
Pre-Feasibility Study

(Household Solar System Distribution)



Small and Medium Enterprises Development Authority
Ministry of Industries & Production
Government of Pakistan
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1 DISCLAIMER

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2 EXECUTIVE SUMMARY

Solar Photovoltaic (PV) is a method of converting solar energy into direct current electricity using semiconducting materials that exhibit the photovoltaic effect. Power generation from solar PV has long been seen as a clean sustainable energy technology that draws upon the planet's most plentiful and widely distributed renewable energy source, which is the sun.

The proposed product is a Solar Home (PV) System, this system will be used as power saving feature in homes in the presence of electricity and also to be used as alternative power source in the absence of electricity hence eliminating the need for other alternative power sources such as generators and UPS. The Solar Home (PV) System will include Solar Panels, Hybrid Inverter, Charge Controller, Power Bank / Batteries and Frames.

The business can be established at any of the major cities across Pakistan such as Karachi, Hyderabad, Sukkur, Larkana, Multan, Lahore, Faisalabad, Gujranwala, Sialkot, Rawalpindi, Quetta, Peshawer, Mirpur and Islamabad etc.

Distribution capacity **216 kW** (kilowatt) and initial utilization **60%**

Total Investment in the business is estimated to be **Rs.2,562,050** with fixed investment of **Rs. 721,000** and working capital requirement of **Rs.1, 841,050**.

Given the cost assumptions IRR and Payback are **47%** and **3.6 years** respectively.

The most critical considerations or factors for success of the project are:

- Most significant consideration(s)
 - Owner and key employees must have technical expertise & experience.
 - Financial position and credit standing of the distributor.
 - After Sales Services is also crucial in creating good personal relationship with customers.
 - Linkages development with the local market & households.
- Equally important factors:
 - Effective marketing plan for the business so that the potential customers could be reached.
 - Good customer care is vital for creating positive image for business growth.
 - Selection of a central location based on the target market.

3 INTRODUCTION TO SMEDA

The Small and Medium Enterprises Development Authority (SMEDA) was established in October 1998 with an objective to provide fresh impetus to the economy through development of Small and Medium Enterprises (SMEs).

With a mission "to assist in employment generation and value addition to the national income, through development of the SME sector, by helping increase the number, scale and competitiveness of SMEs", SMEDA has carried out 'sectoral research' to identify policy, access to finance, business development services, strategic initiatives and institutional collaboration and networking initiatives.

Preparation and dissemination of prefeasibility studies in key areas of investment has been a successful hallmark of SME facilitation by SMEDA.

Concurrent to the prefeasibility studies, a broad spectrum of business development services is also offered to the SMEs by SMEDA. These services include identification of experts and consultants and delivery of need based capacity building programs of different types in addition to business guidance through help desk services.

4 PURPOSE OF THE DOCUMENT

The objective of the pre-feasibility study is primarily to facilitate potential entrepreneurs in project identification for investment. The project pre-feasibility may form the basis of an important investment decision and in order to serve this objective, the document/study covers various aspects of project concept development, start-up, and production, marketing, finance and business management.

The purpose of this document is to facilitate potential investors in **Household Solar Distribution** by providing them with a general understanding of the business with the intention of supporting potential investors in crucial investment decisions.

The need to come up with pre-feasibility reports for undocumented or minimally documented sectors attains greater imminence as the research that precedes such reports reveal certain thumb rules; best practices developed by existing enterprises by trial and error, and certain industrial norms that become a guiding source regarding various aspects of business set-up and it's successful management.

Apart from carefully studying the whole document one must consider critical aspects provided later on, which form basis of any Investment Decision.

5 BRIEF DESCRIPTION OF PROJECT & PRODUCT

A photovoltaic system employs solar panels composed of a number of solar cells to supply usable solar power. The direct conversion of sunlight to electricity occurs without any moving parts or environmental emissions during operation.

Pakistan has always been in the grip of sustainable energy scarcity. There is an ever increase in energy demand that cannot be fulfilled using the current resources. The official estimates based on household surveys suggest that about 5 million people remained off-grid in 2016 but data from a 2017 census leads to an estimate that is almost 10 times as high: almost 50 million people constituting 36 percent of the population.¹

Around the world, solar energy particularly, is positioned to become a new source of sustainable energy. The increased awareness towards environmental issues has prompted a new shift towards low-carbon energy alternatives that has enabled new investment in the alternate energy. "Pakistani households spend \$ 2.3 billion per annum on alternative lighting products."² Commercial manufacturing of the PV Systems has served to decrease the cost of its components with the passage of time due to advancements in manufacturing technology, techniques and process.

