

## **1. Introduction**

There are different energy sources available in India such as Hydro, Nuclear, Small hydro, Wind Energy, Biomass power, Biogas co-generation, Biomass Gasification and Solar energy, but out of all these energy, the solar energy is meritorious. Solar energy is independent, environments friendly and pollution free. It works even at power cut, consumes very less energy, works day and night, and works in summer, rainy, winter means all the year along and woks programmable. Above all it does not have electrical hazard and it has got negligible maintenance. By utilizing Solar energy apparatus like Emergency lamps, Lanterns, Cooker, Home lights, Street lights, Torch, Fan, Radio, T.V, Tape, Power pack, UPS for Computers/Lap-top, Mobile charger, water heating system, Room heaters and also Power plants can be operated successfully.

## **2. Market and Demand Aspects:**

There are large numbers of units, manufacturing solar energy products in Small Scale Sector in the country. Since domestic apparatus/Gadgets, equipments/appliances and machineries are operated successfully by Solar energy, so, the market potential is tremendously high now and is also expected in the future. As there are few MSMEs available in this sector so, the Solar products shall create a tremendous market place in and around the state.

## **3. Basis and Presumptions**

- i) The basis for calculation of production capacity has been taken on single shift basis on 75% efficiency.
- ii) The maximum capacity utilization on single shift basis for 300 days a year. During first year and second year of operations the capacity utilization is 60% and 80% respectively. The unit is expected to achieve full capacity utilization from the third year onwards.
- iii) The salaries and wages cost of raw materials, utilities, are based on the prevailing rates, in and around Cuttack (Orissa) as in 2009-10. These cost factors are likely to vary with time and location.
- iv) Interest on term loan and working capital loan has been taken at the rate of 14% on an average. This rate may vary depending upon the policy of the financial institutions/agencies from time to time.

v) The cost of machinery and equipments refer to a particular make/model and prices are prevailing in 2006-07, presumed as approximate.

vi) The break-even point percentage indicated is of full capacity utilization.

vii) The project preparation cost etc. whenever required could be considered under pre-operative expenses.

viii) The essential production machinery and test equipment required for the project have been indicated. The unit may also utilize common test facilities available at Electronics Test and Development Centres (ETDCs) and Electronic Regional Test Laboratories (ERTLs) set up by the State Governments and STQC Directorate of the department of Information Technology, Ministry of Communication and Information Technology, to manufacture products conforming to Bureau of Indian Standards.

#### 4. Implementation Schedule

The major activities in the implementation of the project has been listed and the average time for implementation of the project is estimated at 12 months:

Sl. No.	Name of Activity	Period (Estimated) in months.
1	Preparation of project report	1
2	Registration and other formalities	1
3	Sanction of loan by financial institutions.	3
4	<b>Plant and Machinery:</b>	
	a) Placement of orders	1
	b) Procurement	2
	c) Power connection/ Electrification	2
	d) Installation/Erection of machinery/Test Equipment	2
5	Procurement of raw materials	2
6	Recruitment of Technical Personnel etc.	2
7	Trial production	11
8	Commercial production	12

## Notes

1. Many of the above activities shall be initiated concurrently.
2. Procurement of raw materials commences from the 8th month onwards.
3. When imported plant and machinery are required, the implementation period of project may vary from 12 months to 15 months.

## 5. Technical Aspects

### I. Process of Manufacture

As there are three items are intended to manufacture by this SSI, so, different segments/components are used for manufacturing, as classified with different products mentioned bellow:-

- (1) Solar LED lantern, which is consisting of Cabinet, light diffuser glass, PCB for LEDs and battery indicator, LEDs and Heat Sink and other accessories.
- (2) LED street light, which is consisting of Cabinet, PCB, Heat Sink, Reflector and other accessories.
- (3) Solar CFL Inverter, which is consisting of Cabinet, PCB with components, Battery 12Volt 7 Ah(Solar), Solar Panel and other accessories.
- (4)Solar CFL Street Light, which is consisting of Cabinet, Reflector with plate, Panel cable, Nut/bolt accessories and Galvanized poles 15 fts etc.

After checking all the above items & their value, these are assembled and soldered on the terminal strip/PCB etc. The PCB is mounted in the cabinet along with the components. Electro-mechanical components are fixed. After the wiring is completed the product is finally thoroughly tested for its specified output voltage/current/illumination and reflection etc, before packing the product for dispatch.

