DETAILED PROJECT REPORT
ON
SEPARATOR (1.5 TPH)
(GANJAM RICE MILL CLUSTER)

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SEPARATOR FOR RICE MILL (1.5 TPH)

GANJAM RICE MILLS CLUSTER

BEE, 2010
Detailed Project Report on Separator (1.5 TPH)
Rice Mill SME Cluster, Ganjam, Orissa (India)
New Delhi: Bureau of Energy Efficiency;
Detail Project Report No.: **Ganjam/Ricemills/PC/01**

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Zenith Energy Services Private Ltd.

Hyderabad

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Lists of Abbreviations

- BEE - Bureau of Energy Efficiency
- DPR - Detailed Project Report
- DSCR - Debt Service Coverage Ratio
- GHG - Green House Gases
- HP - Horse Power
- IRR - Internal Rate of Return
- MoP - Ministry of Power
- MSME - Micro Small and Medium Enterprises
- NPV - Net Present Value
- ROI - Return On Investment
- MoMSME - Ministry of micro Small and Medium Enterprises
- SIDBI - Small Industrial Development Bank of India
- TPH - Ton Per Hour

EXECUTIVE SUMMARY

Zenith Energy Services Pvt. Ltd is executing BEE-SME program in Ganjam Rice Mills Cluster, supported by Bureau of Energy Efficiency (BEE) with an overall objective of improving the energy efficiency in cluster units.

Paddy is one of the major crops cultivated in the eastern states especially in the state of Orissa. The Rice comes out of milling of paddy. Hence rice milling is an important activity in the state. There are about 250 rice mills in Ganjam rice mills cluster covering Berhampur, Hinjilicut, Bhanjanagar, and Ganjam areas. The major Energy forms used in the cluster is electricity. Electricity is used for driving the prime movers of elevators, Chaluni, separator, paddy cleaners, Rubber Sheller, and whiteners/cones, drives and for lighting. The cost of energy as a percentage of end product cost (Rice) cost varies anywhere between of 1% to 1.5%.

Separator is one of the essential equipment in a rice mill. The huller aspirator removes the lighter material such as husk, bran and very small broken rice. The remainder passes onto the separator where the unshelled paddy rice is separated from the brown rice. The present equipment has Inferior design and hence more power consumption, lower processing capacity and also poor cleaning efficiency. The clean paddy is then sent to the rubber roll Sheller to process further.

Installation of proposed technology i.e. new separator of 1.5 TPH capacity would lead to save about 4673 kWh of electricity per year.

The DPR highlights the details of the study conducted for assessing the potential for reducing electricity consumption by replacing the present separator with new separator in various units of the cluster, possible electricity savings and its monetary benefit, availability of the technologies/design, local service providers, technical features and proposed equipment specifications, various barriers in implementation, environmental aspects, estimated GHG reductions, capital cost, financial analysis, and schedule of Project Implementation.

This bankable DPR also found eligible for subsidy scheme of MoMSME for “Technology and Quality Upgradation Support to Micro, Small and Medium Enterprises” under “National Manufacturing and Competitiveness Programme”. The key indicators of the DPR including the Project cost, debt equity ratio, monetary benefit and other necessary parameters are given in table:

S.No	Particular	Unit	Value
1	Project cost	` (In lakh)	0.60
2	Electricity saving	kWh/annum	4673
3	Monetary benefit	` (In lakh)	0.20
4	Debit equity ratio	Ratio	3:1
5	Simple payback period	Years	3
6	NPV	` (In lakh)	0.13
7	IRR	%age	16.22
8	ROI	%age	23.89
9	DSCR	Ratio	1.35
10	Process down time	Days	6
11	CO_2 reduction	Ton /year	4

The projected profitability and cash flow statements indicate that the project implementation of new separator by the present inefficient separator in the cluster units will be financially viable and technically feasible solution for the cluster.

ABOUT BEE'S SME PROGRAM

Bureau of Energy Efficiency (BEE) is implementing a BEE-SME Programme to improve the energy performance in 29 selected SMEs clusters. Ganjam Rice Mills Cluster is one of them. The BEE's SME Programme intends to enhance the energy efficiency awareness by funding/subsidizing need based studies in SME clusters and giving energy conservation recommendations. For addressing the specific problems of these SMEs and enhancing energy efficiency in the clusters, BEE will be focusing on energy efficiency, energy conservation and technology up-gradation through studies and pilot projects in these SMEs clusters.

Major activities in the BEE -SME program are furnished below:

Activity 1: Energy use and technology audit

The energy use technology studies would provide information on technology status, best operating practices, gaps in skills and knowledge on energy conservation opportunities, energy saving potential and new energy efficient technologies, etc for each of the sub sector in SMEs.

Activity 2: Capacity building of stake holders in cluster on energy efficiency

In most of the cases SME entrepreneurs are dependent on the locally available technologies, service providers for various reasons. To address this issue BEE has also undertaken capacity building of local service providers and entrepreneurs/ Managers of SMEs on energy efficiency improvement in their units as well as clusters. The local service providers will be trained in order to be able to provide the local services in setting up of energy efficiency projects in the clusters

Activity 3: Implementation of energy efficiency measures

To implement the technology up-gradation project in the clusters, BEE has proposed to prepare the technology based detailed project reports (DPRs) for a minimum of five technologies in three capacities for each technology.

