

Revolutionizing Energy: Hydrogen stoves to substitute the usage of wood for cooking

San Miguel Petapa, Guatemala Zona Reyna, Guatemala
Diego Quan



Year Founded:

2014

Organization type:

nonprofit/ngo/citizen sector

Project Stage:

Start-Up

Budget:

\$1,000 - \$10,000

Facebook:

https://www.facebook.com/diego.a.quan/media_set



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Project Summary

Elevator Pitch

Concise Summary: Help us pitch this solution! Provide an explanation within 3-4 short sentences.

75% of Guatemalan families use wood as a main source of energy, around 70 pounds per day in open fire stoves with 3% of efficiency. This problem is spread worldwide around 2.5 billion people. A clean, renewable and culturally accepted solution is required -> Hydrogen stoves powered with solar energy.

WHAT IF - Inspiration: Write one sentence that describes a way that your project dares to ask, "WHAT IF?"

What if...children didn't have to carry half their weight on their backs, moms and their babies could breathe clean air and trees give shelter to life?

About Project

Problem: What problem is this project trying to address?

The usage of wood as a main source of energy. Energy is fundamental for life. Wood is generally used around the world because it's accessible, but expensive. Using wood requires children and women to invest a lot of time that could be used for studying or living, in carrying heavy loads of wood to cook inefficiently, polluting the air, causing respiratory diseases and the death of 5000 kids/year in GUA, and the disappearance of entire forests.

Solution: What is the proposed solution? Please be specific!

The solution is a stove that uses clean electricity to generate hydrogen from rain water (or regular water) that can be burned like LPG but without depending on Oil, leaving as a byproduct only steam water, no CO nor CO2. Also giving families the control over fire so they decide when to use it or not, not like wood that has to be burning all the time. The project is being made using CBPR, because not only technical variables are being considered, also the cultural acceptance and social response to the change of life style, because stoves are more than a source of heat, they are the center of the families, and the fire is a sacred and fundamental part of their lives. That's why non polluting fire is required and hydrogen is the answer.

Awards

2014 IBD Greenovators Award. Invited to be part of ECOin 2015

Impact: How does it Work

Example: Walk us through a specific example(s) of how this solution makes a difference; include its primary activities.

1)Hydrogen does not produce fumes. According to my surveys, smoke is the #1 problem for the families, 17hours/day of smoke in the house is a serious problem. 2)Not gathering wood allows children to study and be kids. 3)Deforestation will stop once wood is not necessary. 3)It will bring hi tech to families. 4)Through CBPR we are encouraging people to use science to solve their own problems without external help. 5)The project has the support of the CPK, that is a group of leaders from the K'iche indigenal group, this opens the doors to scaling and sharing the knowledge and results to other communities 6)Not gathering wood also releases time that can be used for other productive activities 7)Contemplates social, cultural variables

Impact: What is the impact of the work to date? Also describe the projected future impact for the coming years.

We have established great relationships with the families of the main community and their surroundings (125families). We have determined the specific amount of heat required for cooking corn (1.4MJ/kg of Nixtamal), studied the process of cooking and the importance of the stove in rural communities, that goes far beyond the function of cooking, its also the time where family gathers and talks about their important subjects. We have built prototypes of electrolytic cells and built the theory behind their functioning in a level that someone with no academic background can understand and manipulate. The projected future is to make the stoves as efficient as possible, both thermodynamically and economically so they can be accessed by a larger group of people.

Spread Strategies: Moving forward, what are the main strategies for scaling impact?

First: The technology needs to keep developing, a 100,000+years old problem is not solved in 6 months, but we will solve it. Once the technology gets to the thermodynamic efficiency and the economic viability (that are the 2 fields where we are working on) the project and be reached to a bigger group. We already have the network thanks to the CPK and the need is palpable. Once we get the technology to its mature point, in about 5 years, this has the potential to expand to anyplace that uses wood.

Sustainability

Financial Sustainability Plan: What is this solution's plan to ensure financial sustainability?

For the following maturing period, we will rely on grants and donations because there is not yet a product to sell. Once the project has matured enough, then we will have a Social Profit platform. Our product will be the stove and the main goal of this project is to reduce climate change and improve peoples access to clean and sustainable energy, not making money for its own sake, therefor, we will make it an accessible product to the majorities

Marketplace: Who else is addressing the problem outlined here? How does the proposed project differ from these approaches?

Most other people are creating technical solutions (biogas, improved stoves, etc) without ever considering the users feelings about it, the implications that the stove has beyond cooking, the cultural importance of fire, nor involving them in the development of the the project. We are considering all this aspects and also empowering people to use science throw CBPR so they can become independent and can solve their own problems using their own knowledge and resources instead of just be waiting for solutions like the traditional model does.

Team

Founding Story

Since I was a kid, ive been interested in the enjoyment of the environment in a sustainable way.Using resources doesn't have to embrace destroying it, so I started thinking what was the main problem of humanity now a days. Energy was the answer. I started studying Energy Systems Engineering 4 years ago, founded a NGO (Guateambiente) and started doing development projects with rural communities. In my career i found hydrogen a pretty cool element, specially because thats where the world is moving forward. During my projects i realized that the biggest problem in GUA is wood, so i took the personal challenge of finding a solution that can be accessed by anyone, anywhere and that they will like

Team

Diego Quan: Director of the project Victor Mora: Right hand, meetings facilitator and survey maker. Nelson Rios: Community member, host and translator. Julian Maquin: Community member, Host. Elena Cruz: Community Member. Luis Rodriguez, Julio Quan, William Fagiani: Advisors.

Background

Please confirm how you heard about the Unilever Awards:

Ashoka contacted me

Please confirm your role in the initiative (eg Founder/co-Founder) and your organisational title:

Founder

Which of the 8 UN Global Goals (Sustainable Development Goals) pre-selected for this competition does your solution relate most closely to? [select all that apply]

Affordable and Clean Energy, Climate Action.

Leadership and the Unilever Awards

Please provide examples of any previous entrepreneurial initiatives you have pioneered.

2010) Created a reforestation plan for my high school that won the Municipal award to the best seminar.

2011) Created an environmental movement in my High School called CoAm (Consciencia Ambiental), its goal was to create environmental awareness on highschool students through a 4 module program: 1) Organic Domestic Agriculture, 2) EM's, the use of efficient microorganisms to clean water (there was a polluted river near by). 3) Environmental attitudes. 4) Solid Waste Management.

2012) A group of committed friends from engineering school and I founded Guateambiente, an NGO that makes renewable energy projects and environmental sciences project.

2014) Co-worked with Engineers Without Borders (University of Washington) in a community development project in Sibinal, Guatemala.

2015) Won, with Guateambiente, the presidential medal of the environment.

Beyond your existing team, who else are you working with to achieve your objectives, eg partners, advisors, mentors?

My entire team was described before.

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