

## PROJECT PROFILE ON SOLAR LANTERN

### **Introduction:**

Solar Lantern is a portable light source which gives an omni directional pure white light. Solar lantern, designed in the form of a traditional lantern uses CFL as the light source. The solar photovoltaic module provided with the lantern charges the sealed maintenance - free battery inside the lantern when exposed to sunlight. The battery supply power to the Compact Fluorescent Lamp whenever required. Solar Photovoltaic module, battery, Compact Fluorescent Lamp, Charge Controller and Inverter are the main parts in a solar lantern. The lantern can be used for 3-4 hours after a sunny day's charging.

### **Market:**

There is a wide gap between power supply and demand in India. Heavy and incessant consumption of traditional source of energy has resulted in their gradual depletion over a period of time accompanied by environmental damages. Situation has reached to such an alarming position, nations world wide have been forced to consider the non-conventional energy as a solution for the present energy crisis. Solar energy is one very important source of non conventional energy.

Earth receives an incredible supply of solar energy. The sun provides enough energy in one minute to cater to the global energy needs for one year. Enhanced direct and indirect utilisation of this abundant energy source will play a key role in solving the energy and environmental problems faced by the world.

India receives 5000 trillion KWH per year of solar energy which is far more than the total energy consumption of the country. For years, solar technology has been considered as an expensive alternative but however due to the technological advancement, solar energy based system is now economically feasible.

Considering the potential for further growth in this sector and new developments in the technological scenario, there is scope for setting up of more number of units manufacturing solar energy based systems.

➤ **Basis & Presumptions:**

- The basis for calculation of production capacity has been taken on a single shift basis on 75% efficiency,
- The maximum capacity utilization on single shift basis, for 300 days in a year. During the 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,
- The salaries and wages, cost of raw materials, utilities, rent, etc. are based on the prevailing rates in and around Thrissur. These cost factors are likely to vary with time and location,
- Interest on term loan and working capital has been taken @ 16% on an average. This rate may vary depending upon the policy of financial institutions/agencies from time to time,
- The cost of machinery and equipments refer to a particular make/model and the prices are approximate,
- The break-even point percentage indicated is of full capacity utilization,
- The project preparation cost, etc. whenever required could be considered under the pre-operative expense,
- The essential machinery and equipments required for the project have been indicated. The unit may also utilize common facilities available available at Electronics Test & Development Centres (ETDC) and Electronic Regional Test Laboratories (ERTLs) set up by state Governments and STQC Directorate of Department of Information Technology, Ministry of Communication and Information Technology to manufacture products conforming to Bureau of Indian Standards.

### **Implementation Schedule:**

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

<b>Sl.No</b>	<b>Name of the activity</b>	<b>Period in months (Estimated)</b>
1	Preparation of project report	1
2	Registration & other formalities	1
3	Sanction of loan by financial institution	3
4	Plant & machinery:	
a	Placement of orders	1
b	Procurement	2
c	Electrification & installation	2
5	Procurement of raw materials	2
6	Recruitment of technical personnel	2
7	Trial operation	11 <sup>th</sup> month
8	Commercial operation	12 <sup>th</sup> month

**Note:** Many of the above activities shall be initiated concurrently,

When imported equipments are required, the implementation period of the project may vary from 12 months to 15 months,

Procurement of raw materials commences from the 8<sup>th</sup> month onwards.

### **Technical aspects:**

#### **Process:**

The incoming raw material and components are tested for required quantity and specifications. The components are shaped, formed and

soldered on pre-designed printed circuit boards. The assembled printed circuit boards are tested for desired performance. The PCBs , transformer, sub-assemblies, battery, CFL and electro-mechanical parts are connected inside the enclosure and the electrical wiring is made . The switches , knobs, Solar Photo voltaic Panel and other parts are connected and the final system is thoroughly tested as per the required specification.

**Production Capacity per annum:**

Quantity	7200 Nos
Value	Rs. 2,66,40,000/-
Motive power required	10 KVA

**Pollution Control:**

Government accords utmost importance to control environmental pollution. The small scale entrepreneurs should have an environmental friendly attitude and adopt pollution control measures by process modification and technology substitution.

India having acceded to the Montreal Protocol in September 1992, the production and use of Ozone Depleting Substances (ODS) like Chlorofluoro Carbon (CFC), Carbon Tetrachloride, Halons and Methyl Chloroform etc. need to be phased out immediately with alternative chemicals/solvents. A notification for detailed rules to regulate ODS phase out under the environment Protection Act, 1986 have been put in place with effect from 19<sup>th</sup> July, 2000.