Activity 4: Facilitation of innovative financing mechanisms for implementation of energy efficiency projects

The objective of this activity is to facilitate the uptake of energy efficiency measures through innovative financing mechanisms without creating market distortion

1 INTRODUCTION

1.1 Brief Introduction about cluster

Paddy is one of the major crops cultivated in the eastern states especially in the state of Orissa. The Rice comes out of milling of paddy. Hence rice milling is an important activity in the state. There are about 250 rice mills in Ganjam rice mills cluster covering Berhampur, Hinjilicut, Bhanjanagar, and Ganjam areas. The major Energy forms used in the cluster is grid electricity. Electricity is used for driving the prime movers of elevators, Chaluni, separator, paddy cleaners, Rubber Sheller, and whiteners/cones, drives and for lighting. The cost of energy as a percentage of end product cost (Rice) cost varies anywhere between 1% and 1.5%.

1.1.1 Production process

Pre-Cleaner/ Paddy Cleaner

Paddy cleaner is a most essential equipment in a rice mill and separates all the impurities like dust, straw, sand, clay and heavy particles of even and uneven sizes from paddy before the paddy is processed. The clean paddy sent to the rubber roll sheller to process further. The advantages with the paddy cleaner are it increases the life of rubber rollers and the percentage of oil in bran.

The function of the dust blower is to remove the dust from paddy through the pipeline connected to the paddy cleaner. This equipment is recommended for installation in conventional rice mills, also to get the same advantages as of modern rice mills. If this are not removed prior to shelling the efficiency of the rubber Sheller and the milling recovery is reduced.

The pre-cleaners separate three groups of materials:

- The first separation is done by scalping or removing the objects that are larger than the grain. Either a flat oscillating screen or a rotary drum screen that allows the grain to pass through but retains straw.
- The second separation retains the grains but allows broken grains, small stones and weed seeds to pass through. Aspirator is installed to remove the dust and light empty grains

Rubber Sheller

The objective of a hulling/de husking operation is to remove the husk from the paddy grain with a minimum of damage to the bran layer and, if possible, without breaking the brown rice grain. Since, the structure of the paddy grain makes it necessary to apply friction to the grain surface to remove the husk; it leads to breaking of some of the rice.

The paddy is fed into the center of the machine through a small hopper. A vertically adjustable cylindrical sleeve regulates the capacity and equal distribution of the paddy over the entire surface of the rotating disc, paddy is forced between the two discs (rubber Sheller)and as a result of pressure and friction most of the paddy is de husked (hulled), where husk and brown rice are separated.

Separator

The output from the huller is a mixture of brown rice, husk, broken paddy etc. The huller aspirator removes the lighter material such as husk, bran and very small broken rice. The remainder passes onto the paddy separator where the unshelled paddy rice is separated from the brown rice. The amount of paddy present depends on the efficiency of the husker, and normally less than 10%. Paddy separators work by making use of the differences in specific gravity, buoyancy, and size between paddy and brown rice. Paddy rice has a lower specific gravity, higher buoyancy, and is physically bigger, longer and wider than brown rice

The compartment type of paddy separator uses the difference in specific gravity and the buoyancy to separate paddy and brown rice. When paddy and brown rice move over an inclined plane, they move at different speeds depending on their specific gravity, their shape and contact area, smoothness of inclined surface and the co-efficient of sliding friction. Brown grains are smaller, heavier, rounder, and smoother and will slide faster than paddy grains. The processing capacity of the compartment separator is dependent on the compartment area. For a 1.5 ton/hr capacity rice mill, a 45-compartment separator made up of 15 compartments on each of three decks is used.

Whitening and Polishing

In the process of whitening, the skin and bran layer of the brown rice are removed. During polishing of the whitened rice, the bran particles still sticking to the surface of the rice are removed and the surface of the rice is slightly polished to give it a glazed appearance. For further whitening if required as per the market demand or for export market, the polished rice is further processed in the silky machine for additional polishing.

Rice grader

After polishing, the white rice is separated into head rice and, large and small broken rice by a sifter. Head rice is normally classified as kernels, which are 75-80% or more of a whole kernel. The sifter is made up of a series of oscillating or cylindrical screens through which the rice passes. The output from the bottom screen is the very fine broken tips and is called the “brewers”.

Elevators

The elevator used at different stages of rice milling for transferring paddy, brown rice and white rice during the milling process