Pakistan predominantly requires alternate sources of energy to both deal with the environmental challenges and the energy shortage. This feasibility study explores the opportunity that exists in the Home (PV) Distribution Business, in Pakistan. Hybrid Systems are more appealing because of the flexibility to connect along with the national grid electricity connection. So will enable the consumers to utilize the solar energy as an energy saving option in the presence of the electricity as well as to provide as a backup power in the absence of electricity in the day times with the ability to charge the batteries that will provide backup in the nights.

Following are the key parameters for the proposed distribution unit:

- **Technology:** There are three types of Solar (PV) Systems widely available:
 - The first type is the Grid Tied Systems that are connected to the utility power grids, which is an alternative power generation method like the hydel or fuel or gas generators used by power companies to meet the needs of the area or city or country and they will only work in the presence of sunlight.

¹ Impact of electricity shortage on economy, recorder report Sept 20th, 2018

² Pakistan Off-Grid Lighting Consumer Perceptions Study 2015, (IFC) World Bank Group

- The second type is the Off-Grid PV System that are also known as stand-alone Systems. These types of Systems are not connected to the grid and it requires batteries. The batteries ensure the availability of electricity even in the absence of sunlight. These types of systems are mainly used in the remote areas, which are not in the reach of national power distribution.
- The third type is the Hybrid PV Systems, it is best suited for households because of the flexibility to connect along with the national grid electricity connection.

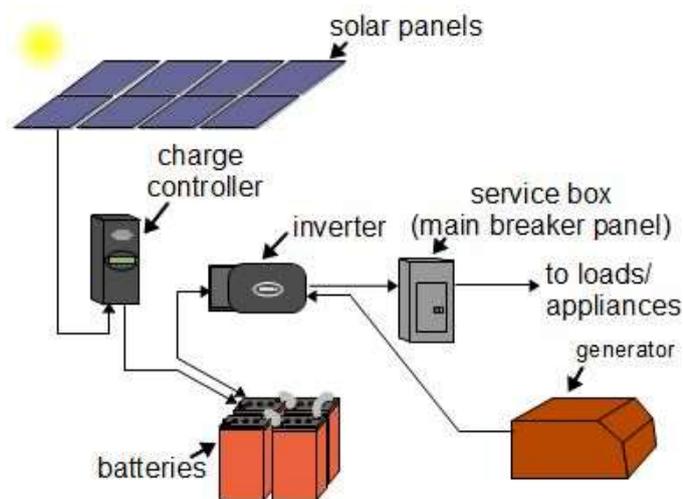


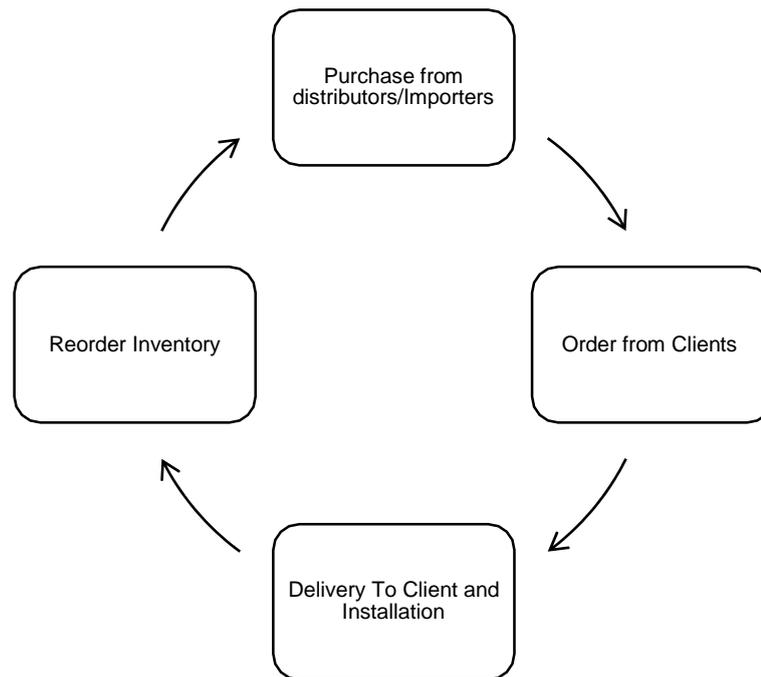
Fig 01: Off-Grid PV System



Fig 02: On-Grid / Hybrid PV System

- **Location:** This solar back-up power business can be located anywhere in Pakistan, especially in urban cities like Karachi, Hyderabad, Sukkur, Larkana, Multan, Lahore, Faisalabad, Gujranwala, Sialkot, Rawalpindi, Quetta, Peshawer, Mirpur and Islamabad.
- **Product:** This distribution business would buy the Hybrid PV Systems from the importers or distributors which would be sold to and installed at premises of the end consumers.
- **Target Market:** The target market for the proposed business consists of three segments. The proposed segments are household consumers, small sized businesses and organizations, and educational institutions located in major cities of the country.
- **Employment Generation:** The distribution unit would generate both direct and indirect employment. Direct employment would be provided to 6 people. One person who would look after the accounts and general administration activities, one person would handle marketing and procurements and three people with technical skills are proposed to be engaged to manage system installation and after sales services.

