

Working With In-Country Partners to Install Renewable Energy and Water Systems in Rural Villages Around the World Since 1997



green empowerment



Defining the challenges

Energy

Electricity is the foundation for a productive economy and a healthy life, yet 1.2 billion people around the world lack access to electricity. Access to electricity correlates positively to work productivity and improved health. Electricity can improve education outcomes by extending the available hours students can study and can improve household health by providing low pollution alternatives to cooking with firewood or charcoal, and lighting with kerosene.

Millions of people living in energy poverty reside in remote locations, far from the energy grid that relies on polluting, non-renewable sources of energy, like coal, petroleum, and natural gas. To add another 1.2 billion people to non-renewable sources of energy would exceed our planet's already limited ability to absorb the carbon emissions.

The need to scale up off-grid and decentralized renewable sources of clean energy is so urgent that the United Nations declared 2014 as the start of the 'Decade of Sustainable Energy for All.' Green Empowerment has been a pioneer in this effort since 1997.

Health, Water, Sanitation & Cooking

While bringing electricity to communities is transformative, a community doesn't move to vibrancy and resiliency by only addressing one technology or one issue at a time. There are still 750 million people who do not have access to clean water, 2.5 billion who do not have access to adequate sanitation, and 2.6 billion people who live without clean cooking facilities.

Without basic infrastructure, communities confront higher mortality and morbidity rates from water-borne diseases, such as diarrhea, dengue, malaria, and cholera. Women typically provide 90% of a household's effort in collecting water and fuel for firewood, representing 11-14 hours of work each day. Repeated diarrhea leads to malnutrition and impacts childhood development. Together, diarrhea and upper respiratory infections from airborne pollution caused by wood burning cookstoves are leading causes of disease and death in children under age five in the developing world. These diseases are preventable through simple, affordable interventions, such as providing access to basic health care, clean water, toilets, and clean cookstoves.



Our Approach

Green Empowerment helps rural communities in developing countries access affordable and renewable energy, safe drinking water, sanitation systems, and fuel-efficient cookstoves, which together enable communities to dramatically improve the quality of their lives by reducing water-borne diseases, improving health and childhood development outcomes, and freeing up time to focus on income generating activities.

Green Empowerment enables communities to start on a sustainable energy pathway that leads to improved health outcomes and livelihoods.

GE helps communities access affordable, robust, and easy-to-maintain sources of renewable energy by partnering with visionary leaders who are transforming their communities and their countries.

Available renewable energy technologies that convert sunlight, water, and wind, into power can meet most of the world's energy needs more effectively and sustainably than fossil fuels while reducing carbon emissions.

To address the dual challenges of energy poverty and environmental degradation, GE utilizes a range of clean technologies, taking into account the local context and needs. These technologies include micro-hydro power, small-scale wind power, biogas digesters, ram pumps, solar panels, and fuel-efficient cookstoves. GE provides operations and maintenance training, watershed protection, handwashing and hygiene education, and other complimentary initiatives. GE works closely with locally-based Non-Governmental Organizations (NGOs) to ensure long-term sustainability of the systems introduced. GE facilitates the provision of technical, organizational, and financial assistance to support local leaders and communities motivated to improve their lives. Green Empowerment also engages local governments and a diverse constituency of volunteers, universities, civic groups, and businesses to expand projects, broaden skill-sets, and mobilize resources.

Established in 1997, GE is currently working with communities in seven core countries: Peru, Ecuador, Nicaragua, Burma, Malaysia, the Philippines and Kenya. Green Empowerment has a staff of 15, and a growing network of volunteers, interns, technical advisers and supporters around the world.



Training



GE develops and conducts trainings for organizations, communities, and government agencies on how to design, construct, operate, maintain, and finance small scale, renewable energy, and water and sanitation systems to provide access to electricity, clean drinking water and sanitation. Trainings have taken place in Liberia, Republic of Georgia, Ecuador, Peru, Nicaragua, Fiji, Malaysia, and the Philippines and for organizations such as IUCN and Mercy Corps.

Networks



GE convenes networks of regional stakeholders around different technologies such as wind power, hydro-electricity, and biogas. Through coordinated research, conferences, and knowledge sharing, participants from universities, NGOs, businesses, governments, and professionals have magnified their impact. Over 1,000 stakeholders have participated in these networks since 2009.

