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## 3D Printed Green Homes Save Energy, Time, Costs, and are Really Cool

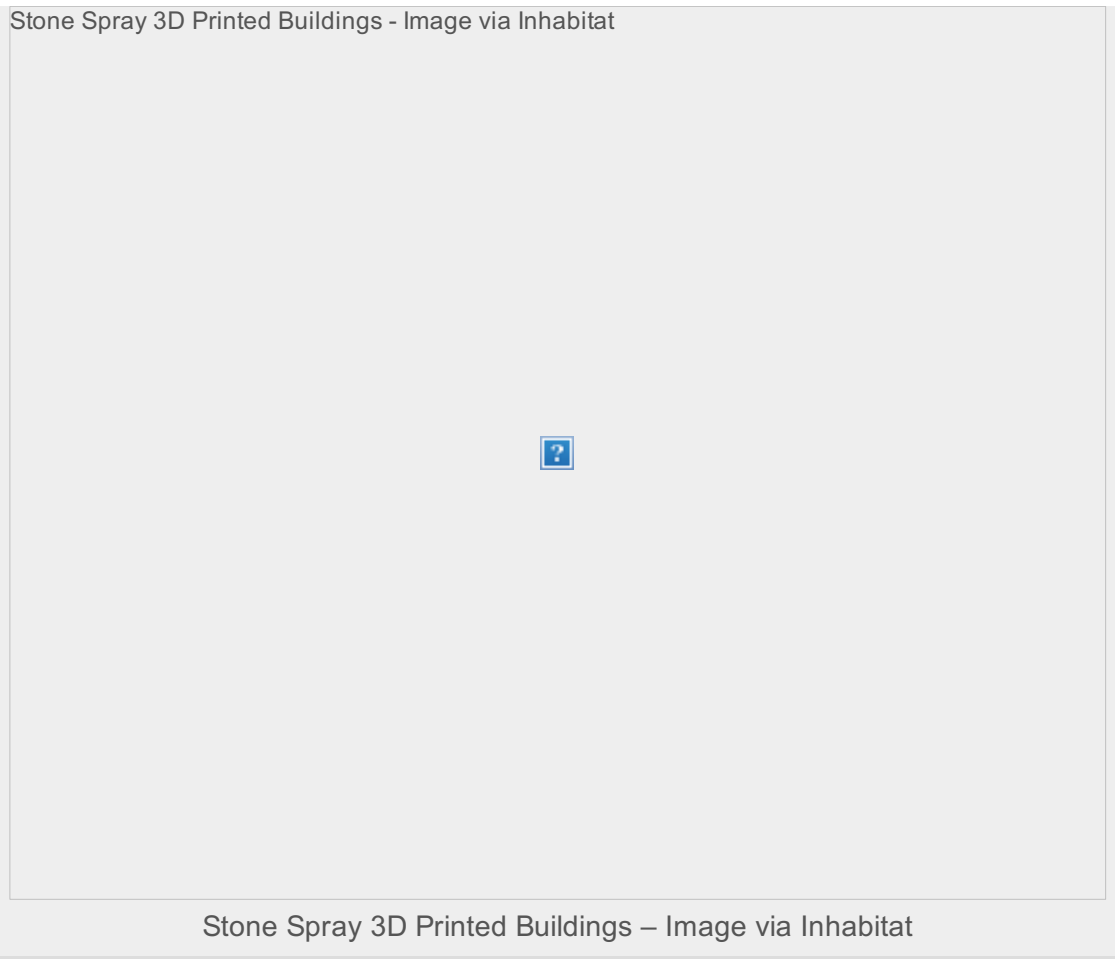
Posted on 27. Aug, 2012 by [Maryruth Belsey Priebe](#) in [Articles](#)

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Stone Spray 3D Printed Buildings - Image via Inhabitat



Stone Spray 3D Printed Buildings – Image via Inhabitat

Imagine scooping up the sand on your property and using that to create 3D printouts of the components you need to construct your green house design. Sounds a little bizarre, doesn't it? Yet 3D printing like this is gaining notoriety in the sustainable building industry as a technique for vastly reducing building material waste, saving energy, cutting construction schedules, and creating buildings out of locally-sourced materials.

