BIO ENERGY
RIGHT SOLUTION ALWAYS!

Biomass Stove and Wood Pellets Solution

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Agenda

- Introduction
- Drivers for Change
- Existing solution for Energy Problem
- The Case Study
- Client List
- Our Partners & Collaborators

Introduction

Introduction

- ADL BIO ENERGY is a dynamic organization Head quartered in Northern Virginia, USA and Chennai. We also work in Bangladesh, Sri Lanka and Philippines.
- Our strong commitment is to assist our customer's Biomass solution and Improvement products in a cost-effective and timely fashion
- We have successfully deployed Biogas plants, Sewage and Waste water Disposal System, Wood Pallet Stove and Solar solutions.

Introduction

- ADL BIO ENERGY manufacturers Renewable energy products & energy Solution Provider for Domestic and International market.
- ADL is deeply rooted in customer satisfaction and ethical business practices.
- Vision - To be the most trusted renewable energy brand across markets, offering innovative, zero emission products, profiting & benefiting the company, customers, employees & community at large.
- Mission - To create futuristic and self-renewing solutions that not only empower life today, but save energy for a better tomorrow

Drivers for Change

What is Pellet Fuels?

- Pellet fuels are heating fuels made from compressed Biomass. Commonly they are called Biomass pellets
- 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.

