Pre-Feasibility Study

ELECTRIC BICYCLE MANUFACTURING UNIT

Small and Medium Enterprises Development Authority

Ministry of Industries and Production

Government of Pakistan

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March 2021

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EXECUTIVE SUMMARY

In recent years, as electric bicycles have started providing assistance to riders, their demand has grown substantially. The popularity of these bicycles is rising owing to the increasing fuel prices, heavy traffic on streets and rising vehicular pollution. Due to the increased power capacity, ability to run on battery, long-distance range and medium speed of electric bicycles, they are now considered a feasible transportation option which makes it reliable to be used by students, females for daily commute to offices, old people for traveling and by handicaps for transportation.

According to Statista.com, China is currently the major player in the market in Asia-Pacific region, with the largest share in terms of sales volume. Given the high sales and production of electric bicycles, China is currently occupying 75% of the global market share.[1]

Owing to similar demands and needs, Pakistan carries a good potential for this sector. The project "Electric Bicycle Manufacturing Unit" highlights the importance of timely investment in the sector as amid rising demand and changing trends, there are few players in market who are serving this need.

This "Pre-feasibility Document" provides details for setting up "Electric Bicycle Manufacturing Unit", which has a capacity of manufacturing 1400 units in a year at a maximum capacity of 100%. The initial starting capacity in "Year One" is assumed to be 50%, with 700 production units annually.

The unit is proposed to be ideally located in any adjoining industrial areas in the metropolitan cities like Lahore, Karachi, Quetta, Islamabad, Peshawar. These areas are preferred for the proposed unit due to their closeness to the market for electric bicycle, proximity of raw material and availability of skilled labor.

A small size "Electric Bicycle Manufacturing Unit" will be set up in a rented building with area of 3,300 square feet. The project requires a total investment of PKR 5.931 million. This includes capital investment of PKR 3.620 million and working capital of PKR 2.311 million. This project is financed through 100% equity. The Net Present Value (NPV) of project is PKR 25.71 million with an Internal Rate of Return (IRR) of 67% and a Payback period of 2.24 years. Further, this project is expected to generate Gross Annual Revenues of PKR 28,890,000 during 1st year, Gross Profit (GP) ratio ranging from 24% to 29% and Net Profit (NP) ratio ranging from 6% to 14% during the projection period of ten years. The proposed project will achieve its estimated breakeven point at the capacity of 30% with annual revenue of PKR 17.33 million and 428 break-even units.

The proposed project will provide employment opportunities to 9 people including the owner. High return on investment and steady growth of business is expected with the entrepreneur having some prior experience or education in the related field of business. The legal business status of this project is proposed as "Private Limited

[1] https://www.statista.com/statistics/255662/sales-of-electric-bicycles-in-china/

Company". Further, the proposed project would be established as a "Sole Proprietorship".

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.

National Business Development Program for SMEs (NBDP) is a project of SMEDA, funded through Public Sector Development Program of Government of Pakistan.

The NBDP envisages provision of handholding support / business development services to SMEs to promote business startup, improvement of efficiencies in existing SME value chains to make them globally competitive and provide conducive business environment through evidence-based policy-assistance to the Government of Pakistan. The Project is objectively designed to support SMEDA's capacity of providing an effective handholding to SMEs. The proposed program is aimed at facilitating around 314,000 SME beneficiaries over a period of five years.

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 provide information to the potential investors about "Electric Bicycle Manufacturing Unit". The document provides a general understanding of the business to facilitate potential investors in crucial and effective 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 its successful management.

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

BRIEF DESCRIPTION OF PROJECT & PRODUCTS

An electric bicycle also known as an e-bicycle is a bicycle with an integrated electric motor which can be used to assist propulsion. E-bike having a battery-powered pedal assist is a machine integrated within the bike to give pedaling a boost as compared to a normal pedaled bicycle. This assistance can reduce stress and impact on rider's knees and thighs and helps in covering large distance with little effort.

Many kinds of e-bicycles are available worldwide, but generally they are broadly categorized as i) bicycles that assist the rider's pedal power (Pedelecs) and ii) those that add a throttle (moped-style).

Pedelecs is a type of electric bicycle where the rider's pedaling is assisted by a small electric motor; thus, it is a type of low-powered e-bike. However, unlike some other types of e-bikes, pedelecs are classified as conventional bicycles. Pedelec cycle is shown in Figure 1.

Figure 1: Pedelec Cycle

Moped style refers to a type of a bicycle with both an engine and pedals. Both types retain the ability to be pedaled by the rider and are therefore not electric motorcycles. Moped-style bicycle is shown in Figure 2.

Figure 2: Moped-Style Cycle

Currently in Pakistan, the Electric bicycles are imported at large scale and there is no formal setup for its local manufacturing. Over the past few years, the demand of electric bicycles has increased manifold due to changing trends of the bicycle users.

This change in trend provides an attractive opportunity for setting up Electric Bicycle Manufacturing Unit which offers good sale potential in Pakistan. Major cities of Pakistan (i.e., Lahore, Karachi, and Islamabad) carry great potential for setting up the manufacturing unit.

