



LUXUR GREEN ENERGY LIMITED

লাক্সার চুলায় রান্না করি,
কার্বন উৎপাদন বন্ধ করি

Luxur Green Energy Ltd.

Luxur Cook Stove – ICS Program.

Profile & standard Operational Procedure For Improved Cook Stove (ICS) Program

ম-ফ-ও-র-প-জ-ও-হ-অ-ন-ই-ন-গ-র-ও



Supported By:



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Catalyzing Clean Energy
in Bangladesh (CCEB)

Abbreviations and Acronyms

AECD	: Atomic Energy Centre, Dhaka
BC	: Black Carbon
BNNAQS	: Bangladesh National Ambient Air Quality Standards
CCT	: Controlled Cooking Test
CO	: Carbon Monoxide
EPA	: Environmental Protection Agency (US)
FRM	: Federal Reference Method (USEPA)
HH	: Household
IAP	: Indoor Air Pollution
ICS	: Improved Cook stove
IWA	: International Workshop Agreement
Lpm	: Liters per minute
PM _{2.5}	: Particulate Matter with aerodynamic diameter less than 2.5 μ m
PM ₁₀	: Particulate Matter with aerodynamic diameter less than 10 μ m
SLCF	: Short-lived Climate Forcers
TCS	: Traditional Cook stove
WBT	: Water Boiling Test
WHO	: World Health Organization
BCE	: Biogas Construction Enterprise
BEK	: Basic Earth-Mound Kiln
CAP	: Country Action Plan
COPD	: Chronic Obstructive Pulmonary disease
GACC	: Global Alliance for Clean Cook stoves
IAP	: Indoor Air Pollution
ACS	: Advance Cook stoves
ISO	: International Standard Organization
LPG	: Liquefied Petroleum Gas
NG	: Natural gas
NGO	: Non- Government Organization
SNV	: Netherlands Development Organization
UNIDO	: United Nations industries Development Organization
WWF	: World Wildlife Foundation
DPM	: District Program Manger
FC	: Field Coordinator
LGEL	: Luxur Green Energy Limited
PO	: Partner organization
SREDA	: Sustainable and Renewable Energy Authority in Bangladesh
HEP	: Household Energy Platform
IDCOL	: Infrastructure Development Company Limited
NEP	: New Energy Policy
CAP	: Clean Cookstoves
BCSIR	: Bangladesh Council for Scientific Industrial Research (BCSIR) Greenhouse gas
CO ₂	: Carbon Dioxide
BC	: Black Carbon
BIHS	: Bangladesh Integrated Household Survey (BIHS),
CHAP	: Clean Household Air Pollution (CHAP)

History & Background

Luxur Green Energy Ltd. is engaged in the manufacturing and supplying of high-efficiency biomass (rice husk, pellet, charcoal and other agro/wood-waste) stoves across Bangladesh and is in the process of exporting to other developing countries. The Company introduced the product named Luxur Cook Stove in 2014 and has been the first mover in Bangladesh, in turning pellet as a fuel in clean cook stoves. Until now, it has developed more than 8 designs for burning rice husk/pellet/other fuel effectively and efficiently. We are the pioneer in pellet fueled biomass gasification stoves. Through our own manufacturing facilities, we market and distribute clean cooking stoves to the large rural public and other small and going large scale industries. We are proud to be the unique leading innovator in the renewable pellet energy field in Bangladesh. The products we sell help reduce our country's dependence on other biomass products, benefit the environment by reducing pollutants and improve cooking performance.

Information of Luxur Green Energy Ltd

SL	Subject	Information		
1.	Name of the NGO/MFI/Private Entity	LUXUR GREEN ENERGY LIMITED.		
2.	Year of establishment	STARTING ON ICS IN 14 OCTOBER 2014 LUXUR GREEN ENERGY LTD. 09 OCTOBER 2016		
3.	Nature of business	Profitable Organization		
4.	Address of the head office	327West Sanarpar, Sarker Bari More, Istikutum Building (1 st Floor). Demra, Dhaka-1362.		
	Telephone	+8801816347991, +8801865066001	Fax	N/A
	E-mail	Luxurcookstove@gmail.com luxurmd123@gmail.com	Web-site	
5.	Registration	Registration Body	Registration no.	Date
	(a)	Microcredit regulatory Authority		
	(b)	NGO Affairs Bureau		
	(c).	Department of Women Affairs		
	(d)	Joint Stock Company	NO.-C-133398/2016	09 OCTOBER 2016
	(e).	Other (specify)		
6.	Address of the registered office, if different from head office	North Sanarpar Near of Padma Kuri High School Mohakash Road Demra, Dhaka-1362		
	Telephone	+8801735107998	Fax	

SL	Subject	Information		
		+8801816347991		
	E-mail	<u>Luxurcookstove@gmail.com</u> luxurmd123@gmail.com	Web-site	
7.	Ownership structure of the organization	Chairman Vice Chairman Managing Director Deputy Managing Director Director Finance Marketing Director Director Director Director	- Professor Moin Uddin - Mustafa Abdul Baten Rusdhi - Shah Alam - Nurul Islam Pinto - Md. Mainul Islam - Md. Rafiqul Islam - Dr. Dharifa Khatun Lina - Mohshin - Md. Abdus Samad Milon	
8.	List the core activities / program	01. IMPROVE COOK STOVE (ICS) 02. KIRON KONNA PROJECT. 03. CUNSUMER PRODUCT. 04. E-COMMERCE BUSINESS		
9.	Year micro-credit program started			
	Affiliation	Affiliated With	Yes/No	Date of affiliation
	(a).			
	(b).	Bank of Small Industries and Commerce ("BASIC")		
10.	(c).	Other (specify) 01. Luxur Cook Stove(Single and Double) approved by IDCOL 02. Luxur Cook Stove (Single and Double) testing by Dhaka University. 03. Sustainable and Renewable Energy Authority in Bangladesh (SREDA) 04. Household Energy Platform in Bangladesh 05. Global Alliance for Clean Cook stoves-(UN) 06. Catalyzing Clean Energy in Bangladesh (CCEB)- (USAID)	Yes	
11.	Program outreach	✓ Local	Divisional	National

SL	Subject	Information		
12.	Area of operation (name of Districts)	Rajshahi , Nougaoon, Bogra , Thakurgaon, Panchoghar, Chapinawabgonj Dinajpur, Pabna Moulabibazar, Dhaka,Gazipur, Khulna Gopalganj(Sador), Sirajgonj, Chittagonj,Chuadanga, Meherpur, Jessore, Jhinaidah, Kustia, satkhira, Manikgonj, Rangpur, Lalmonirhat, Nilphamari, Shoriotpur, madaripur, Mymensingh, Noakhali, Foridpur, Comilla, Feni, Bagerhat, Magura etc.		
	ICS program	14 OCTORBER 2014	CONTINUE	TOTAL SALES/installed 39050 PCS



Vision, Mission & Values:

Luxur Green Energy leadership team developed a Vision, Mission and Values soon after the company's founding. These statements have formed the core principles that have motivated & guided the company ever since. They continue to do so today- and will for many years into the future.

Vision:

To become the benchmark manufacturing & distribution organization that best understands and satisfies the clean cooking product, service and fundamental needs of people".

Mission:

In order to achieve this vision, the Group strives to achieve the following mission objectives:

- To continuously improve quality, productivity and reduce cost and waste.
- To constantly develop high value-added products and environmental-friendly products.
- To continually pursue excellence in quality and service exceeding customer's expectation.
- To be a good corporate citizen, protecting and enhancing the environment as well as discharging social responsibility in order to ensure sustainable growth..

Goal:

- I. To reduce greenhouse gas emissions
- II. To Improved health of women by reducing respiratory disease, particularly lower respiratory infections such as pneumonia among children and Chronic Obstructive Pulmonary Disease (COPD) among girl & women
- III. To reduce drudgery of women

Objectives:

1. To popularize and promote the use of alternative/renewable energy technology.
2. To raise the living standard of the rural people.
3. To protect the environment.

Role and Responsibilities

LGFL was set up to promote the use of alternative/renewable energy technologies to meet the energy needs in Bangladesh. Acting as an intermediary institution between the operational level NGOs/private promoters of renewable energy and the policy decision levels in relevant ministries (SREDA, Energy etc) , LGFL 's activities include renewable energy policy formulation, planning and facilitating the implementation of the policies/plans

The main role and responsibilities of LGFL are as follows:

- Short, medium and long term policy and plan formulation..
- Standardization, quality assurance and monitoring.
- Service and support.
- Subsidy and financial assistance delivery.
- Co-ordination of various government organization, Donors, NGO/INGOs and private sector.
- Monitoring, evaluation and quality control, and
- Strengthening LGFL and its partners.

Values:

We at Luxur Green Energy treat Total Customer Satisfaction as our top priority. This has given birth to the organization's values:

1. Respect - We trust each another as individuals and value the capabilities & contributions of each person.
2. Integrity & Trust - Living up to our promises, commitments & responsibilities, we do what is right regardless of cost or consequences.
3. We respect and treat people fairly without judging.
4. We take responsibility for mistakes and take corrective action.
5. Continuous Improvement — We are innovative and utilize best practices to continually improve our management techniques, and the quality of our products and services.
6. Teamwork — We contribute fully in group work, demonstrating trust and mutual support as we collaborate with others. Spirit of Winning—
7. We pursue our vision and business objectives with focus and tenacity.
8. We are accountable for our actions and are determined and relentless to meet business objectives.