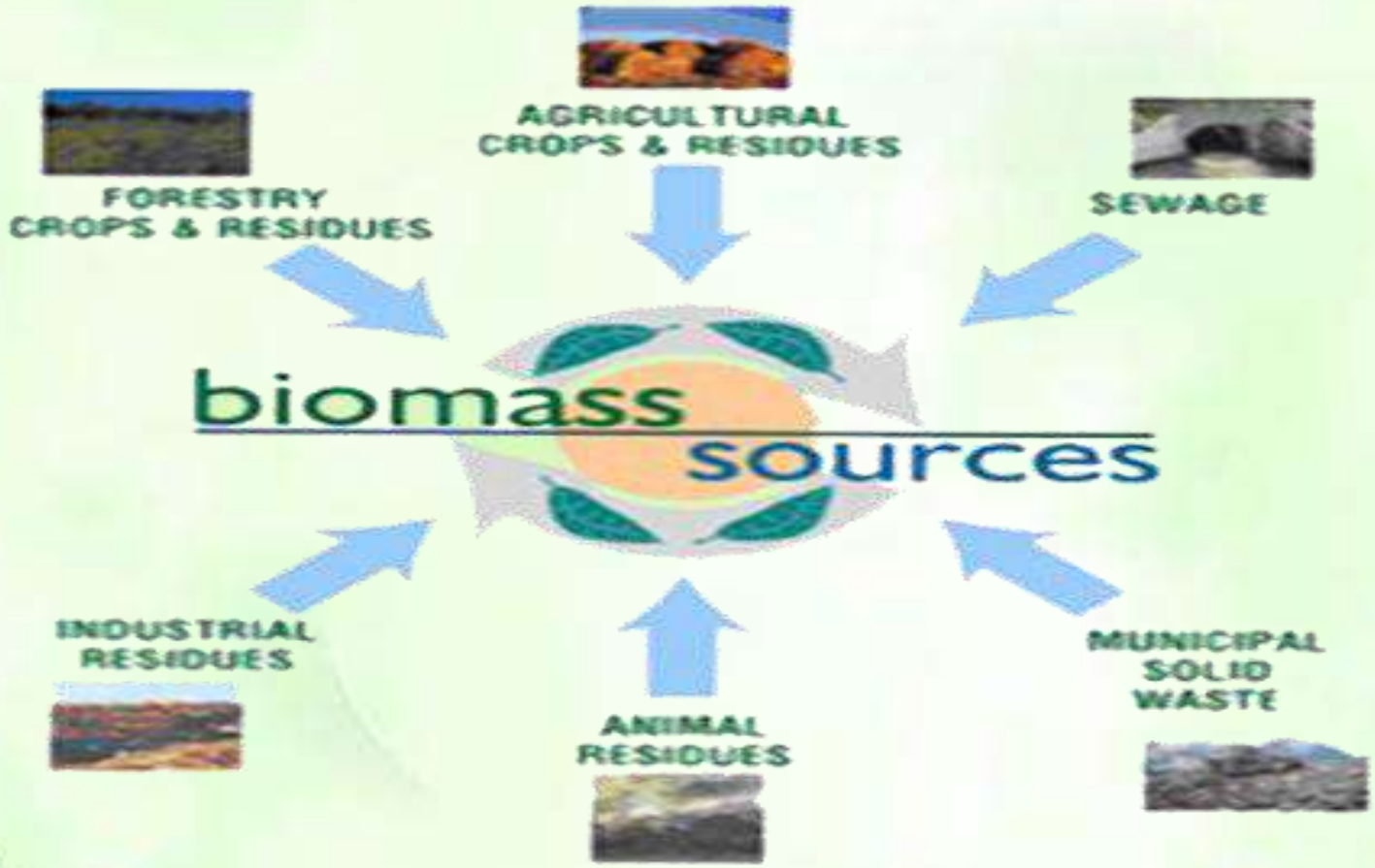
Issue Drives Wood Pallet Stove

- Regular wood burning causes High Moisture, High Smoke and ash which are harmful to humankind and earth
- Other alternatives are available but they are expensive in terms of usage and real-estate cost (more space required to store)
- Currently our system fail to balance Supply & Demand
- Limited source of renewable energy is available but at higher cost and moreover still there also no balance between supply & demand
- Result - needless waste, expense, threats of blackouts and brownouts, and carbon dioxide emissions

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 %

Biomass Source



Basic Calculations

Heat Value	Fuel Cost
LPG: 11,000Kcal/kg	LPG: 64.30 / kg
Diesel: 10,200 Kcal/kg	Diesel: 84.67 / ltr
Furnace Oil: 10,000 Kcal/kg	Furnace Oil: 50/ ltr
Kerosene: 10,500 Kcal/kg	Kerosene: 45/ltr
Wood: 3,000 Kcal/kg	Wood: 9/ kg
Coal: 4000 Kcal/kg	Coal: 10/ kg
Biomass Pellet: 4500 Kcal/kg	Wood Pellet: 15/ kg

Typical Calorific Value

LPG (Kcal/kg) / Pellet (Kcal/kg)

11,000 (Kcal/kg) / 4200 (Kcal/kg)

1 Ltr of LPG = 6 Kg of Pellets

1 Ltr of Diesel = 2.4 kg of Pellet

1 Ltr of Furnace oil = 2.13 kg of Pellet

1 Ltr of Kerosene = 2.28 kg of Pellet

1 Kg of Wood = 0.4 kg of Pellet

1 Kg of Coal = 0.8 kg of Pellet

Comparisons - Pellet V/s LPG

1 kg of LPG = 2.4 kg of Pellets.

LPG cost: 64.30rs/kg = Pellet: 15 rs/ kg x 2.4.

Saving Percentage = 44 %.

Considering 5 % loss.

Pellet Gives 39 % Cost saving when compare to LPG

Pellet Gives 90.6 % Cost saving when compare to Diesel

Pellet Gives 29.6%Cost saving when compare to Furnace Oil

Pellet Gives 53 % Cost saving when compare to Kerosene

Pellet Gives 61.7 %Cost saving when compare to Wood

Pellet Gives 65.8 %Cost saving when compare to Coal

LPG Cost

CALCULATION FOR LPG COST:

POINT	LPG	WOOD PELLET
FUEL CONSUMED IN 1HR	2.5KG	6KG
FUEL CONSUMED IN 12HR	30KG	72KG
TOTAL NO. OF DAYS IN A MONTH	26 DAYS	26 DAYS
FUEL CONSUMED IN 26 DAYS	780KG	1,872KG (APPX. 1.9 TONN)
COST OF FURANCE FUEL PER KG	64.30	15
COST OF FURANCE FUEL PER MONTH	780 * 64.30	1872 * 15
TOTAL COST PER MONTH	50,154	28,080

SAVINGS PER MONTH = LPG – PELLET

50,154 – 28,080

= 22,074

SAVINGS PER YEAR = SAVINGS PER MONTH * 12

= 22,074*12

=2,64,888

: ROI FOR 3 LAKH KCAL BURNER WILL BE COME IN LESS THAN 150 DAYS

Diesel Cost

CALCULATION FOR DIESEL COST:

POINT	DIESEL	WOOD PELLET
FUEL CONSUMED IN 1HR	15LTR	36KG
FUEL CONSUMED IN 12HR	180LTR	432KG
TOTAL NO. OF DAYS IN A MONTH	26DAYS	26DAYS
FUEL CONSUMED IN 26 DAYS	4680LTR	11,232 KG (APPX. 12 TONN)
COST OF FURANCE FUEL PER KG	87.67	15
COST OF FURANCE FUEL PER MONTH	4680*87.67	12000(TONN)*15
TOTAL COST PER MONTH	4102956	180000

SAVINGS PER MONTH = DIESEL OIL – PELLET

=41,02,956-1,80,000

= 39,22,956

SAVINGS PER YEAR = SAVINGS PER MONTH * 12

= 3922956*12

= 4,70,75,472

: ROI FOR 3 LAKH KCAL BURNER WILL BE COME IN LESS THAN 150 DAYS

Furnace Cost

CALCULATION FOR FURANCE COST:

POINT	FURANCE OIL	WOOD PELLET
FUEL CONSUMED IN 1HR	25 KG	53.25KG
FUEL CONSUMED IN 12HR	300KG	639KG
TOTAL NO. OF DAYS IN A MONTH	26DAYS	26DAYS
FUEL CONSUMED IN 26 DAYS	7800KG	16,614KG(APROX- 17 TONE)
COST OF FURANCE FUEL PER KG	50	15
COST OF FURANCE FUEL PER MONTH	7800*50= 390000	17000*15= 2,55,000
TOTAL COST PER MONTH	3,90,000	2,55,000

SAVINGS PER MONTH = FURANCE OIL – PELLET

= 390000-255000

= 1,35,000

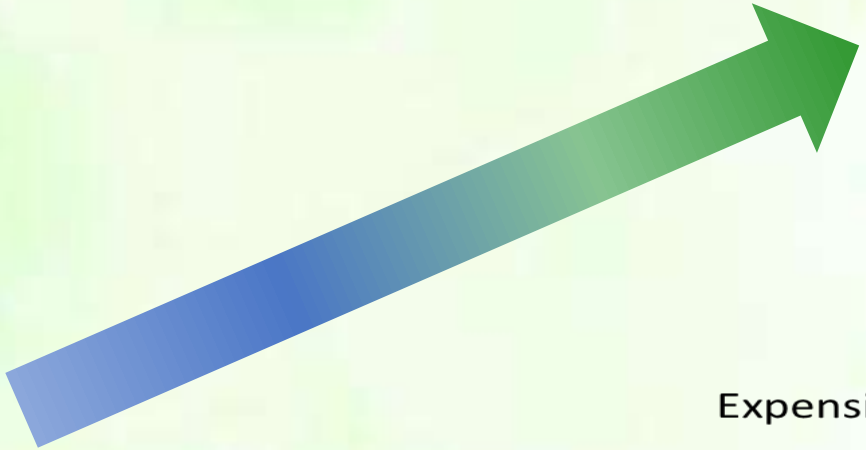
SAVINGS PER YEAR = SAVINGS PER MONTH * 12

= 96000*12

= 11,52,000

: ROI FOR 3 LAKH KCAL BURNER WILL BE COME IN LESS THAN 150 DAYS

Typical Cost and Feature Comparison



High Moisture
High Smoke and ash

WOOD

Availability
Expensive

KEROSEN

Expensive

LPG

High Smoke and Ash Requires more space

Briquette

Low Cost
Efficient
Very low smoke and ash.

Pellets

Summary - Pellets

- Biomass is biological waste derived from plants, tree, agriculture residue and cow dung.
- Biomass can either be used directly or via combustion to produce heat energy , or after converting it into various
- Forms of bio-fuel such as biomass pellets or briquettes

Biomass Fuel Benefits

- Energy conservation: renewable , sustainable
- Cheaper source of energy which is produced in our own country.
- Economic: Up to 50% cheaper than fossil fuels such as lpg, diesel etc.
- Eco friendly: smoke less and zero emission of hazardous gases is insured (if burnt in proper system).
- Endless: it is a form of renewable energy. Fossil fuel have an limitation but biomass fuel will be available for ever.
- Easy available: infinite production and available everywhere.

Existing solution for Energy Problem

Common - Cooking Applications

- Domestic cooking: House hold cooking needs may be fulfilled and cost may be reduced up to 60% compared to any traditional chulha (Aduppu)
- Community cooking: School/college mess, tiffin center, hostel, hotel, community functions, tent house, camps, caterers etc.
- Industrial: Sweet and Namkin manufacturing industries, it may also be used in any other industry for drying, boiler, dyeing etc.