We have suggested Pedelecs bicycle due to the following reasons;

- According to our primary & secondary research, there is a high demand in the country for Pedelec bicycle as compare to Moped-Style bicycle.
- Pedelec bicycle is more acceptable because it can be used after the battery is out of charge.

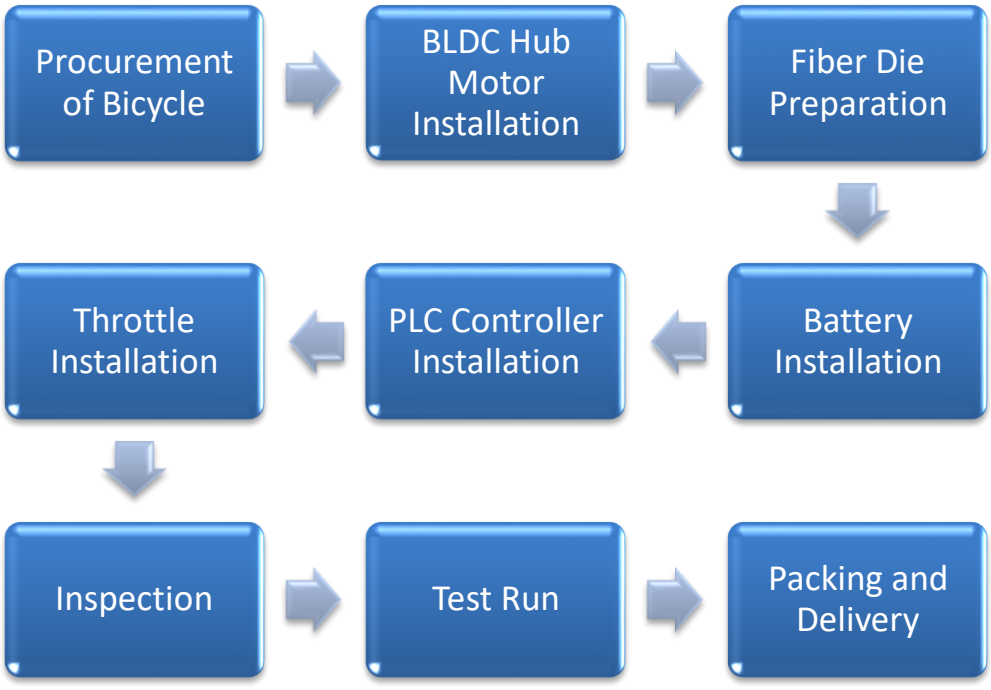
A medium sized Electric Bicycle Manufacturing Unit shall focus on manufacturing bicycles that assist the rider's pedal power and proposed to be set up in a leased building to avoid the cost of construction. The proposed project at maximum installed capacity (100%) shall manufacture 1400 Electric Bicycles per year. However, during first year of operations, the project will attain capacity of 50% producing 700 units.

Total area required for the unit would be of 3,300 Sq. ft. which shall be rented. Estimated total employment required for this project is 9 persons.

5.1. Production Process Flow

The production process flow of a bicycles that assist the rider's pedal power (Pedelecs), is given in Figure 3.

Figure 3: Production Process Flow



The brief description of process flow is as follows:

Procurement of Bicycle

The process of manufacturing of an electric bicycle starts with the procurement of a locally manufactured standard single bar bicycle and its substitute available in market The procured bicycle shall meet the following minimum requirement for further modifications.

- Lightweight frame, wheels and components
- Fiber paddles
- Narrow wheels and tires
- Adjustable seat
- A composite (carbon fiber) front fork and;
- Standard size

Locally manufactured bicycle is selected for conversion into e bicycle by considering our target customer base (middle class and upper middle class), their purchasing power and their commuting requirements.

BLDC Hub Motor Installation

The first step is to install a Brush Less Direct Current (BLDC) Hub Motor in the bicycle. This motor uses an electronic closed loop controller to switch DC currents to the motor windings producing magnetic fields which effectively rotate in space and which the permanent magnet rotor follows. The advantages of a brushless motor include high power-to-weight ratio, high speed, nearly instantaneous control of speed (rpm) and torque, high efficiency, and low maintenance cost. BLDC hub motor is shown in Figure 4.

Figure 4: BLDC Hub Motor

Fiber Die Preparation

A fiber die (box) is installed in the bicycle which carries all the electrical components including batteries, safe and organized. The fiber box is manufactured according to the structure and dimensions of the purchased bicycle which is later to be converted into an electric bicycle. Fiber box is shown in Figure 5.

Figure 5: Fiber Box

Battery Installation

The next step is the sequential installation of electric components in the fiber die. In this step, custom made removable and replaceable lithium-ion batteries (24 Ah, 36 V) are installed. The battery is the deciding factor in how long the bike can be used without recharging and for how long bicycle will work. The e-bike can also be used without the battery. Nevertheless, riding the electric bike without a battery will make it more challenging to pedal, particularly when riding through inclines or tough terrain.

