

# DETAILED PROJECT REPORT ON ENERGY COST REDUCTION WITH VARIABLE FREQUENCY DRIVE OVER COMPRESSOR (ALWAR OIL MILL CLUSTER)



**Bureau of Energy Efficiency (BEE)**

**Prepared By**



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# **ENERGY COST REDUCTION WITH VARIABLE FREQUENCY DRIVE OVER COMPRESSOR**

**ALWAR OIL MILL CLUSTER**

BEE, 2011

**Detailed Project Report on Energy cost reduction with Variable Frequency Drive (VFD) over compressor**

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

New Delhi: Bureau of Energy Efficiency

Detail Project Report No.: **ALW/COM/VFD/13**

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CII – AVANTHA Centre for Competitiveness for SMEs  
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### ***List of Abbreviations***

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



## 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. This can be taken care by Energy Efficient Motors in place of Old / Re-winded Motors.

Implementation of VFD to Compressor will reduce the idle power consumption of the compressor. It helps in reducing the electricity bill amount by availing the benefit and so reduction in power consumption from the Rajasthan State Electricity Board. Project implementation will lead to reduction in electricity bill by Rs. 0.5 Lakh per year.

### **For 100 CFM (18 kW) Compressor**

Load Power – 18 kW

Unload Power – 6 kW

By installing VFD to 18 kW Compressor Unload power can be saved

|                        |                                      |
|------------------------|--------------------------------------|
| Present unloading time | = 40 % of the load time              |
| Load hrs               | = 4775 hrs                           |
| Saving in power        | = 6 kW                               |
| Net saving in power    | = 2.4 kW                             |
| Annual saving          | = 6 kW x Rs 4.8/kWh x 4775 hrs x 0.4 |
|                        | = Rs 0.55 Lakh                       |
| Investment             | = Rs 1.2 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 VFD with a Screw Compressor;

| S. No. | Particular                 | Unit       | Value |
|--------|----------------------------|------------|-------|
| 1      | Project cost               | (in lakh)  | 1.2   |
| 2      | Monetary benefit           | ( in lakh) | 0.55  |
| 3      | Debit equity ratio         | Ratio      | 3:1   |
| 4      | Simple payback period      | years      | 2.1   |
| 5      | NPV                        | (in lakh)  | 0.096 |
| 6      | IRR                        | %age       | 15    |
| 7      | ROI                        | %age       | 26    |
| 8      | Process down time          | hours      | 5     |
| 9      | DSCR                       | Ratio      | 1.09  |
| 10     | Co <sub>2</sub> Reductions | T/yr       | 10.4  |

**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

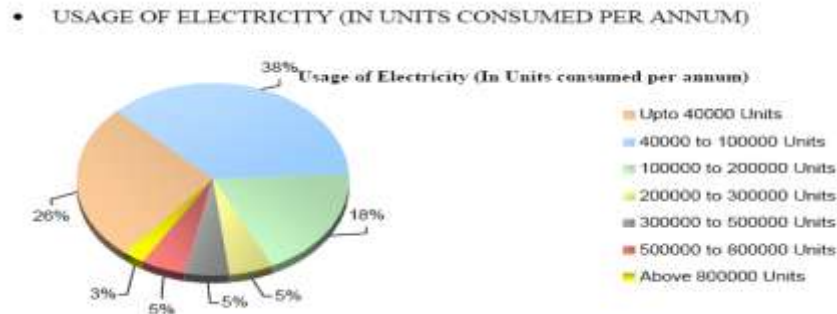
### 1.1 Brief Introduction about the Cluster

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 Sawaimadhapur 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 Sawaimadhapur units lies in range of around 186 Lakhs kWh for processing of 1240000 Quintal of Mustard Seed. Oil units in Alwar & Sawaimadhapur 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     |

