



INYENYERI™

A Rwandan Social Benefit Company

WorldStove™ in Rwanda



WorldStove Director and inventor of the LuciaStove™ Nathaniel Mulcahy has his hands dirty in Rwanda for Inyenyeri's launch.

Measuring Success



Inyenyeri will measure its impact in Rwanda with a set of rigorous survey techniques. Most of Inyenyeri's customers lack access to electricity or proper sanitation.

Inyenyeri's Fuel Model



Inyenyeri is not a typical "clean cookstove" venture. By having a revenue model based on fuel sales, Inyenyeri reaches the rural poor without subsidies or a microcredit scheme.

Give Money



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Inyenyeri is in **critical need** of your support. Grab your credit card and donate now. Please!



Rwanda, Get Ready

"We've got your new fuel!" declares Inyenyeri's Director of Marketing, Jean Bosco Musana. Hundreds of people listened to the announcement at Umuganda, Rwanda's monthly community work day. With support from the Rwandan Red Cross, Inyenyeri is now cranking out 230 LuciaStoves and 100 kg per hour of pelletized biomass fuel for Rwanda's poor. The scale up enables two rural villages to be the first Inyenyeri customers. This interaction will prove the details of the business model, paving the way for more rural biomass collection hubs and fuel pellet factories.

"Inyenyeri" means "star" in Kinyarwanda. The word can also describe heroes and saints; people who are a "guiding light" for

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others to follow. This is the vision of Inyenyeri, a Rwandan “social benefit company” that will change the energy landscape in Rwanda.

Inyenyeri’s solution *gives away* cookstoves to rural customers and sells cookstoves to urban customers. [LuciaStoves](#) produce and burn clean gas and work only with the biomass fuel pellets Inyenyeri produces for its customers.

Cooking with a LuciaStove transforms the biomass fuel pellets into “biochar”, which is 80% carbon. Inyenyeri plans to *sequester* carbon dioxide by applying biochar as a soil amendment to agricultural land, resulting in increased crop yields and improved food security in rural Rwanda. Pellet production uses almost no wood, only twigs smaller than 1 cm in diameter. In addition, no cropland will be converted to biofuel production. Find more information on this in [Nicholas Kristof’s blog](#) for the *New York Times*.

Most of Inyenyeri’s revenue comes from recurring fuel pellet sales, *not from the stove sales*. Together, the LuciaStove and fuel pellet system creates a healthy, low-cost, convenient and carbon negative cooking economy throughout Rwanda. The model is already a game-changer, and it gets even better.

With over 300 rural locations by 2020, Inyenyeri will establish a physical presence in poor rural villages that no other business enterprises or NGOs have entered. As a social benefit company, this close contact with the rural poor is an incredible opportunity for Inyenyeri to further create a positive impact. Building upon the success of the LuciaStove and biomass fuel sales, Inyenyeri will begin to offer many extra products for additional social benefit through a customer rewards program. Customer accounts are credited when the biochar is returned to Inyenyeri. With these credits customers can purchase solar lights, rechargeable batteries, water filters, school vouchers and more.

Returned biochar proves that customers are using the LuciaStoves properly, and also provides a measurable offset that may enable Inyenyeri to get carbon revenues down the road.



Founder and Executive Director Eric Reynolds (left) and Marketing Director Jean Bosco Musana (second from the right) explain Inyenyeri’s vision to local government leaders.



LuciaStoves pyrolyze fuel pellets made from Rwandan biomass and burn as a clean & hot gas flame ([video here](#)). Above, the first LuciaStove to burn Inyenyeri’s Rwandan fuel pellets.

WorldStove in Rwanda



Forming the Partnership

WorldStove, the enterprise behind the LuciaStove, is working with Inyenyeri to scale up stove and fuel pellet production. The two are also building upon WorldStove's successful [5-step program](#) by expanding into Rwanda.

WorldStove's Nathaniel Mulcahy landed in Rwanda in late July. Early difficulties with pellet production provided a tough challenge for the team. The manufacturing issues have since been resolved and the company is charging ahead, producing pellets daily.

Mulcahy has spent much of his efforts thus far to characterize the Rwandan biomass for the LuciaStove. The results have been extremely encouraging. In particular, Eucalyptus pyrolyzes better than "anything [he's] ever seen", and the plant appears to blend effectively with urubingo (a native grass) and banana leaves. While it's too early to confirm this discovery, a more efficient fuel will allow Inyenyeri to reduce costs and reach Rwanda's poor even faster.

