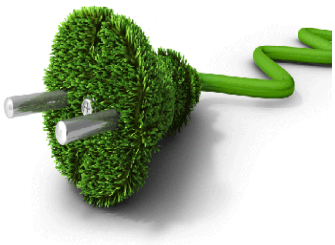
DETAILED PROJECT REPORT
ON
SOLAR WATER HEATING SYSTEM
(SOLAPUR TEXTILE CLUSTER)



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Bureau of Energy Efficiency

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SOLAR WATER HEATING SYSTEM

SOLAPUR TEXTILE CLUSTER

BEE, 2010

Detailed Project Report on Solar Water Heating System (2000 LPD)

Textile SME Cluster, Pune, Maharashtra (India)

New Delhi: Bureau of Energy Efficiency;

Detail Project Report No.: **SLP/TXT/SHW/03**

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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 Abbreviation

BEE	Bureau of Energy Efficiency
DPR	Detailed Project Report
DSCR	Debt Service Coverage Ratio
FD	Forced Draft
GHG	Green House Gases
HP	Horse Power
IBR	Indian Boiler Regulation
IRR	Internal Rate of Return
ID	Induced Draft
NPV	Net Present Value
ROI	Return on Investment
SME	Small and Medium Enterprises
SIDBI	Small Industries Development Bank of India

EXECUTIVE SUMMARY

Zenith Energy Services Pvt. Ltd is executing BEE - SME program in Solapur textile cluster, supported by Bureau of Energy Efficiency with an overall objective of improving the energy efficiency in cluster units.

Since Solapur cluster is one of the largest clusters in textile sector in India, accordingly this cluster was chosen for energy efficiency improvements by implementing energy efficient technologies, so as to facilitate maximum replication in other textile clusters in India. Solapur textile cluster is mainly famous for cotton towel and bed sheet products. The main form of energy used in the cluster units are grid electricity, wood, and small quantity of coal. Wood and coal are used in boiler for generating hot water which is further used in dyeing of yarn.

This DPR highlighted the energy, environment, economic and social benefits by replacing **less efficient existing technology i.e. conventional chulhas with 2000 LPD solar water heating system (SWHS).**

The project activities reduce overall wood consumption by 42 tonnes per year and there is no saving in electricity consumption.

Project cost, debt equity ratio, monetary benefit, simple payback period, internal rate of return, net present value, dept service coverage ratio etc for proposed solar water heating system are furnished in table below:

S.No	*Parameter*	*Unit*	*Value*
1	Project cost	₹ in lakh	3.47
2	Debit equity ratio	Ratio	3:1
3	Monetary benefit	₹ in lakh	1.26
4	Simple payback period	Years	2.75
5	Net present value in 3 years @ 10.00%	₹ in lakh	0.43
6	Internal rate of return	%	14.51
7	Return on Investment	%	27.21
8	Average debt service coverage ratio	Ratio	1.50
9	Procurement and implementation schedules	Week	8-10

The projected profitability and financial indicators shows that the project will be able to earn profit from inception and replacement of conventional chulhas with SWHS project is financially viable and technically feasible.

ABOUT BEE SME PROGRAMME

Bureau of Energy Efficiency (BEE) is implementing a BEE-SME Programme to improve the energy performance in 25 selected SMEs clusters. Solapur Textile Cluster is one of them. The BEE's SME Programme intends to enhance the energy efficiency awareness by funding/subsidizing need based studies in SME clusters and giving energy conservation recommendations. For addressing the specific problems of these SMEs and enhancing energy efficiency in the clusters, BEE will be focusing on energy efficiency, energy conservation and technology upgradation through studies and pilot projects in these SMEs clusters.

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

Energy use and technology studies

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 stakeholders 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 INTRODUCTION

1.1 About the SME cluster

The products manufactured in Solapur Textile Cluster are cotton terry towels and bed sheets. The towels and bed sheets manufactured in the Solapur cluster are renowned in the country and have good market in India. The main raw material for the units is cotton yarn, which is procured from local spinning mils and agents. The cost of energy (electrical and thermal energy) as percentage of manufacturing cost varies between 8 and 10%.

Majority of the cluster units are of integrated type, where the raw material yarn is processed in-house to the final product. The energy cost is second to the raw materials cost. Majority of the units in the cluster are dependent on local / run of the mill technologies of low end and with little investment initiatives and technology up-gradation.

The main energy forms used in the cluster units are grid electricity, wood, and small quantity of coal. The electricity is used in power looms, doubling machines, winding machines, hydro extractors, warping machines and lighting. Wood is used as fuel for thermic fluid heaters, boilers and chulhas for hot water generation. The details of annual energy consumption of a typical unit having a production capacity of approximately 86,400 kg are furnished in the Table 1.1below:

Table 1.1Energy consumption of a typical unit

S.No	Particular	Unit	Value
1	Electricity consumption	kWh	1,03,500
2	Wood consumption	tonnes	42
3	Production	kg	86,400

Production processg

The main operational process for production of towels and bed sheets in cluster units are:

Doubling

In the Doubling process, thin single yarn is converted to double yarn for strengthening the yarn by using doubling machine.

Yarn dyeing

Initially, the yarn is soaked in soap water for 24 hours to remove the dirt and other foreign

**Details of Mayuri Textiles, Solapur*

materials and thereafter yarn is taken for bleaching. Bleaching is carried out by soaking the yarn in tanks mixed with bleaching agents and after completion of the process; the yarn is washed with normal water.

The hank dyeing machine tanks are filled with required quantity of normal water and required chemicals and dyeing agents are added. The temperature of the water is raised by oil circulation or direct steam injection. Fire wood is used as fuel. The required colors are added to the yarn and the dyeing process takes about 90 to 120 minutes per batch. After dyeing, the yarn is washed with normal water, and the yarn is taken for soaping for colour fixation in hot water for about 20 minutes in hank dyeing machines. The water is drained to the waste drainage lines.

Drying

The wet yarn is taken to hydro extractors for removing the water in the yarn and taken for natural drying in the sunlight.

Winding

The yarn after drying is taken for winding in which the yarn is wounded to bobbins and cones. The winded yarn is taken for further process.

Warping

In warping, the winded yarn is wound to beams according to designed pattern (customized designs). Then the beams are taken for Weaving.

Weaving

The beams, which are wound with yarn are taken and placed in power looms where the designed pattern is already set. In power looms, the yarn is converted to final product (towel or bed sheets) by weaving machine. The product obtained from weaving is taken for stitching and packing. The general process flow diagram of a typical unit for production of towels and bed sheets is furnished in Figure 1.1 below.

