"Providing the tools to ignite your business

StovePlus Academy 4th Edition

Business Development for Improved Cookstoves and Innovative Fuels

WORKSHOP COMPLETION REPORT

20-24 February 2017
KDC-CPU Campus, Iloilo City, Philippines

stove+
A PROGRAM BY geres

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EXECUTIVE SUMMARY

The fourth edition of the Stove*Plus* Academy titled **Business Development for Improved Cookstoves and Innovative Fuels** was held from 20-24 February 2017 at the Knowledge for Development Center of the Central Philippine University Campus in Iloilo City, Philippines. Stove*Plus* Program (www.stoveplus.org) of the Group for Environment Renewable Energy and Solidarity (GERES) organized the training-workshop in collaboration with several partners – the Philippine Equity Foundation (PEF), Rexel Foundation, French Ministry of Foreign Affairs, Fonds Francais Pour L'Environnement Mondial (FFEM), ADB- Energy4All Program (ADB-E4ALL), Central Philippine University (CPU), and the Iloilo Caucus of Development Nongovernment Organizations, Inc. (ICODE).

Thirty-four (34) participants attended: 12 of them are improved cookstove designers/ producers/ promoters; 7 are innovative fuel producers/promoters; and 15 came from the sector support group (e.g., local government, NGOs, microfinance institutions and donor agencies, and private sector). In addition, there were nine guest participants from government line agencies and the academe.

The learning event was composed of five modules: 1) setting the frame and technology focus; 2) baseline assessment and market survey; 3) business development; 4) access to finances; and 5) ways forward to scale. Some of the participants were asked to present on particular aspects of their operations, while the facilitators also gave extra sessions on topics of special interest.

Through an iterative process of "learning by doing", the training-workshop employed a range of adult learning methods. Lecture-discussions and Q&A were used to explain concepts and processes. Tasked to immediately apply what they have learned from the lectures and discussions, participants were engaged in a variety of practical exercises: performing the water boiling test; simulation of conducting a market survey on customers' aspirations; including developing and staging special presentations to promote their products. Working in groups, the participants were made to develop business plans for viable enterprises and action plans on projects of their choice. Through a plenary discussion, they also came up with a collective action plan on how to move forward.

The participants gave the Stove*Plus* Academy an overwhelmingly positive evaluation. They gave high marks to the workshop content and processes, and to the workshop facilitators, organizers, and support staff. The logistics – training facilities, food, accommodation, and travel/transportation arrangements – were likewise given very positive ratings. Having been involved in organizing and facilitating three previous Stove*Plus* Academies conducted in Africa, Ms. Roth declared that the Iloilo City workshop was "the best so far."

Opening Ceremony

The opening program started at 8:30 a.m., with Mr. Jeriel Militar of the Central Philippine University (CPU) acting as the Master of Ceremony. He led the opening prayer, followed by the singing of the Philippine national anthem, and then the customary welcome messages.

The CPU President Dr. Teodoro Robles welcomed the participants and guests to the university. He shared that one of the university's key services is conducting learning events such as seminars, trainings, or workshops – for students, faculty and staff, and for the community. He was gratified that CPU is a partner in putting together the Stove*Plus* Academy and was chosen as the venue for the event. He expressed his hope that the participants will be actively engaged in order to get the most out of the five-day workshop.

In behalf of the Asian Development Bank (ADB), Ms. Grace Yeneza mentioned that her team did not hesitate to get involved when Ms. Marina Dubois of GERES-Stove*Plus* pitched the idea of this workshop during the latter's visit to ADB sometime in 2016. She remarked that the Stove*Plus* Academy is in consonance with ADB's Energy for All Initiative (E4ALL) which aims to strengthen investments in energy access especially for poor and remote regions in developing countries of the region.

Ms. Yeneza further invited everyone to be a partner of E4ALL by registering through its website www.energyforall.asia. According to her, the partnership provides a regional platform for information exchange, cooperation, and project development. It is open to key stakeholders in the sector – institutions and individuals alike. She wished a productive week for all, and hoped that the workshop will spark collaboration between and among the participating individuals and institutions.

Iloilo City Mayor Jed Patrick Mabilog sent his executive assistant Mr. Dominador Co to welcome the participants and guests in his behalf. Mr. Co commented that the Stove*Plus* Academy is a highly welcome event for local stove and fuel entrepreneurs. He also remarked that the workshop is timely and relevant in light of what was presented during the 2015 Iloilo City Clean Air Forum which identified household cooking with solid fuels as one source of pollution, and recommended the use of improved stoves and clean fuels to reduce emissions. He wished for everyone an exciting and fruitful exchange which can eventually result in an improved domestic cookstove industry.

GERES- Stove*Plus* Program and Stove*Plus* Academy Concept

To introduce her organization, the Stove*Plus* Asia Coordinator Ms. Marina Dubois played an audio-visual presentation (http://www.stoveplus.org/en/about-us). Stove*Plus* is a program by GERES which aims to produce and distribute high performance cookstoves in Asia and Africa. The program carries out its work through coaching project developers on improved cooking solutions in the following areas: baseline assessment, testing and R&D, standards and labelling, quality assurance and quality control, monitoring and evaluation, research and advocacy, access to finance, and business development.

The AVP showed the staff of Yayasan Dian Desa (Stove*Plus'* NGO partner in Indonesia) describing their work such as stove testing for certification and training local stovemakers on the production of improved cookstoves. The video also included interview clips from several individuals who benefited from Stove*Plus'* assistance, e.g.:

- a member of a women's group in Mali engaged in shea butter production who attested that using improved cookstoves substantially shortened their work days;
- a stove producer who increased his production capacity after attending a Stove*Plus* Academy in Kenya; and
- Indonesian stovemakers who produced more and better stoves after being trained by Yayasan Dian Desa.

Ms. Dubois shared Stove*Plus* Academy principles that she encouraged the participants to observe throughout the workshop – knowledge sharing and exchange, adapted solutions, holistic

interventions, and building partnerships. She urged everyone to actively participate and make full use of the next five days to learn from each other. She added that although Stove*Plus* brought in stove and fuel experts to lead the learning event, she also stressed that the participants also have a lot to contribute due to their actual experience in the local (Philippine) context.

Lastly, Ms. Dubois acknowledged the local partners – ICODE and CPU – who worked hard to help ensure that all the technical and logistical arrangements are in place for the learning event. She also thanked the Philippine Equity Foundation (PEF) and ADB for their support – PEF for underwriting the participants' costs, and ADB for making it possible to bring in the two international experts to this Philippine edition of the Stove*Plus* Academy.

Participant Introduction

Ms. Christa Roth, the lead facilitator, wanted a more dynamic manner for the participants to introduce themselves rather than the usual "Hello, I am (name) - I work as a (designation) - with (institution) - based in (place)". She asked everyone to stand up and group themselves according to the geographic area where they came from and introduce themselves to their group mates. After a few minutes, she told them to break up and form another group according to how long they have been in the cookstove or fuel business: less than a year; 5-10 years; and over 10 years. After another few minutes, Ms. Roth again instructed them to group according to the sector that they represent – stove or fuel business, academe, government, or nongovernment institutions.

Elaine Arnaiz

"I need the group of stove designers to go to this corner."

The activity was indeed a more interactive way of self-introduction and an effective icebreaker; the participants were observed to have carried on with their conversations from the session hall to the dining area for the coffee break immediately afterwards.

Stoves 101, Part 1: An Introduction to Stoves and Fuels

Ms. Roth started the session by presenting the context of stove and fuel use especially in developing countries. She described the characteristics of fuels and stoves, from the basic and general to the more technical aspects. She also emphasized that stove and fuel go together and provided several examples of this interaction. Highlights of the presentation and discussion:

- **Stove design starts with the fuel.** Make a stove that works with the fuel that people already use, or what is readily available in their community.
- Despite the negative image often associated with solid fuels, **biomass is here to stay.** It is the best source of thermal energy we need for cooking and heating; it is renewable; it can be grown on-farm; and it can be available on demand unlike some other sources of energy.
- There is a constant demand for fuel. People cook meals everyday and therefore need fuel on a daily basis. Unlike a stove, fuel is consumable – there is more money in fuels.
- **Energy or stove ladder is a misconception;** energy/stove shelf is a more appropriate term. Ladder connotes that something is better as it goes up the steps, while a shelf contains the options from which users make their choice according to their needs and preferences.
- Stove and fuel go together. One needs to know what type of fuel to use for different types of combustion chambers (or what type of stove to design or to use for available fuels). Some fuels are designed for specific types of stoves for maximum efficiency, and vice versa. Examples: rocket stoves = uncarbonized log-shaped fuels; TLUD gasifiers = small size, uncarbonized fuel (nut shells, wood chips, etc.); charcoal stoves = charcoal, char-briquettes
- Shape and substance of the fuel matter. The particle size of the fuel should not exceed 20% of the diameter of the fuel chamber for good combustion.

Christa Roth's Ppt presentation

Where is the hottest portion on the flame?

- *Demo on lighting a matchstick and slide photo showing the "anatomy" of a matchstick flame*
- Contrary to popular knowledge, the hottest area on a lighted matchstick is **not** where the blue color is but rather, a little just above the flame (hot air or heat rises to the top). The principle has implication on designing the pot rest to be at a certain height in relation to the stove's combustion chamber.
- The fire on a matchstick (or a lighted fuel) has several by-products: two of them are tar and soot. Soot is an indicator of incomplete combustion, resulting in blackened pots. However, the problem is not in the fuel. **Don't "blame" the fuel; blame the user.** *Ms. Roth lit a matchstick and set it on a saucer until it burned out, leaving a yellowish- brown substance with a distinct burnt smell. She lit another matchstick and put the saucer above the flame which blackened the saucer but left no odor. The saucer was later passed around for participants to see and smell the difference between tar and soot.*
- To understand how a stove functions, one should look at it both as a **heat generator** and as a **heat transfer structure.** 1) As heat generator, a stove should be designed as to make the most heat from the fuel. Here, the "three Ts" need to be optimized for complete combustion: time, temperature, and turbulence. 2) As heat transfer structure, the stove should be able to get the most heat generated into the cooking pot or the food being cooked, i.e., meat being grilled. The transfer of heat can be in three forms: radiation (without contact), conduction (contact between materials), and convection (heat transport by hot gases).
- Gasifier stoves turn raw biomass fuel into char, which can in turn be used as fuel for charcoal stoves. Biochar can also be utilized as soil amendment to increase the soil's water retention capacity and improve fertilizer uptake of crops. However, biochar needs to be properly primed with microbes before incorporating it into the soil.
- On the ideal ratio of primary air to secondary air for optimum combustion: There is no prescribed ratio as each stove is constructed differently. You just need to experiment and make the needed changes on the stove design based on your observations. However, for gasifier stoves, a 1:6 ratio between primary and secondary air is usually practiced.
- **There is no "best" stove.** A stove can only be either appropriate or not depending on the situation. For instance, an open fire stove which is generally considered to be inefficient is "better" than a single burner LPG stove (commonly known as *gasulito* in the Philippines) for cooking big volumes of food for a one-day *fiesta*.

Christa Roth's Ppt presentation

An open fire stove can be "ideal" depending on the situation.

The lecture-demonstration was practically a crash course on thermodynamics, pyrolysis, fuel configurations, combustion, stove engineering, including sociology, anthropology, etc. Ms. Roth ended her session by emphasizing that knowing the principles and applying them to stove design will substantially contribute to increased stove performance and safety.

Stoves 101, Part 2: Water Boiling Test (WBT) and Safety Procedures

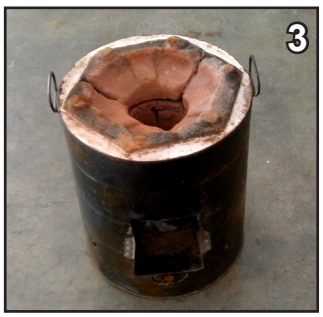
Before the main activity for the afternoon, Ms. Roth discussed how stoves are tested and explained why they need to be tested. She explained the distinction between fuel use efficiency and thermal efficiency and how these values are determined. WBT measures a stove's performance on fuel use and speed of cooking. Other stove testing protocols are done to measure emissions, where two pollutants are of general interest: carbon monoxide (CO) and particulate matter (PM), with focus on $PM_{2.5}$ (< 2.5 microns).

CO is an odorless gas but can be lethal if inhaled in high enough dose. It is not visible to the naked eye and thus small enough to get into the lungs; in accumulation, it can cause a range of respiratory ailments. Carbon dioxide or CO_2 on the other hand is a gas produced by clean combustion. Although not a pollutant, it is considered as a greenhouse gas (GHG) due to its warming potential in the atmosphere.

Ms. Roth further clarified two key points about the WBT exercise:

1. WBT is designed to look at the relative performance between two stove models on two parameters: fuel use and speed of cooking. The test is **not** meant to evaluate a single stove in a laboratory and expect the results to be valid worldwide. Also, WBT does not predict a stove's performance in the field. There are more appropriate tools for this purpose: the controlled cooking test (CCT) and kitchen performance test (KPT).
2. The WBT exercise primarily aims for the participants to experience how to perform stove testing using a standardized protocol and to be able to describe the results.

Ms. Aries Roda Romallosa from the CPU Faculty of Agriculture facilitated the laboratory exercise. After distributing copies of the WBT guide, she explained the step-by-step process in detail – from loading the stove with fuel to the actual water boiling procedure. She also outlined what to record, what to observe, etc. Five of the participants' stoves were used for the test: 1) Daniel Belonio's Biolexis gasifier stove; 2) Rebecca Vermeer's Eco-Kalan TinCan TLUD (clay-metal hybrid); 3) Joshua Guinto's Papa Brick stove; 4) Eduardo Arroyo's Wonder Kalan charcoal stove; and 5) Rainier Roa's Mabaga Kalan charcoal stove. An ordinary charcoalstove was used as the control.



Photos by Elaine Arnaiz

The participants formed six groups and were provided their respective fuels and kindling materials, cooking vessels, and digital thermometers. Two student assistants were assigned to each group to help in recording and especially in computing the stoves' thermal efficiency. The results of the exercise are presented in the table on the next page:

Table 1. Results of the WBT[1]

	Biolexis RHGS	Eco-Kalan TinCan TLUD	Papa Brick Stove	Wonder Kalan	Mabaga Kalan	Ordinary Stove (Control)
Fuel	rice hull	wood	*pili* nut shells	charcoal	charcoal	charcoal
Start-up time	30.73 sec	02:47	01:50	08:55	03:08	03:15
Kerosene used	0	25 ml	0	0	0	0
No. of paper used	½ pc	0	2 pcs	7 pcs	8 pcs	4pcs
Initial weight of fuel loaded	0.75 kg	1.10 kg	1.42 kg	0.40 kg	0.25 kg	0.45 kg.
Weight of add'l fuel	0	0	0.07 kg	0	0	0.15 kg
Total weight of fuel loaded	0.75 kg	1.10 kg	1.49 kg	0.40 g	0.25 kg	0.60 kg
Initial weight of water used	2.50 kg	2.50 kg	2.50 kg	2.50 kg	2.50 kg	2.50 kg
Final weight of water used	2.45 kg	2.35 kg	2.20 kg	2.50 kg	2.40 kg	2.28 kg
Boiling time	23:49	02:36	20:00	19:24	24:58	18:00
Total operating time	32 min	23 min	21:50	28:15	28:06	21:15
Computed thermal efficiency	15.86%	68.31%	no data provided	12.99%	27.3%	28.74%

Observations and post- exercise discussion points:

1. **Biolexis RHGS:** smoke emission- white; flame color- yellowish, pink to bluish pink; ash color- black; 2-3 persons operated the stove; no fly ash seen. The legs are designed in such a way that makes the stove (which is quite tall compared to the other stoves) stable; they can be unscrewed when packing the unit for transport. The handle does not get hot since it is not attached to the gasifier.

   Find a way to design a platform where the pot rest can be attached so you can slide the reactor from underneath it whenever you need to fill it up with fuel or empty it. – C. Roth

   It is the only one with a name and instruction-for-use sticker, making it look more professional. – CF Talamanca

   Rice hull ash has high silica content. However, the by-product of the gasifier is char, not ash. – C. Roth

2. **Eco-Kalan TLUD**. Too little kerosene was initially used for kindling so additional kerosene was squirted on the fuel (which should **never** be done for safety reasons), making the flame go up. TLUD models can be "unforgiving" and finicky (the fuel needs to be dry), but very convenient to use if the cook knows her stove. Cooking tests previously done on the stove model showed that one batchload of fuel can cook a meal consisting of steamed rice, stewed meat, boiled fish, and a vegetable dish good for 13 adults.

   With TLUDs, go for a strong start. –C. Roth

[1] The figures presented in Table 1 were the results from a single test (no replications). Some of the numbers do not seem right, e.g.: 1) boiling time at 2 minutes and 36 seconds for 2.50 kg of water with the Eco-Kalan TLUD; 2) no evaporation occurred with the Wonder Kalan, as the final was the same as the initial weight of water after almost 9 minutes of boiling; et cetera. The three charcoal stoves also used different amounts of fuel, which negated the purpose of the control. The reader should note that the exercise was a first time experience for most of the participants and was conducted in a mixed atmosphere of order- chaos, excitement, and even "competition"; the results should be seen in this context. Nevertheless, it could be said that the aim of the exercise was achieved, i.e., *"for the participants to experience how to perform stove testing..."*

Users have a tendency to fill their stoves with fuel, packing in more than what they need which is wasteful. Determine the amount of fuel to load based on your cooking requirement. –AR Romallosa

3. **Papa Brick Stove.** Because the *pili (Canarium ovatum)* shell is hard/dense, the fuel is slow to start; however, it remains hot for a longer time and therefore is ideal for slow cooking of meat dishes like *bulalo* (beef stew). Although *pili* harvesting and processing is seasonal and the shells may not be readily available year-round, making use of them when abundant helps reduce agricultural wastes that are otherwise thrown away or left lying around. The stove is a gasifier made of ceramic; bricks used in the combustion chamber are constructed in sections to avoid cracking from the intense heat.
4. **Mabaga Kalan:** The stove is cool to the touch due to the insulation layer between combustion chamber and GI sheet cladding. The insulation also helps ensure that heat stays inside the stove. The Mabaga comes in different sizes: small, medium, large, and jumbo.
5. **Wonder Kalan:** smoke emission- observed at start, minimal during cooking with some smoke on one side; flame color- orange (concentrated); ash color- white; one person operated the stove; no fly ash (contained inside); stove lip is not hot during operation; the stove fire power can be regulated via a vent that can be opened or closed as needed.
6. **Ordinary charcoal stove:** a little smoke emission (only at kindling time); flame color- bright orange; ash color- white; no fly ash

Special note by Ms. Roth on the combustion chamber of the three charcoal stoves:

	Mabaga K.	Wonder K.	Control
Height	10 cm	11 cm	8 cm
Inside "lip" diameter	17 cm	18 cm	20 cm

Heat loss can be lessened through simple changes in stove design: reduce volume of the combustion chamber (i.e., making the "lip" narrower); and make the pot rest lower.