The following steps are suggested which may help to control pollution in electronics industry wherever applicable:

In electronic industry fumes and gases are released during hand soldering/wave soldering/dip soldering, which are harmful to people as well as environment and the end products. Alternate technologies may be used to phase out the existing polluting technologies. Numerous new fluxes have been developed containing 2 – 10% solids as opposed to the traditional 15 – 33% solids. Electronic industry uses CFC, Carbon Tetrachloride and Methyl

Chloroform for Cleaning of printed circuit boards after assembly to remove flux residues left after soldering, and various kinds of foams for packaging.

Many alternative solvents could replace CFC-113 and Methyl Chloroform in electronics cleaning. Other Chlorinated solvents such as Trichloroethylene, Perchloroethylene and Methylene Chloride have been used as effective cleaners in electronics industry for many years. Other organic solvents such as Ketones and Alcohols are effective in removing both solder fluxes and many polar contaminants.

### **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 the Govt. of India since 1980s. The Energy Conservation Act, 2001 has been enacted on 18<sup>th</sup> August, 2001 which provides for efficient use of energy, its conservation and capacity building of Bureau of Energy Efficiency created under the Act.

The following steps may help for conservation of electrical energy:

- Adoption of energy conserving technologies, production aids and testing facilities.,
- Efficient management of process/manufacturing machineries and systems, QC and testing equipments for yielding maximum Energy Conservation,
- Optimum use of electrical energy for heating during soldering process can be obtained by using efficient temperature controlled soldering and disordering stations,
- Periodical maintenance of motors, compressors, etc.
- Use of power factor correction capacitors. Proper selection and layout of lighting system; timely switching on-off of the lights; use of compact fluorescent lamps wherever possible, etc.

## Financial Aspects

### A) Fixed Capital

#### i) Land and Building

Built up Area	250 sq.mts,
Office, stores	100 sq.mts.
Assembly and Testing	150 sq.mts.
Rent payable per annum	Rs.1,20,000/-

#### ii) Machinery & Equipments

Sl.No.	Description	Indi/ Imp	Qty. Nos	Value (Rs.)
1	Drilling Machine	Ind	1	6,000/-
2	Grinder(portable)	Ind	1	5,000/-
3	Oscilloscope( 50 MHz)	Ind	1	50,000/-
4	LCR-Q meter	ind	2	30,000/-
5	Digital Lux meter	Ind	1	70,000/-
6	Power Supply(0-30V, 3Amps)	Ind	2	40,000/-
7	High Voltage Break Down Tester	Ind	1	35,000/-
8	Auto Transformer	Ind	1	5,000/-
9	Insulation Tester	Ind	1	5,000/-
10	Testing Set up (consisting Voltmeter, Ammeter, Wattmeter etc)	Ind	1	40,000/-
11	Digital Multimeter	Ind	2	20,000/-
12	Analogue Multimeter	Ind	3	4,500/-
13	Servo Voltage Stabilizer	Ind	1	8,000/-
14	Personal Computer with UPS and Printer	ind	1	60,000/-
	<b>Total</b>			<b>3,78,500/-</b>
15	<b>Electrification and Installation charges @ 10% of the total above</b>			<b>37,850/-</b>
16	Temperature Controlled soldering stations, Tools, Jigs, Fixtures, Electronic Srew Drivers etc			<b>50,000/-</b>
17	Office equipments and Furniture			<b>50,000/-</b>
18	Pre-Operative Expenses			<b>20,000/-</b>
	<b>Total Fixed Capital</b>			<b>5,36,350/-</b>

## B) Working Capital

### Recurring expenditure per month

#### i) Staff & Labour

Sl.No.	Designation	No.	Salary (Rs)	Total (Rs)
1	Manager	1	6,000/-	6,000/-
2	Supervisor	1	5,000/-	5,000/-
3	Office Assistant	1	2,500/-	2,500/-
4	Design Engineer	1	5,000/-	5,000/-
5	Marketing Executive	1	3,500/-	3,000/-
6	Peon/Watchman	1	2,000/-	2,000/-
7	Skilled worker	4	2,500/-	10,000/-
8	Semi Skilled Worker	5	2,000/-	10,000/-
	<b>Total</b>			<b>43,500/-</b>
	Perquisites @15% of salary			4,350/-
	<b>Total</b>			<b>47,850/-</b>

