

# Deep Energy Home Challenge

**How low can you go? Imagine** reducing the energy use in your home by **70-90%**. It is **possible** – and economically feasible – without using renewable energy. Super-insulation and Passive Haus principles can be applied to existing housing. In fact, homes that need a lot of rehab work are a great opportunity for cost-effective deep energy reductions. The Affordable Green Housing Center (AGHC) at Environmental Health Watch is challenging Cleveland area **green builders and homeowners** to see how low they can go in reducing utility bills and develop deep energy retrofit examples locally. We have the expertise and experience to help you achieve your goals. AGHC has partnered with the national **Thousand Home Challenge** to promote deep energy reduction case studies. Your home could be our next case study! Learn more at <http://thousandhomechallenge.com>.



**Deep Green and Healthy** HUD, EHW, Cleveland Housing Network, the Case Sears Swetland Center for Environmental Health, and Intwine Connect are partnering to achieve and study deep energy reductions in six lease purchase homes



**Ohio City Landmark District** Jen and David Hovis hired Matt Berges to achieve a deep energy reduction as part of their century home renovation. Financing was provided in part by the Cleveland Restoration Society and C.A.S.H.

**Why deep energy reductions?** Housing is responsible for **27% of carbon emissions** in Northeast Ohio. In order to meet long term carbon reduction goals to stop climate change, we need to go beyond standard weatherization in many homes and achieve greater energy reductions. It is **more sustainable**, more efficient and **more cost effective** to rehab an **existing house** then to build a new one. Deep energy reductions add about 30-40K to the cost of a substantial rehabilitation. Existing homes can be converted to **net zero energy** homes for less than the cost of building a new net zero energy home.

**You can put your home on the path to deep energy reductions.**

Even if it is not possible to do a complete deep energy reduction on your home all at once, there are unique opportunities over the life of a home to put and keep it on the path toward deep energy reductions. **Energy efficiency pays for itself and then some.** Utilize the immediate payback test: every month, your savings should be greater than your cost to finance the improvements. **Seal it tight and ventilate it right.** Major home energy efficiency improvements should include the addition of controlled mechanical ventilation for optimal durability and health. Once mechanical ventilation is installed, homes should be sealed up as tight as possible. The addition of mechanical ventilation enables maximum energy efficiency. **Look for the opportunity points** listed on the reverse of this handout. When replacing appliances, windows, and heating and cooling systems, go Energy Star or beyond. When re-siding, re-roofing, or waterproofing the foundation, add insulation.

# The **Opportunity** Points



**When major changes are made** to a home, **consider opportunities** for **energy efficiency** upgrades. It will be ***much more expensive*** to make the energy efficiency upgrades at a ***later*** time. Homes that need extensive renovation work represent important opportunities for cost effective energy savings. For most homeowners, major improvements happen ***infrequently*** in the life-cycle of a home.

- **When replacing appliances and fixtures** make sure they conserve water and are Energy Star rated
- **When replacing mechanicals**
  - First put all focus on maximizing insulation values
  - Ensure that furnace is not over-sized (based on improved insulation values you expect to implement)
  - Locate all HVAC equipment and duct work in conditioned spaces and remove any below-slab duct work
  - Remove duct work from outside walls when possible
  - Evaluate tank vs tankless water heating
- **When excavating** to waterproof or repair a foundation, take the opportunity to insulate the exterior of the foundation. In some cases the foam may only make sense below grade (in line with the rubber used for soil flashing) but in other cases the greatest benefit may come from running the foam board all the way up to the bottom of the siding.
- **When replacing siding**, weigh the benefit of installing a complete layer of rigid foam board along with a house wrap, to achieve a continuous thermal barrier over the entire building envelope. It is already typical for vinyl siding installers to use thin layers of foam for leveling, but if this detail were also treated in a way that insulation benefit could be gained (and greater air sealing), the added cost would be minimal compared to the added benefit.
- **When replacing a roof**, don't miss the opportunity to improve the performance level of attic insulation. With the right details, there may be great benefit to creating a fully conditioned, thermally broken, vented or non-vented attic, with rigid foam board installed below the shingles.
- **When insulating an attic that is not conditioned:**
  - Be sure that air sealing takes place first
  - Be sure that bath fans are properly exhausted to the exterior (not disconnected in the attic)
  - Consider the use of a pre cast Styrofoam hatch/access
  - Consider upgraded insulation levels if funds allow
  - If HVAC ducting is located in the attic, include this duct work in the conditioned space
  - When the furnace is located in the attic, consider the value of re-locating it (when it is an option)
- **When faced with a gut renovation** on the interior, but when the outer shell is in good shape, consider installing a layer of rigid foam under the drywall. Make use of the Energy Star thermal bypass checklist.
- **When installing plastic over dirt in crawl spaces** or **when pouring concrete** for a basement floor, consider the benefit of rigid foam below the concrete or above the plastic.