

DETAILED PROJECT REPORT ON ENERGY COST REDUCTION WITH REPLACING V-BELT BY FLAT BELT (ALWAR OIL MILL CLUSTER)



Bureau of Energy Efficiency (BEE)

Prepared By



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ENERGY COST REDUCTION WITH FLAT BELT IN PLACE OF V-BELT

ALWAR OIL MILL CLUSTER

BEE, 2011

Detailed Project Report on Flat belt in place of V-belt in Oil Mills

Oil Mill SME Cluster, Alwar (Rajasthan) (India)

New Delhi: Bureau of Energy Efficiency

Detail Project Report No.: **ALW/EXP/FB/10**

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CII – AVANTHA Centre for Competitiveness for SMEs
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Chandigarh

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List of Abbreviations

BEE	Bureau of Energy Efficiency
SME	Small and Medium Enterprises
DPR	Detailed Project Report
GHG	Green House Gases
PF	Power Factor
EEF	Energy Efficient Motor
CDM	Clean Development Mechanism
DSCR	Debt Service Coverage Ratio
NPV	Net Present Value
IRR	Internal Rate of Return
ROI	Return on Investment
MT	Metric Tonne
SIDBI	Small Industries Development Bank of India

EXECUTIVE SUMMARY

Confederation of Indian Industry is executing BEE-SME program in Alwar Oil Mill Cluster, supported by Bureau of Energy Efficiency (BEE) with an overall objective of improving the energy efficiency in cluster units.

Alwar Oil Mill cluster is one of the largest Oil Mill clusters in India; accordingly this cluster was chosen for energy efficiency improvements by implementing energy efficient measures / technologies, so as to facilitate maximum replication in other Oil Mill clusters in India. The main energy forms used in the cluster units are grid electricity. In Oil Mill plant, electricity bill is almost 100% of total plant energy bill.

Most of the Industrial installations in the country have large electrical loads which are severely inductive in nature, such as motors, large machines etc which results in a high power consumption. This means loss and wastage of energy by electricity boards as well as for Oil Mill units. It is good practice that Kolhu motors are running with flat belt.

It was also observed that in most of the expellers, V-belts were used for transferring power from the motor to the process system.

This DPR study the proposal for replacement of V-belts with flat belts for expeller motors.

V – Belts are made up of hard material and also there is wedge in/wedge out frictional losses at the vertical contact points between the belt and the pulley. Wedge in/wedge out losses account for around 6 – 8% of power losses.

There is good potential to replace existing V – belts with energy efficient poly V-belts. Flat belts are suitable for steady loads. There is good potential to save power by replacing all V – belts with poly V-belts. At least 4% saving in present power consumption can be achieved.

Implementation of flat belt on motors will reduce the running cost of energy. It helps in reducing the electricity bill amount by availing the benefit of improvement in efficiency of motor so reduction in power consumption from the Rajasthan Electricity Board. Project implementation will lead to reduction in electricity bill by Rs. 0.58 Lakh per year.

Power consumption	= 37 kW
Power saving	= 4%
Power saving	= 1.5 kW
Running hrs	= 10 hrs/day

Energy saving = 1.5 kW x 10 hrs/day
= 15 kWh /day / motor
Monetary saving = 15 kWh/day x300 days/yr Rs. 4.8/kWh
= Rs. 0.21 Lakh
Investment required = Rs. 0.48 Lakhs

The total investment, debt equity ratio for financing the project, monetary savings, Internal rate of return (IRR), Net present value (NPV), Return on investment (ROI) etc for implementing flat belt on motor in place of V-belt on motors is furnished in Table below;

S. No.	Particular	Unit	Value
1	Project cost	(in lakh)	0.48
2	Monetary benefit	(in lakh)	0.21
3	Debit equity ratio	Ratio	3:01
4	Simple payback period	years	2.2
5	NPV	(in lakh)	0.011
6	IRR	%age	13
7	ROI	%age	24
8	Process down time	hours	5
9	DSCR	Ratio	0.99
10	Co ₂ Reductions	T/yr	4.0

The projected profitability and cash flow statements indicate that the project implementation will be financially viable and technically feasible.

ABOUT BEE'S SME PROGRAM

Bureau of Energy Efficiency (BEE) is implementing a BEE-SME Programme to improve energy performance in 29 selected SMEs clusters. Alwar Oil Mill Cluster is one of them. The BEE's SME Programme intends to enhance 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:

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.

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 of energy efficiency projects in the clusters.

Implementation of Energy Efficiency Measures

To implement the technology up gradation projects in 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.

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.

1.0 INTRODUCTION

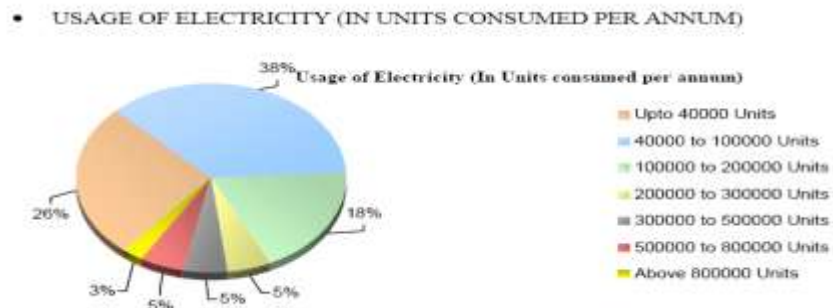
1.1 Brief Introduction about the Cluster

Alwar SME Cluster is one of the largest Oil Mill clusters in India, which is famous for manufacturing of Mustard Oil. The nearest airport is at Jaipur, which is 150 KM from Alwar by road.