Management Strategy:

LUXUR GREEN is following the underneath management strategies:

- Planning and arrangement
- Participatory and group building approach
- Optimum utilization of resources
- Equal opportunity for both sexes
- Honor to culture, religion, belief and custom
- Transparency and accountability
- Gender sensitiveness
- Cost effectiveness

Working Experience with various government or non-governmental institutions:

1. Sustainable and Renewable Energy Authority in Bangladesh (SREDA)
2. Luxur Cook Stove (Single and Double) approved by IDCOL
3. Luxur Cook Stove (Single and double) testing by Energy Institute, Dhaka University.
4. Household Energy Platform in Bangladesh
5. Global Alliance for Clean Cook stoves-UN
6. CCEB-USAID
7. Member of the Executive Committee - HEP, SREDA

Partner Approach:

To make a project aiming to spread the use of improved cook stoves successful, it is necessary to first understand the rationale of the different actors; if the project does not respect the rationale of the people involved, it is not likely to succeed or for its effects to outlast the life of the project. Who are the actors interested by such projects and what are their motivations and constraints: National and international institutions that finance projects on improved cook stoves, families with the power of decision (will they or won't they replace their traditional stove with an improved cook stove?), and craftsmen with their power of decision (will they or won't they produce and commercialize improved cook stoves instead of traditional stoves?).

Improved cooking stove has brought a revolution in Bangladesh which reduced time and money consumption, produces minimum Carbon dioxide and saves from health disorder. Dependency on fuel consumption has significantly reduced. Many organizations, specifically GIZ, big NGO's and even the root level NGO's have come forward working together. Many initiatives have been taken by the Government of Bangladesh. Cow dung, jute sticks, other agricultural waste, wood – 90% of all Bangladeshis still employ these traditional fuels for cooking, and most use inefficient and poorly ventilated clay stoves that produce smoke, carbon monoxide, and carcinogens; the particulate pollution levels may be 30-35 times higher than accepted guidelines.

The women, who cook over these stoves and their small children, are exposed to these high levels of toxins for between three and seven hours a day. The World Health Organization has estimated that 46,000 women and children die each year in Bangladesh as a direct result of exposure to indoor air pollution, while millions more suffer from respiratory diseases, tuberculosis, asthma, cardiovascular disease, eye problems, and lung cancer. 70% of the victims of indoor air pollution

are children under five. The best immediate way of addressing this urgent problem is the rapid and widespread introduction of improved cooking stoves: stoves that burn biomass much more efficiently and – even more importantly – are designed to draw off the smoke and toxins, thus creating a safe environment for women and children.

Partner Organization (PO)

Partner Organization (PO) refers local or national NGOs (Non-governmental Organizations) working in rural/urban in Bangladesh under the registration with Social welfare / women affair/ Youth development/ NGO bureau/joint stock, Micro credit regulatory.

PROJECT DESCRIPTION

Program Title: Improved Cook Stove (ICS Program)

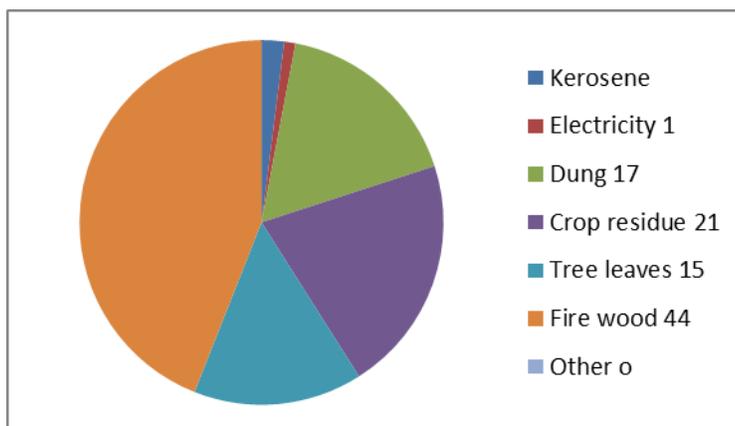
BACKGROUND AND RATIONALE FOR THE PROGRAM

Bangladesh is an agricultural country and more than 90% of her population lives in the villages. Readily available fuels are biomass energy. Biomass resources on the basis of their characteristics and quality, they are used as food, fodder, building materials, fuel and manure. Only a fraction of the total biomass produced by photo synthesis process is used as fuel. In Bangladesh commonly known biomass fuel are: fuel wood, agricultural residues and animal dung. The traditional appliances commonly used for cooking and other heating purposes across the country are called “Chullas” which generally use fuel wood, agricultural residues, cow dung cake etc. as fuel

In both the rural and the urban areas more than 90% families use biomass fuel for cooking purposes. But in rural area about 97% energy consumed by biomass fuel. The rural household’s energy consumption by sources is given below in Fig.No.

The Program:

In Bangladesh energy shortage is most important barrier for economic growth. However government of Bangladesh has a vision to supply electricity to all by 2021. According to Government statistics the gap between electricity supply and demand is 500-800MW. Population (%) with access to electricity is about 49%. (Source: IDCOL)



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Biomass energy considered as a cleaner source of energy and there is a growing concern regarding green house gas emission at the global level. Beneficiaries will be attracted to “green power”

generated by biomass owing to its various environment benefits which include minimizing global warming effect because “zero net carbon dioxide” is emitted. This means the amount carbon dioxide emitted is equal to the amount absorbed from the atmosphere during the biomass growth phase. Energy from biomass produces no sulfur emissions, helping to mitigate acid rain.

A small numbers of cities and towns of the country are supplied with natural gas. As a result, most of the people of the cities and towns of the country use fuel wood for cooking and other heating purposes. Some 44 million tons of biomass fuels are being consumed

Improved stoves save 50-65% traditional fuel as compared with the traditional ones. Total amount of traditional fuel consumption in the country is about 44 million tons annually. If improved stoves popularized in the country and if it saves 50% traditional fuel, then annually about 22 million tons of traditional fuel will be saved. The reduction of traditional fuels by improved stoves, therefore have lower emission of greenhouse gases (CO₂) in the atmosphere .It also helps to conserve the forest resources of the country (Source: IDCOL

In riverine Bangladesh it will be difficult to supply natural gas for cooking purpose to the every households of the country. Therefore, improved stoves have bright future in the country. Large scale dissemination of improved stoves in the country can conserve the local forest and change the social life to a great extent.

Considering the situation, Luxur Green Energy Ltd has been working with local NGOs across the country titling the name of the program “**Kiron Konna**”. **The thematic** translation of its is the angel of change.

General Energy Situation in Bangladesh:

- Power: Installed capacity: 10000 MW (Operating: 8000 MW)
- Natural Gas: 11 tcf, Consumption: 500 bcf/a
- Coal reserve: 2 billion ton
- 50% of total energy supply is provided by biomass
- 40% of HHs: connected to grid electricity (rural area, 20%)
- 6% of the HHs: natural gas, primarily in urban areas
- For cooking: >90% depend on biomass, e.g. rice husks, jute sticks, cow dung, wood. The way is traditional, inefficient

Compares between Improved Cooking Stove (ICS) and Traditional Cooking Stove:

A stove is the combination of heat generation and heat transfer to a cooking pot. Cook stoves are commonly called “improved” if they are more “efficient” than the traditional cook stoves. “Efficient” mean Energy efficiency. The core question concerning the efficiency of two alternative stoves is: “With which of the two stoves do I use less fuel to prepare my meal?”

IMPROVED COOKING STOVE (ICS)

What is ICS?

ICSS are those traditional stoves which upon some modification/alternation/addition yield higher efficiencies when compared with the unmodified ones.

Salient Features of an ICS :

- a) An ICS is an improved version of the traditional stove having higher fuel efficiency compared with the traditional ones.
- b) An ICS has a grate in the middle of its combustion chamber and fuel burns on it.
- c) There is entry of primary air in an ICS below the grate which helps burning of charcoal formed during burning of fuel wood.
- d) The three raised ends of a chimneyless ICS are much smaller than those of the traditional stoves.
- e) In case of multiple mouth ICSs with chimneys, cooking in the first mouth is done by direct flame produced from fuel, while cooking in the other mouths are done by hot flue gases coming out from the first mouth and the spent flue gases are led out of the kitchen through a chimney

Importance of ICS:

Over recent years, a variety of projects aiming to spread the use of improved cook stoves have been realized. The first NGOs introduced the improved cook stoves on a local level in order to reduce the dangers that come with traditional stoves: to prevent children from burn injuries and reduce respiratory problems caused by inhaling smoke from indoor cooking. These projects have progressively been expanded to a greater scale, with the aim of reducing the impact of domestic cooking on the local and global environment. Looking back on several decades of activity on this topic, it is interesting to take stock of the issue of improved cook stoves and the role they can play in a sustainable supply of cooking energy for local communities.

Importance of ICS in short:

- No smoke in the kitchen
- Efficiency: 26%-29% (traditional stove: 5% - 15%)
- Fuel saving: 50% - 60%
- Household, which buys fuel, saves 250 – 400 Taka/month (payback period: 2-3 month)
- Restaurant saves 200-400 Taka/day (payback period: 1-2 month)
- Significant reduction of indoor air pollution in kitchens
- Saving of money
- Reduced burden on forest resources
- Improvement of soil by increased use of bio-fertilizer
- Time saving
- Clean kitchen & pots Income generation for builders and trainers
- reduction of indoor air pollution in kitchens
- Reduction of cooking fuel by about 50% - biomass saving

Advantages of Improved Cook Stove (ICS) Technology:

The improved stoves have many advantages over traditional stoves. Some of the advantages of ICS are given below:

- i. Saves 50-65 % traditional fuels
- ii. Reduces indoor air pollution (IAP)
- iii. Save cooking times 40–50 %
- iv. Keeps the kitchen environment pollution free and thereby check health hazards of the users.
- v. Maintaining proper nutritive values of the cooked food.
- vi. Less blacking of the cooking utensils
- vii. Check the fire hazards. Reduces CO₂ emissions in the atmosphere, thereby reduce the greenhouse effects.

Objectives of Improved Cook Stove (ICS) Technology:

- (a) To save traditional fuels by popularization of improved stove and keep pollution free environment in rural areas.
- (b) To reduce indoor air pollution (IAP) in the kitchen.
- (c) To develop skill manpower through training course of improved stoves to the unemployed men and women of the country.
- (d) To create awareness about the effectiveness and usefulness of improved stoves by massive advertisements through various media.
- (e) To reduces deforestation and maintain ecological balance of the country by massive used of improved stove.
- (f) To involve different Government, Semi-Government and Non-Government Organizations in dissemination program of improved stoves.
- (g) To improve the hygienic condition of the kitchen.