Jonathan Lacayanga

Ms. Romallosa explaining the WBT procedure

Jonathan Lacayanga

Discussing how much kerosene to use for kindling

Elaine Arnaiz

Rainier's group trying to start his Mabaga Kalan

Melody Batongbakal

All the participants busy enjoying playing with fire

Summary Findings of Related Studies

After the recap of the previous day's sessions and activities, three presentors discussed main findings of their studies which partly informed the design of this Philippine edition of Stove*Plus* Academy: 1) 2014 case study on the status of the domestic improved cookstoves (ICS) industry; 2) 2015 GERES Stove*Plus* exploratory mission; and 3) 2013 FPRDI market study for charcoal briquettes.

PEF Study on the Status of Improved Cookstoves in the Philippines- Ines Vivian Domingo

The study, which primarily aimed to provide a snapshot of the existing domestic ICS industry, was commissioned by the Peace and Equity Foundation (PEF) in 2014. The study found that use of ICS in the Philippines is generally low. Although there is a variety of ICS that have been developed, stove developers/promoters face common problems which include:

- lack of funding which constrains all aspects of their work (e.g., continued R&D, inability to scale up production, no extra funds for product promotion and marketing);
- they are generally not aware of the work of their fellow stove developers, thus there is limited cross-fertilization of ideas;
- majority do not have a comprehensive marketing strategy; and
- government involvement in ICS promotion is very limited.

The study also looked at factors that convinced adoptors to first try, and to eventually use ICS. The findings suggest that the main reason for adoption is (substantial) fuel savings – especially if the users buy part or all of their fuel for cooking. On the other hand, factors for the low take-up of the technology include people's general lack of awareness about ICS; resistance to anything new; and insufficient supply or unavailability of the product in the market.

GERES- StovePlus Exploratory Mission- Marina Dubois

The presentation cited 2009 data for the Philippines that more than 12M tons of wood is harvested for fuel and a fifth of the woodfuels burned for cooking are exceeding the regeneration potential in their areas of origin. The top three consumers of wood for cooking are Regions IV-A (Southern Tagalog), III (Central Luzon), and I (Ilocos Region).

Data for 2014 show that a third of Manila slum dwellers use charcoal for cooking, followed by LPG, firewood, and kerosene. Although LPG is considered more convenient and cheaper in the long term, its high upfront cost is a barrier to adoption. Traditional charcoal and wood stoves in local markets sell for PhP 35- PhP 300 (USD 0.70-USD 6.00)[2]; pricing system for these stoves is not clear. Middlemen supply stoves to the retailers. Most of the latter do not have direct contact with the producers, although they have a general idea of where they come from. This disconnect between producers and retailers (and more so, the end-users) does not help the producers in getting any information on stove users' needs or preferences.

The mission also found that there were many innovative stoves but produced only in small scale. It appears that generally, the ICS producers directly sell their products (no middlemen or retailers in the picture). The producers have no funds for marketing and scaling up.

Marketing Strategies for FPRDI- Developed Charcoal Briquetting Technology - Emelyne Cortiguerra

The Forest Products Research and Development Institute (FPRDI) is required to conduct impact evaluation of technologies it has generated. Charcoal briquetting is one of them; FPRDI developed the machines and processes for and

[2] Average monthly exchange rate in February 2017 was USD 1= PhP 49.99

trained communities on the technology. The Institute has carried out 102 training courses on charcoal production and briquetting from 1986 to 2014, or a yearly average of five events.

Uptake of FPRDI's briquetting technology was found to be low and adoption is short-lived mainly due to the following: lack of raw materials; limited (local) buyers of briquettes; and briquette prices are not competitive. Further, operations were generally inefficient, never reaching their targets – with the exception of some private firms that were able to move from manual to mechanized briquetting.

A very significant finding of the study is that the more successful operators had two basic characteristics in common:

- **they invested resources for R&D,** both in fabricating or improving their equipment, and in product development and improvement ; and
- **they actively engaged in product marketing** by linking to several traders and by directly selling to consumers; they also joined trade fairs and conducted promo-and-demo activities in malls and supermarkets.

FPRDI's recommendations to technology adoptors include: 1) intensify product promotion especially to institutional buyers such as restaurants, hotels, food chains, supermarkets, etc.; 2) study how to make use of briquettes adaptable to specialized cooking practices of traditional bakeries and roasting of pigs and chickens *(lechon baboy* and *lechon manok)*; 3) strategic targeting and product pricing; and 4) if using manual briquettors, to consider having at least two units for better profit margins. FPRDI strongly recommended potential adoptors to work out a sound marketing plan before investing in the charcoal briquetting business.

Conducting a Market Survey for a Specific Product

Mr. Carlo Figa Talamanca started his session by presenting two statements and asked the group which one, as entrepreneurs, they should live by: ***"Sell what you can produce"*** **or** ***"Produce what you can sell."*** After some discussion, he declared that the second is a better guideline. We cannot dictate to customers what to buy; rather, we ask them to tell us what they want and we produce it.

Asked if any one of the participants has ever conducted a market survey for his or her product(s), none of them raised a hand. Mr. Talamanca then proceeded to define the term – which is simply assessing the viability of a product or service directly with intended customers. The research results should enable the producer to make better informed decisions with regard to the 4Ps of the marketing mix (product, price, promotion, and place).

He further added that the process need not always be elaborate or complicated; a common sense approach that gets a good "pulse" from clients is sometimes enough. He gave examples of how he and his staff conduct such market surveys, e.g., "man-on-the-street (or shop)" interviews. These entail asking just one or a few questions on a very specific aspect, e.g., weight of a bag of briquettes that customers can comfortably carry; feedback became valuable input for product packaging. Or it could be a study that has a clearly outlined set objectives and scope, sampling design and methodology, up to the tabulation and analysis of the research results.

The Importance of Considering Customers' Aspirations

To illustrate the meaning of customers' aspirations, Mr. Talamanca showed two short videos that dramatized the attributes of an ICS. One is from Cambodia introducing the GERES stove; the other is from India, promoting a certain brand of ICS. Even if the dialogues were in Khmer and Hindi without English voice dubbing, the viewer could somehow get the general message.

- Khmer video (https://www.youtube.com/watch?v=HZ61E_E9UiI): A mother was excitedly awaiting the arrival of her son but to her dismay, he comes home with his girlfriend who brought an improved stove as a present to the mother. Seemingly not appeased, the mother had a cooking "showdown" with the young woman. The mother was shown having difficulties with her smoky stove while the young woman, with the ICS stove burning nicely and using much less fuelwood, was able to finish cooking quicker. After tasting the young woman's dish, the mother somewhat softened up. The final scene shows the mother, son, and girlfriend eating dinner together. "And they lived happily ever after."

- Hindi video (https://www.youtube.com/watch?v=hqi5rzCv0jo): A man comes home to find that lunch is not yet ready – his wife still preparing the meal on her smoky stove. The man complains, while the wife blows on the stove and rolls dough for her chapatti. Suddenly she stands up and drags her husband to a neighbor's house where her friend is also cooking, but using a Greenway stove (supposedly the most popular ICS in India). The friend extols the virtues of her stove – that it emits 70% less smoke; is fuel and time saving; and with smart air flow technology. The closing shot shows two models of Greenway, their cost and warranty, with the telephone number of the distributor.

Mr. Talamanca cited another example to further explain the concept of customers' aspirations. Through informal surveys, SGFE found that its char-briquettes are considered an aspirational product (one that people aspire to have or use), that customers associated them with good value for money, practical, even "fun" – in contrast to SGFE presenting its own products as environmentally friendly, good for the health, safe, and cheap (which gave the unintended negative image that the char-briquettes are for the poor).

Based on the survey findings, the company developed promotional materials that resonate with clients' image of its products. It also repainted its briquette delivery *tuktuks* with red flames from the original green color, which connotes being environmentally friendly but looks admittedly boring in hindsight. See photos below.

SGFE's delivery tuktuks THEN

SGFE's delivery tuktuks NOW

CF Talamanca's Ppt presentation

Activity with traditional stove users

The Iloilo City Environment and Natural Resources Office (CENRO) arranged for a group of housewives and owners of *carinderia* or small eateries to take part in the exercise on customers' aspirations. The guests all use traditional stoves, and the exercise was meant to find out what they look for in a stove. The activity also aimed to see how the ICS developed by some of the participants would fare vis-à-vis the needs and preferences of the users' panel.

Table 2. Users' panel and the stoves under "evaluation"

Guests	Stoves
▪ Merlyn Dianon (housewife) ▪ Ma. Luz Magbanua (*carinderia* owner) ▪ Nema Blando (housewife) ▪ Rowena Lamery (housewife) ▪ Deuryl Salting (*carinderia* owner) ▪ John Salvador Pinedez (coffee shop assistant) ▪ Evangeline Abada (housewife) ▪ Merly Parcillano (*carinderia* owner, housewife)	1. Mabaga Kalan (large) 2. Wonder Kalan 3. Terra cotta micro-oven 4. Mabaga Kalan (medium) 5. Swirly Pinay (all-clay TLUD) 6. Eco- Kalan TinCan TLUD (clay-metal hybrid) 7. Eco- Kalan (all-clay rocket stove) 8. Vertical-fed woodfuel stove 9. Biolexis rice hull gasifier stove 10. Gaz Lite (mini LPG) 11. Papa Brick stove

Jonathan Lacayanga

Posing for the camera before Round 1 of "Battle of the Stoves"

Round 1: The guests were instructed to examine closely all the stoves arrayed in front of the room. Ms. Roth posed to them the question, "If you were to bring home (i.e., buy) a stove, which one would you choose? Pick out two stoves (No. 1 and No. 2) and give the reasons for your choices."

Shown below are the stove rankings made by the users, along with their reasons.

Choice No. 1

- Mabaga Kalan (4 "votes"): it is easy to carry because it has a handle (2x); one can carry it like a bucket or pail; portable; looks sturdy and will not crack or break easily
- Eco-Kalan rocket stove (3 votes) : it looks big enough to accommodate a grill; can use either charcoal or fuelwood (2x)
- Vertical-fed stove (1 vote): looks different from the rest, attracts people's attention/curiosity

Jonathan Lacayanga

Ms. Roth explaining the mechanics of the exercise

Choice No. 2

- Gaz Lite (5 votes): can be used for cooking something quick even if it's late at night; can be used to prepare breakfast quickly; can be used to fix a quick breakfast for grandchildren before they go to school; can be used for emergencies; quick and easy/convenient to use
- Medium size Mabaga stove (2 votes)
- Eco-Kalan rocket stove (1 vote)

Round 2: The stove producers were each given one minute to make their sales pitch to convince the users' panel (as potential buyers) to choose their stove, highlighting its special features, outlined below:

1. Mabaga Kalan (large): could use firewood and charcoal; has insulation layer between combustion chamber and cladding so stove is not hot to the touch during cooking; the large-sized one which costs USD 10.10 can accommodate a rack for grilling
2. Wonder Kalan: could save up to 50% from fuel use; a product of five-year research; special design – safe and not hot to the touch when in use; one batchload of fuel is enough to cook rice, viand, and boil water; no ash fly; price-USD 7.00

3. Terra cotta micro-oven: could bake pizza of 30cm diameter or *lechon manok* (roast chicken)*;* can be placed on top of any of the other stoves; if put on top of a hot Papa Brick stove, could be used to simmer food while baking at the same time; USD 19.00
4. Mabaga Kalan (medium): same features as No. 1 except for its size
5. Swirly Pinay: can accommodate up to 2 kg. of fuel which has been tested to last for 2.5 hours of cooking; just have to ignite and keep cooking until fuel runs out; designed for flame to swirl (creates turbulence which enhances combustion); due to its capacity, perfect to use for batch cooking during celebrations like *fiestas*; no price yet (prototype stage)
6. Eco-Kalan TLUD stove: a little amount of kerosene is needed for start-up; no need to push firewood because it is batch type; USD 8.00
7. Eco-Kalan rocket stove: less smoke; economical due to less fuel needed; can save up to USD 1.50 per day *(for industrial/ commercial use);* could use both charcoal and firewood; 6-year lifespan; USD 12.00 which can be recovered in 1 month
8. Vertical-fed biomass stove: no smoke; vertical placement of firewood; comes with rings for pot rest so that stove opening can be adjusted depending on size of cooking pot; comes with a chimney (extendable) to further reduce indoor emissions; USD 16.00
9. Biolexis RHGS: uses rice hull for fuel; one batchload of fuel is good for 30 minutes of operation; produces a blue flame similar to an LPG stove; has adjustable fan to control firepower; USD 50.00/unit retail price and USD 40.00/unit for resellers
10. Gaz Lite: the first refillable LPG canister in the Philippines; LPG refill costs PhP 45 which can last for 3-5 days; can save up to 50% per month compared to similarly-sized butane canisters; whole set which includes a light weight stove and two LPG canisters costs USD 18.00; 3 years durability and 6 months warranty; currently available in Luzon but with target to distribute throughout the country
11. Papa Brick stove: can use all kinds of fuels, e.g., fuelwood, coconut fronds, bamboo, *pili* shells, coco shells, charcoal, etc.; not smoky; estimated life span is five years or more due to special design (bricks won't crack from intense heat); USD 15.00; 1kg fuel is enough for more than one hour of cooking, stove cost can be recovered in 45 days

Jonathan Lacayanga

The VFBS inventor doing his best to "sell" his stove

Afterwards, the guests were again asked to choose which stove they would like to bring home based on what they heard from the stove developers. Three of them chose Stove No. 4 (Mabaga-medium); and one each chose the large- sized Mabaga, Wonder Kalan, Terra cotta micro-oven, vertical-fed stove, and Gaz Lite. A raffle draw was held and Ms. Evageline Abada won a Mabaga, her stove of choice.

Additional discussion highlights:

- The group generally preferred convenience over safety and affordability.
- On the issue of hazards, one of them expressed that stove or kitchen safety is the mother's responsibility, especially for the children.
- Although Gaz Lite is acknowledged to be the most convenient, it is considered only as a second choice or back up or – ideal for quick and light cooking, e.g., boiling water for coffee, cooking instant noodles, etc. One respondent also said that you cannot use it if you don't have money to buy the refill, while you can still cook with all the other stoves using found fuels.
- On emissions: If a certain stove uses 50%-75% fuel compared to the one in current use, this is a proxy indicator that it is more efficient and therefore produces less emission. This also means less cutting of trees used for fuelwood or to make charcoal.

Jonathan Lacayanga

Posing with some of the stoves after the exercise

- R&D is no guarantee that a stove will sell itself. Even the cleanest stove is useless if it stays on the shelf. On the other hand, even if an ICS is not perfect but 1M households are using it, the impact on human health and the environment can be tremendous.

Case Studies on Designing, Producing, and Selling Improved Cookstoves and Fuels

The Evolution of Stove and Oven Models from Users' Feedback- Joshua Guinto

Mr. Guinto is partial to using clay as he considers it cheaper and a more malleable material that can be easily shaped to a desired configuration with the tweak of a hand. He related the design processes he undertook for his several stoves and brick ovens and how he modified them based on users' feedback and by applying his accumulated experience in stovemaking. He cited several improvements he made on his stoves as a result:

- Creating a second barrel beneath the fuel feeder to facilitate removal of ash from the Holey rocket stove

Joshua Guinto

Modifying the stove design for easier ash removal

- Heavy, brittle stoves: better baking, and mixing clay with carbonized hull – its silica content acts a good binding agent within the bricks as they melt
- Constructing the stove using "Lego" or separate pieces according to their specific functions in the stove (e.g., fuel chamber, riser, pot rest) to address cracking under intense heat
- Better combustion by providing for secondary air from below and through the combustion chamber via tubes (holes made in the bricks), "harvesting" preheated air

The original stoves were developed for home use, although seeing their potential for commercial purposes, Mr. Guinto also came up with larger versions that are more heavy duty. He also observed that *carinderia* owners make better promoters of the stoves and can demonstrate how they work, as customers see the stoves "in action".

Mr. Guinto's observation finds validation in the PEF study – from a respondent who remarked that *carinderia* owners should be made key players in ICS promotion efforts. According to him, customers or even passersby see the cookstove being used in roadside eateries, whereas if it is for home use, people would only know about it if they enter one's kitchen.

To patent or not to patent?

In the ensuing discussion, Mr. Guinto indicated that he has never patented any of his stove designs or parts thereof, concerned that he will be stuck with it (particular design) and neglect the continuous innovation process that he enjoys doing. Although he is aware of the benefits of patents, he asserted that he'd rather use his time and money on "more useful matters"; and even if someone "steals" his ideas, he feels that the market for ICS is so big that there will always be a customer for every stovemaker.

Mr. Eduardo Arroyo, the developer of Wonder Kalan, shared that his motivation to apply for patent is not to be able to sue parties that copy his inventions, but rather to protect himself from being sued. He further explained that you can live in peace if you are the first one to file a patent for your idea or product; he happens to have a lawyer friend who takes care of the matter *pro bono.*

Mr. Guinto believes that inventions or innovations should be made open source and one can apply for grants to further develop them.[3] He acknowledged that his stovemaking remains struggling as a business. However, this has been compensated by social capital with the highly enriching experience from his stream of engagements with various groups across the country. He went as far as to declare that in this age of Facebook® or social media, patents have become irrelevant.

Promotion of Vertical-fed Cookstove, the BPSU Experience- Jonathan Lacayanga

Mr. Lacayanga outlined the salient features of the vertical-fed cookstove: natural draft, simple design, low fuel consumption, improved heat utilization efficiency, starts easily and requires no subsequent blowing, less smoke, adjustable potholes, and extendable chimney.

