DETAILED PROJECT REPORT

ON

ENERGY COST REDUCTION BY REPLACEMENT OF RECIPROCATING COMPRESSORS WITH SCREW COMPRESSOR

Bureau of Energy Efficiency (BEE)

Prepared By

Confederation of Indian Industry

Reviewed By

ISTSL

ENERGY COST REDUCTION BY REPLACEMENT OF RECIPROCATING COMPRESSORS WITH SCREW COMPRESSOR

ALWAR OIL MILL CLUSTER

BEE, 2011

Detailed Project Report on Screw Compressor

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

New Delhi: Bureau of Energy Efficiency

Detail Project Report No.: **ALW/SCW CMP/HC/15**

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Acknowledgement

We sincerely appreciate the efforts of industry, energy auditors, equipment manufacturers, technology providers, consultants and other experts in the area of energy conservation for joining hands with Bureau of Energy Efficiency (BEE), Ministry of Power, Government of India for preparing the Detailed Project Report (DPR) under BEE SME Program in SMEs clusters. We appreciate the support of suppliers/vendors for providing the adoptable energy efficient equipments/technical details to the SMEs.

We have received very encouraging feedback for the BEE SME Program in various SME Clusters. Therefore, it was decided to bring out the DPR for the benefits of SMEs. We sincerely thank the officials of BEE, Executing Agencies and ISTSL for all the support and cooperation extended for preparation of the DPR. We gracefully acknowledge the diligent efforts and commitments of all those who have contributed in preparation of the DPR.

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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 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. This can be taken care by installation of Screw Compressor in place of old Reciprocating Compressors.

Installation of Screw Compressor will reduce the running cost of energy. It helps in reducing the electricity bill amount due to improvement in the specific energy consumption and so reduction in power consumption from the Rajasthan Electricity Board.

Project implementation will lead to reduction in electricity bill by Rs. 1.52 Lakh per year.

Reciprocating Compressors

Number of Reciprocating Compressors in the plant = 4 Nos

Rated CFM = 100 CFM, 50 CFM and 25 CFM (2nos)

Total CFM = 200 CFM

Total power consumption = 42 kW

Screw Compressor

Number of Screw Compressor to be installed in the plant = 1 Nos

Rated CFM = 203 CFM at 7.5 bar

Rated Power Consumption = 30 kW

Saving in Power Consumption = 12 kW

Running hrs = 24 hrs/day

Energy saving = 12 kW x 24 hrs/day

= 288 kWh /day

Monetary saving = 288 kWh/day x330 days/yr Rs. 4.8/kWh

= **Rs. 4.56 Lakhs**

Investment required = **Rs. 7.50 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 energy efficient expeller in place of old expeller is furnished in Table below;

S. No.	Particular	Unit	Value
1	Project cost	(in lakh)	7.50
2	Monetary benefit	(in lakh)	4.56
3	Debit equity ratio	Ratio	3:01
4	Simple payback period	years	1.8
5	NPV	(in lakh)	3.90
6	IRR	%age	33.7
7	ROI	%age	43
8	Process down time	hours	15

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

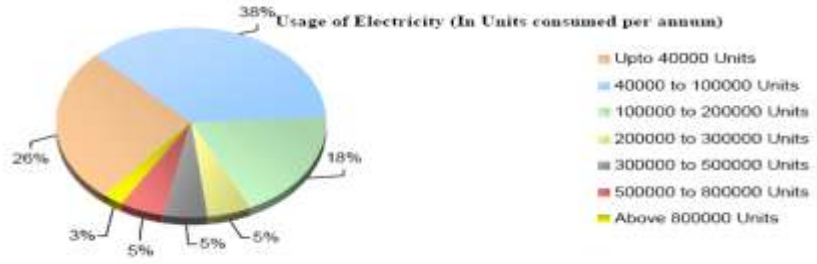
Alwar SME Cluster is one of the largest Oil Mill clusters in India, which is famous for manufacturing of Mustard Oil. The nearest airport is at Jaipur, which is 150 KM from Alwar by road.

