



*Biomass energy
and renewable charcoal briquettes*



Name: SGFE

Date of creation : Dec. 2009

Location: Phnom Penh, Cambodia

Nb staff : 17 employees

Production capacity :

**With 1 production line, up to
20T/month**

Beneficiary :

More than 1000 persons

FY 2012 revenues:

US\$ 40 000

Business model :

**Factory manufacturing
charbriquettes and selling it
through distributors**

CASE STUDY

S GFE - Sustainable Green Fuel Enterprise is a factory that has developed a type of clean energy that offers a more sustainable future related to Cambodia's cooking fuel consumption and utilization. Combining modern processing techniques with innovative technologies, SGFE is manufacturing a high quality and sustainable alternative to wood charcoal: char-briquettes made of organic biomass waste.

EXECUTIVE SUMMARY

SGFE - Sustainable Green Fuel Enterprise is a factory that has developed a type of clean energy that offers a more sustainable future related to Cambodia's cooking fuel consumption and utilization. Combining modern processing techniques with innovative technologies, SGFE is manufacturing a high quality and sustainable alternative to wood charcoal: char-briquettes made of organic biomass waste.

SGFE's char-briquettes replace directly the utilization of the traditional charcoal in Cambodia, leading to:

- Reduction of deforestation (reducing illegal logging for the production of charcoal).
- Improvement of home cooking conditions (better, safer and healthier product).
- Enhancement of waste management in urban areas (recycling of biomass waste).
 - Alleviation of poverty (creating new jobs).

Date of creation :	2008 as a Geres & PSE's project & Dec. 2009 as a business
Operation area :	Phnom Penh, Cambodia
Nb staff :	17 employees
Business Model	Factory manufacturing charbriquettes and selling it through distributors
Target Market	The traditional charcoal market of Cambodia for premium charbriquettes
Source of revenue	Sales of charbriquettes Sales of starters
Production capacity	With 1 production line, up to 25T/month - With 2 production lines, up to 40T/month
Revenue for 2012	US\$40 000
Total Beneficiaries	More than 300 final end-users at the moment (restaurants+ households), + jobs created + suppliers & distributors,
Supplier	Factories (garment, ice...) for char residue & suppliers that collect char residues in factories and coconut shells in markets and sell it.
Technology type	Carbonization of wastes through T-LUD charring, briquetting of the carbonized product through extruding technology and drying of the charbriquettes with the heat from the T-LUD
Funding source	Self-funded and grants
Legal Incorporation	Cambodian foreign owned private limited company (PLC), single member limited company



Economical impacts

At user level:

- **Monthly consumption:**
 - » For households: ~18,75kg
 - » For shops: Between 60kg and 150kg
 - » For restaurant: Between 400kg and 800kg
- **Monthly savings:** For end-users ~ US\$4 - US\$5
- **Ancillary revenue:** For factories, coconut vendors, entrepreneurs, shops...

At factory level:

- **Cost of 1 additional line of production:**
 - » Less than US\$15 000 for 1 extruder (not available in Cambodia) + 1 dryer (purchased in Cambodia & assembled and built at the factory)
 - » Less than US\$22 000 for 1 new warehouse to stock the final products
- **Equipment lifetime:** ~ 3 years (max. 5 years)
- **Total revenue:** FY 2012 US\$40 000
- **Expected growth:** FY 2013 more than 160% and again 50% more FY 2014
- **Operational profitability:** FY 2012, operational loss of US\$ 12 000

Environmental impacts

- Reduction of deforestation (reducing illegal logging for the production of charcoal).
- Enhancement of waste management in urban areas (recycling of biomass waste).
- Reduction of Green House Gases emissions

Social impacts

- Access to improved cooking fuel leading to less health hazard and cleaner and safer cooking conditions.
- Insertion of former waste-picker in the formal labor market with decent social working conditions.

Innovations

The energy efficient charbriquette production process: T-LUD technology to char the biomass and reuse of the heat from the charring process for the drying of the final charbriquettes.

PROBLEM TACKLED AND MAGNITUDE OF THE PROBLEM

General overview of Cambodia

- Population : 14,7 M
- Population growth rate : 1,78%
- GDP Growth rate : 7,1% en 2011
- IDH : 0,523 (ranking : 138 over 186)
- Average age of population: 23,3 years old
- 80% of the population in rural areas
- 1/3 of Cambodians live below poverty line (KHR 2473 - US\$0,61/day)
- Minimum wage in garment factories: US\$61 per month
- 24% of households have access to electricity
- 16% have access to clean cooking solutions

Deforestation

Although 57,7% of country is still covered by forest, Cambodia is facing a problem of massive deforestation, third only to Nigeria and Vietnam with a rate of 1,14% (1). Between 1990 and 2010 Cambodia has lost 22% of its forest cover. One explanation for this critic situation is the fact that today, biomass, in the form of wood and charcoal, is the principal source for thermal energy in Cambodia. 85% of all thermal energy is produced from wood and is used for cooking purposes by the population or by factories (3).

