



**Pre-feasibility Study**

# **MANUFACTURING UNIT FOR HOUSEHOLD VACUUM CLEANER**

**August 2021**

*“The figures and financial projections are approximate due to fluctuations in exchange rates, energy costs, and fuel prices etc. Users are advised to focus on understanding essential elements such as production processes and capacities, space, machinery, human resources, and raw material etc. requirements. Project investment, operating costs, and revenues can change daily. For accurate financial calculations, utilize financial calculators on SMEDA’s website and consult financial experts to stay current with market conditions.”*

**Small and Medium Enterprises Development Authority**  
Ministry of Industries and Production  
Government of Pakistan

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## 1. DISCLAIMER

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### **Document Control**

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## 2. EXECUTIVE SUMMARY

A vacuum cleaner is a household device, used for cleaning, by creating a partial vacuum to suck dust and dirt, from floors and other surfaces. The dirt/dust is collected in a dust bag for later disposal. Vacuum cleaners are manufactured in a variety of sizes and models which are used indoor in homes, offices, shops, etc.

The first attempt to provide a mechanical solution to floor cleaning was made in England in 1599. On June 8, 1869, Chicago inventor, Ives McGaffey patented a "sweeping machine". The early versions of vacuum cleaners were bulky, noisy, smelly, and unsuccessful. With the advancement of technology, during the last decades of the 20<sup>th</sup> century, a widespread use of technological advancement was achieved which led to the development of the modern-day vacuum cleaners. Following are the benefit of vacuum cleaners.

- Vacuum cleaner saves time and energy.
- Vacuum cleaners are easy to use.
- Vacuum cleaners are equipped with HEPA or other type of filters which blocks, removes air borne disease causing germs, bacteria and viruses
- Vacuum cleaners are very useful in removing pet hair which are stuck in piles of carpet.

Rapid urbanization is expected to contribute to the growth of the vacuum cleaner in the coming times. Pakistan's current population is about one-third urban which is expected to rise to nearly 50% by 2025. In 2020, Pakistan imported vacuum cleaners of worth USD 1.39 million under the HS code 8508.<sup>1</sup>

This "Pre-feasibility Document" provides details for setting up a "Manufacturing unit for Household Vacuum Cleaner" (hereinafter referred to as the proposed unit/proposed business). The proposed unit is established to manufacture vacuum cleaners mainly for domestic use. The proposed business may be established in major cities such as Karachi, Lahore, Sargodha, Peshawar, Rawalpindi, Quetta, Bahawalpur, Faisalabad, Sialkot, Hyderabad, Sukkur, Gujranwala, Multan, etc. These cities are suitable locations due to presence of good industrial infrastructure and easy availability of skilled labor and raw materials.

The proposed unit has an annual capacity of producing 50,960 household vacuum cleaners. The production includes four types of products; differentiated on the basis of their power consumption and method of usage. The proposed unit, at 100% capacity, will produce 15,120 vacuum cleaners of 1800 watts, 14,000 vacuum cleaners of 2000 watts, 8,400 vacuum cleaners of 2200 watts and 13,440 cordless handheld vacuum cleaners. During the first year of production the proposed unit will utilize 50% of its total capacity and will manufacture 7,560 vacuum cleaners of 1800-watt, 7,000 vacuum cleaners of 2000 watt, 4,200 vacuum cleaners of 2,200 watt and

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<sup>1</sup> <https://comtrade.un.org/>

6,720 vacuum cleaners of cordless handheld vacuum cleaner vacuum cleaners. In the proposed model, the outer body of the vacuum cleaner is manufactured through injection molding machine. Electronic components and fasteners, etc. are purchased from the market. All the parts are assembled to form the final product.

The proposed project will be set up in a rented building having an area of 3,690 sq. ft. (16.40 Marla). The proposed business requires a total investment of PKR 35.26 million. This includes capital investment of PKR 25.55 million and working capital of PKR 9.71 million. This project is financed through 100% equity in which case the Net Present Value (NPV) is PKR 123.53 million with an Internal Rate of Return (IRR) of 45% and a Payback period of 3.40 years. Further, this project is expected to generate Gross Annual Revenues of PKR 209.90 million during 1<sup>st</sup> year of operations, Gross Profit (GP) ratio ranging from 15% to 21% and Net Profit (NP) ratio ranging from 3% to 10% during the projection period of 10 years. The proposed project will achieve its estimated breakeven point at capacity of 35% (17,869 units) with annual revenue of PKR 147.20 million.