There are approximately 60 Oil Mill units in this cluster which are engaged in manufacturing of mustard oil (kacchi Ghani and Pakki Ghani). There are more Oil Mill units coming up in Alwar.

Energy used for oil extraction is electricity. In Alwar and Sawaimadhopur region there is shortage of power and that leads to less production of oil. Because of the power shortage some of the very small scale units of cluster are planning to shut their plant.

Table 1.1 Details of Annual Energy Consumption Scenario at Alwar Oil Mill Cluster



Electrical energy consumption in Alwar and Sawaimadhopur units lies in range of around 186 Lakhs kWh for processing of 1240000 Quintal of Mustard Seed. Oil units in Alwar & Sawaimadhopur regions are having Specific Energy Consumption in range of 10-15 kWh/Quintal of mustard seed processed.

Energy Usage Pattern

Average monthly electricity consumption in Oil Mill plants ranges from 0.5 lakh to 2 lakh kWh depending on the size of the plant.

Classification of Units

The Oil Mill units can be categorized into following three types based on capacity of production

- Large scale units
- Medium scale units
- Small scale units

Production Wise Unit Breakup

Alwar Oil Mill cluster can be broken into three categories viz. small, medium and large size unit. Table 1.2 shows that production wise breakup of Alwar cluster.

Table 1.2 production wise unit breakups

S. No.	Type of Unit	Production Capacity
1	Large scale unit	More than 120 MT
2	Medium scale unit	50 to 120MT
3	Small scale unit	Less than 50 MT

Products Manufactured

Different types of products manufactured in Alwar SME cluster are as shown in Table 1.3 below.

Table 1.3 Product Manufactured

S. No	Type of Product	% Share
1	Pakki Ghani	70
2	Kacchi Ghani	30

Production Process of Oil Mill:

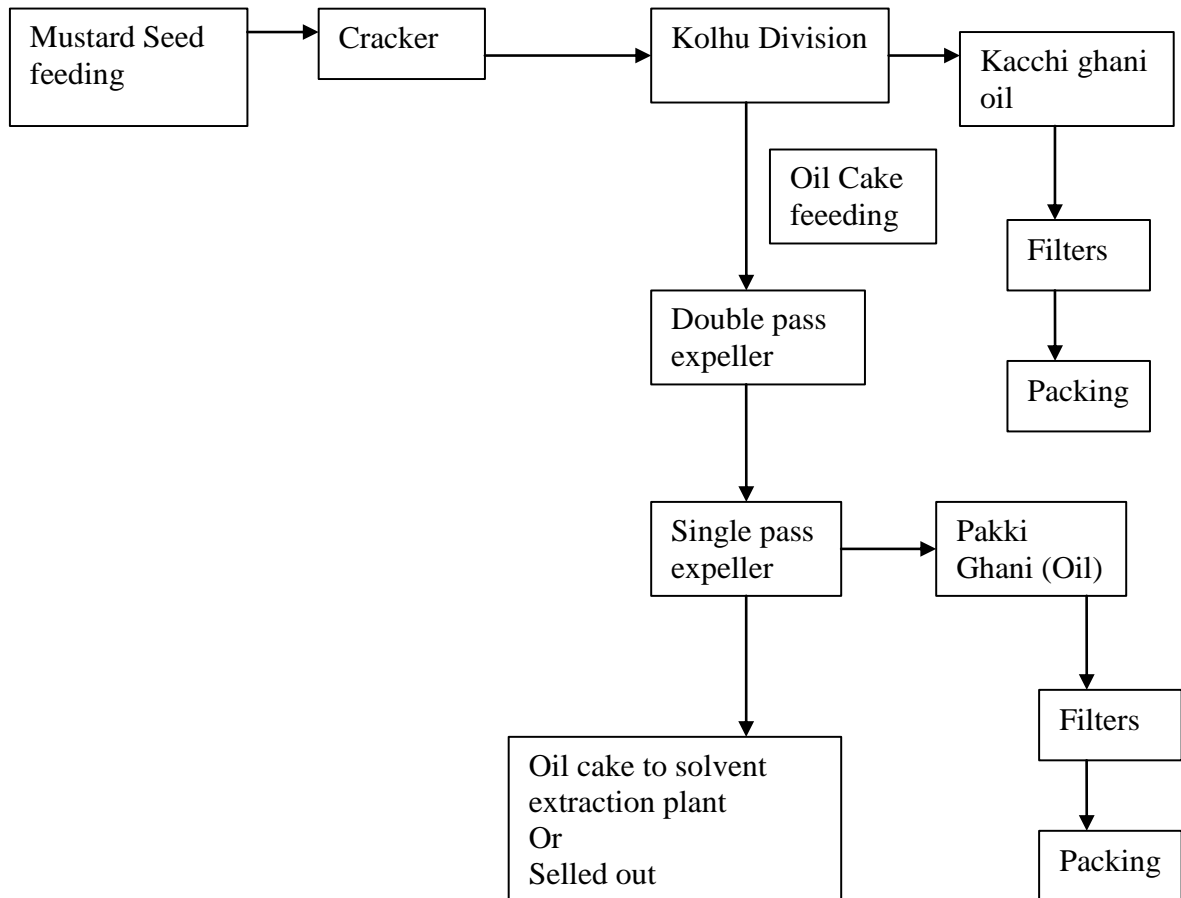


Figure 1.1 Process flow diagram of Oil Mill Units

Mustard Oil Extraction

Raw material used for oil production is mustard seeds, which is purchased from Local Mandi of Alwar and Sawaimadhopur.