Marina Dubois

The vertical-fed biomass cookstove at work

To promote the stove, his team at the university (Bataan Peninsular State University- Abucay Campus) has been doing presentations and demonstrations in trade fairs and in farmers' training courses and seminars, including demonstrations in different parts of the Philippines and abroad (Clean Cooking Forum in Phnom Penh). The stove has also been featured by the local radio and TV stations, with the inventor even interviewed on national TV.

BPSU has been undertaking its stove promotion efforts with a range of partners: the local government health office, other state universities and colleges (SUCs), people's organizations (POs), indigenous people's groups, nongovernment organizations (NGOs), including religious groups.

Major accomplishments include the identification of local fabricators as part of promoting livelihood activities; installation of 65 units of the stove in a housing rehabilitation project in Leyte (hit by Typhoon Yolanda/Haiyan in November 2013); and a recent collaboration with Burn Design Laboratory in the U.S. for testing of the stove.

[3] Mr. Carlo Talamanca mentioned that Massachussetts Institute of Technology (MIT) patents everything generated by the Institute and reportedly spends around USD 5million annually on lawyers' fees alone.

Business Development

The secret to developing and running an improved cookstove or fuel enterprise, Mr. Talamanca declared, is no different from any other business – **maximize revenues** and **minimize costs.** He introduced the business model canvas to guide the participants in examining different aspects of their enterprise which include the following: value proposition, customer segments, channels, customer relations, key activities, key resources, key partners, cost structure, and revenue streams. He also stressed the value of studying the competition, so you can also articulate how different (or better) your product is compared to similar products available in the market.

Mr. Talamanca presented his company as a sample case, the Sustainable Green Fuel Enterprise or SGFE that produces char-briquettes from biomass wastes. SGFE identified ordinary charcoal as the main competition – which enjoys very low or no cost for raw materials, production, and human resources. To "beat" the competition, the company identified several strategies: innovation, efficiency, economies of scale, and marketing and branding.

1. **Innovation was implemented on several fronts.** The company had to enhance and maintain product quality. It identified its product thus, ***SGFE's char-briquettes are not just "an alternative to" but a "better quality, price competitive alternative to" traditional charcoal.*** It also had to improve and enforce strict fiscal policies through accurate production planning, management, and monitoring – always looking at the bottom line. In addition, the company also made changes on its marketing strategy and branding (see No. 3 below).
2. **Efficiency and economies of scale.** In order to economize and be more efficient, the company mechanized its production process. Efficiency in energy use is also practiced by harnessing heat (which would have otherwise gone to waste) from the carbonizers or kilns for use with the briquette dryers *("I did this **primarily** to be efficient and to cut costs, not because it is clean and environmental."- CFT)*. By shifting from manual to mechanized operation, SGFE was able to increase production volume. The company regularly maintains its equipment, promptly replacing parts that wear out to avoid unnecessary downtime.
3. **Marketing and branding.** SGFE rationalized its pricing and distribution systems and refocused its communication messages and channels. Its sales pitch was changed to center around product quality, rather than being environmental. As previously mentioned, part of refurbishing the company's image is repainting its delivery *tuktuks* from the original (boring) green color to the hot-looking "*Tuktuks* on Fire" or "Ghost rider *tuktuks*" that never fail to attract people's attention.

CF Talamanca's Ppt presentation

Equally important, SGFE developed a proposal within the policy context of government support to sustainable biomass energy in Cambodia; the company negotiated with the government, and was able to obtain value added tax (VAT) exemption status! Results of ingenious strategizing, coupled with hard work bore substantial results – from the annual production volume of around 100 tons in 2010 to almost 900 tons in 2016.

Mr. Talamanca had three major recommendations for entrepreneurs to succeed in business: 1) finding the right partners and adopting a simple business model from the start; 2) being creative in finding ways to increase revenues; and 3) being methodical, rational, and analytical to decrease costs.

Other key points of the presentation and discussion:

- Find your market niche, meet the user's needs, and keep your customers satisfied.
- The Four A Model can be used as guide to capture and keep your market: **A**ccessibility, **A**ffordability, **A**cceptability, and **A**ttractiveness.
- Love your product and never give up when you hit rough spots.
- Measure, record, and analyze everything to know your costs! Find ways for cost cutting, e.g., sourcing raw materials for free or for the lowest price; fabricating some of the equipment locally if feasible instead of importing them; engaging engineer-interns (instead of hiring professionals for a fee) to help with technical improvements in the factory, etc.
- Explore how else you can generate additional income, e.g., selling advertisement space using SGFE's briquette bags, selling complementary products, applying for grants, etc.
- While it is true that mechanization can make some workers redundant (resulting in lay offs), not doing so would have otherwise even more negative consequences, e.g., inefficiency => not making profit => possible bankruptcy => everyone lose their jobs. An efficient operation translates to more profits, enabling the company to give better pay and benefits to its employees; possible expansion eventually means being able to hire more people, and so on.

Group work on developing viable commercial enterprises

Using the template that the facilitator previously presented as a guide, the participants broke into groups to develop a business model for an enterprise of their choice. Six groups were formed which worked on different enterprises, specifying their main activities (in *italics* below). Bullets indicate the presentors' main points and additional inputs or comments on the presentations.

Elaine Arnaiz

The Eco-Kalan group working on their business plan

Note: Scanned copies of the actual group outputs are in Annex 1.

1. Eco-Kalan stoves and ovens

Stove/oven production and marketing/ distribution; fuel marketing; running Eco-kitchens, livelihood and feeding centers; training women's groups

- The scope of entrepreneurship will be widened by specifically involving young people and women for income generation. The livelihood centers will also sell stoves, ovens, and fuels.
- The business will be a social enterprise; part of the revenues shall be used for child feeding programs. The centers will be built on government land which hopefully the LGUs will donate for use by the livelihood groups (as experienced by the Eco-Kalan project in two other villages).
- *Your having many potential partners is impressive. However, you have too many components; such complexity makes it difficult to manage the business, and increases the chance of failure. – CF Talamanca*

2. Biolexis RHGS

Product R&D; stove fabrication and marketing

- Main selling points: it uses fuel that is free/ almost free; burns almost as clean as LPG; very convenient as it only takes 30 seconds to ignite.

- Main target users are households, even students (for research purposes).
- High start up cost can be addressed by partnering with microfinance institutions (MFIs) like CARDI.
- What is unique about Biolexis is that it does not directly compete with the other ICSs.

3. Papa Brick stove

R&D; production; marketing and training of users; after-sales service

- Special feature: it is a stove that produces charcoal, not consume it.
- Revenues will be generated by training others to make the stove, and I get royalties from their sales (5%-10%, depending on agreement).
- A mechanism will be developed for a buy-back scheme of the char that the stoves will produce; many products can be made from the char which will become additional sources of revenue.

4. Wonder Kalan

Stove promotion and marketing; partnership with NGAs and NGOs

- Safety of the stove is the main selling point. Also economics due to fuel savings.
- On putting a handle on the stove to make it more portable (like a similarly constructed charcoal stove): No plan to do it as moving the stove around may even cause accidents – although the idea may be reconsidered if there is really a great demand for such change.
- *You should always keep in mind partnering with MFIs as most users of conventional stoves cannot afford the switch to improved versions. – C. Roth*

5. Charcoal briquettes

Charcoaling; briquetting; packaging, selling, and distribution; fabricating heaters (for brooder houses)

- The Department of Science and Technology (DOST) will be the primary technical partner through its Small Entrepreneurs Technology Upgrading Program (SETUP).

6. Franchising business

Production of charcoal (briquettes?); developing franchise name; training franchisees

- Franchise stores that will be set up will sell charcoal (briquettes?) and ICS. Experts' help will be needed to establish the distribution network.
- Sourcing of stoves and fuels may be centralized due to advantages of bulk buying. Payments will be on consignment basis. The market will determine what stoves (and fuels) will be sold in each outlet.
- Franchisees/staff shall be given appropriate training; business development knowledge imparted to them is considered a key resource.

Setting up Distribution and Marketing Systems and Strategies

There are fundamental differences between cookstoves and fuels – strategies for selling and distributing them are quite different. Mr. Talamanca gave the examples of Toyota in the business of manufacturing and selling cars but not gas, and Total being in the gas/fuel business but not in selling cars. He reminded the group that the 4Ps (product, price, place, promotion) should form the core of one's distribution system and marketing strategy. There are several factors to consider:

1. A producer can sell through wholesalers/ distributors, retailers, or directly to the consumers; the choice can vary depending on the nature of the product and the needs of the customers.
2. Find partners that can help advance your business. For example, there are about 60 MFIs in the Philippines. Dungganon (a Negros-based cooperative) already finances solar power, sanitary toilets, water systems, and ICS. It is also worth noting that it has a customer base of 3,000 end users. "*You may want to partner with Dungganon or a certain MFI…but does it want to partner with you?*" Another way to advance your enterprise and increase revenues is to sell complementary products.
3. Build your distribution channels (e.g., retailers) and sell to them the mutual benefits of the partnership. Train your retailers and run promotions or programs to support them. Help them increase sales and ensure they make a decent profit from selling your product. Rationalize pricing system especially if you have multiple channels to avoid "conflicts".

4. People cook food daily and therefore need fuel everyday, so we need to make our product available and accessible everyday! Especially if we have a new product or one that is not yet popularly known, relying on traditional distribution systems may not be enough. Distribute free samples especially to potential institutional clients (those who buy in bulk). We need to find ways on how our product can best move from the production site to the different market segments.
5. Aim to keep customer loyalty. Maintain product quality; satisfied customers make good endorsers. Keep reserve inventory because if you run out of stock, even regular customers will switch to another supplier. Go the extra mile to satisfy your customers, e.g., providing home delivery. Use customer service as a marketing tool.

CF Talamanca's Ppt presentation

SGFE's PREMIUM burns for two hours, while its DIAMOND burns for five hours

6. Never underestimate the value of **trust.** Always deliver on your "promise". If you claim that your briquette can burn for two hours, then it should burn for two hours.
7. Develop your image; branding is essential – it can be a color, logo, or a name to identify your product. When people see it, they should easily associate it with your product, e.g. *tuktuks* on fire.

Group exercise on selling and promoting one's product

In order to apply some of the concepts they learned from the session, the participants were asked to identify a product or service they want to sell/promote and generate a marketing strategy for it. They also needed to define one or two main messages to focus on.

1. **Group 1- Papa Brick stove (skit).** Jester wants to borrow money from his neighbor to buy fuel for his stove but the latter instead gives him charcoal produced by his Papa Brick stove. Enters Jed, who is collecting the last instalment from the stove user but who does not have the full amount for the said payment. Jed sees the big pile of charcoal produced by the Papa Brick, which is a hybrid gasifier stove model. Jed takes the char to make up for the payment balance, and declares that the neighbor is now the full and rightful owner of the stove.
2. **Group 2- Eco-Kalan TLUD stove (TV advertisement).** Rebecca is at home babysitting her youngest while watching TV when an advertisement for an improved cookstove came on. A man (Ariel) is enumerating all the features of an Eco-Kalan TLUD stove while an attractive young woman (Merde Luz) is dancing behind the stove, like the product promo girls often seen on TV. Rebecca finds the stove will make her cooking more convenient, and decides to buy one.
3. **Group 3- Wonder Kalan (skit).** A husband comes home to find his wife in front of her traditional stove, her face all smudged with charcoal and coughing from all the smoke she is inhaling. An argument ensues – with the man so hungry and tired from work while the woman is complaining about the charcoal she buys from the market; it always takes too long to ignite and then gets used up so quickly. A visiting neighbor hears them and suggests that they buy Wonder kalan like theirs – explains how it is designed for optimum combustion, etc. and how it also fuel-saving.

Elaine Arnaiz

Make up session before the presentations

4. **Group 4- Charcoal briquettes (skit-comedy).** Super-excited, Emilia is preparing a special dish for Ricardo, her Mexican boyfriend who she met via the internet. The phone rings – it is Ricardo, who just got off the plane. Emilia is in panic mode, her charcoal is not burning well, and the meat might not be tender yet when the boyfriend arrives from the airport. Her friend Marie who is keeping her company goes home and returns with a bag of charcoal briquettes for her to use instead. Ricardo loved the meal and gushed, "I travelled across the seas just to have a taste of this delicious food!" Getting down on one knee, he asks Emilia's hand for marriage.
5. **Group 5- Biolexis (print or TV ad).** Sporting his most winsome smile and pointing to the stove he is promoting, Dan delivers a very short line, *"Biolexis – blue flame like LPG, but fuel is free."*

Post-presentation comments and suggestions

Mr. Talamanca thanked all the groups for their entertaining presentations. Asked to comment on the exercise, the participants acknowledged that preparing and staging their presentations was not easy, given the limited time they were given. **Being allowed to say only one or two main messages was also difficult, but this forced them to think carefully about crafting their messages and focusing on the most salient points to highlight.** Ms. Roth remarked that the Biolexis ad delivered a "short and sweet" message, but managed to capture the outstanding features of the stove.

Other things to consider:

- Determine/rationalize the pricing system for your products. What is your wholesale/retail price? Do you set a suggested retail price (SRP) for your retailers or give them a free hand to do it?
- You specified NGOs, NGAs, or other partners you want to work with; do you think these parties also want to work with you? You have to clarify what benefit(s) they will get from the partnership.
- Use the business model as guide to ensure that your enterprise makes profit and becomes sustainable; the enterprise is **not** a nonprofit NGO and should not be run like one.
- Seed grants are short-term funds meant for specific purposes, e.g., upgrade facilities/ equipment, establish a distribution system, staff capacity building, etc. and not as money to subsidize or run your operations.
- Before dealing with a bank (taking out a loan), first explore if you can borrow from the three Fs: family, friends, and "fools". If banks are unavoidable, make sure that everything is clear to you (interest rates, repayment scheme, surcharges/penalties for defaults) before you take the plunge.
- Conduct a market survey to find out what your customers need and want. The more you know your customers, your enterprise has a better chance of succeeding.
- ***This workshop was not designed to solve your problems in the business; it is meant to provide you with tools, and not solutions.***

Making Good Money from Institutional Cookstoves

To give an example that one can become rich from making stoves, Ms. Christa Roth presented the case of Mr. Ken Chilewe from Mulanje, Malawi. She briefly outlined how the stovemaker's business developed as follows:

- 2004: Mr. Chilewe delivered his first institutional stove prototype; at that time, he only owned a small car and had to use the overhead rack when delivering the units, one at a time.
- 2005: He secured large orders from World Food Program (WFP) and Mary's Meals (child feeding program); by this time, he was already making deliveries using a truck that could accommodate 18 of the stoves in one load.
- 2006: His firm won the Ashden Awards for sustainable energy
- 2009: He started with hotel construction
- 2012: WFP placed another huge order of 1,500 units which helped him to finish the hotel
- 2013: Inauguration/opening of the hotel, the Hapuwani Village Lodge

Ms. Roth remarked that there is (more) money in making institutional stoves. However, it is important that one has acute business acumen and be able to see opportunities as they present themselves. Mr. Chilewe has always wanted to have his own hotel. Whenever he would get

Façade of Mr. Chilewe's almost finished hotel with his rocket stoves in the foreground

Christa Roth's Ppt presentation

paid for big projects, he plowed back the money into gradually building his dream hotel; he was diversifying his business by reinvesting revenues from his stovemaking. Mr. Chilewe must have known all along that his hotel, which is situated near the foot of Mt. Mulanje (a popular tourist destination), is good business – just like his stoves are.

Case Studies

Biochar and Biochar Cookstoves- Bernardo Tadeo, ECO-REMATES

Mr. Bernardo Tadeo began his session by showing statements from prominent scientists and environmental activists on the significant potential of using biochar not just in carbon sequestration, but also in restoring fertility of depleted soils. In addition, biochar can be deployed for numerous other uses, e.g., precursor for activated carbon used for water filtration, prevention of toxic substances from leaching into water bodies, for breaking down heavy metals and cleaning up polluted/contaminated soils and waters, various medical applications, and many others.

He also showed the many ways that humans contribute to greenhouse gas (GHG) emissions, and some data on the prevalence and potencies of different GHGs.

Mr. Bernardo mentioned rice, corn, coconut, and sugar – main agricultural crops in the country as possible sources of biochar. Since only the farm wastes or by-products are used for biochar production, he stressed that the usual issue of FOOD vs FUEL does not apply in this regard. He explained that if all farm residues were charred and plowed back into soils, we should be removing from instead of adding CO_2 to the environment – which is contributing to global warming. He also identified municipal solid wastes as the most sustainable feedstock; other sources are energy crops such as napier grass, sweet sorghum, and bamboo.

Mr. Bernardo cited several studies on how biochar can reduce GHG emissions and improve soils leading to increased crop yields. He introduced the Philippine Biochar Association (PBiA) of which he is one of the founding members. PBiA aims to establish 150 town or municipal-level networks to promote the use of biochar in farmlands.

Aside from the usual backyard and industrial scales of biochar production, **one promising method is through the use of char-producing cookstoves.** In this connection, he is proposing for the marketing of biochar- producing gasifier cookstoves to access funds.

Sustainable Fuelwood Plantation for Certified-Legal Charcoal Production for Community, Retail, and Industrial Markets- Oscar Carrasco

ELDF is the nonprofit arm of Industries Development Corporation (IDC), a wood-based company that has been operating for more than five decades. It works closely with local communities in establishing tree plantations and developing sustainable and legally certified supply chains for timber and non-timber forestry products. It also partners with people's organizations and indigenous peoples in establishing sustainable sources of fuelwood and charcoal for the community's use, and for both retail and industrial markets.

The company is one of only a few in the country that produces woody biomass (wood chips or sawdust for briquettes), found to have more consistent output for energy generation. However, more research is needed to establish empirically based information on the characteristics of different timber species with regard to their cultivation, economic uses, calorie content, and other relevant properties.

Mr. Carrasco remarked that there is an attendant cost to every activity that we do, but this is often not given due attention – in reference to the economic feasibility of projects being implemented.