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

- USAGE OF ELECTRICITY (IN UNITS CONSUMED PER ANNUM)



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/Quinal 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:

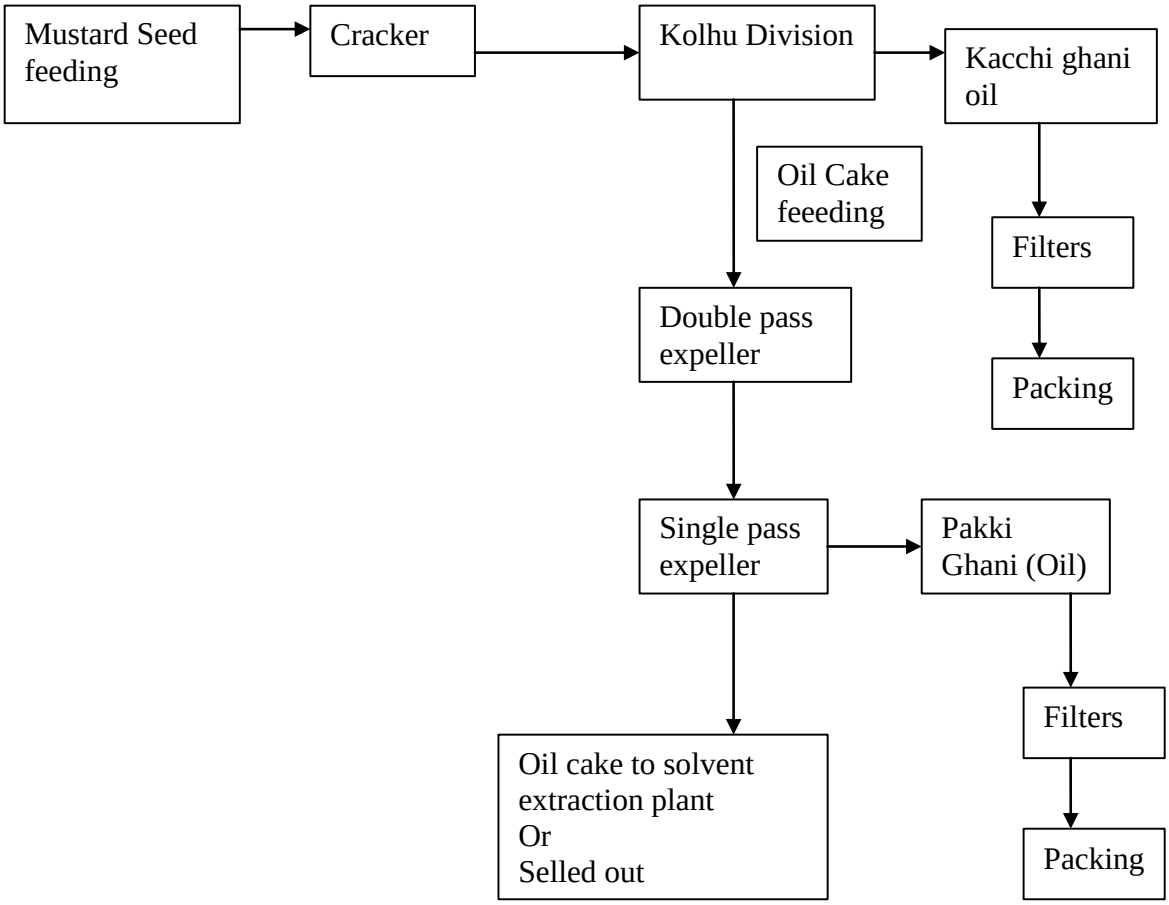


Figure 1.1 Process flow diagram of Oil Mill Units

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 Kolhu and Expeller. To get oil from raw mustard seed, it is first given to Kolhu 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 expellers (Double pass & Single pass), Kolhus 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/Quinal 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:

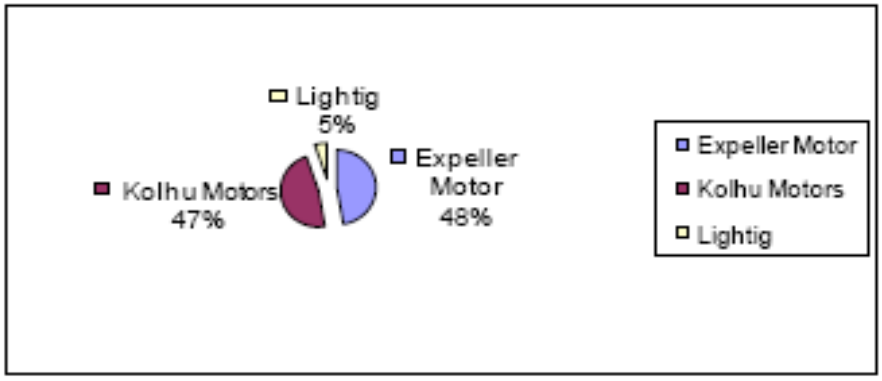


Table 1.5 Annual Energy Consumption

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

Air compressors are one of the major loads at Alwar Oil Mill cluster. There are old reciprocating compressors installed in the plant. On an average compressors are operated for 24 hrs/ day.