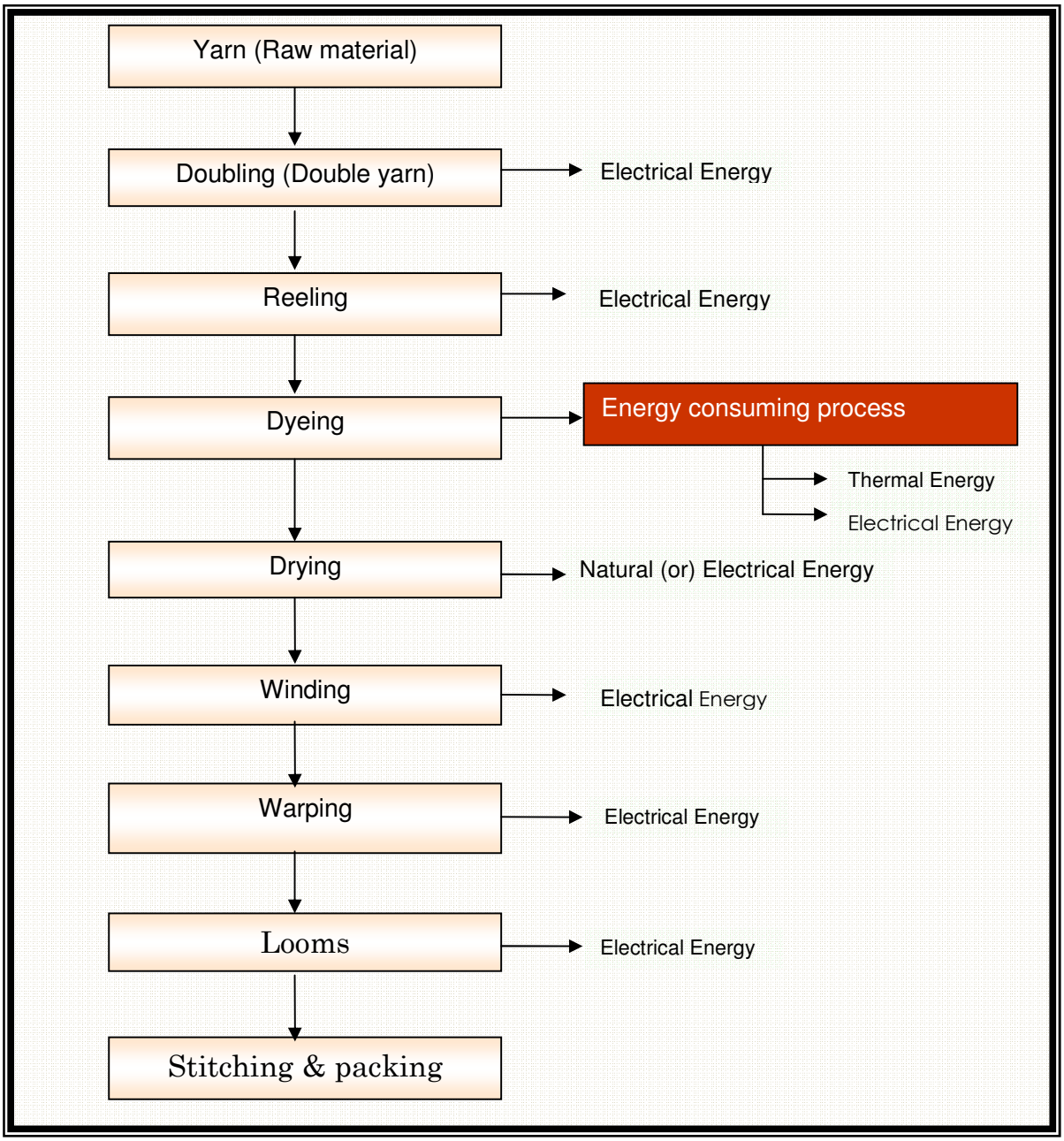


Figure 1.1 Process flow chart of typical textile unit

The production process as depicted above is similar for all textile units in Solapur textile cluster. However, depending on type of product and product quality, the above stated process flow varies as per the requirement.

1.2 Energy performance in Solapur textile cluster

The main energy sources for Solapur cluster units are electricity and fuels such as Wood & GN Husk briquettes. The wood and GN husk briquettes are used as fuel for thermic fluid

heaters, boilers and chulhas for hot water generation and electricity is used for operation of prime movers of doubling machine motors, ID fans, pumps, hank dyeing machine drives, power loom drives, winding machine motors, etc. Majority of the units in the Solapur textile cluster are using wood for thermal energy generation due to their easy availability and cost competitiveness.

Energy cost is around 8 to 10 percent of manufacturing cost in typical manufacturing unit, out of which the cost of thermal energy works out to 42 percent of the total energy cost and remaining accounts for electrical energy.

In a typical textile manufacturing unit of the cluster, the annual electricity and wood consumption is 1, 03,500 kWh and 42 tonnes respectively. Average production capacity of typical textile manufacturing unit is around 86,400 kg per annum.

1.2.1 Specific energy consumption

Specific electrical and thermal energy consumption in textile units depends on the final product manufactured in that unit.

The average specific fuel consumption per kg of the yarn (dyeing process only) for 3 typical units having chulhas for hot water generation is furnished below in Table 1.2.

Table 1.2 Specific energy consumption of typical units

S.No.	*Name of unit*	*Specific fuel consumption kg of wood/kg of yarn*
1	Yemul Textiles	0.48
2	SRL Towel Industry	0.44
3	Burgul Textiles	0.37

1.3 Identification of technology/equipment

1.3.1 Description of technology/equipment to be replaced

During energy use and technology audit studies in various textile industries in Solapur textile cluster, it has been observed that about 250 to 300 conventional chulhas having poor energy efficiency are being used in entire cluster. The performance of various existing chulhas are evaluated and furnished in Annexure 1.

Figure 1.2 Conventional chulhas operations at typical textile industry

From energy use and technology gap audit studies in various textile industries in Solapur textile cluster, the following were identified:

- Energy efficiency improvement opportunities
- Environment and working conditions improvement
- Design flaws in the conventional chulhas

Technical gap analysis in wood fired boiler

The following technology gaps in wood fired inefficient chulhas are identified in a typical unit:

- The conventional local chulha has no mechanism for air circulation and smoke removal
- Heat losses through the grate openings from the front and back end sides
- No control on air supply for combustion
- Radiation losses from all sides of the chulha
- Lack of monitoring of wood feeding

From the above mentioned analysis it is clear that the performance of the existing conventional chulhas is poor in terms of energy, environment and social aspects. Based on above facts, the present inefficient chulhas is to be replaced with solar hot water system (SHWS).

1.3.2 Role in process

For production of towels and bed sheets of different colours, the dyeing of cotton yarn is vital and dyeing process requires hot water. The chulhas is used for hot water generation and also to maintain the constant temperature during the dyeing and soaping process.

1.4 Establishing the baseline for the technology/equipment

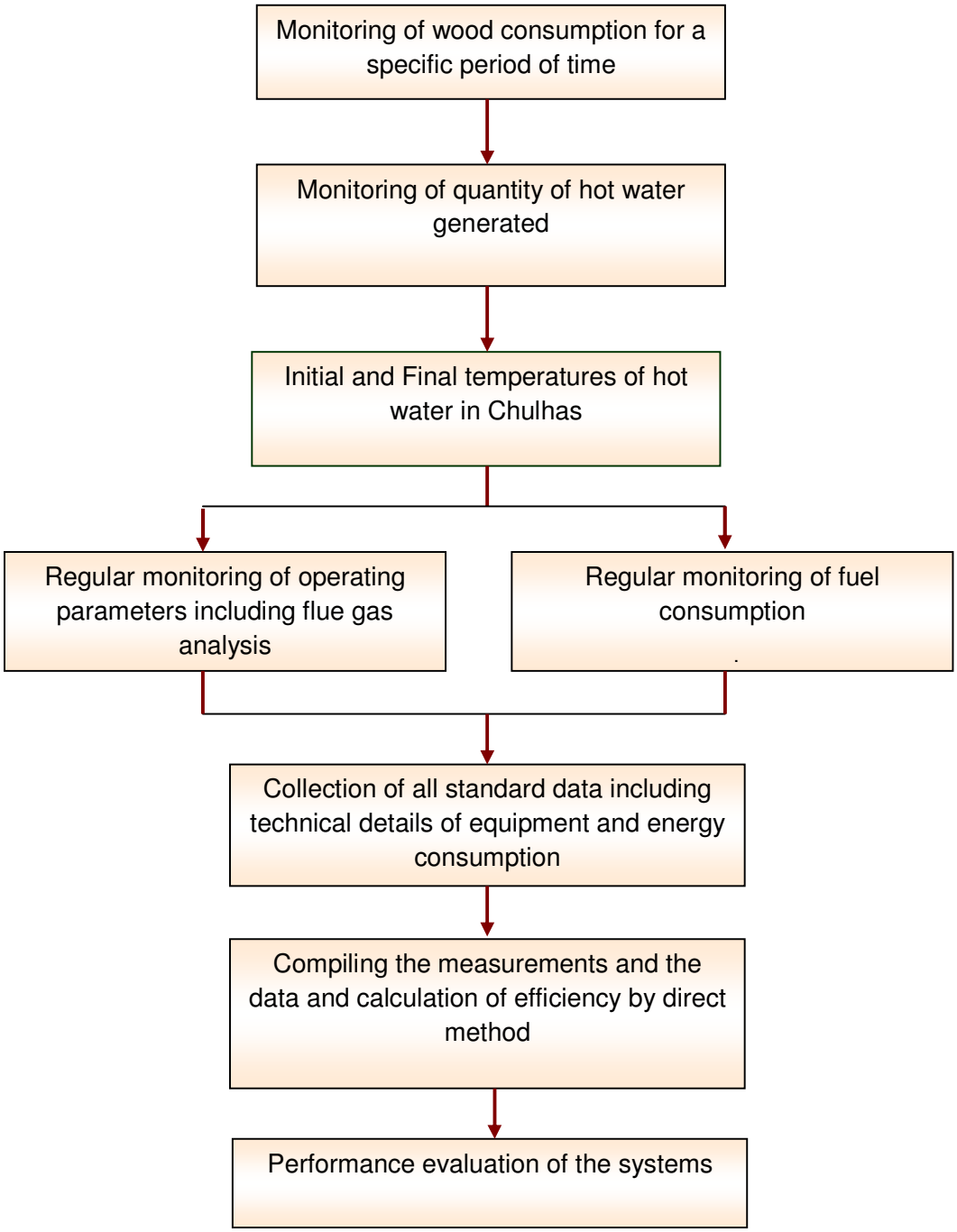
Energy consumption in chulhas would depend on the followings:

- Cold water temperature
- Dyeing temperature which depends on the color of the yarn
- Quantity of hot water required
- Climate conditions
- Type of wood and its calorific value

Energy use and technology audit studies were conducted in various units of Solapur textile cluster, the baseline energy consumption of present inefficient chulhas and their performance data is attached in Annexure 1.