When sourcing materials, the company strives to do it with the local people using what they already have, e.g., ipil- ipil *(Leucaena leucocephala),* madre de cacao *(Gliricidia sepium),* and the likes. By engaging in projects that provide livelihood opportunities, it brings back money to the community which enables it to develop more tree plantations or forests.

ELDF is also exploring possibilities for producing and promoting cookstoves with significant potential for GHG mitigation. In line with this initiative, it has funded university students' theses aimed at quantifying the benefits of improved cookstoves, and people's understanding and acceptance of the technology.

He added that the company/foundation is in need of relevant research results that are actionable.

Visit to a Clay Potters' Cooperative

After the last session of the day, everyone piled up into two jeepneys. Mr. Anecito Sorrilla (one of the participants) has arranged for the group to visit the workshop of a cooperative of clay potters located in the outskirts of Iloilo City. The participants spent about an hour going around the facility, watching the potters in action, and discussing with the members.

Jonathan Lacayanga

Participants watching the clay potters at work

Asian Development Bank- Energy For All Initiative (ADB-E4ALL)

Mr. Elmar Elbling, senior energy access specialist with E4ALL program at ADB opened his presentation by citing figures on the energy access situation in the Asia- Pacific Region: 4.4B population of which 2B have no access to clean cooking, and 426M with no access to electricity. He outlined the pillars of ADB's energy policy which are quite relevant to the Stove*Plus* Academy: 1) maximizing access to energy especially for the rural poor; 2) promoting clean energy, energy efficiency, and renewables; and 3) promoting energy sector reforms, capacity building, and governance. Highlights of his presentation include:

- E4ALL's launch in 2008; targets and accomplishments (provided energy access to 125M by end of 2015 which exceeded the target of 100M); new goal of 200M coverage by 2020
- Implementation approaches and specific examples: knowledge management, capacity building, project development, facilitation of investments. Under investment facilitation, **E4ALL aims to increase private sector involvement by working with both investors and entrepreneurs** (through mentoring, connecting with investors, credit enhancement, etc.)
- Current energy access projects being supported in the Philippines are mostly in electricity in remote and off-grid locations such as micro hydropower and solar hybrids, in partnership with the government and local cooperatives.
- Project interventions in urban areas include, among others, **increasing access to clean cooking and heating technologies.**

Mr. Elbling remarked that E4ALL's focus is on people's access to electricity, but mentioned that they would also like support initiatives on clean cooking solutions[4]. To cap off his presentation, he asked the participants to visit the program website (www.energyforall.asia) and encouraged them to sign up for membership. By being a member, entrepreneurs or institutions would have access to a range of resources and even assistance from E4ALL if qualified. He informed the group that the annual two-day **Asia Clean Energy Forum (ACEF)** held at the ADB headquarters is now going to be held for four days (5-8 June 2017). Details about the event are posted in the website and everyone was invited to register.

IV Domingo

ADB-E4ALL's Mr. Elbling in a discussion with Mr. Hechanova, Iloilo City's Environment Officer

Entrepreneurs du Monde- Access to Energy Program

Ms. Solene Gondrexon talked about her organization's youngest program in the Philippines, Access to Energy (Ate co). Incidentally, "ate" in Filipino means big sister – someone who helps take care of the household. Ate co's mission is to *"give safe and accessible energy to the poorest of the poor in Metro Manila through a sustainable business model".* Ms. Gondrexon mentioned that although Metro Manila is fully connected to the electricity grid, illegal connections are quite common in sections of the city where illegal settlers reside. Fire outbreaks due to system overloading and from unattended candles and kerosene lamps is a perennial problem in such areas.

[4] The facilitation of the workshop by two international cooking energy experts was made possible through ADB-E4ALL's support.

In October 2015, Entrepreneurs du Monde launched its energy program in two slum areas of Manila involving 100 beneficiaries. Everyday, each household was provided with two fully charged batteries for a rent of PhP 15/day. The program was beset with countless problems, so Ate had to adopt another business model in August 2016, a rent-to-own system. With PhP 20/day minimum payment, the users can claim full ownership of their system consisting of a solar panel and two LED lamps within two years during which time their units are under warranty.

The prepaid set-up is tied up to SMART mobile phone system where the administrator can see the status of subscribers' payments. The system is rigged to shut down with non-payment of electrical load. On the other hand, a reward system is built in so that payments made earn points that are convertible to other household implements such as power adaptors, water filters, and now – possibly cookstoves.

Recently, Ate co has undertaken a survey to look at the project beneficiaries' cooking practices: where they cook, frequency of cooking, for what purpose(s), type of cookstoves and fuels being used, etc. This is in line with Entrepreneurs du Monde's intention to expand its energy program beyond electricity to providing cleaner cooking solutions.

Case Study

The Gaz Lite Project in the Philippines - Matthew Par & Nathaniel Camat

PR Gaz, a company engaged in LPG retail and distribution, was founded in 2000. The first of its kind to offer franchising and adopt the LPG convenience store model, it aimed to be "a virtual one-stop shop for household cooking needs." It currently counts 300,000 loyal customers, 191 branches, 130 franchisees, and 4 refilling plants.

In 2013, PR Gaz created the Gaz Lite brand as its **social enterprise arm** with the goal of **alleviating energy poverty.** Gaz Lite's vision is to provide affordable and clean energy in 1 million households throughout the country by 2021. The company sees the country's unserved/underserved market of 46% as an opportunity.

To address affordability, PR Gaz worked on product innovation and in 2013, created **Gaz Lite** – the world's first refillable aluminum LPG canister. Unlike its butane counterpart, the canister is made of seamless aluminum alloy with 20 bar ~290 psi pressure resistance. Gaz Lite is certified by the Metals Industry Research and Development Center of DOST, Philippines and other appropriate product certifying bodies in China, Thailand, and Australia.

Through a market research that compared LPG with other fuels such as kerosene, wood, and charcoal, it was found that product affordability and accessibility are the widest gaps that LPG needs to address.

The Gaz Lite starter kit priced at PhP 899 (USD 17.98) consists of 1 Gaz Lite stove, 2 LPG canisters, and 1 stove case. With a net content of 330 g, a refill which costs PhP 45 can last from 3-5 days depending on use. Comparing it with other cooking fuels, Mr. Par showed a slide where **Gaz Lite appears to be the cheapest** at a cost of PhP15/day or USD 0.30 (e.g., firewood, PhP 30= USD 0.60; charcoal, PhP 30= USD 0.60; kerosene, PhP 26.50= USD 0.53; and butane, PhP 24.92= USD 0.50).

Beyond price, Gaz Lite's advantage over butane (which it is often mistaken for) is **safety.** The presentors showed newspaper clippings on fire accidents in various parts of the country caused by illegally filled butane canisters. The worst happened in Cebu City as recently as August 2016 involving the explosion of 6,000 butane canisters that burned a truck, school service vehicle, and two motorcycles. The government's Bureau of Fire Protection recorded 44 fires between 2010-2015 due to LPG- refilled butane canisters.

M. Par and N. Camat's Ppt presentation

Gaz Lite has adopted the "Yakult® model" of marketing[1]

[5] In order to win new customers, Gaz Lite conducts house-to-house marketing. In urban and peri-urban areas of the Philippines, Yakult (a probiotic drink) is usually sold by women plying the streets. These "Yakult ladies" are easily identifiable by their uniforms and visor hats – with their signature coolers mounted on handcarts.

Gaz Lite is using an anchor strategy where strategic PR Gaz branch locations are identified to serve areas or towns around it that the company cannot (yet) reach. It continues to develop micro-entrepreneurs, now numbering 400+, who will continue to provide the product in their communities. It has also piloted an in-house financing strategy to find out what types of borrowers would pose lower risks in terms of repayment rates.

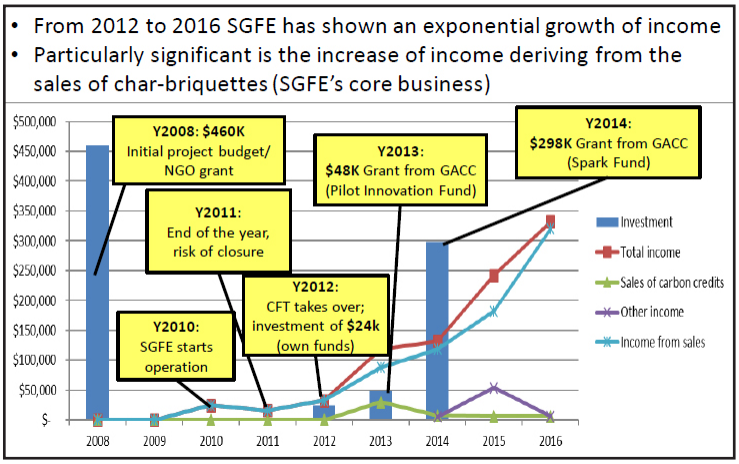
Currently, PR Gaz is sold only in Luzon. The company would like to establish its presence in other islands of the archipelago but access to funds to finance its expansion has been a challenge. As a private company, it faces difficulties in obtaining grants; it has already experienced rejection from the UN Foundation, USAID, and IFC[6]. Convincing NGOS to partner with has likewise been not easy. In closing, Mr. Camat expressed that his team is interested to explore collaboration with the other participants and institutions in the room.

Access to Finances

When trying to raise funds, one should have a clear idea of what it is for, how much, and from where/from whom it is coming from.
According to Mr. Talamanca, money can come from several sources, each one providing different types of financing: 1) government, which could take the form of direct funding, grants, subsidies, and fiscal incentives; 2) civil society through grants; 3) customers through direct purchases and fees; 4) financial institutions in the form of loans – either direct or consumer financing; and private investors through private equity capital.

Again, using SGFE as a case study, Mr. Talamanca outlined his financing model:

- 2008-2011: set up and funded by NGOs (e.g., GERES), with grants from the French government and other sources
- 2012: privately owned company, with personal funds injected as private equity capital
- Income from sales: Premium char-briquettes @ 0.32.-0.45 USD/kg; Diamond char-briquettes @ 0.75 USD/kg; SGFE currently sells an average of 110 tons per month.
- Awards (2014 International Ashden Award) and grants (Pilot Innovation Fund in 2013 and Spark Fund in 2014 – both from the Global Alliance of Clean Cookstoves or GACC)
- Other sources of income: renewable energy collaborative projects with other NGOs; sales of complementary products; selling advertisement space in SGFE's char-briquettes bags; sales of carbon credits
- Fiscal incentives: VAT exemption status from the government



CF Talamanca's Ppt presentation

SGFE's investments and financial performance (2008-2016)

SGFE used the USD 48,000 Pilot Innovation Fund (PIF) from GACC for the following: 1) installing one additional production line; 2) building a new warehouse for raw materials and finished products; 3) building a network of distribution centers in Phom Penh and three provinces; and 4) marketing and communication campaign. Putting this new production and distribution system yielded an increased capacity of 40 tons/month. It also meant 22 full time employees, 10 suppliers of raw materials, 5 distributors, 32 retailers, and 28 restaurants (institutional buyers). Serving approximately 500 households and restaurant kitchens per month, this further translates to a reduction of CO_2 emissions of 4,000 tons/year.

Mr. Talamanca emphasized critical aspects of being a PIF grantee:

1. **The grant period is very short** at seven weeks only, so activities and expenditures must be planned very well.
2. **Keep focused on your innovation concept**. For instance, not all of SGFE's new distributors were successful, but its distribution **model** still worked, with some flexibility and modifications.

[6] The International Finance Corporation is a member of the World Bank group; it is the largest global development institution focused exclusively on the private sector in developing countries.

3. **Be prepared for fast growth.** With expanded operations, new employees needed to be hired and trained; business growth also brought with it more complex accounting and management requirements.
4. **Keep cash flow under control.** The growth stimulated by cash inflow from the grant resulted in increased operational costs, but resulting increase in revenues was not immediate.
5. **Stepping up to the plate.** With the "heightened" profile, SGFE has raised the expectations of clients or beneficiaries, partners, and even the donor(s). *"We cannot let them down. We need to maintain performance. There is no turning back."*

Mr. Talamanca briefly explained the types of available grants from GACC (e.g., PIF, Spark Fund, Women Empowerment Fund, etc.) – the amounts given, and what they are for. He also gave his opinions/observations on the preferences and biases of the Alliance which the participants may want to keep in mind:

- GACC tends to fund (more) private companies rather than NGOs.
- Its focus is on long term financial sustainability (after the funding ends).
- You need a solid business plan and proven performance and capacity record.
- It is partial to funding investments compared to expenses.

Awards, on the other hand, can help an institution to win prize money and get added visibility and prestige to access funding (to win grant proposals or attract impact investors). However, Mr. Talamanca advised that one needs to make sure that there is money with the award one is competing for. For this matter, he added that it is best to aim for awards that are prestigious or internationally recognized, e.g., Ashden Award which SGFE won in 2014.

Writing a Project/Grant Proposal

Mr. Talamanca shared some tips and tricks in writing proposals to increase the likelihood of getting the nod of funding agencies. He stressed the need to have an **innovative idea,** and that one is not just "reinventing the wheel". It is also important for a project or grant poponent to study the guidelines and adhere to what the specific donor requires.

Another key concept to remember is **sustainability.** Consider sustainability of results from the start, and this should be indicated in the overall and specific objectives of the proposal. No matter what the nature of the project is, the donor often decides on the basis of its economic sustainability.

Mr. Talamanca outlined the process of project proposal evaluation as per SWITCH Asia's (EU Programme) protocol. Considering that experts/ evaluators have limited time to read each proposal (1-1.5 hours only), one should write the proposal following a few basic rules:

- Outline what the proposed project aims to achieve with clear, measurable objectives.
- Use simple language.
- Try to keep the document short (within the donor's prescribed guidelines).
- Technical terms or acronyms should be explained or spelled out, as the group of experts evaluating the proposals submitted come from different lines of expertise.

Each proposal is discussed by a group of evaluators who have to agree on a vote (0-5) over a set of criteria as follows: 1) financial and operational capacity; 2) relevance of the action (concept); 3) effectiveness and feasibility of the action; 4) sustainability; and 5) budget and cost effectiveness of the action. Mr. Talamanca showed a detailed evaluation grid-criteria against which each proposal is rated. At the end of this rigorous process, the whole group of experts ranks the eligible proposals in a final panel session and endorses the results to the call committee. The call committee in turn determines the final ranking of the proposals and then notifies projects selected for funding.

Preparing a Business Plan

Mr. Talamanca also underscored the need for a business plan when pitching a proposal to private investors as well as to grant-giving bodies. He provided an example of a business plan structure, and some recommendations on how to prepare it:

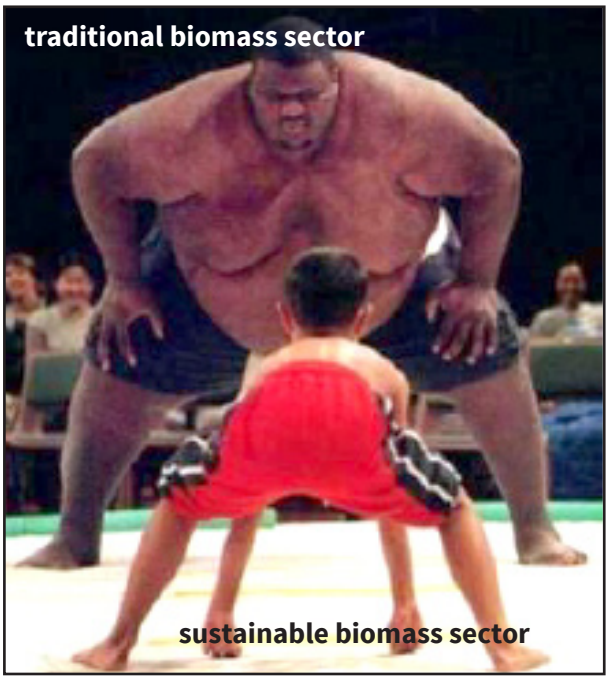
- Show that you know your sector, industry, and market very well.
- Present your great team – qualified, well motivated – that helps you achieve success.
- Show your captive market, that you already have clients that pay for your product(s) and service(s).

- Present your short term action plan in detail; show that you know **exactly** what you are going to do, what you need in order to do it, how much it is going to cost, etc.
- Demonstrate that you have a vision for the future.
- Last but not least, be realistic about financials!

Case Study: *VAT Exemption for SGFE*

SGFE developed the VAT exemption proposal for sustainable biomass within the framework of the Eurocham Green Business Committee, a public-private collaboration that promotes adoption of green business practices in Cambodia and works with the government in effecting needed reforms in this area.

The proposal was made in the context of the existing and predominant biomass sector in the country as being unsustainable, largely an informal economy, and whose products are sold at extremely low prices. It argued that by investing in **sustainable** biomass, the private sector can compete on a more equal footing.



CF Talamanca's Ppt presentation

Unfair competition between traditional and sustainable biomass sectors

By exempting the (private) sustainable biomass sector from VAT, the government would enable them to reduce their prices by 10% or increase their profitability by 10%, which can lead to more positive effects:

- increased competetiveness of sustainable biomass
- increased investments in the sustainable biomass sector
- formalization of a sector which currently is still an informal economy
- traceability and mapping of national biomass resources
- preservation of forests and reduction of CO_2 emissions

Mr. Talamanca explained that the proposal provided a general framework for companies that want to apply for VAT exemption status. The first step entails application to and verification by the Ministry of Mines and Energy, and the second step is to submit the application to the Ministry of Economy and Finance. He added that an applicant must demonstrate the sustainability of its biomass value chain on a number of areas: general (compliance with national laws), social, environmental, and economic aspects.

Post-presentation comments and discussions

- When running a business, also invest in your people, not just in technology.
- *"You get money from GACC, you get married to it."*
- Clean development mechanism (CDM) is a long and complicated process, but we should keep trying. We are currently looking at the carbon sequestration potential of 1 million improved cookstoves. – *B. Tadeo*
- The voluntary carbon market can be a good and substantial source of funding; e.g., SGFE got some money from a company that makes dog and cat food. Through CDM, Walt Disney gave USD2.5 M to a forest management group in Cambodia.
- More money is not always good if you cannot or do not know how to manage it. Big cash inflows can make your enterprise collapse if you are not successful.
- If you submit a proposal for funding, ensure that you write a good one. Do not waste their (experts/evaluators') time! – *C. Roth*
- State the relevance of your idea or concept within the context of government policy; evaluators also focus on this angle.