### Stony Spray Creates 3D Sand Houses

#### Energy Costs

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The idea behind creating 3D printed sand homes and other structures arose through the work of architects Petr Novikov, Inder Shergill, and Anna Kulik through the Institute for Advanced Architecture of Catalonia. Their goal was to use the idea of digital manufacturing to explore how it could be used with on-site fabrication machines. The [Stone Spray](#) concept was the result.

The system works via a robot that gathers up soil (or sand), mixes it with a solidifier component, and then sprays it onto surfaces (on both horizontal and vertical planes) to create structures (check out the video for a full view of how it works). Structures like the sand wall you see here can be made on an in the architectural scale and will support their own weight as well as bear a load, and so can be optimized for home building.

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Stone Spray 3D printed sand wall - green house plans



Stone Spray 3D printed sand wall

Not only does the Stone Spray Robot require little to no energy to operate, it is also solar powered. And the components it creates are LEED Certified. This technology still requires some time to perfect, but holds a lot of promise as an extremely sustainable building method for impoverished communities where building resources, transportation systems, and energy are in scarce supply. Not only that, but by using soil and sand, these earth-built homes may prove much more comfortable in which to live if they're anything like rammed earth, [earth-sheltered](#), or adobe designs of old.

**Print a House by Facit Homes and Eentileen**



Facit Homes and Eentileen have come together to create a digital green home building system as well. Their first digitally fabricated and [affordable green home](#) called Villa Asserbo is located in the woodlands of Copenhagen using 820 sheets of plywood that were sourced sustainably from Finland (PEFC certified).

Facit Homes, Eentileen digital 3D printed homes - green house plans



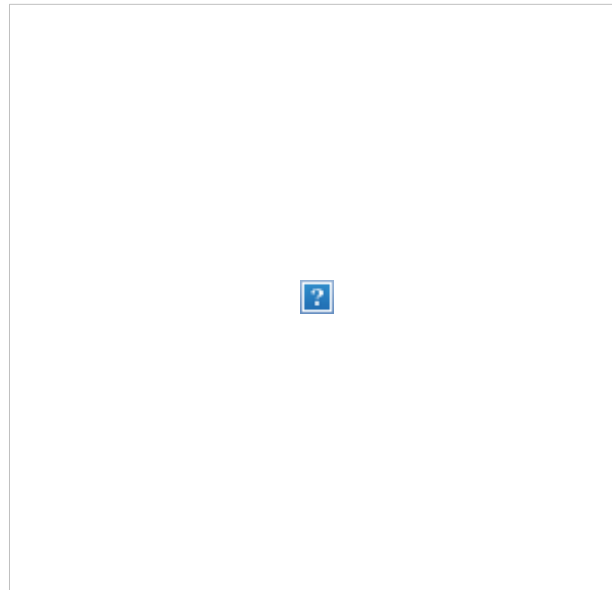
Facit Homes, Eentileen digital 3D printed homes

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After feeding the 1,345 square foot designs into their digital design system, the room-sized computerized CNC printer, which is actually a milling machine, cuts sheets of plywood into pieces that are then slotted and fitted together with incredible snugness for maximum energy efficiency. In all, the home took only four weeks to complete using this on-site fabrication technique.

The environmental benefits go well beyond energy efficiency. Here are the highlights of this green building system:

- No concrete is required to build homes this way – only wood is used for construction of walls (except for where windows are installed, of course).
- Material waste is extremely minimal due to the software's ability to carefully plan each cut.
- The home has a very small physical footprint since it touches the ground only where the screw pile foundations are installed.
- No heavy machinery is needed in the assembly process – only the labour of two workers – which vastly reduces the carbon emissions of the construction process.



Additionally, because of the on-site fabrication system used in this concept and the lightning fast way it can construct homes, it is highly suited to disaster areas. Technology like these 3D printing systems are fast becoming more widely used in sustainable construction. We'll likely see many more variations on the 3D printing and on-site fabrication schemes in the years to come.



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## About YellowBlue Designs

We blog about green building practices to help you create energy efficient homes.

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