Fuel wood using Urban, peri-Urban and Rural Industries in Bangladesh where Improved Stoves can be used:

A) Food Processing Industries:

- i) Bakeries
- ii) Fish Smoking
- iii) Ghur making
- iv) Noodle making, potato chips
- v) Jams & Jallies etc.

B) Agro- Processing Industries:

- i) Rich parboiling.
- ii) Tobacco leaf curing.
- iii) Tea leaf curing.
- iv) Vegetable drying.

C) Miscellaneous Industries:

- i) Soap making
- ii) Printing (Saree/Clothes)
- iii) Road Tarring
- iv) Textile mills

D) Household / Restaurant:

- i) Rice, Meat, Vegetable Etc.
- ii) Water Boiling.
- iii) Tea Stroll
- iv) Bread, Fish & all items Fry etc.

Government Institutional Frameworks: Specific to Improved Cooking Stoves (ICS) are as follows:

1. Power Division, Ministry of Power, Energy and Mineral Resources.
2. Department of Environment.
3. Local Government Engineering Department (LGED).
4. Bangladesh Council of Scientific and Industrial Research (BCSIR)
5. Sustainable and Renewable Energy Development Authority (SREDA)
6. Infrastructure Development Company Limited (IDCOL)
7. SME Foundation, it can promote entrepreneurship in cook stove promotion.

Impact of SDGs Goal:

Co- benefits for local sustainable development

This project will result in significant co-benefits, categorized below using the three pillars of sustainable development: economic, social and environmental impacts. Co-benefits will be accounted for using a qualitative assessment, with a full proposal examining what statistics are readily available to measure and monitor sustainable development impacts.

Economic Impacts

- I. Income- and employment-generating effects through the improvement of existing businesses and the promotion of new businesses.
- II. Reduced money spent on fuel wood, freeing up financial resources
- III. Save time or money, enabling girls to stay in school or learn
- IV. Save or invest earnings and assets
- V. Earn

Social Impacts

- Improved working conditions and health status of the cooks
- Reduced indoor air pollution and associated respiratory illness
- Less pain and physical stress caused by smoke, intense heat, burns and accidents
- Reduced cooking time because of more efficient stoves means more time is available for other useful activities such as farming, food processing
- Improved nutrition of pupils, small children and adults due to more and better meals
- Acquisition of new skills and knowledge through capacity building and awareness creation
- Increased environmental awareness through good practices; Adolescent Girl will be agents of change

Environmental Impact

- I. Feel safe and secure
- II. Smock free and reduced carbon
- III. 30 to 90 percent reduction in indoor air pollution
- IV. Reduction in greenhouse gas emissions by about 2.5 ton carbon dioxide per year per stove

Country Action Plan for Clean Cookstoves (CAP)

The Power Division of Bangladesh Ministry of Power, Energy and Mineral Resources has announced and published the Country Action Plan for Clean Cookstoves (CAP) in November 2013. The target of CAP is to disseminate Cookstoves to over 30 million households in Bangladesh by 2030. CAP defines ten priority interventions, to be implemented immediately:

1. Development of a coordination mechanism, called the Household Energy Platform
2. Research and Development to improve the existing local models and potentially create new Cookstoves models
3. Development of a national network of suppliers
4. Identification of strong non-cooking product distribution channels and the addition of improved cooking solutions into already successful distribution chains
5. Increase of awareness of clean cooking solutions among consumers
6. Building of capacity of individual suppliers and distributors to effectively market their products
7. Increase of access to finance for Cookstoves and fuel entrepreneurs
8. Better understanding of Bangladeshi consumer preferences
9. Establishment of a national cook stove testing and knowledge centre for laboratory and field testing
10. Inclusion of Cookstoves and fuels into other key Government priorities

As one of the measures to support this plan the government of Bangladesh has approved \$ 4.4 million from their Climate Change Trust Fund to implement the ICS (improved Cook Stove) program

Source of Cooking Fuels (in %)

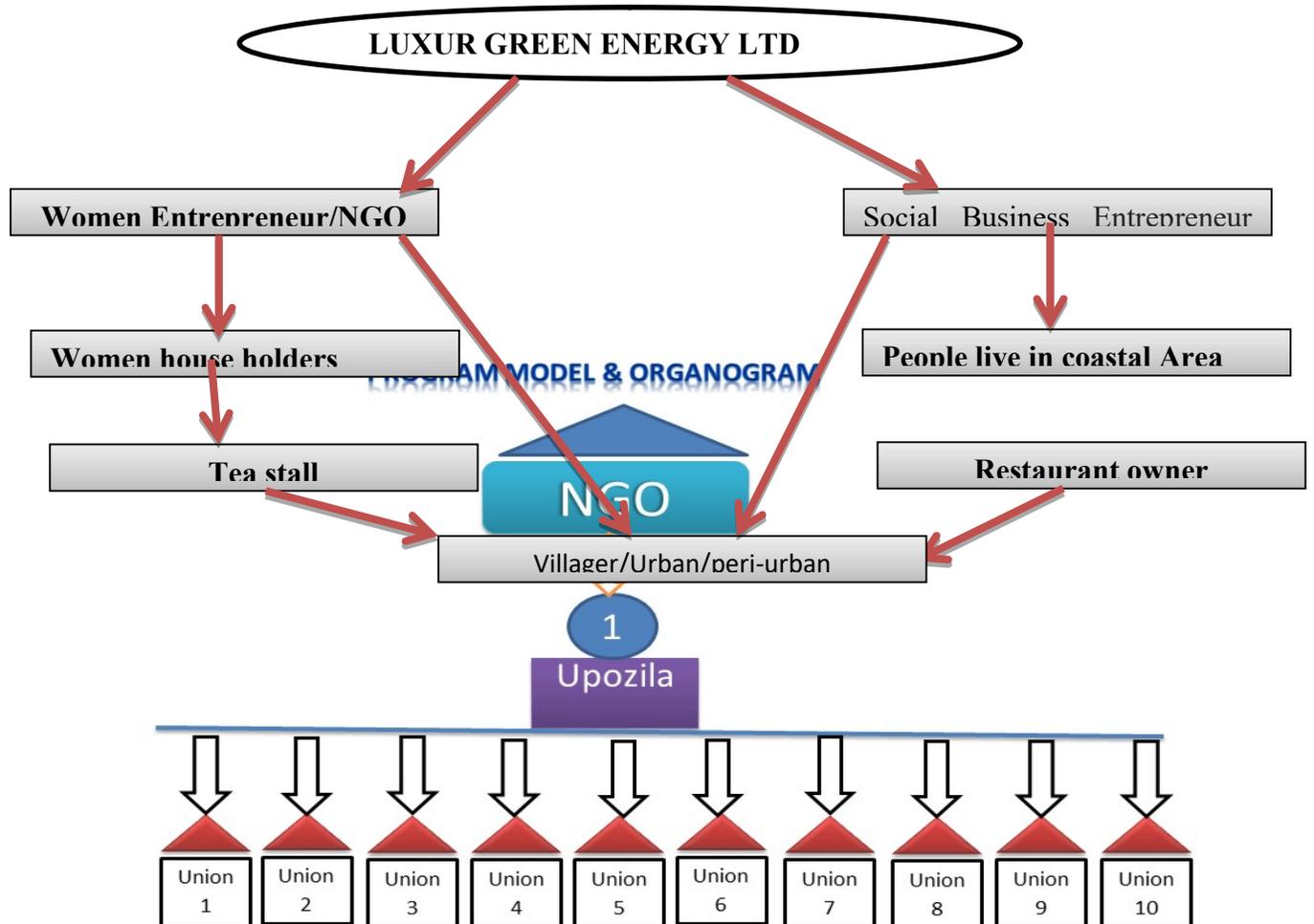
Fuel Type	2011	2004	1991
Wood	34.8	31.76	44.27
Kerosene	1.0	1.79	0.57
Gas/LPG	12.6	9.09	2.36
Electricity	0.4	0.76	0.88
Straw/Leaf/Dried cow dung	51.2	55.91	-
Bio-gas	0.1	-	-

Source: IDCOL Webpage

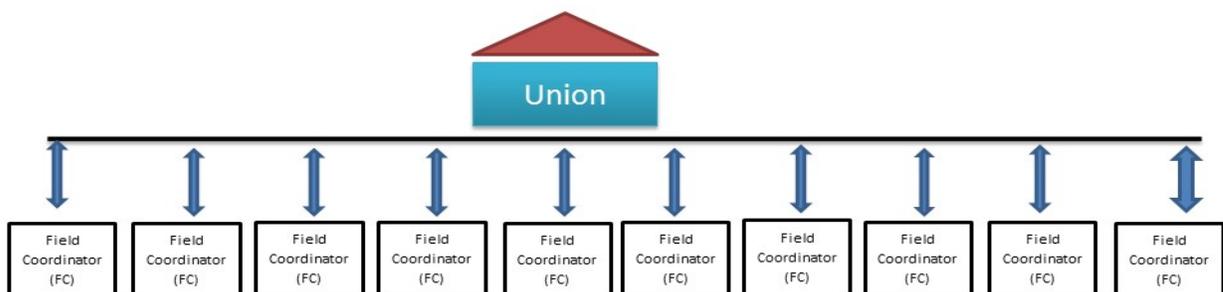
Target group

- I. The consumers/end users
- II. The sales person
- III. Employed workers
- IV. The distributors/NGO's