The specific energy consumption of a screw compressor is less than reciprocating compressor when operating at same backpressure

These old reciprocating compressors can be replaced with Energy Efficient screw compressor. Energy-efficient expellers are the ones in which, design improvements are incorporated specifically to increase operating efficiency and for reduction in power consumption.

Energy-efficient screw compressors now available in India which operates with lower specific energy consumption as compared to old reciprocating compressors.

1.4 Establishing the Baseline for the Proposed Technology

Presently all the Oil Mill plants at Alwar are operating with very old reciprocating compressors. Installation of Energy efficient screw compressors in place of old reciprocating compressors will save electrical energy.

Advantages:-

- Less power consumption
- Longer life
- 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 for old reciprocating compressors
- 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. 7.50 Lakhs for a 200 CFM compressor. Each unit is having around 3- 4 reciprocating compressors. 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.

2.0 PROPOSED TECHNOLOGY

2.1 Detailed Description of Technology

2.1.1 Description of Technology

Air compressors are one of the major loads at Alwar Oil Mill cluster. There are old reciprocating compressors installed in the plant. On an average compressors are operated for 24 hrs/ day.

The specific energy consumption of a screw compressor is less than reciprocating compressor when operating at same backpressure

These old reciprocating compressors can be replaced with Energy Efficient screw compressor. Energy-efficient expellers are the ones in which, design improvements are incorporated specifically to increase operating efficiency and for reduction in power consumption.

Energy-efficient screw compressors now available in India which operates with lower specific energy consumption as compared to old reciprocating compressors.

2.1.2 Technology Specification

For implementation of the proposed project, old reciprocating compressors must be replaced with screw compressor 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 these types of compressors have low specific power consumption.

2.1.4 Availability of Technology

Now days when energy cost is high, it is poor practice to use old reciprocating compressors. As far as technology is concerned Energy efficient screw compressors are available in local/ national market. It is well proven technology which is adopted in many of the other similar and dissimilar units. 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 energy efficient screw compressor, 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 energy efficient screw compressor will be having longer life 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 old reciprocating compressors can be considered.

3.0 ECONOMIC BENEFITS FROM PROPOSED TECHNOLOGY

3.1 Technical Benefits

3.1.1 Electricity savings per year

Project of Installation of Energy Efficient Screw Compressor in place of Old Reciprocating Compressors will result in savings of electricity consumption in Oil Mill plant.

3.1.2 Improvement in product quality

This project is not contributing to any improvement in product quality, but frequent maintenance can be reduced.

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 installation of Energy Efficient screw compressor will be Rs. 4.56 Lakhs per year.

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

This project will not be contributing for environmental benefits.

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	7.25
2	Other cost	0.15
3	Misc	0.10
4	Total Cost	7.50

4.1.1 Technology Cost

Cost of the project is about 7.25 Lakhs/ screw compressor which includes the purchase of Energy Efficient screw compressor for rated CFM capacity of 200 CFM.

4.1.2 Other Cost

Other costs required will be 0.15 Lakh which includes taxes, commissioning, manpower cost, transportation etc and other miscellaneous costs will be 0.10 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 1.87 Lakhs.

4.2.2 Loan Amount

Remaining 75% cost of the proposed project will be borrowed from bank, which is 5.63 Lakhs.

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 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 7.50 Lakhs and monetary savings due to reduction in electricity consumption is 4.56 Lakh hence, the simple payback period works out to be 1.8 years.

4.3.3 Net Present Value (NPV)

The Net present value of the investment at 12% works out to be 3.9 Lakhs.

4.3.4 Internal Rate of Return (IRR)

The after tax Internal Rate of Return of the project works out to be 33.70 %. 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 43%.