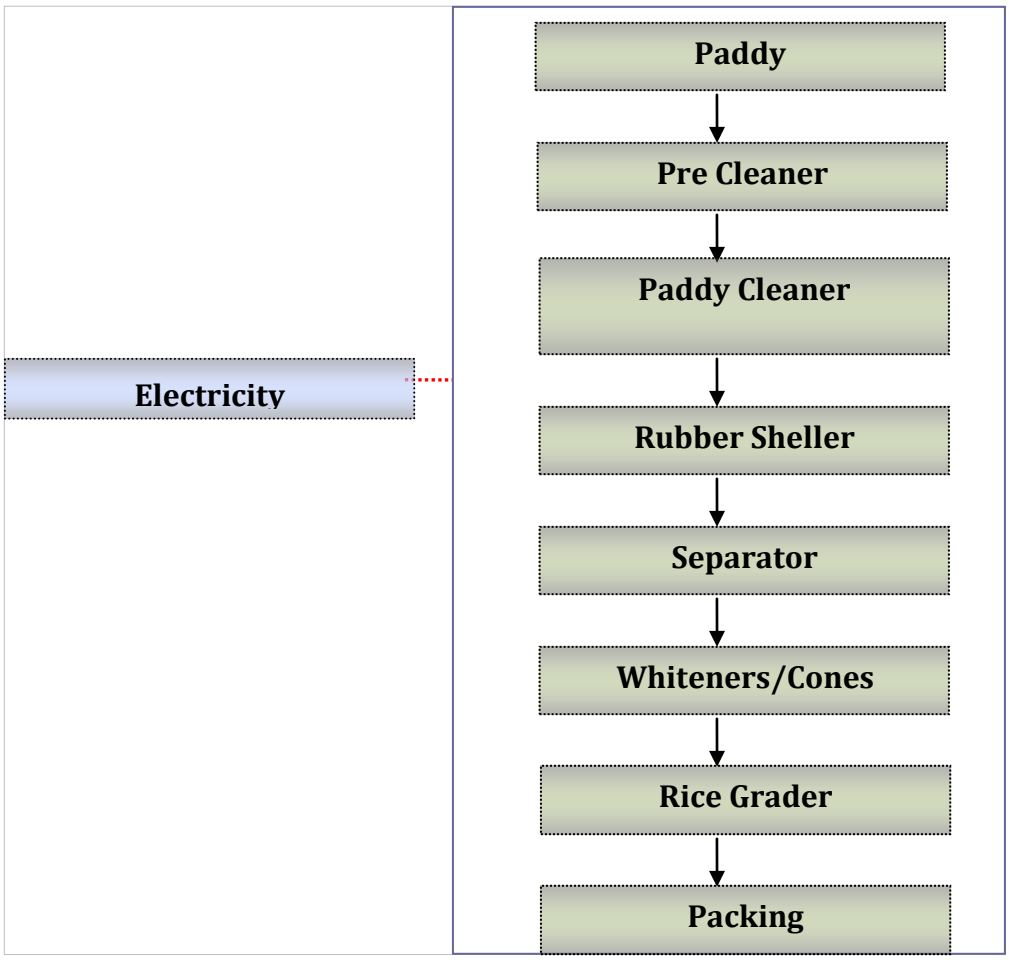


Figure 1.1: General Process Flowchart of a rice mill is furnished below.

1.2 Energy performance in existing situation

1.2.1 Electricity consumption of a typical unit in the cluster

The main source of energy for a typical rice milling unit in the cluster is electricity and is used for driving the prime movers of common drive shaft motor and in individual drive system like elevators, Chaluni, separator, paddy cleaners, Rubber Sheller, and whiteners/cones, drives and for lighting. The energy consumption of a typical rice production unit in the cluster having old and inefficient design separator of 1.5 TPH capacity is furnished in Table 1.1 below:

Table 1.1: Energy consumption of a typical unit (M/s Janatha Rice Mill)

S.No.	Details	Unit	Value
1	Electricity Consumption	MWh/annum	180
2	Production (Rice)	tonne/annum	9000

1.2.2 Average production by a typical unit in the cluster

The average production in a year in a typical rice production unit is 7800 tonne per annum.

1.2.3 Specific Energy Consumption

The major source of energy for paddy processing is electricity and the specific electricity consumption per ton of processing for a typical unit of having 1.5 TPH capacities is furnished in Table 1.2 below:

Table 1.2: Specific energy consumption for a typical unit (M/s Janatha Rice Mill)

S. No.	Type of energy	Units	Specific Energy Consumption
1	Electricity	kWh/ton	20.0

1.3 Existing technology/equipment

1.3.1 Description of existing technology

More than 50% of the rice mills are old more than 15 years and these industries has installed old and local make equipments like paddy cleaners and separators. The present equipment has the following disadvantages w.r.t power consumption, quality and productivity

- Inferior design and hence more power consumption w.r.t. the technologies available in the market.
- Lower processing capacity for the same power consumption.
- Cleaning of the unshelled paddy rice from brown rice is poor and cleaning efficiency is also poor.

The existing separator's technical specifications and operating parameters are furnished in Table 1.3 below:

Table 1.3 Existing separator specifications

S.No	Parameter	Details
1	Make	--
2	Year	---
3	Processing capacity	1.5 TPH
4	Power consumption	2.2
5	No. of hours of operation	22

1.3.2 Its role in the whole process

The output from the huller is a mixture of brown rice, husk, broken paddy etc. The huller aspirator removes the lighter material such as husk, bran and very small broken rice. The remainder passes onto the separator where the unshelled paddy rice is separated from the brown rice. The pre-separators separate three groups of materials:

- The first separation is done by scalping or removing the objects that are larger than the grain. Either a flat oscillating screen that allows the grain to pass through but retains straw.
- The second separation retains the grains but allows broken grains, small stones and weed seeds to pass through. Aspirator (blower) is installed to remove the dust and light empty grains

The advantages with the separator are it increases the life of rubber rollers and the percentage of oil in bran.