Seed cracker cracks the crop of mustard in fine pieces so that it can be further processed in expeller. To get oil from raw mustard seed, it is first given to expeller and the waste (oil cake) from the kolhu is given to Expeller which extracts more oil from the same oil cake. Remaining oil cake is given to solvent extraction plant or sold out in market. Filtered oil goes to oil filling plant where oil is filled in bottles as per requirement and finally packed in cartoon to send at required places across India.

Technology used for process involve expeller run by motors instead of any animal. Single motors run many kolhus, which are connected on same shaft by belts. After extracting oil from machines, it is sent for filtration to fine filter cloth

1.2 Energy performance in existing situation

Oil units in Alwar & Sawaimadhopur regions are having Specific Energy Consumption in range of 10-15 kWh/Quintal of mustard seed processed.

1.2.1 Average Production

Annual production in typical unit in Alwar Cluster is given in Table 1.4.

Table 1.4 Annual Production of a Typical Unit

S. No	Type of Product	Production MT/annum
1	Mustard Oil	122691

1.2.2 Energy Consumption

Energy consumption (electrical) in a typical Oil Mill plant for different types of products is given in Table 1.5 below:

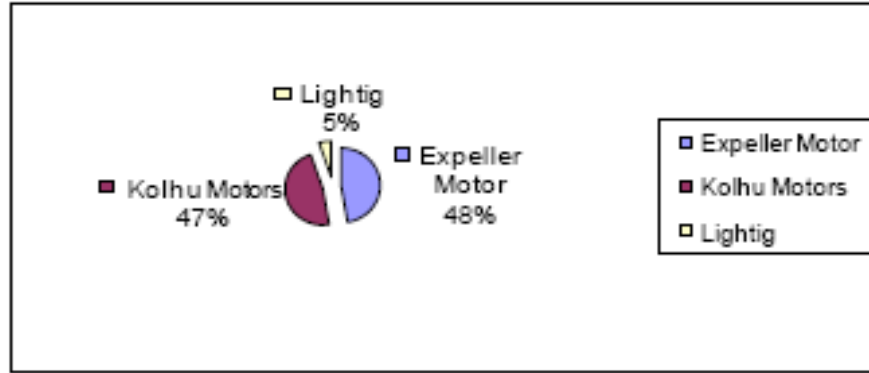


Table 1.5 Annual Energy Consumption

Annual energy consumption is around 186 Lakh Units for processing of around 1240000 quintal of mustard.

Table 1.6 Annual Energy Consumption

S. No	Type of Fuel	Unit	Value	Contribution in equivalent energy terms (%)
1	Electricity	Mwh/year	18.6	100

1.2.3 Specific Energy Consumption

Specific electrical energy consumption is 10 to 15 kWh for quintal of mustard seed processing in Oil Mill industry

1.3 Proposed Technology/Equipment

1.3.1 Description about the existing technology

Expellers and seed crackers are the main area where motors are installed.

50 HP Induction motor is the prime movers for the expeller. At the time of audit following parameters were measured for expeller motor.

Voltage = 405 V
Power = 37.0 KW

It was observed that the maximum of motors are re-winded more than 5 times and were under loaded which leads to higher power consumption and lower operating efficiency.

It was also observed that in most of the units V-belts were used for transferring power from the motor to the process system.

In this DPR, detailed study on replacement of V-belts with flat belts is done.

1.4 Benchmarking for Existing Specific Energy Consumption

Presently the Oil Mill cluster in Alwar is operating with flat belts on motors. Most of the motors are re-winded more than 5 times and were under loaded which leads to higher power consumption and lower operating efficiency.

Also, in most of the units V-belts were used for transferring power from the motor to the process system.

As per recommendations in DPR, replacing V-belts with flat belts will lead to energy savings by 4 to 5% on the energy consumed by the motors.

Advantages:-

- Less power consumption
- High efficiency
- Less losses
-

1.5 Barriers in adoption of proposed technology

1.5.1 Technological Barrier

- Lack of awareness and information of the loss in terms of efficiency with V-Belt
- Due to lack of technical knowledge and expertise, V-belts are used in the Expeller for Oil Mill plants.
- In this cluster, like many others, there is lack of leadership to take up the energy efficiency projects in the plant.

1.5.2 Financial Barrier

Implementation of the proposed project activity requires an investment of Rs. 0.48 Lakhs/belt/ motor. Each unit is having around 4 - 20 motors. This is a significant investment and not commonly seen in the cluster for the implementation of energy efficiency projects.

1.5.3 Skilled Manpower

In Alwar Oil Mill cluster, the availability of skilled manpower is one of the limitations, this issue gets further aggravated due to more number of Oil Mill units as compared to the availability of skilled manpower. One local technical person available at Alwar

takes care of about 2 to 3 Oil Mill units. For major equipments of Oil Mill units like expeller for maintenance or the repair works of these equipments take care by the equipment suppliers itself.