Cambodia doesn't have a "legal" charcoal production. All wood used to produce charcoal derives from illegal logging, which explains the low price of charcoal in Cambodia. In fact, if the wood needed for the production of charcoal was bought from managed forests, the price of the wood would reflect directly on the final price of charcoal, which would impact the already extremely poor charcoal producers and final consumers.

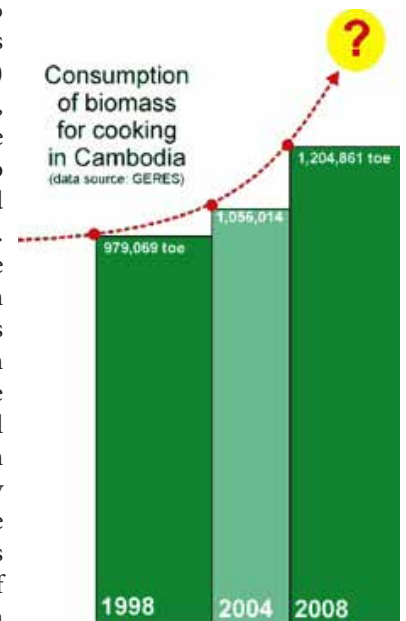
Poverty

- Because of the progressing deforestation and its consequent reduction of available wood, the price of charcoal seems to increase significantly every year, impacting mostly the poorest people and families.
- Furthermore, after the closure of the dumpsite of Steung Meanchey, many families that used to earn a living (KHR 6000 to 10 000 - US\$1,50 to 2,50) through waste collection, got left without any source of subsistence.



Cooking energy needs

While in rural areas, 96% of the population uses biomass (mainly wood) for domestic cooking, in urban areas the percentage decreases to a value between 60% and 80 % (mainly charcoal). However, due to the continuing migration of the poorest segments of the population from the countryside to the main cities, charcoal consumption in urban areas is increasing. Only in Phnom Penh, the population consumes annually 100.000 tons of charcoal deriving from deforestation and 27% of Phnom Penh's residents use charcoal as their main energy source (2).



Waste

In comparison with the cost of traditional charcoal (0.225-0.275 US\$/kg), the cost of alternative fuel is far too high for most of the population (1,33 US\$/kg GPL).

At the same time, about 900 tons of waste are accumulated daily in the municipality of Phnom Penh. Of these 900 tons, 87% is represented by organic waste. These are partially burned at the dumpsite to reduce their volume, which produces toxic emissions. The part which is not burned decomposes, emitting methane gas (worldwide, emissions of methane gas contribute to 23% to global warming, second cause after CO2 emissions). Each day, tens of tons of organic waste (coconut fibre and sugar cane residues) are being disposed in Phnom Penh, representing valuable fuel.

(1) (FAO 2010, paper 230)

(2) Source: World Food Program - Cambodia Socio-Economic Survey 2004

(3) Energypedia 2012



ID CARD

General information

Name: SGFE - Sustainable Green Fuel Enterprise

Creation & Context:

SGFE is the result of a joint project implemented by two NGOs, GERES (Group for Environment, Renewable Energy and Solidarity) and PSE (Pour un Sourire d'Enfant). To develop it, they both invested partly own funds and partly grants deriving from an international development and cooperation program of the French Government.

The project started in early 2008 and the factory was opened (operational) in December 2009. GERES has then continued running and subsidizing the business for the entire years of 2010 and 2011. At the end of 2011, SGFE was still not fully sustainable and the two NGOs had exhausted the funds allocated to the project. SGFE was thus facing the risk of closure.

Carlo Figà Talamanca, who was working as a consultant for GERES since July 2010, and who had already been involved in the "SGFE project" in terms of project evaluation and business management/development support, decided to take over the business starting from January 2012.

Human Resources

Location:

- Head office and factory in the south of Phnom Penh
- 1 distribution center in the north of Phnom Penh
- 1 distribution center in Sihanouk ville

Number of employees: 17 people working at the factory

Employees: Mainly people that were left out of formal employment before (former waste-pickers, usually parents of children schooled at PSE).

