The Briquetting project Economics

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Annexure-1

The Indian Energy scenario

About 70% of India's energy generation capacity is from fossil fuels, with coal accounting for 40% of India's total energy consumption followed by crude oil and natural gas at 24% and 6% respectively. India is largely dependent on fossil fuel imports to meet its energy demands by 2030; India's dependence on energy imports is expected to exceed 53% of the country's total energy consumption. In 2009-10, the country imported 159.26 million tons of crude oil which amounts to 80% of its domestic crude oil consumption and 31% of the country's total imports are oil imports The growth of electricity generation in India has been hindered by domestic coal shortages and as a consequence, India's coal imports for electricity generation increased by 18% in 2010

Due to rapid economic expansion, India has one of the world's fastest growing energy markets and is expected to be the second-largest contributor to the increase in global energy demand by 2035, accounting for 18% of the rise in global energy consumption. Given India's growing energy demands and limited domestic fossil fuel reserves, the country has ambitious plans to expand its renewable and nuclear power industries.

Biomass - An Alternative Source of Renewable Energy

Biomass being a product of natural resources, gives much hope as an alternative, reliable and renewable source of energy. Biomass is an organic matter produced by plants, both terrestrial and aquatic and their derivatives. Plant materials use the sun’s energy to convert atmospheric carbon dioxide to sugars during photosynthesis. On combustion of the Biomass, energy is released as the sugars are converted back to carbon dioxide. Thus energy is harnessed and released in a short time frame, making Biomass a renewable energy source. Though fossil fuels have also been derived from atmospheric carbon dioxide, the time frame is very long - in the order of millions of years as compared to a few years in case of Biomass. Currently, Biomass contributes 14% of the total energy supply worldwide and 38% of this energy is consumed in developing countries, predominantly in the rural and traditional sectors of the economy.

Biomass Potential

India is a tropical country blessed with sunshine and rains and thus offers an ideal environment for Biomass production. Further, the vast agricultural potential also makes available huge agro-residues to meet the energy needs. With an estimated production of about 460 million tons of agricultural waste every year, Biomass is capable of supplementing the coal to the tune of about 260 million tons. This can result in a saving of about Rs. 250 billion, every year.

VARIOUS TYPES AGRO FIELD / INDUSTRIAL RESIDUES

Type of Agro residues	**Quantity(Million Metric tons / annum)**
Straws of various pulses & cereals	225.50
Baggass	31.00
Rice Husk	10.00
Groundnut Shell	11.10
Stalks	02.00
Various Oil Stalks	04.50
Others	65.90
Total	**350.00**

Calorific value and ash percentage of major agro wastes available...

Agro Wastes	Kcal/Kg.	Ash Contents
Groundnut Shell	4524K.	3.80%
Baggass	4380K.	1.80%
Castor Seed Shells	3862K.	8.00%
Saw Dust	3898K.	8.20%
Cotton Stalks/Chips	4252K.	3.00%
Bamboo Dust	4160K.	8.00%
Babul [Wood]	4707K.	0.90%
Coffee Husk	4045K.	5.30%
Tobacco Waste	2910K.	31.50%
Tea Waste	4237K.	3.80%
Paddy Straw	3469K.	15.50%
Mustard Stalk	4200K.	3.40%
Mustard Shell	4300K.	3.70%
Wheat Straw	4100K.	8.00%
Sunflower Stalk	4300K.	4.30%
Jute Waste	4428K.	3.00%
Palm Husk	3900K.	4.90%
Soya bean Husk	4170K.	4.10%
Sugarcane	3996K.	10.00%
Barks Wood	1270K.	4.40%
Forestry Waste	3000K.	7.00%
Coir Pitch	4146K.	9.10%
Rice Husks	3200K.	19.20%
Wood Chips	4785K.	1.20%

Briquette is an Ideal fuel due to...

- ✓ Eco friendly & **Renewable Energy** fuel.
- ✓ Economical and cheaper than other solid fuels.
- ✓ Thermal calorific value approx 4000 Kcal / Kg.
- ✓ Pollution free & non-hazardous.
- ✓ Lower ash contains 2% - 5%. There is no fly ash when burn.
- ✓ Consistent high burning efficiency.
- ✓ Contain high density & higher fix carbon value.
- ✓ Easy for transportation, feeding & combustion.
- ✓ Combustion is more uniform due to high rise in fossil fuel prices.
- ✓ The process increases the net calorific value per unit volume.
- ✓ Densified product is easy to transport and store.
- ✓ The process helps to solve the problem of residue disposal.
- ✓ The fuel produced is uniform in size and quality.

Industrial Use of Briquettes

Briquettes are being used in industries like

- ✓ Brick Kilns
- ✓ Chemical Plants
- ✓ Food Processing Units
- ✓ Hot air generators
- ✓ Paper Mills
- ✓ Spinning Mills
- ✓ Solvent Extraction Plants
- ✓ Milk Plant & Dairy
- ✓ Laminate Industries
- ✓ Bakery Industries
- ✓ Ceramic Units
- ✓ Vegetables Plant
- ✓ Leather Industries
- ✓ Dyeing Houses
- ✓ Textile Mills
- ✓ Rubber Industries
- ✓ Process Houses
- ✓ And Many Other Commercial and Domestic Uses.