- On why would impact investors give money to start-ups or organizations they are not familiar with: they make their own assessments and take calculated risks. If a fraction of their grantees are successful, they attain the beneficial social, environmental, or financial returns they are looking for.
- You do not have to grab every opportunity that you encounter. Assess if you really need or want it. Examples: 1) *"Singapore-based Impact Hub has too many questions which I don't have the time to answer.";* 2) SGFE was approached to be a showcase for some crowd funding but Mr. Talamanca knew he is better at writing proposals for projects he wants to pursue. *"Sometimes we don't apply now to specific calls for proposals because we don't need them."*
- Donors, like banks, want to see your business plan – you (proponent) have to do the math.

Negros Women For Tomorrow Foundation, Inc. (NWTF) – Andy Coscolluela

Founded in 1984, NTWF is a Bacolod- based nongovernment NGO that aims to help women achieve self-sufficiency and self-reliance, particularly in Negros Occidental's low income communities. From four branches in Negros in 1989, the organization has expanded to other islands and provinces and now operates in Negros Occidental and Oriental, Cebu, Bohol, Samar, Leyte, Iloilo, Capiz, Aklan, Antique, and Palawan.

Mr. Andy Coscolluela focused his presentation around Dungganon, the main thrust of the Foundation which provides micro-credit facilities to women – patterned after the Grameen Bank system that originated from Bangladesh. He explained that part of Dungganon's loan portfolio is for financing household implements such as water filters, solar lamps, and even clean cookstoves. NTWF keeps an inventory of these items in its 100 or so branches, from partner-suppliers who deliver them to the Foundation on terms (30-60 days). Members usually make weekly payments over a period of months, which may vary depending on the cost of the item(s) being financed.

Mr. Coscolluela especially mentioned the two types of stoves that they carry: the Econochar at USD 39.00 and Econofire at USD 36.00. These are supplied by Envirofit, a US-based designer/producer/distributor of clean-burning stoves and solar and hand-cranked lighting systems. Asked why NTWF chose Envirofit and not local producers of improved cookstoves, Mr. Coscocuella explained that the former approached them with its proposal, and that the Foundation was not aware (until now) that there are Filipino designer-producers of improved cookstoves.

In behalf of NTWF/Dungganon, Mr. Coscolluela expressed that he is quite open to working with any of the domestic ICS producers. He asked if GERES-Stove*Plus* can help the organization with information campaign on the importance of using clean or improved cookstoves. He further mentioned that if the 70% (traditional cookstove users) of their ~300,000 members can be convinced to switch to improved cookstoves, this is a big potential market that local producers can tap.

CARD Mutually Reinforcing Solutions (CARD MRI) – Julius Adrian Alip

CARD MRI traces its origin to the founding of the Center for Agriculture and Rural Development, Inc. (CARD, Inc.) in 1986 as a social development foundation through responsible financial services. Like Dungganon, CARD was largely inspired by the Grameen Bank model and has successfully evolved its micro-lending operations into a formal financial institution. And after 30 years, the Center has grown into a group of 14 mutually reinforcing institutions offering a diverse range of financial and non-financial services to its members.

Mr. Julius Alip outlined the 14 MRIs and their products and services as follows

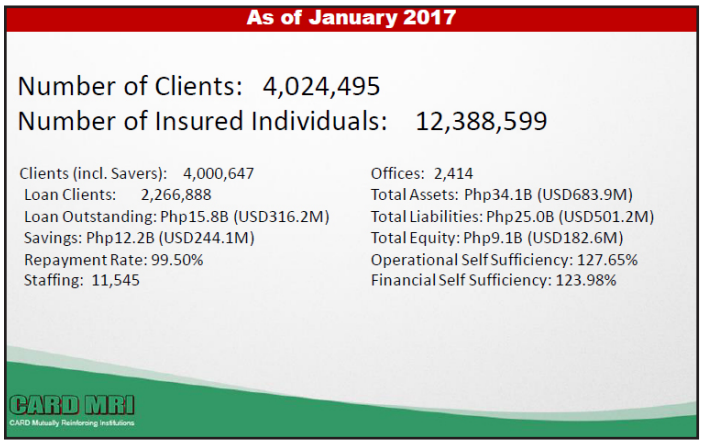
- CARD: microfinance loans and community development services in agriculture, health, and education
- CARD Bank, Inc.: loans, savings, and remittance. *Starting in 2000, ownership of the bank was opened to members who were given the option of using their compulsory savings to buy shares of stocks.*
- CARD Mutual Benefit Association, Inc.: basic life and golden life insurance, retirement savings fund, loan redemption, disaster relief assistance program, mass wedding, and build-operate-and-transfer (BOAT) program
- CARD MRI Development Institute, Inc.: Senior High School with two tracks *(Accountancy and Business Management/ABM)* and

Information Communication Technology/ ICT); College Courses *(BS in Entrepreneurship with specialization in Microfinance, BS in Accountancy* and *BS in Information Systems* (to be offered starting in June 2017); various training programs

- CARD MRI Insurance Agency, Inc.: nonlife micro-insurance, traditional nonlife insurances, e.g., motor vehicle, fire, general liability, electronic equipment, surety bond, group life, health care, and travel
- CARD SME Bank, Inc.: SME loans and savings, remittance
- CARD MRI Information Technology, Inc.: customized ICT for the microfinance industry
- BotiCARD, Inc.: medicines (from CARD MRI's very own pharmacy) and health education
- Rizal Bank, Inc. (formerly Rizal Rural Bank acquired by the CARD group): microfinance loans and savings focusing on clients in urban areas
- Responsible Investment for Solidarity and Empowerment Financing Company, Inc. (RISE): lending services to microfinance and educational institutions
- CARD Pioneer Micro-insurance, Inc.: nonlife insurance (underwriting/funds)
- CARD Business Development Service Foundation, Inc.: "non-financial notion" business development, marketing assistance, linkages and network
- *Mga Likha ni Inay*[7]*:* livelihood projects through local handicrafts and food processing/ packaging
- CARD Leasing and Finance Corporation: solar micro loans to MSME loans, car and motorcycle rental business, finance lease

CARD MRI is engaged in a range of community development programs. Its microfinance and health protection program provides the community access to quality health services. Mr. Alip mentioned that the Institution is a firm believer that change can be achieved through education – and thus it allocates 10% of its profits to sponsor scholars. In times of calamities, it deploys a program that provides relief goods, stress debriefing, medical missions, and immediate claims payment for members.

The slide below summarizes the current status of the Institution:



JA Alip's Ppt presentation

CARD MRI at a glance

Among the partners that the Institution counts is HAPINOY, a social business enterprise (*Pinoy* is the colloquial word for Filipino; Hapinoy simply means happy Filipinos.). It is a microenterprise development program focusing on neighborhood *sari-sari* (convenience) stores. These *sari-sari* stores make available basic household goods and in the case of Hapinoy, even social impact products like solar solutions. With a network of more than 800,000 all over the island of Luzon, these *sari-sari* stores represent the biggest local trade chain and possibly a big market opportunity for locally made improved cookstoves.

CARD MRI has now established its presence in other Southeast Asian countries, e.g., Cambodia, Indonesia, Lao PDR, Myanmar, and Vietnam – including Hongkong where many Filipino overseas workers are based.

Note: The Dungganon and CARD MRI presentations were an eye-opener for most of the participants. Some of them were surprised that such microfinance institutions (MFIs) not only enable their members to purchase goods not within their disposable incomes to purchase, but also provide the facilities to "sell" such products.

[7] MLNI subcontracts for well known brands such as RED LOGO and Kultura Filipino, an outlet of Philippine handicrafts in ShoeMart, the biggest chain of department stores in the country. It also processes and packages food products for GEM Foods International, Inc. for the domestic and export markets.

Cookout

After the last session of the day, the group proceeded to a restaurant that allowed the participants to cook within the premises. The objective was for the participants to demonstrate how their stoves work beyond being able to boil water (i.e., WBT exercise on the first day) by cooking simple "dishes".

Boiled corn (maize) was cooked on the Wonder Kalan, French fries on the Papa Brick stove, *binangkal*[8] (deep fried native snack made from sweetened flour dough and rolled in sesame seeds) on the Eco-Kalan TLUD, and *pinakbet*[9] (native viand of stewed mixed vegetables) on the vertical-fed cookstove. Everyone had fun starting the stoves, preparing the ingredients, cooking, and eating the "fruits of their labors."

IV Domingo

CF Talamanca extolling the virtues of his char-briquettes???

Marina Dubois

Ariel Castro and Rebecca Vermeer preparing "bibingka"

Joshua Guinto

Some people are still trying to finish up their boiled corn

Merwin Granzon

Sitdown dinner for the real and proper evening meal

[8] Binangkal is a deep fried native snack made from sweetened flour dough and rolled in sesame seeds.

[9] Pinakbet is a native viand of stewed mixedvegetables seasoned with fish sauce.

Special Session: Lighting Cones

Following the recap of the previous day's sessions, the discussion "migrated" to problems commonly associated with starting a good fire.

1. Uncarbonized briquettes produce a lot of smoke when used with a charcoal stove.

- Make sure that they are bone dry. – *C. Roth*
- Uncarbonized briquettes are better used with rocket stoves. – *J. Guinto*

2. Charcoal takes a while to ignite and produce a lot of smoke.

- The geometry of most charcoal stoves does not allow for concentrating heat to release the gases for combustion. Redesign by decreasing the diameter of the stove opening. – *C. Roth*
- And if you have a charcoal stove, use charcoal for fuel. – *C. Roth*
- Toplighting (putting the kindling material over instead of under the charcoal) can help if you place a tin can on top of the stove to act as a "skirt". You can also make a simple collapsible or telescoping lighting cone using different sized tin cans. – *J. Guinto*

Taking off from the discussion above, Ms. Roth showed a slide of a lighting cone which is a stove accessory used with batchload gasifiers. Ideally, the base should be of the same diameter as the stove opening and high enough to get a good draft. (Mr. Guinto also showed a contraption using tin cans during his presentation on the second day.)

Christa Roth

Joshua Guinto

Case Study: Water Hyacinth for Green Energy- Hazel Pajotagana

Ms. Hazel Pajotagana gave a brief presentation on HiGi Energy, a social start-up that promotes the production and use of charcoal briquettes from an unconventional raw material – the common water hyacinth. Water hyacinths, considered as invasive species, are quite difficult to get rid of once they have colonized rivers, canals, lakes, and other waterways. According to Ms. Pajotagana, the plant has caused disasters in more than 50 countries worldwide, the Philippines included.

Major accomplishments of HiGi Energy were highlighted as follows:

- 2015: validated the market for the briquettes in Cotabato (Southern Philippines)
- 2016: impacted over 250 people in Victoria, Tarlac (Central Luzon); brought the Filipino story to Indonesia, Malaysia, Vietnam, and Singapore
- 2017: harvested over 2 tons of water lilies; sold over 10,000 *Uling Lili* (Lily Charcoal) and resulted in 30% increase in household income of the project beneficiaries

H. Pajotagana's Ppt presentation

Ms. Pajotagana reported that accumulated grants amounting to PhP 1,000,000 (~USD 20,000) were used to create the product prototype, assess the problems, and grow the project's impacts. The PhP 200,000 (~USD 4,000) support funding from

Silicon Valley (US) was used by HiGi to further improve the product and expand the team. She also mentioned some of the organization's partners such as Impact Hub, World Wildlife Fund (WWF), PEF, the local government of Victoria, Tarlac, and some media outlets.

Post-presentation comments

- Briquettes from water hyacinth could be smoky, and this can affect the product's acceptability among users. – *B. Tadeo*
- Smoky briquettes are usually due to (lower) quality of carbonization and lower density of the material. – *CF Talamanca*
- We should work together in further developing your technology for you to avoid making the same mistakes I committed. Although water hyacinths are largely considered as pests, they also absorb pollutants in the water. This important function will be lost if they are over-harvested; HiGi should do more study on this aspect. – *J. Guinto*
- The plant is hygroscopic (absorbs water from the environment); more water also means more ash content. There are more processes the plant has to undergo before it becomes a briquette, which has cost implications. – *E. Cortiguerra*
- Because of the raw material, they might have higher ash content and lower calorific value. – *CF Talamanca*
- Look at your cost of production. Evaluate the product and compare it with conventional charcoal as the baseline. – *CF Talamanca*

  Ms. Pajotagana briefly explained HiGi's cross-subsidization model where the briquettes are sold at PhP 8/kg (USD 0.16) to the community, while they are packaged differently and sold at a much higher price for an upscale market.[10] For the latter, product promotion is anchored on the organization's tagline, *"Feel good doing good."*
- Because of its quality, water hyacinth briquettes will never be able to compete with ordinary charcoal. Using different marketing strategies for different market segments is a good move. – *C. Roth*
- With the low heating value of water hyacinth, you may need to mix it with other materials such as sawdust and charcoal fines. Technically, it is still better to carbonize it to make it more suitable for charcoal stoves. – *J. Guinto*

Special Session: Stove Auction

The session introduced to the participants the novel concept of *The Stove Auction.* According to Mr. Carlo Talamanca, it is the first wholesale auction dedicated to the sale of advanced biomass cookstoves (ABC) in developing countries. Developed by GIZ/Energising Development (EnDev), it is being piloted in Cambodia, Laos, and Vietnam. The project runs from March 2015- March 2019.

The Stove Auction has twin objectives: 1) to speed up the market for ABC by increasing the number of actors involved and improving end-users' access to cleaner cookstoves; and 2) to demonstrate a new way of carrying out a results-based financing (RBF) as a tool to accelerate access to low-carbon energy.

Mr. Talamanca outlined how the process works and the parties involved. For instance, like in any other auction, there are sellers (stove producers or their agents) and buyers (locally based distributors and retailers). A few stove models – gasifiers in particular – are prequalified. Agreements (which include guarantee price) are made with the sellers for consignment. The RBF scheme covers the difference between the guarantee price and auction price. Buyers also get an incentive for every stove they sell to end-users.

Mr. Talamanca mentioned that this has never been tried before by any other institution anywhere else in the world. If it works, it should benefit the sellers and buyers alike – and create a thriving market for cleaner and safer advanced biomass stoves.

Fuel savings has nothing to do with the stove's fuel efficiency per se. This just indicates the stove model's savings in fuel over the baseline, or the particular stove that people use most; in this case it was the Traditional Lao Stove. This could be determined using the controlled cooking test (CCT) and the kitchen performance test (KPT). – *C. Roth*

[10] Uling Lili is sold at Earth Kitchen in BGC (Bonifacio Global City, an upscale commercial-residential real estate development in Taguig City, Metro Manila) and Katipunan, Quezon City. A pack of 12 briquettes weighing about 0.5kg is being sold for PhP 79.00 (USD 1.58) – *text message from Ms. Pajotagana, 01 May 2017*

Model		Type of Stove	Location of Manufacturing	Fuel Savings*
	ACE 1 Solar Biomass Cookstove	Fan-driven Top-lit Updraft (TLUD)	Lesotho (Africa)	20%
	Mimi Moto	Fan-driven Top-lit Updraft (TLUD)	China	31%
	Prime Fuelwood	Natural draft Top-lit Updraft (TLUD)	Indonesia	11%
	3G Small	Side-feed Semi-Gasifier	Vietnam	18%

CFT's Ppt Presentation

**Based on controlled cooking test (CCT)*

Stove models being traded in The Stove Auction

Special Session: The Elevator Pitch

To further practice their marketing skills, Mr. Roth asked the stovemakers to prepare their "elevator pitch", so-called because one should be able to promote one's product within an elevator ride's time (very quick and short, 30-60 seconds). She gave a hypothetical situation where they (stovemakers) would find themselves sharing an elevator with a possible donor; they should be able to sell their idea within the short time span of the elevator ride.

The stovemaker participants essentially made the same sales pitch, albeit an abridged version, of what they delivered to the panel of stove users during the second day. Comments from the floor:

- Devote your pitch to capturing the donor's attention, details can always come later. *– C. Roth*
- Focus on the social, environmental, etc. impact of what you are doing in line with the self-image the donor wants to project, instead of highlighting the characteristics of your stove; you are not selling a product to the end user! *– R. Pellicer*
- Lay out who already has buy in to your idea or how much you have already accomplished so the other party understands you are not coming in from the cold, e.g., "I have already sold xx units but with your customer base, imagine how many more people could benefit from this product!" *– O. Carrasco (on making a pitch to a microfinance institution)*

IV Domingo

Action planning for Biolexis with a little help from friends

WAYS FORWARD TO SCALE

A. Individual Action Planning

Only eight of the participants were ready to proceed with articulating their post-workshop action plans: Emelyne Cortiguerra, Joshua Guinto, Nathaniel Camat/Matthew Par, Daniel Alexis Belonio, Anecito Sorrilla, Jonathan Lacayanga, Rebecca Vermeer, and Bernardo Tadeo. The rest of the participants were asked to join any of the aforementioned, making the individual action planning a group effort.

B. Group Action Planning

Following the presentation of the individual/ institutional action plans, Ms. Grace Yeneza of ADB-E4ALL facilitated the group action planning through a plenary discussion. She reiterated her invitation for the participants to register as E4All partners. Presented on the next page is a summary

of the suggestions, comments, and agreements on how the group shall move forward; progress on the plans are in *italics*:

1. Create a Facebook® discussion group for participants of the Stove*Plus* Iloilo workshop. This communication tool or sharing platform may later stimulate collaboration and partnerships among the members. Ms. Hazel Pajotagana volunteered to create the account and administer the site. Mr. Ricardo Pellicer encouraged everyone to regularly check the site and post relevant updates to keep it "alive".

   The discussion group, named The Fire Benders Network Philippines (Stove+) was already up the week after the Iloilo workshop (www.facebook.com/groups/257529971340949/). Mr. Joshua Guinto took over the job of administering the site due to Ms. Pajotagana's unpredicatable access to the internet. There are currently 39 members of the group – some of those who joined are not participants to the workshop.

   The group is quite active, with members posting updates on activities related to their stove and fuel enterprises; news on visits to their fellow StovePlus Academy participants and on actual and planned/potential collaborative projects; and uploading materials of mutual interest (e.g., photos, videos, articles, upcoming forums and seminars, etc.).