5.1 Distribution Process Flow



- **Stage 1:** Bare minimum inventory is maintained to fulfil the demand on time
- **Stage 2:** Demand from clients analyzed
- **Stage 3:** Delivery and Installation at the premises of clients takes place
- **Stage 4:** Reorder of inventory according to demand

5.2 Installed and Operational Capacities

The operational capacity of this pre-feasibility is 18 kW per month. The assumed operational capacity during the first year of operations is 60%.

6 CRITICAL FACTORS

The key success factors are as follows:

- Quality of components
- Effective marketing plan for the business so that the potential customers could be reached.
- After sale services is also crucial in creating good personal relationships with customers.
- Owner or key employees must have technical expertise & experience.
- Selection of a central location based on the target market.
- Linkages development with the local market & households.

7 GEOGRAPHICAL POTENTIAL FOR INVESTMENT

Pakistan's geography is most favorable to exploitation of solar energy as it is sixth most fortunate country in the world in terms of solar irradiance and where sunshine availability is 8-10 hours per day over much of the plains of Sindh, Baluchistan and Southern Punjab.

Solar energy intensity in Sun Belt of Pakistan is approximately 1,800-2,200 Kwh per square meter per day which is most favorable for exploitation of solar energy. Potential capacity for installation of solar photovoltaic power by some estimates is 1,600 GW, which is 40 times greater than present consumption³.

Since solar power is available only during times of sunshine, it can at most meet up to 30% of daily consumption. Thar, lower Sindh & Baluchistan, Punjab and lower KPK are prime regions with potential to generate more than 250 Gigawatts electric power to meet energy shortfall over coming decades. Business of Solar (pv) based micro generation systems have a good demand owing to the geographical potential and energy shortfall in the country.

8 POTENTIAL TARGET CUSTOMERS

The solar (PV) system consumers are increasing in Pakistan as more people are shifting from fuel generators to solar power for power needs. The potential customers are segmented into following groups: Small Businesses and Organizations: Small businesses operating in areas with disrupted electricity supply opt for solar power systems for their electricity needs. Organizations including Health facilities, Government offices and NGOs operating in remote rural areas with no grid power access also install PV systems to meet their electricity needs. Such customers are found both in rural as well as urban areas of Pakistan. Households: Household consumers with adequate buying power prefer PV systems over power generators. People from urban centers of Punjab and Sindh are especial target with huge potential as these areas get maximum amount of sunlight. The affordability of such consumers is also high as the PV systems cost quite high. However, individual households may order PV systems from across the country. Educational Institutions: Schools and colleges operating in rural areas with no grid power supply install PV systems to meet their requirements.

³ Impact of electricity shortage on economy, recorder report Sept 20th, 2018

9 PROJECT COST SUMMARY

A detailed financial model has been developed to analyze the commercial viability of this project. Various costs and revenue related assumptions along with results of the analysis are outlined in this section.

9.1 Project Economics

All the figures in this financial model have been calculated for estimated revenue of Rs. 17.909 million in the year one. The capacity utilization is worked out at 60%.

The following table shows internal rate of return, payback period and net present value of the proposed venture:

Table 9.1: Project Economics

| Description | Details |
|-------------------------------|--------------|
| Internal Rate of Return (IRR) | 47% |
| Payback Period | 3.68 years |
| Net Present Value | Rs.4,596,027 |

9.2 Project Financing

Following table provides details of the equity required and variables related to bank loan:

Table 9.2: Project Financing

| Description | Details |
|---------------------|-----------|
| Total Equity (100%) | 2,562,050 |
| Bank Loan (0%) | - |

9.3 Project Cost

Following fixed and working capital requirements have been identified for operations of the proposed business. Working capital is estimated to be Rs. 1,841,050 to meet the initial requirements of operating the business

Table 9.3: Project Cost

| Description | Cost (Rs.) |
|------------------------------|------------------|
| Capital Cost | |
| Furniture & Fixture | 246,000 |
| Office Equipment | 172,000 |
| Machinery and Equipment | 100,000 |
| Pre-operating costs | 203,000 |
| Total Capital Cost | 721,000 |
| Working Capital | |
| Raw Material Inventory | 1,066,050 |
| Up-front Building Rent | 270,000 |
| Up-front insurance payment | 5,000 |
| Cash | 500,000 |
| Total Working Capital | 1,841,050 |
| Total Project Cost | 2,562,050 |

9.4 Space Requirement

The space requirement for the proposed Solar Systems distribution business is estimated considering two facilities including a management office and a store. Details of space requirement and cost related to building are given below:

Table 9.4: Space Requirement

| Description | Estimated Area (Sq ft) | Rent Cost (Rs./sqft) | Total Cost (Rs.) |
|--------------|------------------------|----------------------|------------------|
| Rented Space | 750 | 60 | 45,000 |
| Total | | | 45,000 |