1.4 Establishing the baseline for the equipment to be changed

1.4.1 Design and operating parameters power consumption per year

The present power consumption of a separator is 2.2 kW. The separator is operated for 22 hours in a day for 300 days. The annual power consumption in the separator is 14520 kWh. The operating parameters of the existing separator machine are furnished in Table 1.4 below:

Table 1.4 operating parameters of the existing separator (M/s Janatha Rice Mills)

S.No	Details	Unit	Value
1	Measured Voltage	Volt	396
2	Measured Amps	Amp	4.2
3	frequency	Hz	50
4	Actual Power Consumption	kW	2.20
5	Speed	RPM	1400
6	Paddy processing	TPH	1.5

1.4.2 Electricity consumption

The electricity consumption of three typical units having 1.5 TPH paddy processing capacity of the existing separator is furnished below in Table 1.5 below

Table 1.5 Power consumption of three typical units of separator

S. No	*Name of the unit*	*No of (hours/ day)*	*No of (days /annum)*	*Production capacity (Tons / annum)*	Actual Power Consumption separator (kW)	*Actual Power consumption (kWh/annum)*
1	M/s Janatha Rice Mill	22	300	9900	2.2	14520
2	M/s Balaji traders	14	300	6300	2.1	8820
3	M/s Gouri Shankar rice mill	15	325	7312.5	2.2	10725

1.4.2 Operating efficiency of the existing system

The detailed energy audits studies had been undertaken in various units of the cluster to evaluate the efficiency of the existing separator and compare w.r.t power consumption of the latest separators available in the market. Based on the studies undertaken, the separators installed in cluster units are consuming about 50% more power than the new separators available in the market.

1.5 Barriers for adoption of new and energy efficient technology / equipment

1.5.1 Technological Barriers

The major technical barriers that prevented the implementation of the new separator in the cluster are:

- Lack of awareness of the technologies in the area
- Lack of technical knowledge and its losses

1.5.2 Financial Barrier

The replacement of separator with new improved design separators requires high initial investment. Hence, many of the owners don't show interest for implementation. Further, the production capacities of these mills are low and operated for one shift only and further the energy cost w.r.t paddy cost is low or negligible.

Further, lack of awareness of the losses of existing separator and monetary benefit of the new improved design separators also one of the major factors for implementing the technology.

Energy Efficiency Financing Schemes such as SIDBI's, if focused on the cluster, will play a catalytic role in implementation of identified energy conservation projects & technologies. The cluster has significant potential for implementing the improved design separator by replacing separator.

1.5.3 Skilled manpower

Not applicable

1.5.4 Other barrier(s)

Information on the energy efficient technologies is not available among cluster unit owners.

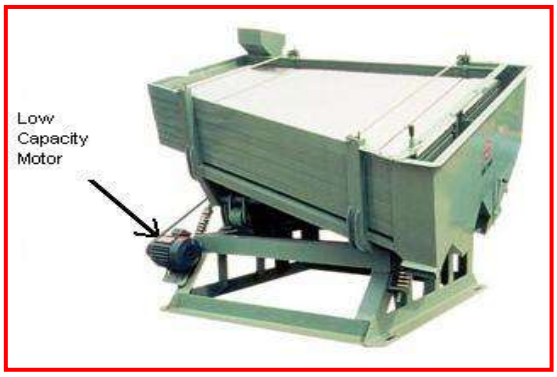
2. EQUIPMENT OPTION FOR ENERGY EFFICIENCY IMPROVEMENT

2.1 Detailed description of technology/equipment selected

2.1.1 Description of technology

The project activity is replacement of old and inferior separator with new improved design separator.

The new improved design separator accurately separates Oversized and Undersized impurities and part of the Immature Grains from Paddy; the inbuilt Self-separation system ensures optimum efficiency during the production cycle. Vibromotors make the operation noiseless and trouble-free.



2.1.2 Technology /Equipment specifications

The detailed specifications of separator of Milltech make suggested are furnished in Table 2.1 below:

Table 2.1: Proposed separator specifications

S. No.	Parameter	Details
1	Type	MGCZ60 x 16
2	Capacity	1.25-1.75 TPH
3	Power required	1.5 kW
4	Voltage	415 V/50 Hz
5	Aspiration required	.....
6	Overall dimensions (Inch)	2180 x 480 x 2190
7	Motor capacity	2 HP

2.1.3 Justification of the technology selected & its suitability

About 50% of the rice mill units in the cluster have separators and is a very technology adopted. Majority of these separators are very old and inferior design and consuming more power consumption for same output. Whereas, the new improved will consume less power and the paddy processing capacity is more than the old separators.

2.1.4 Superiority over existing technology/equipment

The following are the superior features of new improved design separator developed by Milltech

- Removes Immature grains along with other Impurities
- Inbuilt separation system to avoid clogging of screens
- Different screens can be mounted to suit the applications
- Screens can be interchanged easily
- No relatively moving parts
- Maintenance free

2.1.5 Availability of the proposed technology/equipment

The separator suppliers are available at Hyderabad and at Berhampur; the Milltech dealers are available at Berhampur. The detail of the suppliers is provided in Annexure 5.

