

**Passive Homes are as diverse as they are comfortable!**



## Affordable

Choices such as kitchen cabinetry and countertops or siding materials likely have a bigger impact on initial cost than the upgrades associated with Passive House. And the upgrades can be offset by reductions in heating and cooling equipment costs. Dramatically lower utility bills often outweigh any added mortgage expense. Indeed, the cost of ownership may be lower for a Passive House starting the first month. And if (when?) utility rates go up, your savings actually increase!

## Versatile & Resilient

Passive House does not dictate a particular style or construction method leaving folks to be very creative in their designs. Passive House is increasingly being used in retrofits and for non-residential buildings such as schools, office buildings, manufacturing plants and hotels.

Power outage? No problem! Because Passive Houses are so well insulated, they will stay comfortable for hours, if not days or weeks during power outages—even in the dead of winter.

## Quality Assurance

The Passive House Institute and its network of Accredited Building Certifiers offer quality assurance for Passive House buildings. You can be sure that buildings having attained the Certified Passive House designation have met stringent quality criteria.

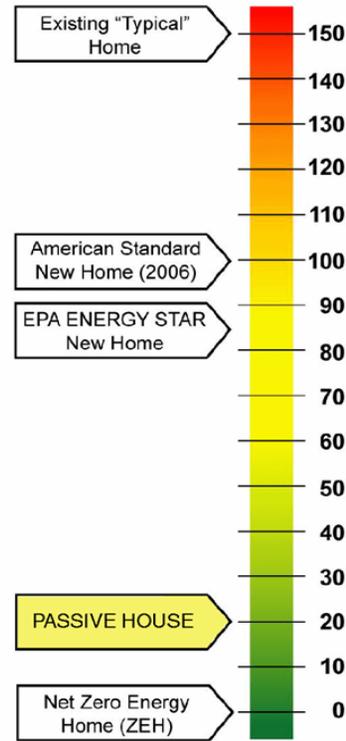
## Sustainable

A Passive House uses about 90% less energy than a typical home for heating and cooling. As reductions in energy use lead to reductions in greenhouse gas emissions, Passive House is a truly sustainable alternative to conventional construction.