9.5 Furniture & Fixtures Requirement

Details of the furniture and fixture required for the project are given below:

Table 9.5: Furniture & Fixture

| Description | Quantity | Unit Cost (Rs.) | Total Cost (Rs.) |
|------------------------------|----------|-----------------|------------------|
| Computer Table and Chair | 02 | 30,000 | 60,000 |
| Tables for store/workshop | 02 | 25,000 | 50,000 |
| Chairs | 08 | 7,000 | 56,000 |
| Air Conditioners (1.5) | 01 | 70,000 | 70,000 |
| Electrical wiring & lighting | 10 | 1000 | 10,000 |
| Total | | | 246,000 |

9.6 Office Equipment Requirement

Following office equipment will be required for Solar Systems distribution business:

Table 9.6: Office Equipment

| Description | Quantity | Unit Cost (Rs.) | Total Cost (Rs.) |
|---------------|----------|-----------------|------------------|
| Computers | 02 | 60,000 | 120,000 |
| Printer | 01 | 30,000 | 30,000 |
| Tablet | 01 | 20,000 | 20,000 |
| Telephone Set | 01 | 2000 | 2,000 |
| Total | | | 172,000 |

9.7 Human Resource Requirement

In order to run operations of PV Systems distribution business smoothly, details of human resources required along with number of employees and monthly salary are recommended as under:

Table 9.7: Human Resource Requirement

| Description | No. of Employees | Salary per month per Person (Rs.) | Total Monthly Salary (Rs.) |
|--------------------------------|------------------|-----------------------------------|----------------------------|
| CEO | 01 | 80,000 | 80,000 |
| Sales Rep./Procurement officer | 01 | 30,000 | 30,000 |
| Installer | 02 | 25,000 | 50,000 |
| Accounts and admin. officer | 01 | 25,000 | 25,000 |
| Security Guard | 01 | 18,000 | 18,000 |
| Total | 07 | | 203,000 |

9.8 Utilities and other costs

An essential cost to be borne by the project is the cost of electricity, telephone and internet. The electricity expenses are estimated to be around Rs.19,824 per month, telephone expenses are estimated to be around Rs.7,650 per month including internet expenses. Furthermore, promotional expense being essential for marketing of PV Systems distribution business is estimated as 03% of sales.

9.9 Revenue Generation

Based on the approx. capacity utilization of 60% for PV distribution, revenue during the first year of operations is estimated as under:

Table 9.9: Revenue Generation – Year 1

| Description | No. of Units Procure (kW) | Remaining Inventory (kW) | Units available for Sale (kW) | Sale Price / kW (Rs.) | Sales Revenue (Rs.) |
|--------------------|---------------------------|--------------------------|-------------------------------|-----------------------|---------------------|
| Solar (PV) Systems | 130 | 5.8 | 124.2 | 144,200 | 17,909,640 |
| Total | | | | | 17,909,640 |

10 CONTACT DETAILS

10.1 Raw Material Suppliers

Raw Material Supplier -1

| | | | |
|-------------------------|--|------------|------------------|
| Name of Supplier | Nizam Energy Pvt LTD. | | |
| Address | G-30/4 KDA Scheme No. 5, Block 8, Clifton, Karachi | | |
| Phone | 021-35360583 | Fax | +92-21-3536-0584 |
| E-mail | sales@nizamenergy.com | | |
| Website | www.nizamsolar.com | | |

Raw Material Supplier -2

| | | | |
|-------------------------|----------------------------------|------------|--------------|
| Name of Supplier | W11 STOP | | |
| Address | 6-U, Block 6, P.E.C.H.S. Karachi | | |
| Phone | 021-37233508 | Mob | 0333-8777667 |
| E-mail | info@w11stop.com | | |
| Website | https://w11stop.com/ | | |

Raw Material Supplier -3

| | | | |
|-------------------------|-----------------------------------|------------|-----|
| Name of Supplier | Tesla Solar | | |
| Address | 81-G, Street 6, I-10/3, Islamabad | | |
| Phone | 03218375278 | Fax | N/A |
| Website | www.tesla-pv.com | | |