The proposed project may also be established using leveraged financing. At 50% financing at a cost of KIBOR+3%, the proposed production unit for household vacuum cleaner provides Net Present Value (NPV) of PKR 139.84 million, Internal Rate of Return (IRR) of 42% and Payback period of 3.61 years. Further, this project is expected to generate Net Profit (NP) ratio ranging from 3% to 10% during the projection period of ten years. The proposed project will achieve its estimated breakeven point at capacity of 36% (18,345 units) with annual revenue of PKR 151.13 million.

The proposed project will provide employment opportunities to 58 people. The legal business status of this project is proposed as "Sole Proprietorship or Partnership".

### **3. INTRODUCTION TO SMEDA**

The Small and Medium Enterprises Development Authority (SMEDA) was established in October 1998 with the 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 'sectorial 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 aimed at facilitating around 314,000 SME beneficiaries over a period of five years.

#### **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 provide information to the potential investors about establishing a “Manufacturing Unit for Household Vacuum Cleaner”. 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 attain 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 basis of any investment decision.

#### **5. BRIEF DESCRIPTION OF PROJECT & PRODUCTS**

This section provides details about the proposed project, proposed products, specifications of the proposed products, raw materials requirements, equipment and machinery requirements and the process of manufacturing household vacuum cleaners.

A vacuum cleaner is an electric appliance that uses suction to collect dust, dirt and other small particles from floors, carpets, upholstery and other surfaces. Vacuum cleaner is an essential appliance for homeowners due to its ease and efficiency in cleaning. A vacuum cleaner uses a fan to create the suction to effectively pick up dirt

and dust. Conceptually, the fan works as a reversed blower which creates a negative pressure (vacuum). The fan blows air towards the outlet, which forces air to enter the vacuum from the inlet. This can be thought of as air from the inlet “replacing” the air blown away by the fan. Since the fan spins at a constant speed, it creates a constant stream of air that travels from the inlet, through the vacuum’s internal piping, and eventually to the outlet. The airstream is powerful enough to pick up and carry any dust or dirt near the vacuum’s inlet. This dusty air eventually reaches the vacuum’s bag where the dust is trapped (collected) for later disposal. The air leaves through the porous bag.

Vacuum cleaner is operated by electricity. It reduces the time of cleaning and increases the quality of cleanliness; when compared with the option of simple sweeping/ mopping. Vacuum cleaners, which are used in residential or commercial buildings, are manufactured in a variety of sizes and models. The available vacuum cleaners include small battery-powered hand-held devices, wheeled Sledge models for home use, domestic central vacuum cleaners, huge stationary industrial appliances that can handle several hundred liters of dust before being emptied. In addition to these, self-propelled vacuum trucks are also used for recovery of large spills or removal of contaminated soil.

Main types of vacuum cleaners are listed below:

- Mains-operated vacuum cleaners
- Commercial vacuum cleaners
- Cordless vacuum cleaners
- Robot vacuum cleaners

### **Mains-operated Vacuum Cleaners**

Mains powered means a vacuum cleaner connected to a mains voltage electrical supply during its operation. This category includes mains-operated cylinder and mains-operated upright vacuum cleaners.

Upright vacuum cleaners are also called Beat and Brush vacuum cleaners, because the roller brush in the head assists dirt removal from the surface, which makes it especially suited for carpet flooring. In upright vacuum cleaners, the head forms an integral part of the housing and the integrated handle above the housing, which means the entire cleaner is moved over the surface to be cleaned.

The two most distinctive types of subcategories within the cylinder vacuum cleaner category are the sledge and barrel as shown in Figure 1. Barrel vacuum cleaners are also known as “tub” vacuum cleaners and are the most popular for non-domestic purposes.

**Figure 1 Barrel and Sledge Vacuum Cleaners****Commercial Vacuum Cleaners**

Commercial dry vacuum cleaners are generally not very different from domestic vacuum cleaners, except that they generally have a stronger construction and larger container; allowing them to operate for longer hours, around 5-6 times more than the domestic vacuum cleaners.

**Cordless Vacuum Cleaners**

Cordless means a vacuum cleaner with integrated electrical supply (usually low voltage DC) using rechargeable battery storage of electricity for operational use. It is only connected to the mains electrical supply for the purpose of recharging the batteries. Cordless vacuum cleaners are assumed to follow the same use pattern as mains-operated vacuums. However, most cordless vacuums often do not have sufficient run time, as cordless vacuum cleaners have a battery life of 15-40 minutes while only a few can run for up to 60 minutes.

**Robot Vacuum Cleaners**

Robot vacuum cleaners perform cleaning autonomously, i.e., without human intervention. The robot vacuum cleaner is a battery-operated vacuum cleaner with a “self-drive” system. The system is using a sensory feedback control to clean surfaces automatically. Some vacuum cleaners include both a camera and Wi-Fi allowing the end-user to remote control the unit while other models are simpler with a more random cleaning pattern. Many robot vacuum cleaners are equipped with a “dock” which makes the vacuum cleaner able to charge itself whenever it is needed.