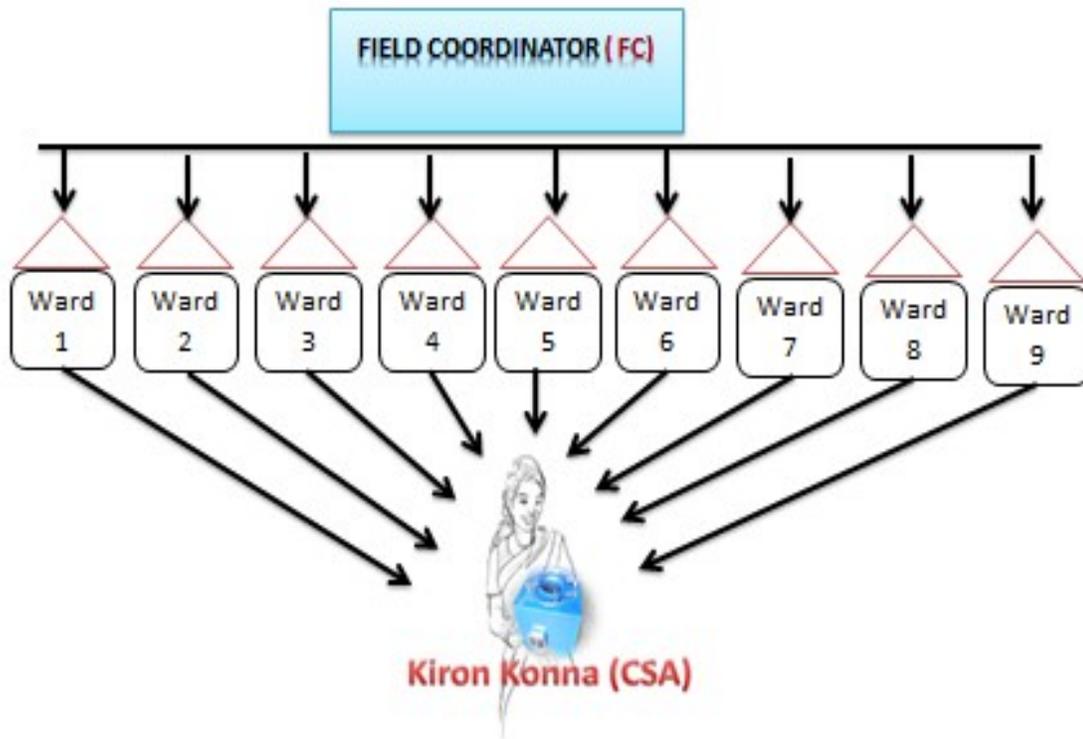
Targeted beneficiaries/ customer and target marketing strategy as follows:



Union Model



Union/Ward Model



Summary of the main assumptions for Kiron Konna program

With 165 million people, Bangladesh is the 9th most populous country in the world, upwards of 70% of its population lives in rural areas. In both urban and rural areas, more than 90% of households depend on biomass as a fuel source, leading to major health and environmental issues. An estimated 46,000+ people die from the effects of IAP every year while 3.5% of Bangladesh forests have been destroyed in the last 20 years. Bangladesh has a large potential market for ICS, estimated at greater than 30 million households; Basic capabilities exist across the value chain to support programs, but there appears to be a lack of product diversity, enterprise financing and larger private sector participation. Improved cooking stove can mitigate this situation though it is not the full solution but considering economic and health aspects it can work, instead of traditional biomass cook stove. ICS project will bring considerable improvement in rural lives through consume less fuel and alleviating poverty. In addition, it can bring multiple positive results in terms of women's welfare, employment and income generation. Propose project will be implement partnership with IDCOL.

Why energy saving stove

- Reduce pressure on standing carbon in the environment.
- Increase efficiency of cooking time..

OUTLINE OF PRO-FORMA BUSINESS PLAN FOR NGO/MFI/Private Entity

General Objectives:

- 1) To reduce indoor air pollution in the rural kitchens.
- 2) To improve the kitchen environment for supporting the mother and child health care program.
- 3) To establish a sustainable framework and strategy for making available needed technically and socially appropriate Improved Cooked Stoves (ICS) in pri urban and rural communities based on local capacity building and income generation in Bangladesh.
- 4) To create and build up the capacity on community, district and national level regarding the promotion and dissemination of ICS and to achieve broad coverage of ICS
- 5) To popularize and promote the use of clean energy technology to raise the living standard of the rural people.
- 6) To protect the environment, Conservation of fuel pellet or brigades and other biomass by using environment friendly technology.

Specific Objectives:

1. To implement the approved Improved Cooked Stoves (ICS) in household levels in areas where gas facilities is absent or unlikely to reach in the near future.
2. To reduce the number of deaths from chronic obstructive pulmonary diseases attributable to Pellet or solid fuel burning at pri urban or rural area;
3. To protect de-forestation through improving the fuel efficiency of cooking stove.
4. To reduce the Green House Effects.
5. To accelerate the dissemination of ICS across Bangladesh by extending loans or micro credit to households in the programmed areas.
6. Improvement of traditional stoves into improved cooked stoves (ICS) which is environment friendly technology.
7. Raising adoption of energy solutions in the rural communities, Reduction in the drudgery of women and girl children from cooking.
8. Raising awareness among the community people towards adopting the Income generating activities & women empowerment.

Specification of the products

Manufacturer Model:

There are many NGOs/private companies in Bangladesh locally developing different model of ICS. These models do not have higher efficiency, are not suite for alternative energy and also they don't follows standard test such as water boiling test(WBT), Control Cooking Test (CCT) or kitchen performance test (KPT) to evaluate the performance in practical life. But Luxur Green Energy limited in this research completely succeeded with different parameters of ICS which was studied thoroughly as follows:

1. Grate height
2. Grate hole

3. Feed hole
4. Primary air in let/ ash outlet
5. First exit
6. Distance between two pot
7. Height between utensil and bottom of the second mouth
8. Slope of the bottom of the second mouth
9. Characteristics of pellet
10. Characteristics of metal

After studying above parameters a sample design in AutoCAD 2D and 3D model of was developed. According to these design real implementation of metal based stove and induction stove was constructed. After real implementation, performance of the ICS was evaluated and compared with the conventional stove.

Description of Product:

Luxur Cook Stove(Single Burner):

- Body of Luxur Cook Stove
- Height: 10.5"
- Width: 11"
- Length: 11"
- Weight: 4.87 Kg
- Body: Silver or Multiple Colors
- Materials: Stainless steel with other precious metal components



PRODUCT AND FE ATURES

DOMESTIC STOVES:

Luxur Cook Stove(Square) :

Luxur Cook Stove (Square) is a continuous, natural draft stove. It is smokeless stove compared to traditional mud stoves It uses pellet as a fuel which are fed in outer reactor, which produces flame efficiently in downdraft mode. It is the most economical stove which serves the weakest section of rural society.



It requires pieces of paper to ignite the stove within a minute stove is ready for cooking.

Luxur Cook Stove is designed for BPL Families, saves 70% of cost in comparison to traditional cook stove. Hence no drudgery tasks for children & women, it is designed to optimize fuel-efficiency and reduce toxic emissions when cooking meals.

Specifications:

Fuel Required	250gm of pellet per load (Batch Type Loading)
Stove Size	10.5.”*10.5.”*10.25”(Inch)
Stove Weight	2.7 Kgs Stove & .8kgs charge Controller
Reactor Type	Stainless Steel
Battery	6V/ 4.5Ah.
LED Light	4Watt DC LED Light
Fan	4V (0.35Amp DC Fan) -China
Capacity	Could take load up to 25 Kg.
Battery Backup	1) Only Fan: 8-10hrs 2) Only Light: 25~28hrs 3) Both Fan & Light: 5~ 6hours
Thermal Efficiency	43.6%~44.5% (Tested by Dhaka University)
Operating Time	40-45 Minutes (Depending upon operation/pellet Type)
Tier	3
Specific fuel consumption	45-94g/per litter
CO	2.7 ppm

Features:

- Available with an AC/DC/Solar (Combo) [5W Solar Panel to charge battery (controller).
- Available with 5in1 DC Mobile Charger.
- A 4VDC fan 0.28Amp and a 4.5AH SMF battery is configured inside the charge cum fan controller.
- Can same the flames through potentiometer. No fossil fuel is required for ignition just few pieces of paper.
- An LED light is also configured with the power bank/charge controller that can be used to light darkness.



User Feedback:

Multi Use (Luxur Cook Stove, LED Light & Mobile Charger)

- ❖ Low fuel cost
- ❖ Traditional Taste
- ❖ Easy to ignite
- ❖ Flame like a LPG
- ❖ Portable
- ❖ Ash(burnt Pellet/Charcoal) can be used for soil conditioning.

How to Operate?

Initially from the mouth of the stove reactor pellet/charcoal/chopping wood is filled completely leaving 1 inch gap and ignite the fuel with few pieces of paper lighting it with match stick at different places. Once the fire takes place slowly covering the top layer of the fuel then switch on the fan from the controller to start the gasification process after 20 seconds place the steel vessel support on top and stove is ready for cooking, flame can be controlled by the controller (high, medium and low).

Controller:

Controller / Power bank is provided along with stove for charging of battery which also controls the fan's speed. The power bank/controller has two sockets to be charged via 230V electricity or a 5W Solar Panel. The power bank is configured with LED Light and we also provide 5in1 DC Mobile Charger to charge mobile.

Luxur Cook Stove (Square-02):

Luxur Cook Stove (Square) is a continuous, natural draft stove. It is smokeless stove compared to traditional mud stoves. It uses pellet as a fuel which are fed in outer reactor, which produces flame efficiently in downdraft mode. It is the most economical stove which serves the weakest section of rural society.

It requires pieces of paper to ignite the stove within a minute stove is ready for cooking.

Luxur Cook Stove is designed for BPL Families,

saves 70% of cost in comparison to traditional cook stove. Hence no drudgery tasks for children & women, it is designed to optimize fuel-efficiency and reduce toxic emissions when cooking meals.