### II. Plant capacity per annum:

Quantity:
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- (1) Solar LED Lantern : 3,000 Nos. per annum rating 03 watts @ Rs.2900/-
- (2) LED Street Light (37 Watts): 1200 nos. per annum @ Rs.24, 000/-per pc.
- (3) Solar CFL Invertors:3,000 Pcs per annum @ Rs.5000/-
- (4) Solar CFL Street Light(75 Watts):1500 Pcs Per annum @ Rs.35,000/-

**Value :**

- (1) Solar LED Lantern :Rs.87,00,000 /-
- (2) LED Street Light (37 Watts) :Rs.2,88,00,000/-
- (3) Solar CFL Invertors:Rs.1,50,00,000 /-
- (4) Solar CFL Street Light:Rs.5,25,00,000/-

**Total Value:10,50,00,000/-**

**III. Motive Power : 03KVA**

**IV. Quality Control and Standards**

As the firm producing Mix-products and as per customer requirement so , it's different products have different specifications but in this project only one of each product is mentioned as follows:

(1) Solar LED Lantern: Required Panel 03 Watts. (As per customers requirements)

(2) Solar -LED Street Light: Required Panel 50 Watts. (As per customers requirements)

(3) Solar CFL Inverter: Required Panel 10 Watts. (As per customers requirements)

(4) Solar CFL Street Light: Required Panel 75 Watts. (As per customers requirements)

**V. Energy conservation**

With the growing energy needs and shortage coupled with rising energy cost a greater thrust in energy efficiency in industrial sector has been given by govt. of India since 1980. The energy conservation act 2001 has been enacted on 18th August 2001, which provides for efficient use of energy, its conservation

& capacity building of Bureau of Energy Efficiency created under the act. The following steps may help for conservation of energy:

- i. Adoption of Energy conserving technologies, production aids and testing facilities.
- ii. Efficient managements of process/manufacturing machineries and systems QC and testing equipments for yielding maximum energy conservation.
- iii. Using efficient temperature controlled soldering and disordering stations can obtain optimum use of electrical energy for heating, during soldering process.
- iv. Periodical maintenance of motors, compressors etc.
- v. Use of power factor correction capacitors, proper selection and layout of lighting system, timely switching on off of the lights use of CFLs wherever Possible.

## **6. Financial Aspects**

### **A. Fixed Capital**

#### **(i) Land & Building: Own Land**

Cost for constructing of the Shed & Partition Cabins :Rs.1,50,000/-

Total Built up area:	3000 Sqr.ft
Office and Store:	300 Sqr.ft
Factory shed:	1500 Sqr.ft
Lab.& Packaging:	600 Sqr.ft.
Open space:	600 Sqr.ft.

**(ii) Machinery and Equipments**

Sl. No.	Description	Ind./Imp.	Qty. (Nos.)	Rate (Rs.)	Total (Rs.)
1	Volt Meter(3v-30v DC)	Ind.	1	@7,000	7,000
2	Oven for drying.(0-300 degree centigrade)	Ind.	1	@6,000	6,000
3	Digital Multimeter 4½ digits	Ind.	2	@10,000	20,000
4	Drilling machine, (Motorized)		2	@3,000	6,000
5	Digital true RMS Multimeter 3½ digits		2	@9,000	18,000
6	Temp, controlled soldering stn.		6	@4,000	24,000
7	Dip-Soldering Machine		2	@7,000	14,000
8	Digital panel (Volt/Amp) meter		2	@4,000	8,000
9	Soldering (Manual) Iron 10/25/35/60 Watts rating & 05 nos. each.		20	@80	1,600
10	Grinding m/c 100 mm		2	@6,000	12,000
11	Press cum Bending machine		2	@40,000	80,000
12	Dies for lantern, home light, street light, inverter		1	@3,75,000	3,75,000
13	Welding Machine(200 Amps)		1	@7,000	7,000
				Total=	5,78,600

12	Electrification and installation charges @ 10% of machinery and Equipments.		57,860
13	Tools, Jigs, dies & fixtures etc.		10,000
14	Office equipment (A/Conditioner/Computer /working benches and furniture etc.		1,50,000
<b>Total plant and m/c cost=</b>			<b>7,96,460</b>

(iii)Pre-operative Expenses =Rs.50,000/-

**Total Fixed Cost** = (i) + (ii)+(iii) =Rs.9,96,460/-

## **B. Working Capital (per month)**

### **(i) Staff and Labour**

<b>Designation</b>	<b>Strength (Nos.)</b>	<b>Salary (Rs.)</b>	<b>Total (Rs.)</b>
Product Manager	1	@ 5,000	5,000
Sales Manager	1	@ 4,000	4,000
Sales & Marketing Personnel	4	@ 3,500	14,000
Accountant	1	@ 4,000	4,000
Steno/ Typist	1	@ 3,000	3,000
Supervisor	1	@ 4,000	4,000
Skilled Workers	4	@ 4,500	18,000
Un skilled workers	20	@ 3,000	60,000
Peon/ Watchman	2	@ 2,500	5,000
<b>Total</b>			<b>1,17,000</b>
Add Perquisites @ 15% of the salaries			17,550
<b>Total</b>			<b>1,34,550</b>