#### ii) Raw Materials p.m

S.No	Particulars	Ind/Imp	Rate/unit(Rs)	
1	Solar PV Module 12V/10wp	Ind	2000	
2	Battery 12V/7 Ah	Ind	600/-	
3	C F Lamp	Ind	80/-	
4	On/Off Switch	Ind	12/-	
5	Plastic Cabinet	Ind	200/-	
6	Input Connector	Ind	12/-	
7	Fuse & Fuse Holder	Ind	12/-	
8	Connecting Cables	Ind	20/-	
9	LEDs	Ind	2/-	
10	PCB, Semi Conductors, resistors, capacitors, transistors and other	Ind	200/-	

	Electro-Mechanical Components		
	Total	3,138/-	
	Cost of 600 Nos.		18,82,800/-

**iii) Utilities**

		Rs
1	Power	5,000/-
2	Water	500/-
	<b>Total</b>	<b>5,500/-</b>

**iv) Other contingent expenses per month**

		Rs
1	Rent	10,000/-
2	Stationery, postage & printing	2,000/-
3	Repair, maintenance etc	2,000/-
4	Traveling and conveyance	10,000/-
5	Advertisement and Publicity	10,000/-
6	Insurance, taxes.	1,000/-
7	Other Office Expenses, telephone, internet etc	3,000/-
8	Other Miscellaneous Expenditure	2,000/-
	<b>Total</b>	<b>40,000/-</b>
	<b>Total Recurring expenditure per month</b>	<b>19,76,150/-</b>
	<b>Working capital (for 3 months)</b>	<b>59,28,450/-</b>

C	Total Capital Investment	Rs
	<b>Fixed Capital</b>	<b>5,36,350/-</b>
	<b>Working Capital</b>	<b>59,28,450/-</b>
	<b>Total</b>	<b>64,64,800/-</b>

D	Financial analysis	
1	<b>Cost of production/annum</b>	<b>Rs</b>
	Total recurring expenditure	2,37,13,800/-
	Depreciation on machinery & equipment @ 10%	37,850/-
	Depreciation on office equipment & furniture @ 20%	10,000/-
	Depreciation on tools, jigs, fixtures etc @25%	12,500/-
	Interest on total capital investment @ 16%	10,34,360/-
	<b>Total</b>	<b>2,48,08,518/-</b>



2	<b>Turnover per annum</b>	
	<b>Quantity(Numbers)</b>	<b>7200/-</b>
	<b>Total turnover @ Rs 3700/-</b>	<b>2,66,40,000/-</b>
3	<b>Profit per annum(Before taxes)</b>	<b>18,31,482/-</b>
4	<b>Net profit ratio = <math>\frac{\text{Net profit} \times 100}{\text{Total Turnover}}</math></b>	<b>7%</b>
5	<b>Rate of Return = <math>\frac{\text{Net profit} \times 100}{\text{Total Capital Investment}}</math></b>	<b>28%</b>
6	<b>Break-even point</b>	
	<b>Fixed cost per annum</b>	<b>Rs</b>
1	Rent	1,20,000/-
2	Depreciation on machinery & equipment @ 10%	37,850/-
3	Depreciation on office equipment, furniture @ 20%	10,000/-
4	Depreciation on tools, jigs, fixtures etc @25%	12,500/-
5	Interest on total capital investment @ 16%	10,34,360/-
6	40% salary & wages	2,29,680/-
7	40% of other contingent expenses excluding rent and insurance	1,39,200/-
	<b>Total fixed cost</b>	<b>15,83,590/-</b>
	<b>Break-even point = <math>\frac{\text{fixed cost} \times 100}{\text{Fixed cost} + \text{net profit}}</math></b>	<b>46%</b>

#### **Additional Information:**

- The project may be modified/tailored to suit the individual entrepreneurship qualities/capacity, production programme and also to suit the locational characteristics, wherever applicable,
- The technology in this sector is undergoing rapid strides of change and there is a need for regular monitoring of the national and international technology scenario. The unit, may therefore, keep abreast with new technologies in order to keep them in pace with the developments for global competition,
- 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 system and ISO 14001 defines standards for environmental

management system for acceptability at international level. The unit may therefore adopt these standards for global competition,