11 USEFUL WEB LINKS

| | |
|--|--|
| Small & Medium Enterprises Development Authority (SMEDA) | www.smeda.org.pk |
| Government of Pakistan | www.pakistan.gov.pk |
| Ministry of Industries & Production | www.moip.gov.pk |
| Ministry of Education, Training & Standards in Higher Education | http://moptt.gov.pk |
| Government of Punjab | www.punjab.gov.pk |
| Government of Sindh | www.sindh.gov.pk |
| Government of Khyber Pakhtunkhwa | www.khyberpakhtunkhwa.gov.pk |
| Government of Baluchistan | www.balochistan.gov.pk |
| Government of Gilgit Baltistan | www.gilgitbaltistan.gov.pk |
| Government of Azad Jamu Kashmir | www.ajk.gov.pk |
| Trade Development Authority of Pakistan (TDAP) | www.tdap.gov.pk |
| Security Commission of Pakistan (SECP) | www.secp.gov.pk |
| Federation of Pakistan Chambers of Commerce and Industry (FPCCI) | www.fpcci.com.pk |
| State Bank of Pakistan (SBP) | www.sbp.org.pk |
| Bank of Punjab | www.bop.com.pk |
| Bank of Khyber | www.bok.com.pk |
| National Bank of Pakistan | www.nbp.com.pk |
| Punjab Small Industries Corporation | www.psic.gop.pk |
| Sindh Small Industries Corporation | www.ssic.gos.pk |
| Pakistan Horticulture Development and Export Company (PHDEC) | www.phdec.org.pk |
| Punjab Vocational Training Council (PVTC) | www.pvtc.gop.pk |
| Technical Education and Vocational Training Authority (TEVTA) | www.tevta.org |
| Pakistan Readymade Garment Technical Training Institute | www.prgmea.org/prgtti/ |
| Livestock & Dairy Development Department, Government of Punjab. | www.livestockpunjab.gov.pk |
| Punjab Industrial Estates (PIE) | www.pie.com.pk |
| Faisalabad Industrial Estate Development and Management Company (FIEDMC) | www.fiedmc.com.pk |

12 ANNEXSURES

12.1 Income Statement

| Calculations | | | | | | | | | | |
|--|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Income Statement | | | | | | | | | | |
| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 |
| Revenue | 17,909,640 | 21,795,253 | 25,355,378 | 29,345,633 | 33,812,055 | 38,805,292 | 44,381,050 | 50,600,576 | 54,768,729 | 59,150,227 |
| Cost of sales | | | | | | | | | | |
| Cost of goods sold 1 | 12,792,600 | 15,279,741 | 17,446,418 | 19,818,089 | 22,411,554 | 25,244,889 | 28,337,544 | 31,710,434 | 33,686,935 | 35,708,151 |
| Cost of goods sold 2 | - | - | - | - | - | - | - | - | - | - |
| Operation costs 1 (direct labor) | 575,000 | 656,307 | 720,371 | 790,665 | 867,796 | 952,432 | 1,045,305 | 1,147,217 | 1,261,679 | 1,384,517 |
| Total cost of sales | 13,367,600 | 15,936,048 | 18,166,789 | 20,608,754 | 23,279,350 | 26,197,321 | 29,382,848 | 32,857,652 | 34,948,614 | 37,092,669 |
| Gross Profit | 4,542,040 | 5,859,206 | 7,188,589 | 8,736,880 | 10,532,705 | 12,607,971 | 14,998,202 | 17,742,924 | 19,820,115 | 22,057,558 |
| <i>Gross Profit Margin</i> | 25% | 27% | 28% | 30% | 31% | 32% | 34% | 35% | 36% | 37% |
| General administration & selling expenses | | | | | | | | | | |
| Administration expense | 1,836,000 | 2,014,756 | 2,210,915 | 2,426,173 | 2,662,388 | 2,921,602 | 3,206,054 | 3,518,200 | 3,860,736 | 4,236,623 |