**(ii) Raw Material Required (per month)**

<b>Description</b>	<b>Qty. (Nos.)</b>	<b>Rate (Rs.)</b>	<b>Total (Rs.)</b>
<b>(1) Solar LED Lantern</b>			
Cabinets	250	@50	12,500
Solar Panel	250	@600	1,50,000
Circuit board	250	@200	50,000
Led with heat sink	250	@150	37,500
Switch, fuse, wire misc. items	250	@50	12,500
battery	250	@220	55,000
<b>Sub Total</b>	250		3,17,500
<b>(2) Solar LED street light</b>			
Structure(pole, battery box panel stand)	100	@2100	2,10,000
Solar panel	100	@6105	6,10,500
Cabinets	100	@1200	1,20,000
Led	100	@1000	1,00,000
Circuit board	100	@500	50,000
Battery	100	@3,500	3,50,000
<b>Sub Total</b>			14,40,500
<b>(3) Solar C.F.L Inverter</b>			
Cabinet	250	@100	25,000
Solar panel	250	@2000	5,00,000
Circuit Board	250	@450	1,12,500
Switch, wire, fuse	250	@100	25,000
Battery	250	@500	1,25,000
<b>Sub Total</b>	250		7,87,500
<b>(4) Solar Street light</b>			
Structure(pole, battery box panel stand)	125	@2100	2,62,500



Solar panel	125	@12210	15,26,250
Cabinets	125	@100	12,500
CFL with holder & reflector	125	@250	31,250
Circuit board	125	@1200	1,50,000
Battery	125	@5700	7,12,500
Sub Total			26,95,000
<b>GRAND TOTAL</b>			<b>52,40,500</b>

<b>(iii) Utilities (per month)</b>	
Power	Rs.10,000
Water	Rs. 1,000
<b>Total</b>	<b>Rs.11,000</b>

<b>(iv) Other Contingent Expenses (per month)</b>	
Postage and Stationery	Rs. 5,000
Telephone	Rs. 10,000
Consumable stores	Rs. 20,000
Repair and Maintenance	Rs. 3,000
Transport and Conveyance	Rs. 50,000
Advertisement and Publicity and marketing	Rs.1,00,000
Insurance/Taxes	Rs. 2,000
Miscellaneous expenses	Rs. 2,000
<b>Total</b>	<b>Rs.1,92,000</b>

**(v) Total Recurring Expenditure(per month)= (i+ii+iii+iv)**

= Rs.1, 34,550 +Rs. 52,40,500 +Rs.11, 000+Rs.1, 92,000=**Rs.55,78,050/-**

### **C. Total Capital Investment**

(i)	Fixed Capital	<b>Rs. 9,96,460</b>
(ii)	Working Capital for 1 month in	<b>Rs. 55, 78,050</b>
<b>Total</b>		<b>Rs. 65,74,510/-</b>

#### **D. Financial Analysis**

<b>(I) Cost of Production (per annum)</b>	<b>Value in Rs</b>
Total recurring expenditure	6,69,36,600
Depreciation on machinery and equipment @ 10%	48,860
Depreciation on tools, jigs, dies and fixtures @ 25%	2,500
Depreciation on office equipment and furniture @ 20%	30,000
Interest on capital investment@ 14%	9,20,431
<b>Total</b>	<b>6,79,38,391</b>

#### **(II) Turnover (per annum)**

<b>Item</b>	<b>Quantity (Nos.)</b>	<b>Rate per Unit (Rs.)</b>	<b>Value (Rs.)</b>
1) Solar LED Lantern	<b>3000</b>	<b>2,200</b>	66,00,000
2) Solar LED Street Light	<b>1200</b>	<b>2,400</b>	28,80,000
3) Solar CFL Inverter	<b>3000</b>	<b>5,000</b>	1,50,00,000
4) Solar CFL Street Light	<b>1500</b>	<b>31,000</b>	4,65,00,000
Total=			7,09,80,000

#### **(3) Net Profit (per annum) (Before Taxes)**

Turnover – cost of production = Rs. 30,41,609/-

#### **(III) Net profit Ratio: 4.3%**

**(IV) Rate of Return on Capital Investment: 46.2%**

**(V) Break-even Point**

<b>Fixed Cost</b>	<b>(Rs.)</b>
Total Depreciation	81,360
Interest on total capital investment @ 12%	9,20,431
40% Salaries and wages	6,45,840
40% other contingent expenses excluding insurance	9,12,000
Insurance	24,000
<b>Total</b>	<b>25,83,631</b>

**Break-even Point**

$$\begin{aligned} & \text{Fixed cost} \times 100 \\ & = \frac{\text{Fixed cost} + \text{Profit}}{\text{Rs. } 25,83,631 \times 100} \\ & = \frac{\text{Rs. } 56,25,240}{\text{Rs. } 25,83,631 \times 100} \\ & = 46\% \end{aligned}$$

**Additional Information**

(a) The Project Profile may be modified/tailored to suit the individual entrepreneurship qualities/capacity, production programme and also to suit the locational characteristics, wherever applicable.