The Government of India has declared the incentives as under *

- ✓ 100 % Income Tax benefit up to 5 years
- ✓ 80% depreciation on first year
- ✓ Doesn't require NOC from pollution control board
- ✓ Prompt finance available from nationalized bank

(* Kindly check the updates)

Economic Feasibility & Profitability

Briquetting plant set-up has key advantages as below:

- ✓ A way to earn money by selling agriculture waste of crop, therefore renewable
- ✓ Cost effectiveness
- ✓ Exceptional growth
- ✓ Easy availability with wide range of briquetting plants
- ✓ Easy marketing
- ✓ Fast payback time
- ✓ Higher level of employment
- ✓ Keeps environmental balance and conversion of ordinary sources
- ✓ Saves worthy foreign exchange

Annexure-2

Shree Khodiyar Engineering Works.

The Company, under sole proprietorship of **Mr. Mahesh Vala** having experience of two decades for design, execution, manufacturing, utilizing the field feed-backs, is proudly standing with highest percentage of satisfied customers.

The company is located at RAJKOT, a well-known engineering hub of GUJARAT- INDIA. The company is equipped with all the in-house engineering facilities to manufacture the Briquette press. Each and every stage of the manufacturing process is directly being observed by the keen eyes of Mr. Mahesh Vala with the help of highly skilled technical staff to produce excellent product.

We supply briquetting solutions all our clients for production of industrial type of briquettes for use in big boilers at heating plants etc. The supply of briquetting machines for many different applications, enables us to constantly innovate and adapt our machines to the latest market requirements, so that we can continue to deliver the strongest and most efficient briquetting machines to the grounds.

Quality in Manufacturing

we work closely with our customers to ensure that our solutions meet their future demands and expectations.

We manufacture most components for our systems internally to maintain a high quality for all vital parts.

Our high-tech production machinery is efficient and state-of-the-art enabling us to make heavy demands on our production in terms of profitability and quality.

By producing all the components ourselves we can secure prompt delivery of machines and spare parts.

We have full control of how the parts are produced, thus ensuring the unparalleled quality policy.

Annexure-3

Below are the briquetting machine models placed side by side for easy comparison With approximate unit prices.

Specification	*Model*		
	SK – 6000	***SK – 7000***	***SK - 9000***
Product detail			
Briquette Diameter	60 mm	70 mm	90 mm
Briquette Length	50 to 200 mm	50 to 300 mm	100 to 500 mm
Finished product shape	Cylindrical	Cylindrical	Cylindrical
Production Capacity max.	700 kg/hr.*	1000 kg/hr*	1600 kg/hr*
Production with various raw material			
Sugarcane Baggass	300 – 400 kg/hr.	400 – 500 kg/hr	800 – 900 kg/hr
Groundnut shell	400 – 600 kg/hr.	800 – 900 kg/hr.	1200–1500 kg/hr.
Saw Dust/Wood Chips/coconut Shell	500 – 700kg/hr.	900 – 1000 kg/hr	1200 – 1600 kg/hr.
Raw material specification			
Raw- material size	**Powder form**	**10 mm max,**	**20 mm max**
Permissible Moisture % of Raw Material	10 % max.	10 % max.	10 % max
Electrical power requirement			
Required Power Connection (3 phase)	37 hp.	50 hp.	90 hp.
Approx. electrical Load (amp.)	45 – 50	60 – 70	80 - 90
Power Consumption	20 – 25 unit/Mt.	25 – 35 unit/Mt.	35 – 40 unit/Mt.
Land area required			
Total project area min. (Sq.Mtrs/acre)	5000/1.25	5000/1.25	5000/1.25
Machine Room construct min. (WxLxH)	20’x30’x12’	20’x30’x12’	20’x30’x14’
Staff required			
Trained & Skilled operator	One/Shift	One/Shift	One/Shift
Unskilled labor	Six/Shift	Six/Shift	Six/Shift
Approximate Price per unit (Ex. Factory, taxes extra)	**9,50,000/=**	**10,50,000/=**	**14,50,000/=**
Hammer mill (Optional, if the raw material size >20 mm)	**3,00,000/=**	**3,00,000/=**	**3,00,000/=**
Rotary shaft type dryer (Optional, if the moisture contains is >12%)	**15,00,000/=**	**15,00,000/=**	**15,00,000/=**