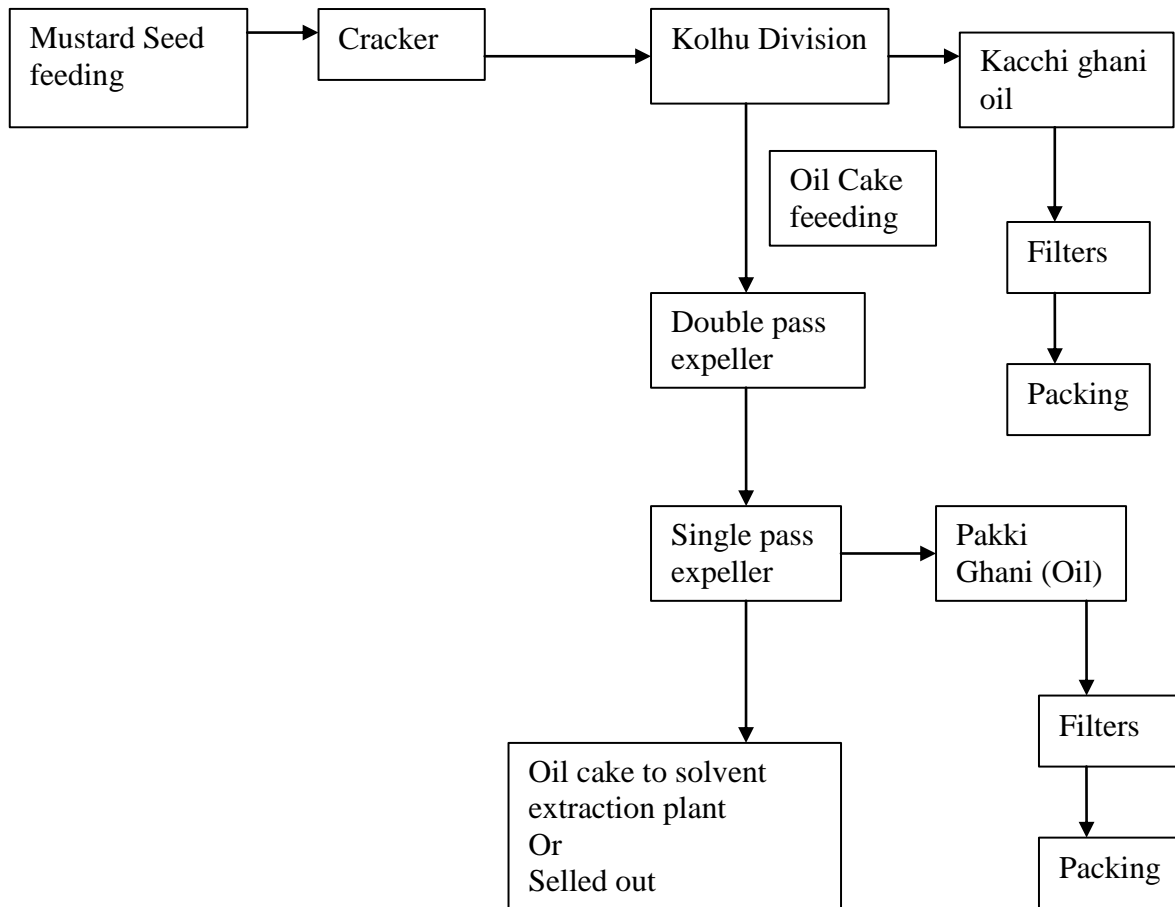
### Products Manufactured

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 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/Quintal of mustard seed processed.

#### 1.2.1 Average Production

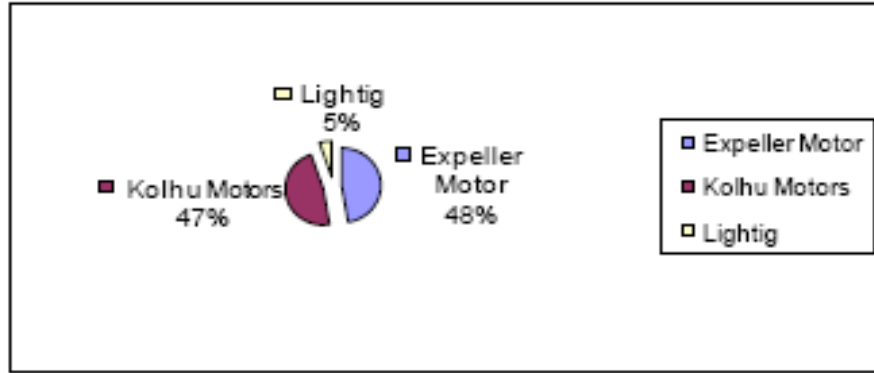
Annual production in typical unit in Alwar Cluster is given in Table 1.4.

