Open Source Ecology

Executive Summary

March 20, 2012

Mission

Open Source Ecology is working on the **Global Village Construction Set (GVCS)**: a modular, DIY, low-cost, high-performance platform that allows for the easy fabrication of the 50 different industrial machines that it takes to build a small, sustainable civilization with modern comforts. Our goal is to create the next economy, an open source economy, which optimizes both production and distribution while providing environmental regeneration and social justice.

We support bottom-up, ecologically sound manufacturing development and train producers to create entrepreneurial-based solutions to unemployment and poverty.

Through open source, global collaboration, we accelerate the development of solutions to economic and environmental issues by entering into innovation-sharing partnerships with people who experience these problems most directly. ***We provide comprehensive hands-on trainings and online documentation*** that facilitates the independent replication of the Global Village Construction Set through a format similar to Wikipedia. In turn, we are provided with data from independent replicators on how we can improve the designs so that, over time, they are more accessible, cost less, are more productive, last longer, and integrate further with natural ecological systems.

Our Founder and Executive Director, Dr. Marcin Jakubowski, is a Senior TED Fellow and a Princeton graduate with a PhD in Physics from the University of Wisconsin. He delivered a TED Talk that was rated the 6th top presentation of 2011 by the Huffington Post, and we would like to invite you to watch his brief presentation after the jump:

See what we do:

TED - Marcin Jakubowski, PhD

Open-Sourced Blueprints for Civilization

http://www.ted.com/talks/marcin_jakubowski.html

GVCS - Key Features

Open Source - we freely publish our 3D designs, schematics, instructional videos, budgets, and product manuals on our open source wiki, and we harness open collaboration with a network of global contributors.

Low-Cost - The cost of making or buying our machines is on average 49% cheaper than buying from an industrial manufacturer and 69% cheaper if built by the end user.

Modular - Motors, parts, assemblies, and power units can interchange, where units can be grouped together to diversify the functionality that is achievable from a small set of units.

User-Serviceable - Design-for-disassembly allows the user to take apart, maintain, and fix tools readily without the need to rely on expensive repairmen.

DIY - The user gains control of designing, producing, and modifying the GVCS tool set.

Closed Loop Manufacturing - Metal is an essential component of advanced civilization, and our platform allows for recycling metal into virgin feedstock for producing further GVCS technologies - thereby allowing for cradle-to-cradle manufacturing cycles.

High Performance - Performance standards must match or exceed those of industrial counterparts for the GVCS to be viable.

Flexible Fabrication - It has been demonstrated that the flexible use of generalized machinery in appropriate-scale production is a viable alternative to centralized production.

Distributive Economics - We encourage the replication of enterprises that derive from the GVCS platform as a route to truly free enterprise - along the ideals of Jeffersonian democracy.

Industrial Efficiency - In order to provide a viable choice for a resilient lifestyle, the GVCS platform matches or exceeds productivity standards of industrial counterparts.

Programs

1. Open Source Capital Development

We redesign conventional clean energy, manufacturing, construction, and agricultural equipment so that it is low cost, easy to build and service, modular, and built to last (*see* **GVCS – Key Features**). The technology works together in different configurations ('machine ecologies') to create complex manufacturing processes. Examples include simple farm equipment like tractors, hay rakes, and combines, but also encompass more advanced products like bio-plastic from corn using the *Bioplastic Extruder* or virgin steel from scrap metal using the *Induction Furnace* powered by *Solar Concentrators* and *Modern Steam Engines*.

Production Process = Concept Design + Prototyping + Field Testing + Documentation

We hire retired engineers who have a lifetime of experience to design our machinery based on conventional technology. Prototyping and field testing are conducted in part by our trainees, and we hire industry professionals to create documentation and training materials.

2. Fellowship Program

Factor e Farm, a 30-acre permaculture site held in a community trust, is the global headquarters of Open Source Ecology. We have provided job skills and economic development training under the Dedicated Project Visits program since 2004, and participants have kept progress logs documenting their experiences which are available on our wiki.

In Q3 2011, we received $100,000 in construction grants, and we will complete a 3,000 sf training and fabrication facility as well as 10 living units on March 15. We are outfitting our facilities with manufacturing equipment from Detroit and are prepared to transition into full implementation of the **OSE Fellowships** program in April 2012. This program serves both novices as well as experienced and highly skilled individuals who have been affected by the changes in the global economy and who need help adapting to new economic conditions. We provide people with a competitive advantage through job skills and enterprise development training under the emerging open source economic paradigm. The program serves to stimulate open business model incubation, and the fellows help us fabricate prototypes and conduct extensive field testing operations and reports.