PLC Controller Installation

A Programmable Logical Controller (PLC) is then installed which is a type of a control system that works according to the pre-programmed instructions. The programmable logic controller (PLC) will process the given information (inputs), execute the instruction from the program, and deliver the results (outputs) based on the provided information and written logic. PLCs operate in a repeating loop once the user determines the inputs and outputs. The controller basically acts as the “heart” for the e-bicycle. It takes energy from the battery and directs it to the motor. By twisting the throttle, the user can regulate the power that is being sent to the controller, this, in turn, controls the speed of the e-bicycle.

Throttle Installation

Throttle installation is the next step in making of an electric bicycle which helps the bicycle in providing the option to pedal or just kick back and enjoy a “free” ride. When the throttle is engaged, the motor provides power and propels the rider and the bicycle forward.

Inspection

After all the installations, electric components are inspected to ensure their proper fitting before going into the test run phase. The main touch points during the inspection of electric bicycles include:

- Components check to see that all the required components are installed and that they are operational.
- Accessories check; user manual, battery capacity check.
- Design and labels check; stickers attached according to the specifications attached to the frame.
- Visual check; workmanship check, overall product check: frame, saddle, chain, cover chain, tires, wiring and connectors, battery, charger.

Test Run

A test run is conducted, which includes a thorough checking/testing to ensure that the electric bicycle can be ridden properly (straight line and turns), all assistance modes and display having proper functions, motor assistance/brakes/transmission working properly, no unusual sounds or functions, tires inflated and mounted properly on rims, spokes installed properly in the rims. Hence, ensuring the drivability and road worthiness of the bicycle before it may be delivered to the customer.

Packing and Delivery

After the inspection and test run phase is cleared, the electric bicycle is packed and ready to be delivered to the customer.

5.2. Installed and Operational Capacities

The proposed manufacturing unit shall, at maximum capacity of 100%, will produce 1400 units of electric bicycles annually. The Product market is at growing stage. General public is not fully aware about the electric bicycle. Hence, it is assumed that during the projected period of 10 years, the facility shall continue to operate with 10% annual increase in capacity each year.

The unit would operate for 8 hours per day, working in one shift per day for 280 working days in a year.

Table 1 depicts the installed and operational capacities of the proposed unit.

Table 1: Installed and Operational Capacity

Production Description	Daily Production Capacity	Total Annual Installed Capacity	Estimated Operational Capacity Year 1 @ 50%
Electric Bicycle	5	1,400 (5*280)	700

CRITICAL FACTORS

The following factors may be taken into account while making investment decision:

- Technical know-how and basic knowledge of the entrepreneur
- Production of a quality product, specific to user need and satisfaction
- Availability of specialized workforce
- Strict checks on quality standards
- Up-to-date knowledge of market needs and new technology
- Selection of appropriate machinery, technology and human resources
- Rigorous supervision of the production process at every level
- Ability to generate work orders through industrial networking (B2B and B2C)
- Quality products and customer satisfaction and;
- Attractive labeling and packaging

GEOGRAPHICAL POTENTIAL FOR INVESTMENT

For the success of this manufacturing unit, it is necessary to determine the target market of the product. In recent years the demand of bicycles has increased in metropolitan cities like Lahore, Karachi, Quetta, Islamabad, Peshawar.

Locating the unit in large developed cities would provide advantage of being close to buyers to generate consistent orders, followed by an increased demand.

POTENTIAL TARGET MARKETS

Electric bicycle first gained popularity among older and disabled people as an alternative to regular cycling or for leisure. However, in recent years, its use has become more mainstream. The manufacturing unit will produce electric bicycles and sell through wholesale dealers in the market.

Increased electric bicycle use can potentially support a shift toward more sustainable and active transport systems. There is a potential of rise in demand of electric bicycle from three user groups i.e., commuters, rural residents and students. Therefore, it is argued that it is timely to invest in the proposed project.

Locally manufactured bicycle is selected for conversion into e bicycle by considering our target customer base (middle class and upper middle class), their purchasing power and their commuting requirements.

PROJECT COST SUMMARY

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

The projected Income Statement, Cost of Goods Sold, Cash Flow Statement and Balance Sheet are attached as Annexure.

9.1. Project Economics

All the figures in this financial model have been calculated after carefully taking into account the relevant assumptions and target market.

9.1.1. Financial Feasibility Analysis

The financial feasibility analysis given in Table 2 provides the information regarding projected IRR, NPV and payback period of the study based on 100% equity.

Table 2: Financial Feasibility Analysis

Description	Values
IRR	67%
NPV (PKR)	25,714,280
Payback Period (years)	2.24
Projection Years	10
Discount Rate used for NPV	20%

9.1.2. Financial Feasibility Debt Financing

The financial feasibility analysis given is shown in Table 3 provides the information regarding projected IRR, NPV and payback period of the study based on combination of equity (50%) and debt (50%) financing for the proposed project.