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 per 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 being used for compressed air requirement mainly in oil packing machines. Generally reciprocating or screw compressors without any automation, which run on load/unload mode are used in oil mills. The percentage of loading depends on the requirement. Generally compressors are 60 – 70 loaded in oil mills. It means that the compressor run on 30 – 40% unload condition. During unload condition, the compressor does not deliver any air, but consumes unload power.

A Variable Frequency Drive (VFD) Air Compressor is an air compressor that takes advantage of variable-speed drive technology. This type of compressor uses a



special drive to control the speed (RPM) of the unit, which in turn saves energy compared to a fixed speed equivalent.

#### **1.4 Establishing the Baseline for the Proposed Technology**

VFD can be installed with screw air compressors. Installation of Variable frequency drives over compressor will save the un-load power of compressor.

##### **Advantages:-**

- Compressor can be operated at lower average pressure
- No un-loading will occur
- Less leakage at reduced generation pressure
- Better motor efficiency

#### **1.5 Barriers in adoption of proposed technology**

##### **1.5.1 Technological Barrier**

- Lack of awareness and information of the un-loading power loss of compressor
- Due to lack of technical knowledge and expertise, un-loading of compressors is common practice in the 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. 1.2 Lakhs/VFD. Some of the units are having compressors which are of capacity nearly 100 CFM. 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 compressors 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**

A major portion of the electricity bill is attributed to the production of compressed air. The majority of modern foundry units are heavily involved in cutting costs, and energy awareness should be a key concern.

Large electrical cost savings can be achieved by installing a variable speed drive compressor in place of an existing rotary screw.

A Variable Frequency Drive (VFD) Air Compressor is an air compressor that takes advantage of variable-speed drive technology. This type of compressor uses a special drive to control the speed (RPM) of the unit, which in turn saves energy compared to a fixed speed equivalent.

The most common form of VSD technology in the Air Compressor Industry is a variable-frequency drive, which converts the incoming AC power to DC & then back to a quasi-sinusoidal AC power using an inverter switching circuit. The variable-frequency drive article provides additional information on electronic speed controls used with various types of AC motors.

In compressed air system once the required pressure is achieved the compressor is getting unloaded. The loading - unloading pattern indicates the quantity of compressed air requirement in the plant. The higher unload time of the compressor indicates excess capacity available in the compressor

During the unload time, the compressor does not deliver useful work, but operates only to overcome its internal losses. The compressors should be so selected to operate with a minimum unload time.

There is a good potential to save energy by avoiding the unload time of the compressor. This can be achieved by varying the speed of the compressor to match with the compressed air requirement. Speed variation can be carried out by installing a Variable Frequency Drive.

A Variable Frequency Drive (VFD) with the feedback as the receiver pressure would constantly sense even the slightest increase / decrease in the receiver pressure. Accordingly it would vary the speed of the compressor.

This installation of the VFD would completely avoid the unload time and would hence result in tremendous savings in power consumption.

Assumption for VFD to a Compressor

|                        |                                    |
|------------------------|------------------------------------|
| Rated Compressor CFM   | 100                                |
| Compressor Motor       | 18 kW                              |
| Load Power             | 18 kW                              |
| Unload Power           | 6 kW                               |
| Present unloading time | 40 % of the load time              |
| Load time              | 4775 hrs                           |
| Annual saving          | 6 kW x Rs 4.8/kWh x 4775 hrs x 0.4 |
|                        | Rs 0.55 Lakh                       |
| Investment             | Rs.1.2 Lakhs                       |
| Pay Back               | 2.1 years                          |

### 2.1.2 Technology Specification

For implementation of the proposed project, VFD has to be installed to the 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 motors have high efficiency.

### 2.1.4 Availability of Technology

Now days when energy cost is high, it is poor practice to use compressor in load / unload mode. As far as technology is concerned VFD over compressor 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 VFD 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 VFD over 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. During the final connection with the main supply of the oil plant, breakdown period of 2 to 3 hours will be required.