2.1.6 Source of technology/equipment for the project

The source of the technology is indigenous and is locally available.

2.1.7 Service/technology providers

Details of service providers had been furnished in Annexure 5.

2.1.8 Terms of sales of the suppliers, etc.

The terms and conditions of the equipment supplier for supply of the separator are furnished below:

Terms & Conditions:

- 40% advance and 40% after delivery of the materials and 20% after completion of the Work
- 12 months guarantee from the date of delivery of the materials

2.1.9 Process down time during implementation

The process down time for installation of new improved design separator is considered at one week for dismantling the existing system and installation of new machine, providing electrical connections to the motor, cable laying, panels and starters installation etc.

2.2 Life cycle assessment and risks analysis

The life of the separator is considered at 15 years. There is no risk involved as the separators are successfully in operation in since 3 decades in the rice mills.

2.3 Suitable unit/plant size the identified equipment

The paddy processing capacity of the present separator is 1.5 TPH and the capacity of the new separator is 1.5 TPH.

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3. ECONOMIC BENEFITS OF NEW ENERGY EFFICIENT TECHNOLOGY

3.1 Technical benefits

3.1.1 Fuel Saving

No fuel saving is envisaged due to proposed technology

3.1.2 Electricity savings

The new improved design separator will consume less power than the existing separator and hence reduces electricity consumption. The power savings due to installation of project activity is estimated at 4673 kWh per annum. Details of electricity saving is given in Annexure 2.

3.1.2 Improvement in product quality

The product quality will improve to certain extent due to better cleaning of the paddy and removes unwanted materials accurately.

3.1.3 Increase in production

The new separator has more production capacity than the existing separator and hence there may be improvement in the production for the same duration of operation of the rice mill.

3.1.4 Reduction in raw material consumption

Not Applicable

3.1.5 Reduction in other losses

Not applicable.

3.2 Monetary benefits

The monetary benefit due to installation of new improved design separator is estimated at ` 0.20 lakh per annum due to reduction in electricity consumption. Details of monetary saving are given in Annexure 2.

3.3 Social benefits

3.3.1 Improvement in working environment in the plant

As installation of improved design separator will reduce the noise levels and dust and hence working environment may improve.

3.3.2 Improvement in skill set of workers

The technology selected for the implementation is new and energy efficient. The technology implemented will create awareness among the workforce and improves skills of the workers.

3.4 Environmental benefits

3.4.1 Reduction in effluent generation

Not applicable

3.4.2 Reduction in GHG emission such as CO2, NOx, etc

The major GHG emission reduction source is CO_2. The technology will reduce grid electricity consumption and emission reductions are estimated at 4 tons of CO_2 per annum due to implementation of the project activity.

3.4.3 Reduction in other emissions like SOx

No significant impact on SOx emissions.

4. INSTALLATION OF NEW ENERGY EFFICIENT EQUIPMENT

4.1 Cost of equipment implementation

4.1.1 Cost of equipments

The total cost of new separator is estimated at ` 0.50 lakh as per the quotation provided in Annexure 6.

As per discussions with technology provider resale value of ` 0.35 lakh for old equipment and discount of ` 0.10 lakh on new separator has been considered.

4.1.2 Other costs

Cost included in cabling modification and commissioning is ` 0.10 lakh. Detail of project cost is furnished in Table 4.1 below:

Table 4.1: Project cost

S.No	Particular	Unit	Value
1	Separator	` in lakh	0.50
2	Cabling, Shaft , Modifications, Commissioning etc	` in lakh	0.10
3	Total Investment	` in lakh	0.60

4.2 Arrangement of funds

4.2.1 Entrepreneur's contribution

The entrepreneur's contribution is 25% of total project cost, which works out at ` 0.15 lakh.

4.2.2 Loan amount

The term loan is 75% of the total project cost, which is ` 0.45 lakh.

4.2.3 Terms & conditions of loan

The interest rate is considered at 10.0% which is prevailing interest rate of SIDBI for energy efficiency related projects. The loan tenure is 5 years and the moratorium period is 6 months.

4.3 Financial indicators

4.3.1 Cash flow analysis

Considering the above discussed assumptions, the net cash accruals starting with ` 0.10 lakh in the first year operation and increases to ` 0.44 lakh at the end of eighth year.

4.3.2 Simple payback period

The total project cost of the proposed technology is ` 0.60 lakh and monetary savings due to reduction in electricity consumption is ` 0.20 lakh and the simple payback period work out to be 3 years.

4.3.3 Net Present Value (NPV)

The Net present value of the investment at 10.0% interest rate works out to be ` 0.13 lakh.

4.3.4 Internal rate of return (IRR)

The after tax Internal Rate of Return of the project works out to be 16.22%. Thus the project is financially viable.

4.3.5 Return on investment (ROI)

The average return on investment of the project activity works out at 23.89%.

4.4 Sensitivity analysis in realistic, pessimistic and optimistic scenarios

A sensitivity analysis has been worked out to ascertain how the project financials would behave in different situations like there is an increase in power savings or decrease. For the purpose of sensitive analysis, two scenarios are considered are.

- Increase in power savings by 5%
- Decrease in power savings by 5%

In each scenario, other inputs are assumed as constant. The financial indicators in each of the above situation are indicated along with standard indicators.