Table 3: Financial Feasibility Debt Financing

Description	Values
IRR	67%
NPV (PKR)	38,131,334
Payback Period (years)	2.24
Projection Years	10
Discount Rate used for NPV	14%

9.2. Project Cost

Total cost of the project has been calculated to be PKR. 5,931,647. The project will be financed through 100% Equity. Table 4 provides the detail of cost calculated for the proposed manufacturing unit.

Table 4: Project Cost

Description of Costs	Amount (PKR)
Capital Cost	
Building / Infrastructure	482,000
Machinery & Equipment	157,000
Furniture & Fixtures	420,000
Office Equipment	668,000
Office Vehicles	1,262,500
Incorporation Costs	20,000
Pre-operating Costs	310,737
Incorporation Costs	300,000
Total Capital Cost	**3,620,237**
Working Capital	
Equipment spare part inventory	55,667
Raw material inventory	1,628,139
Upfront building rent	100,000
Upfront insurance payment	27,605
Cash	500,000
Working Capital	**2,311,410**
Total Project Cost	**5,931,647**

Details of the listed items of the project cost are discussed in the following paragraphs:

9.2.1. Land

The Electric Bicycle Manufacturing Unit will be started in a rented building with an area of 3,300 sq. ft. This has been proposed to avoid the high land cost in a metropolitan city. Factory buildings with required area for the proposed project are usually available in the market. Therefore, no land cost has been added to the project cost. Breakup of the space requirement is provided in Table 5.

Table 5: Breakup of Premises

Area Description	Area (sq. ft.)
Covered Area	
Management Building	500
Factory Area	1,250
Store	600
Kitchen	150
Washrooms	150
Total Covered Area	**2,650**
Uncovered Area	
Pavement/Driveway	400
Grounds	250
Total Uncovered Area	**650**
Total Area	**3,300**

9.2.2. Building

There will be no cost of building since Electric Bicycle Manufacturing Unit will be set up in a rented premise of 3,300 sq. ft. However, building renovation and interior decoration cost is included in the capital investment. Table 6 Provides details of building renovation and interior decoration cost.

Table 6: Building Renovation Cost

Cost Item	Unit(s)	Total Liter / Area / Number	Unit Cost (PKR)	Total Cost (PKR)
Paint Cost	Litre	330	500	165,000
Labour Cost	Feet	33,000	8	264,000
Wall Racks	Units	1	15,000	15,000
Curtains	Units	6	3,000	18,000
Blinds	Units	4	5,000	20,000
Total				**482,000**

9.2.3. Machinery and Equipment Requirement

Table 7 provides details of machinery and equipment required for the project.

Table 7: Machinery and Equipment Requirement

Cost Item	Unit(s)	Unit Cost (PKR)	Total Cost (PKR)
Mechanical Tool Kits	3	17,000	51,000
Electrical Tool Kits	3	15,000	45,000
Welding Plant	2	12,000	24,000
Paint Spray Gun	1	7,000	7,000
Drill Machine	1	15,000	15,000
Electrical Grinder	1	15,000	15,000
Total Cost			**157,000**

Table 8 provides detail of tool kits.

Table 8: Components of tool kits

Mechanical Tool Kit	Electrical Tool Kit
Wrenches (Set)	Multi-meter
Screwdrivers	Voltage Tester
Pliers	Wire Strippers
Hammer	Circuit Finder
Multi-meter	Screw drivers & Nut drivers
Scissors	Pliers
Electrical Tape	Fish Tape
Hex Wrench(Set)	Tape Measure
LED Headlamp	Hammer
Mechanic Gloves (Disposable and Non-disposable)	Level
Wire Terminal Crimper	Torch
Wire Terminals (set)	Utility Knife

9.2.4. Furniture & Fixtures Requirement

Table 9 provides details of the furniture and fixture requirement of the project.

Table 9: Furniture and Fixtures Requirement

Cost Item	Units	Unit Cost (PKR)	Total Cost (PKR)
Executive Chairs	2	20,000	40,000
Executive Table	1	30,000	30,000
Office Chairs	6	10,000	60,000
Office Tables	2	25,000	50,000
Sofa Set	2	35,000	70,000
Conference Room Chairs	10	10,000	100,000
Conference Room Table	1	70,000	70,000
Total Cost			**420,000**

9.2.5. Office Equipment Requirement

Details of office equipment required for the project is provided in Table 10.

Table 10: Office Equipment Requirement

Cost Item	Units	Unit Cost (PKR)	Total Cost (PKR)
Air Conditioners	3	90,000	270,000
Water Dispenser / Water Cooler	2	20,000	40,000
Laptop	3	80,000	240,000
Printer	1	40,000	40,000
Wi-Fi / Internet Connection with Router Cost	1	5,000	5,000
Telephone Exchange	1	5,000	5,000
Security Cameras (2MP)	8	2,000	16,000
DVR	1	12,000	12,000
LED	1	40,000	40,000
Total Cost			**668,000**

9.2.6. Office Vehicle Requirement

Details of office vehicle required for the project is provided in Table 11.