### **2.2 Life Cycle Assessment**

Life of the proposed Variable frequency drive will be around 100,000 hours 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, have air compressor of 100 CFM installed in the plant.

### **3.0 ECONOMIC BENEFITS FROM PROPOSED TECHNOLOGY**

#### **3.1 Technical Benefits**

##### **3.1.1 Electricity savings per year**

Implementation of this project will provide an annual saving of Rs 0.55 Lakh by installing a Variable Frequency Drive , reducing the RPM of the motor and optimizing the unload power consumption.

##### **3.1.2 Improvement in product quality**

This project is not contributing to any improvement in product quality, but frequent unloading of compressor can be avoided.

##### **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.

##### **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 VFD over compressor will be Rs. 0.55 Lakh per year/compressor.

#### **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 Co<sub>2</sub> reduction. Emission reductions are estimated at 10.4 tons of Co<sub>2</sub> 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 | 0.96          |
| 2      | Other cost     | 0.12          |
| 3      | Misc           | 0.12          |
| 4      | Total Cost     | 1.2           |

#### 4.1.1 Technology Cost

Cost of the project is about 1.2 Lakhs/VFD which includes the purchase of Variable Frequency Drive.

#### 4.1.2 Other Cost

Other costs required will be 0.12 Lakh which includes taxes, commissioning, manpower cost, transportation etc and other miscellaneous costs will be 0.12 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 0.3 Lakh.

### 4.2.2 Loan Amount

Remaining 75% cost of the proposed project will be borrowed from bank, which is 0.9Lakh.

### 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 5 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 1.2 Lakhs and monetary savings due to reduction in electricity consumption is 0.55 Lakh hence, the simple payback period works out to be 2.1 years.

#### 4.3.3 Net Present Value (NPV)

The Net present value of the investment at 12% works out to be 0.096 Lakh.

#### 4.3.4 Internal Rate of Return (IRR)

The after tax Internal Rate of Return of the project works out to be 15%. 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 26%.

**Table 4.2 Financial Indicators of Proposed Technology**

| S No | Particular     | Unit        | Value |
|------|----------------|-------------|-------|
| 1    | Simple Payback | Year        | 2.1   |
| 2    | NPV            | Rs. In Lakh | 0.096 |
| 3    | IRR            | %age        | 15    |
| 4    | ROI            | %age        | 26    |

#### 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 | 0.5225                          | 13      | 0.02         | 24      |
| Base        | 0.55                            | 15      | 0.096        | 26      |
| Optimistic  | 0.5775                          | 18      | 0.169        | 29      |

**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 compressor without VFD | ■     |   |   |   |   |   |   |
| 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      | Compressor capacity | CFM  | 100   |
| 2      | Compressor power    | kW   | 18    |
| 3      | Unloading           | %    | 40    |

### Annexure -2: Detailed Technology Assessment Report

| S. No | Particular         | Unit  | Present situation |
|-------|--------------------|-------|-------------------|
| 1     | Compressor Motor   | kW    | 18                |
| 2     | Loading Power      | kW    | 18                |
| 3     | Un - Loading Power | kW    | 6                 |
| 4     | Monetary saving    | Rs/yr | 55000             |

### Annexure -3: Detailed Financial Calculations

| Templet: Financials for BEE projects |                                       |       |
|--------------------------------------|---------------------------------------|-------|
| Name of Project                      | Implementation of VFD over compressor |       |
|                                      | Units                                 | Value |
| Cost of equipments                   | Rs(Lakhs)                             | 1.2   |
| Saving Potential                     | Rs(Lakhs) per year                    | 0.55  |
| IRR                                  | %                                     | 15    |
| NPV                                  | Lakhs                                 | 0.096 |
| ROI                                  | %                                     | 26    |
| Simple pay back period               | Months                                | 25    |

| <b>Assumptions</b>                |              |              |                     |
|-----------------------------------|--------------|--------------|---------------------|
| <b>Particulars</b>                | <b>Units</b> | <b>Value</b> | <b>Source</b>       |
| Commercial Inputs                 |              |              |                     |
| Required Investment               | Rs(Lakhs)    | 1.2          |                     |
| O&M cost (5% of equipment cost)   | Rs(Lakhs)    | 0.06         |                     |
| Acceleration in O&M cost per year | %            | 5%           |                     |
| Debt/Equity ratio                 |              | 3 to1        |                     |
| Debt component of Investment      | 75%          | 0.95         |                     |
| Equity component of investment    | 25%          | 0.32         |                     |
| 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%       |                     |