1.4.1 Energy audit methodology adopted

The following methodology was adopted to evaluate the performance of boilers:


Monitoring of wood consumption for a specific period of time
Monitoring of quantity of hot water generated
Initial and Final temperatures of hot water in Chulhas
Regular monitoring of operating parameters including flue gas analysis
Regular monitoring of fuel consumption
Collection of all standard data including technical details of equipment and energy consumption
Compiling the measurements and the data and calculation of efficiency by direct method
Performance evaluation of the systems

1.4.2 Operating efficiency

The operating efficiency of the chulhas installed in various units of the cluster used for hot water generation for 3 units is furnished in Table 1.3 below and also details of efficiency calculation are shown in Annexure 1.

Table 1.3 Operating efficiency of three different units

S.No	Name of the unit	Unit	Value
1	Yemul Textiles	%age	6.25
2	Burgul Textiles	%age	5.04
3	Chatla Textiles	%age	6.2

1.5 Barriers in adoption of proposed technology / equipments

Major barriers in the upgradation of technology in the cluster are

- Non availability of desired technology in the local market
- Distrust on technology supplier
- Lack of information about energy efficiency

The other barriers identified for implementation of energy efficiency in Solapur textile cluster are as under:

1.5.1 Technological Barrier

The major technical barriers that prevented the implementation of SWHS in typical unit:

- Lack of awareness and information about the new and emerging technologies available in the market.
- A lack of awareness about the favorable lifecycle economics of SWHS technology vis à vis present system of hot water generation
- Dependence on local equipment suppliers for uninterrupted after sales service
- The lack of technical know-how made it impossible for the textile unit owners to identify the most effective technical measures.
- The availability of solar radiation is intermittent in nature and hence, the production process may disrupt and need to depend on auxiliary heating system, which requires additional investment and maintenance of the equipments.

1.5.2 Financial Barrier

The Financial barriers for adoption of SWHS are most common. Some major financial barriers which prevent the implementation of proposed technology are:

- Implementation of the proposed project activity requires investment of ₹ 3.47 lakh, which is a significant investment and not commonly seen in the cluster for energy efficiency.
- Low cost of conventional fuel is the main reason for low demand or low penetration of SWHS technology. Further, the high initial cost of the solar hot water system due to dependence on expensive imported systems makes the SWH technology costly leading to reluctance in its adoption by cluster units.
- Relative high investment and comparative low returns is also one of the major financial barriers for the adoption of SWHS.
- The majority of the unit owners are of the view that it makes business sense for them to invest in enhancing production capacity rather than making investment in energy efficiency.
- The unit owners in the cluster are wary of approaching banks for financial assistance due to their old perception that getting loan sanctioned from Banks involves lot of paper work / documentation and needs collateral security. .

However, the financial attractiveness of the project activity and the other benefits such as subsidy & depreciation for the equipments may motivate the unit owners to move forward in adopting SWHS.

1.5.3 Manpower skill

Skilled manpower is not required for adoption / operation of SWHS.

1.5.4 Other barrier (if any)

Some of the SME unit owners are willing to adopt SWHS technology however they often encounter difficulty in finding credible local suppliers of SWHS who can provide system design and further assist them in installation and maintenance of SWHS.

2 TECHNOLOGY/EQUIPMENT FOR ENERGY EFFICIENCY IMPROVEMENTS

2.1 Solar water heating system (SWHS)

2.1.1 Description of technology/equipment

The Solar Hot Water Systems consists of two main parts:

- Solar collector
- Storage tank

The collector used in such SWHS is of flat-plate type. The solar radiation directly falls on the collector surface and the solar energy is converted into thermal energy. Water is circulated in tube and gets heated by solar energy. Heated water is then stored in the storage tank for use in the process. However, the existing conventional system is sometimes also maintained to provide the thermal heat required during inclement weather conditions.

Figure 2.1: Solar hot water system

Solar water heating systems can be either active or passive. However, the present DPR is prepared for passive solar water system which is most commonly used.

Passive solar water heaters

Passive solar water heating system works on Thermosyphon principal. Such systems are economical and reliable choice. These systems rely on the natural convection of water. As water in the solar collector heats, it becomes lighter and rises naturally into the storage tank above. Meanwhile, the cooler water flows down the pipes to the bottom of the collector, enhancing the circulation.

Solar collectors

Solar collectors are the key component of SWHS. Solar collectors gather the sun's energy, transform its radiation into heat, and then transfer that heat to water. There are several types of solar collectors viz flat-plate collector, evacuated-tube collector and integer collector-storage system. However, Flat –plate collectors are generally used.

Flat-plate collectors

Flat-plate collectors are the most common solar collector for SWHS. A typical flat-plate collector is an insulated metal box with a glass or plastic cover (called the glazing) and a dark-colored absorber plate. These Collectors, heat liquid or air at temperatures less than 80℃. Liquid flat-plate collector's heat liquid as it flows through tubes in or adjacent to the absorber plate. The simplest liquid systems use potable water, which is heated as it passes directly through the collector and then flows to the process line.

Comparison of conventional chulhas with SWHS is shown in Table 2.1below:

Table 2.1 Comparison of chulhas with SWHS

S. No	*Details*	*Chulhas*	*SWHS*
1	Wood consumption	High	No fuel required
2	Environment pollution	High	Pollution free
3	Safety of workers	Poor	Good
4	Maintenance	High	Low (only cleaning of collector surface)
5	Operational cost	High	Nill
6	Availability of local service providers	Yes	Yes / limited
7	Hot water generation	Continuous	Intermittent
8	Fuel cost	High	Nill
9	Man power	Required	No required
10	GHG emission	High	No GHG emission

Though, the availability of hot water is intermittent and requirement of hot water is partially met, the other benefits of solar hot water systems such as relatively nil operational and maintenance cost, clean and free form of energy and other economic benefits such as

availability of capital subsidy and accelerated depreciation etc makes it attractive proposition for the cluster units to install solar hot water system.

2.1.2 Equipment specification

Equipment specification of SWHS along with terms of sales, performance guarantee and after sales services details are furnished in Annexure 8.

2.1.3 Suitability with existing process

The proposed new equipment is used for hot water generation which was earlier generated by conventional chulhas. Hence proposed equipment is suitable with existing process.

2.1.4 Availability of equipment / technology

Based on the detailed energy use and technology audits conducted in various textile industries in Solapur textile cluster, it is suggested to install solar hot water system of 2000 LPD capacity for dyeing and soaping process.

The company representatives of various solar equipment suppliers are locally available in Solapur and these companies will also provide necessary guidance for documentation required for getting loan and financial incentives available for installing SWHS.

The technology provider identified has successfully implemented SWHS in few units of the cluster.

2.1.5 Source of equipment supplier

The technology/service provider "M/s TATA BP Solar India Ltd" is one of the leading companies in India engaged in the manufacture and supply of SWHS and having experience of more than 3 decades. Details of other service providers are given in Annexure 7.

2.1.6 Technical specifications of equipment

Technical and design specifications of proposed SWHS are given in Table 2.2 below:

Table 2.2: Technical specifications

Details	*Units*	*Value*
Name of equipment	NA	Solar water heating system
Model	NA	VIJRA
Capacity	LPD	1000
Temperature of hot water	^{o}C	60
Ambient temperature	^{o}C	25

Details	Units	Value
Transmitivity	%age	85

VAJRA 1000 LPD Non-Press, Non- HHC, Thermosyphon type Solar Water Heating system @ 60 deg. C consisting of:

- 1 nos. x 1000 lit. insulated SS304 hot water storage tanks,
- 8 nos. of TBP make solar flat plate collectors,
- Mounting stand for tanks & collectors,

Detail technical specifications of SWHS are shown in Annexure 7.