2.0 PROPOSED TECHNOLOGY

2.1 Detailed Description of Technology

2.1.1 Description of Technology

During the audit it was observed that the maximum of motors were re-winded more than 5 times and were operating in under loaded conditions, which leads to approx 2.5 times more power consumption and lower operating efficiency.

Also, in most of the units V-belts were used for transferring power from the motor to the process system.

Theoretically, V-belt drives may have an efficiency of 85% to 90% but the efficiency of loose belts may be lower. The losses in V-belts are higher as the belt wedges-in and wedges-out of the pulley grooves. Due to wedging between V-Belt and Pulley groove, resistance is more. This increases manifold in a misaligned and non-matched belt and pulley.

The resistance causes unnecessary power loss, heat, deterioration of belt and uneven load on different belts. When multiple belts (v-belts) are used, these are generally not tight equally and do not work in synchronism, thus reducing transmission efficiency.

The latest trend is to convert V-belt drives to flat belt drives. There is a potential to save at least 5% energy by using flat belt drives. This is mainly on account of reduced 'WEDGE - IN' and 'WEDGE - OUT' losses.

Also the weight of the flat belt is 1/3 of the V- belt and has an extended life. However, it should be ensured that the area is free from oil or oil spillage. Also care must be taken for proper alignment between the drive and driven equipment. Pulleys also need to be precisely aligned for optimum performance.

They must also be properly spaced for belts to have the right tension. Both parallel and angular misalignment will result in unnecessary friction between belt and pulley.

2.1.2 Technology Specification

For implementation of the proposed project, V-belts with flat belts for 50 HP Pulverisor systems .Details of recommended technology specification are provided in annexure-7 in the Oil Mill plant.

2.1.3 Suitability or Integration with Existing Process and Reasons for Selection

This is the simplest and widely accepted measure for energy cost reduction in all the industries. It does not affect the process but improves the process efficiency since replacing V-belts with Flat belts improves the efficiency of the system.

2.1.4 Availability of Technology

Now days when energy cost is high, it is poor practice to use V-belt on re-winded motors. As far as technology is concerned flat belts are available in local/ national market. It is well proven technology which is adopted in many of the other similar and dissimilar units. Local vendors can arrange Flat belt in place of V- belt at order. Local service providers are also available at Alwar. More details of service provider are given in annexure 5.

2.1.5 Source of Technology

The main source which has taken the initiative to create the awareness for implementation of this project by providing the benefit to the consumers in terms of rupees is the State Electricity Board. With use of flat belt on motors, State Electricity Distribution Board will be able to deliver more power to other industry.

2.1.6 Terms and Conditions after Sale

Warranty period of one year will be provided from the date of invoice against any manufacturing defects.

2.1.7 Process down Time during Implementation

Technology provider will bring the complete setup for the proposed project from their site and make all the arrangements for implementation at the client's site.

2.2 Life Cycle Assessment

Life of the proposed flat belt on motors will be around 4 to 5 years which depends on the operating conditions and maintenance at client's side.

2.3 Suitable Unit for Implementation of the Identified Technology

For estimation of the saving potential on implementation of this project, here the Oil Mill plant engaged in producing mustard oil, having V – belt on motors can be considered.

3.0 ECONOMIC BENEFITS FROM PROPOSED TECHNOLOGY

3.1 Technical Benefits

3.1.1 Electricity savings per year

Replacing existing V-belts with Flat belts have a potential of saving power by 4 to 5%, thus leading to substantial energy saving in Oil Mill plant.

3.1.2 Improvement in product quality

Product quality achieved would be same as the present quality. It does not have any impact in improving the quality of the product. However it improves the overall efficiency of the system and hence reduces power consumption.

3.1.3 Improvement in production

This project is not contributing for increasing in production in Oil Mill plant. But it reduces the power consumption for producing same amount of oil.

3.1.4 Reduction in raw material consumption

Raw material consumption will be the same after the implementation of the proposed project.

3.1.5 Reduction in other losses

This project does not contribute to any reduction in any loss.

3.2 Monetary Benefits

Annual monetary savings with flat belts over Motors will be Rs. 0.21 Lakh/belt/motor.

3.3 Social Benefits

3.3.1 Improvement in Working Environment in the Plant

There is no significant impact of this project in the working environment in the plant.

3.3.2 Improvement in Skill Set of Workers

The technical skills of workers will definitely improve. Training on the regular maintenance will help in improving the technical understanding of the workers.

3.4 Environmental Benefits

The major GHG reduction would be in Co₂ reduction. Emission reductions are estimated at 4.0 tons of Co₂ per annum.

4.0 INSTALLATION OF THE PROPOSED TECHNOLOGY

4.1 Cost of Technology Implementation

Table 4.1 Details of Proposed Technology Installation Cost

S. No.	Particular	Cost (Lakhs)
1	Equipment cost	0.45
2	Other cost	0.015
3	Misc	0.015
4	Total Cost	0.48

4.1.1 Technology Cost

Cost of the project is about 0.48 Lakhs/ motor which include the purchase of belts for motor.

4.1.2 Other Cost

Other costs required will be 0.048 Lakh which includes taxes, commissioning, manpower cost, transportation etc and other miscellaneous costs will be 0.048 Lakh as the contingency amount.