Conditions of Employment: Labor contract, a base salary (~40% higher than minimum wages in garment factories)+overtime opportunities, 13th month salary+Insurance (accident & health) + charbriquettes distribution (1 bag of 30kg per month ~ 7\$ for their own usage as a complement of their wages)

Salaries:

- **Foreman/workers:** average of US\$86-87/month + attendance bonus & production bonus
- **Security guard:** average of US\$95/month
- **Production manager:** US\$390/month + production bonus
- **Sales person:** US\$90/month + variable (on sales) + attendance bonus
- **CEO:** US\$0/month

Main product

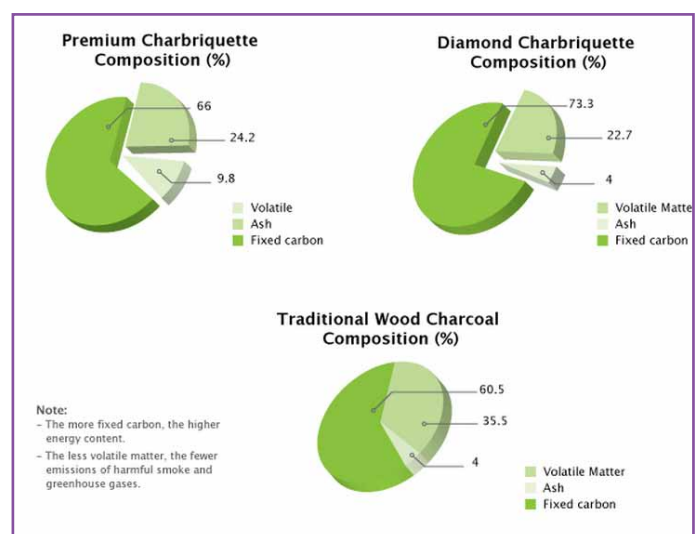
Type:

- **There are two main types of product sold by SGFE:**
 - » Premium briquettes: 95% char residue, 5% coco shell char + binder + water
 - » Diamond briquettes: 100% coco shell char + binder + water
- **Production is distributed so:** 97% Premium & 3% Diamond

Advantage of charbriquette over traditional charcoal:

- Produced with 100% recycled biomass waste
- Sold ready for use (unlike traditional charcoal that needs to be cut in small pieces before any use producing in that way a lot of dust)
- Burn longer (1 to 1.5h for traditional charcoal / 1.5 to 2h for Premium / up to 5 hours for Diamond)
- Burn without producing sparks
- Burn producing no smell and less smoke
- Premium Charbriquettes sold the same price or sometimes lower than traditional charcoal (especially during rainy season when charcoal prices rise)

In addition to these major sales, SGFE manufactures and sells "starters" made from a by-product of the production - "coconut shell powder"



Target market

SGFE's target market is the traditional charcoal market :

- **Restaurants:** Cambodian small restaurants which still use charcoal to save on cooking fuel costs and kitchens that are usually small rooms at the back of the facility where women prepare the food.
- **Private household:** Mainly daily cooking needs and in some cases barbecue.
- **Food street vendors and markets**

Remark: Very poor households cannot afford to buy charcoal and generally collect combustible in the streets.

The current annual market for charcoal in Phnom Penh, is US\$25 million (100.000 tons/year) — a figure that is expected to more than double during the next 5 years based on current trends (according to the Pullizer Center).

Business Model

Manufacturing: Combining modern processing techniques with innovative technologies, SGFE is manufacturing a high quality and sustainable alternative to wood charcoal:
Char-briquettes made of organic biomass waste.

Distribution & Selling: The objective in the future is to reduce the distribution & selling part of the activity to the minimum by finding the appropriate distribution channels (more wholesale retailers and less end users distribution). SGFE would preferably focus on its core business, which remains the production of sustainable cooking fuel, and promote the appearance of new actors in its value chain for the distribution and sales of its products (supplier, distributors, wholesalers, retailers, etc.).

Raw materials: SGFE preferably buys char residue (charcoal waste) and coconut shells from suppliers. If needed, they can also do it themselves collecting and purchasing charcoal waste from factories (like garment or ice factories) and coconut shells from coconut vendors in the markets of Phnom Penh.

