



UpEnergy's Carbon Credit Initiative

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AFFORDABILITY MECHANISMS AND ENERGY ACCESS

Driving Down the Costs of Clean Cookstove Adoption

UpEnergy is a San Francisco-based social enterprise that finances, builds, and supports distribution channels for products such as high efficiency cookstoves, water purification technologies, and solar lights using carbon credit mechanisms. In Uganda, UpEnergy's focus is on cookstoves, where the local entity has sold 11,000 units since launching in October 2011.

With its local brand, "SmartHome," UpEnergy plans to reach over 100,000 households in Uganda by the end of 2015. UpEnergy is a leader in the use of carbon credits in developing markets. The founders of UpEnergy registered each of the world's first three Gold Standard energy efficient cookstove projects, resulting in the sale of over 500,000 clean cookstoves.

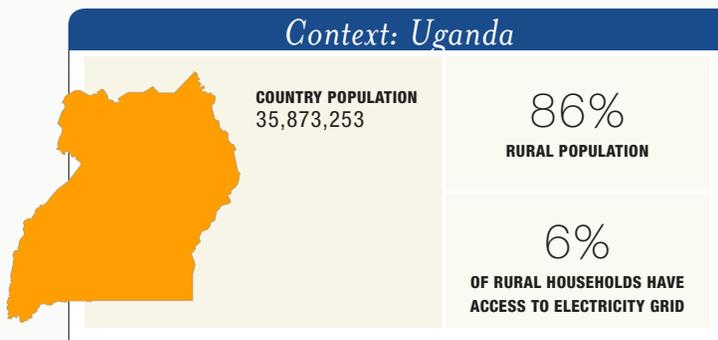
CHANGING LIVES THROUGH ACCESS TO FINANCE
FOR CLEAN ENERGY AND WATER



“There are more high quality and locally appropriate technologies available in the market now than ever before. The challenge is getting those products into the hands of the people that need them at the right price point and in a financially sustainable way.”

—Nicole Ballin, Chief Operating Officer of UpEnergy

UPENERGY'S CUSTOMERS



The target customers for wood-burning, fuel-efficient cookstoves are rural women with families in the bottom quartiles of wealth distribution. They cook for their families and social events; some may also cook for sale. In selecting its cookstoves, UpEnergy took into consideration the typical dishes and cooking habits of the target customer. For example, in Uganda there are a variety of starchy dishes that require lengthy cooking times. Generally, there is no need for baking bread, whereas fried chapattis and omelets are very common.

BOX 1. TECHNOLOGY *UpEnergy Products*

SERVICES: COOKING



ENERGY HARDWARE
ENVIROFIT G-3300
(COOKSTOVE)

JIKO POA
(COOKSTOVE)

UNIT OPERATING LIFE
5 YEARS



THE HARDWARE ©UPENERGY 2011

High efficiency cookstoves that burn wood as a fuel source. These stoves replace traditional ‘three stone’ cooking methods characterized by a pot balanced above an open fire constructed of wood logs piled on top of three large stones.

The Envirofit and Jiko Poa reduce smoke and harmful gasses by up to 80% and reduce biomass fuel use by up to 60%.

FIGURE 1. ENVIRONMENTAL IMPACT WOOD BURNING AND DEFORESTATION



AFFORDABILITY MECHANISM: CARBON CREDITS

The product subsidy is created by monetizing the reduced carbon output of the stove, estimated to be approximately three tons of CO₂ per stove per year when compared with traditional cooking methods. For example, at a price per ton of USD \$4, and a life span of

five years, USD \$60 of carbon revenues can be applied to subsidize the cost of the stove that would otherwise retail for USD \$30 –\$100.

UpEnergy sells its heavily discounted, wood-burning, fuel-efficient cookstoves to rural families through a distribution channel of local organizations such as commercial retailers, micro-entrepreneurs, NGOs and microfinance institutions. Stoves are currently sold for cash on delivery, but UpEnergy is examining innovative payment mechanisms for its market, such as payment by installment and free trial offers. Customer education occurs at the point of sale so as to reinforce social and environmental benefits as well as correct usage. UpEnergy offers product warranties as part of after-sales service, and careful attention is given to acquiring accurate contact details for the customer to enable subsequent carbon crediting.