**Capacity of Vacuum Cleaners**

The suction capacity indicates how powerful the vacuum cleaner is and the air volume indicates how much air the vacuum cleaner is able to move. The suction power adds up the suction capacity and the air volume and indicates how much power the vacuum cleaner has. This is an indication of how good the vacuum cleaner is to clean i.e., the effectiveness of cleaning. The suction power of vacuum cleaners is measured in Watt (W). The suction power is measured at the end of the

tube of a complete vacuum cleaner (i.e., with tube, hose and filters – but without nozzle).

A good cleaning result (dust collection capacity) is obtained when the suction power is high and the nozzle is of a good quality i.e., the suction power together with the nozzle gives good cleaning result.

The result is shown as a percentage and indicates the quantity of dust collected. The results obtained on hard surfaces are from 90 to 100% and on carpets from 50 to 85%.

### **Proposed Products**

The proposed unit will manufacture vacuum cleaners for households use. Two types of vacuum cleaners will be manufactured: mains-operated Sledge vacuum cleaner and cordless handheld vacuum cleaner.

#### **Sledge Vacuum Cleaner**

Sledge vacuum cleaners are suitable for cleaning bare floors, stairs, floor under furniture and the attachments are handy for cleaning drapes and upholstery. Some Sledge vacuum cleaners are as good as uprights at cleaning carpets. Most Sledge vacuums are quieter, and the separate powerhead makes them seem lighter as well. They come equipped with a suction hose and a retractable cord for easy maneuvering. Sledge models have a separate unit for the motor and receptacle for ease of use. That makes these devices best for furniture and multi-surface use. Figure 2 shows Sledge vacuum cleaner.

**Figure 2 Sledge Vacuum Cleaner**



### Cordless handheld Vacuum Cleaner

These miniature models are cordless machines. These are handy for light, quick surface cleaning on short-pile carpets and bare floors and upholstery. These are also useful for cleaning car's interior. Cordless handheld vacuum cleaners can clean areas that are difficult to access by the upright and Sledge vacuum cleaner. Portable and cordless designs make these vacuum cleaners more ideal for cleaning small areas. Cordless handheld vacuums are lightweight, quiet and easy to use. They are typically battery powered, making them portable and handy for cleaning up small spills. Figure 3 shows cordless handheld vacuum cleaner.

**Figure 3 Cordless Handheld Vacuum Cleaner**

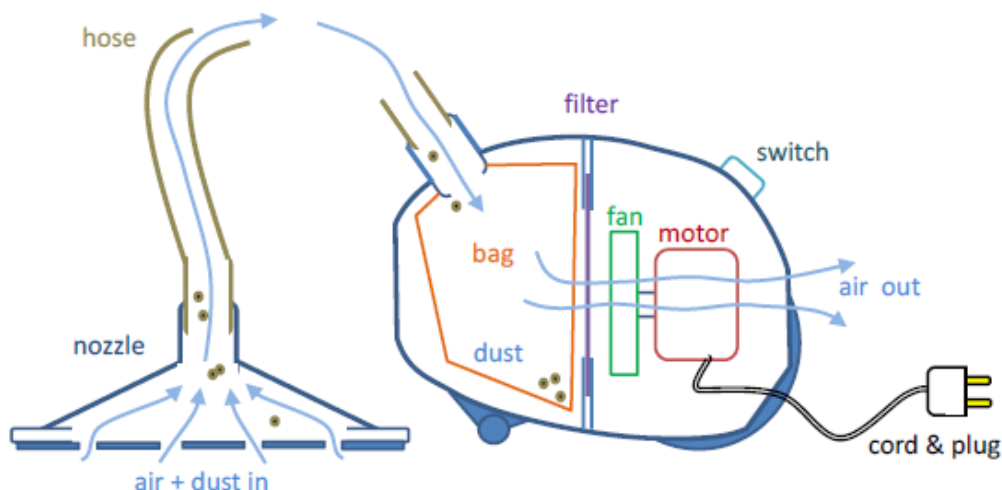


The proposed manufacturing unit will manufacture the body of vacuum cleaners and other parts will be purchased from local market or will be imported. Then these parts will be assembled to form the final product.

### Specifications of the Proposed Products

The proposed project will manufacture sledge vacuum cleaner of 1800 watts, 2000 watts and 2200 watts. Key components in a mains-operated Sledge vacuum cleaner are shown in Figure 4.