Energy Cost Reduction with VFD over Compressor in Oil Mills

| PROFITABILITY & IRR Calculations : |           |       |       |        |       |        |
|------------------------------------|-----------|-------|-------|--------|-------|--------|
| Particulars/ Years                 |           | 1     | 2     | 3      | 4     | 5      |
| Total saving                       | Rs(Lakhs) | 0.550 | 0.550 | 0.550  | 0.550 | 0.550  |
| Expenditure                        |           |       |       |        |       |        |
| O&M Expenditure                    | Rs(Lakhs) | 0.060 | 0.063 | 0.066  | 0.069 | 0.073  |
| Interest on term loan              | Rs(Lakhs) | 0.09  | 0.08  | 0.06   | 0.03  | 0.01   |
| Book depreciation                  | Rs(Lakhs) | 0.063 | 0.060 | 0.0568 | 0.053 | 0.051  |
| Total expenses                     |           | 0.217 | 0.199 | 0.178  | 0.157 | 0.137  |
| PBT                                | Rs(Lakhs) | 0.333 | 0.351 | 0.372  | 0.393 | 0.413  |
| Tax                                |           | 0     | 0.135 | 0.141  | 0.147 | 0.1540 |
| PAT                                |           | 0.333 | 0.216 | 0.230  | 0.245 | 0.259  |
| Cash Flow Statement                |           | 1     | 2     | 3      | 4     | 5      |
| PAT                                |           | 0.333 | 0.216 | 0.230  | 0.245 | 0.259  |
| Add: Depreciation                  |           | 0.063 | 0.060 | 0.056  | 0.053 | 0.051  |
| Add: Interest                      |           | 0.09  | 0.08  | 0.06   | 0.03  | 0.01   |
| Net cash In flow                   |           | 0.490 | 0.352 | 0.342  | 0.333 | 0.323  |
| Net cash out flow                  |           | -1.3  |       |        |       |        |
| Net cash flow                      |           | -0.8  | 0.352 | 0.342  | 0.333 | 0.323  |
|                                    |           | -1.3  | 0.490 | 0.352  | 0.333 | 0.323  |
| IRR                                |           | 15%   |       |        |       |        |
| NPV                                |           | 0.096 |       |        |       |        |
| ROI                                |           | 26%   |       |        |       |        |

| Cash statement |      | 1     | 2     | 3     | 4     | 5     |
|----------------|------|-------|-------|-------|-------|-------|
| Source         |      |       |       |       |       |       |
| Equity         | 0.32 |       |       |       |       |       |
| Loan           | 0.95 |       |       |       |       |       |
| PAT            |      | 0.333 | 0.216 | 0.230 | 0.245 | 0.259 |
| Depreciation   |      | 0.063 | 0.060 | 0.057 | 0.054 | 0.051 |

Energy Cost Reduction with VFD over Compressor in Oil Mills

|                        |           |        |       |       |       |       |
|------------------------|-----------|--------|-------|-------|-------|-------|
| Total                  | 1.26      | 0.397  | 0.276 | 0.287 | 0.299 | 0.310 |
|                        |           |        |       |       |       |       |
| Application            |           |        |       |       |       |       |
| Capital expenditure    | 1.3       |        |       |       |       |       |
| Loan repayment         |           | 0.09   | 0.08  | 0.06  | 0.03  | 0.01  |
| Total                  | 1.3       | 0.09   | 0.08  | 0.06  | 0.03  | 0.0   |
|                        |           |        |       |       |       |       |
| Net surplus            | 0.00      | 0.304  | 0.199 | 0.232 | 0.264 | 0.297 |
| Add: Opening balance   | 0         |        | 0.30  | 0.50  | 0.73  | 1.00  |
| Closing balance        | 0         | 0.30   | 0.50  | 0.73  | 1.00  | 1.30  |
|                        |           |        |       |       |       |       |
|                        |           |        |       |       |       |       |
|                        |           |        |       |       |       |       |
| Tax calculation        |           | 1      | 2     | 3     | 4     | 5     |
|                        |           |        |       |       |       |       |
| PBT                    | Rs(Lakhs) | 0.333  | 0.351 | 0.372 | 0.393 | 0.413 |
| ADD: Book depreciation |           | 0.063  | 0.060 | 0.057 | 0.054 | 0.051 |
| SUB: IT Depreciation   |           | 0.960  | 0.013 | 0.012 | 0.011 | 0.011 |
| PBT&D                  |           | -0.563 | 0.398 | 0.417 | 0.435 | 0.453 |
| Tax                    |           | 0      | 0.135 | 0.141 | 0.147 | 0.154 |