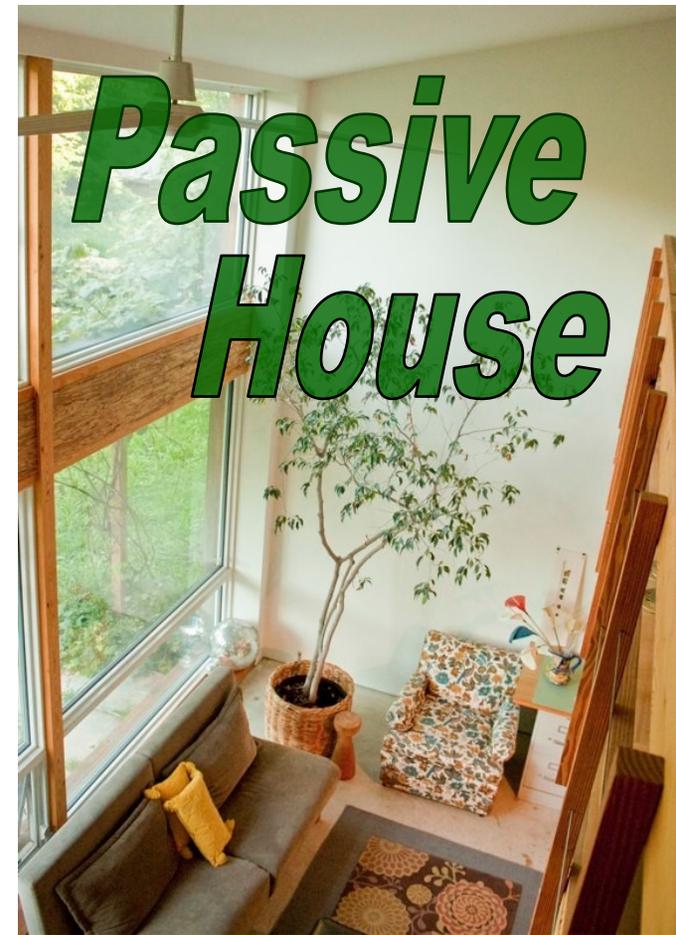
## Net Zero Energy

Many Passive Homes are also equipped with renewable energy systems, such as solar hot water and solar electric (PV) systems. If properly designed, these renewable energy systems can not only bring your house to Net Zero Energy, they can also provide hot water and electricity during power outages.

### HERS Index



\*HERS = Home Energy Rating System



**"Comfort without the Gizmos" ...or High Energy Bills!**



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# Welcome

to the exciting world of Passive House\* Design! We hope you enjoy this introduction and hope it makes you hungry to learn even more about the principles and many benefits of the Passive House Approach.

## Comfort & Health:

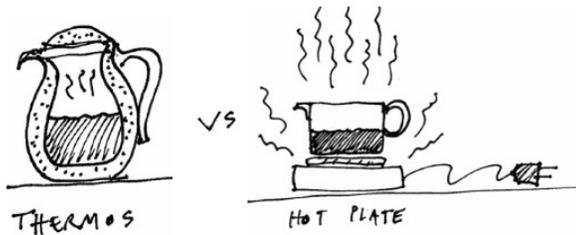
In Traditional Design, an engineer “adds on” the Heating, Ventilation and Air Conditioning (HVAC) systems after the architect has otherwise “finished” designing a building.

Passive House Design is fundamentally different.

Early in the design phase, the Passive House Designer determines “how well must we build the house to ensure Health and Comfort without adding conventional heating and cooling systems.” In this way, Health and Comfort are literally designed into the building components.

## Simplicity

Passive House is new and different, which has led some to believe it is complicated. And while a Passive House Designer may have to do some fancy calculations, the approach is elegantly simple. Much as an insulated Thermos “passively” keeps its contents hot or cold, a Passive House is built to keep the heat in in winter - out in the summer.



The most difficult part about Passive House Design may simply be believing that it is possible. Rest assured that since the first example built in Germany in 1990, tens of thousands of successful Passive House buildings have been built around the world.

\*Passivhaus in German.



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# Passive House: Comfort without the Gizmos



## The Key Concepts

again, are pretty simple—as outlined below.

### Super-Insulation

Probably the most obvious step in making a home more efficient and comfortable is to add more insulation. Passive houses typically have **more than double** what you would find in other homes. Luckily, insulation is usually a small part of the house budget and lasts for the life of the home.

### Thermal Bridge Free Design

Simply making conventional walls thicker has diminishing returns largely because wooden parts like studs act as “thermal bridges” letting heat transfer through the walls. Designing thermal bridges out of the house maximizes insulation, yields pleasant, even temperatures and helps to reduce the chance of mold and moisture damage.

### Airtightness

Passive Houses are **ten times “tighter”** than typical new built homes. Eliminating air leaks isn’t exactly difficult, but *must be designed* into

the house. Airtight homes boost energy efficiency while preventing draughts and moisture damage.

### Ventilation with Heat Recovery

To ensure good air quality, **all homes need mechanical ventilation-period!** Typical Passive House ventilation systems provide plenty of fresh, pollen and dust-free air with maximum energy efficiency by recovering the heat (“coolth” in summer) of the exhaust air. Humidity recovery is also an option.

### Passive House Windows

Windows found in Passive Houses are two to **three times better insulated** than typical new home windows! Strategically positioned, these highly insulated windows also do their part to make optimal use of the sun’s energy.

*With dwindling energy resources, risky extraction methods like fracking, global climate change and rising energy costs, there has never been a smarter time to build a high-performance, energy-efficient, comfortable Passive Home.*