2. CENRO Iloilo can organize a cleaner cookstoves forum sometime in March or April where interested producers can showcase and demonstrate their products to potential clients. The Department of Agriculture also holds a regular summer fair in May where participants may want to exhibit their products. *The CENRO-organized forum reportedly did not push through.*

3. Ms. Aries Romallosa announced that the regional NEDA office (National Economic Development Authority) is leading the effort to hold a regular weekend *tienda* (bazaar) at MegaWorld. She suggested that stovemakers and fuel producers may want to band together under the ICODE umbrella and display their products every Friday, Saturday, and Sunday.

4. Ms. Romallosa also informed the group that CPU organizes an annual AgriFair every November and welcomed the group to join and exhibit/demonstrate their products. In behalf of the university, she also committed for the Approtech Center to offer free stove testing services for partners.

5. Mr. Jonathan Lacayanga suggested that a stove camp be held as a regular activity of the group. He volunteered his university to host the first event but he will need to present the idea and get the approval of the BPSU president first. ADB-E4ALL (Ms. Grace Yeneza) was open to considering support for such a stove camp; it depends on the merits of the proposal. Mr. Guinto volunteered to take the lead in writing the proposal. He pointed out that the group would still need GERES-Stove*Plus'* technical support for the event.

   Mr. Emmanuel Areño also volunteered ICODE's assistance in organizing the stove camp. He further suggested for the group to access PEF for financial support. He also mentioned that PEF holds a yearly national conference on social enterprises (usually in August); participants could join under the cookstove/fuel category.

6. Mr. Nathaniel Camat reiterated his proposal to form an association of ICS and innovative fuel producers, define its goals and objectives, and decide on its structure. Mr. Guinto expressed his lack of readiness to be put under such a structure at this stage. Mr. Pellicer commented that formally binding the participants is still premature, and the association may peter out in a few months if the members cannot come up with a concrete activity.

   Someone remarked that the Facebook® discussion group should suffice for now. However, members should not use it for product promotion but rather as a platform to share ideas, give updates on their activities, and upload materials that may be interesting or relevant to the other members.

7. Mr. Oscar Carrasco reminded the group to partner or collaborate with local communities or people's organizations, NGOs, and agencies of the government, e.g., LGUs or NGAs. He suggested for the participants to look at mutual interests and find ways where they could complement each other in their efforts.

Workshop Evaluation

Ms. Christa Roth facilitated the participant's evaluation of the workshop. She asked them to answer five questions; in addition, she also solicited their suggestions as input for improving similar learning events in the future.

1. What is the most surprising thing that you learned?
2. What will you remember this Stove*Plus* Academy for?
3. What was the most useful exercise for you?
4. What was good about the workshop?
5. What should be improved?
6. Other comments and suggestions

After the participants have turned in their evaluation, **Ms. Roth declared that the Iloilo Stove*Plus* Academy is the best so far for several reasons:**

- The workshop had a most complete range of participants which provided for a rich and dynamic exchange of ideas – stove designers and fabricators who were working on an equally diverse stove models, fuel producers, and representatives from university, government, NGOs, and micro-finance institutions.
- There was active participation of everyone, from the first day to the last; there never appeared to be a dull moment, inside or outside the session hall.
- The logistical arrangements were excellent. Everything was ready when and as they were needed. There were no headaches, and one (as a facilitator) just had to concentrate on the content and process of each session.

It should be noted that Ms. Roth was a key person in organizing and facilitating the three previous Stove*Plus* Academies – one was held in Kenya in 2014, another in Ghana in 2015, and the most recent one in Sierra Leone in 2016.

Note: The complete transcript of the participants' evaluation is in Annex 3.

Closing Ceremony

A brief and simple ceremony was held to cap off the workshop. Mr. Talamanca and Ms. Roth gave their quick impressions about the last five days and thanked everyone for their active participation. The CPU president gave the closing remarks. Mr. Joel Somosierra and Mr. Dianala from CPU rendered a couple of musical numbers, accompanied by Mr. Guinto. Afterwards, each participant was given a certificate of participation and a USB containing the presentations of the resource persons.

IV Domingo

Mr. Oscar Carrasco posing with the workshop organizers

Annex 1
Group Outputs on Developing a Business Plan

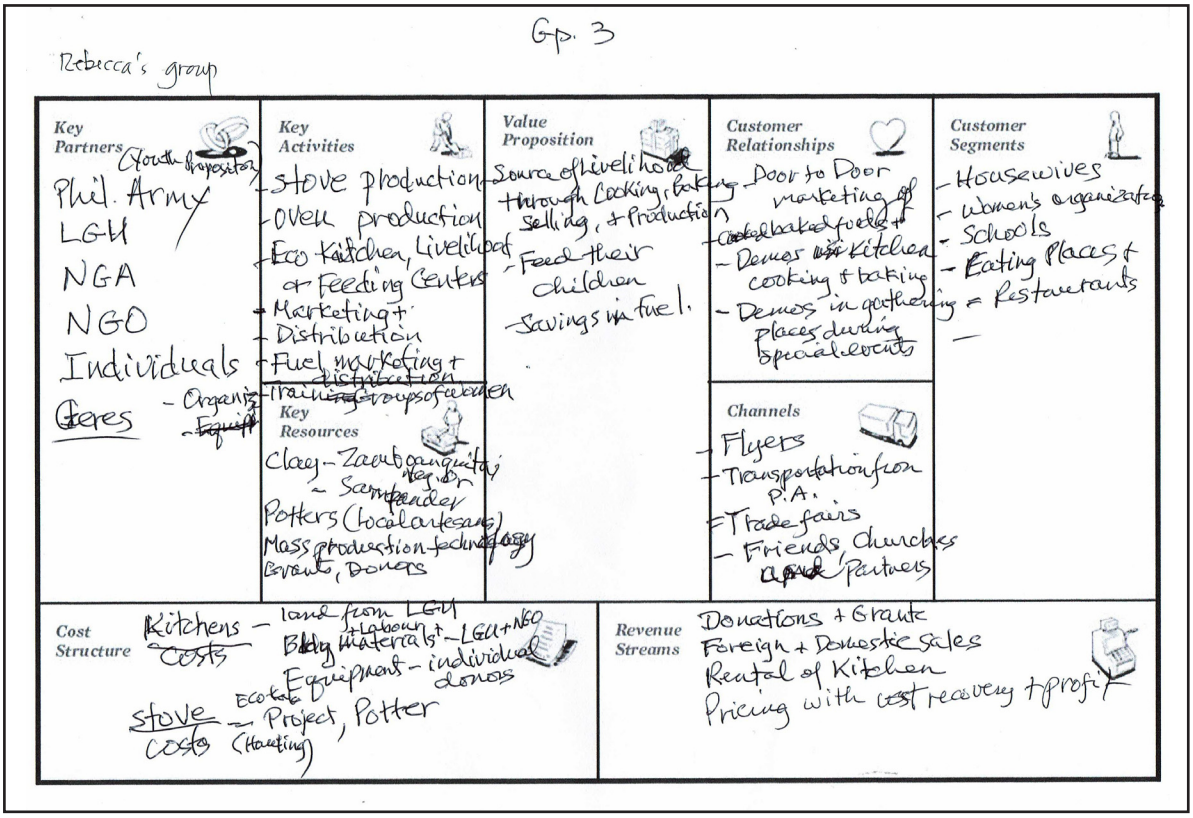


Fig 1. Eco- Kalan stoves and ovens (R. Vermeer's group)

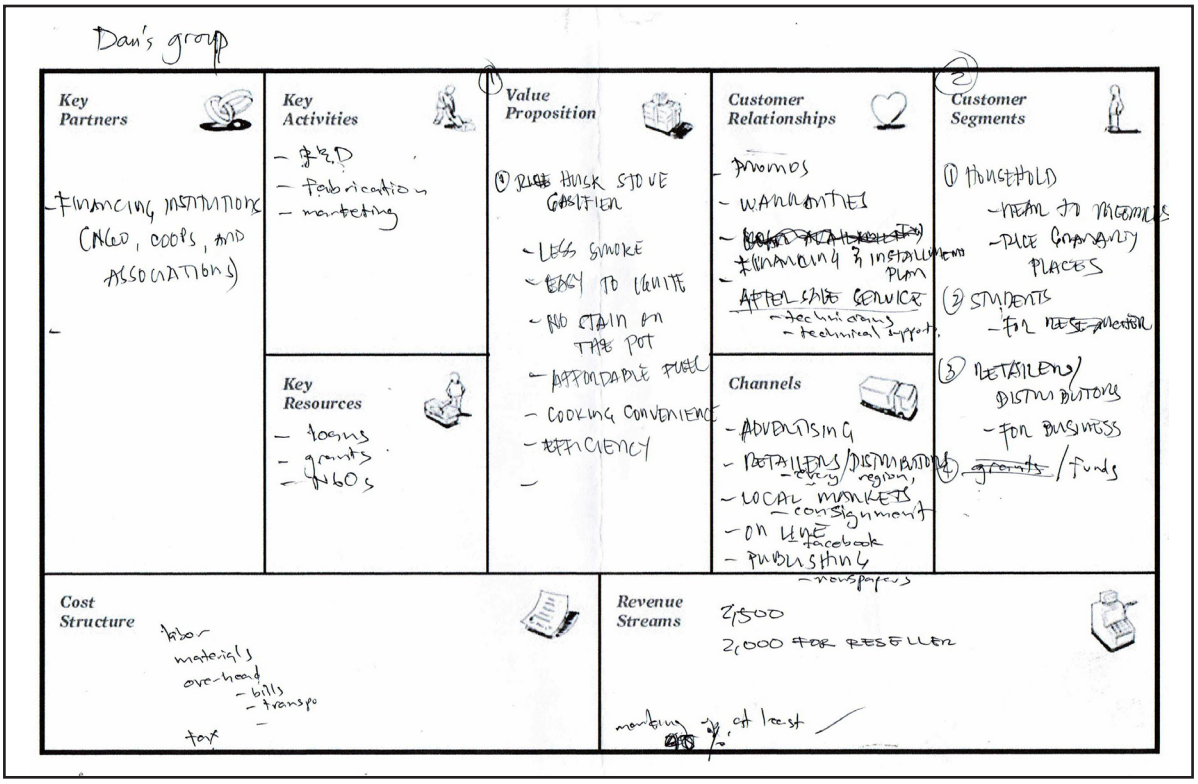


Fig 2. Biolexis RHGS (D.A. Belonio's group)

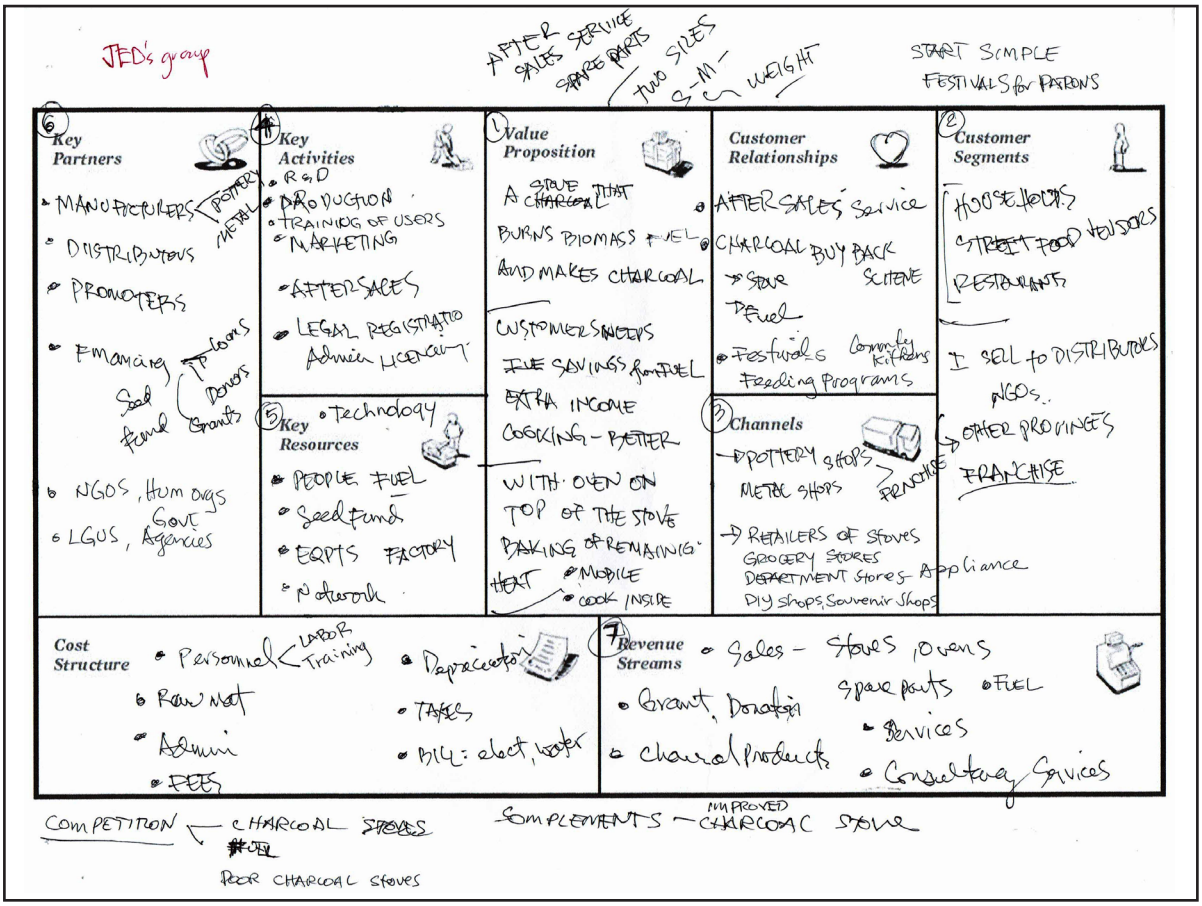


Fig 3. Papa Brick stove (J. Guinto's group)

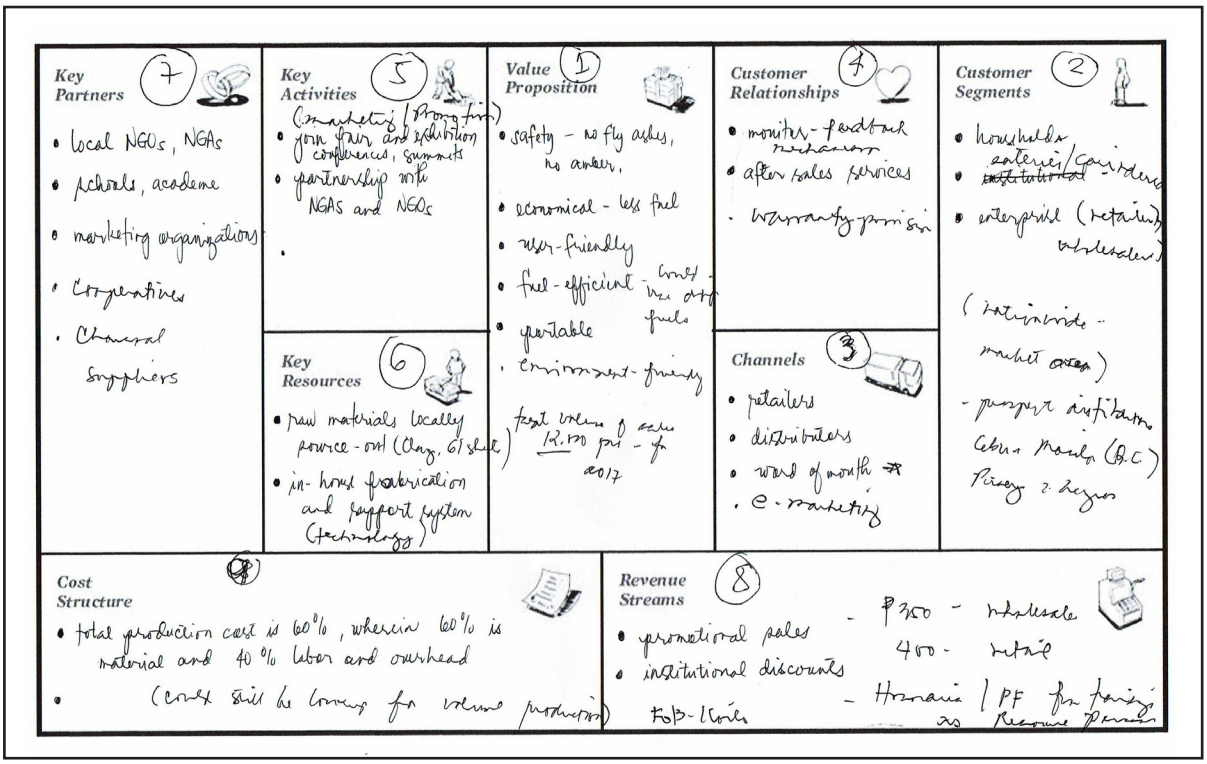


Fig. 4. Wonder Kalan (E. Arroyo's group)