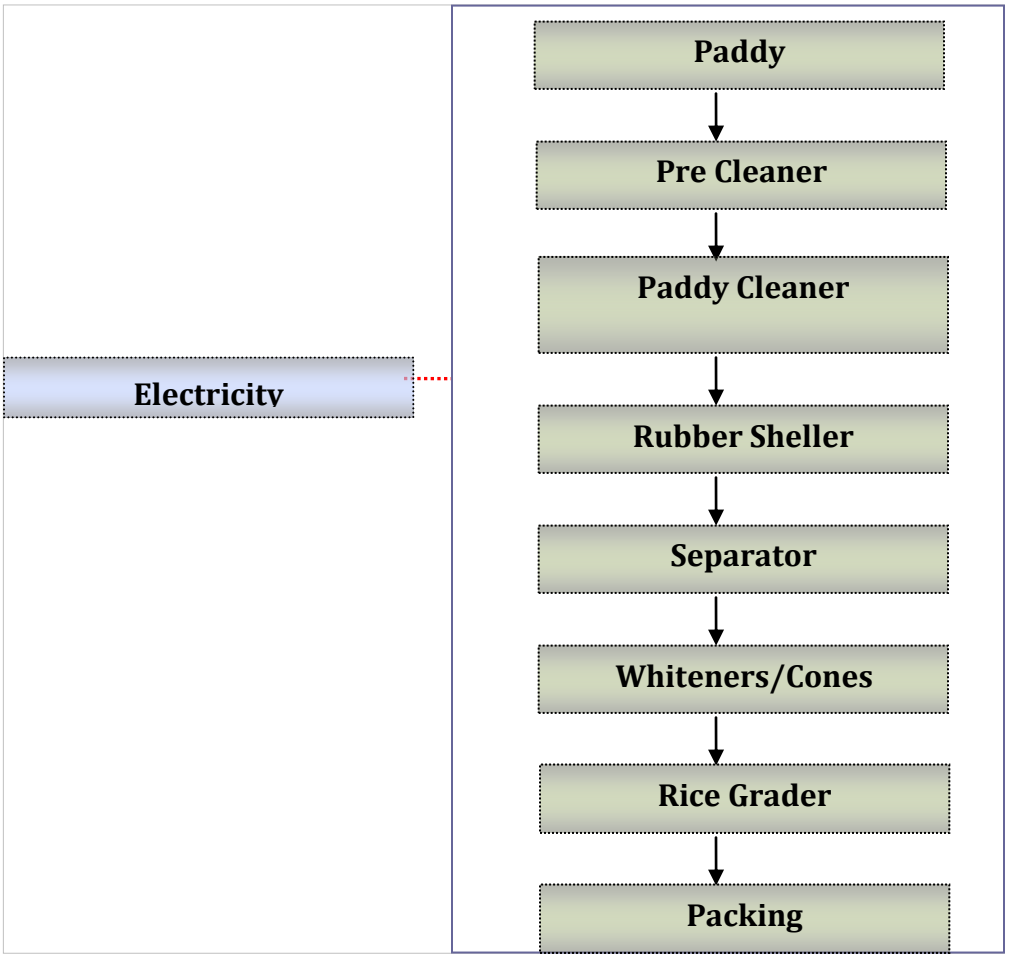
Table 4.2: Sensitivity analysis

Particulars	*IRR* %	*NPV* ` in lakh	*ROI* %	*DSCR*
Normal	16.22	0.13	23.89	1.35
5% increase in power savings	26.42%	0.35	25.56	1.76
5% decrease in power savings	17.79%	0.16	24.27	1.42

4.5 Procurement and implementation schedule

The project is expected to be completed in 4 weeks from the date of release of purchase order. The detailed schedule of project implementation is furnished in Annexure 4.

Annexure 1: Process flow diagram



Annexure 2: Detailed Technology Assessment Report

S.No.	Particulars	Unit	Value
1	Present rated capacity of separator	HP	3
2	Actual power consumption	kW	2.2
3	Rated capacity of proposed separator	HP	2
4	Electricity consumption in new separator	kWh	1.49
5	Power savings	kWh	0.71
6	Total operating hours	Hours	22
7	Total operating days	Days	300
8	Power savings per annum	kWh	4673
9	Cost of electricity	` /kWh	4.2
10	Monetary savings per annum	`(In lakh)	0.20
11	Investment required for new separator	`(In lakh)	0.60
12	Payback period	Years	3

Annexure 3: Detailed Financial Calculations & Analysis

Assumption

Name of the Technology	**Separator**		
Rated Capacity	**1.5 TPH**		
Details	***Unit***	***Value***	***Basis***
Installed Capacity	TPH	1.5	
No of working days	Days	300	
No of operating hours	hrs	22	
Proposed Investment			
Equipment cost	` (in lakh)	0.50	
Cabling, Civil works and Modification	` (in lakh)	0.10	
Total Investment	` (in lakh)	0.60	
Financing pattern			
Own Funds (Equity)	` (in lakh)	0.15	
Loan Funds (Term Loan)	` (in lakh)	0.45	
Loan Tenure	years	5	Assumed
Moratorium Period	Months	6	Assumed
Repayment Period	Months	66	Assumed
Interest Rate	%age	10.00%	SIDBI Lending rate
Estimation of Costs			
O & M Costs	% on Plant & Equip	4.00	Feasibility Study
Annual Escalation	%age	5.00	Feasibility Study
Estimation of Revenue			
Power saving	kWh/year	4673	
Cost	`/kWh	4.2	
St. line Depn.	%age	5.28	Indian Companies Act
IT Depreciation	%age	80.00	Income Tax Rules
Income Tax	%age	33.99	Income Tax