Features:

- Available with an AC/DC/Solar (Combo) [5W Solar Panel to charge battery (controller)].
- Available with 5in1 DC Mobile Charger.
- A 4V DC fan 0.35Amp and a 4.5AH SMF battery is configured inside the charge cum fan controller.
- Can sim the flames through potentiometer. No fossil fuel is required for ignition through just few pieces of paper.
- An LED light is also configured with the power bank/charge controller that can be used to light darkness



Specifications:

Fuel Required	250gm of pellet per load (Batch Type Loading)
Stove Size	11.0*11.0*11.25”(Inch)
Stove Weight	3.7 Kg Stove & .8kg charge Controller
Reactor Type	Stainless Steel
Battery	6V/ 4.5Ah.
LED Light	4Watt DC LED Light
Fan	4V (0.35Amp DC Fan) -China
Capacity	Could take load up to 15 Kg.
Battery Backup	1) Only Fan: 8-10hrs 2) Only Light: 25~28hrs 3) Both Fan & Light: 5~ 6hours
Thermal Efficiency	39.6%~40.5% (Tested by Dhaka University)
Operating Time	40-45 Minutes (Depending upon operation/pellet Type)
Tier	3
Specific fuel consumption	45-94g/per litter
CO	4.89±0.8 ppm

User Feedback :

Multi Use (Luxur Cook Stove, LED Light & Mobile Charger)

- a. Low fuel cost
- b. Traditional Taste
- c. Easy to ignite

- d. Flame like as a LPG
- e. Portable
- f. Ash(burnt Pellet/Charcoal) can be used for soil conditioning.

How to Operate ?

Initially from the mouth of the stove reactor pellet/charcoal/chopping wood is filled completely leaving 1 inch gap and ignite the fuel with few pieces of paper lighting it with match stick at different places.

Once the fire takes place slowly covering the top layer of the fuel then switch on the fan from the controller to start the gasification process after 20 seconds place the steel vessel support on top and stove is ready for cooking, flame can be controlled by the controller (high, medium and low).

Controller:

Controller / Power bank is provided along with stove for charging of battery which also controls the fan's speed. The power bank/controller has two sockets to be charged via 230V electricity or a 5W Solar Panel. The power bank is configured with LED Light and we also provide 5in1 DC Mobile Charger to charge mobile.

Luxur Cook Stove(Round)-Tea Stall Stove:

Description:

Luxur Cook Stove are designed with built-in fans which help to circulate the air and heat. It's a unique solution which provides LPG like performance and made easily accessible to tea stroll/households/small restaurants.



Luxur Cook Stove burns using specifically developed biomass residue based solid fuel called "Pellets". The stove works in such a manner so as to provide appropriate air to fuel ratio thus delivering much higher efficiency & consequently lower emissions.

Luxur Cook Stove burn so hot and clean that there's very little ash left behind, especially compared with woodstoves.

The Idea behind Luxur Green Energy Ltd. chose " Luxur Cook Stove " is as the Pellets are considered carbon-neutral because the CO2 level exhausted by the stove is similar to the carbon released when wood decomposes naturally on the forest floor.

The Luxur Cook Stove gives you uncompromising performance year after year with the comfort of knowing you have selected a product made with true craftsmanship & advanced technological innovations.

Features :

- Available with an AC/DC/Solar (Combo) [10W Solar Panel to charge battery (controller).]
- Available with 5in1 DC Mobile Charger.
- A 12VDC fan 0.40Amp and a 4.5AH SMF battery is configured inside the charge cum fan controller.
- Can sum the flames through potentiometer. No fossil fuel is required for ignition just few pieces of paper.
- An LED light is also configured with the controller that can be used to light darkness.



How to Operate?

Initially from the mouth of the stove reactor rice husk is filled completely leaving 1 inch gap and ignite the fuel with few pieces of paper lighting it with match stick at different places.

Once the fire takes place slowly covering the top layer of the fuel then switch on the fan from the controller to start the gasification process after 20 seconds place the steel vessel support on top and stove is ready for cooking, flame can be controlled by the controller (high, medium and low).

Controller:

Controller / Power box is provided along with stove for charging of battery which also controls the fan's speed. The power bank has two sockets to be charged via 220V electricity or a 5W Solar Panel. The power bank are using LED Light and 5in1 DC Mobile Charger to charge mobile.

Specifications:

Fuel Required	400 gm of Pellet per load (Batch Type Loading)
Stove Size	30*30*50 cm
Stove Weight	3.7 Kgs Stove & 1kgs Controller
Reactor Type	Stainless/MS Steel
Battery	6V/ 4.5Ah,
LED Light	4 Watt DC LED Light
Fan	4V (0.35Amp DC Fan) -China
Capacity	Could take load up to 10 Kg.
Battery Backup	1)Only Fan: 8-10hrs 2) Only Light: 25~28hrs 3) Both Fan & Light: 5~ 6hours

Thermal Efficiency	34.54%~35% (Tested by CCEB)
Operating Time	40-45 Minutes (Depending upon operation/ Pellet Type)
Particulate Matter (TSP)	89±13 µg/m ³)
Power Output	2.16Kw
CO	4.89±0.8 ppm

User Feedback :

Multi Use (Luxur Cook Stove, LED Light & Mobile Charger)

- a. Low fuel cost
- b. Traditional Taste
- c. Easy to ignite
- d. Flame like as a LPG
- e. Portable
- f. Ash(burnt Pellet/Charcoal) can be used for soil conditioning.

Luxur Cook Stove (Double Burner-01):

Description:

Luxur Cook Stoves are designed with built-in fans which help to circulate the air and heat. It's a unique solution which provides LPG like performance and made easily accessible to households product.

Luxur Cook Stove burns using specifically developed biomass residue based solid fuel called "Pellets". The stove works in such a manner so as to provide appropriate air to fuel ratio thus delivering much higher efficiency & consequently lower emissions.



Luxur Cook Stove burn so hot and clean that there's very little ash left behind, especially compared with woodstoves.

The Idea behind Luxur Green Energy Ltd. chose " Luxur Cook Stove " is as the Pellets are considered carbon-neutral because the CO₂ level exhausted by the stove is similar to the carbon released when wood decomposes naturally on the forest floor. The Luxur Cook Stove gives you uncompromising performance year after year with the comfort of knowing you have selected a product made with true craftsmanship & advanced technological innovations.

Features :

- Available with an AC/DC/Solar (Combo) [10W Solar Panel to charge battery (controller).
- Available with 5in1 DC Mobile Charger.

- A 4VDC fan 0.28Amp and a 4.5AH SMF battery is configured inside the charge cum fan controller.
- Can sim the flames through potentiometer. No fossil fuel is required for ignition just few pieces of paper.
- An LED light is also configured with the controller that can be used to light darkness.

How to Operate?

Initially from the mouth of the stove reactor rice husk is filled completely leaving 1 inch gap and ignite the fuel with few pieces of paper lighting it with match stick at different places. Once the fire takes place slowly covering the top layer of the fuel then switch on the fan from the controller to start the gasification process after 20 seconds place the steel vessel support on top and stove is ready for cooking, flame can be controlled by the controller (high, medium and low).

Controller

Controller / Power box is provided along with stove for charging of battery which also controls the fan's speed. The power box has two sockets to be charged via 230V electricity or a 10W Solar Panel. The power box is configured with LED Light and we also provide 5in1 DC Mobile Charger to charge mobile.

Specifications:

Fuel Required	250gm of Pellet per Combustion Chamber load (Batch Type Loading)
Stove Size	26*11*8.5 inch
Stove Weight	4.5kg(Stove) ; 1 Kg Power Bank (Controller)
Battery	6V/ 4.5Ah,
LED Light	4 Watt DC LED Light (
Reactor Type	Stainless Steel
Battery Cycle	8-10 Hours Backup after full charge of 3-4 Hours.
Battery Type	Sealed Maintenance Free Leadic Acid 6Volt 4.5 AH
Fan	6V (0.35Amp DC Fan)- China
Capacity	Could take load upto 15 Kg.
Thermal Efficiency	39.64% (Tested by CCEB-USAID)
Operating Time	60-70 Minutes (Depending upon operation/Pellet Type)
Particulate Matter	60.88mg/MJd
Power Output	2.17 kW
CO	4.89±0.8ppm
Emissions	CO/CO2=0.04, TSP 0.7 mg/m3

User Feedback :

Multi Use (Luxur Cook Stove, LED Light & Mobile Charger)

- a. Low fuel cost
- b. Traditional Taste
- c. Easy to ignite
- d. Flame like as a LPG
- e. Portable
- f. Ash(burnt Pellet/Charcoal) can be used for soil conditioning.

Luxur Cook Stove (Commercial Burner):

Description: :
Luxur Cook Stove are designed with built-in fans which help to circulate the air and heat. It's a unique solution which provides LPG like performance and made easily accessible to households product.

Luxur Cook Stove burns using specifically developed biomass residue based solid fuel called "Pellets". The stove works in such a manner so as to provide appropriate air to fuel ratio thus delivering much higher efficiency & consequently lower emissions.



Luxur Cook Stove burns using specifically developed biomass residue based solid fuel called "Pellets". The stove works in such a manner so as to provide appropriate air to fuel ratio thus delivering much higher efficiency & consequently lower emissions.

Luxur Cook Stove burn so hot and clean that there's very little ash left behind, especially compared with woodstoves.

The Idea behind Luxur Green Energy Ltd. chose " Luxur Cook Stove " is as the Pellets are considered carbon-neutral because the CO2 level exhausted by the stove is similar to the carbon released when wood decomposes naturally on the forest floor.

The Luxur Cook Stove gives you uncompromising performance year after year with the comfort of knowing you have selected a product made with true craftsmanship & advanced technological innovations.

Features :

- Available with an AC/DC/Solar (Combo) [10W Solar Panel to charge battery (controller).]
- Available with 5in1 DC Mobile Charger.
- A 4VDC fan 0.28Amp and a 4.5AH SMF battery is configured inside the charge cum fan controller.
- Can sim the flames through potentiometer. No fossil fuel is required for ignition just few pieces of paper.
- An LED light is also configured with the controller that can be used to light darkness.

How to Operate ?

Initially from the mouth of the stove reactor rice husk is filled completely leaving 1 inch gap and ignite the fuel with few pieces of paper lighting it with match stick at different places.

Once the fire takes place slowly covering the top layer of the fuel then switch on the fan from the controller to start the gasification process after 20 seconds place the steel vessel support on top and stove is ready for cooking, flame can be controlled by the controller (high, medium and low).