2.1.7 Terms and conditions in sales of SWHS

The terms and conditions of the company for supply of solar hot water system are shown in Table 2.3 below:

Table 2.3 Terms & conditions of sale for energy efficient boiler

Particular	Condition
Price	Transportation, Loading - Unloading & Handling Charges at actual
Insurance	0.45%
Taxes	CST 4% and exempted from excise duty
Delivery	7 weeks from the date of order with advance
Inspection	Inspection of equipment prior dispatch, at your own cost
Commissioning	Included in total cost
Inspection	At our works prior to dispatch
Guarantee	18 months from the date of Performa invoice or 12 months from the date of completion of installation, which ever is less

2.1.8 Process down time during Implementation

There is no process down time, as the proposed equipment is additional equipment.

2.2 Life cycle of equipment

The life expectancy of SWHS is 8-12 year depending upon its maintenance, cleaning and uses.

2.3 Suitable unit for Implementation of proposed equipment

Large quantities of hot water is required in the dyeing process and the proposed system will give an output of 2000 LPD, which replaces about 2000 LPD hot water generation in conventional chulha systems .

3 ECONOMIC BENEFIT DUE USES OF SWHS

3.1 Technical benefit

3.1.1 Fuel saving

The wood savings due to installation of SWHS in a typical unit having 2000 LPD hot water generation capacity is estimated as 42 tonnes per annum. The wood savings is estimated based on the present Chulhas efficiency of 5.04 %

3.1.2 Electricity saving

Project implementation will not save electricity consumption.

3.1.3 Improvement in product quality

Product quality achieved would be same as the present quality. It does not have any impact in improving the quality of the product.

3.1.4 Increase in production

The proposed equipment does not contribute to any increase in production.

3.1.5 Reduction in raw material consumption

Raw material consumption is same even after the implementation of proposed technology.

3.2 Monetary benefits

Annual monetary savings due to implementation of SWHS in place of the conventional chulhas is ₹ 1.26 lakh per annum. Energy & monetary benefit analysis of energy efficient boiler is presented in Table 3.1 below:

Table 3.1: Energy and cost benefit analysis of energy efficient boiler

S.No	*Parameter*	*Unit*	*Value*
1	Wood consumption in existing chulhas	Tonnes/annum	42
2	Operational hours	hours	8
3	Operational days per annum	Days	240
4	Wood consumption in proposed equipment	Tonnes/annum	Nill
5	Wood saving	Tonnes/annum	42
6	Cost of wood	₹/Tonne	3000
7	Total monetary benefit	₹ in lakh	1.26

3.2 Social benefits

3.2.1 Improvement in working environment in the plant

The replacement of inefficient chulhas with SWHS will reduce the wood consumption and will improve the work condition and environment.

3.2.2 Improvement in skill set of workers

The technology implemented will create awareness among the workforce towards clean and renewable energy systems.

3.2.3 Impact on wages/emoluments

No significant impact on wages and emoluments of the workers.

3.3 Environmental benefits

3.3.1 Reduction in effluent generation

There is no major impact in effluent generation due to implementation of the project

3.3.2 Reduction in GHG emission such as CO_2, NOx

Implementation of this project will lead to reduction in CO_2 emissions due to reduction in overall fuel consumption. Implementation of this project will result in saving of 42 tonnes of wood per year thereby; reducing 59 tonnes of CO_2 emissions per year from one unit. Similarly, there are many similar type of unit in Solapur, and if all units will implement this project then significant amount of CO_2 emission reduction possible per year. This will also help in getting the carbon credit benefit through Clean Development Mechanism (CDM) project.

Taking CO_2 emission factor as 1.4 tCO_2 per tonnes of wood consumption

3.3.3 Reduction in other emissions like SOx

As wood doesn't contain sulphur and hence there is no impact on SO_x emissions.

3.3.4 Reduction of deforestation

Proposed SWHS will reduce wood consumption in unit thus automatically reduce the deforestation.

4 INSTALLATION OF NEW ENERGY EFFICIENT EQUIPMENT

4.1 Cost of project

4.1.1 Cost of equipment

The total cost of equipment and machinery is estimated ₹ 3.35 lakh, , the total cost includes for solar collectors, insulated hot water tanks of SS make, mounting stands for hot water tank & collectors besides the installation & commissioning cost.

4.1.2 Other costs

Other cost includes erection & commissioning cost which is ₹ 0.03 lakh, and interest during implementation which is ₹ 0.09 lakh. The total cost of implementation of the SWHS is estimated at ₹ 3.47 lakh and furnished in Table 4.1 below:

Table 4.1: Details of project cost

S.No	*Details*	*Cost (₹ in lakh)*
1	Equipment and machinery	3.35
2	Erection & Commissioning	0.03
3	Investment without interest	3.38
4	Interest during implementation	0.09
5	**Total**	**3.47**

4.2 Arrangement of funds

4.2.1 Entrepreneur's contribution

The total cost of the proposed technology is estimated at ₹ 3.47 lakh. The entrepreneur's contribution is 25% of total project cost, which is ₹ 0.87 lakh.

4.2.2 Loan amount

The term loan is 75% of the total project cost, which is ₹ 2.60 lakh.

4.2.3 Subsidy by Government

As the overall energy efficiency in the project is more than 15% it qualifies for subsidy of 25 % of the project cost as per the NMCP scheme of Ministry of MSME, GoI. 25 % of the project cost in this case works out to ₹ 0.87 lakh. As the subsidy is normally available after implementation of the project the same has not been taken in the project cost and means of

finance. On receipt of subsidy from Ministry of MSME, GoI through the nodal agency the amount of subsidy is generally set off [reduced] from the loan outstanding by the lender bank. Availability of this subsidy will make the project economically more attractive.

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

Considering the above mentioned assumptions, the net cash accruals starting with ₹ 0.71 lakh in the first year operation and gradually increases to ₹ 1.73 lakh at the end of sixth year.

4.3.2 Simple payback period

The total project cost of the proposed technology is ₹ 3.47 lakh and monetary savings due to reduction in wood consumption is ₹ 1.26 lakh hence the simple payback period works out to be 2.75 years.

4.3.3 Net Present Value (NPV)

The net present value of the investment at 10 % works out to be ₹ 0.43 lakh.

4.3.4 Internal rate of return (IRR)

The after tax internal rate of return of the project works out to be 14.51%.

4.3.5 Return on investment (ROI)

The average return on investment of the project activity works out at 27.21%.

Details of financial indicator are shown in Table 4.2 below:

Table 4.2: Financial indicator of project

S. No	*Particulars*	*Unit*	*Value*
1	Simple Pay Back period	Month	33
2	IRR	%	14.51
3	NPV	lakh	0.43
4	ROI	%age	27.21
5	DSCR	Ratio	1.50

4.4 Sensitivity analysis

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 fuel savings or decrease in fuel savings. Following two scenarios has been considered

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

In each scenario, other inputs are assumed as constant. The financial indicators in each of the above situation are indicated along with standard indicators in Table 4.3 below:

Table 4.3: Sensitivity analysis in different scenario

Particulars	*DSCR*	*IRR*	*ROI*	*NPV*
Normal	1.50	14.51%	27.21%	0.43
5% increase in fuel savings	1.57	16.55%	27.79%	0.63
5% decrease in fuel savings	1.42	12.42%	26.56%	0.23

4.5 Procurement and implementation schedule

The project is expected to be completed in 8 to 10 weeks from the date of financial closure. The detailed schedule of project implementation is furnished in Annexure 6

Annexure

Annexure – 1 Efficiency of the existing chulhas - Direct Method

Case1: Yemul Textiles:

S.No	Particular	Unit	value
1	Quantity of hot water generated	litre	600
2	Initial temperature of water	^{0}C	30
3	Final temperature of water	^{0}C	80
4	Wood consumption	kg/day	150
5	Calorific value of wood	kCal/kg	3200
6	Heat input	kCal/day	4, 80,000
7	Heat output	kCal/day	30,000
8	Efficiency	%age	6.25