The UpEnergy model initially faced significant challenges. First, it had to find a way to be sustainable while serving low-income customers. Second, it had to persuade those customers to invest money in a product that replaces current cooking methods that are both simpler and free. Traditional cooking using the “three stone method” requires nothing more than stones and the fuel (wood). People with very little income need to be persuaded that they should invest in a stove — that they should pay money for a cooking device. Communicating the environmental benefits of clean technology to Base of the Pyramid (BoP) customers has not proven to be an effective marketing message. Rather, potential customers must be convinced that these products will bring significant benefits to their lives — including economic benefits — or a significant demand for them will never develop. The UpEnergy model also meets the dual challenge of affordability, which includes stimulating demand by using carbon credits to subsidize the cost of the product, and engaging consumers to persuade them that the cookstoves deliver tangible benefits. To accomplish these critical steps, the model relies on two key support processes: creating a cost-efficient distribution model that maximizes scale; and managing the complex documentation processes required by entities governing the carbon markets, such as the United Nations and the Gold Standard.

BOX 2. CONVENTIONAL COOKING

Harmful Effects of Traditional Cooking Methods



TYPICAL HOME ©UPENERGY 2011

The World Health Organization estimates that indoor air pollution from three-stone fires causes 20,000 deaths per year in Uganda.

CARBON MONOXIDE

- Inhalation into respiratory system
- Absorbtion into blood from lungs
- Elevated carboxyhemoglobin (cohb) levels
- Reduced oxygen to body tissues
- Possible cilla-state impact on lung clearance

PARTICULATES

- Inhalation into respiratory system
- Deposition in respiratory tract
- Irrigation and toxicity

BENZO[A]PYRENE

- Inhibition into respiratory system
- Deposition and absorbion in lungs
- Metabolic activation
- Precursor to cancer

FORMALDEHYDE

- Irritation of mucosa
- Toxicity to cilia
- Reduction in lung clearance ability
- Possible carcinogen

ANALYSIS: KEY DRIVERS & SUPPORT FACTORS

BOX 3. AFFORDABILITY MECHANISM

About Carbon Credits



UPENERGY CUSTOMERS ©UPENERGY 2011

A carbon credit is created when one metric ton of carbon is prevented from entering the atmosphere. Efficient cookstoves reduce emissions, and therefore create credits. Credits are bought by companies, individuals and governments to offset their emissions locally. There is an active market in credits where prices fluctuate on a daily basis.

For the system to work, credits must be verifiable, and only projects approved under the United Nations Framework Convention on Climate Change can create tradable compliance credits. The approval process is complex because of the need to create a robust market with price integrity.

UpEnergy has obtained the approvals necessary to generate and sell carbon credits, thus creating a revenue stream to underpin a profitable social enterprise.

Carbon Credit Discounting

UpEnergy has designed a carbon credit scheme to deliver high quality products at affordable prices.

The company deploys its future carbon cash flows to offer an immediate subsidy to the end user. This approach simplifies the interaction with the customer, allowing UpEnergy to offer its products at an attractive, low price to persuade the customer to adopt the technology.

This affordability mechanism offers the possibility, assuming carbon prices are high enough, of discounting the stoves to the point that they would be free. UpEnergy has not chosen to pursue this approach as, in their experience, products given away for free are often undervalued and are therefore unlikely to encourage

FIGURE 2. COST COMPARISON

UPENERGY PRODUCTS VS. CONVENTIONAL SOURCES

ENERGY TYPE	RETAIL PRICE
Fuel Efficient Cookstoves UNSUBSIDIZED	\$30-100 U.S. DOLLAR
Jiko Poa SUBSIDIZED	\$14 U.S. DOLLAR
Envirofit G3300 SUBSIDIZED	\$18 U.S. DOLLAR

ongoing usage. If a product is free, it also risks being discarded in favor of a free replacement, rather than being maintained. If an UpEnergy cookstove is not used to replace traditional cooking, it cannot create a carbon savings and will not qualify for carbon credits, which would undermine the revenue stream on which the initial cookstove price is based. In short, each product has a specific price that will maximize sales volume while still maximizing usage and impact. The challenge is to find that price.