3. Distance Learning Program

We facilitate the independent replication of the GVCS technology and its use in enterprise through comprehensive online training materials that include the following: (1) design rationale; (2) 3D CAD files; (3) 2D fabrication drawings; (4) CAE analyses; (5) CAM files (where applicable); (6) exploded parts diagrams; (7) bills of materials and sourcing information; (8) scaling calculations; (9) A-Z instructionals; and (10) cost and performance comparisons to industry standards. All documentation is openly available on our website, along with high-quality video tutorials showing how to fabricate and safely use the machinery. *We are an open source business model incubator*, drawing on the power of our *GVCS Replicators Network*, and we are building an online archive of open source business models free for anyone to use in the world.

Organization

OSE Organizational Structure

Open Source Ecology is a non-profit incorporated in the State of Missouri. We currently use The Terra Foundation of San Obispo, California as our Fiscal Sponsor, and our fiscal sponsorship fee is 2%. We anticipate having 501c3 status by July 1st.

Revenue to Date*

- **Ewing Marion Kauffman Foundation** - *$100k*
- **Shuttleworth Foundation** - *$360k*
- **Construction Grants** - *$60k/$43k*
- **Kickstarter.com** - *$63,573*
- **True Fans** - *520 supporters $10/mo*

The Ewing Marion Kauffman Foundation

This grant funds the design and prototyping of six GVCS machines with a June 01, 2012 deadline.

1. *CNC Multimachine* – we purchased machine tools from Detroit and are finalizing designs.

2. *CNC Torch Table* – the prototype has completed hundreds of hours of field testing.

3. *CNC Circuit Mill* – the prototype was completed on 02/13/12.

4. *Ironworker Machine* – the machine design was completed on 02/09/12 and the prototype is in fabrication.

5. *Modern Steam Engine* – we are working with the Steam Automobile Club of America, who offers the world's only modern steam engine kit, to use their design as the basis for the open source version.

6. *Dimensional Sawmill* – the prototype is complete.

Shuttleworth Fellowship

Our partnership with the Shuttleworth Foundation began on March 1st and covers the development of the *Induction Furnace* in the Fabrication Tools Package; *Biomass Pelletizer*, *Solar Concentrator*, and *Power Inverter* in the Energy Tools Package; and the *Well Drilling Rig*, and *Bulldozer* in the Construction Tools Package.

The grant covers design and prototyping as well as field testing and complete documentation.

Construction Grants

These grants funded the construction of the *FabLab*, a 3,000 sf training and fabrication facility, and the *HabLab*, a building with 10 living units, kitchen, bathroom, and office. We used our beta-released machinery from the Construction Package (tractor, compressed earth brick press, soil pulverizer, and hydraulic power unit) to create earth-brick structures using double-wall construction with hay insulation. We were able to reduce our carbon footprint and building costs, which allowed us to outfit our facilities with fabrication and machine tools. Construction is due for completion on March 15.

Kickstarter.com Campaign

On October 9th, we initiated a campaign to raise $50,000 on Kickstarter.com. We made a promise to deliver four full product releases by December 25th as the OSE Christmas Gift to the World. By November 20th, we raised $63,573 with 1,384 donations, and on Christmas Day we delivered on our promise.