Table 11: Office Vehicle Requirement

Cost Item	Unit(s)	Unit Cost (PKR)	Registration fee @ 1%	Total Cost (PKR)
Pickup/Delivery van	1	1,250,000	12,500	1,262,500
Total Cost				**1,262,500**

9.2.7. Licenses Permits and Registration

Details of licenses, permits and registration requirement for the project is provided in Table 12.

Table 12: Licenses, Permits, and Registration

Cost Item	Unit Cost (PKR)	Total Cost (PKR)
Company Incorporation / Registration Cost	20,000	20,000
Total Cost		**20,000**

9.2.8. Pre-Operating Cost

Details of pre-operating cost for the project are provided in Table 13.

Table 13: Pre-Operating Cost

Cost Item	Total Cost (PKR)
Administration costs	262,000
Electricity Bill	48,737
Total Cost	**310,737**

9.2.9. Security against Building Rent

Details of pre-operating cost for the project are provided in Table 14.

Table 14: Security against Building Rent

Cost Item	Months	Unit Cos/Month (PKR)	Total Cost (PKR)
Security against Building Rent	3	100,000	300,000
Total Cost			**300,000**

9.3. Breakeven Analysis

Breakeven analysis is provided in Table 15.

Table 15: Breakeven Analysis

Particulars	Amount First Year (PKR)	Ratios
Sales	28,890,000	100%
Variable Cost	22,409,126	78%
Contribution	6,286,046	22%
Fixed Cost	3,963,985	14%
Breakeven		
Breakeven Units		428
Breakeven Revenue		17,670,383
Breakeven Capacity		31%

9.3.1. Revenue Generation

Based on the 50% capacity utilization of the unit, sales revenue during the first year of operations is estimated in Table 16.

Table 16: Revenue Generation

Estimated Sale Units (A)	Sale Price (PKR) (B)	Annual Revenue (PKR) (A*B)
642	45,000	28,890,000

9.3.2. Variable Cost Estimate

Variable costs of the project have been provided in detail in Table 17.

Table 17: Variable Cost Estimate

Description of Costs	Total Cost (PKR)
Raw material Cost	19,401,240
Paint and packing cost	136,425

Utilities	390,013
Direct labor	1,914,994
Travelling expense	14,400
Communications expense (phone, fax, mail, internet, etc.)	43,200
Office vehicles running expense	436,853
Office Expenses (stationery, entertainment, janitorial Services)	72,000
Total Variable Cost (PKR)	**22,409,125**

Detailed calculations of the variable costs are discussed in the following paragraphs:

9.3.3. Raw Material Cost

Per unit cost of goods sold related to major components used in manufacturing and total cost of goods sold based on estimated annual sales of 642 units is provided in Table 18.

Table 18: Raw material

Description of Costs	Per Unit Cost (PKR)
Non-Electric Bicycle	10,000
BLDC Hub Motors 250 watts	7,000
Lithium-Ion Battery (24 Ah, 36 v)	10,000
Programmable Logic Controllers (PLC)	2,000
Throttle	1,000
Fibre Sheet Cost	220
Total Per Unit Cost	**30,220**
Total Cost (642 sold units)	**19,401,240**

9.3.4. Paint and Packing Cost

Per unit cost of goods sold related to other components (i.e., Packing material and paint) used in manufacturing and total cost of goods sold based on estimated annual sales of 642 units is provided in Table 19.

Table 19: Paint and Packing Cost

Description of Costs	Per Unit Cost (PKR)
Paint	62.5
Packing	150
Total Per Unit Cost	**212.5**
Total Cost (642 sold units)	**136,425**

9.4.5 Raw Material Inventory

Details of raw material inventory, based on 1-month requirement, for the project are provided in Table 20.

Table 20: Raw Material Inventory

Raw Material	Units	Unit Cost (PKR)	Cost (PKR)
Manual Bicycle	58	10,000	580,000
BLDC Hub Motors 250 watts	58	7,000	406,000
Lithium-Ion Battery	58	10,000	580,000
PLC Controllers	58	2,000	116,000
Throttle	58	1,000	58,000
Fiber Sheet rolls	1	11,000	11,000
Total			**1,751,000**

9.4.6 Fixed Cost Estimate

Details of fixed cost for the project are provided in Table 21.

Table 21: Fixed Cost Estimate

Description of Costs	Amount (PKR)
Utilities Cost	194,828
Administration expense (Management staff salaries)	1,440,000
Administration benefits expense	35,280
Building rental expense	1,200,000
Promotional expense	577,800
Insurance expense	27,605
Depreciation expense	424,325
Amortization of pre-operating costs	62,147
Amortization of legal, licensing, and training costs	2,000
Total Fixed Cost	**3,963,985**

9.4. Human Resource Requirement

For the 1st year of operations, the Electric Bicycle Manufacturing Unit shall require the workforce at a salary cost as projected in Table 22.