Carbon credits are traded on international exchanges and are therefore subject to price fluctuations. In the context of an extended global recession, prices are currently around USD \$4 per ton – an historic low. Emitters have reduced outputs, thereby reducing demand for credits. However, despite the failure of the international community to agree upon a successor to the Kyoto Protocol, which expires at the end of 2012, the European Union Emissions Trading Scheme (EU ETS) has committed to continuing to cap emissions and buy carbon credits through 2020, but only from least developed countries (LDCs) and from renewable energy and energy efficiency projects. Since the overwhelming majority of credits to date have come from middle income countries and from various industrial sectors, the narrower carbon credit eligibility criteria is a significant departure from past policies and paves the way for projects such as UpEnergy's stoves in Uganda to lead the market. Many analysts predict that this change in policy will lead to decreased supply and thus increased prices. There is good reason, therefore, to believe that UpEnergy is positioning itself strategically to capitalize upon a thriving carbon market post-Kyoto.

Effective Consumer Messaging

UpEnergy's targeted marketing has three key messages. First, it reveals the hidden costs of traditional cooking methods. Second, it highlights the aspirational aspects of the product. Third, given that the market is broadly aware of the health issues caused by indoor smoke and the benefits of spending less time collecting wood, UpEnergy's messaging highlights that fuel-efficient stoves reduce smoke and harmful gas emissions by up to 80 percent, biomass fuel use by up to 60 percent, and cooking time by up to 50 percent.

As a for-profit social enterprise, UpEnergy has a mission and a need to ensure the proper usage of every stove it sells in order to realize the social and environmental benefits of its products. To ensure maximum adoption and proper usage, UpEnergy offers an integrated package to the market: a quality, well-designed and low-cost product, user training, and after-sales service. Early sales results demonstrate the importance of the cookstove products' aesthetics, with more expensive, design-rich models outselling cheaper, more basic offerings. At the point of sale, customers go through a brief training by the distributors on how to use their cookstoves effectively. Finally, in an environment where customer service is rarely offered, customers are given one-year manufacturer warranties, ensuring customer satisfaction and continued usage.

All of these benefits — health, cost, time savings, reliability and appearance — create an attractive product that customers both buy and recommend.

Efficient Distribution

UpEnergy has experimented with different distribution models to find the most efficient and appropriate model for the Ugandan context. As the company deploys products in different markets, it must remain flexible to local conditions just as it has in Uganda.

Distribution occurs through a direct sales force and through partner organizations and enterprises. UpEnergy's direct sales force is leveraged to gain customer knowledge in the field and to test trial sales innovations first hand. These lessons are then packaged and transferred to partner distribution channels through extensive training and sales support.

UpEnergy's initial entry point into the Ugandan market was through its direct sales team. In each new area that it went to, the sales team conducted product demonstrations

to the local community and sold products on the spot immediately after the demonstrations. This way, the team was able to rapidly identify retailers and individuals who were excited by what they had seen and were interested in selling the stoves. The direct sales team also reached out to local retail chains to identify partners who could market and distribute UpEnergy products to larger audiences. By leveraging local partners with an existing and strong presence in these markets to sell their products, UpEnergy is able to quickly scale distribution through indirect sales. UpEnergy has also recently added large companies with substantial employee bases to their distribution targets, and has begun attending trade and industry shows to further strengthen its brand and access in the market.