Revenue Model

SGFE earns its revenue from:

- Sales of charbriquettes
- Sales of starters

Billing principles: SGFE's char-briquettes are sold almost the same price as the traditional charcoal (0.225-0.275 USD/kg). Nevertheless depending on the customer, SGFE has adopted different price strategies:

- **For end-users:** The price of the charbriquettes when sold and delivered to the end-user (e.g.: restaurant) is 1,100 Riel/kg (0.275 US\$/kg)
- **For shops:** The price of the charbriquettes when sold and delivered to shops is 1,100 Riel/kg (0.275 US\$/kg). The shops can then sell the charbriquettes by the kg (retail) to the final end-user and have a complete autonomy in the choice of the selling price (usually 1,200-1,300 Riel/kg or 0.300-0.325 US\$/kg).
- **For distributors (entrepreneurs or new distribution center):** SGFE's distributors buy charbriquettes at SGFE's factory at a price of 900 Riel/kg (0.225 US\$/kg). They can then sell them to their own customers, typically restaurants, households, food street vendors and sometimes at markets (sold by the kg to the people in the markets). The only restriction on charbriquettes' price set by SGFE is that the distributors mustn't sell them at a price lower than 1,100 Riel/kg (price at which SGFE is selling the charbriquettes to its customers when the delivery service is included). Therefore, the usual

price set by the distributors is also 1,100 Riel/kg, when selling to "bigger" customers (restaurants) and 1,200-1,300 Riel/kg, when selling at retail level by the Kg.

Economic Sustainability

Penetration rate:

Today SGFE has a market share of 0.2% of the entire annual charcoal market in Phnom Penh (about 100,000 tons of charcoal every year).

With the actual production capacity and sales trend, SGFE can reach 0.3% of the entire market (300 tons/year).

SGFE's costs for the installation of a new production line and a new warehouse:

- Less than US\$11 000 for 1 extruder (not available in Cambodia) + US\$6 500 for 1 dryer (purchased in Cambodia & assembled and built at the factory) + US\$3 500 for 1 mixer
- Less than US\$22 000 for 1 new warehouse to stock the final product

Average monthly cost: FY 2012 - in average US\$3900 distributed as followed, 38% HR, 32% Raw Material, 19% Production Overhead and 11% Office Overhead.

Average monthly revenue: FY 2012 - in total US\$40 000 mainly coming from the sale of charbriquettes (~ US\$3300)

Operational balance: FY 2012 - in average a deficit of US\$600 per month

Financial capacity to renew equipment: None for now (except from grant awarding)

For now, the company is still not yet economically viable, with the owner having to bail out almost every month (15% of the total income).

Nevertheless, with the obtention of a grant from the GACC which has allowed SGFE to invest in a second production line, the sales growth forecast for 2013 is expected to be more than 160% of its sales for year 2012 which should allow SGFE to reach breakeven point.



VALUE CHAIN OF BUSINESS

Raw materials

Nature of the raw material:

The raw materials used to produce SGFE's charcoal are:

- Char-residues collected from factories (like gasifiers, ice factories, brick factories, etc. which burn wood to produce heat or electricity and throw away the ashes, which still contain combustible char-residues).
- Coconut shells collected in markets around Phnom Penh, which otherwise would end up in open air dumpsites to decompose.
- Binder (tapioca starch)

Price of raw material :

75\$/ton for coco shell (up to US\$125 depending on Vietnam's own needs, viz. if it uses it or not to produce its own electricity)
50\$/ton for "raw" char residue (without cleaning and without transport) - 60-75\$/ton depending on the quality with delivery and with cleaning.

Quantity of raw material needed:

In average, to produce 1 ton of premium charbriquette, SGFE needs 1.5 ton of char residue, 0.35 ton coco shell and 0.08 ton of binder.

R&D & Innovation

Charbriquettes quality:

SGFE's briquettes comply with EU NF 1860-2, the international standard for charcoal briquettes (tests performed by GERES Biomass Energy Lab - G-BEL).

A production process energy efficient:

The production process has been designed to be as energy efficient as possible. The kilns used to carbonize the biomass ensure efficient combustion, reducing the emission of harmful gases and air pollution. Furthermore the energy generated by the carbonization process is recovered and used to increase production process efficiency.

Production

- With the actual sole line of production, SGFE has a maximum production capacity of 20 tons/month.
 - With the imminent opening of the second line of production, SGFE should reach a production capacity of 40 tons/month."

Marketing

To get end-users to know about the product is the key to raising the sales. Indeed, it seems that once they have tried the product, end-users usually switch to it. However, for now the main problems were not related to the sales but to the production and distribution capacity. With the actual adoption of a new production line and new forms of distribution, there most probably will be soon a need for marketing campaigns (end of this year).