Biomass Green Stoves

S.No	Product Description	Available Model	Fuel
1	“Eco Green” 1.5 Kg Domestic Small	STD.	Biomass Pellets
2	“Eco Green” Domestic Large 6.0 Kg	STD.	Biomass Pellets
3	“Eco Green” 9.0 KG Community Small	STD.	Biomass Pellets
4	“Eco Green” Medium 15.0 KG Community Stove	STD.	Biomass Pellets
5	“Eco Green” Large 30 KG community Stove	STD.	Biomass Pellets
6	“Eco Green” Community cooking Continues Feeding System.	STD.	Biomass Pellets

Features of Green Stove

Discription Of Various Items	STD MODEL OF 6,9,18,30kg & Continues Feeding Stoves
CHAMBER	Fire Proof Bricks
GRADE (JALI)	MS
TOP OF THE STOVE	MS
ASH REMOVAL TRAY	YES
POWER REQUIRED	12 V
BATTERY BACKUP KIT PROVIDED	YES
DC FAN 12 V	2 NOS.

Capacity and Burning Analysis of Green Stoves

MODEL OF “Eco Green” Biomass Stoves	Chamber Capacity	Total Burning Time (Aprx.)	Water Boiling Cost/Ltr. (As Per Observation)
“Eco Green” Domestic Small	2 KG	45 MIN.	1.10 RS./LTR.
“Eco Green” Domestic Large	6.0 KG	110 MIN.	0.85 RS./LTR
“Eco Green” Community Small	9.0 KG	140 MIN.	0.68 RS.P/LTR.
“Eco Green” Community Medium	15.0 KG	180 MIN.	0.45 RS./LTR
“Eco Green “Community Large	30.0 KG	240 MIN	0.30 RS/LTR

Why Green Stoves

- Durability: high grade ms for heat chamber and grade(jali) is used which is high temperature resistant. It makes system run efficiently for years without any maintenance
- Heavy stand for burner
- Ash removal tray
- Economic: cost of cooking cuts down upto 50 %
- Safe and efficient: very well insulated to prevent any heat loss so the efficiency of the system remains high. This also make it very safe , friendly and convenient for users.
- Flame controller: controller given in the system
- Eco friend: smokeless and zero carbon emission
- Power backup: appropriate rechargeable battery is given for backup to run the system continuously. Solar charging system may also be provided
- After sales service: one call away

The Case Study

Client List – Partial

Past Performance & Client List

Schools and Institutes:

- Police Training Academy's
- Central Jail Mess Sagar.
- Central Jail Bhopal.
- Shri Arbindo Medical College Of Medical and Science(MBBS ,BDS , Nursing Etc.)Indore.
- Index Medical College of Science (MBBS ,BDS ,Nursing Etc.)Indore.
- LNCT Engineering College Indore.
- GSITS Engineering College Indore.
- Delhi Public School Indore, Sagar.
- Vedanta School Indore.
- New Digambar Public School Indore.
- Sanmati Public School Indore.
- Millennium Public School Indore.

Past Performance & Client List

Restaurant:

- Govardhan Restaurants Indore
- Shuksagar Restaurants Indore.
- Krishna Restaurants Indore.
- Grukripa Restaurants Indore
- Midland Restaurants Indore
- Crown Palace Indore
- Idli Hut Restaurants Indore
- Shark IN Hotel and Restaurants Rewa
- Calcutta Sweets Satna
- And Many More Small Dhabas and Restaurants

Past Performance & Client List

Industrial:

- J.P Cement Rewa.
- Mahindra Two Weller Pitampur Indore
- Pratibha Syntex Textile Pitampur Indore
- CASE Pitampur Indore
- Akash Namkeens Indore
- Bhartam Namkeen Indore
- Om Namkeens Indore
- Kundan Namkeens Bhopal
- And Some more Smaller Units.

Midday Meals:

- Majorly in all the city including Indore, Sagar, Jabalpur, Satna, Rewa, Gwalior.

Partners & Collaborators

Partners

- XXXX

Result: Right Solution Always!

- Identify opportunities for cost savings
- Drive out inefficiencies
- Address demands for operational budget reductions
- Demonstrate business value
- Common language for Business & Operational staff

THANK YOU !!