Table 4.2 Financial Indicators of Proposed Technology

S No	Particular	Unit	Value
1	Simple Payback	Year	1.8
2	NPV	Rs. In Lakh	3.9
3	IRR	%age	33.70
4	ROI	%age	43

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	4.33	30	3.35	40
Base	4.56	33.7	3.90	43
Optimistic	4.78	37	4.56	46

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 Old Reciprocating Compressors							
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	Number of Old Reciprocating Compressors		4
2	Total CFM	CFM	200
3	Total Power Consumption	kW	42
4	Number of Screw Compressor		1
5	Rated CFM Capacity	CFM	203
6	Power Consumption	kW	30

Annexure -2: Detailed Technology Assessment Report

S. No	Particular	Unit	Present situation	Proposed situation
1	Power consumption	kW	42	30
2	Running hrs	Hrs/day	24	24
4	Power saving	kW		12
5	Monetary saving	Rs/yr		456000

Annexure -3: Detailed Financial Calculations

Financials for BEE projects		
Name of Project	**Replacement of Old and Inefficient expellers**	
	Units	**Value**
Cost of equipments	Rs(Lakhs)	7.50
Saving Potential	Rs(Lakhs) per year	4.56
IRR		33.7%
NPV		3.90
ROI		43
Simple payback period	Months	20

Assumptions			
Particulars	**Units**	**Value**	**Source**
Commercial Inputs			

Required Investment	Rs(Lakhs)	7.50	
O&M cost (5% of equipment cost)	Rs(Lakhs)	0.375	
Acceleration in O&M cost per year	%	5%	
Debt/Equity ratio		3 to1	
Debt component of Investment	75%	5.63	
Equity component of investment	25%	1.88	
Interest on term loan	%	10%	SIDBI Lending rates
Loan tenure	Years	5	
Moratorium period	Months	6	
Depreciation rate (Companies act)	%	5.28%	
Depreciation rate (IT act)	%	80%	
Income tax rate	%	33.99%	

PROFITABILITY & IRR Calculations						
Particulars/ Years		1	2	3	4	5

Revenue						
Total saving	Rs(Lakhs)	3.56	3.56	3.56	3.56	3.56
Expenditure						
O&M Expenditure	Rs(Lakhs)	0.375	0.394	0.413	0.434	0.456
Interest on term loan	Rs(Lakhs)	0.55	0.45	0.33	0.20	0.08
Book depreciation	Rs(Lakhs)	0.396	0.3750912	0.355286385	0.336527	0.318759
Total expenses		1.326	1.222	1.097	0.974	0.853
PBT	Rs(Lakhs)	3.234	3.338	3.463	3.586	3.707
Tax		0	1.23	1.27	1.30	1.34
PAT		3.234	2.103	2.191	2.277	2.362

Cash Flow Statement						
		1	2	3	4	5
PAT		3.234	2.103	2.191	2.277	2.362
Add: Depreciation		0.396	0.3750912	0.355286385	0.336527	0.318759
Add: Interest		0.55	0.45	0.33	0.20	0.08
Net cash In flow		4.185	2.931	2.874	2.817	2.759
		2.665	1.928	1.871	1.813	1.755
Net cash out flow		-7.5				
Net cash flow		-3.3	2.931	2.874	2.817	2.759
	-7.5	4.185	2.931	2.874	2.817	2.759
IRR	34%					
NPV	3.9					
ROI	43%					

Cash statement

		1	2	3	4	5
Equity	1.88					
Loan	5.63					
PAT		3.234	2.103	2.191	2.277	2.362
Depreciation		0.396	0.375	0.355	0.337	0.319
Total	7.50	3.630	2.478	2.546	2.614	2.680
Application						
Capital expenditure	7.5					
Loan repayment		0.55	0.45	0.33	0.20	0.08
Total	7.5	0.55	0.45	0.33	0.20	0.1
Net surplus	0.00	3.076	2.025	2.218	2.410	2.602
Add: Opening balance	0		3.08	5.10	7.32	9.73
Closing balance	0	3.08	5.10	7.32	9.73	12.33
Tax calculation		1	2	3	4	5
PBT	Rs(Lakhs)	3.234	3.338	3.463	3.586	3.707
ADD: Book depreciation		0.396	0.375	0.355	0.337	0.319
SUB: IT Depreciation		6.000	0.079	0.075	0.071	0.067
PBT&D		-2.370	3.634	3.743	3.852	3.959
Tax		0	1.23	1.27	1.30	1.34