Like previously, these campaigns will be composed of:

- **Radio campaign/advertising** – 1 month radio campaign, advertising SGFE's char-briquettes in Phnom Penh, with the following features:
 - » Up to 10 short spots during the day, communicating the main characteristics, the location of the distribution center and a contact phone number.
 - » Sponsor of 1 or 2 popular radio programs, where directly the speakers will talk daily about SGFE's char-briquettes during their programs, explaining and analyzing in detail all the characteristic, advantages and benefits of the new cooking fuel, and also clarifying where and how to buy it.
- **Other types:** Largely by word-of-mouth and also through flyers, t-shirts, billboard, umbrellas and local press

During marketing campaigns, SGFE usually uses marketing students from PSE.

Sales & Distribution

Distribution capacity:

SGFE's on-demand distribution is currently done with SGFE's tuk tuk, which has a load capacity of max. 600kg. Today, the tuk tuk performs in average 2 trips per day (one in the morning and one in the afternoon, serving multiple clients on each trip) with a medium load of 200kg-400kg per trip. An increase of demand exceeding 23 tons/month (2 trips per day with an average load of 500kg/trip) will put SGFE's distribution under pressure (difficulty serving every customer in time), affecting again "accessibility" of the product.

Evolution of the distribution system:

- **Direct Sales:** While the direct sales and delivery to the "bigger" customers as restaurants was already quite efficient, by delivering the char-briquettes in medium/big quantities (50-300kg/order) with SGFE's tuk tuk, the difficulty was reaching private households, which order only a few kg (3-5kg) at a time and to reach street food vendors, which also order small quantities (5-10kg), since they have no place to store it.
- **Distribution through retailers:** To overcome this bottleneck and be able to reach those customers which could not be efficiently reached otherwise, SGFE decided to address intermediaries for the distribution and sale of the charbriquettes. As a consequence, SGFE addresses now shops (retailers) in Phnom Penh, which along with other products, sell henceforth also SGFE's charbriquettes. SGFE sells the





charbriquettes to the shops in 30kg bags, where the average order goes from 60kg (2 bag) to 150 kg (5 bags), and delivers the char-briquettes to the shop with its tuk tuk.

- **Distribution through independent entrepreneurs:** In addition to the shops, SGFE also addresses distributors (wholesalers). Distributors are independent “entrepreneurs”. They usually own a mean of transportation like motor carts (motorbikes with a two wheel cart attached to it) or a tuk tuk, and work with it providing small transportation services or buying and selling goods in different parts of the city. (One of

these distributors is for example also one of SGFE’s suppliers, who collects the coconut shells in the markets of Phnom Penh and then brings them to the factory to sell them.)

- **Distribution through multiple distribution centers:** Most of SGFE’s customers are today within a distance of 5-6 km from the factory. Therefore SGFE is already experiencing complaints, mainly from shops, who lament the slow-down of their businesses due to the multiplication of “char-briquettes points of sales” (shops) in the same area. Fortunately this is just a slow-down, in the sense that it is a slower increase of sales, since the multiplication of the points of sales is counterbalanced by the increasing number of end-users buying the char-briquettes. However, this suggests the necessity of finding customers/shops in different areas, further from the factory. In addition to that, new potential end-users (restaurants) need to be found in different areas of the city. Needing to find new customers in different geographical areas will have an effect on transportation costs and potentially also on the char-briquettes price, affecting the “profitability” of the value chain.

To face these barriers and to keep on growing, SGFE plans to develop its actual distribution system, transforming it from a centralized distribution system (one central distribution center, which today is represented by the factory and one distribution center in Sihanouk), to a decentralized distribution network (with multiple distribution centers).”

Billing & Payment

Payment at purchase



IMPACT TO DATE

Social impact

Scale and reach:

- Considering that an average Cambodian household with 5 people uses about 1.25kg of charcoal/day, SGFE reaches every month about 300 households (1500 people) and about 15 restaurant kitchens (in average 2-3 people/women working inside one kitchen).
- In addition to that, there are the 17 employees of the company.

Cooking conditions improvement: Because the charbriquettes produce no sparks (which can cause domestic fires), less smoke (which cause respiratory diseases in indoor cooking) and are ready to use, the end users that use them see their cooking conditions improve (health, cleanliness...).