4.2 Arrangements of Funds

4.2.1 Entrepreneur's Contribution

Entrepreneur will contribute 25% of the total project cost which is 0.12 Lakh.

4.2.2 Loan Amount

Remaining 75% cost of the proposed project will be borrowed from bank, which is 0.36 Lakh.

4.2.3 Terms & Conditions of Loan

The interest rate is considered at 10% which is SIDBI's rate of interest for energy efficient projects. The loan tenure is 4 years excluding initial moratorium period is 6 months from the date of first disbursement of loan.

4.3 Financial Indicators

4.3.1 Cash Flow Analysis

Profitability and cash flow statements have been worked out for a period of 5 years. The financials have been worked out on the basis of certain reasonable assumptions, which

are outlined below. The cost of equipment considered is inclusive of hot water storage tanks also.

- The Operation and Maintenance cost is estimated at 10 % of cost of total project with 5 % increase in every year as escalations.
- Interest on term loan is estimated at 10 %.
- Depreciation is provided as per the rates provided in the companies Act.

Based on the above assumptions, profitability and cash flow statements have been prepared and calculated in Annexure-3.

4.3.2 Simple Payback Period

The total project cost of the proposed technology is 0.48 Lakhs and monetary savings due to reduction in electricity consumption is 0.21 Lakh hence, the simple payback period works out to be 2.2 years.

4.3.3 Net Present Value (NPV)

The Net present value of the investment at 12% works out to be 0.011 Lakh.

4.3.4 Internal Rate of Return (IRR)

The after tax Internal Rate of Return of the project works out to be 13%. 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 24%.

Table 4.2 Financial Indicators of Proposed Technology

S No	Particular	Unit	Value
1	Simple Payback	Year	2.2
2	NPV	Rs. In Lakh	0.011
3	IRR	%age	13
4	ROI	%age	24

4.4 Sensitivity analysis in realistic, pessimistic and optimistic scenarios

A sensitivity analysis has been carried out to ascertain how the project financials would behave in different situations like when there is an increase in rupees savings or decrease in rupees savings. For the purpose of sensitive analysis, two following

scenarios have been considered.

- **Optimistic scenario (Increase in monetary savings by 5%)**
- **Pessimistic scenario (Decrease in monetary savings by 5%)**

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

Table 4.3 Sensitivity Analysis in Different Scenarios

Scenario	Monetary Benefit(Rs Lakh/year)	IRR (%)	NPV(in Lakh)	ROI (%)
Pessimistic	0.2	11	-0.01	22
Base	0.21	13	0.011	24
Optimistic	0.22	15	0.039	27

4.5 Procurement and Implementation Schedule

Procurement and implementation schedule required for implementation of this technology is about 8 weeks and 0.5 weeks required as a process break down. Details of procurement and implementation schedules are shown in Table 4.4 below

Table 4.4 Procurement and Implementation Schedule

S. No.	Activities	Weeks						
		1	2	3	4	5	6	7
1	Identification of V-belt motor	■						
2	Planning and material order		■					
3	Procurement			■	■	■		
4	Commissioning						■	■

ANNEXURES

Annexure -1: Energy audit data used for baseline establishment

S. No.	Particular	Unit	Value
1	Expeller motor capacity	hp	50
2	Actual power consumption	kW	37
3	Motor with V-belt	Nos	4-20

Annexure -2: Detailed Technology Assessment Report

S. No	Particular	Unit	Present situation	Proposed situation
1	Power consumption	kW	37	35.5
2	Running hrs	Hrs/day	10	10
4	Power saving	kW		1.5
5	Monetary saving	Rs/yr		0.21

Annexure -3: Detailed Financial Calculations

Templet : Financials for BEE projects		
Name of Project	Replacement of V-belt from motors	
	Units	Value
Cost of equipments	Rs(Lakhs)	0.48
Saving Potential	Rs(Lakhs) per year	0.21
IRR		13
NPV		0.011
ROI		24
Simple payback period	Months	27

Assumptions			
Particulars	Units	Value	Source
Commercial Inputs			
Required Investment	Rs(Lakhs)	0.48	
O&M cost (5% of equipment cost)	Rs(Lakhs)	0.024	
Acceleration in O&M cost per year	%	5%	
Debt/Equity ratio		3 to1	
Debt component of Investment	75%	0.38	
Equity component of investment	25%	0.13	
Interest on term loan	%	10%	SIDBI Lending rates
Loan tenure	Years	4	
Moratorium period	Months	6	
Depreciation rate (Companies act)	%	5.28%	
Depreciation rate (IT act)	%	80%	
Income tax rate	%	33.99%	