Loan payment schedule								
YEARS	QUARTERS	BALANCE AT THE BEGNING OF QUARTER	QUARTER INTEREST	QUARTER'S PRINCIPEL PAYMENT	BALANCE AT THE END OF QUARTER	ANNUAL PRINCIPEL PAYMENT	ANNUAL INTEREST PAYMENT	Debt Compone
1	1	5.63	0.14	0.00	5.63	0.63	0.55	1.18
	2	5.63	0.14	0.00	5.63			
	3	5.63	0.14	0.31	5.31			
	4	5.31	0.13	0.31	5.00			
2	1	5.00	0.13	0.31	4.69	1.25	0.45	1.70
	2	4.69	0.12	0.31	4.38			
	3	4.38	0.11	0.31	4.06			
	4	4.06	0.10	0.31	3.75			
3	1	3.75	0.09	0.31	3.44	1.25	0.33	1.58
	2	3.44	0.09	0.31	3.13			
	3	3.13	0.08	0.31	2.81			
	4	2.81	0.07	0.31	2.50			
4	1	2.50	0.06	0.31	2.19	1.25	0.20	1.45
	2	2.19	0.05	0.31	1.88			
	3	1.88	0.05	0.31	1.56			
	4	1.56	0.04	0.31	1.25			
5	1	1.25	0.03	0.31	0.94	1.25	0.08	1.33
	2	0.94	0.02	0.31	0.63			
	3	0.63	0.02	0.31	0.31			
	4	0.31	0.01	0.31	0.00			

Depreciation schedule :						
Depreciation as per companies act		1	2	3	4	5
Value of machine at the beginning of year		7.5	7.1	6.7	6.4	6.0
Depreciation		0.396	0.375	0.355	0.336	0.318
Net value at the end of year		7.1	6.7	6.4	6.0	5.7
Depreciation as per IT act		1	2	3	4	5
Value of machine at the beginning of year		7.50	1.5	1.4	1.3	1.3
Depreciation		6	0.07	0.075	0.071	0.067
Net value at the end of year		1.5	1.4	1.3	1.3	1.2

Annexure:-4 Procurement and implementation schedule

S. No.	Activities	Weeks						
		1	2	3	4	5	6	7
1	Identification of Old reciprocating compressors							
2	Planning and material order							
3	Procurement							
4	Commissioning							

Annexure:-5 Break-up of Process down Time

S No	Activities	Weeks		
		1/7	2/7	3/7
1	Dismantling of Old Reciprocating Compressors			
2	Installing Screw Compressor in Place of Reciprocating Compressor			
3	Testing & Trial			

Annexure -6: Details of technology service providers

Energy Conservation measure	Source of product	Details of Local vendor / service provider
1. Energy Efficient Screw Compressor	Atlas Copco	Mr. Enayat Bhutani Sales Engineer Atlas Copco Limited Mob-09316965633 Email – enayat.bhutani@in.atlascpco.com

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

TECHNO-COMMERCIAL OFFER
For
Screw Compressor

Atlas Copco

M/s. CII
Chandigarh

07/11/2011

Subject: Your requirement of Air Compressor

Dear : Mr. Manpreet Singh

We thank you very much for your above referred enquiry and with reference to the same, we would like to submit the following proposal for your requirements.

We shall also take this opportunity to introduce ourselves as Atlas Copco. Atlas Copco is a global leader and continuously maintains its legacy of leadership through continuous research and development. Backed by a century of leading the compressor industry, Atlas Copco products stand for the best in quality and efficiency. Assembly facilities, manufacturing capabilities for production of compressor elements and other core components and all other major operations in the company ISO 9001 and ISO 14001 certified.

Compressor Technique Division:

The compressor technique division of Atlas Copco designs, manufactures, and markets oil-free and oil-injected air compressors, portable air compressors, gas and process compressors, turbo expanders, quality air solution products, air management systems and a wide range of aftermarket products. We offer complete range of compressors from 2 KW to 900 KW in screw compressor.

Leadership Through Innovation -Our Core Strength:

For Atlas Copco it is always a continuous endeavor to introduce new technologies and working methods to improve the customer's efficiency. As results of years of commitments and dedications of the development teams, Atlas Copco has developed products that enhance customers values. Every new products benefits customer in the key areas of noise reductions, energy savings, air treatment and system monitoring and control and integration of functionality.

Quality Air

The quality of compressed air is vital to equipment operation and end product quality within manufacturing and process applications. We at Atlas Copco has developed a complementary range of dryers, filters, drains and other ancillary equipment that includes radical new quality air products.