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

***NAMES AND ADDRESSES OF MACHINERY &  
EQUIPMENT SUPPLIERS***

1	M/s. International Machine/Tools Corporation, 5, Banks Street, Behind Bank, Fort, Mumbai-400023	Machinery&Tools
2	M/s Quality Machine Tools 34,J.C Road, VLSL Building Banglore-560002	Machinery&Tools
3	M/s Electronic Trade and Technology Dev Corporation Ltd, 15/48, Malcha Marg, New Delhi-110021	Machinery, Testing Equipments and Components
4	M/s Central Electronics Ltd, 4, Industrial Area, Sahibadabad-201010 Tel: 0120-2895153/2895154/57	Solar Photovoltaic cell
5	M/s Amini Solar systems Pvt Ltd, Plot No 33-37, KINFRA Small Indi. Park, St Xavier's College (P.O) Kazhakkuttom, Thiruvananthapuram-695582 Tel: 0471- 2705588 E-mail: solar@ammini.com	Solar Photovoltaic cell, parts
6	M/s bharat Heavy Electricals Ltd, P.B No 2606, Mysore Road, Bangalore-560026 Tel: 080-26747396	Solar Photovoltaic cell
7	M/s TATA BP Solar India Ltd, Plot No 78, Electronic City, Hosur Road, Bangalore-560048 Tel: 080-28520972 E-mail:tatabp@tatabp.com Web: tatabpsolar.com	Solar Photovoltaic cell

8	M/s Lintek Energy Systems, B-167, Freedom Fighters Enclave, Neb Sarai, New Delhi-110068 Tel: 011-26854946,26854872 E-mail: <a href="mailto:lintek@vsnl.com">lintek@vsnl.com</a> Web:www.lintekgroup.com	SMF battery
9	M/s Aplab Limited,XL 1/583, II nd floor, Krishna Nivas Adv. Eashwara Iyer Road, Kochi-682035 Tel: 0484-2361623 E-mail: <a href="mailto:aplabkochi@vsnl.net">aplabkochi@vsnl.net</a>	Test and measuring equipments
10.	M/s. Mecco Instruments Private Limited P.O. Box 6388, 301, Bharat Industrial Estate T.J. Road Sewree(W) Mumbai-400015 Tel.022-24137253/24137423 Email <a href="mailto:sales@mecoinst.com">sales@mecoinst.com</a> web. <a href="http://www.mecoinst.com">www.mecoinst.com</a>	Testing Equipments
11.	M/s. Max technology (India) New Gulf Mobile Super bazaar GCDA Complex kochi Ph. 0484-3414393 Email <a href="mailto:rajput.mukesh@indiatimes.com">rajput.mukesh@indiatimes.com</a> web. www. Maxtechnoindia.com	Soldering equipments and material
12	M/s. Sumitron Exports Pvt.Ltd. 27, Community Centre Narina Phase-I New Delhi-110028 Ph. 011-25893783/25891519 Email: <a href="mailto:sumitron@vsnl.com">sumitron@vsnl.com</a>	Soldering equipments and tools etc.

	web. <a href="http://www.sumitron.com">www.sumitron.com</a>	
13.	M/s. DVance Tech Services 56-Second Floor Rani Jhansi Road New Delhi-110055 Ph. 011-23684683,23684684 E-mail <a href="mailto:info@advancetechinfo.com">info@advancetechinfo.com</a> Web. <a href="http://www.advancetech-info.com">www.advancetech-info.com</a>	Tools and Soldering stations
14.	M/s. Tomson Electronics Puliackkal Buildings Pallimukkuy M.G Road ,Kochi-682016 Ph. 0484-2356973,2356022 Email tomsonelectronics@hotmail.com Web <a href="http://www.tomsonelectronics.com">www.tomsonelectronics.com</a>	Components
15.	M/s. Wipro Info Tech 38/628-F 4 <sup>th</sup> Floor A&P Arcade SA Road Kochi-682016 Ph. 0484-2312379 Web <a href="http://www.wipro.co.in">www.wipro.co.in</a>	Computer hardware/software/accessories
16.	M/s Amara Raja Batteries Ltd, No 12, kodambakkam High Road, Nungambakkam, Chennai-600034 Tel: 044-28213270 E-mail: <a href="mailto:mktg@amararaja.co.in">mktg@amararaja.co.in</a>	SMF battery
17.	M/s RX Electronic Centre, 39/3958-B,Padmalayam Building M G Road, Pallimukku Kochi-682016 E-mail: <a href="mailto:rx@rx.electronics.com">rx@rx.electronics.com</a> Tel:0484-2382494	Testing Equipments & Components
18	M/s. Component & Devices Manikkiri Cross Road Kochi-682016 Phone:0484-2353150, 2382250 Email <a href="mailto:Component@md3.vsnl.net.in">Component@md3.vsnl.net.in</a>	Testing Equipments & Components
19.	M/s. Laxmi Electrotek Manappat Centre, HMT Junction	Testing Equipments & Components

	Kaloamassery P.O Ernakulam District, Kerala 683 104 Phone 0484-2551288, 2540321	
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