Controller :

Controller / Power box is provided along with stove for charging of battery which also controls the fan's speed. The power box has two sockets to be charged via 230V electricity or a 10W Solar Panel. The power box is configured with LED Light and we also provide 5in1 DC Mobile Charger to charge mobile.

User Feedback :

Multi Use (Luxur Cook Stove, LED Light & Mobile Charger)

- a. Low fuel cost
- b. Traditional Taste
- c. Easy to ignite
- d. Flame like as a LPG
- e. Portable
- f. Ash(burnt Pellet/Charcoal) can be used for soil conditioning.

Luxur Cook Stove (Commercial Round Model):

Description: :
Luxur Cook Stove are designed with built-in fans which help to circulate the air and heat. It's a unique solution which provides LPG like performance and made easily accessible to households product.

Luxur Cook Stove burns using specifically developed biomass residue based solid fuel called "Pellets". The stove works in such a manner so as to provide appropriate air to fuel ratio thus delivering much higher efficiency & consequently lower emissions.



Luxur Cook Stove burns using specifically developed biomass residue based solid fuel called "Pellets". The stove works in such a manner so as to provide appropriate air to fuel ratio thus delivering much higher efficiency & consequently lower emissions.

Luxur Cook Stove burn so hot and clean that there's very little ash left behind, especially compared with woodstoves.

The Idea behind Luxur Green Energy Ltd. chose " Luxur Cook Stove " is as the Pellets are considered carbon-neutral because the CO₂ level exhausted by the stove is similar to the carbon released when wood decomposes naturally on the forest floor.

The Luxur Cook Stove gives you uncompromising performance year after year with the comfort of knowing you have selected a product made with true craftsmanship & advanced technological innovations.

Features:

- Available with an AC/DC/Solar (Combo) [10W Solar Panel to charge battery (controller).]
- Available with 5in1 DC Mobile Charger.
- A 4VDC fan 0.28Amp and a 4.5AH SMF battery is configured inside the charge cum fan controller.
- Can sim the flames through potentiometer. No fossil fuel is required for ignition just few pieces of paper.
- An LED light is also configured with the controller that can be used to light darkness.

How to Operate ?

Initially from the mouth of the stove reactor rice husk is filled completely leaving 1 inch gap and ignite the fuel with few pieces of paper lighting it with match stick at different places.

Once the fire takes place slowly covering the top layer of the fuel then switch on the fan from the controller to start the gasification process after 20 seconds place the steel vessel support on top and stove is ready for cooking, flame can be controlled by the controller (high, medium and low).

Controller:

Controller / Power box is provided along with stove for charging of battery which also controls the fan's speed. The power box has two sockets to be charged via 230V electricity or a 10W Solar Panel. The power box is configured with LED Light and we also provide 5in1 DC Mobile Charger to charge mobile.

User Feedback:

Multi Use (Luxur Cook Stove, LED Light & Mobile Charger)

- g. Low fuel cost
- h. Traditional Taste
- i. Easy to ignite
- j. Flame like as a LPG
- k. Portable
- l. Ash(burnt Pellet/Charcoal) can be used for soil conditioning.

Combustion Chamber:

Combustion Chamber: Combustion chamber is designed calculating perforations on it scientifically. Inner chamber of stove where pellets they are poured in are proportionate to the measurement amount of fuel required to cook rice and vegetables for a day.

Durability: 1 years and above

No rust by moisture or water



Resistance capacity: mud soil causes no affect over decades

Ash: Very small residue of ash after the full burning of pellet which can easily be removed from the stove.

Can resist 300° Celsius temperature

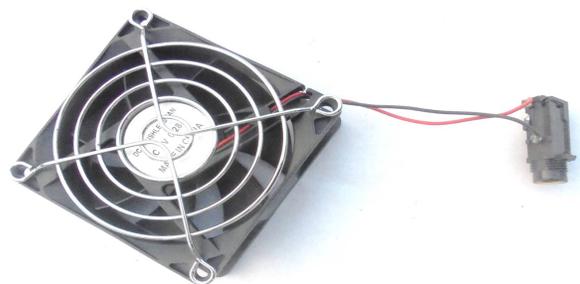
Ultraviolet (UV) passing resistance: 4,000 hours

Saline water dipped / steeped capacity:1,500 hours

Handle: On the outer body of the cook stove, two handles made of Bakelite are fixed which enables the users to lift and carry on without any fear of getting burnt.

Cooling Fan:

A cooling mini-fan is fixed alongside the body of the cook stove to enhance the fire into combustion chamber to put in more oxygen in order to burn the pellet (fuel) efficiently.



Power Bank: A re-chargeable Power Bank is provided to users to help the cooling fan to rotate. Charger has back-up time up to 6 hours. This Power Bank is kept outside the body at a distance of 2 or 3 feet.



Power Net: A metallic round shaped instrument with special type of wire to prevent the fire-flame from spreading outside the stove. This also helps to get more energy into the combustion chamber.

Pot Stand: A pot stand is placed on top of the cook stove to keep utensil, crockery on which cooking is carried on.

User Feedback

Multi Use (Luxur Cook Stove, LED Light & Mobile Charger)

- » Low fuel cost
- » Traditional Taste
- » Easy to ignite
- » Flame like as a LPG
- » Portable
- » Ash (burnt Pellet/Charcoal) can be used for soil conditioning

Features of this oven

- There will be no smoke in this cook stove
- One can cook the stove wherever one want
- 50% of the time to cook on this oven will be saved
- 70% of the cost will be saves comprising with traditional cook stoves
- Gas / Kerosene oil / electricity is not needed as fuel.
- Specially produced palate which is made by wood pulp / tus (rice mush) and non-other available materials.
- Carbon will reduce.
- Easily portable
- Affordable price.
- General hard fuel i.e. wood, charcoal, dry caw dung can be used

This product can reduce carbon and play a significant role to the climate change

- ❖ Women led organizations are prioritized and encouraged to women led entrepreneur to implement the program. This product can reduce carbon and play a significant role to the climate change.

Criteria of Product/Business

The business plans to create a product or service that helps girls aged 10-19 do one or more of the following:

- V. Save time or money, enabling girls to stay in school or learn
- VI. Save or invest earnings and assets
- VII. Earn
- VIII. Feel safe and secure
- IX. Smock free and reduced carbon
- X. 30 to 90 percent reduction in indoor air pollution
- XI. Reduction in greenhouse gas emissions by about 2.5 ton carbon dioxide per year per stove

The product or service must be a physical and financial asset that targets or benefits girls. It may also benefit or be purchased by her family.

How to Operate

Initially from the mouth of the stove reactor pellet/charcoal/chapping wood is filled completely leaving 1 inch gap and ignite the fuel with few pieces of paper lighting it with match stick at different places.

Once the fire takes place slowly covering the top layer of the fuel then switch on the fan from the controller to start the gasification process after 20 seconds place the steel vessel support on top and stove is ready for cooking, flame can be controlled by the controller (high, medium and low).

Controller :

Controller / Power bank is provided along with stove for charging of battery which also controls the fan's speed. The power bank/controller has two sockets to be charged via 230V electricity or a 5W Solar Panel. The power bank is configured with LED Light and we also provide 5in1 DC Mobile Charger to charge mobile



Sampling method & size

- i. Area based probability survey.
- ii. Census will be held for the distributors/NGO's and sales person if possible
- iii. Random sampling method, also according to the expansion of ICS in proposed project area.

Survey method

- I. Focus group discussion for the workers and the salespersons.
- II. Individual questionnaire-based survey for NGO's, distributors, consumers, organizations.

Steps:

Selecting the most promising areas on basis of the following factors:

- Current sales of areas
- Market potential (absence of natural gas and Pellet, Solid fuel, supply demand scenario, and population)
- Availability and presence of actors.

ii. Finding and listing the actors of those areas, to make the sampling frame

iii. Arrange focus group discussion and conduct the questionnaire-based survey for the actors and the consumers according to the methodology.

iv. Data for ICS installation

Operational procedures, e.g. Marketing methods

- Increasing people's needs in this regard, is the key factor for marketing ICS in many areas.
- Personal contact, campaigning and demonstration will be taken as strategies for marketing.
- ICS program team will directly serve the purpose of marketing with its skilled marketing teams with the goal and target with proper management and supervision.
- Supply: quality and procurement; service and guarantees
- Partnership with suppliers for a long-term business horizon.
- Clear arrangement about service and maintenance.
- Training: LGEL has a training option for giving trainings to District Project Manager, Upazila Project Manager, engineers, supervisors, and technicians for implementing ICS program.

Quality materials with guarantee on performance, sufficient stock preservation and provide after sales service creates the people's trust and builds staff confidence for promoting the program. A long-term agreement with a business entity approved by Technical Standard Committee (TSC) will be made so that supply of guaranteed materials and components of ICS can be assured. They should also provide after sales service of the system and help POs during installation. To achieve highest potential of the system the user has also responsibility to ensure preventive maintenance. Sufficient awareness with requisite technical knowledge can establish a good maintenance system and this can be done through appropriate training. Our organization with the help of IDCOL will arrange different training and orientation course both for the customers/users in order to change their knowledge, skills and attitude towards ICS.

Installation:

Installation needs many staff and equipment.

Staff is going to install an ICS an agreement between the customer and PO will be completed in organizational agreement form mention details and other relevant terms and conditions. A technical staff having past experience on ICS will go along with the concern field staff for setting the ICS.

Maintenance and service

Proper maintenance and timely service delivery makes the system good performance. User of ICS has a role of maintenance the system where as the PO and the equipment supplier provides after sales service. For the purpose regular follow up activities will have to be ensured and to encourage the users for its maintenance.

Reporting, accounting and monitoring:

Reporting:

To know the actual position of a program and to take necessary decision in this respect reporting and monitoring is very important tools for a management. Monthly, Tri-monthly and annual reports will be developed during the implementation of this project and report will send to head office and IDCOL. Register to be maintained at beneficiary level for timely documentation of proposed project activities.