Estimation of Interest on Term Loan

` (in lakh)

Years	***Opening Balance***	***Repayment***	***Closing Balance***	***Interest***
1	0.45	0.03	0.42	0.05
2	0.42	0.06	0.36	0.04
3	0.36	0.08	0.28	0.03
4	0.28	0.10	0.18	0.02
5	0.18	0.12	0.06	0.01
6	0.06	0.06	0.00	0.00
		0.45		

WDV Depreciation **` (in lakh)**

Particulars / years	1	2
Plant and Machinery		
Cost	0.60	0.12
Depreciation	0.48	0.10
WDV	0.12	0.02

Projected Profitability **` (in lakh)**

Particulars / Years	1	2	3	4	5	6	7	8
Fuel savings	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Total Revenue (A)	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Expenses								
O & M Expenses	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03
Total Expenses (B)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03
PBDIT (A)-(B)	0.18	0.18	0.18	0.18	0.17	0.17	0.17	0.17
Interest	0.05	0.04	0.03	0.02	0.01	0.00	-	-
PBDT	0.13	0.14	0.14	0.15	0.16	0.17	0.17	0.17
Depreciation	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
PBT	0.09	0.11	0.11	0.12	0.13	0.14	0.14	0.14
Income tax	-	0.01	0.05	0.05	0.06	0.06	0.06	0.06
Profit after tax (PAT)	0.09	0.09	0.06	0.07	0.08	0.08	0.08	0.08

Computation of Tax **` (in lakh)**

Particulars / Years	1	2	3	4	5	6	7	8
Profit before tax	0.09	0.11	0.11	0.12	0.13	0.14	0.14	0.14
Add: Book depreciation	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Less: WDV depreciation	0.48	0.10	-	-	-	-	-	-
Taxable profit	(0.35)	0.04	0.14	0.15	0.16	0.17	0.17	0.17
Income Tax	-	0.01	0.05	0.05	0.06	0.06	0.06	0.06

Projected Balance Sheet **` (in lakh)**

Particulars / Years	1	2	3	4	5	6	7	8
Liabilities								
Share Capital (D)	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Reserves & Surplus (E)	0.09	0.19	0.25	0.32	0.39	0.47	0.56	0.64
Term Loans (F)	0.42	0.36	0.28	0.18	0.06	0.00	0.00	0.00
Total Liabilities (D)+(E)+(F)	0.66	0.70	0.68	0.65	0.60	0.62	0.71	0.79

Assets	1	2	3	4	5	6	7	8
Gross Fixed Assets	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Less Accm. Depreciation	0.03	0.06	0.10	0.13	0.16	0.19	0.22	0.25
Net Fixed Assets	0.57	0.54	0.50	0.47	0.44	0.41	0.38	0.35
Cash & Bank Balance	0.10	0.16	0.17	0.17	0.16	0.21	0.33	0.44
TOTAL ASSETS	0.66	0.70	0.68	0.65	0.60	0.62	0.71	0.79
Net Worth	0.24	0.34	0.40	0.47	0.54	0.62	0.71	0.79
Debt Equity Ratio	2.80	2.40	1.87	1.20	0.40	0.00	0.00	0.00

Projected Cash Flow **` (in lakh)**

Particulars / Years	***0***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***
Sources									
Share Capital	0.15	-	-	-	-	-	-	-	-
Term Loan	0.45								
Profit After tax		0.09	0.09	0.06	0.07	0.08	0.08	0.08	0.08
Depreciation		0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Total Sources	0.60	0.13	0.12	0.09	0.10	0.11	0.11	0.11	0.11
Application									
Capital Expenditure	0.60								
Repayment Of Loan	-	0.03	0.06	0.08	0.10	0.12	0.06	-	-
Total Application	0.60	0.03	0.06	0.08	0.10	0.12	0.06	-	-
Net Surplus	-	0.10	0.06	0.01	(0.00)	(0.01)	0.05	0.11	0.11
Add: Opening Balance	-	-	0.10	0.16	0.17	0.17	0.16	0.21	0.33
Closing Balance	-	0.10	0.16	0.17	0.17	0.16	0.21	0.33	0.44

IRR

` (in lakh)

Particulars / months	***0***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***
Profit after Tax		0.09	0.09	0.06	0.07	0.08	0.08	0.08	0.08
Depreciation		0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Interest on Term Loan		0.05	0.04	0.03	0.02	0.01	0.00	-	-
Cash outflow	(0.60)	-	-	-	-	-	-	-	-
Net Cash flow	(0.60)	0.18	0.16	0.13	0.12	0.12	0.11	0.11	0.11
IRR	16.22%								
NPV	0.13								