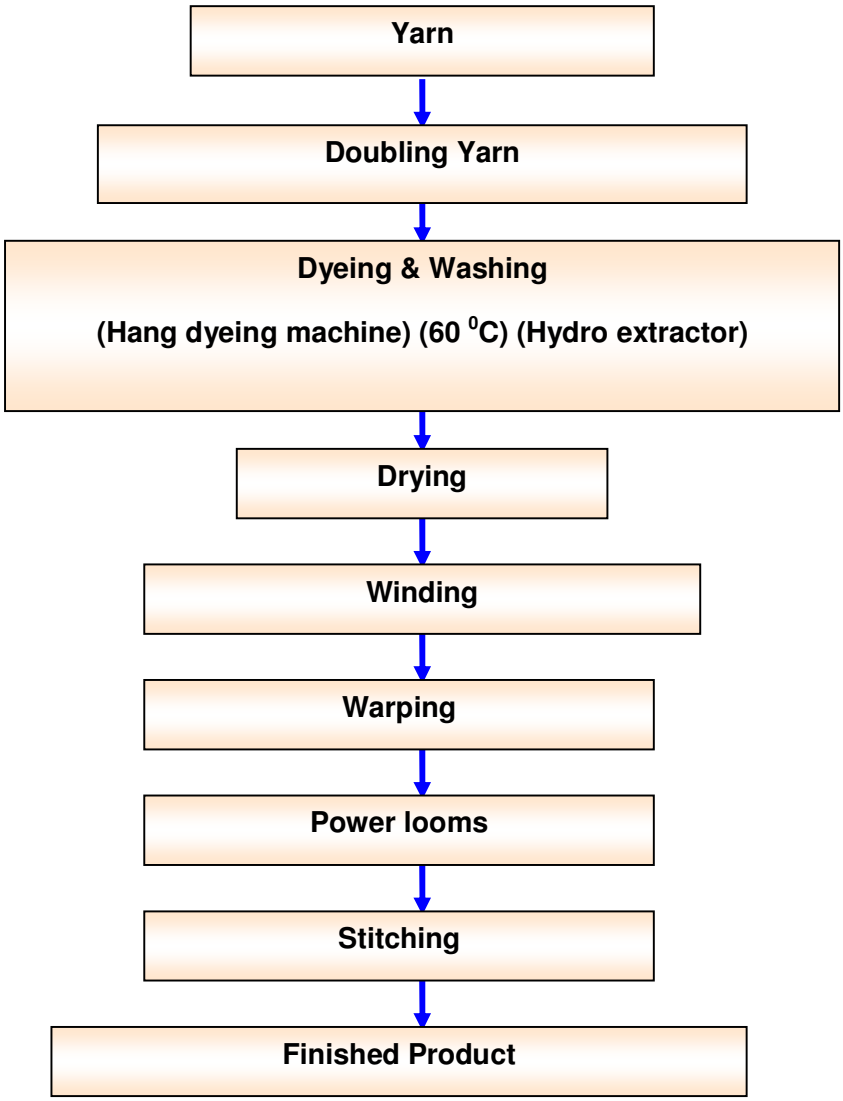
Case2: Burgul Textiles:

S.No	Particular	Unit	value
1	Quantity of hot water generated	litre	350
2	Initial temperature of water	^{0}C	30
3	Final temperature of water	^{0}C	90
4	Wood consumption	kg/day	130
5	Calorific value of wood	kCal/kg	3200
6	Heat input	kCal/day	4, 16,000
7	Heat output	kCal/day	21,000
8	Efficiency	%age	5.04

Case3: Chatla Textiles:

S.No	*Particular*	*Unit*	*value*
1	Quantity of hot water generated	litre	1000
2	Initial temperature of water	^{0}C	30
3	Final temperature of water	^{0}C	80
4	Wood consumption	kg/day	250
5	Calorific value of wood	kCal/kg	3200
6	Heat input	kCal/day	8,00,000
7	Heat output	kCal/day	50,000
8	Efficiency	%age	6.25

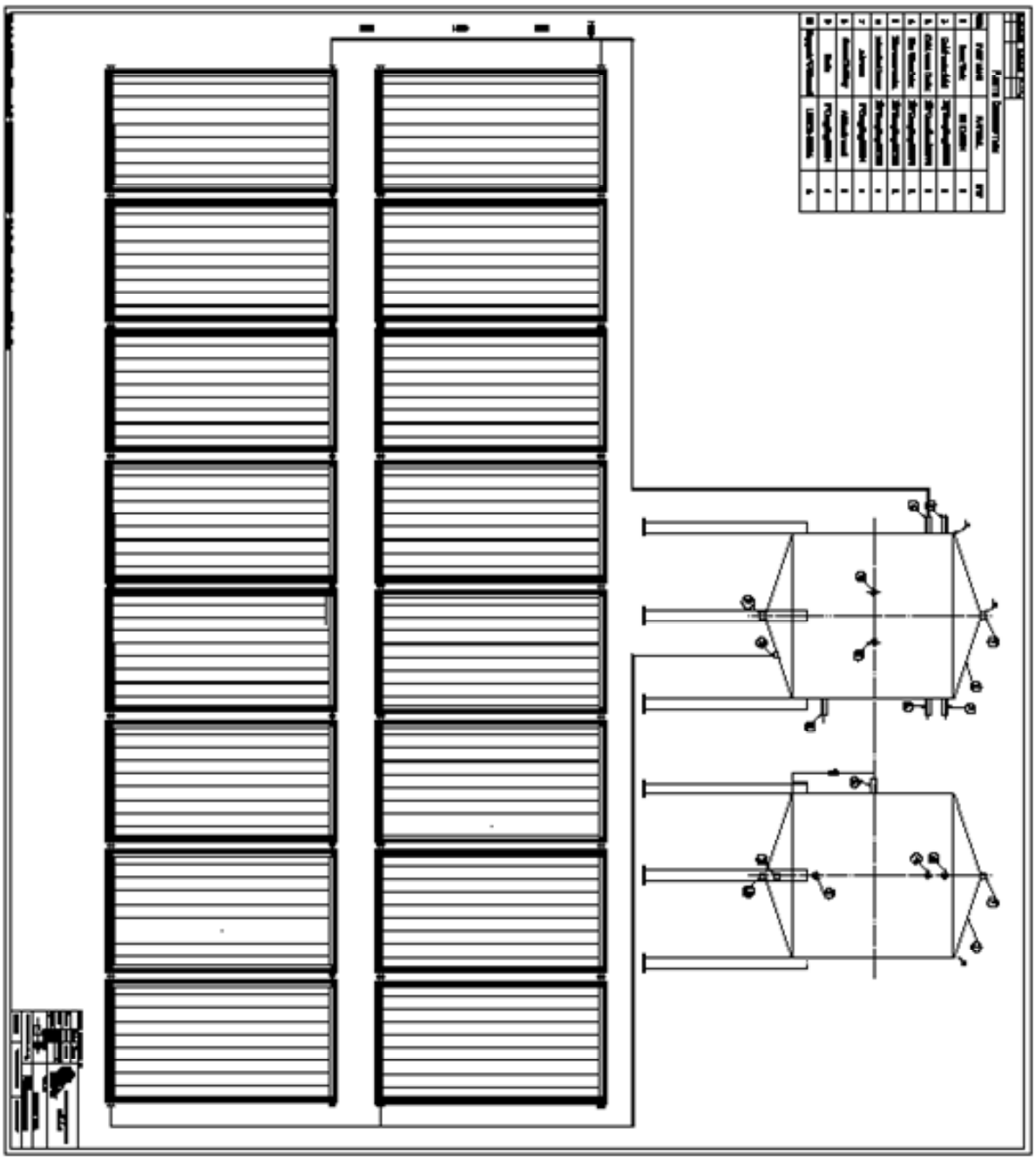
Annexure – 2 Process flow diagrams



Annexure - 3 Detailed technology assessment report

S.No	Particular	Unit	Value	
			Existing technology	Proposed technology
1	Name	NA	Chulhas	SWHS
2	Operating hour	hr	8	8
2	Operating days	days	240	240
4	Wood consumption	tonne/year	42	Nill
5	Wood saving	tonnes/year	0	42
6	Cost of wood	₹/tonne	3000	-
8	Efficiency	%age	6.25	-
9	Cost of project	₹ in lakh	-	3.47
10	Monetary saving	₹ in lakh	-	1.26