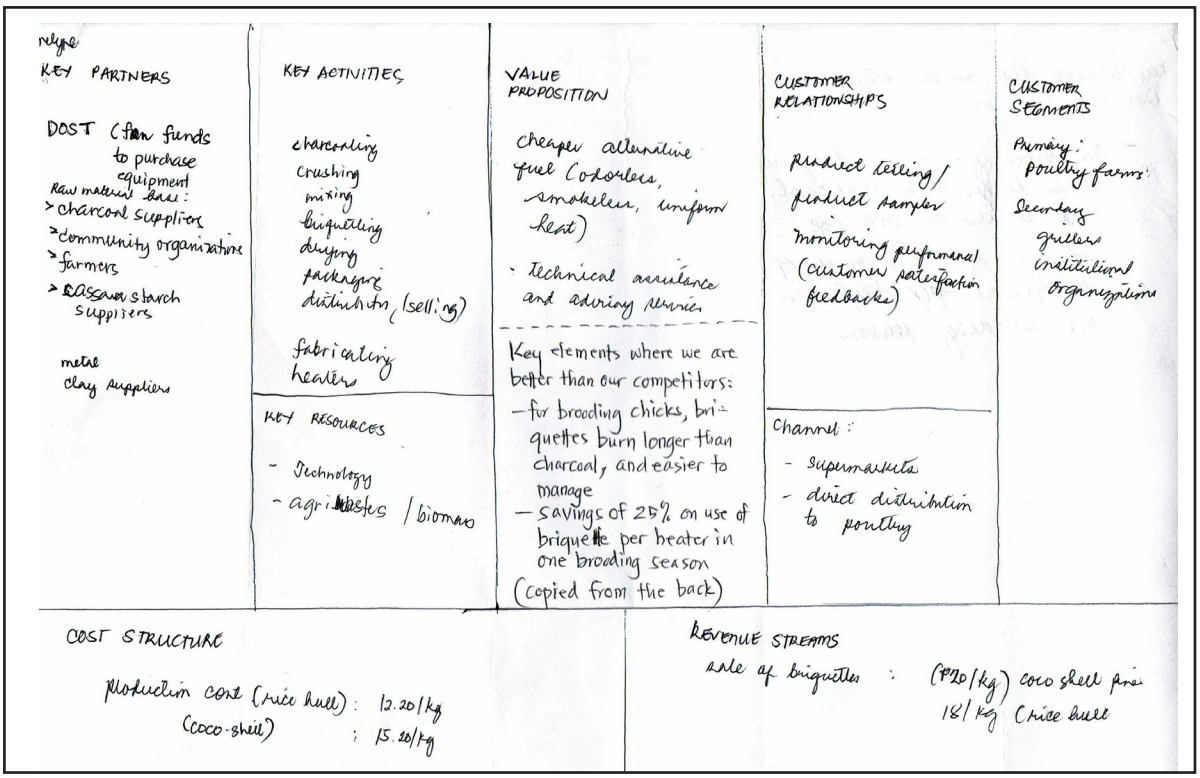


Fig 5. Charcoal briquettes (E. Cortiguerra's group)

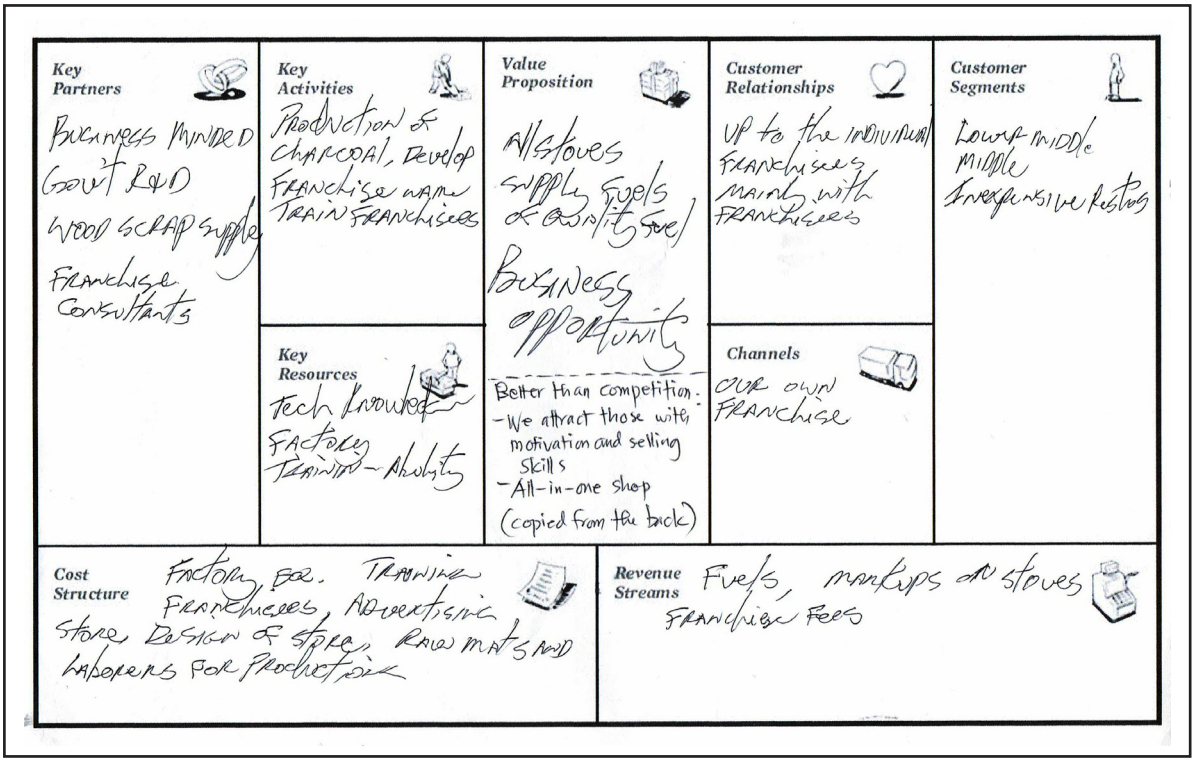


Fig 6. Franchising for fuel and stove outlets (R. Pellicer's group)

Annex 2

Individual Action Plans

Outlined below are the individual or institutional action plans of eight of the participants. Text in *italics* indicate progress on the plans or updates on the participants' activities that were not part of the action plans that they presented.

1. Ms. Emelyne Cortiguerra, Forest Products R&D Institute- Department of Science and Technology (FPRDI-DOST)

Goal: viable and operating briquette enterprises

- Work with technical experts to consider water hyacinth as raw material for briquettes as there is a high demand/request for technical assistance for making briquettes as social enterprise; consider how to improve briquettes from water hyacinth (e.g., mixing with higher heating value charcoal materials). *In response to HiGi Energy's request for a briquettor, Ms. Cortiguerra and Ms. Bisana (one of FPRDI's technical experts on char-briquetting) made a site assessment in HiGi's field site on April 20th. Ms. Cortiguerra is continuing discussions with their technical experts regarding other raw and binding materials that can be used. The Institute reportedly has already done a number of studies on the subject. In the meantime, FPRDI is waiting for HiGi to send the technology licensing agreement before they can proceed further on this initiative.*
- Identify cookstove suited for briquettes
- Marketing program to improve saleablility of briquettes. *Ms. Cortiguerra recently presented a project proposal on market validation of charcoal briquettes to the Technology Application and Promotion Institute (TAPI); TAPI is one of six service institutes of DOST. Mr. Leonardo Javier, the owner and CEO of "Andok's Litson"[1] and two other officers of the company and representatives from the Department of Energy, among others, were invited as panelists. Mr. Javier reportedly called up Mr. Joseph Issifu of McKay Green Energy[2] for a market testing of FPRDI's char-briquetting technology. According to Ms. Cortiguerra, MCGE has ordered 78 units of FPRDI's briquettors to produce briquettes for supplying to Andok's Litson. Mr. Issifu has also inquired about the possibility of carbonizing bana grass as raw material for char-briquettes. MKGE has established plantations of the grass in several sites.*

  FPRDI aims to establish the optimum combination of raw materials that will be ideal for chicken grilling. Aside from heating value, the researchers also need to consider odor which is critical in food grilling because of the direct contact of the smoke from the fuel with the food.
- Work on an outreach project proposal and explore possibility for funding to help displaced typhoon victims come up with a cheaper, clean(er) cookstove and produce fuel (briquettes) as a source of income (technical assistance, capacity building).
- *Another offshoot of the Iloilo workshop is that Mr. Jonathan Lacayanga of BPSU has requested for a training on char-briquetting for an upland farmers' group that he is working with. The schedule is yet to be arranged, depending on the availability of FPRDI's technical experts/trainers who are currently loaded with previous commitments.*

2. Mr. Joshua Guinto, Tagsibol Development Innovations (for registration)

As Mr. Guinto mentioned in an email shortly after the workshop, his biggest step toward action on his plans is to earn some money, and that he was very much in the middle of it (i.e., engaged in a consultancy contract). Part of this consultancy is writing a manual on a number of appropriate technologies – among them are

[1] *Andok's Litson* is one of the oldest and biggest chains of chicken rotisserie establishments in the Philippines. The company has expressed interest in char-briquettes as an alternative to wood charcoal which it has been using since its first roadside grill opened in 1985.

[2] MacKay Green Energy is focused on the development of renewable energy systems designed to convert waste and biomass to energy and fuels.

making Holey rocket stoves and briquettes, and EasyBioPress (in Filipino and English). Since he has preserved proprietary claims over the aforementioned technologies, Mr. Guinto is at liberty to share them around, and intends to promote the technologies in the Fire Benders circle very soon.

Output	Activities	Steps	Resources needed
Microfinance partners	Write business plan	Market survey	Templates
My company: Tagsibol Development Innovations	Create my company: business registration, *secure* mayor's permit	Recruit people, sell stoves, consultancy contracts	Consultancy services ➔ money
Improved stoves and fuels	Renovate the machines, equipment, and processes	Fresh round of production	Truck, workers, skills training, raw materials, workshop

He also mentioned that the Bulacan Environment and Natural Resources Office (BENRO) has recently asked him to submit a proposal (which he already did) to teach community leaders in selected towns of the province on ***how to make cleaner stoves and fuel briquettes****. It will be a partnership with the local government of Calumpit and a big pulp and paper company.*

Mr. Guinto shared some of the activities which also kept him busy, e.g., designing a "fire hood" to improve combustion, with encouraging results; he posted photos of this in the Facebook® discussion group. With pili shells at the bottom of the charcoal stove and charcoal on top, he reportedly was able to toplight the flame (TLUD) using a lighting cylinder similar to the lighting cone discussed during the workshop. He further remarked that the flame was smokeless as soon as it stabilized.

3. Mr. Nathaniel Camat and Mr. Matthew Par, PR Gaz, Inc.

- Create a committee or informal network comprising of the participants and sponsors of Stove*Plus* Academy Philippine Edition. The long term goal of this network is to become a formally recognized association or alliance promoting cleaner/improved cooking technologies in the country. *As indicated in the plenary session, the participants were not so receptive to the idea; some of them expressed that for now, the Facebook® discussion group being proposed at that time should suffice.*
- Develop a framework for the above committee: setting goals and objectives, strategies, courses of action. *(See comment above.)*
- On Monday *(27 February),* will formalize our partnership with ADB's Energy For All Initiative
- Work out a plan or strategy on how to enter the Iloilo market (and eventually other key islands of the country). Such strategies may include: partnering with another LPG company in the area (e.g., Petron); ship and store our products in warehouses; or invest in the construction and operation of our own LPG refilling plant. *Immediate plans have shifted to exploring partnerships with MFIs. For starters, Mr. Par and Mr. Camat will be flying to Bacolod later part of May to discuss with Mr. Andy Coscolluela of NWFT/ Dungganon.*
- Partner with LGUs, Clean Air Asia, and other entities to develop projects aimed at curbing air pollution in the latter's area of responsibility through increased public awareness, education, and offering of cleaner alternatives. *On the same trip mentioned above, Mr. Par and Mr. Camat will also stop by Iloilo City to meet with Mr. Noel Hechanova (CENRO) who intends to introduce the pair to "Taytay sa Kauswagan, Inc." (TSKI), an Iloilo-based MFI.*

4. Mr. Daniel Alexis Belonio, Approtech Enterprises

- Test our stove using other fuels (e.g., water hyacinth, corn cobs, etc.). *A student ordered a unit for her thesis and tested other fuels such as mahogany leaves, rice straw, and cashew nuts.*
- Fabricate a machine for chopping biomass

- Look for a tinsmith or those working with thin sheets to be used for fan assembly
- Continue production
- Prepare jigs and fixtures to increase production speed. *Work in progress.*
- Acquire more equipment/tools for fabrication such as shear cutter, press, etc. *Shortly after the Iloilo workshop, Mr. Belonio purchased an electric shear cutter to help speed up the production process. A month later, he also bought a vice clamp for use in assembling the reactor cylinder.*
- We'll produce a version of the Biolexis stove that is designed for performance (i.e., using stainless steel or adding refractory lining for reactor, heated air, perforated sheet, etc.) for niche market that's not constrained by cost.
- *Additional updates: "Doing great with the stove; sold 12 units already since the start of February which is quite okay considering that production of the Biolexis is not yet in full swing. We are currently working on orders for large/industrial gasifiers." – via email, 27 March*

  "We are displaying the Biolexis in a booth at the annual convention of the PSAE (Philippine Society of Agricultural Engineers) being held in Legazpi City, Albay." I designed for it a small banner for display. I also printed a user's manual to go with the stove." – via email, 24 April

5. Mr. Anecito Sorrilla

- As innovator/fabricator of briquetting equipment
- To design a cleaner and cheaper version of the "Mayon" stove

Note: *No update received to date.*

6. Mr. Jonathan Lacayanga, Bataan Peninsula State University

Plan 20/20: targeting 20,000stove sales by 2020

- Synthesize all inputs/ideas from the workshop
- Develop a business plan for cookstove (proposal for BPSU income generating project). *Two weeks after the workshop, Mr. Lacayanga mentioned about his struggles to push the commercialization issue with his superiors, the GAD office, and the health extension/outreach units of the university. But in his email of April 4th, the winds have turned – as per CHED[3] requirement for budget programming, state universities and colleges (SUCs) have to commercialize mature technologies from their R&D efforts – so BPSU is now under pressure to set related targets for its 2018-2020 cycle.*
- Identify and make presentations to different partners that include church groups, NGOs/people's organizations, SUCs, research institutions, MFIs, etc.

  The bishop of the United Church of Christ of the Philippines (UCCP) has reportedly indicated that his church is considering inclusion of the vertical-fed cookstove for its next round of outreach program planning.

  Mr. Lacayanga will also be organizing a three-day training on char-briquetting for the upland farmers association that he chairs; it will be held as soon as the technical experts from FPRDI become available to lead the event. FPRDI has agreed to provide the training at cost to be shouldered by the association. The group wants to promote the use of briquettes as an alternative fuel for cooking and heating in the province (Batangas), and aims (as an association) to produce quality briquettes for the local market.
- Development of promotional strategies for specific locations. *Mr. Lacayanga and his wife are planning to put up a small "lugawan" (a breakfast place that serves congee) with the vertical-fed cookstove as its main attraction. He also intends to use the lugawan as an outlet-cum demo site for the stove.*
- Fabricate the cookstove and develop woodfuel packaging

[3] The Commission on Higher Education governs all institutions of higher learning, public and private alike.

- Identify distributors or retailers who will sell the stove. *Mr. Ricardo Pellicer, one of the S+ Academy participants, reportedly expressed interest to discuss plans re. dealership of the vertical-fed stove.*
- Continue stove development (R&D). *Mr. Lacayanga is trying to modify the stove design so it can also work on char-briquettes aside from woodfuel. He is also exploring other alternative materials to bring the cost down, e.g., pumice (which is cheaper, locally available, and easier to work with compared to clay) mixed with refractory cement.*
- *The team also plans to submit an entry to the POST CODE GREEN Lottery that provides funding for social entrepreneurs. The entry will be a version of the vertical-fed stove that charges electricity with low GHG emissions. He intends to consult with Mr. Carlo F. Talamanca regarding the business plan.*

7. Rebecca Vermeer, Eco-Kalan Project

- March: Develop an all-clay version of the Eco-Kalan TinCan TLUD; Training the Youth for Peace. *The stove has progressed to become an Eco-Kalan Stainless Steel TLUD. Ms. Vermeer figured that this version has a much greater market potential than her all-clay Whirly Pinay TLUD stove due to lower production costs and greater durability.*
- April: Production of *Bingka* ovens, Large Eco-Kalans (commercial or institutional version)
- May: Meeeting with Dungganon (MFI); look at feasibility of my cousin's invitation to establish a store for clay stoves and ovens. *Ms. Vermeer has met with Mr. Andy Coscolluela of NWFT/Dungganon for a detailed review of the Eco-Kalan Standard and Commercial models. They also scheduled a visit to the Eco-Kalan kitchens in Sagay and Cadiz to determine how the womens' groups can achieve sustainable community development with the Eco-Kalan stoves and "bingka" ovens.*
- Explore production and use of corn cob char which is reportedly better than wood char
- Visit to GERES in Cambodia and Indonesia to learn how to make stoves with moulds

8. Bernardo Tadeo, ECO-REMATES

Title: Biochar Cookstoves for Carbon Sequestration Project

Objective: deploy 1 million cookstoves that can produce biochar for carbon sequestration

Collaborators: Philippine Biochar Assosciation (PBiA)
cookstove manufacturers (minimum standard designs)
DENR-EMB Climate Change Office
Climate Change Commission
Private investors/developers
Full Advantage Phils (preparer- carbon sequestration methodology)

Methodology:

1. Select/design/adapt/modify clean and efficient cookstoves that can produce biochar (minimum standard designs), include safety and health (minimum indoor pollution and risk mitigation)
2. Biochar analysis
3. Identify or select methodology or write new methodology on carbon sequestration
4. Monitoring, verification, and reporting (MVR) of CO2 emission reduction

Funding: Green Climate Fund, cost sharing, etc.

Note: *In his email of March 27th, Mr. Tadeo simply stated, "With hopes and prayers, we may be able to strike a deal end of this year!" No further details received.*

Additional updates

Some of participants who did not present action plans posted some updates via the *Fire Benders* discussion group. Others were contacted via e-mail, text messages, and phone calls for news on their enterprises and related activities.

- **Mr. Eduardo Arroyo, Wonder Kalan**

"Thanks to all the people behind the success of the Iloilo workshop. The impact – more orders for my charcoal stove. ***Malaking*** *order. Again, salamat sa inyong lahat!!!!"* – via email, 25 April

According to Mr. Arroyo, the **big** order means 2,000 units coming from distributors from islands outside Iloilo, cooperatives, retailers, institutions, *barangays (villages)*, and reorders from his customers. Work on his new plant (e.g., building a new kiln and installing machineries) would reportedly take five more months. In order to be able to cater to the above orders, he had to "revive" his old workshop which he had previously decommissioned with the construction of the new one.

In another email of May 23rd, Mr. Arroyo gave the news that Mr. Norberto Yeban (one of the two CARD participants to the Iloilo workshop) together with a colleague visited him just the day before. He showed them his temporary stove workshop and some of the "discarded" although still operable equipment, including a batch of one-week old cured molded stove inner casings. Mr. Arroyo remarked that he is awaiting the arrival of his workers before he could fully operate and install a solar drier shed and shelves. He added that curing of the molded stove combustion chambers would take around 14-20 days so he estimates that the fully assembled stoves would be ready for sale by the last week of June yet.