When the Rwandan specific stove dimensions are finalized WorldStove will begin training Inyenyeri employees to manufacture the stoves at the Rwandan Red Cross. Inyenyeri will begin by making 230 LuciaStoves together with WorldStove at this factory.



Eric Reynolds raises the banner at the new stove and pellet factory.



WorldStove's Nathaniel Mulcahy (second from the left) looks on as Reynolds adjusts the pellet mill. The machine can produce about 5000 kg of pellets each day.



A complete LuciaStove is ready for assembly. The stove ships flat-packed to Rwanda where the stainless steel sheets are rolled, bent, and welded into a finished LuciaStove.



Measuring Success



Mubuga and Kabere

On August 13th, Inyenyeri is rolling out in two rural Rwandan villages. 200 of Inyenyeri's first 230 LuciaStoves will be deployed in these two communities, and Inyenyeri will measure the impacts every step of the way.

Inyenyeri has set up a modest Randomized Control Trial (RCT) to measure its impacts most accurately. The intent is to create a control group by randomly offering the LuciaStove to 50% of the population, and

recording the entire population with Inyenyeri's seven-page survey. After the baseline is established, the goal will be to monitor the new customers and the control group in order to measure health impacts, deforestation impacts, changes with CO₂ emissions, and effects on disposable income. The Rwandan Red Cross began administering the survey on August 3rd and expects to finish data collection within one week.

Local health center data and school attendance records are supplementing the survey.

Streamlining the Fuel Model

Quick Facts:



Inyenyeri “crowd sources” eucalyptus twigs less than 1 cm wide, native urubingo (above) and banana leaves from rural populations who now collect these cooking fuels across Rwanda. Urubingo can grow up to 20 ft tall every 4 months.



Fuel pellets are manufactured from crowd-sourced raw biomass and are sold to urban customers and given for free to rural customers. Urban customers save money by paying 50%-75% of the price of charcoal for Inyenyeri pellets.

- 86% of Rwanda’s total energy consumption is used for cooking.¹
- 11 million Rwandans or 2.5 million households cook with wood, charcoal or other biomass.²
- Rwanda spends \$211 million a year on charcoal.³
- Rwanda’s population: Growing at 2.8% per year, urbanizing at 9% per year.
- Between 1998 and 2005, Rwanda lost 1/3 of its forests.⁴
- Women and children spend up to 20 hours each week collecting and drying wood fuel for cooking.⁵
- Respiratory diseases account for 34% of visits to health centers in Rwanda.⁶

Cooking fuel generates revenue, not cookstoves.

How it works: Rural customers provide raw biomass to supply both themselves and the urban customers. Each week, rural customers must collect and bring biomass to the Inyenyeri Hub. In return, rural customers receive free fuel pellets, need to spend less time collecting biomass, and have access to free biochar fertilizer. Crowd-sourced biomass lowers the cost of fuel pellet production, enabling Inyenyeri to outcompete wood and charcoal. Revenues come primarily from fuel pellet sales to *urban* customers, not rural customers.

PLEASE GIVE NOW

Dear Friend,

At this time Inyenyeri has a wealth of momentum but no money.

Eric Reynolds is committing his life to Inyenyeri's success. In July 2010 he moved to Rwanda and has loaned the company \$350,000. However, having purchased the capital equipment and recruiting the team needed to scale production, all that remains are pockets full of lint.

Inyenyeri is in serious need.
Click to [Donate now](#) with your credit card.

Together we'll keep this venture flourishing.



To Paraphrase Muhammad Yunus:
**“In 20 years we must see this
only in a museum.”**

Sincerely,

The Inyenyeri Team

Referenced Documents:

1. GTZ. Biomass Energy Strategy. Kigali, 2008.
2. GTZ. Biomass Energy Strategy. Kigali, 2008.
3. Calculated from Inyenyeri's survey data on current charcoal use rates and prices from 2010.
4. MINITERE and CGIS-NUR (2007).
5. Global Alliance for Clean Cookstoves. *Cooking Shouldn't Kill*. 2011.
6. Rwanda Statistical Yearbook. Ministry of Health. 2009.