

# RECREATING ECONOMIES WITH 3D PRINTING

Open Source Ecology measures success in days, not weeks, with LulzBot.

## From factory to farm

LEGO aren't just for kids anymore. Open Source Ecology (OSE) is building its network of farmers, engineers, and supporters by creating life-size sets of modular tools, similar to the ever-popular building blocks of our youth. Except instead of make-believe forts and killer robots, the tools created by OSE, called the Global Village Construction Set, allow for the easy, do-it-yourself fabrication of the 50 different industrial machines it takes to build a sustainable civilization with modern comforts.

OSE's open source, low-cost, high-performance technological platform is designed to lower the barriers of entry into farming, building, and manufacturing, creating entirely new economies in the process. But it takes a lot of iterations to create and test the small-scale models that someday will be large, metal, operational equipment. Finding a way to

"Rapid prototyping allows you to build at a very low cost because you're doing it once instead of ten times."

> Marcin Jakubowski Founder and Director, Open Source Ecology

create prototypes quickly and affordably was essential for OSE to continue on their mission of providing a method for rural communities, urban redevelopment areas and the developing world to have access to machines—everything from tractors and wind turbines to bread ovens and dairy milkers.



### A well-oiled machine

"Rapid prototyping allows you to build at a very low cost because you're doing it once instead of ten times," says Marcin Jakubowski, OSE's founder and director.

OSE chose to use two TAZ machines and an AO-101 in their Kansas City, MO, facility to create small-scale models of the parts for each of the machines, which are then tested to make sure they work properly. Take the backhoe, for instance. Once the designs are finalized, OSE prototypes the parts to simulate building the backhoe.

"It takes three days to build a backhoe without rapid prototyping," Jakubowski says. "With a 3D printer, it takes one day."

Having this physical representation of the backhoe allows OSE to make a training video, which is then used to demonstrate and teach people how to build the machine on their own.

#### Metal workers

Now Jakubowski and his crew can measure their success in days instead of weeks. And instead of the costly trial-and-error with metal, OSE workers spend their energy perfecting their designs and testing their ABS prints before manufacturing with metal.

"The efficiency is that if we can prototype something before we build it in metal, we're saving ourselves wasted time and parts," Jakubowski says.

Once rapid development is complete, OSE's machines will compete in the open market for a fifth of the current cost for these machines, which will put OSE well on its way to the goal of creating an open source economy built on collaboration and innovation.

## **Open Source Ecology At a Glance**

www.opensourceecology.org

#### Industry

Open source technology, farming, engineering, building, manufacturing

#### 3D printing application

Small scale prototyping

#### Key challenges

Testing before building and manufacturing machines

#### **Key benefits**

Savings in time and money with fabrication and rapid development

#### 3D printing software tool chain

Python 2.7, Replcatorg, Pronterface/Printrun and Slic3r

#### Material(s) used to print

**ABS** 

#### Operating system/computer system

Ubuntu 12.04 (32bit)

For more information on 3D printers, parts, and plastics, +1-970-377-1111 | sales@lulzbot.com

626 West 66th Street, Loveland, Colorado 80538 USA

LulzBot is a trademark of Aleph Objects, Inc.

©2014 Aleph Objects, Inc.