As the focus of UpEnergy's distribution strategy has shifted from direct to indirect sales, the role played by UpEnergy staff has shifted from selling to training and distribution management. Feedback is constantly sought from the marketplace to improve product messaging. All sales trips are reviewed for lessons learned. Sales training is regularly updated and ensures that trainees receive deep product knowledge, coaching in basic organization and business skills, understanding of the profit model and, of course, sales skills such as handling objections and closing. Training also plays a key role in reinforcing the need for proper record keeping, which is necessary for carbon credit validation.

BOX 4. TECHNOLOGY

Carbon Keeper

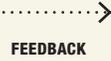


SMARTPHONE TECHNOLOGY ©UPENERGY 2011

Innovative smartphone technology that improves the end customer information collection required by carbon crediting mechanisms.

Carbon Revenues Drive Down Consumer Prices and Support Operations

DIAGRAM KEY:

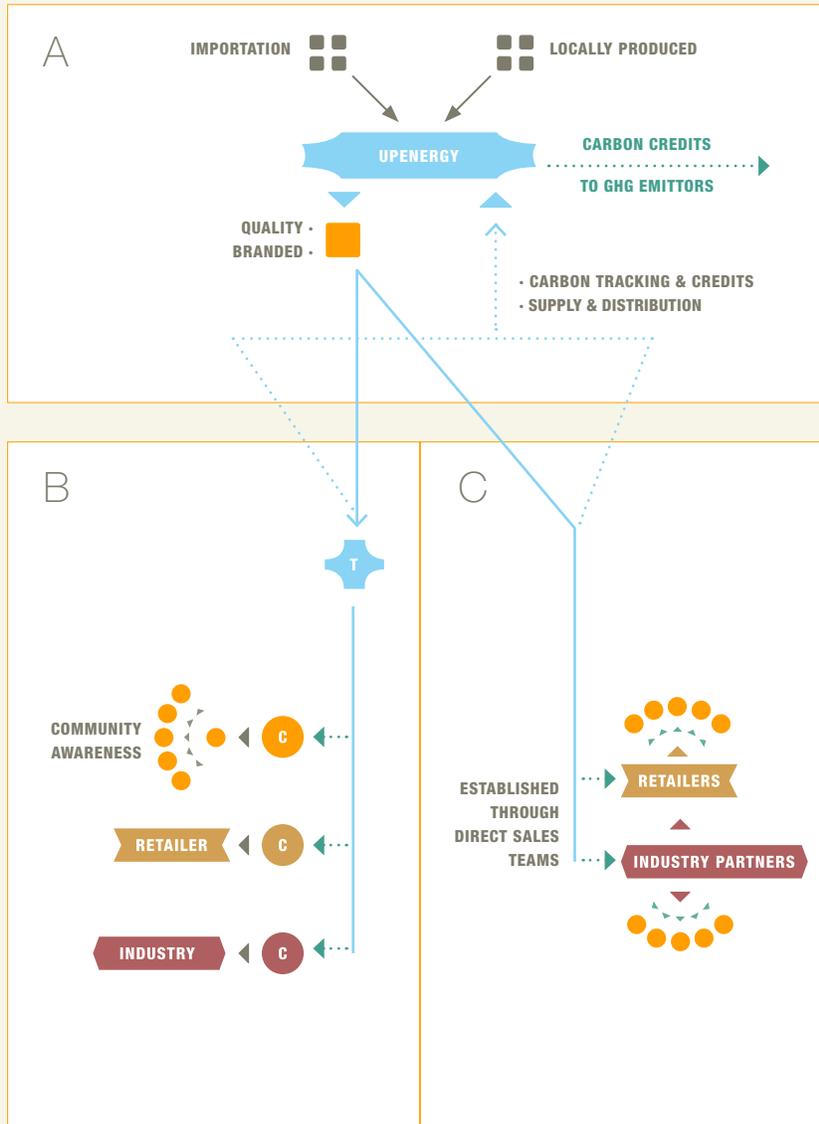


DIRECT SALES TEAM



INDIVIDUAL CUSTOMERS

DIAGRAM
THE UPENERGY DISTRIBUTION MODEL



Displacing Carbon and IAP

UpEnergy sells a stove to replace a dirty, inefficient and dangerous cooking method in a developing country, effectively accumulating Greenhouse Gas (GHG) savings

Monitoring and Verification

A rigorous auditing process and issuance by governing bodies (Gold Standard or United Nations) ensures creditable and widely accepted carbon credits.

