

**Letter of Inquiry**

**Letter of inquiry cover sheet**

Organization Name:  
Open Source Ecology

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Sponsoring organization, if applicable:  
The Terra Foundation

Prefix (Mr./Ms.):  
Mr.

First Name:  
Aaron

Last Name:

Makaruk

Title:

Development Officer

Which Noyes funding priorities does your organization address?

Sustainable Agriculture  
Environmental Justice

One-sentence description of proposed activity:

We create open source, build-it-yourself, low-cost industrial technology that is designed to regenerate the environment, re-localize manufacturing, and bring wealth back to communities.

Grant would cover period beginning:

07/01/2012

Ending:

06/30/2013

Type of support you are requesting:

Program Support

Total organization budget (current year):

\$460,000

Project or program budget, if request is for other than general support:

\$2,184,918

Amount requested from Noyes Foundation:

100,000

From what other major sources does your organization receive funding?

The Shuttleworth Foundation - \$360,000

The Ewing Marion Kauffman Foundation - \$100,000

Anonymous Foundation -- Construction Grant - \$100,000

True Fans -- 540+ supporters - \$10/month

### **Description of your organization and proposed activity**

Description of your organization, including your constituencies:

Imagine a world where everyone had access to the tools and the knowledge to make an abundant life. Open Source Ecology is dedicated to this vision, and we are yielding results that are gaining international recognition. Our founder, Dr. Marcin Jakubowski, is a 2012 Senior TED Fellow, and his presentation was rated #6 on the Best of TED list issued by the Huffington Post.

We are building the Global Village Construction Set (GVCS), a modular, high-performance, do-it-

yourself, low-cost 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. The GVCS includes machinery, equipment, tools, components, and other infrastructures for creating a complete economy: food, fuel, energy, building materials, transportation, and fabrication. We redesign the conventional technological underpinnings of society so that they are affordable to make at the local level, user serviceable, designed to last a lifetime, and available for everyone to build and use without restriction anywhere in the world. The platform enables more people to produce clean energy, manufacture goods, construct buildings, and grow food locally using machinery that is, on average, 69% cheaper than commercial models when built by the end user.

Through open source, global collaboration, we develop solutions to economic and environmental issues by entering into innovation-sharing partnerships with people who experience these problems most directly. We provide hands-on jobs skills and enterprise development training and create distance learning materials so that people across the world can replicate our business models and technology. In turn, we are provided with data from independent replicators on how we can improve the machine designs so that they are more accessible, cost less, more productive, last longer, and integrate further with natural ecological systems.

Here is a partial list of machines within the Global Village Construction Set platform:

- Solar concentrator
- Biomass Gasifier
- Modern Steam Engine
- Wind Turbine
- Tractor
- Hay Rake
- Microcombine
- Bulldozer
- Soil Pulverizer
- Compressed Earth Brick Press
- +40 other machines

A quick way to get an overview of our organization is to watch the TED Talk given by our founder in 2011:

Dr. Marcin Jakubowski - Open Source Blueprints for Civilization -- #6 - Best of TED 2011-- The Huffington Post: <http://www.huffingtonpost.com/news/tedtalks2011>

Below are details on our constituents broken up by section:

Open Source Ecology Replicators Network: people are independently replicating our technology in Pasadena, California, Guatemala, The Philippines, Baltimore, Maryland, Austin, Texas, Dallas, Texas, Tulsa, Oklahoma, and the United Kingdom.

Open Source Ecology -- Europe: Bulgaria, Croatia, the Czech Republic, Estonia, Germany, Greece, Italy, Spain, and the UK. They are making a video presentation showing all of their activities, and their progress can be tracked on our wiki.

Open Source Ecology -- Guatemala: TED Global Fellow, Manuel Aguilar, is building a replicable model for sustainable village development in Guatemala using our technology designs and training materials.

Open Source Ecology -- The Philippines: Butte Metz is building an enterprise selling GVCS machinery in the Philippines.

We have an online, community-driven wiki with 3,440+ pages and 1,466 registered users. Our True Fans network, people who donate \$10/month for 24 months, is currently over 540 people. We have an online forum, as well as a YouTube channel with 850+ video updates documenting our current

state of development and history.

We conducted a community needs assessment in February and published an evaluations report that is available on our website. The survey was transparent in order to give people the opportunity to learn more about who else is interested in Open Source Ecology in their area, and we are using the information to conduct a demographics study to attain details on our constituents.

Describe your organization's strategy for addressing the problems, needs or issues that you work on:

Open Source Ecology offers three programs: an open source innovation development pipeline with a current focus on the Global Village Construction Set, the OSE Fellowships Program that provides hands-on capital fabrication and maintenance education as well as enterprise development training, and distance-education programs that facilitate independent replication of the machinery and widespread adoption of our in-development archive of open business models.

At the heart of our work, we teach individuals and communities to fabricate their own means of production. Our strategy is to create low-cost, high power, user serviceable industrial machinery that can be used by communities to grow their own food, construct their own buildings, produce their own clean energy, and manufacture their own goods.

We have recently negotiated an alliance with Team Wikispeed and their founder, Joe Justice, which helps align us with the capacity we need to manage our rapid innovation development pipeline. Team Wikispeed is an all-volunteer distributed Agile/Scrum team that built a 100 mpg vehicle, a record for a road-legal gasoline engine, in three months, and is the lightest car ever to achieve a five-star equivalency rating for front, side and rear impact tests. The Team Wikispeed car placed 10th of 134 teams in the Progressive Insurance X-Prize Competition, beating out other entries from Tesla Motors and MIT, and its designs now serve as the basis for the open source car and the open source truck within the GVCS platform. Joe and Marcin are working together to incorporate Agile project management protocols into every aspect of our innovation development pipeline.

Each machine undergoes four phases of product development: concept design, prototyping, field testing, and documentation. After trying multiple strategies, we have determined that concept design is best handled by retired engineers, who can often provide a lifetime of experience, financial stability, free time, and a desire to contribute to society. Prototyping and field testing are handled by trainees in our OSE Fellowship Program in tandem with professional fabricators, and documentation involves a set of individuals with diverse skills from videography and editing to mechanical drafting and 3D modeling.

The final prototype becomes our model for documentation, which includes the following training materials to facilitate independent replication: (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. Documentation is openly available on our website and for shipment in DVD format, along with high-quality video tutorials showing how to fabricate and safely operate the machinery.

Development of the GVCS machinery is taking place throughout a distributed network. The entire development pipeline is managed by a projects director who coordinates with project leaders that manage teams working on the development of a single machine. Each project team consists of concept engineers, prototype fabricators, field testers, and documenters. Project teams are located throughout the United States in California, Washington, New York, Texas, and Missouri, with more being recruited.

Please describe the activities for which you are requesting funding:

A grant from the Jesse Smith Noyes Foundation would help fund the development of the Global Village Construction Set, pay OSE Fellows to build prototypes and field test them, and be used to create documentation and training materials to assist communities and individuals in building their own machinery.

What do you hope to accomplish during the grant period?

We plan to completely design, prototype, field test, and create training material documentation/videos for each of the 50 GVCS machines using rapid Agile project management and an international, distributed network within 12 months. We plan to see two classes of graduating OSE Fellows, a targeted 100 independent replications of the technology, and the publication of evaluation reports providing data points on the effectiveness of our hands-on and distance-education programs. Our online archive of open business models will be in an advanced stage of development, and we will be halfway through an economic experiment to see how much value can be created in a single location using the Global Village Construction Set. This experiment will be the subject of a documentary and serve as the model for expansion into other regions.