Table 22: Human Resource Requirement

Post	No.of Employees	Monthly Salary (PKR)	Annual Salary (PKR)
Management Staff			
CEO	1	80,000	960,000
Security Guard	1	20,000	240,000
Office Boy	1	20,000	240,000
Total Management Staff Salary			**1,440,000**
Direct Labor			
Die Maker-Skilled	1	30,000	360,000
Die Maker-Unskilled	1	20,000	240,000
Associate Mechanical Engineer (DAE)	1	40,000	480,000
Assistant Mechanical Engineer	1	22,000	264,000
Associate Electrical Engineer (DAE)	1	40,000	480,000
Assistant Electrical Engineer	1	22,000	264,000
Total Direct Labor Salary			**2,088,000**
Total Human Resource Cost			**3,528,000**

CONTACT DETAILS

Details of suppliers of Machinery and Equipment are provided in Table 23.

Table 23: Suppliers of Machinery and Equipment

Cost Item	Origin	Supplier Name
Mechanical Tool Kits	China	JML automation
Electrical Tool Kits	China	MAXX Tools
Welding Plant	China	Shanghai Jufan Industrial Co., LTD
Paint Spray Gun	China	CLOUNDS
Drill Machine	China	FIXTEC
Electrical Grinder	China	Chuangwei Electric Tools Manufacture Co., Ltd.

Contact details of suppliers of Machinery and Equipment are provided in Table 24.

Table 24 Contact Details of Suppliers

Cost Item	Contact Number	E-mail	Web Address
Mechanical Tool Kits	8618560651752 8618561754198	james@jmlautomation.com	www.jmldirect.com
Electrical Tool Kits	8651258689066 8651258689811	Sales04@maxxtools.com.cn	Maxxtools.en.alibaba.com
Welding Plant	862169588202	-	www.shjufan.gongwong.com
Paint Spray Gun	8613566569346	cloudtop@ctool.cn	www.cloundstool.com
Drill Machine	862552275196 8613605168946	export@fixtectools.com	www.fixtectools.com

USEFUL LINKS

Table 25: Useful Links

Name of Organization	Website
Small and Medium Enterprises Development Authority (SMEDA)	www.smeda.org.pk
National Business Development Program (NBDP)	www.nbdp.org.pk
Government of Pakistan	www.pakistan.gov.pk
Ministry of Industries and Production	www.moip.gov.pk
Government of Punjab	www.punjab.gov.pk
Trade Development Authority of Pakistan	www.tdap.gov.pk
Security and Exchange Commission of Pakistan	www.secp.gov.pk
State Bank of Pakistan	www.sbp.gov.pk
Federation of Pakistan Chambers of Commerce and Industry (FPCCI)	www.fpcci.com.pk
Technical Education and Vocational Training Authority (TEVTA)	www.tevta.org
Punjab Vocational Training Council (PVTC)	www.pvtc.gop.pk
Punjab small industries corporation	www.psic.gop.pk
Global Source Products	www.globalsources.com
Fortune business Insights	https://www.fortunebusinessinsights.com/electric-e-bike-market-102022