Energy Cost reduction with Flat belt in Expeller motor for Oil Mills

PROFITABILITY & IRR Calculations :						
Particulars/ Years		1	2	3	4	5
Total saving	Rs(Lakhs)	0.210	0.210	0.210	0.210	0.210
Expenditure						
O&M Expenditure	Rs(Lakhs)	0.024	0.025	0.026	0.028	0.029
Interest on term loan	Rs(Lakhs)	0.04	0.03	0.02	0.01	0.01
Book depreciation	Rs(Lakhs)	0.025344	0.024005837	0.022738329	0.021538	0.020401
Total expenses		0.087	0.080	0.071	0.063	0.055
PBT	Rs(Lakhs)	0.123	0.130	0.139	0.147	0.155
Tax		0	0.05074068	0.053258534	0.05575	0.058215
PAT		0.123	0.080	0.085	0.091	0.097
Cash Flow Statement		1	2	3	4	5
PAT		0.123	0.080	0.085	0.091	0.097
Add: Depreciation		0.025344	0.024005837	0.022738329	0.021538	0.020401
Add: Interest		0.04	0.03	0.02	0.01	0.01
Net cash In flow		0.186	0.134	0.130	0.126	0.123
Net cash out flow		-0.5				
Net cash flow		-0.3	0.134	0.130	0.126	0.123
		-0.5	0.186	0.134	0.126	0.123
IRR		13%				
NPV		0.011620378928449				
ROI		24%				

Energy Cost reduction with Flat belt in Expeller motor for Oil Mills

Cash statement		1	2	3	4	5
Source						
Equity	0.13					
Loan	0.38					
PAT		0.123	0.080	0.085	0.091	0.097
Depreciation		0.025	0.024	0.023	0.022	0.020
Total	0.50	0.149	0.104	0.108	0.113	0.117
Application						
Capital expenditure	0.5					
Loan repayment		0.04	0.03	0.02	0.01	0.01
Total	0.5	0.04	0.03	0.02	0.01	0.0
Net surplus	0.00	0.111	0.073	0.086	0.099	0.112
Add: Opening balance	0		0.11	0.18	0.27	0.37
Closing balance	0	0.11	0.18	0.27	0.37	0.48
Tax calculation		1	2	3	4	5
PBT	Rs(Lakhs)	0.123	0.130	0.139	0.147	0.155
ADD: Book depreciation		0.025	0.024	0.023	0.022	0.020
SUB: IT Depreciation		0.384	0.005	0.005	0.005	0.004
PBT&D		-0.235	0.149	0.157	0.164	0.171
Tax		0	0.0507	0.05325	0.0557	0.0582

Energy Cost reduction with Flat belt in Expeller motor for Oil Mills

Loan payment schedule :							
YEARS	QUARTERS	BALANCE AT THE BEGINNING OF QUARTER	QUARTER INTEREST	QUARTER'S PRINCIPLE PAYMENT	BALANCE AT THE END OF QUARTER	ANNUAL PRINCIPLE PAYMENT	ANNUAL INTEREST PAYMENT
1	1	0.38	0.01	0.00	0.38	0.04	0.04
	2	0.38	0.01	0.00	0.38		
	3	0.38	0.01	0.02	0.36		
	4	0.36	0.01	0.02	0.34		
2	1	0.34	0.01	0.02	0.32	0.08	0.03
	2	0.32	0.01	0.02	0.29		
	3	0.29	0.01	0.02	0.27		
	4	0.27	0.01	0.02	0.25		
3	1	0.25	0.01	0.02	0.23	0.08	0.02
	2	0.23	0.01	0.02	0.21		
	3	0.21	0.01	0.02	0.19		
	4	0.19	0.00	0.02	0.17		
4	1	0.17	0.00	0.02	0.15	0.08	0.01
	2	0.15	0.00	0.02	0.13		
	3	0.13	0.00	0.02	0.11		
	4	0.11	0.00	0.02	0.08		
5	1	0.08	0.00	0.02	0.06	0.08	0.01
	2	0.06	0.00	0.02	0.04		
	3	0.04	0.00	0.02	0.02		
	4	0.02	0.00	0.02	0.00		

Energy Cost reduction with Flat belt in Expeller motor for Oil Mills

Depreciation schedule :							
Depreciation as per companies act		1	2	3	4	5	
Value of machine at the beginning of year		0.5	0.5	0.4	0.4	0.4	
Depreciation		0.025344	0.024005837	0.022738329	0.02154	0.0204	
Net value at the end of year		0.5	0.4	0.4	0.4	0.4	
Depreciation as per IT act		1	2	3	4	5	
Value of machine at the beginning of year		0.48	0.1	0.1	0.1	0.1	
Depreciation		0.384	0.0050688	0.004801167	0.00455	0.00431	
Net value at the end of year		0.1	0.1	0.1	0.1	0.1	

Annexure:-4 Procurement and implementation schedule

S.NO.	Activities	Weeks						
		1	2	3	4	5	6	7
1	Identification of flat belt on motors							
2	Planning and material order							
3	Procurement							
4	Commissioning							

Annexure:-5 Break-up of Process down Time

S No	Activities	Week		
		1/7	2/7	3/7
1	Dismantling of V-belt from Motor			
2	Installing of flat belt in Place of Old Motors			
3	Testing & Trial			

Annexure -6: Details of technology service providers

Energy Conservation measure	Source of product	Details of Local vendor / service provider
1. Flat belt	Habasit make	Mr. K. Veluswamy

Annexure-7: Quotations or Techno-commercial bids for new technology/equipment

HI/SBU-HARY/ NT-1298

March 26, 2012

The CII – AVANTHA centre for competitiveness

Confederation of Indian Industry

Block -3, Sector-31/A,

Chandigarh 160 030.

Ph 09356859196

KIND ATTN : MR. Yogesh Bhatt, Engineer-Energy

Dear Sirs,

Sub: Supply of imported Habasit make flat belts and flat pulleys - reg.