Annexure – 4 Drawings for proposed electrical & civil works



Annexure- 5 Detailed financial calculations & analysis for financial indicators

Assumptions

Name of the Technology	**Solar Hot Water System**		
Rated Capacity	**2000 LPD**		
Detail	**Unit**	**Value**	
Installed Capacity	LPD	2000	Feasibility Study
No of working days	Days	250	Feasibility Study
No of Shifts per day	Shifts	1	Feasibility Study
Capacity Utilization Factor	%		Feasibility Study
Proposed Investment			
Plant & Machinery	₹(in lakh)	3.35	Feasibility Study
Erection & Commissioning (5%)	% on Plant & Equip	0.03	Feasibility Study
Investment without IDC	₹ (in lakh)	3.38	Feasibility Study
Interest During Implementation	₹ (in lakh)	0.09	Feasibility Study
Total Investment	₹ (in lakh)	3.47	Feasibility Study
Financing pattern			
Own Funds (Internal Accruals)	₹ (in lakh)	0.87	Feasibility Study
Loan Funds (Term Loan)	₹ (in lakh)	2.60	Feasibility Study
Loan Tenure	Years	5	Assumed
Moratorium Period	Months	6	Assumed
Repayment Period [excluding moratorium]	Months	60	Assumed
Interest Rate	%	10	SIDBI's rate of interest for energy efficiency project
Estimation of Costs			
O & M Costs	% Plant & Equip	4.00	Feasibility Study
Annual Escalation	%	5.00	Feasibility Study
Estimation of Revenue			
Wood savings	Tonnes/year	42	
Cost	₹/Tonne	3000	
St. line Depn.	%	5.28	Indian Companies Act

Estimation of Interest on Term Loan ***(₹ in lakh)***

Years	Opening Balance	Repayment	Closing Balance	Interest
1	2.60	0.18	2.42	0.23
2	2.42	0.36	2.06	0.23
3	2.06	0.40	1.66	0.19
4	1.66	0.46	1.20	0.14
5	1.20	0.60	0.60	0.09
6	0.60	0.60	0.00	0.02
		2.60		

WDV Depreciation:

Particulars / years	1	2	3	4	5	6
Plant and Machinery						
Cost	3.47	0.69	0.14	0.03	3.47	0.69
Depreciation	2.77	0.55	0.11	0.02	2.77	0.55
WDV	0.69	0.14	0.03	0.01	0.69	0.14

Projected Profitability

Particulars / Years	1	2	3	4	5	6
Revenue through Savings						
Fuel savings	1.26	1.26	1.26	1.26	1.26	1.26
Total Revenue (A)	1.26	1.26	1.26	1.26	1.26	1.26
Expenses						
O & M Expenses	0.14	0.14	0.15	0.16	0.16	0.16
Total Expenses (B)	0.14	0.14	0.15	0.16	0.16	0.16
PBDIT (A)-(B)	1.12	1.12	1.11	1.10	1.10	1.10
Interest	0.23	0.23	0.19	0.14	0.09	0.02
PBDT	0.89	0.89	0.92	0.96	1.01	1.09
Depreciation	0.18	0.18	0.18	0.18	0.18	0.18
PBT	0.70	0.71	0.74	0.78	0.83	0.90
Income tax	-	0.11	0.28	0.32	0.34	0.37
Profit after tax (PAT)	0.70	0.59	0.46	0.46	0.48	0.53

Computation of Tax ***(₹ in lakh)***

Particulars / Years	1	2	3	4	5	6
Profit before tax	0.70	0.71	0.74	0.78	0.83	0.90
Add: Book depreciation	0.18	0.18	0.18	0.18	0.18	0.18
Less: WDV depreciation	2.77	0.55	0.11	0.02	-	-
Taxable profit	(1.89)	0.34	0.81	0.94	1.01	1.09
Income Tax	-	0.11	0.28	0.32	0.34	0.37

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

Particulars / Years	1	2	3	4	5	6
LIABILITIES						
Share Capital (D)	0.87	0.87	0.87	0.87	0.87	0.87
Reserves & Surplus (E)	0.70	1.30	1.76	2.22	2.70	3.24
Term Loans (F)	2.42	2.06	1.66	1.20	0.60	0.00
Total Liabilities D)+(E)+(F)	3.99	4.22	4.29	4.28	4.17	4.10
Assets						
Gross Fixed Assets	3.47	3.47	3.47	3.47	3.47	3.47
Less: Accm. Depreciation	0.18	0.37	0.55	0.73	0.92	1.10
Net Fixed Assets	3.28	3.10	2.92	2.74	2.55	2.37
Cash & Bank Balance	0.71	1.12	1.37	1.55	1.62	1.73
TOTAL ASSETS	3.99	4.22	4.29	4.28	4.17	4.10
Net Worth	1.57	2.16	2.63	3.08	3.57	4.10
Debt Equity Ratio	1.54	0.95	0.63	0.39	0.17	0.00

Projected Cash Flow: ***(₹ in lakh)***

Particulars / Years	0	1	2	3	4	5	6
Sources							
Share Capital	0.87	-	-	-	-	-	-
Term Loan	2.60						
Profit After tax		0.70	0.59	0.46	0.46	0.48	0.53
Depreciation		0.18	0.18	0.18	0.18	0.18	0.18
Total Sources	3.47	0.89	0.78	0.65	0.64	0.67	0.72
Application							
Capital Expenditure	3.47						
Repayment of Loan	-	0.18	0.36	0.40	0.46	0.60	0.60
Total Application	3.47	0.18	0.36	0.40	0.46	0.60	0.60

Net Surplus	-	0.71	0.42	0.25	0.18	0.07	0.12
Add: Opening Balance	-	-	0.71	1.12	1.37	1.55	1.62
Closing Balance	-	0.71	1.12	1.37	1.55	1.62	1.73

Calculation of Internal Rate of Return ***(₹ in lakh)***

Particulars / months	***0***	***1***	***2***	***3***	***4***	***5***	***6***
Profit after Tax		0.70	0.59	0.46	0.46	0.48	0.53
Depreciation		0.18	0.18	0.18	0.18	0.18	0.18
Interest on Term Loan		0.23	0.23	0.19	0.14	0.09	0.02
Salvage/Realizable value							-
Cash outflow	(3.47)	-	-	-	-	-	-
Net Cash flow	(3.47)	1.12	1.00	0.83	0.79	0.76	0.73
IRR	**14.51%**						

NPV	**0.43**

Break Even Point ***(₹ in lakh)***

Particulars / Years	***1***	***2***	***3***	***4***	***5***	***6***
Variable Expenses						
Oper. & Maintenance Exp (75%)	0.10	0.11	0.11	0.12	0.12	0.12
Sub Total ***(G)***	**0.10**	**0.11**	**0.11**	**0.12**	**0.12**	**0.12**
Fixed Expenses						
Oper.& Maintenance Exp (25%)	0.03	0.04	0.04	0.04	0.04	0.04
Interest on Term Loan	0.23	0.23	0.19	0.14	0.09	0.02
Depreciation *(H)*	0.18	0.18	0.18	0.18	0.18	0.18
Sub Total (I)	0.45	0.44	0.41	0.37	0.31	0.24
Sales (J)	1.26	1.26	1.26	1.26	1.26	1.26
Contribution (K)	1.16	1.15	1.15	1.14	1.14	1.14
Break Even Point (L= G/I)	39.16%	38.62%	35.71%	32.05%	27.56%	20.90%
Cash Break Even {(I)-(H)}	23.32%	22.72%	19.75%	16.03%	11.54%	4.88%
BREAK EVEN SALES (J)*(L)	0.49	0.49	0.45	0.40	0.35	0.26

Return on Investment ***(₹ in lakh)***

Particulars / Years	***1***	***2***	***3***	***4***	***5***	***6***	***Total***
Net Profit Before Taxes	0.70	0.71	0.74	0.78	0.83	0.90	4.66
Net Worth	1.57	2.16	2.63	3.08	3.57	4.10	17.11
							27.21%