CSR: SGFE, mainly thanks to its CEO's mentality, seeks by all mean to have a strong social impact, especially with its own employees (& families). This results in:

- **Jobs creation:** SGFE's factory is located in Steung Meanchey, one of the poorest districts of Phnom Penh, where the recent closure (2010) of the municipal dump site, left the already extremely poor community (waste pickers) without a source of subsistence. By employing former waste-pickers (parents of PSE's children), SGFE has offered to people that were used to have informal occupations, jobs with fair and social working conditions (monthly salaries 40% above minimum wages, 13 months of salary paid per year, accident and health insurance...).
- **Schooling of children:** SGFE being linked with PSE, the management get immediately contacted when one of their employees' children start missing school. When that happens, SGFE seeks by all means to understand its reasons, to treat it with the family and PSE so that, at the end, the child returns to school.
- **Solving of life impacting problems such as indebtedness:** The indebtedness of the majority of employees is a problem.



Children playing with coco shell

E.g: One of the employees had contracted 5 loans, representing a global amount of more than \$1000, coming from a 2 private companies (5% monthly interest rate) and from 3 moneylenders (up to 20% monthly interest rate). As a consequence, she had to pay every month US\$240 only of interest rate. Not being able to reimburse the loans, the parents decided to put their children to work. After long and complicated discussions with the family, SGFE and PSE were able to convince the family to solve the problem: the family agreed to sell their motorbike (US\$ 500), SGFE and PSE lended each, at a 0% rate, US\$ 250 (US\$500 in total) to the family; SGFE hired the husband that was at this moment unemployed and in this way the family could buy the loans and send their children back to school.

Economical impact

End-users: SGFE's charbriquettes are sold at about same price as the traditional charcoal (0.225-0.275 US\$/kg), but have a longer burning duration (higher fixed carbon content). So households are enabled to save on cooking fuel (up to US\$4 - 5 per month) (for restaurant the savings are higher).

Jobs creation: SGFE created a whole new economy around its new product, including raw materials suppliers who can earn an extra US\$200 - US\$400 per month, charbriquettes distributors that can in average make a profit of US\$600 and retailers that have a new product into their basket.

Environmental impact

Reduction of deforestation (reducing illegal logging for the production of charcoal):

Deforestation causes 12% of the world's CO2 emissions. 1kg of SGFE charbriquettes can replace 1.1kg of traditional wood charcoal, which results in saving up to 6.6kg of wood from forests. As a result, SGFE activities contribute to reducing pressure on natural forests in Cambodia, a country which has one of the highest deforestation rates in Asia, and where biodiversity sanctuaries are now threatened by forest encroachment.

Reduction of Green House Gases emissions at each and every step of the process :

- **Collection of the raw material:** All the biomass that is collected to be used for SGFE charbriquettes comes from organic matter (coconut husks and shells, etc.) which would otherwise end up in local landfills; This reduces the amount of methane emissions resulting from biomass decomposition in open landfills.
 - **Along the production process:** SGFE energy efficient carbonization technology burns the organic matter completely and reuses the heat generated for the drying of the charbriquettes.
 - **When using the final product:** the low volatile matter content limits emissions of harmful smoke and greenhouse gases.
- In total, the sales and the use of SGFE's recycled charcoal in Cambodia has led to a **reduction of 2070 tons of CO2eq**

Improving waste management: By recycling part of the biomass waste generated in Phnom Penh, Cambodia, SGFE contributes to improved waste management in urban areas.



ECOSYSTEM CONDITIONS

Corporate finance

The project started in 2008, initially promoted by two french NGOs (“Group Energies Renouvelables, Environnement et Solidarités” and “Pour un Sourire d’Enfant”). By the end of 2011 the budget dedicated to the project terminated and, since the new business was still not sustainable (was losing money every month) the only possible solution seemed to close the factory. In January 2012, Carlo Figà Talamanca (the current owner) decided to take over SGFE and to try to lead the business to sustainability. During the last year, using only personal financial resources, without public funding, the factory could reduce costs and increase sales, leveraging economies of scale.

Carbon finance

With the sales forecast for 2013 and 2014 and the sales done since 2010, the total amount of charcoal sold by SGFE could be about 846 tons which would correspond to an emission reductions of about 4382 tons of CO₂. Thus the objective would be, one day, to access carbon finance to have ancillary revenues for investments in production capacity.

Key factor of success

For the evolution from the status of “NGO’s Project” to the one of “Business”:

- Already in the phase of project preparation and then in the project implementation, issues such as competitiveness and profitability necessarily have to be taken into consideration. They are definitely the bare bones of business.
- The management and especially the CEO of the future company must have a strong entrepreneurial mentality with

business knowledge and know how.