Accessing Carbon Markets

Carbon credits are then sold to carbon-emitting institutions and companies in developed countries. This helps them comply with pollution laws such as mandated emissions cuts or voluntary carbon neutrality commitments.

Revenues Bolster Demand, Growth

Carbon revenues reduce the price of stoves, as well as bolstering distribution channels and marketing efforts.

FACTORS INFLUENCING SCALE

Managing Carbon Market Uncertainty

With over 96 percent of the population in Uganda using firewood for cooking, the market for stoves represents a sizeable opportunity for UpEnergy. There are, however, clear challenges to overcome in order to be successful. One of the biggest challenges to a business reliant on the carbon market is the unpredictability of carbon prices. UpEnergy mitigates this risk by forward-selling carbon credits, thereby locking in pricing for the project. This enables them to predict future cash flows and allows for product subsidies to be offered ahead of carbon volume deliveries

Distribution at Scale

A 15 percent penetration of stoves in the potential customer base of four-and-a-half-million Ugandan families represents 675,000 stoves. These numbers pose a considerable logistical challenge for market leaders. UpEnergy addresses this challenge through its two-pronged distribution strategy. By leveraging partner distribution networks, UpEnergy is able to utilize existing infrastructure and more efficiently deploy capital in areas where alternatives solutions do not already exist. Operational efficiencies and technology-based logistics solutions also serve to reduce the cost of distribution, allowing UpEnergy to

scale. Lessons gleaned from the direct sales team are standardized and replicated across regions, further enabling efficient expansion.

Handling Competition and Market Disruptors

As more organizations come to market with approved programs for carbon credit subsidized stoves, a period of intense price competition is likely. For late entrants, the temptation will be to try to create a portfolio of customers quickly by discounting stoves close to zero, or even less than zero. This could be very disruptive for other market participants who will find their pricing structures under pressure. UpEnergy is preparing for this by working to establish a trusted brand and a distribution network that will be difficult to replicate.

As a technology-agnostic organization, UpEnergy is reliant on local suppliers to deliver high-quality and affordable technologies. While great progress has been made in the creation of locally appropriate technologies, the current scale of operations and lack of competition in the market have meant that these technologies are still relatively expensive. As demand from consumers for better quality products increases, more manufacturers will come to market, creating downward pressure on product pricing as well as more competition on non-price factors such as product warranties, lead times, and quality control.

“The Uganda project is the culmination of the past experience of our founders and the social marketing and distribution innovations that we have developed. Many of the lessons we have learned there will be transferred to our projects in other parts of the developing world.”

—Nicole Ballin, Chief Operating Officer of UpEnergy

Closing: Lessons Learned

A Viable Market Can Be Developed Among BoP Clients

BoP customers have limited disposable income, but they can represent a viable market if products are locally appropriate, are marketed in an effective way, and if the so-called "last mile" challenge can be overcome.

The Marketing Message Must Be Expanded Beyond Environmentalism

The marketing message must highlight the direct, short-term and long-term value the product will offer to the customer. Product design must be driven by aesthetics as well as functionality, ensuring that the product is perceived as attractive. Messages emphasizing the environmental or social impact have limited ability to prompt behavior change.

When it Comes to Cash, Timing Is Everything

Effective BoP sales have to take into account that consumers in these markets not only have limited disposable income, but also inconsistent or "lumpy" cash flows. Marketing events must be carefully timed to coincide with high-income periods such as post-harvest seasons or heavy shopping periods prior to religious holidays such as Easter or Christmas. Equal care must be taken to avoid moments of limited income such as after holidays or after school fees have been paid.

*Thank you to the UpEnergy team for their
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