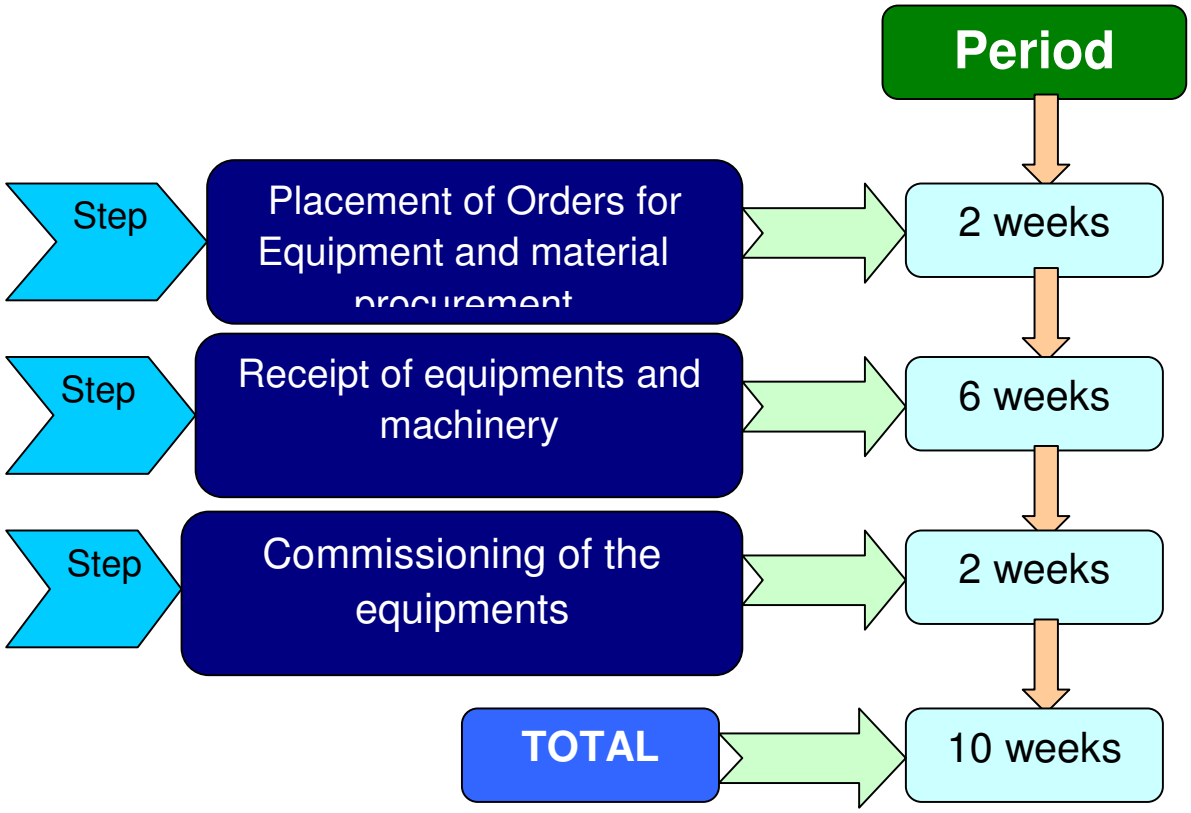
Debt Service Coverage Ratio ***(₹ in lakh)***

Particulars / Years	*1*	*2*	*3*	*4*	*5*	*6*	*Total*
Cash Inflow							
Profit after Tax	0.70	0.59	0.46	0.46	0.48	0.53	3.24
Depreciation	0.18	0.18	0.18	0.18	0.18	0.18	1.10
Interest on Term Loan	0.23	0.23	0.19	0.14	0.09	0.02	0.90
TOTAL (M)	1.12	1.00	0.83	0.79	0.76	0.73	5.24

DEBT

Interest on Term Loan	0.23	0.23	0.19	0.14	0.09	0.02	0.90
Repayment of Term Loan	0.18	0.36	0.40	0.46	0.60	0.60	2.60
TOTAL (N)	0.41	0.59	0.59	0.60	0.69	0.62	3.50
Average DSCR (M/N)	1.50						

Annexure -6 Details of procurement and implementation plan with schedule/timelines



Annexure -7 Details of equipment service providers

Equipment details	Service/technology providers
Solar water heating system	**TATA BP SOLAR INDIA LTD.** Ujwal V Dusane Sr. Engineer (Sales & Mktg) – Thermal 103,Gera Sterling, North Main Road, Koregaon Park, Pune – 411 001 **Solar Product Company** No. A-2/10, Rambaug Colony, Navi Peth Pune, Maharashtra - 411 030, India +(91)-(20)-24334494/ +(91)-9371007016 Email: aquahot@rediffmail.com **Urmi Solar Systems Limited** Plot No. 2113, Phase - 3, G. I. D. C, Vatva Ahmedabad, Gujarat - 382 445, India +(91)-9371007016 / 9373307815 Email:dipal@urmisolar.com, urmisolarheater@yahoo.co.in

Annexure - 8 Quotations or Techno-commercial bids for new technology/ equipment

TATA BP SOLAR INDIA LTD.,
103,Gera Sterling, North Main Road, Koregaon Park, Pune – 411 001
Tel. No. 91 20 26138262, 26122344, Fax: 91 20 66012741
Website: www.tatabpsolar.com

A. Technical Specifications

FLAT PLATE COLLECTORS
COLLECTOR SPECIFICATION (I.S.I Mark)

1.	Collector Frame	: Specially Designed Extruded Aluminium
2.	Collector Type	: **Cu-Cu** Fin and tube type **Laser Welded Fins.**
3.	Absorber Coating	: Selective – **NALSUN Coating.**
4.	Absorber Plate	: Copper
5.	Raiser	: Cu Dia 12.9mm
6.	Inlet Header	: Copper -Dia 25.4mm
7.	Bottom Insulation	: Rock wool, below raiser assembly.
8.	Side Insulation	: Rock Wool
9.	Reflective Foil	: Aluminium Sheet .
10.	Coating Absorptivity	: > 0.95.
11.	Coating Emmissivity	: < 0.20
12.	Transmitivity	: 85%
13.	Glazing (Cover)	: **Toughened Clear Glass.**
14.	Gasket for Glass (Beeding)	: EPDM U Type Gasket
15.	Collector Back Sheet	: Aluminium.
16.	Hardware	: Stainless Steel – 304
17.	Finish Spray Painting	: Golden Yellow
18.	Insulation	: Rock wool.
19.	Grommet angles	: EPDM for Frame and Mack Black for Glass retaining
20.	Sealing	: Silicon sealant between Glass, Clamp and Casing.
21.	Header Inlet & Outlet	: Brass Flanges
22.	Weight	: 38 Kg (Dry), 46 Kg (Flooded)
23.	Collector Support Structure	: 35 x 35 x 3 mm, M. S. angle, black painted.
24.	Operating Conditions	: 10 ºC. To 50 ºC.
25.	Window Velocity	: 75 Km/Hr*
26.	Termination	: 65 mm Dia. Brass Flanges with 4 holes of Dia. 7mm at PCD 45mm, EPDM Gasket & 4 nos. of M6 x 20, SS 304 Bolts.

Features :-

- Corrosion resistance, Extruded Aluminium sections with Stainless Steel fasteners.
- High Transmissivity, Toughened and Tempered Glass.
- Designed, Manufactured and Certified as per " BIS" standard specifications.
- Design Registered with Patent Office (Patent Reg. No. 175095).

TATA BP SOLAR INDIA LTD.,
103,Gera Sterling, North Main Road, Koregaon Park, Pune – 411 001
Tel. No. 91 20 26138262, 26122344, Fax: 91 20 66012741
Website: www.tatabpsolar.com

SCOPE OF SUPPLY & PRICE SCHEDULE

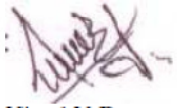
TATA BP SOLAR MAKE SOLAR WATER HEATERS

A. ***VAJRA 1000 LPD Non-press, Non-HHC, Thermosyphon type Solar Water Heating System @ 60 deg. C***

No	Item & Description	Qty.	Rate/Unit	Amount
1.	**VAJRA 1000 LPD Non-Press, Non- HHC, Thermosyphon type Solar Water Heating system @ 60 deg. C consisting of:** i) 1 nos x 1000 lit. insulated SS304 hot water storage tanks, ii) 8 nos. of TBP make solar flat plate collectors, iii) Mounting stand for tanks & collectors,	1 set	1,47,000.00	1,47,000.00
2	Over Head Cold water tank 1500 Ltrs. Capacity with Fabricated stand.	1 Nos.	If required	By customer
3.	Cold water line– GI pipe size 1"	Mtr		By customer
4.	Hot water line – Kitec make hot water composite piping ----------1" ----------3/4" ----------1/2"	Mtr.		By customer
5	**Fabricated supporting structure required for the elevation of the system and the Hot water tank.**	--	---	**By Customer**
	SUB TOTAL			**1,47,000.00**
	CST @ 4% as applicable			Extra
	Excise			NA
	Insurance @ 0.45%			Included
5.	Installation & Commissioning , Material Lifting Charges			8500.00
6.	Transportation, Loading - Unloading & Handling Charges			Extra as acutal
	GRAND TOTAL			**1,55,500.00**

Note:- ** We have considered the ambient temp is 24-25 deg. C
1. Shadow free area required for the solar system @ 30 sqm
2. Cold water inlet & hot water outlet piping will be charged as per the final measurements.
3. These systems are designed to working pressure at normal gravity pressure.
4. Customer should provide overhead cold water tank if required.