Energy Cost Reduction with VFD over Compressor in Oil Mills

| Loan payment schedule : |          |                                     |                  |                             |                               |                          |                         |                |
|-------------------------|----------|-------------------------------------|------------------|-----------------------------|-------------------------------|--------------------------|-------------------------|----------------|
| YEARS                   | QUARTERS | BALANCE AT THE BEGINNING OF QUARTER | QUARTER INTEREST | QUARTER'S PRINCIPAL PAYMENT | BALANCE AT THE END OF QUARTER | ANNUAL PRINCIPAL PAYMENT | ANNUAL INTEREST PAYMENT | Debt Component |
| 1                       | 1        | 0.95                                | 0.02             | 0.00                        | 0.95                          | 0.11                     | 0.09                    | 0.20           |
|                         | 2        | 0.95                                | 0.02             | 0.00                        | 0.95                          |                          |                         |                |
|                         | 3        | 0.95                                | 0.02             | 0.05                        | 0.89                          |                          |                         |                |
|                         | 4        | 0.89                                | 0.02             | 0.05                        | 0.84                          |                          |                         |                |
| 2                       | 1        | 0.84                                | 0.02             | 0.05                        | 0.79                          | 0.21                     | 0.08                    | 0.29           |
|                         | 2        | 0.79                                | 0.02             | 0.05                        | 0.74                          |                          |                         |                |
|                         | 3        | 0.74                                | 0.02             | 0.05                        | 0.68                          |                          |                         |                |
|                         | 4        | 0.68                                | 0.02             | 0.05                        | 0.63                          |                          |                         |                |
| 3                       | 1        | 0.63                                | 0.02             | 0.05                        | 0.58                          | 0.21                     | 0.06                    | 0.27           |
|                         | 2        | 0.58                                | 0.01             | 0.05                        | 0.53                          |                          |                         |                |
|                         | 3        | 0.53                                | 0.01             | 0.05                        | 0.47                          |                          |                         |                |
|                         | 4        | 0.47                                | 0.01             | 0.05                        | 0.42                          |                          |                         |                |
| 4                       | 1        | 0.42                                | 0.01             | 0.05                        | 0.37                          | 0.21                     | 0.03                    | 0.24           |
|                         | 2        | 0.37                                | 0.01             | 0.05                        | 0.32                          |                          |                         |                |
|                         | 3        | 0.32                                | 0.01             | 0.05                        | 0.26                          |                          |                         |                |
|                         | 4        | 0.26                                | 0.01             | 0.05                        | 0.21                          |                          |                         |                |
| 5                       | 1        | 0.21                                | 0.01             | 0.05                        | 0.16                          | 0.21                     | 0.01                    | 0.22           |
|                         | 2        | 0.16                                | 0.00             | 0.05                        | 0.11                          |                          |                         |                |
|                         | 3        | 0.11                                | 0.00             | 0.05                        | 0.05                          |                          |                         |                |
|                         | 4        | 0.05                                | 0.00             | 0.05                        | 0.00                          |                          |                         |                |