ANNEXURES

12.1. Income Statement

Calculations **SMEDA**

Income Statement

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue	28,890,000	40,352,580	51,143,825	63,334,106	77,257,549	93,123,018	101,650,914	110,087,940	119,225,239	129,120,934
Cost of sales										
Raw material cost	19,401,240	27,098,999	34,345,920	42,532,371	51,882,736	62,537,280	68,264,236	73,930,168	80,066,372	86,711,881
Paint & packing cost	136,425	190,554	241,513	299,078	364,827	439,748	480,018	519,860	563,008	609,738
Direct labour	1,914,994	2,208,418	2,376,992	2,551,828	2,741,406	2,946,479	3,186,609	3,419,232	3,668,836	3,936,661
Utilities	390,013	424,335	461,676	502,304	546,506	594,599	646,924	703,853	765,792	833,182
Total cost of sales	21,842,673	29,922,306	37,426,100	45,885,580	55,535,476	66,518,105	72,577,787	78,573,112	85,064,008	92,091,461
Gross Profit	7,047,327	10,430,274	13,717,725	17,448,526	21,722,073	26,604,913	29,073,127	31,514,828	34,161,232	37,029,473
General administration & selling expenses										
Administration expense	1,440,000	1,545,120	1,657,914	1,778,941	1,908,804	2,048,147	2,197,662	2,358,091	2,530,232	2,714,938
Administration benefits expense	35,280	37,855	40,619	43,584	46,766	50,180	53,843	57,773	61,991	66,516
Building rental expense	1,200,000	1,320,000	1,452,000	1,597,200	1,756,920	1,932,612	2,125,873	2,338,461	2,572,307	2,829,537
Utilities	194,828	211,972	230,626	250,921	273,002	297,026	323,164	351,603	382,544	416,208
Travelling expense	14,400	15,451	16,579	17,789	19,088	20,481	21,977	23,581	25,302	27,149
Communications expense (phone, fax, mail, internet, etc.)	43,200	46,354	49,737	53,368	57,264	61,444	65,930	70,743	75,907	81,448
Office vehicles running expense	436,853	473,112	512,381	554,908	600,966	1,330,362	1,440,782	1,560,367	1,689,878	1,830,137
Office expenses (stationery, entertainment, janitorial services, etc	72,000	77,256	82,896	88,947	95,440	102,407	109,883	117,905	126,512	135,747
Promotional expense	577,800	807,052	1,022,876	1,266,682	1,545,151	1,862,460	2,033,018	2,201,759	2,384,505	2,582,419
Insurance expense	27,605	23,464	19,324	15,183	11,042	52,337	41,381	31,805	24,990	18,174
Depreciation expense	424,325	424,325	424,325	424,325	424,325	1,096,527	971,152	720,402	720,402	720,402
Amortization of pre-operating costs	62,147	62,147	62,147	62,147	62,147	-	-	-	-	-
Amortization of legal, licensing, and training costs	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Subtotal	4,530,438	5,046,109	5,573,424	6,155,997	6,802,915	8,855,984	9,386,665	9,834,489	10,596,568	11,424,676
Operating Income	2,516,889	5,384,165	8,144,301	11,292,529	14,919,157	17,748,928	19,686,462	21,680,339	23,564,664	25,604,797
Other income										
Gain / (loss) on sale of machinery & equipment	-	-	-	-	62,800	-	-	-	-	
Gain / (loss) on sale of office equipment	-	-	-	-	267,200	-	-	-	-	
Gain / (loss) on sale of office vehicles	-	-	-	-	505,000	-	-	-	-	
Earnings Before Interest & Taxes	2,516,889	5,384,165	8,144,301	11,292,529	15,754,157	17,748,928	19,686,462	21,680,339	23,564,664	25,604,797
Subtotal	-	-	-	-	-	-	-	-	-	-
Earnings Before Tax	2,516,889	5,384,165	8,144,301	11,292,529	15,754,157	17,748,928	19,686,462	21,680,339	23,564,664	25,604,797
Tax	841,570	1,673,080	2,473,519	3,386,505	4,691,760	5,448,457	5,973,983	6,479,490	7,025,944	7,634,308
NET PROFIT/(LOSS) AFTER TAX	**1,675,319**	**3,711,086**	**5,670,782**	**7,906,024**	**11,062,398**	**12,300,471**	**13,712,479**	**15,200,849**	**16,538,720**	**17,970,489**

12.2. Balance Sheet

Statement Summaries **SMEDA**

Balance Sheet

Rs. in actuals

	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	500,000	880,146	2,082,299	3,275,868	4,449,834	9,660,657	21,916,761	35,354,539	49,782,893	65,314,274	96,615,110
Finished goods inventory	-	1,973,326	2,529,664	3,128,498	3,851,407	4,672,456	5,555,148	6,013,588	6,510,344	7,048,161	7,630,435
Equipment spare part inventory	55,667	60,120	64,930	70,124	75,734	81,793	88,336	95,403	103,035	111,278	-
Raw material inventory	1,628,139	2,433,318	3,299,929	4,372,531	5,707,158	7,360,712	8,597,216	9,962,540	11,544,691	13,378,103	-
Pre-paid building rent	100,000	110,000	121,000	133,100	146,410	161,051	177,156	194,872	214,359	235,795	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Pre-paid insurance	27,605	23,464	19,324	15,183	11,042	52,337	41,381	31,805	24,990	18,174	-
Total Current Assets	2,311,410	5,480,374	8,117,145	10,995,303	14,241,585	21,989,005	36,375,998	51,652,747	68,180,311	86,105,784	104,245,545
Fixed assets											
Land	-	-	-	-	-	-	-	-	-	-	-
Building/Infrastructure	482,000	433,800	385,600	337,400	289,200	949,216	830,195	711,173	592,151	473,130	354,108
Machinery & equipment	157,000	133,450	109,900	86,350	62,800	269,935	211,782	161,479	126,876	92,274	57,671
Furniture & fixtures	420,000	357,000	294,000	231,000	168,000	803,212	635,480	488,748	384,017	279,285	174,553
Office vehicles	1,262,500	1,073,125	883,750	694,375	505,000	2,414,417	1,910,224	1,469,155	1,154,336	839,517	524,698
Office equipment	668,000	567,800	467,600	367,400	267,200	1,148,511	901,084	687,058	539,831	392,604	245,378
Security against Building	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000
Total Fixed Assets	3,289,500	2,865,175	2,440,850	2,016,525	1,592,200	5,885,291	4,788,765	3,817,613	3,097,211	2,376,810	1,656,408
Intangible assets											
Pre-operation costs	310,737	248,589	186,442	124,295	62,147	-	-	-	-	-	-
Legal, licensing, & training costs	20,000	18,000	16,000	14,000	12,000	10,000	8,000	6,000	4,000	2,000	-
Total Intangible Assets	330,737	266,589	202,442	138,295	74,147	10,000	8,000	6,000	4,000	2,000	-
TOTAL ASSETS	5,931,647	8,612,138	10,760,437	13,150,123	15,907,932	27,884,297	41,172,763	55,476,360	71,281,523	88,484,594	105,901,953
Liabilities & Shareholders' Equity											
Current liabilities											
Accounts payable	-	1,842,832	2,554,418	3,245,898	4,036,984	4,950,951	5,938,946	6,530,065	7,134,379	7,798,730	7,245,600
Total Current Liabilities	-	1,842,832	2,554,418	3,245,898	4,036,984	4,950,951	5,938,946	6,530,065	7,134,379	7,798,730	7,245,600
Other liabilities											
Total Long Term Liabilities	-	-	-	-	-	-	-	-	-	-	-
Shareholders' equity											
Paid-up capital	5,931,647	5,931,647	5,931,647	5,931,647	5,931,647	5,931,647	5,931,647	5,931,647	5,931,647	5,931,647	5,931,647
Retained earnings	-	837,660	2,274,373	3,972,577	5,939,301	17,001,698	29,302,169	43,014,648	58,215,497	74,754,217	92,724,706
Total Equity	5,931,647	6,769,307	8,206,020	9,904,225	11,870,948	22,933,345	35,233,816	48,946,295	64,147,144	80,685,864	98,656,353
TOTAL CAPITAL AND LIABILITIES	5,931,647	8,612,138	10,760,437	13,150,123	15,907,932	27,884,297	41,172,763	55,476,360	71,281,523	88,484,594	105,901,953