GE works closely with local NGOs to magnify their impact and strengthen their program implementation by embedding GE staff to build their capacity in the design, construction, operation, and maintenance of renewable energy and water systems. GE assists with project fundraising and financial management, monitoring and evaluation, reporting, and strategic planning.



Service Learning

GE organizes 1 - 4 week Service Learning trips for professionals, students, community groups, and families, to engage in hands-on learning about renewable energy, clean water access, and sustainable development. Countries include Ecuador, Nicaragua, and the Philippines. GE also offers 3 - 12 month overseas Fellowships that allow students and professionals to apply their knowledge and develop their skills while making a meaningful impact and engaging with local communities.



Micro-Hydro



In remote communities, a resource as small as a stream can provide high-quality electricity 24 hours per day to a whole community by diverting a small portion of the water to fall downhill through a turbine. It can then be distributed to the community through electrical transmission lines. Clean energy drives economic development by powering small-scale industries and agricultural processing, resulting in increased income.

Water Pumps



GE uses a variety of technologies to improve access to potable safe drinking water. Solar powered water pumps are used to draw water from bore holes and wells to water tanks above communities. Ram pumps are gravity-powered pumps that use hydraulics to pump water uphill and over long distances without using diesel or electricity. Water continues by gravity to communal tap stands, or directly to homes and schools.

Solar panels convert sunlight into electricity. Thanks to rapid price reductions, solar is now being utilized in everything from schools to health clinics to homes, displacing dangerous and more costly alternatives such as kerosene and diesel. Solar micro-grids provide electricity to whole communities, that can be used for lighting, cellphone charging, and micro-enterprise development.



Clean Cooking

Almost half of the world cooks with biomass (wood, dung, coal). Improved cookstoves burn biomass more efficiently, reducing fuel consumption and indoor air pollution by 90%. This reduces respiratory illness and pollution-related diseases, and saves significant time on firewood collection. Another cooking fuel comes from biogas; when used with small-scale livestock husbandry (as small as four pigs or one cow), it offers a range of direct benefits, such as the production of cooking gas, and organic, nutrient rich fertilizer.



Other GE technologies include: wind energy, sustainable agriculture training, watershed management, sanitation, and water treatment. GE continually updates our portfolio to respond to local needs.



Enjoying fresh water in the Philippines

After Typhoon Haiyan, USAID funded expansion of GE's work in the Philippines, relying on our robust system of locally manufactured clean water & sanitation technologies. Partners are installing public water taps fed by new ram pumps.

Miel Hendrickson©GE/2015



Biosand filters like this bring potable water to households in the Andean highlands of Peru. Brian Ferry©GE/2014



Community members construct the Tito Grande community center, which will be used for water and health training. Brian Ferry©GE/2014



GE local partner BGET provided solar power training and installation so that two medical clinics in east Burma can provide care to war victims and improve and expand their medical care. ©BGET/2015



Training participants from two east Burma medical clinics receive certificates for completing their solar installation, operations and maintenance workshop. ©BGET/2015

Peru

- In four high Andean communities in Peru, 965 people now have access to potable water as a result of biosand filter installations.
- The community of Tito Grande contributed 413 days of volunteer labor to advance the construction of a community hall and kitchen that will be used for water and health-related training activities.
- GE partner Soluciones Prácticas expanded its Healthy Homes program to include the high-Andean communities of Phinaya and Chillca, where over 500 people were served via the installation of 51 single-family potable water systems, 7 composting toilets, and 100 solar panel systems.

Burma

- Provided solar power and training for 2 rural medical clinics along the Thai/Burma border. These facilities serve approximately 15,000 patients annually and can now improve and expand their medical care thanks to clean, affordable, and reliable energy access.
- GE participated in the Micro-Hydro Empowerment Network's (HPNet) "Practice to Policy Dialogue" with Burmese policy-makers, energy businesses and NGOs as part of an international delegation to advocate to the state government to adopt micro-hydro and the community-based approach as part of their national electrification strategy. The exercise has set the stage for further GE involvement in Burma in 2015, beginning with a proposed pilot project that would provide micro-hydro power to over 70 households, while transferring efficient turbine technology to Burmese micro-hydro practitioners.