| Administration benefits expense | 55,080 | 60,443 | 66,327 | 72,785 | 79,872 | 87,648 | 96,182 | 105,546 | 115,822 | 127,099 |
| Building rental expense | 540,000 | 594,000 | 653,400 | 718,740 | 790,614 | 869,675 | 956,643 | 1,052,307 | 1,157,538 | 1,273,292 |
| Electricity expense | 237,888 | 261,677 | 287,844 | 316,629 | 348,292 | 383,121 | 421,433 | 463,576 | 509,934 | 560,927 |
| Communications expense (phone, fax, mail, internet, etc.) | 91,800 | 100,738 | 110,546 | 121,309 | 133,119 | 146,080 | 160,303 | 175,910 | 193,037 | 211,831 |
| Office vehicles running expense | - | - | - | - | - | - | - | - | - | - |
| Office expenses (stationary, entertainment, janitorial services, etc.) | 73,440 | 80,590 | 88,437 | 97,047 | 106,496 | 116,864 | 128,242 | 140,728 | 154,429 | 169,465 |
| Promotional expense | 537,289 | 653,858 | 760,661 | 880,369 | 1,014,362 | 1,164,159 | 1,331,432 | 1,518,017 | 1,643,062 | 1,774,507 |
| Insurance expense | 5,000 | 4,500 | 4,000 | 3,500 | 3,000 | 2,500 | 2,000 | 1,500 | 1,000 | 500 |
| Professional fees (legal, audit, consultants, etc.) | 89,548 | 108,976 | 126,777 | 146,728 | 169,060 | 194,026 | 221,905 | 253,003 | 273,844 | 295,751 |
| Depreciation expense | 51,800 | 51,800 | 51,800 | 51,800 | 51,800 | 51,800 | 51,800 | 51,800 | 51,800 | 51,800 |
| Amortization of pre-operating costs | 40,600 | 40,600 | 40,600 | 40,600 | 40,600 | - | - | - | - | - |
| Bad debt expense | 537,289 | 653,858 | 760,661 | 880,369 | 1,014,362 | 1,164,159 | 1,331,432 | 1,518,017 | 1,643,062 | 1,774,507 |
| Miscellaneous expense 1 | 200,000 | 220,000 | 242,000 | 266,200 | 292,820 | 322,102 | 354,312 | 389,743 | 428,718 | 471,590 |
| Subtotal | 4,295,735 | 4,845,794 | 5,403,969 | 6,022,249 | 6,706,784 | 7,423,737 | 8,261,737 | 9,188,348 | 10,032,982 | 10,947,892 |
| Operating Income | 246,305 | 1,013,411 | 1,784,620 | 2,714,631 | 3,825,921 | 5,184,234 | 6,736,466 | 8,554,576 | 9,787,133 | 11,109,667 |
| Earnings Before Interest & Taxes | 246,305 | 1,013,411 | 1,784,620 | 2,714,631 | 3,825,921 | 5,184,234 | 6,736,466 | 8,554,576 | 9,787,133 | 11,109,667 |
| Subtotal | - | - | - | - | - | - | - | - | - | - |
| Earnings Before Tax | 246,305 | 1,013,411 | 1,784,620 | 2,714,631 | 3,825,921 | 5,184,234 | 6,736,466 | 8,554,576 | 9,787,133 | 11,109,667 |
| Tax | 71,429 | 293,889 | 517,540 | 787,243 | 1,109,517 | 1,503,428 | 1,953,575 | 2,480,827 | 2,838,269 | 3,221,803 |
| NET PROFIT/(LOSS) AFTER TAX | 174,877 | 719,522 | 1,267,080 | 1,927,388 | 2,716,404 | 3,680,806 | 4,782,891 | 6,073,749 | 6,948,864 | 7,887,863 |
| Balance brought forward | 1% | 3% | 5% | 7% | 8% | 9% | 11% | 12% | 13% | 13% |
| Total profit available for appropriation | 174,877 | 894,399 | 1,714,280 | 2,784,528 | 4,108,668 | 5,735,140 | 7,650,461 | 9,898,980 | 11,898,354 | 13,837,040 |
| Dividend | - | 447,199 | 857,140 | 1,392,264 | 2,054,334 | 2,867,570 | 3,825,230 | 4,949,490 | 5,949,177 | 6,918,520 |
| Balance carried forward | 174,877 | 447,199 | 857,140 | 1,392,264 | 2,054,334 | 2,867,570 | 3,825,230 | 4,949,490 | 5,949,177 | 6,918,520 |