This includes the latest membrane drying technology, incorporating the most advanced air/water separation fibre techniques, as well as energy saving Air Dryers and efficient Air Filters.

Atlas Copco Compressor Sales — A Division of Atlas Copco (India) Ltd.
Address: DLF IT Park, Tower "C", 3rd Floor, Office No. 6, 161101 Kishangarh, Chandigarh India
Tel:
Fax:
Website: www.atlascopco.com

Atlas Copco launches Rental division in India

ENERGY IS LIFE
BEE
CONSERVE IT

Committed To More Air For Less Power:

As Atlas Copco, being first in mind first in choice for all your compressed air needs is our goal. Delivering best in class air is guarantee. We supply equipment that adds values to your process and hence adds to your profits.

We are committed to provide you with customized air solutions that can be the driving force behind your business.

After Market Support:

Atlas Copco has a wide dealers networks and provides services with trained and certified service engineers, original spare parts, authentic measurement instruments and audits, consulting and monitoring to assure continuous efficiency improvement and optimal reliability of the total compressed air system.

Please find enclosed herewith the following

- Technical Specifications
- Price Schedule
- Terms and Conditions

We trust you will find our offer in order and in line with your requirements. Should you need any further information/ clarification, please feel free to contact us.

Thanking you again for your enquiry and faith reposed in our product.

Yours sincerely

ATLAS COPCO COMPRESSOR SALES

Enayat Bhutani
Sales Engineer

Mobile: 93169 65633
E-Mail: enayat.bhutani@in.atlascopco.com

Price Summary

Product Description	Qty	Unit Ex Works Price	Discounted Ex Works Price
Option 1 : Fixed Speed Machines			
Compressor			
Atlas Copco Make Air Compressor Model GAe 18 FF having capacity of 116 CFM (FAD) at 7.5 bar, having elektronikon and inbuilt dryer. The compressor is coupled with 18 Kw Motor.	1	7,00,000.00	5,25,000.00
Atlas Copco Make Air Compressor Model GA 30 + FF having capacity of 203 CFM (FAD) at 7.5 bar, having elektronikon and inbuilt dryer. The compressor is coupled with 30 Kw Motor.		10,00,000.00	7,50,000.00
Option 2 : Variable Speed Machines			
Compressor			
Atlas Copco Make Air Compressor Model GAe 18 FF VSD having capacity of 33.7 – 112.2 CFM (FAD) at 7 bar, having elektronikon and inbuilt dryer. The compressor is coupled with 18 Kw Drive.	1	10,50,000.00	7,87,500.00
Atlas Copco Make Air Compressor Model GA 37 FF VSD having capacity of 54 – 256 CFM (FAD) at 7 bar, having elektronikon and inbuilt dryer. The compressor is coupled with 37 Kw Drive.	1	15,80,000.00	11,85,000.00

Discount: there would be 3 – 10 discounts over & above ex-work price. However final costing would depend upon final negotiation.

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)*.

(` Lakhs)

Particular	**FY ….**	**FY …..**	**Particular**	**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: **Name & Designation with Seal**

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.**
Reciprocating Compressor	Attached Doc.	3 Months	7.5	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		4.560	4.560	4.560	4.560	4.560	22.8
2	Raw material							
	Power and fuel							
	Wages and salaries							
	Selling expenses							
	Other expenses		0.375	0.394	0.413	0.434	0.456	2.072
	Total cost		1.326	1.222	1.097	0.974	0.853	5.471
3	Profit before depreciation, interest and taxes (PBDIT)		3.23	3.34	2.61	3.58	3.70	16.46
4	Interest on term loan		0.55	0.45	0.33	0.20	0.08	1.617
5	Interest on working capital		-	-	-	-	-	-
6	Interest on unsecured land		-	-	-	-	-	-
7	Depreciation		0.396	0.375	0.3552	0.336	0.318	1.782
8	PBT		3.234	3.338	3.463	3.586	3.707	17.329
9	Tax		0	1.23	1.272	1.309	1.345	5.162
10	PAT		3.234	2.103	2.191	2.277	2.362	12.167
11	Dividends/ withdrawal							
12	Cash accruals		3.62	2.47	2.54	2.6	2.67	
13	Debt service coverage ratio		3.55	1.72	1.82	1.45	1.33	3.55
	Av. DSCR		1.97					

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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(Ministry of Power, Government of India)
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