Kenya

- Working with our local partner, MANDO, a preliminary site assessment was conducted for water and solar micro-grid power systems in rural communities.
- GE continues to assess renewable energy needs in Kenya to develop long-term programming.



This micro-hydro electric turbine constructed at the CREATE center is being installed and tested and will provide renewable energy to a rural indigenous community in Sabah, Malaysia. Gabe Wynn@GE/2014



Students at CREATE build innovative concrete turbines that lowers the cost of providing clean electricity to rural villages in Sabah, Malaysia. Gabe Wynn@GE/2014



A biogas technician helps his neighbors determine how to link their family biodigester to their pig pen in Estero Hondo, Esmeraldas, Ecuador. Sam Schlesinger@GE/2014



A cacao technician explains proper pruning techniques to farmers in Las Amazonas. Sam Schlesinger @GE/2014

Borneo, Malaysia

- Integrating renewable energy with watershed protection, three micro-hydro systems were installed with the indigenous communities of Ulu Papar. In addition to electrification of 50 households, these projects include participatory watershed planning to restore and protect the forest and water resources that sustain local livelihoods and the micro-hydro plants themselves.
- Tonibung and GE are facilitating the construction of a micro-hydro power system in the village of Saliku, deep in Sabah's interior. Kampung Saliku's micro-hydro power plant will provide its 240 residents with 24-hour, renewable power, while providing incentives to conserve its 1,200 acre rainforest watershed.
- The Center for Renewable Energy and Appropriate Technology Education (CREATE) graduated its first class of renewable energy trainees from rural Sabah and Sarawak in June 2014. The 15 trainees completed three months of theoretical and practical curriculum and can now lead the planning, operation and management of micro-hydro power systems in their own villages. CREATE also serves as a local manufacturing facility for micro-hydro power turbines, generating local employment and supplanting expensive imports. In 2014, 3 turbines were manufactured at CREATE, benefitting over 100 rural households.

Ecuador

- Under the new Growing Esmeraldas With Renewable Energy (CRECER) project in northwestern Ecuador, 50 families in the rural communities of Felfa, Estero Hondo, and Las Amazonas are now receiving agro-ecological training to improve cacao yields and income while simultaneously protecting the environment, with the construction of cacao nurseries and solar dryers benefitting ~300 residents.
- Seven biogas digesters were installed, and are providing energy independence, decreased firewood consumption, and reduced greenhouse gas emissions for families.
- Funding secured and system designs completed for a potable water system in Felfa, benefitting ~200 residents who previously depended on rainwater and highly contaminated surface-water.



Rafaela grows tomatoes in her patio garden with grey water from the solar powered drinking water system. Childhood malnutrition is the highest health concern in Nicaragua. Jaime Munoz©AsoFenix/2014



Fuel-efficient cookstoves reduce smoke in the home by 95%, improving the health and well-being of families. Jaime Munoz©AsoFenix/2014



Manobo Tribe elders celebrate in front of the new water tank that will bring potable water to households in Agusan del Sur, Philippines for the first time. Monina Hernandez©GE/2015



These low cost, locally-made toilets will provide indoor sanitation for homes in Leyte, Philippines affected by Typhoon Haiyan. Miel Hendrickson©GE/2015

Nicaragua

- In the villages of El Balsamo and Pueblo Amado, Nicaragua 715 people now have clean water to drink, thanks to newly installed solar and gravity powered water systems, operated and managed by the community.
- Across El Balsamo, Candelaria, Sonzapote, and San Jose de Bocay, Nicaragua, 85 families now have fuel-efficient improved cookstoves that reduce indoor air pollution in their homes and deforestation in their communities. Local stove technicians were trained in the fabrication, installation, and promotion of the stoves to ensure sustainability and adoption by neighboring families.
- Through an intensive agroforestry program led by local partner Ben Linder Rural Development Workers Association (ATDER-BL), we are assisting 100 people in the community of La Camaleona, Nicaragua to simultaneously improve their farming incomes and restore the surrounding watershed. Families are now growing and planting native hardwood tree species and cultivating shade-grown coffee intermixed with cacao, banana and citrus. This system establishes wind breaks, reinforces river banks, and implements silvopastoral practices such as live fencing, fodder banking, and creating a mixed pastureland of trees and grasses that balance soil quality (fix nitrogen), are quick to regenerate, are nutritious for cattle, and prevent soil erosion.