12.2 Balance Sheet

| Calculations | | | | | | | | | | | SMEDA |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------------|-------------------|-------------------|
| Balance Sheet | | | | | | | | | | | |
| | Year 0 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 |
| Assets | | | | | | | | | | | |
| Current assets | | | | | | | | | | | |
| Cash & Bank | 725,000 | 575,972 | 731,832 | 877,699 | 1,108,800 | 1,404,407 | 1,736,366 | 2,131,368 | 2,792,178 | 3,266,357 | 8,529,158 |
| Accounts receivable | - | 736,013 | 815,854 | 968,849 | 1,123,993 | 1,297,761 | 1,492,137 | 1,709,308 | 1,951,677 | 2,165,123 | 2,340,800 |
| Finished goods inventory | - | 581,200 | 666,137 | 759,209 | 861,090 | 972,505 | 1,094,237 | 1,227,126 | 1,372,078 | 1,456,192 | 1,545,528 |
| Equipment spare part inventory | - | - | - | - | - | - | - | - | - | - | - |
| Raw material inventory | 1,066,050 | 1,336,977 | 1,602,890 | 1,911,826 | 2,270,115 | 2,684,966 | 3,164,585 | 3,718,314 | 4,147,579 | 4,616,255 | - |
| Pre-paid annual land lease | - | - | - | - | - | - | - | - | - | - | - |
| Pre-paid building rent | 45,000 | 49,500 | 54,450 | 59,895 | 65,885 | 72,473 | 79,720 | 87,692 | 96,461 | 106,108 | - |
| Pre-paid insurance | 5,000 | 4,500 | 4,000 | 3,500 | 3,000 | 2,500 | 2,000 | 1,500 | 1,000 | 500 | - |
| Total Current Assets | 1,841,050 | 3,284,162 | 3,875,163 | 4,580,978 | 5,432,883 | 6,434,612 | 7,569,045 | 8,875,308 | 10,360,974 | 11,610,534 | 12,415,487 |
| Fixed assets | | | | | | | | | | | |
| Machinery & equipment | 100,000 | 90,000 | 80,000 | 70,000 | 60,000 | 50,000 | 40,000 | 30,000 | 20,000 | 10,000 | - |
| Furniture & fixtures | 246,000 | 221,400 | 196,800 | 172,200 | 147,600 | 123,000 | 98,400 | 73,800 | 49,200 | 24,600 | - |
| Office vehicles | - | - | - | - | - | - | - | - | - | - | - |
| Office equipment | 172,000 | 154,800 | 137,600 | 120,400 | 103,200 | 86,000 | 68,800 | 51,600 | 34,400 | 17,200 | - |
| Total Fixed Assets | 518,000 | 466,200 | 414,400 | 362,600 | 310,800 | 259,000 | 207,200 | 155,400 | 103,600 | 51,800 | - |
| Intangible assets | | | | | | | | | | | |
| Pre-operation costs | 203,000 | 162,400 | 121,800 | 81,200 | 40,600 | - | - | - | - | - | - |
| Legal, licensing, & training costs | - | - | - | - | - | - | - | - | - | - | - |
| Total Intangible Assets | 203,000 | 162,400 | 121,800 | 81,200 | 40,600 | - | - | - | - | - | - |
| TOTAL ASSETS | 2,562,050 | 3,912,762 | 4,411,363 | 5,024,778 | 5,784,283 | 6,693,612 | 7,776,245 | 9,030,708 | 10,464,574 | 11,662,334 | 12,415,487 |
| Liabilities & Shareholders' Equity | | | | | | | | | | | |
| Current liabilities | | | | | | | | | | | |
| Accounts payable | - | 1,161,335 | 1,387,613 | 1,591,089 | 1,815,469 | 2,062,728 | 2,335,025 | 2,634,728 | 2,947,234 | 3,148,207 | 2,934,917 |
| Export re-finance facility | - | - | - | - | - | - | - | - | - | - | - |
| Short term debt | - | - | - | - | - | - | - | - | - | - | - |
| Other liabilities | - | - | - | - | - | - | - | - | - | - | - |
| Total Current Liabilities | - | 1,161,335 | 1,387,613 | 1,591,089 | 1,815,469 | 2,062,728 | 2,335,025 | 2,634,728 | 2,947,234 | 3,148,207 | 2,934,917 |
| Other liabilities | | | | | | | | | | | |
| Deferred tax | - | 14,500 | 14,500 | 14,500 | 14,500 | 14,500 | 11,600 | 8,700 | 5,800 | 2,900 | (0) |
| Long term debt (Project Loan) | - | - | - | - | - | - | - | - | - | - | - |
| Long term debt (Working Capital Loan) | - | - | - | - | - | - | - | - | - | - | - |
| Total Long Term Liabilities | - | 14,500 | 14,500 | 14,500 | 14,500 | 14,500 | 11,600 | 8,700 | 5,800 | 2,900 | (0) |
| Shareholders' equity | | | | | | | | | | | |
| Paid-up capital | 2,562,050 | 2,562,050 | 2,562,050 | 2,562,050 | 2,562,050 | 2,562,050 | 2,562,050 | 2,562,050 | 2,562,050 | 2,562,050 | 2,562,050 |
| Retained earnings | - | 174,877 | 447,199 | 857,140 | 1,392,264 | 2,054,334 | 2,867,570 | 3,825,230 | 4,949,490 | 5,949,177 | 6,918,520 |
| Total Equity | 2,562,050 | 2,736,927 | 3,009,249 | 3,419,190 | 3,954,314 | 4,616,384 | 5,429,620 | 6,387,280 | 7,511,540 | 8,511,227 | 9,480,570 |
| TOTAL CAPITAL AND LIABILITIES | 2,562,050 | 3,912,762 | 4,411,363 | 5,024,778 | 5,784,283 | 6,693,612 | 7,776,245 | 9,030,708 | 10,464,574 | 11,662,334 | 12,415,487 |