| <b>Depreciation schedule :</b>            |       |        |       |       |       |
|---|-------|--------|-------|-------|-------|
|   | Years |        |       |       |       |
| Depreciation as per companies act         | 1     | 2      | 3     | 4     | 5     |
| Value of machine at the beginning of year | 2.8   | 2.7    | 2.5   | 2.4   | 2.3   |
| Depreciation                              | 0.147 | 0.1400 | 0.132 | 0.12  | 0.119 |
| Net value at the end of year              | 2.7   | 2.5    | 2.4   | 2.3   | 2.1   |
|   | Years |        |       |       |       |
| Depreciation as per IT act                | 1     | 2      | 3     | 4     | 5     |
| Value of machine at the beginning of year | 2.80  | 0.6    | 0.5   | 0.5   | 0.5   |
| Depreciation                              | 2.24  | 0.029  | 0.028 | 0.026 | 0.025 |
| Net value at the end of year              | 0.6   | 0.5    | 0.5   | 0.5   | 0.5   |

| Depreciation schedule :                   |  |        |       |       |        |        |
|---|--|--------|-------|-------|--------|--------|
|   |  |        |       |       |        |        |
| Depreciation as per companies act         |  | 1      | 2     | 3     | 4      | 5      |
|   |  |        |       |       |        |        |
| Value of machine at the beginning of year |  | 1.2    | 1.1   | 1.1   | 1.0    | 1.0    |
| Depreciation                              |  | 0.0636 | 0.060 | 0.056 | 0.0538 | 0.051  |
| Net value at the end of year              |  | 1.1    | 1.1   | 1.0   | 1.0    | 0.9    |
|   |  |        |       |       |        |        |
| Depreciation as per IT act                |  | 1      | 2     | 3     | 4      | 5      |
|   |  |        |       |       |        |        |
| Value of machine at the beginning of year |  | 1.20   | 0.2   | 0.2   | 0.2    | 0.2    |
| Depreciation                              |  | 0.96   | 0.012 | 0.012 | 0.011  | 0.0107 |
| Net value at the end of year              |  | 0.2    | 0.2   | 0.2   | 0.2    | 0.2    |

**Annexure:-4 Procurement and implementation schedule**

| S.NO. | Activities   | Weeks |   |   |   |   |   |   |
|-------|--|-------|---|---|---|---|---|---|
|       |  | 1     | 2 | 3 | 4 | 5 | 6 | 7 |
| 1     | Identification of compressor with loading unloading mode | ■     |   |   |   |   |   |   |
| 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     | Load –unload time and power data recording and analysis | ■   |
| 2    | Installation of VFD to compressor |       | ■   |     |
| 3    | Testing & Trial                   |       |   | ■   |



**Annexure -6: Details of technology service providers**

| Energy Conservation measure  | Source of product          | Details of Local vendor / service provider   |
|------------------------------|----------------------------|--|
| 1. Variable Frequency Drives | Rockwell Automation        | <p>Vijay Asri<br/>                     Area Manager Drives (North)<br/>                     Email: (vkumar3@ra.rockwell.com)<br/>                     Cell: +91-9811504179</p>   |
| 2. Variable Frequency Drives | Rockwell Automation        | <p>Vijay Kumar Bhat<br/>                     Product Manager Drives (India)<br/>                     Email - (vkbhat@ra.rockwell.com)<br/>                     Cell: +91-9899787392</p>  |
| 3. Variable Frequency Drives | Danfoss Industries Pvt Ltd | <p>Sanjeev Kumar Sanju<br/>                     Senior Manager – Industry Sales (Projects)<br/>                     Email – <a href="mailto:sanju_s@danfoss.com">sanju_s@danfoss.com</a><br/>                     Cell -+91-9810243088</p> |

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

**From:** Vijay Kumar Bhat [mailto:vkhat@ra.rockwell.com]

**Subject:** CII - BEE Cluster - VFD Request

Dear Sir,  
Please find the information attached,

**1. Quotation / tentative pricing of the Variable Frequency Drives for the motors ranging from 15 – 100 HP**

| HP Rating | Voltage | Qty | Tentative prices Rs INR | Remark  |
|-----------|---------|-----|-------------------------|---|
| 15        | 415V    | 1   | 85000                   | Approximate drive prices given.<br>Actual pricing will depend upon the project scope and final Negotiation done |
| 20        | 415V    | 1   | 100000                  |   |
| 25        | 415V    | 1   | 130000                  |   |
| 30        | 415V    | 1   | 160000                  |   |
| 40        | 415V    | 1   | 210000                  |   |
| 50        | 415V    | 1   | 260000                  |   |
| 60        | 415V    | 1   | 320000                  |   |
| 75        | 415V    | 1   | 370000                  |   |
| 100       | 415V    | 1   | 500000                  |   |