He will construct his kiln on the new site once the ground is compacted (the area is still being filled). According to him, the kiln will be fired by an electrically driven continuous type rice hull gasifier. He further mentioned that he will be fitting it with "engineering measures" to comply with environmental ordinances. He will be firing the raw inner part of his stoves in the new kiln.

Mr. Arroyo added that further communication with CARD regarding financial assistance will be carried out via email.

- **CARDI MRI/LFC/BDSFI**

Mr. Julius Adrian Alip and his team visited the Approtech Enterprises workshop of Mr. Daniel Belonio in mid-April to offer their financing/leasing services not only to the business but to their clients as well.

Mr. Norberto Yeban together with Ms. Rodessa Burgos went back to Iloilo on May 23rd. They met with Mr. Eduardo Arroyo, Ms. Melvy Pinuela of Leganes Cooperative, and Mr. Rainier Roa of Mabaga stove. According to Mr. Yeban *(via phone call, 27 May),* Leganes CDPC's business is doing well and needs a loan to purchase a lot and building where the cooperative plans to relocate. The cooperative intends to use the building for several purposes: as an office, showroom for its pottery products, and space for a miscellaneous/ convenience store. Mr. Yeban felt that with CDCP's plans for business expansion, there are several more opportunities for partnership with CARD.

On the other hand, Mr. Roa's stove sales has reportedly declined and that he is keeping a substantial inventory in his workshop, and expressed the need for marketing support. Mr. Yeban advised him to come up with a more concrete set of plans so that CARD may be able to determine the specific nature of assistance to extend to him.

From Iloilo City, Mr. Yeban and Ms. Burgos proceeded to Roxas City in the neighboring province of Capiz to visit Mr. Jester Quint Dellava, another participant to the Stove*Plus* workshop. Mr. Dellava's core enterprise is the design, fabrication, and installation of farm and industrial equipment. Although stovemaking is currently not a priority, Mr. Yeban encouraged Mr. Dellava to contact CARD in case his family wants to pick up on its stovemaking project.

Mr. Yeban expressed satisfaction over the whole trip and found it to be quite productive. CARD also plans to visit Mr. Joshua Guinto's workshop at a later time to offer its services.

- **Ricardo Pellicer, Lupel Marketing, Inc.**

On April 20th, Mr. Pellicer also visited the Approtech Enterprises workshop and posted on the Fire Benders Network a photo of him and Mr. Belonio test-firing the Biolexis that he just bought. He also offered to buy a unit of Mr. Lacayanga's vertical-fed stove. Perhaps he is trying to make a selection of the stoves that he plans to distribute?

- **Hazel Pajotagana, HiGi Energy**

In response to comments (during the Stove*Plus* workshop) on the need to further improve its production process, HiGi's technical team has for the past two months conducted several experiments. Ms. Pajotagana reported that production time has been reduced by 79.4% and resulted to a 385% increase in briquette production.

HiGi has finally completed the 3-month long incubation period with Impact Hub Manila. On May 24 and 25, it will participate in the Energy Innovation Arena wherein this start-up will pitch in to an audience estimated to run to the thousands. At the same time, HiGi will also be exhibiting its products there. The event will be held at SMX Convention Center in Pasay City.

HiGi has likewise kept itself busy establishing partnerships with several institutions as follows:

1. registered with ADB's Energy for All Initiative;
2. partnered with different *sari-sari* stores in its pilot location in Victoria, Tarlac;
3. finalized partnership with UNITEN, a Malaysian University – which entails the sharing of knowledge and facilities for HiGi to conduct its product R&D efforts, as well as for patent registrations;
4. forged collaboration with FPRDI (home institution of Ms. Cortiguerra, one of the Stove*Plus* workshop participants) on a couple of fronts: for the purchase of briquetting equipment, and request for FPRDI's to undertake proximate analysis of HiGi's briquettes.

In addition, HiGi Energy has been recently tapped by an entity in Langkawi (Malaysia) to provide briquettes for its daily operations. The team is currently conducting the necessary research and feasibility studies in Langkawi, as well as talking to different agencies in order to establish the needs for the entire partnership. This project will focus on the utilization of other kinds of biomass aside from water hyacinth.

- **ATE co of Entrepreneurs du Monde**

Ate co has converted the initial model of battery rentals launched in 2015 to the new model (pay-as-you-go) which it has deployed in Metro Manila since April of the current year.

As mentioned by Ms. Gondrexon in her presentation during the February workshop, ATE co shall pursue its objective of integrating one or several cooking solutions in its pay-as-you-go model. It is currently designing a cooking solutions survey for the areas where it operates. According to her, the survey will be done by the end of July; the findings will provide needed information about the appropriate (cooking) solution for integrating into its solar energy project by the end of 2017.

Annex 3

Workshop Evaluation

1. **What is the most surprising thing that you learned?**
   - I was surprised that Carlo is also an engineer and an entrepreneur, this gives me hope that I can run a business also; that my dad had helped some of our friends here like the machine designed for Mr. Julius, Mr. Jed; and Ma'am Christa on the explanation of fire/smoke – that I did not know the highest temperature in a match flame.
   - The "punchlines": Don't sell what you produce *(sic)*[1], produce what you can sell!; Don't blame the stove, blame the operator!; Different stoves for different needs.
   - Learning from others' experiences is basically the best part; Learning the science behind stove making (as I am not in the industry of stove making)
   - I was surprised of the stove designs that already exist in the market. Maybe, I'm not just really exposed to them.
   - HiGi Energy can study making the hyacinth (water lily) become fuel (char briquette). The young people hoping to be a big corporation. It can help *(solve)* the problems of flood caused by hyacinth in the lowland area.
   - I learned that using a biomass cookstove is beneficial to mother nature.
   - The different processes and products developed as fuels particularly the biomass pellets
   - Briquetting of the fuels
   - I learned a lot just like the following: a) There were lots of fabricators doing different stoves with different features; b) Different briquettes come from different raw materials such as coco, rice, corn, or even from other plants; c) That there were business opportunities in here.
   - Lack of thought about supply chain and user perspective (-); Despite difficult market, people continue (+)
   - Even if I am a new beginner for this kind of business (stove fabrication), I'm so excited and I'm so eager to start this kind of business because I have a full knowledge of how to distribute or how to market my product and most important, I learned *(from)* this seminar is how to satisfy your users or customers after they buy your product. Note: customer satisfaction and convenience = IMPORTANT
   - That the microfinancer *Dongganon* has offered to help sell our stoves.
   - I wasn't aware that there exists an organization that caters to stove producers and manufacturers to improve and make innovations with the stoves and fuels.
   - Of course the very basic of putting up a business relevant to the business to expect from the different industries. *(The sentence is not clear.)*
   - That the microfinance people can also be distributors; a double glass for the stove lantern – and that it was Christa's original creation; the sound of glass in a ceramic will compromise its insulating property; that I could build a modular kiln, one that I can expand later; that my clay mix is not good enough; that Engr. Aries and her team can test my stove
   - Solar-powered[2] biomass cookstove and other innovations of local partners
   - I'm amazed and I enjoyed doing activities such as cooking using the different stoves and fuels.
   - That there is so much movement and activity with the development of better (traditional) fuels and cookstoves. The awareness of this group's existence, innovations, and works.
   - Microfinancing to support every project does exist and can possibly give full assistance to individuals who lack financial support; NGOs that offer assistance in providing seminars to share ideas, even discuss upfront how he managed his own project.

1 What CFT actually presented were two statements – "Sell what you can produce", and "Produce what you can sell" – advising participants that the latter would be the better guide for entrepreneurs to live by.

2 There was no participant who designed a solar-powered cookstove or a discussion on the topic, except for an example of a stove model that may be powered by a solar panel as a back up (part of CFT's presentation on stove auction).

- Stove business is a complex thing. It requires a lot of hard work.
- I was really excited and pleased to hear about the S+ Academy workshop because of the following reasons: a) We learned that there were alternative *(stove?)* technologies and innovative fuels currently available in the market; b) "Having a sole cooking fuel is a myth and so is the fuel ladder."; c) That there is such a thing as fuel stacking.

2. **What will you remember this Stove*Plus* Academy for?**
   - The experiences here will be a memory that will not be forgotten… (e.g., Ma'am Christa, knowing that there are MFIs or investors, etc.)
   - Best experts to talk about stoves and fuels; healthy/active participation of participants who are eager to learn from each other and share knowledge and experiences
   - Stove+ Academy will be remembered for its well prepared resource speakers, especially Carlo and Christa. These experts made the learning curve more effective and efficient.
   - I will remember S+ Academy for the practical insights of doing a business, not just stove/fuel business.
   - I remember the S+ Academy to make business plan as an entrepreneur. I remember this if I pursue my plans to have business with improved cookstoves and innovative fuels. I can remember this because I can use this knowledge as my tool to ignite my own business.
   - S+ Academy is a business development for improved cookstove and innovative fuels.
   - The convergence of the different stakeholders in the renewable energy sector (fuel, cookstove, technology providers, enablers, etc.)
   - Clean stoves
   - I would remember that Stove+ Academy enhanced my knowledge in improving business and bonding as well.
   - Network and opportunities
   - To be honest to your costumers/buyers ; to learn from your mistakes
   - All the help given to us by Christa and Carlo and Marina and support staff; and all the knowledge they have shared with us about stoves and fuels
   - S+ Academy was very supportive and helpful to different stove producers, sharing a lot of ideas and business plan strategies.
   - It's the time that the S+ Academy really helps the individuals to make their business grow more and to innovate their products into a better one.
   - The people I know were able to finally come together and learn together; the open sharing of knowledge and exchanges of encouragement; cooking together
   - For facilitating learning exchange among producers, ICS manufacturers, users, NGOs, MFIs, academe
   - The network of friends, like-minded individuals with a similar goal
   - I will remember those types of stoves that help us in our needs such as cooking. I saw many types of stoves and it is very exciting.
   - To be honest it is having these new crazy friends and turned out to be a family; advice, discussion, solutions; the new ways and innovation on how to improve stoves and fuels with less smoke
   - It was a great initiative that helps players in the stove sector; think of business while creating awareness that responds to issues of health, household energy, and environment.
   - S+ Academy created a platform for PR Gaz Inc. and our Gaz Lite project to be known to several sectors in the society.
   - A holistic approach on helping to empower local stove makers – the workshop also provides good networking opportunities to help the stove makers develop their business and penetrate the market.

3. **What was the most useful exercise for you?**
   - The most useful exercise for me is the stove pitch…to explain the stove in just 30 seconds.
   - All exercises were helpful.
   - The thinking about how much finances we are currently needing and how we're gonna use it. It makes us rethink of both our long- and short-term plans.
   - The water boiling test – it confirms/unconfirms the claims of the producers/manufacturers.
   - The making of business plan, the marketing strategy, and the actual cooking using the improved cookstoves
   - Their business plan presentation
   - The activity where producers presented their products because they were able to thoroughly reflect on the benefits of their products which is important in marketing these.
   - Entrepreneurship and access to financing
   - The *(water)* boiling test
   - Role playing awareness and get feedback from users
   - When all of the stoves were tested
   - The WBT/thermal efficiency and cooking with the stoves
   - Making the business plan, because some do not have a clear mission and vision for their business
   - It was on the 4th day of the seminar. Because there is a difference among the stoves/fuels when we do the actual cooking. There is a difference on how we use them.
   - The market survey; the business model; elevator pitch
   - Short market study- customer preference
   - Having an FGD with consumers. Seeing their way of thinking, decision making, aspirations
   - Cooking activity, I enjoyed much
   - Interaction, sharing ideas, exercises and presentations
   - Role plays/developing promotional strategies and propaganda
   - Access to finance – particularly the availability of grants and the process of creating a successful proposal

4. **What was good (about the workshop)?**
   - The accommodation and food is good. The scientific theory discussed by Ma'am Christa and the business aspects by Carlo was good.
   - All topics were helpful.
   - Again, the experts' sharing; also, giving the floor to the different stove makers enlightened the others who are not that aware; the presence of funding organizations; the logistical arrangements and nonstop food
   - The idea of making the cookstove cleaner
   - The accommodation at GT Hotel for almost 5 days, the convenient training facilities, and the enjoyable services of the partner stakeholders.
   - Market survey
   - The stoves/less smoke
   - Every information very good
   - Perspectives that can create synergy that was not existing re absence of the workshop *(that would not have existed without the workshop?)*
   - All is for free, especially accommodation.
   - All the topics covered were well presented and discussed freely; the offers to help from presenters and colleagues were most generous!!
   - The 5-day seminar provided great interaction and networking.

- From the first day until the last was good for me because I do have lots of ideas and learnings gained.
- The diversity of stoves, fuels and sectors; interactive learning process
- Sharing of good, success, and learning experience from failures
- The experience as a whole. The conceptualization and execution of the event.
- Cooking
- EVERYTHING!!!
- Presentation/understanding players to make a successful stove business/enterprise
- S+ *(Academy)* was very well organized! The workshop was excellent! Thank you to ADB for endorsing us and for the facilitators for doing a grand job – Christa, Marina, Carlo, IV, and all from ICODE. There were no interruptions and dull moments.
- I like all topics, very comprehensive lectures and interaction.
- I'm enjoying the networking, particularly the "breakthrough" dinner!
- I gained some very valuable information and was able to connect with individuals, organizations, and enterprises which will greatly help my endeavors to build a prosperous business.
- The summary of the stove/fuel business, the science behind stove technology, and the various case studies, were well done and very enlightening. The "101" on running a business, although somewhat basic for me, was an excellently presented overview, especially for those who are mainly artisans, academics, and government employees, who have not been exposed to the business world. The hands-on, getting dirty, playing with fire activities definitely gave the workshop a good balance between classroom time and practical exercises. Lastly, there is only one word that can describe the social and bonding activities - incredible!

5. **What should be improved?**
   - For me, it would be better if there will be more mathematical modeling, and rigorous designs regarding stoves. But maybe it will be in a different workshop.
   - Everything was excellent.
   - Add more resource speakers (different topics); add more interactive exercises which are more organized; invite more also from the biomass *(fuel)* industry[3].
   - I am interested to have the science of combustion be explained hand in hand with the design of each stove presented.
   - The higher level of engagement with local government units (LGUs)[4] to be with us.
   - Actual demonstration
   - Sufficient time to network with as many participants
   - Field outreach – go to a community (IP, PO, CBFMA, or other user groups)[5]
   - I've learned *(how)* to improve my design.
   - More practical guidance (with an example) on the BUSINESS PLAN
   - None at the moment, each day has been educational and informative to everyone.
   - Maybe we should improve those things that are not existing or lacking in the product to enhance its value.

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[3] Three briquette producers did not respond to repeated invitations by the workshop organizers; an NGO that reportedly worked with communities in producing and marketing non-wood based briquettes confirmed participation but did not attend the workshop.

[4] The Iloilo City Environment and Natural Resource Office (CENRO) is under the LGU; Mr. Noel Hechanova, the CENRO Head, sent four of his staff to attend the StovePlus Academy. The CENRO also arranged for a group of housewives and eatery owners to participate in the group discussion on the importance of considering customers' aspirations on the second day of the workshop. Moreover, the CENRO group, along with representatives from its three partner universities (re. Clean Air for Smaller Cities) met with Ms. Marina Dubois and the two international experts on the afternoon of February 17th.

[5] Indigenous peoples, people's organization, community-based forestry management association

- Please have a half day off – to see the city, to make/see friends; an actual firing of a kiln to observe the pots before and after
- NGA participation[6]
- More presence from the government sector; national scale involvement
- I think the demonstration of every stove.
- More seminars in Iloilo City; presence of local city microfinance
- During stove demo, potential costumers/users/sellers must be invited to see how the stove operates.
- Nothing.
- Subjective selection of cookstoves by the potential buyers might have been corrected by actual demo on operating the stoves, or at least video presentation of actual cooking operation.
- More participatory activities, particularly on accessing finance and refining cookstove business plans. Any financial model we can use to prepare our feasibility study?
- Allow more open forums, either by setting an allocated time towards the end of the day, or integrating it into the breaks. Take note of discussions that had to be cut short and revisit them during the open forum. Solicit more opinions on debatable topics… it would be only fair to allow the participants to hear both sides to make better informed decisions. Solicit more information from participants regarding topics or options not covered completely.
- Make sure that there is a first aid kit available and everyone know who has it ;)

6. **Other comments and suggestions:**
   - Starting a briquetting plant *(topic)*; directory of microfinance *(institutions)* and briquette and stove producers
   - Do conduct more of this, maybe in Manila or Cebu with more diverse participants.
   - The whole concept of Stove+ Academy was great
   - Thank you for this opportunity. This opened more venues for us to expand our professional skills.
   - Workshop should be yearly.
   - Very organized
   - Most enjoyable stove and fuel workshop; Christa and Carlo were excellent teachers.
   - To make this seminar annually
   - How to shorten the learning days for others *(who)* can attend not more than 3 days
   - Looking forward to future interactions with this group
   - More workshops to gain more knowledge
   - NONE
   - Perhaps invite more representatives from microfinance institutions, grant-awarding bodies, and the like; Have one more *(S+ Academy?)* regularly *(held)* in the country! I hope one of the facilitators/ sponsors could spearhead the creation of a national/regional platform.
   - Perhaps looking also at how the government can help facilitate shift of households/small commercial establishments to cleaner fuels/stoves, help stove makers further their business.
   - I can say that the activities were very informative and interactive unlike other seminars and workshops where it's usually boring especially in the afternoons.The participants become lively and enjoyable and at the same time, were able to share their knowledge.
   - All topics were interesting, very dynamic in the sense that everybody is participating. It was encouraging as well especially with the true experiences shared by Carlo and well grounded inputs from Christa.

[6] Regional directors were in fact invited from six National Government Agencies (NGAs) to attend the opening and closing ceremonies (but none showed up): the Departments of Agriculture (DA); Environment and Natural Resources (DENR); Energy (DOE); Health (DOH); Science and Technology (DOST); and Trade and Industry (DTI). They were also requested to designate a staff member to attend for the duration of the workshop so that they would be better able to determine how their respective departments can help advance the improved cookstoves and fuels sector. Two participants from the DA and one from DENR attended some of the sessions

Annex 4

Workshop Group Photo

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