



Europe-China Eco-Cities Link  
中欧低碳生态城市合作项目

## Case 1 Germany: “Aktivhaus”

Germany . Aktivhaus prototype in Stuttgart– aiming for mass production



Source: <http://www.cnn.com/2015/03/17/world/gallery/aktivhaus-sustainable-architecture/index.html>



## CASE STUDIES

### Case 2 Germany: “Aktivhaus”

**Problem to resolve: GLOBAL WARMING**

**Means: Reversal of CO2 Emmission in the production, operation and final disposal of buildings**

*Ecological Aktivhaus seeking an image of glamour and new luxury<sup>1</sup>*



#### **Description:**

**The Aktivhaus’s Triple Zero Effect - no emissions, no waste, no energy from fossil fuels.** The German Aktivhaus generates double the energy needed. The so-called ‘B10’ does not require as much energy as a conventional house. This is due to green building technology and a sophisticated energy concept. The house is smart. It is connected to local weather stations so that it can adjust its energy usage based on the forecast. Thus, the house can forecast how much energy is likely to be produced under the projected weather conditions, and it knows how much energy it will need under each weather condition. This even allows to predict the energy results, the possible excess energy in later days. An underground ice storage tank also reduced energy needs by removing the need for traditional heating and air conditioning systems. The ice is used in hot seasons to cool the house. When it melts, it absorbs heat energy. In winter, it gradually freezes. When water turns into ice, a certain amount of heat energy is released, which is then used to heat the house via a heat pump, which brings the energy to a higher temperature level. But when there is no sunshine at all, the house draws on its energy reserves. This is the moment batteries with energy stored, will be utilized. It is being recognized that today’s batteries are still not as effective (and expensive). Their use is definitely a must at night time when there is no sun. The Aktivhaus to reduce the consumption of electric energy over the night hours as much as possible. To this end, the refrigerator runs especially cold during the daytime before automatically switching off after dark, so that the contents don't spoil overnight. It

turns on again when the sun rises. The current prototype of the Aktivhaus was imagined for high-density cities. In 2015, prototypes will be built in Patagonia (Southern Argentina), while 2016 will see the Aktivhaus debut in Siberia and Turkey. It will soon be possible for people to order their own custom-made Aktivhaus. In 2015, the architect and a group of industrial partners will start selling the concept to consumers. The house can be ordered from a catalogue, like purchasing a car. It can be customized however. A standard model costs €3,000 (\$3,500) per square meter, but Sobek says prices can exceed €10,000 (\$12,000) per square meter for more luxurious models, adjustable to certain regions or tastes (and luxury finishing), or environmental specifications. The Aktivhaus is a modular and modernist home that generates two times as much energy as it consumes. It positions itself as the next step in sustainable living and architecture, thanks to a series of clever adaptations and technological advances. The current Aktivhaus prototype in Stuttgart, Germany -- nicknamed 'B10' -- is powered by photovoltaic thermal panels on its roof, which generate electricity that creates heat as a byproduct. Its components are fully recyclable, and take only a day to assemble; and the fact the modules can be stacked suggests they could be suited to high-density cities. It is a house that produced no emissions or waste, and derived no energy from fossil fuels -- three tenets, or the *Triple Zero* standard. B10 is the first to generate not only enough energy to fuel itself, but surrounding buildings too, or it can sell energy to the public grid.<sup>2</sup> →Tool GB 2

As the concept of the Active House gets traction, so will the building certifications.<sup>3</sup> As one observer put it: Net-Zero Energy Modern House is a mix of 21st century tech and mid-century modern design.<sup>4</sup> →Tool GB 2

### Technology:

**Construction21 – digital networking.** Construction21 is a knowledge-sharing platform for a multidisciplinary group of building practitioners. Just like the Green Building Councils pulled together, this network pulls together all of the necessary stakeholders in the building industry digitally. It was developed with five Green Building Councils and other expert organizations for energy efficiency in green buildings across Europe, and it was piloted and developed in six countries and is now entering the international phase. The platform includes a case study structure that has been designed specifically to highlight energy and environmental performance of buildings.

**Good practices of demonstration projects.** The Living Future Europe campaign, another private sector initiative, is highlighting the work by the International Living Future Institute. This institute is working on good practices of real life or “living buildings”, demonstrating high-performance buildings which can encourage industry to accept higher standards. A qualified building must have at least one year of demonstrated performance as a positive-energy building, so it's not about just hiring a construction, it's absolutely about performance. It actually has to perform. It also has a list of over 30 chemicals that are common to the construction industry but are not allowed [for Living Building Challenge projects] due to their inherently dangerous levels of toxicity that have been proven over time. Also, the building has to be built on brownfield sites, so it can't take new land away from very scarce land in Europe.

## Credentials

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## Sources and Further Reading

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<sup>1</sup> Source: <http://www.cnn.com/2015/03/17/world/gallery/aktivhaus-sustainable-architecture/index.html>

<sup>2</sup> Glamorous living off the grid: Aktivhaus generates double the energy you need, CNN International Edition, London. CNN March 17, 2015. <http://www.cnn.com/2015/03/17/world/gallery/aktivhaus-sustainable-architecture/index.html>

<sup>3</sup> Alter, L. 2013. Zero Energy Building Certification finally defines what Net Zero really means. <http://www.treehugger.com/green-architecture/net-zero-energy-building-certification-finally-defines-what-net-zero-really-means.html>

<sup>4</sup> Alter, L. 2013. Net-Zero Energy Modern House is a mix of 21st century tech and mid-century modern design. <http://www.treehugger.com/green-architecture/does-net-zero-energy-really-mean-anything-green-building.html>; see also: Alter, L. 2016. Net Zero Energy isn't perfect, but it's still a pretty good idea. <http://www.treehugger.com/green-architecture/net-zero-energy-isnt-perfect-its-still-pretty-good-idea.html>