Philippines

- The Building Climate Resilience in Water Stressed Communities (CREST) program reached 10,000 people across 14 districts in remote communities of Leyte and Mindanao in the Philippines. These people now have access to potable water through installation of hydraulic ram pumps and other technologies, combined with water storage and piping systems.
- In two districts in Leyte, 121 people participated in water, sanitation and hygiene training, and 334 household and public toilets were constructed and improved, serving 8,475 people.
- Fifteen new sites are being prepared for water system installation, with a focus on communities affected by the devastating Typhoon Haiyan in 2013.



Service Learning participants in El Balsamo, Nicaragua, participate in bio-intensive farming

GE organizes 1 - 4 week Service Learning trips to Nicaragua, Ecuador, and the Philippines. Professionals and students learn about renewable energy with a unique hands-on trip living and working overseas. Kyle Howerton©University of Idaho/2015

Local Non-Profit Partners (NGOs)

Burma/Thailand

Border Green Energy Team (BGET), Mae Sot

Colombia

Fundación para la Producción Agropecuaria Tropical Sostenible (Fundación UTA), Santander

Centro para la Investigación en Sistemas Sostenibles de Producción Agropecuaria (CIPAV), Cali

Ecuador

Fundación Ecuatoriana de Tecnología Apropiada (FEDETA), Quito
Agency for Economic and Territorial Development of Esmeraldas (Corpo Esmeraldas)

Kenya

Matonyok Nomads Development Organization (MANDO), Nairobi

Malaysia

Tonibung, Sabah, Borneo

Nicaragua

Asociación Fénix, Managua

La Asociación de Trabajadores de Desarrollo Rural-Ben Linder (ATDER-BL), Matagalpa

Peru

Soluciones Prácticas, Cajamarca, Cusco and Lima
Desarrollo Sostenible en Acción (DESEA), Lamay

Philippines

Alternative Indigenous Development Foundation Inc. (AIDFI), Bacolod, Negros Occidental

Wellspring of Science and Technology (SIBAT), Quezon City

Water, Agroforestry, Nutrition and Development Foundation (WAND), Misamis Oriental