12.3 Cash Flow Statement

| Calculations | | | | | | | | | | | SMEDA |
|---|--------------------|------------------|----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------------|
| Cash Flow Statement | | | | | | | | | | | |
| | Year 0 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 |
| Operating activities | | | | | | | | | | | |
| Net profit | | 174,877 | 719,522 | 1,267,080 | 1,927,388 | 2,716,404 | 3,680,806 | 4,782,891 | 6,073,749 | 6,948,864 | 7,887,863 |
| Add: depreciation expense | | 51,800 | 51,800 | 51,800 | 51,800 | 51,800 | 51,800 | 51,800 | 51,800 | 51,800 | 51,800 |
| amortization of pre-operating costs | | 40,600 | 40,600 | 40,600 | 40,600 | 40,600 | - | - | - | - | - |
| amortization of training costs | | - | - | - | - | - | - | - | - | - | - |
| Deferred income tax | | 14,500 | - | - | - | - | (2,900) | (2,900) | (2,900) | (2,900) | (2,900) |
| Accounts receivable | | (736,013) | (79,841) | (152,995) | (155,145) | (173,767) | (194,377) | (217,171) | (242,369) | (213,445) | (175,678) |
| Finished goods inventory | | (581,200) | (84,937) | (93,072) | (101,881) | (111,415) | (121,732) | (132,889) | (144,952) | (84,114) | (89,336) |
| Equipment inventory | | - | - | - | - | - | - | - | - | - | - |
| Raw material inventory | (1,066,050) | (270,927) | (265,912) | (308,937) | (358,289) | (414,850) | (479,619) | (553,729) | (429,265) | (468,676) | 4,616,255 |
| Pre-paid building rent | (45,000) | (4,500) | (4,950) | (5,445) | (5,990) | (6,588) | (7,247) | (7,972) | (8,769) | (9,646) | 106,108 |
| Pre-paid machinery & equipment lease interest | | - | - | - | - | - | - | - | - | - | - |
| Pre-paid office equipment lease interest | | - | - | - | - | - | - | - | - | - | - |
| Pre-paid office vehicles lease interest | | - | - | - | - | - | - | - | - | - | - |
| Advance insurance premium | (5,000) | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 |
| Accounts payable | | 1,161,335 | 226,278 | 203,475 | 224,380 | 247,259 | 272,298 | 299,703 | 312,506 | 200,973 | (213,291) |
| Other liabilities | | - | - | - | - | - | - | - | - | - | - |
| Cash provided by operations | (1,116,050) | (149,028) | 603,060 | 1,003,007 | 1,623,364 | 2,349,941 | 3,199,529 | 4,220,232 | 5,610,300 | 6,423,355 | 12,181,322 |
| Financing activities | | | | | | | | | | | |
| Issuance of shares | 2,562,050 | - | - | - | - | - | - | - | - | - | - |
| Purchase of (treasury) shares | - | - | - | - | - | - | - | - | - | - | - |
| Cash provided by / (used for) financing activities | 2,562,050 | - | - | - | - | - | - | - | - | - | - |
| Investing activities | | | | | | | | | | | |
| Capital expenditure | (721,000) | - | - | - | - | - | - | - | - | - | - |
| Acquisitions | - | - | - | - | - | - | - | - | - | - | - |
| Cash (used for) / provided by investing activities | (721,000) | - | - | - | - | - | - | - | - | - | - |
| NET CASH | 725,000 | (149,028) | 603,060 | 1,003,007 | 1,623,364 | 2,349,941 | 3,199,529 | 4,220,232 | 5,610,300 | 6,423,355 | 12,181,322 |
| Cash balance brought forward | | 725,000 | 575,972 | 731,832 | 877,699 | 1,108,800 | 1,404,407 | 1,736,366 | 2,131,368 | 2,792,178 | 3,266,357 |
| Cash available for appropriation | 725,000 | 575,972 | 1,179,032 | 1,734,839 | 2,501,064 | 3,458,741 | 4,603,936 | 5,956,598 | 7,741,668 | 9,215,534 | 15,447,679 |
| Dividend | | - | 447,199 | 857,140 | 1,392,264 | 2,054,334 | 2,867,570 | 3,825,230 | 4,949,490 | 5,949,177 | 6,918,520 |
| Cash balance | 725,000 | 575,972 | 731,832 | 877,699 | 1,108,800 | 1,404,407 | 1,736,366 | 2,131,368 | 2,792,178 | 3,266,357 | 8,529,158 |
| Cash carried forward | 725,000 | 575,972 | 731,832 | 877,699 | 1,108,800 | 1,404,407 | 1,736,366 | 2,131,368 | 2,792,178 | 3,266,357 | 8,529,158 |

13 KEY ASSUMPTIONS

13.1 Operating Cost Assumptions

| Description | Details |
|---------------------------|----------|
| Office hours | 08 hours |
| Number of shifts | 1 |
| Days operational per year | 330 days |

13.2 Product Cost Assumptions

| Description | Details |
|---|--------------|
| Increase in cost of each component of PV System | 08% per year |
| Promotional Expense | 3% of sales |

13.3 Revenue Assumptions

| Description | Details |
|---------------------------------|-----------------|
| Increase in price of PV System | 8% per year |
| Number of kilowatts | 130 kW per year |
| Increase in number of kilowatts | 5% per year |
| GP Margin (First Year) | 25 % |
| Capacity Utilization | 60 % |
| Maximum production capacity | 216 kW |

13.4 Financial Assumptions

| Description | Details |
|---------------------|-----------|
| Total Equity (100%) | 2,562,050 |
| Bank Loan (0%) | - |