- The ownership of the company must be clearly defined and the governance well thought.
- The new company policy should have reasonable standards in comparison to the country’s standards.
- An incentive system should be put in place for the company’s workers and especially for the executive director and its team. The executive director and its team should be motivated to promote and make the business grow, keeping efficiency, low operation costs and increasing profitability.

For SGFE’s value chain:

- **Accessibility:** SGFE’s char-briquettes are available in shops, markets (through distributors) and on demand, responding to customers who usually order by phone and SGFE delivers the char-briquettes with its tuk tuk the same day (within a few hours). Critical are the production capacity, the distribution capacity and geographical distance (the distance of the customers from the factory, affecting delivery time).
- **Profitability:** Every actor in the value chain “wins” (everyone has a profit), including distributors, shops and end-users (restaurants/businesses and households). Critical are the distance of the actors/customers from the factory (geographical distance increases transportation costs and reduces profit margins) and the business growth potential (current relatively scarce geographical density of the wholesalers and retailers determines low competition and respective bigger markets).

Key Awards

SGFE has been awarded with a grant of US\$ 47000 from the Pilot innovation fund of the GACC for a second production line, new warehouse and potentiation of distribution system.

CURRENT CHALLENGES

Raw Material:

Securing the supply of raw material

Human Resources:

The employees are mostly former waste pickers, used to earning money, between KHR 6 000 - 10 000 (US\$ 1,5 - 2,5) per person and per day, at their “own rhythm”, viz. only when they need to go to the dumpsites, and with that comes a lot of unexpected challenges.

- One of the biggest challenge comes to instilling “working” values such as: attendance, quality of work, loyalty, motivation... Despite the favourable conditions, turnover remains high. In general, to be able to motivate and retain its employees can be a challenge in Cambodia especially when they come from the lower social classes.
- Another challenge concerns the highly informality and the really low resources of its employees.

E.g.:

In case of an accident when commuting to office, insurance supports only if the person has a driving license. But today none of the employees do have one. The company therefore plans to regularize the situation of all employees in this regard.

Another aspect is related to medical reimbursements. To date the insurance taken only supports in case of hospitalization. However for its employees, the simple act of going to the doctor is a huge burden. The company therefore plans to take over the costs of medical bills on presentation by employees.

- Another challenge comes from the fact that SGFE was formerly run as an NGO. Some of the employees got used to get a salary independently of the result of the company
- Finally and, last but not least, comes the problem of debt often related to the schooling of their children. The indebtedness of the majority of employees is a major problem that the company is trying to tackle. Due to the usurious rates at which they borrow (e.g. 20% monthly), employees are simply only able to reimburse the interests without ever being able to repay the capital. Moreover, to help them repay, they usually take their children out of school and put them to work to earn an extra salary. However, despite the implication of SGFE, no general solution has been found. Microfinance institutions have for example been contacted but none of them has agreed to take the credit despite the fact that the company agreed to act as surety.



GROWTH GOALS

SGFE will start to sell carbon credits from mid 2013. However, with the actual production capacity and sales, the financial contribution deriving from carbon credits will only be enough to make the business sustainable, with an estimated annual gross profit of 9,000 USD. Through the increase of the production capacity foreseen in the pilot project, SGFE will be able to leverage on economies of scale to reduce the production costs, and at the same time, by increasing its sales, the carbon credit contributions will increase its profits. After the pilot phase, SGFE looks forward to increase its production capacity in its current facility from 40 tons/month (production capacity available after the project) to 80 tons/month within 2 years. This production capacity will enable to potentially reach over 1,300 households per month in Phnom Penh, combined to the expansion of the value chain, by introducing new distributors, distribution centers, retailers, etc.

In addition, once SGFE’s production capacity will be maxed-out, it will be possible to open new production facilities in Phnom Penh (a new bigger factory in a different location) and replicate the model in other cities in Cambodia, as for example Siemreap and Battambang.

interesting to develop a partnership with a gasifier that would produce electricity out of coconut shell and thus provide sgfe with charred coconut shell

SGFE FACTORY

Location:
Phlove Lom, Phoum Russey, Sangkat Stueng Meanchey, Khan Meanchey, Phnom Penh, CAMBODIA