Annexure-4

Project economics of Briquetting plant with SK – 6000					
Sl.no.	**Particulars**	**Assumption**	**Unit**	**Rate**	**Total**
A	Installed Capacity				0.7 MT/hr
B	Capacity Utilization	80%			0.56 MT/hr
C	Working Hours per day	16 hours			16 hours
D	Working days per month	25 days			25 days
E	Production per month	B x C x D			224 MT.
F	Wastage of raw material	2%			4.48 MT
G	Raw material required per month	E + F			228.5 MT
H	Raw material landing cost per month	Rs 3500/ MT	228.5 Mt	3500/-	**7,99,750 /-**
I	Elect. Power Consumption per ton (press only)	25 unit /MT	25	Rs. 7.00	Rs 175/MT
J	Elec. Power consumption per month (press only)	E x I			**39,200 /-**
K	Overheads per month (salary + maintenance + expenditures. Etc)	Rs 255.00 / MT	224 MT	255 /-	**57,120 /-**
L	Production cost per month	(H + J + k)			**8,96,070 /-**
M	Selling rate per month	Rs 5500 /MT	224 MT	5500/-	**12,32,000/-**
N	Income per month	(M-L)			**3,35,930/-**
	Income per annum	10 months run			**33,59,300/-**
	Project cost analysis (Land excluded)				
1	Briquetting press SK - 6000		1 unit	10,50,000/-	10,50,000/-
2	Hammer mill (to transform the material size to powder form)		1unit	3,00,000/-	3,00,000/-
3	Electrical power establishment and electrification	2,00,000/-			2,00,000/-
4	Civil work - foundation, machine room, shed etc.	2,50,000/-			2,50,000/-
	Total				**18,00,000/-**
	Working capital required per month	**10,00,000/-**			
	PAY BACK PERIOD	**5.4 MONTHS**			

Annexure-5

Project economics of Briquetting plant with SK – 7000					
Sl.no.	**Particulars**	**Assumption**	**Unit**	**Rate**	**Total**
A	Installed Capacity				1.0 MT/hr
B	Capacity Utilization	80%			0.8 MT/hr
C	Working Hours per day	16 hours			16 hours
D	Working days per month	25 days			25 days
E	Production per month	B x C x D			320 MT.
F	Wastage of raw material	2%			6.4 MT
G	Raw material required per month	E + F			326.4 MT
H	Raw material landing cost per month	Rs 3500/ MT	326.4 Mt	3500/-	**11,42,400 /-**
I	Elect. Power Consumption per ton (press only)	35 unit /MT	35	Rs. 7.00	Rs 245/MT
J	Elec. Power consumption per month (press only)	E x I			**78.400 /-**
K	Overheads per month (salary + maintenance + expenditures. Etc)	Rs 255.00 / MT	320 MT	255 /-	**81,600 /-**
L	Production cost per month	(H + J + k)			**13,02,400 /-**
M	Selling rate per month	Rs 5500 /MT	320 MT	5500/-	**17,60,000/-**
N	Income per month	(M-L)			**4,57,600/-**
	Income per annum	10 months run			**45,76,000/-**
	Project cost analysis (Land excluded)				
1	Briquetting press SK - 7000		1	11,50,000/-	11,50,000/-
2	Electrical power establishment and electrification	2,50,000/-			2,50,000/-
3	Civil work - foundation, machine room, shed etc.	3,50,000/-			3,50,000/-
	Total				**17,50,000/-**
	Working capital required	**15,00,000/-**			
	PAY BACK PERIOD	**3.9 MONTHS**			

Annexure-6

Project Economics of Briquetting plant with SK – 9000					
Sl.no.	**Particulars**	**Assumption**	**Unit**	**Rate**	**Total**
A	Installed Capacity				1.5 MT/hr
B	Capacity Utilization	80%			1.2 MT/hr
C	Working Hours per day	16 hours			16 hours
D	Working days per month	25 days			25 days
E	Production per month	B x C x D			480 MT.
F	Wastage of raw material	2%			9.6 MT
G	Raw material required per month	E + F			489.6 MT
H	Raw material landing cost per month	Rs 3500/ MT	489.6 Mt	3500/-	**17,13,600 /-**
I	Elect. Power Consumption per ton (press only)	40 unit /MT	40	Rs. 7.00	Rs 280/MT
J	Elec. Power consumption per month (press only)	E x I			**1,34,400 /-**
K	Overheads per month (salary + maintenance + expenditures. Etc)	Rs 275.00 / MT	480 mt	275 /-	**1,32,000 /-**
L	Production cost per month	(H + J + k)			**19,80,000 /-**
M	Selling rate per month	Rs 5000 /MT	480 mt	5000/-	**24,00,000/-**
N	Income per month	(M-L)			**4,20,000/-**
	Income per annum	10 months run			**42,00,000/-**
	Project cost analysis (Land excluded)				
1	Briquetting press SK - 9000		1	15,50,000/-	15,50,000/-
2	Electrical power establishment and electrification	2,50,000/-			2,50,000/-
3	Civil work - foundation, machine room, shed etc.	3,50,000/-			3,50,000/-
	Total				**21,50,000/-**
	Working capital required	**20,00,000/-**			
	PAY BACK PERIOD	**5.2 MONTHS**			