Ref: Your mail dated 26.03.12

We thank you for your above mail. We take this opportunity to inform you that ours is an Indo-Swiss joint venture company and our collaborator M/s.Habasit AG, Switzerland (ISO 9001:2000) are the world leaders in the field of PU & PVC Conveyor Belts, Energy Efficient Synthetic Flat Belts, Printing Blankets, Feeder Belts, Timing belts and Modular Belts. We import and market their products all over India.

We are specialized in the field of conversion of V Belt drive to ENERGY EFFICIENT FLAT BELT DRIVE. The main advantages are: Energy Saving, High Efficiency, Easy Maintenance and longer life in addition to various other advantages.

We enclose herewith the catalogue on conversion of V to Flat belt for your reference. We furnish below our estimation for your requirements.

Description Price

(inclusive of drive pulley, driven pulley and flat belt)

50 HP drive Rs.45,000.00

40 HP drive Rs.40,000.00

30 HP drive Rs.30,000.00

15 HP drive Rs.22,000.00

Note: The above price may vary depends on the diameter of the pulley and length of the belt.

Add:-

Excise duty : 10% + Cess 2% + Addl Cess 1% (Nil – for Pulleys)

Taxes : CST 5% (or 2% against form "C")

Freight : Extra as applicable

Delivery : Belt – Immediate, Pulley – 4 weeks

Payment : In advance.

-

Thanking you and assuring you of our best services and prompt attention at all times.
Yours faithfully,

for

HABASIT IAKOKA PVT. LTD.,
K. VELUSWAMY
MANAGER-MARKETING cc: D.O
kvsrs

Annexure 8

**To be submitted by Indian company/firm
Seeking financial assistance under
TIFAC-SIDBI Revolving Fund for Technology Innovation**

**सृजन (SRIJAN)
Application Format**

PART A: Brief about the Unit

1.1 Particulars of company / firm

1	Name	
2	Constitution	
3	Year of incorporation / commencement of operations	
4	Address of registered office and site of operations	
5	Main Promoter(s) / contact details	

1.2 Particulars of Promoters

Name (age)	Educational/ Professional qualification	No of years of professional experience	No of years of entrepre- neurial experience	Stake in the firm / company (%)

**1.3 Present line of business and Technology / product successfully developed by
the entity in the past:**

**1.4 Technology know-how Partner (name, designation with educational and
professional background, affiliation address, telephone, fax, e-mail etc.):**

PART B: Technical Information

2 Project title:

2.1 Background:

2.2 Project objectives :

2.3 Major Targets :

2.4 Process / Products proposed to be developed under the project along with specifications etc.:

2.5 Technology development/demonstration in Product/Process

Technology development:

(i) Process:

(ii) Product:

2.5.1 Detailed technology description:

2.6 What is the specialty / novelty / uniqueness / innovation about the technology:

- 2.7 Work already carried out for proof of concept / technology validation:**
 - 2.8 Whether the technology has been already patented. If yes, provide the details:**
 - 2.9 Process flow-charts / schematic diagram etc.:**
 - 2.10 Raw materials and their availability:**
 - 2.11 Comparative advantages / disadvantages over the conventional/ emerging technologies and brief comments on competitions / challenges:**
 - 2.12 Techno-economics, cost benefit analysis and demand statistics in next 2/3 years:**
 - 2.13 Environmental Impact, if any:**
 - 2.14 Work Plan:**
 - 2.14.1 Project Duration (in months):**
 - 2.14.2 Time schedule indicating important activities/milestones & duration (*bar-chart*):**
-

2.15 Deliverables of the project:

2.16 List of existing facilities already available for the proposed project (land, building, machinery, software, manpower, utilities etc.)

PART C: Financial information

3.1 Total Project Cost:

Project head	Area / Qty./ Specifications/ Capacity	Company/Firm Contribution (Lakh)	Contribution from Fund (Lakh)	Total Cost (Lakh)
Cost of construction / augmentation of factory shed for the project				
Technology Know-how fee / patent / licensing				
Equipment / Machinery / Utilities				
Consumables / Raw Materials				
Equipment for Testing & Evaluation / Quality Control				
Manpower Salaries				
Marketing related expenses				
Working Capital Margin				
Others (pl specify)				
Contingency				
Total				

3.2 Means of Finance:

Means of finance	Amount (lakh)
Additional Share capital	
Unsecured loans from	
SIDBI Assistance	
Assistance sought from the Fund	

Others (pl specify)	
Total	

3.3 Detailed Break-up of following Heads of Project Cost with equipment details (in tabular form):

- 3.3.1 Capital Equipment / plants & machinery
- 3.3.2 Testing & Laboratory Equipment
- 3.3.3 Manpower Salaries
- 3.3.4 Consumables/Raw Materials

3.4 What makes the technology different from existing ones and advantage in terms of business opportunities?

3.5 Whether this proposal has been submitted to any other agency for funding support (if yes, give details)

3.6 Financial performance: In case of existing entity, brief business highlights given below (*Pl. enclose last FY audited accounts with auditors report*).