Accounting:

For each program/project our organization prepares programs and accounts reports regularly. Account officer will maintain ledger book for income and expenditure of ICS project. In ICS program same procedure and practice will be followed or to be done as desired by IDCOL.

Monitoring:

For each program/project our organization prepares programs conduct monitoring regularly. In ICS program same procedure and practice will be followed or to be done as desired by IDCOL. Program activities will be monthly reviewed regularly. Managing director of the organization will be the monitor of the program performance and will discuss overall performance in review meeting. Necessary steps will be taken as per instruction of the executive director for improvement the program activities.

Service and maintenance arrangements

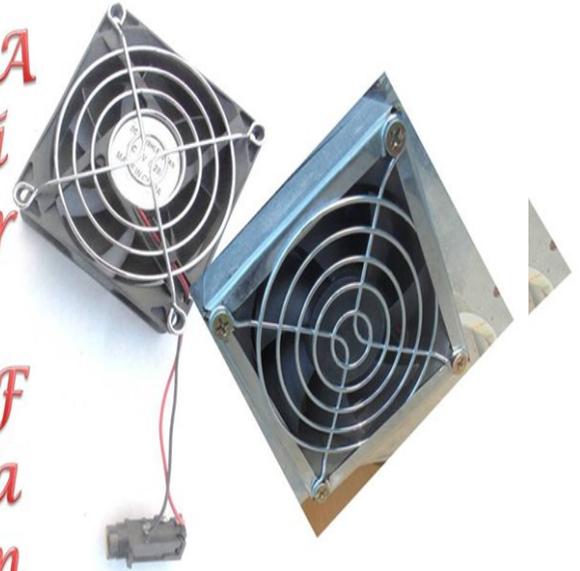
Service here refers to repairing, readjusting or replacement of anything damaged, defaulted or disordered in ICS that has been sold earlier whereas maintenance refers to caring by the users. So, for providing effective service, the required numbers of staff will be deployed and follow up activities will be strengthened, on the other hand proper orientation will be given to the users to make them sensitized for their responsibilities.

Pot Stand (Jhik)



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COMBUSTION CHAMBER

Power Bank (Charger)



ব্যবহার বিধি :

- ❖ লাকড়ীর অপচয় বাঁচাতে রান্না শুরু পূর্বেই সকল আয়োজন সম্পূর্ণ করে রাখুন।
- ❖ প্রথম দেওয়া ৩০০ গ্রাম প্যালেটে বা লাকড়ীতে একটানা ৩০-৩৫ মিনিট জ্বলবে।
- ❖ অধিক সময় রান্নার জন্য পুনরায় অল্প অল্প করে প্যালেট বা লাকড়ীর টুকরা দিন।
- ❖ রান্না শেষে ১০ মিনিট পর্যন্ত ক্যানটি চালিয়ে রাখলে চুলাটি দ্রুত ঠাণ্ডা হয়ে যাবে।
- ❖ ঠাণ্ডা হবার পর ছাই ঢেলে নিয়ে চুলাটি মুছে পরিষ্কার করে রাখুন। এতে দীর্ঘদিন চুলাটি ব্যবহার উপযোগী থাকবে।

লাক্সার পাওয়ার ব্যাংক

- ❖ প্রথম ব্যবহারের পূর্বে কমপক্ষে ১২ ঘণ্টা চার্জ করে নিন।
- ❖ অতঃপর প্রতিদিন বা ২/১ দিন পর পর নিয়মিত চার্জ দিন। এতে দীর্ঘ দিন নির্বিঘ্নে চার্জারটি ব্যবহার করতে পারবেন।
- ❖ বিদ্যুত বিহীন এলাকায় সোলার চার্জারটি চালাতে আমরা চাহিদা অনুযায়ী সোলার প্যানেল সরবরাহ করে থাকি।
- ❖ চার্জিং অবস্থাতেও রান্না করা যাবে।

প্রতিষ্ঠান :



লাক্সার গ্রীণ এনার্জি লিঃ
সানারপাড়, ডেমনরা, ঢাকা।

লাক্সার চুলার অনন্য বৈশিষ্ট্য:

- ❖ চুলাটি সম্পূর্ণ স্টেইনলেস স্টিলের তৈরী ফলে দীর্ঘস্থায়ী।
- ❖ এই চুলায় ধোঁয়া হয় না বললেই চলে তাই ধোঁয়াজনিত অসুখ-বিসুখ থেকে মুক্ত থাকা যায়।
- ❖ ওজন কম হওয়ায় চুলাটি যখন যেখানে খুশি সেখানে নিয়ে রান্না করা যায়।
- ❖ তাপের তীব্রতা বেশী হওয়ায় এই চুলায় রান্না করতে ৫০% সময় বাঁচবে।
- ❖ ব্রুয়িং ফ্যান থাকায় জ্বালানী নিঃশেষ হয়ে জ্বলে ও ৭০% জ্বালানী স্বাধীন হয়।
- ❖ বাজারের সাধারণ এক টুকরা লাকড়ীতে একবেলা রান্না হয়ে যাবে এবং গ্যাসের মতই জ্বলবে।
- ❖ এই চুলায় বিশেষ ভাবে উৎপাদিত প্যালেট / সাধারণ লাকড়ী / চারকল অথবা যে কোন শক্ত জ্বালানী ব্যবহার করা যাবে।
- ❖ Carbon Reduce করে প্রায় সর্বোচ্চ পর্যায়ে।
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- ❖ মজবুত স্ট্যান্ড ফলে ৫০-৬০ কেজি চুলায় চাপানো যায়।
- ❖ ধোঁয়া মুক্ত ও পরিবেশ বান্ধব হওয়ায় স্বাস্থ্যবান্ধব কমাচ্ছে।
- ❖ এই চুলাটির সকল খুচরা যন্ত্রাংশ সহজলভ্য ও বিক্রয়োত্তর সেবা নিশ্চিত করা হয়।



ব্যবহার বিধি :

- ❖ লাকড়ীর অপচয় বাঁচাতে রান্না শুরু পূর্বেই সকল আয়োজন সম্পূর্ণ করে রাখুন।
- ❖ প্রথম দেওয়া ৩০০ গ্রাম প্যালেটে বা লাকড়ীতে একটানা ৩০-৩৫ মিনিট জ্বলবে।
- ❖ অধিক সময় রান্নার জন্য পুনরায় অল্প অল্প করে প্যালেট বা লাকড়ীর টুকরা দিন।
- ❖ রান্না শেষে ১০ মিনিট পর্যন্ত ক্যানটি চালিয়ে রাখলে চুলাটি দ্রুত ঠাণ্ডা হয়ে যাবে।
- ❖ ঠাণ্ডা হবার পর ছাই ঢেলে নিয়ে চুলাটি মুছে পরিষ্কার করে রাখুন। এতে দীর্ঘদিন চুলাটি ব্যবহার উপযোগী থাকবে।

লাক্সার পাওয়ার ব্যাংক

- ❖ প্রথম ব্যবহারের পূর্বে কমপক্ষে ১২ ঘণ্টা চার্জ করে নিন।
- ❖ অতঃপর প্রতিদিন বা ২/১ দিন পর পর নিয়মিত চার্জ দিন। এতে দীর্ঘ দিন নির্বিঘ্নে চার্জারটি ব্যবহার করতে পারবেন।
- ❖ বিদ্যুত বিহীন এলাকায় সোলার চার্জারটি চালাতে আমরা চাহিদা অনুযায়ী সোলার প্যানেল সরবরাহ করে থাকি।
- ❖ চার্জিং অবস্থাতেও রান্না করা যাবে।

প্রতিষ্ঠান :



লাক্সার গ্রীণ এনার্জি লিঃ
সানারপাড়, ডেমনরা, ঢাকা।

লাক্সার চুলার অনন্য বৈশিষ্ট্য:

- ❖ চুলাটি সম্পূর্ণ স্টেইনলেস স্টিলের তৈরী ফলে দীর্ঘস্থায়ী।
- ❖ এই চুলায় ধোঁয়া হয় না বললেই চলে তাই ধোঁয়াজনিত অসুখ-বিসুখ থেকে মুক্ত থাকা যায়।
- ❖ ওজন কম হওয়ায় চুলাটি যখন যেখানে খুশি সেখানে নিয়ে রান্না করা যায়।
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- ❖ ধোঁয়া মুক্ত ও পরিবেশ বান্ধব হওয়ায় স্বাস্থ্যবান্ধব কমাচ্ছে।
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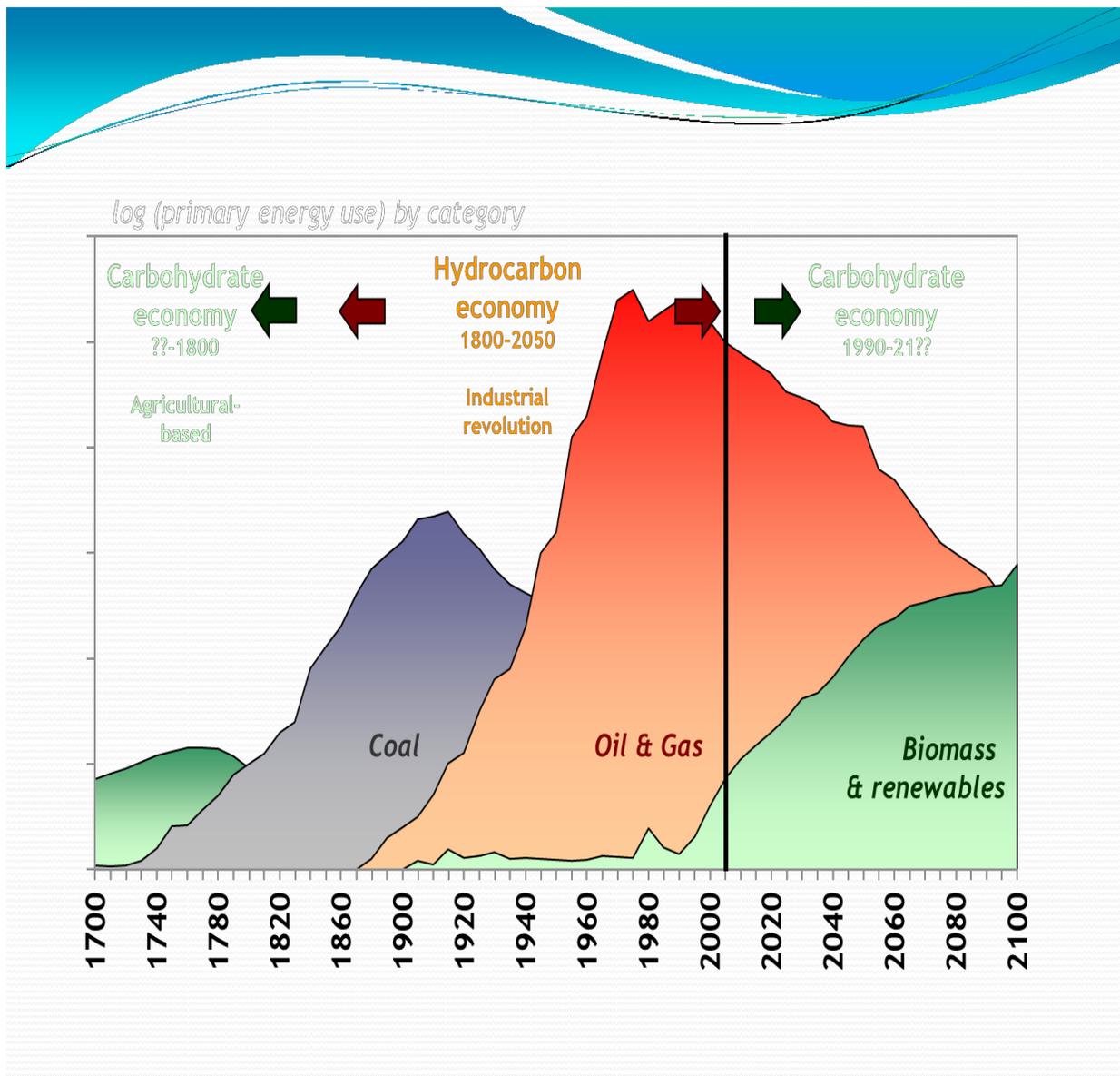
HIGH EFFICIENCY FUEL (PELLET):

Pellet fuels are heating fuels made from compressed Biomass. pellets are a most commontype.

A form of wood fuel, biomass pellets are generally made from compacted sawdust or other wastes from saw milling, groundnut shell and coffee husk

Pellets are extremely dense and can be produced with a low moisture content (below 8%) that allows them to be burned with very high combustion efficiency.

Their high density also permits compact storage and rational transport over long distance.



Typical Biomass pellet specifications

- ✓ Heat Output – 4000 to 4500 kcal/kg
- ✓ Moisture – Less than 5 %
- ✓ Bulk Density – 650kg/cubM
- ✓ Ash – Less than 2 %
- ✓ Sulfur – 0.05 %
- ✓ Fixed Carbon – 15.99 %
- ✓ Water – 7.91 %
- ✓ Oxygen – 37.4 %
- ✓ Hydrogen – 5.27 %
- ✓ Nitrogen – 0.14 %
- ✓ Volatile Content – 74.29



01. Pellet Machine

This Model no: 550B Pellet mill is designed to produce feed pellets, wood pellets, straw pellets, grass pellets and other kinds of biomass pellets from multiple raw material. It is powered by electric engine.

Wood pellet is a kind of high efficient clean renewable energy with the advantages of saving energy, reducing carbon emissions, easy to be stored and transported. It is widely used in house-warming and power generation. Wood pellet is an alternative fuel for non-renewable energy resources of coal, oil, gas etc.



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Pellet Mill Specifications:

Capacity: 500-1000 t/h (pellets output depending on raw material)

Power: 55 kW

Weight: 1770 kg

Size: 2300*750*1850mm

02. Hammer Mill Working Principles:

Hammer Machine:

After being delivered into the crushing chamber, raw material is beaten and crushed by high speed rotating blades. Under centrifugal force the cracked material is crushed quickly due to continuous squeezing, crushing, beating, scrubbing by hammer mill blades. Under rotor centrifugal and fan suction force, crushed particles are discharged through sieve holes while those cannot get through sieve hole will repeat above hammering process till they are discharged through sieve.



FSC420 hammer mill machine diagrammatic sketch

1. Lower body,
- 2 Sevier,
- 3, rotor,
4. Air fan
5. Upper body,
6. Feeding port,
7. Discharging outlet
8. Cyclone

03. Packaging Machine For Pellet:

A Heat Shrink Film Pillow Packaging Machine is an automated packaging system designed to wrap products in a flexible plastic film, forming a secure "pillow"-shaped package that tightly conforms to the product's shape after heat application. Here's a breakdown of its key features and functions.



This system consists of a weighing system, conveying system, packing system and intelligent controller.

The intelligent meter is the brain for the whole system. It has the following advantages:

- Both automatic calibration and manual calibration available, reduce the error caused by longtime using or ambient temperature changes;
- Integrate circuit is adopted, stability and reliability guaranteed;
- Friendly human computer interaction interface.

The package specification is 10kg – 80kg (22.065lbs – 176.52lbs).

Power: 0.92KW

04. Box Dryer:

Dryer for Sew dust:

Dryer is used to adjust moisture of raw materials before feed it into pellet mill. In general, the moisture content of raw materials is higher than 12%. The required moisture is decided by the raw materials and uses of pellets. There are different drying machines in the market, air flow dryer is suggested for small pellet plant because of the features like low price and high efficient.



05. Belt conveyor

Belt Conveyor:

Belt conveyor is the equipment for conveying and feeding the biomass materials in to small pellet mill. Manual control type and frequency control type are common types of screw elevator. Frequency type improves the working frequency and avoids uneven feeding. You can choose suitable one according to your needs.



06. Cooler Machine:

Cooler:

The pellets are too hot to store them when they come out of pellet machine, its temperature reach up 100 °C. For ones who are lack of drying platform, cooler helps to cool the pellets and save time and labor Obviously, cooler is optional machine in the small pellet plant. It is not necessary for some pellet making factory with lower capacity. If you don't set a budget on this part, cooling the pellets on the ground is also available.



QUALITY

Luxur Cook Stove are strives to achieve complete customer satisfaction by consistently matching or exceeding expectations. We aspire to be an innovative, responsive supplier of the best quality products in clean cook stoves division.

We dedicate ourselves to continual improvements in product quality and customer service through.

- Research improvements to add the quality standards of the products.
- Continuous improvements in all existing products.
- Motivating and training the staff to improvise on the process and quality control systems.

Customers are a key source of feedback on quality and product performance, we welcome suggestions and constructive criticism, which forms the basis of improvements.

Quality Objectives:

- Consistently delivering quality products matching the set specifications, contractual, regulatory and statutory requirements.
- Keeping our products and services to provide "value for price" and "cost-effective" as per the application, customer and market needs. 1

ICS WITH PELLET TEST AND RESERCH :

RESEARCH AND DEVELOPMENT:

Fuel	Pellet/Rice husk stored and easily availabilty.
Combustions Device	Release of energy.
Applications	Uses of the energy.
Human Factors	. Costs availability, Cooking Preferences, Sizes, Social Perceptions, Marketing Etc.

Due to easy availability of fuel & Strong sales & service network of Luxur Green Energy (Bangladesh) a good fraction of people adopted 'Luxur Cook Stove'.

Luxur Green Energy is continuously making new researches in the field of Bio-Energy Cooking Devices & Fuel. We have developed 8 prototypes & commercialized more than 6. Very Soon **LG Energy** is Going to Launch " Luxur Cook Stove (Commercialized product)" with similar looks & features just as LPG Stoves which will change the overall of image of so-called " Improved Cook Stove". This will be a revolutionary product & will be accepted by a mass population. Luxur Green Energy will produce more than 1 lacs units of this product in next 2 year.

TEST AND RESERCH:



Closing Remarks, Pending Issues, Question:

Luxur Green Energy Ltd (LGEL) meticulously studied the prospect of Improved Cooked Stove in the areas of both head office and field levels. The areas proposed for ICS and sales targets are judiciously selected with comprehensive data analysis of existing micro finance customers. The key issues of the market selection, market segmentation and market penetration have been seriously important and, on that basis, the operational plan and financial proposal has been presented. LGEL strongly believes that the objective of enriching rural lives and alleviating rural poverty will be greatly enhanced by participating in the IDCOL Improved Cooked Stoves (ICS) Programmers.

LGEL gives more emphasize upon men, women and children to address their problems and to develop their hidden potentials enabling them to stand upon their own feet and live a dignified life in the society. LGEL is playing the role of a facilitator in this noble endeavor. In its noble journey, LGEL solicits cooperation and assistance from the sympathizers, government and non-government donors for advancing its development programs for the poor. LGEL together with its governing body, management and staffs expresses commitment for doing the best for the betterment of the poor in coming days ahead.

Annexure –

- Annex-1_Agreement with PO
- Annex-2_Cluster Form
- Annex-3_Appointment_(Sample)
- Annex-4_appointment letter for FC
- Annex-5_Circular design
- Annex-6_Delivery Challan for kiron konna
- Annex-7_FC_Job Description
- Annex-8_Invoice
- Annex -9_Participatory Assessment Questionnaire
- Annex-10_ product rejected report with product code
- Annex-11_NGO's office deed
- Annex-12 sales report for Luxur
- Annex-13 sales report from KK
- Annex-14_JD_DPM
- Annex-15_JD_KK
- Annex-16_Participants List
- Annex-17_Training Schedule
- Annex-18_Users information form
- Annex-19_Warranty Card
- Annex-20_Daily Allowance sheet
- Annex-21_Daily Allowance sheet
- Annex-22_Salary Requisition
- Annex-23_Kiron Konna's partnership agreement letter
- Annex-25_Salary Sheet
- Annex-26-FC Info