For TATA BP SOLAR INDIA LTD.,



Ujwal V Dusane

Standard application form for financial assistance to existing units
(upto and including Rs. 50 lakh)

I Applicant details

1	Name of Unit	
2	Address for correspondence	
3	Constitution	
4	SSI Registration. No.	
5	Date of Incorporation	
6	Date of Commencement of Operations	
7	Activity / Industry	

	Registered Office	Factory / Service Establishment (existing)	Factory / Service Establishment (proposed)
Full Address			
Contact Person(s)			
Tel No.			
Fax No.			
E mail address			

II Promoters/Directors

Bio-data of all the promoters/directors of the unit (Preferably make separate sheet for each promoter/director)

Promoter/Director	
Name	
Full Address(incl Tel no./ mobile no)	
Age	
Passport No.	
Father's / husband's name	
Qualification	
Experience	
Functional responsibility in the unit	
Relationship with Chief Promoter	
Shareholding in the unit	
Net worth	

Pl. furnish details of any other shareholder having more than 5% in the unit.

III. Products Manufactured

Sl. No.	Product	Installed capacity p.a.	Present capacity utilisation	End use of product	Export orientation
					Yes/ No

IV. Existing Facilities with Banks /FIs incl. SIDBI

a	Name of the Bank(s) / FI, Branch,	
b	Dealing person and contact tel. no.(s)..	
c	Dealing since (each Bank / FI)	

Facilities enjoyed :

Nature of facility (bankwise)	Amount (Rs. lakh)		Rate of interest	Nature of Security and value
	Sanctioned	Outstanding as on ___ ___		
Fund based				
-Term Loan				
-Working capital				
Non Fund Based				

Are there any defaults ? Yes/No

V. Financial Position of applicant unit/ associate concern

(Rs. lakh)

	Net-worth			Sales			Net profit		
	Y1	Y2	Y3	Y1	Y2	Y3	Y1	Y2	Y3
Applicant unit									
Associate concern I									
Associate concern II									

Details of Associate concerns to be given as per **Annexure I**.

VI. Project Details

6.1. Purpose for which assistance now required :

	Purpose	
1	Indicate whether Expansion /diversification / modernisation and details	Technology Upgradation for Energy Efficiency
2	If new products envisaged give details	N/A
3	Details of expected incremental qualitative / quantitative benefits	Saving in the fuel bill to the extent of 20-25% leading to commensurate improvement in the bottom line of the applicant unit.
4	Expected week/month/year of implementation	10 Weeks
5	No. of employees existing and additional	

Cost of Project (Rs. Lakh)

S. No	Details	Total Amount
1	Civil Works	
2	Plant & Machinery (incl. installation) * -Indigenous -Imported	3.35
3	Erection & commisioning charge	0.03
4	Preliminary & pre-operative expenses	0.09
5	Contingency provision, if any (basis)	
	TOTAL	3.47
** Details of Plant and machinery/ Misc. fixed assets at **Annexure II and III***		

Indicate details of expenditure already incurred, if any and how the expenditure was financed ?

6.3. **Means of Finance**

(Rs. Lakh)

S. No. No.	Details	Total
1	Additional share capital / Internal accruals	0.87
2	Interest free Unsecured Loans	
3	Term Loan proposed from SIDBI / Banks	2.60
	Total	3.47

6.4 Whether additional Working Capital required for the unit. If yes, amount and arrangements proposed may be indicated:

6.5 **Technology**

S. No.	Item	
1	Any Technical collaboration? If yes, details	
2	Details of main technical professionals employed	
3	Any quality certification obtained ? If yes enclose certificate.	

6.6 **Raw material / Labour/ Utilities**

1	Raw material (Details, arrangement, sources and distance)	
2	Power	Connected Load Utilised load Requirement of power for Additional machines Back-up arrangement (DG)
3	Other critical inputs if any	

6.7 **Marketing & Selling Arrangements**

Items	Applicants remarks
Main Markets (Locations)	
Main buyers, Indicate clearly if the unit is relying on a single buyer	
Indicate competitors	
Whether product has multiple applications	
Distribution channels (e.g. direct sales, retail network, distribution network)	
Marketing team details, if any.	
Orders on hand (enclose copies)	

6.8 **Projected profitability** : Statement to be enclosed as per **Annexure IV**.

6.9 **Others**

Items	
Please indicate the various licenses / consents for the project / unit already obtained from the respective authorities	
Please indicate licenses / consents for the project / unit that are yet to be obtained.	
Category as per pollution control dept. If polluting, pollution control measures taken	
Whether the project is entitled for any govt. subsidy, tax exemptions. Details thereof	
Repayment period (in months) sought including repayment holiday requested, if any,	
Details of Collateral security offered and value (basis).	
List of guarantors for the proposed loan	

Enclose documents as indicated in the check list at Annexure V.

6.10 **Strengths / Weaknesses of the borrower** (such as market standing, product/ service differentiation, technical expertise, infrastructure facilities etc.)

Strengths	

Weaknesses	

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 application; 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**

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	Remarks reg. after sale service etc.
Solar Water Heater	Tata Bp Solar India Ltd. Ujwal V Dusane 103,Gera Sterling, North Main Road, Koregaon Park, Pune – 411 001	6 Weeks	1.555	Solar Heating	Crediability of the Technolgy Provider	

- Furnish competitive quotations, catalogues / invoice for each machinery proposed to be acquired
- In case of second hand /fabricated machinery, indicate the need / reasons for acquiring such machinery. Also enclose Chartered Engineer's certificate regarding residual value and life in respect of second hand machinery.

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 a whole*

S.No.	Item	Actuals for previous	Y1	Y2	Y3	Y4	Y5	Y6	TOTAL
1	Total Income		1.26	1.26	1.26	1.26	1.26	1.26	**7.56**
2	Raw materials								
	Power and fuel		0.14	0.14	0.15	0.16	0.16	0.16	**0.91**
	Wages and salaries		-	-	-	-	-	-	-
	Selling expenses		-	-	-	-	-	-	-
	Other expenses		-	-	-	-	-	-	-
	Total Cost		0.14	0.14	0.15	0.16	0.16	0.16	**0.91**
3	Profit before depreciation, Interest and taxes (PBDIT) (2 - 1)		1.12	1.12	1.11	1.1	1.1	1.1	6.65
4	Interest on Term Loan		0.23	0.23	0.19	0.14	0.09	0.02	0.9
5	Interest on Working Capital		-	-	-	-	-	-	-
6	Interest on unsecured loans		-	-	-	-	-	-	-
7	Depreciation		0.18	0.18	0.18	0.18	0.18	0.18	**1.08**
8	Profit before Tax (3 - 4 - 5 - 6 - 7)		0.71	0.71	0.74	0.78	0.83	0.9	4.67
9	Tax		-	0.11	0.28	0.32	0.34	0.37	1.42
10	Profit after Tax (8 - 9)		0.71	0.6	0.46	0.46	0.49	0.53	3.25
11	Dividends/ Withdrawals								
12	Cash Accruals (10 - 11 + 7)		0.89	0.78	0.64	0.64	0.67	0.71	4.33
13	Repayments of all term liabilities (Principal)		0.18	0.36	0.40	0.46	0.60	0.60	2.60
14	Debt Service Coverage Ratio ((10+7+4)/(13+4))		2.73	1.71	1.41	1.30	1.10	1.18	1.49
15	Average DSCR (Total of 10+7+4 for projected period/(Total of 13+4 for projected period)		**1.49**						

* Please give projections for the entire tenure of SIDBI / Bank loan.

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 2 years		
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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