**2. Name / Details of the concerned person to be included in the DPR and the Cluster manuals.**

PI add three contacts

For North

Vijay Asri

Area Manager Drives (North)

Email: (vkumar3@ra.rockwell.com)

Cell: +91-9811504179

Vijay Kumar Bhat

Product Manager Drives (India)

(vkhat@ra.rockwell.com)

Cell: +91-9899787392

Rockwell Automation centralised Customer care contacts

ccareindia@ra.rockwell.com

Cell: 0120-4671600

Toll Free: 1 800 2000 121

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**Annexure 8**

**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 entrepreneurial 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:**

| <b>Project head</b>   | <b>Area / Qty./ Specifications/ Capacity</b> | <b>Company/Firm Contribution ( Lakh)</b> | <b>Contribution from Fund ( Lakh)</b> | <b>Total Cost ( Lakh)</b> |
|---|--|--|---------------------------------------|---------------------------|
| 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   |  |  |                                       |                           |
| <b>Total</b>  |  |  |                                       |                           |

**3.2 Means of Finance:**

| <b>Means of finance</b>    | <b>Amount ( lakh)</b> |
|----------------------------|-----------------------|
| Additional Share capital   |                       |
| Unsecured loans from ..... |                       |
| SIDBI Assistance           |                       |

---

|                                 |  |
|---------------------------------|--|
| Assistance sought from the Fund |  |
| Others (pl specify)             |  |
|                                 |  |
| <b>Total</b>                    |  |

**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.**



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### 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. |
|--|---|-------------------------------------|--|------------------------------|------------------------------------|---------------------------------------|
| Variable Frequency Drive                   | Attached Doc.   | 1 Month                             | 1.2  | 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   |                            | 0.55   | 0.55  | 0.55   | 0.55  | 0.55  | 2.75  |
| 2      | Raw material   |                            |        |       |        |       |       |       |
|        | Power and fuel   |                            |        |       |        |       |       |       |
|        | Wages and salaries                                     |                            |        |       |        |       |       |       |
|        | Selling expenses                                       |                            |        |       |        |       |       |       |
|        | Other expenses   |                            | 0.060  | 0.063 | 0.066  | 0.069 | 0.073 | 0.332 |
|        | Total cost   |                            | 0.060  | 0.063 | 0.066  | 0.069 | 0.073 | 0.332 |
| 3      | Profit before depreciation, interest and taxes (PBDIT) |                            | 0.49   | 0.487 | 0.484  | 0.481 | 0.477 | 2.419 |
| 4      | Interest on term loan                                  |                            | 0.09   | 0.08  | 0.06   | 0.03  | 0.01  | 0.272 |
| 5      | Interest on working capital                            |                            | -      | -     | -      | -     | -     | -     |
| 6      | Interest on unsecured land                             |                            | -      | -     | -      | -     | -     | -     |
| 7      | Depreciation   |                            | 0.063  | 0.060 | 0.056  | 0.053 | 0.05  | 0.285 |
| 8      | PBT  |                            | 0.333  | 0.351 | 0.372  | 0.393 | 0.413 | 1.862 |
| 9      | Tax  |                            | 0      | 0.135 | 0.1416 | 0.147 | 0.154 | 0.579 |
| 10     | PAT  |                            | 0.333  | 0.216 | 0.230  | 0.245 | 0.259 | 1.283 |
| 11     | Dividends/ withdrawal                                  |                            |        |       |        |       |       |       |
| 12     | Cash accruals  |                            | 0.3963 | 0.276 | 0.286  | 0.298 | 0.31  | 1.56  |
| 13     | Debt service coverage ratio                            |                            | 2.47   | 1.23  | 1.29   | 0.24  | 0.22  |       |
|        | Av. DSCR   | <b>1.09</b>                |        |       |        |       |       |       |

**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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