Break Even Point **` (in lakh)**

Particulars / Years	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***
Variable Expenses								
Oper. & Maintenance Exp (75%)	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02
Sub Total*(G)*	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02
Fixed Expenses								
Oper. & Maintenance Exp (25%)	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Interest on Term Loan	0.05	0.04	0.03	0.02	0.01	0.00	0.00	0.00
Depreciation *(H)*	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Sub Total (I)	0.09	0.08	0.07	0.06	0.05	0.04	0.04	0.04
Sales (J)	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Contribution (K)	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Break Even Point (L= G/I)	48.26%	41.56%	38.41%	33.77%	27.64%	21.89%	21.17%	21.44%
Cash Break Even {(I)-(H)}	30.93%	24.16%	20.94%	16.23%	10.02%	4.19%	3.38%	3.57%
Break Even Sales (J)*(L)	0.09	0.08	0.08	0.07	0.05	0.04	0.04	0.04

Return on Investment

` (in lakh)

Particulars / Years	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***Total***
Net Profit Before Taxes	0.09	0.11	0.11	0.12	0.13	0.14	0.14	0.14	0.98
Net Worth	0.24	0.34	0.40	0.47	0.54	0.62	0.71	0.79	4.11
									23.89%

Debt Service Coverage Ratio

` (in lakh)

Particulars / Years	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***Total***
Cash Inflow									
Profit after Tax	0.09	0.09	0.06	0.07	0.08	0.08	0.08	0.08	0.47
Depreciation	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.19
Interest on Term Loan	0.05	0.04	0.03	0.02	0.01	0.00	0.00	0.00	0.16
Total (M)	0.18	0.16	0.13	0.12	0.12	0.11	0.11	0.11	0.83

DEBT

Interest on Term Loan	0.05	0.04	0.03	0.02	0.01	0.00	0.00	0.00	0.16
Repayment of Term Loan	0.03	0.06	0.08	0.10	0.12	0.06	0.00	0.00	0.45
Total (N)	0.08	0.10	0.11	0.12	0.13	0.06	0.00	0.00	0.61
	2.17	1.64	1.13	1.00	0.90	1.86	0.00	0.00	1.35
Average DSCR (M/N)	1.35								

Annexure 4: Details of procurement and Implementation plan

Project Implementation Schedule

S. No	Activity	Weeks			
		1	2	3	4
1	Placement of Orders for new separator				
2	Supply of separator				
3	Installation of the separator and cabling				
4	Trial runs				

Process Down Time

S. No	Activity	Weeks			
		1	2	3	4
1	Dismantling of the existing separator				
2	Supply of new separator				
3	Installation of the separator and connections				
4	Trial runs				

The process down time is considered for one week.

Annexure 5: Details of technology/equipment and service providers

Equipment details	*Source of technology*	*Service/technology providers*
Separator	Indigenous	Baba Auto Mechanical works Plot no c-12/b, IDA, Uppal, Hyderabad
Separator	Indigenous	Sree Srinivasa Enterprises 5-5-76/F-8, 1st Floor, Srinivasa Commercial Complex, Ranigunj, Secunderabad

Annexure 6: Quotations or Techno-Commercial Bids

Baba Auto Mechanical Works

Plot no: c-12/b, IDA, Uppal, Hyderabad-500 039

30 years of Excellence in customer satisfaction

TIN: 28790212598 Wednesday, November 24, 2010

NAME : ZENITH ENERGY SERVICES PVT LTD

VILLAGE : HYDERABAD

DISTRICT :

COUNTRY : ANDHRAPRADESH.

PHONE : 9502688948

We thank you for enquiry and have pleasure on Quoting as follows. We trust the same meets with you approval and look forward to receive your valued order.

QUOTATION/ PERFORMA INVOICE-AP-212

S.No.	DESCRIPTION *Sri Laxmi* paddy milling machinery 1ton capacity per hour on paddy	POWER	AMOUNT Indian Rupees
1.	PADDY CLEANER	2HP, 1440 RPM	60000=00
2.	6" RUBBERSHELLER	5HP, 1440RPM	45000=00
3.	DE- HUSK ASPIRATOR		30000=00
4.	PADDY SEPARATOR- 3 TRAY	2HP, 960 RPM	95000=00
5.	RICE WHITENER- 4 STONE	15HP, 960RPMFLANGE	125000=00
6.	BRAN PROCESSING SYSTEM	2HP,1440RPM	40000=00
7.	SIEVE ASPERATOR	2HP, 1440 RPM	40000=00
8.	DOUBLE ELEVATOR (3 HEIGHTS)	1HPx3NO1440RM	144000=00
	TOTAL		**579000=00**
	VAT @	4%	**23560**
	TOTAL		**602160=00**

NOTE: ERECTION CHARGES EXTRA WILL BE CHARGED, TRANSPORT AND TRANSIT INSURANCE EXTRA

Customer's signature

For Baba Auto Mechanical Works

Authorized Signature

Manufacturers of Sri Laxmi Brand Modern Rice mill machinery
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STATE BANK OF INDIA, RAMANTHAPUR BRANCH, CURRENT A/C NO: 30281208834

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(Ministry of Power, Government of India)
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Websites: www.bee-india.nic.in, www.energymanagertraining.com

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