(b) The Electronics Technology is undergoing rapid strides of change and there is need for regular monitoring of the national and international technology scenario. The unit may, therefore, keep abreast with the new technologies in order to keep them in pace with the developments for global competition.

(c) Quality today is not only confined to the product or service alone. It also extends to the process and environment in which they are generated. The ISO 9000 defines standards for Quality Management Systems and ISO 14001 defines standards for Environmental Management System for acceptability at international level. The unit may therefore adopt these standards for global competition.

(d) The margin money recommended is 25% of the working capital requirement at an average. However, the percentage of margin money may vary as per bank's discretion.

## **Addresses of Machinery and Equipment Suppliers**

- 1) BHEL Ltd., Siri Fort, N. Delhi NCT of Delhi, Pin- 110049  
Tel-01126001010, Fax-01126493021, Email [query@bhel.com](mailto:query@bhel.com)
- 2) Kotak Pvt. Ltd., KOTA Group of Enterprises, 378, 10<sup>th</sup> Cross, Phase-IV, Peenya Indl. Area, Bengalooru, Karnatak-560058, Tel-080-28363330, Fax-080-28362347, E-mail- [kotakurja@G.mail.com](mailto:kotakurja@G.mail.com).
- 3) TATA-BP Solar India Ltd., Plot No.78, Electronic City, Hosur Rd., Bengalooru, Karnatak-560100, Tel-080-22358465, Fax-080-28520116, E-mail- [tata@tatabp.com](mailto:tata@tatabp.com).
- 4) Access Solar Ltd., S-5, Phase-II, TIE, Balanagar, Hyderabad, Andhra Pradesh, Tel-040-64518476, Fax-080-23076271, E-mail- [info@acesssolar.net](mailto:info@acesssolar.net)
5. M/s. Aplab Limited, 3rd Floor, 310-313, Chandralok Complex, S.D. Road, Secunderabad.500003 ,(Oscilloscope, Power Supplies, Multi-meters)
6. M/s. Systronics, 2-2-647/A/3, 11th Floor, Karur Vysya Bank Building, Shivam Road, New Nallakunta, Hyderabad-500013. (Oscilloscope, Power Supplies, Multimeters.)
7. M/s. Instrument Techniques Pvt. Ltd., B-2, Co-operative Estate, Balanagar, Hyderabad–500037,(Panel Meters, Insulation Power Supplies, Multi-meters, Testers.)
8. M/s. Automatic Electric Limited,108/117, Chandralok Complex, S. D. Road, Secunderabad - 500 003. (Panel Meters, Variac.)
9. M/s. Signetic Systems Pvt. Ltd., C-3/4-117, Mallapur, Hyderabad - 500 076. (Temp. controlled soldering/desoldering stations.)
10. M/s. Ralli Wolf Limited, 1-7-241/1, S.D. Road, Secunderabad–500003. (For m/c, hand tools and accessories)

11. M/s. Motor Industries Co. Ltd. (Bosch Group-Power Tools), 1-7-241/11, S. D. Road, Secunderabad - 500 003. (M/c and Tools and accessories)

12. M/s. C I T D, Balanagar, Hyderabad - 500 037. (For dies and other implements.)

### **Addresses of Raw Material Suppliers**

1. M/s. BEL Abids, Hyderabad - 500 001.(I.C'S Active, Passive components)

2. M/s. C D I L, C-120, Naraina Industrial Area, New Delhi-110 028 (I.C'S Active, Passive components)

3. M/s. Keltron, 1-1300/3, Syndicate Bank Complex, Hyderabad-20. (Registers and Capacitors.)

4. M/s. M. B. Electronics, 4-3-258/A/F/411, 1<sup>st</sup> Floor, Sri Electronics House, Giriraja Lane, Bank Street, Hyderabad-95. (I.C'S Active, Passive Components.)

5. M/s. Saini Electronics , 4-3-258/9-208, Shree Electronics House, Giriraj Lane, Bank Street, Hyderabad-5000185. (I.C'S Active and Passive components.)

6. M/s. Oswal Industries, 1-1/10, Ferozguda, Hyderabad-500011. (Solder Wires.)

7. M/s. Cosmic Engineering Enterprises, Plot. No.3, Electronics Complex (Ext.), Kushaiguda, Hyderabad-500 062 , (PCB's)

8. M/s. Electromagnetic Cores and Coils, MIG-5, APIIC Colony Moulai Ali, Hyderabad-40. (Transformer Coils.)