YAMOG, Davao City, Mindanao

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Solar technology

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Water treatment



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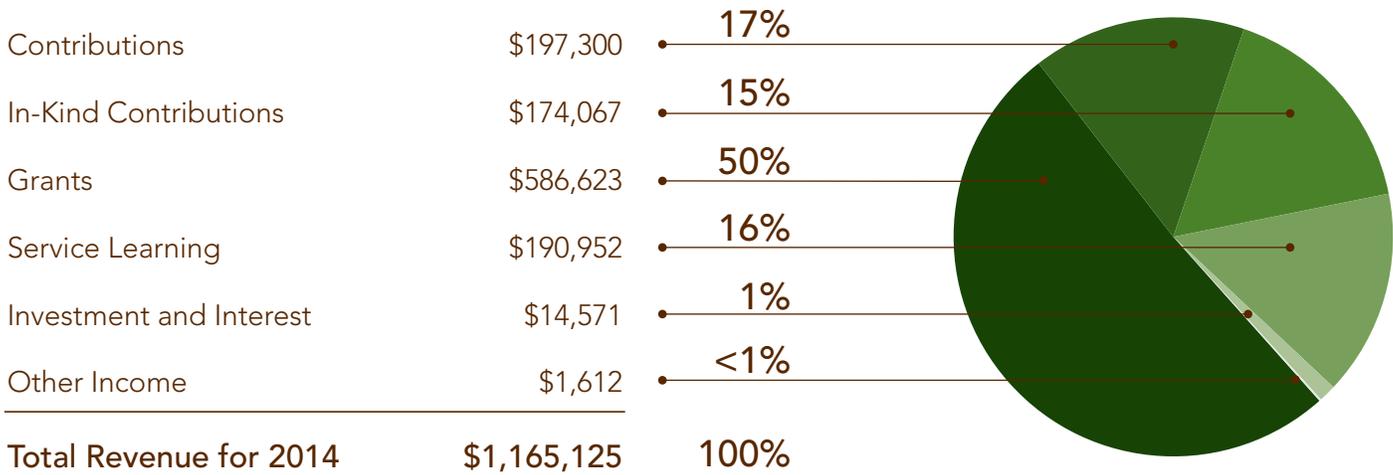
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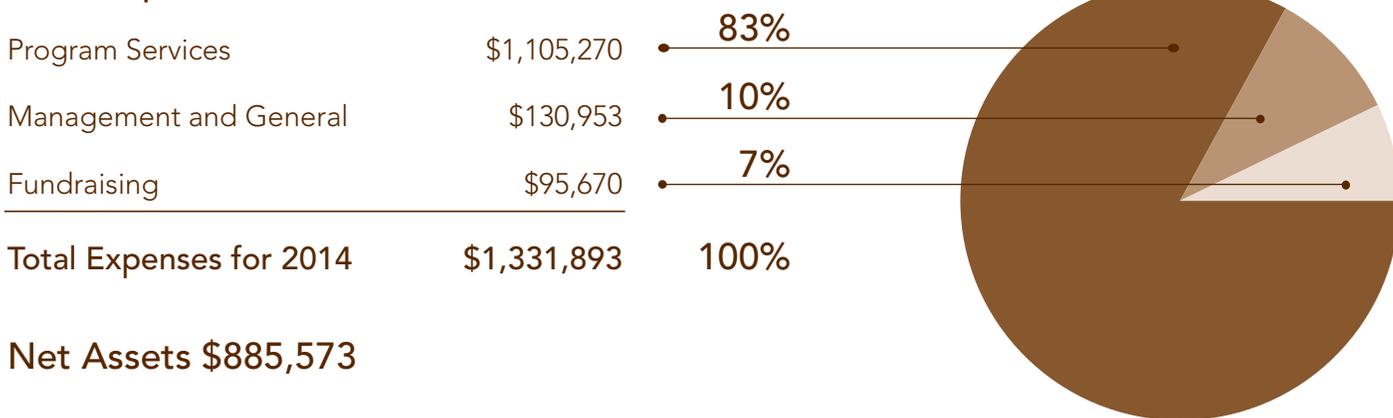
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2014 Revenue



2014 Expenses



Net Assets \$885,573

GE's audited financial statements are available online at

www.greenempowerment.org 2014 financial statement audit was conducted by Richard Winkel, CPA.

GE often receives multi-year grants. Generally accepted accounting principles require that this grant revenue be fully recorded in the year the grant is awarded while most of the expenditures may occur in subsequent years. The decrease in net assets reflected in the 2014 financial statements is a result of the planned expenditure of previously recorded grant revenue.

We greatly appreciate and depend on the many Green Empowerment volunteers who contribute their skills, time, and energy. We would like to specifically recognize the following individuals:

Amy Gilroy, Ernie Brooner, Jay Moskovitz, Jeff Ramsey, Kathy Foldes, Lee Hunt, Samara Hoyer-Winfield, Stephanie Swanberg, Suzi Asmus, William Langslet

Overseas interns assisting GE, their (NGO) partners and local community members:

Nicaragua: Ben Crowley, Caleb Hople

Philippines: Emily Bradford, Nathan Dadap

Malaysia: Chandler Kemp

We thank Andina Restaurant, NW Natural, and Sustainable Business Oregon for their generosity and support.

GE thanks the following for their in-kind donation of time, materials, and/or expertise:

Anvil Media, Hot Lips Pizza - Hawthorne, The Joinery, Joel Stammering, John Grieser and Elemental Energy, Laurelwood Brewery Co, Mark Thomas, Paired Air, Stumptown Coffee Roasters, Whole Foods Market - Laurelhurst

Thank you to Erin Machell for design services!

Our Mission: Green Empowerment works with local partners around the world to strengthen communities by delivering renewable energy and safe water.

GE depends on generous individuals like you to make our life-changing work a reality.

How to Give:

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- Don't have a will or interested in adding GE? Including GE honors your family's legacy with gifts of safe water and clean energy.

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Connect to GE through workplace giving, event sponsorships or employee trips.
GE is a partner with 1% for the Planet, www.onepercentfortheplanet.org.

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