Particular	FY	FY	Particular	(` Lakhs)	
				FY	FY
Revenue			Share Capital (promoters)		
EBDITA			Share capital (others)*		
Profit After Tax (PAT)			Net worth/ Accumulated losses		
Initial/ product dev expenses not written off			Bank term loans		
Net Profit Margin (%)			Unsec loans – promoters		
Debt Equity Ratio (DER)			Unsec loans – others		
			Bank borrowings –WC		

**please provide details*

3.7 Credit/ Banking facilities from SIDBI / other banks/ FIs/ PE or VC or Angel investors in respect of customer (` Lakh)

PE/ VC/ Angel inv/ Bank, branch	Facility	Sanc amt	Outstanding

3.7.1 Whether any over dues in any banking credit facilities by the applicant enterprise/ associate concerns in past 2 years.

- 3.7.2 **Whether any of the accounts of the enterprise/ associate concern classified as NPA/ any restructuring done during past 3 years or any OTS done ever.**
- 3.7.3 **Whether any default in promoters' personal/ consumer loans/credit card payments, etc.**

3.8 Tentative Business projections (in Lakh)

Particular	First Year		Second Year		Third year		Fourth year	
	H1	H2	H1	H2	H1	H2	H1	H2
Sales								
PAT								

4. Key strengths and risk factors

5. Any other relevant information

DECLARATION

I/We certify that all information furnished by me/ us above and in the appendix/annexures/ statements and other papers enclosed is true; I/we have no borrowing arrangements for the unit with any bank / FI except as indicated in the application; that there are no overdues / statutory dues/government enquiry/proceedings/prosecution against the unit/associate concerns/promoters/directors except as indicated in the preliminary information; that no legal action has been/ is being taken against the unit/associate concerns/promoters/directors; that I/ we shall furnish all other information that may be required by SIDBI in connection with my/our application and I/ We have no objection to your furnishing the information submitted by me/ us to any agency as you may deem fit in connection with consideration of the assistance. We have no objection to SIDBI/ its representatives making suitable enquiries while considering the application.

Place:
Signature

Date:
Seal

Name & Designation with

Annexure I

Details of Associate Concerns

Name , Address & products manufactured	Existing since	Name & Address of existing Banker (s)	Facilities Enjoyed	Share holding of the main promoter(s) of applicant unit

Annexure II

Particulars of machinery proposed for the project

Name of machinery, (model / specification)	Name of manufacturer, contact person, e-mail address telephone no	Lead time for delivery Of machinery	Invoice price (for Indigenous machinery) / CIF price (for imported) (Rs. lakh)	Purpose /use of machine.	Basis of selection of supplier	Remark s reg. After Sale Service etc.
Flat belt	Attached Doc.	1 Month	0.48	To Improve energy Efficiency	Techno-commercial competitiveness.	

Annexure III

Details of Misc. Assets / equipment Proposed

S.No.	Name of item	Supplier	Cost (Rs. lakh)	Purpose/ use of MFA	Remarks

Annexure IV

Profitability projections for the unit/company as whole:

S. No.	Items	Actuals for previous years	Y1	Y2	Y3	Y4	Y5	Total
1	Total income		0.21	0.21	0.21	0.21	0.21	1.05
2	Raw material							
	Power and fuel							
	Wages and salaries							
	Selling expenses							
	Other expenses		0.024	0.025	0.026	0.028	0.029	0.133
	Total cost		0.024	0.025	0.026	0.028	0.029	0.133
3	Profit before depreciation, interest and taxes (PBDIT)		0.186	0.185	0.184	0.181	0.18	0.916
4	Interest on term loan		0.04	0.03	0.02	0.01	0.01	0.109
5	Interest on working capital		-	-	-	-	-	-
6	Interest on unsecured land		-	-	-	-	-	-
7	Depreciation		0.025344	0.024	0.022	0.021	0.020	0.114
8	PBT		0.123	0.130	0.139	0.147	0.155	0.695
9	Tax		0	0.050	0.053	0.055	0.058	0.218
10	PAT		0.123	0.080	0.085	0.091	0.097	0.477
11	Dividends/ withdrawal							
12	Cash accruals		0.3896	0.056	0.063	0.07	0.076	0.655
13	Debt service coverage ratio		2.35	1.17	1.23	0.10	0.09	
	Av. DSCR	0.99						

Annexure V
CHECK LIST of documents to be Submitted along with the application

S. No	Documents	Y/N	Reasons for Non-Submission
1	SSI Regn. / CA certificate certifying SSI status.		
2	Certified copies of Memorandum & Articles of association / Partnership Deed.		
3	Audited financial results for the last three years of Applicant unit.		
4	Copies of lease deed / sale deed on which the unit is situated.		
5	Copies of sanction letters from commercial banks/ FIs which have sanctioned assistance to the unit.		
6	NOC from pollution control board/consent letter, if applicable.		
7	IT Returns/Assessment orders/Sales tax returns of the Applicant Unit/ promoters/directors for 2years.		
8	List of existing plant and machinery.		
9	Competitive quotations for machines and Misc.fixed assets proposed to be acquired under the scheme.		
10	Duly signed latest net worth statements of promoters/directors & guarantors in SIDBI format;In case of guarantors please furnish, Name, Age,Father's/Husband's name, residential address.Details of similar guarantee, if any, given to other institutions.		
11	2 sets of photographs along with signatures of all promoters/directors/guarantors duly certified by a Bank or Gazetted Officer.		
12	Audited financial results for last three years for each associate concerns. If applicable.		
13	Copy of title deed of collateral security and valuation report.		



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