



Hill House was built without cutting down any trees. Instead, it blends into its environment. | Photo source Snegiri

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PASSIVE HOUSE BLENDS INTO THE WOODLAND

 PROPERTY & CONSTRUCTION

A passive house, recently built in Russia, uses a living roof and blends passive design with high tech to save energy

Spotted: Using designs that draw on sunshine, shade, insulation and ventilation, passive houses maintain a comfortable temperature while using just a fraction of the energy of a traditional home. Given the push for sustainability, as well as rising energy prices, it's no wonder that passive building methods are rising in popularity. Snegiri Architects, based in Saint Petersburg, Russia, has recently finished work on a passive residence called Hill House, which demonstrates the utility of passive techniques in a forest environment.

Hill House is located in a woodland, yet was constructed without felling any trees. Instead, they are incorporated into the home's layout. The house also boasts a living roof, topped with a grass carpet and a range of plants, including sedum and chamomile. Both the plants and the substrate material are composed of local materials. The slanted roofs back onto the landscape, and combine with the home's wood-paneled façade to blend naturally into the environment.

Other passive techniques include positioning the terrace and rooms towards the sun, to take advantage of passive warming. The building is ventilated with an air recovery system that uses an air-to-air heat exchanger to recover normally wasted heat while at the same time supplying fresh highly filtered air improving the indoor environment. The frame of the house is insulated with mineral wool and sheathed with larch soaked in natural linseed oil, and the house includes a multi-stage water purification system.

Hill Houses's architects [describe](#) the owner of the property as someone who is interested in both history and technology, and who encouraged the design of a house that would suit both smart

technology and vintage furnishings. “The customer of the project is a person who is not indifferent to innovations, a fan of modern technologies and gadgets ...In addition to his love for the latest achievements in science and technology, the client also respects history, being a passionate collector of paintings and vintage furniture that will be vividly presented in the interior of the house.”

Many innovations in passive house design are coming from areas where extreme heat is a regular occurrence. For example, a [school in India](#) was built recently which incorporates an ancient passive technique of using airflow to provide cooling. Technology is also helping deliver passive cooling; an [ultra-white](#), reflective paint has been developed, which can cool buildings without using additional energy.

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Takeaway:

While it is extremely difficult to retrofit many of the features of passive house design onto existing properties (especially when they are quite old), it is extremely important that any new builds incorporate as many passive building techniques as possible. In addition to Hill House’s improved energy efficiency, it will also include a smart home system “integrated into the system of a security company” as well as a nearby parking area equipped with a charger for a Tesla car. This mixture of smart technology and sustainable, passive design may well be the way forward for all new builds. Hill House proves that buildings can both blend into the environment and offer all the modern comforts.