12.3. Cash Flow Statement

Statement Summaries **SMEDA**
Cash Flow Statement

Rs. in actuals

	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	-	1,675,319	3,711,086	5,670,782	7,906,024	11,062,398	12,300,471	13,712,479	15,200,849	16,538,720	17,970,489
Add: depreciation expense	-	424,325	424,325	424,325	424,325	424,325	1,096,527	971,152	720,402	720,402	720,402
amortization expense	-	64,147	64,147	64,147	64,147	64,147	2,000	2,000	2,000	2,000	2,000
Finished good inventory	-	(1,973,326)	(556,338)	(598,834)	(722,909)	(821,049)	(882,692)	(458,440)	(496,755)	(537,817)	(582,275)
Equipment inventory	(55,667)	(4,453)	(4,810)	(5,194)	(5,610)	(6,059)	(6,543)	(7,067)	(7,632)	(8,243)	111,278
Raw material inventory	(1,628,139)	(805,180)	(866,611)	(1,072,601)	(1,334,628)	(1,653,553)	(1,236,504)	(1,365,324)	(1,582,151)	(1,833,412)	13,378,103
Pre-paid building rent	(100,000)	(10,000)	(11,000)	(12,100)	(13,310)	(14,641)	(16,105)	(17,716)	(19,487)	(21,436)	235,795
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Advance insurance premium	(27,605)	4,141	4,141	4,141	4,141	(41,295)	10,956	9,576	6,815	6,815	18,174
Accounts payable	-	1,842,832	711,586	691,481	791,086	913,967	987,995	591,119	604,314	664,352	(553,130)
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
Cash provided by operations	(1,811,410)	1,217,805	3,476,526	5,166,146	7,113,266	9,928,239	12,256,104	13,437,778	14,428,354	15,531,381	31,300,836
Financing activities											
Change in lease financing	-	-	-	-	-	-	-	-	-	-	-
Issuance of shares	5,931,647	-	-	-	-	-	-	-	-	-	-
Purchase of (treasury) shares	-	-	-	-	-	-	-	-	-	-	-
Cash provided by / (used for) financing	5,931,647	-	-	-	-	-	-	-	-	-	-
Investing activities											
Capital expenditure	(3,620,237)	-	-	-	-	(4,717,416)	-	-	-	-	-
Acquisitions	-	-	-	-	-	-	-	-	-	-	-
Cash (used for) / provided by investing	(3,620,237)	-	-	-	-	(4,717,416)	-	-	-	-	-
NET CASH	500,000	1,217,805	3,476,526	5,166,146	7,113,266	5,210,823	12,256,104	13,437,778	14,428,354	15,531,381	31,300,836

KEY ASSUMPTIONS

13.1. Operating Cost Assumptions

Table 26: Operating Cost Assumptions

Description	Details
Building rent growth rate	10%
Furniture and fixture depreciation	15%
Vehicle depreciation	15%
Office equipment depreciation	15%
Inflation rate	8.3%
Wage growth rate	7.3%
Electricity price growth rate	8.8%
Office equipment price growth rate	8.0%
Office vehicle price growth rate	10.7%

13.2. Revenue Assumptions

Table 27: Revenue Assumptions

Description	Details
Sale price growth rate	8.3%
Initial capacity utilization	50%
Capacity growth rate	10%
Maximum capacity utilization	100%

13.3. Financial Assumptions

Table 28: Financial Assumptions

Description	Details
Project life (Years)	10
Debt: Equity	0:100

Discount Rate (100% Equity)	20%
Discount Rate (Debt : Equity, 50:50)	14%

13.4. Cash Flow Assumptions

Table 29: Cash Flow Assumptions

Description	Details
Accounts receivable cycle (in days)	-
Accounts payable cycle (in days)	30