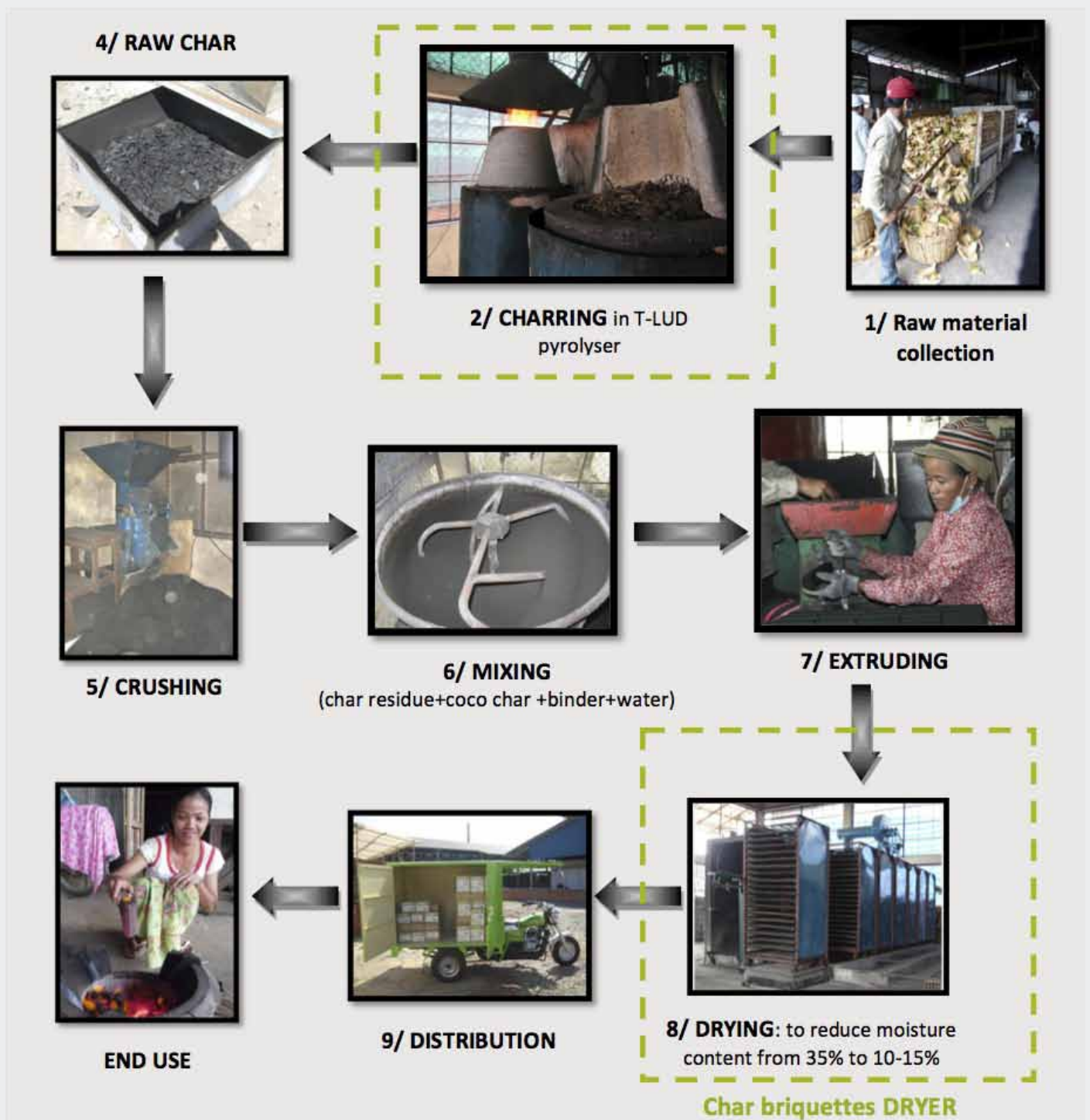
and very expensive. Luckily, SGFE is able to buy some from the factory located just behind its factory.

Electricity:
Electricity supply in Phnom Penh is extremely unreliable

Land:
A land of 1.500 sq. meters owned by PSE in the area of Stung Meanchey.



CHARBRIQUETTE PRODUCTION PROCESS IN SGFE





SEVEA – Synergie pour l’Echange et la Valorisation des Entrepreneurs d’Avenir - is a not-for-profit organisation that strives for an improvement of the answers brought to energy and water issues (from an environmental, a social and a societal perspective) in developing countries by supporting social enterprises from these sectors.

Our partners



Our references



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Sources:

- Data collected during the 5 months consulting mission for SGFE done by SEVEA
- Interviews and reports from Carlo Figà Talamanca
- Energypedia: https://energypedia.info/wiki/Main_Page
- <http://www.cambodiaatlas.com/map>