this mean? As far as heating and cooling, the center compares the design to the way you might dress in layers: the house will automatically adjust itself to the seasons. They’ll completely replace the HVAC system with something that relies on temperature-radiant surfaces placed throughout the house, plus a geothermal heat pump for when things get really chilly.

Natural ventilation will combine with materials designed to absorb and release moisture. The house also won't use artificial lighting at all during daytime hours. Instead, it will be designed to maximize the sunlight coming in. It's designed to be so efficient, in fact, that they hope the [rooftop solar panel](#) will hardly be necessary.



*HouseZero will be model a healthy indoor environment with natural light, pleasing acoustics, and zero off gassing materials. Designed to be durable, functional, flexible, comfortable, and connected to its natural environment, the house will promote well- [Image: Snøhetta/Plompmozes](#)*

## The Greater Impact

Renovating your center's headquarters is nice and all, but the Harvard group has loftier goals. They point out that inefficient buildings "account for vast amounts of energy use and carbon pollution worldwide." And while new buildings are doing their part to reduce waste, few have explored the potential for retrofitting old homes. They think that if the U.S. housing market can retrofit existing homes to meet even some of HouseZero's requirements, we can save billions of dollars every year.

Of course, they don't expect every homeowner to turn their house into a shining beacon of eco-friendliness. The fact that HouseZero is an ongoing project — an architectural science lab, you might say — means that researchers can regularly monitor how well each of their changes are working to save energy, and recommend the best upgrades to homeowners who might like to pick and choose a few fixes to put into action.

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