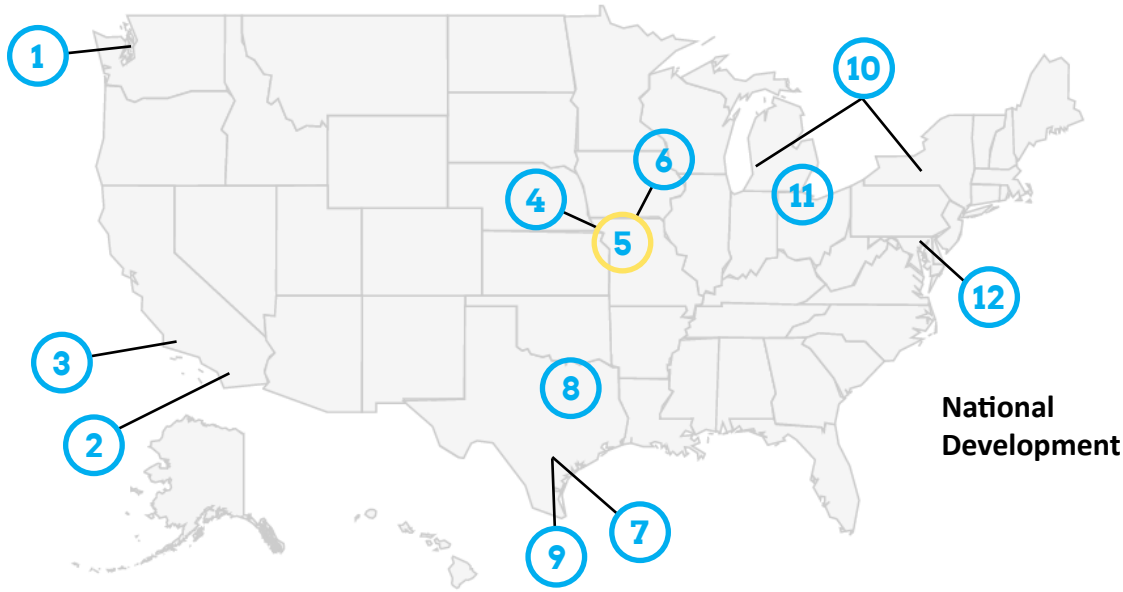
OSE Christmas Gift to the World

On December 25th we published full documentation of the tractor, compressed earth brick press, soil pulverizer, and hydraulic power unit.

*Our income and expenses are available on our website.

(navigation)

Appendix:



1 Gasifier/Burner (*link*)
Seattle, Washington
Larry Dobson

The *Gasifier Burner* converts biomass fuel into power and useful chemicals. It is currently in the **Design** stage of development.

2 Ironworker (*link*)
San Diego, California
Brianna Kufa

The Ironworker, serving as the backbone of many fabrication shops, combines a punching machine, plate shear, section shear, punch and shear machine, and a coper-notcher. It is currently in the **Prototyping** stage of development.

3 Replication (*link*)
Pasadena, California
D&H Tractors

Daniel & Hayden are replicating the *LifeTrac* design with their high school engineering class and plan to donate it to the *Los Angeles South Central Farmers*, subject of the *Academy Award* nominated documentary **The Garden**.

4 CNC Circuit Mill (*link*)
Factor e Farm, Missouri
Yoonseo Kang

The *CNC Circuit Mill* enables automated production of electronic circuit boards, and, as a GVCS technology, it enables automation functionality. It is in the **Prototyping** stage of development.

5 OSE Headquarters (*link*)
Factor e Farm, Missouri
Marcin Jakubowski

Factor e Farm is the central location of development and training; hosting the **OSE Fellows** at a 30-acre permaculture farm held as a community trust. We have a 3,000 sf fabrication and traning facility and 10 living units for visitors.

6 Sawmill (*link*)
Maysville, Missouri
Sweiger Shop

The *Sawmill* converts felled logs from trees into dimensional lumber, and it enables a range of well-established wood construction techniques. It is in the **Prototyping** stage of development.

7 Replication (*link*)
Austin, Texas
James Slade

James did a dedicated project visit at *Factor e Farm,* learning to build GVCS machinery, and he returned home to replicate the *Compressed Earth Brick Press* and *LifeTrac*.

8 Replication (*link*)
Dallas, Texas
Tom Griffing

Tom did a dedicated project visit and returned home to build a refined version of the hydraulic power unit. He actually improved on our designs, which is exactly what we hoped to see. He plans to build the *LIfeTrac* next.

9 CNC Plasma Cutter (*link*)
Austin, Texas
Luke Iseman

The *CNC Torch Table* is a capable of cutting intricate designs out of metal with a 2-axis torch controlled by computer. It is in the **Prototyping** stage of development.

10 Steam Engine (*link*)
Berrien Springs, MI/Willseyville, NY
Tom Kimmel/Mark Norton

The *Steam Engine* is capable of converting steam generated by a solar concentrator into power that can be used to generate electricity or drive the machinery of the GVCS platform. It is in the **Prototyping** stage of development.

11 Heat Exchanger (*link*)
Detroit, MI
(N/A)

The heat exchanger generates steam to power steam engines or steam turbines, while excess heat can be used to create warmth for a home or greenhouse. It is in the **Prototyping** stage of development.

12 Replication (*link*)
Baltimore, MD
Andrew Spina

Andrew is building a *Power Cube* and a *LifeTrac* based solely on our distance learning materials.