**Figure 4: Key Components in a Mains Operated Vacuum**



The outer shell holds two buttons, one for power and one for pushing in the cords, an adjuster for the suction power and two lids, one that opens the vacuum cleaners dust bag and one for the air-filter. Inside view of vacuum cleaner is shown in figure 5.

**Figure 5: Inside View of Vacuum Cleaner**

The cord is placed next to the motor on the inside of the vacuum cleaner. The cord has a connected break and spiral torsion spring, which drags the cord inside automatically when the button is pushed down and further makes it move in steps before slowing down before the end.

The motor is powered via the cord and regulated from the power-button, placed on the top of the machine, via cables. The power of the motor is regulated from a circuit board. The motor consists of a spinning turbine that cuts the air and creates an airflow that creates a spin and suction power in the nozzle. The motor is further silenced with rubber seals on the front and back to prevent the vibration created by the turbine. The dust bag is placed on the front of the vacuum cleaner and can easily be changed and checked on from an opening lid on the shell.

### **Proposed Markets**

The proposed manufacturing unit sells its products in the wholesale market.

#### **5.1. Machinery and Equipment**

Machinery and equipment required for “Manufacturing Unit for Household Vacuum Cleaners” are briefly discussed below:

##### **Injection Molding Machine 550-Ton**

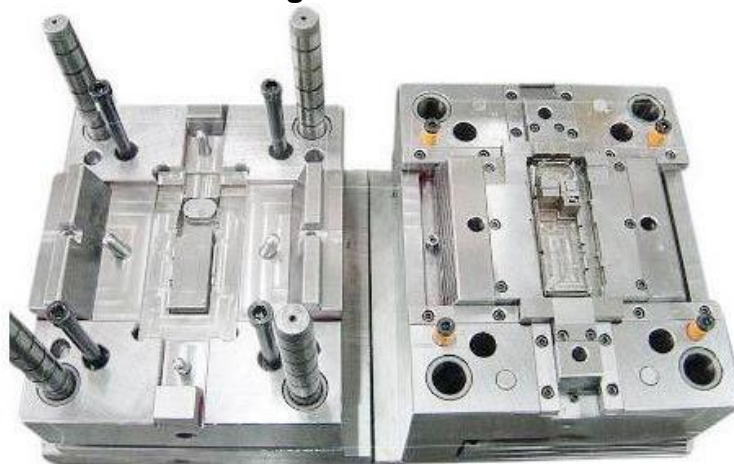
Injection molding machine will be used for manufacturing outer body of vacuum cleaners. For shaping the body of vacuum cleaners, molds will be used. Molds will be separately purchased or manufactured as per the required design from the market. The proposed project will use a 550-Ton injection molding machine with cycle time ranging between 80-150 seconds per mold.

Figure 6 shows the injection molding machine.



**Figure 6 Injection Molding Machine****Molds**

A mold is a hollow metal block (usually made of iron or steel) into which molten plastic is injected to form a certain fixed shape. The mold is opened after cooling process and the ejector rod of the injection molding machine pushes the ejector plate of the mold to further eject moldings. Different molds are used for manufacturing of different types of vacuum cleaners. These molds are manufactured according to customer's requirement and detailed design of the final product. Figure 7 shows molds.

**Figure 7 Molds****Electric Chain Pulley**

An electric chain pulley is used for lifting or moving heavy objects. An electric motor and controller are used to lift, lower and accelerate or decelerate the speed of the pulley. Electric chain pulleys are ideal for use in industrial production lines and small machine shops where more frequent and faster lifting is required. The electric chain pulley used in the proposed project is used to lift molds for injection molding machine and other heavy objects. Figure 8 shows electric chain pulley.

**Figure 8 Electric Chain Pulley****Granules Mixing Machine**

This machine is widely used for mixing granule materials of different colors. Mixing can be done in a short period of time, because of high performance of this machine. This mixing machine has a capacity of mixing 150 kg of granule material per hour has an electricity power of 4 KW. Figure 9 shows granules mixing machine.

**Figure 9: Granules Mixing Machine****Hand Tools & Material Handling Equipment****Platform Trolley**

Platform trolley is used for carrying load or to transport the materials from one point to another point. In the proposed project, trolley is used to carry the raw materials to raw material store and production department as well as to carry the final products to finished goods store room. Figure 10 shows platform trolley.



**Figure 10 Platform Trolley****Grinding Machine**

A grinding machine is used to make the edges of the plastic body smooth after the fabrication process. Figure 11 shows grinding machine.

**Figure 11 Grinding Machine****Plastic Cutter Knife**

Plastic cutter knife is used to cut the extra plastic from the body after the fabrication process. Figure 12 shows plastic cutter knife.

**Figure 12: Plastic Cutter Knife****Hand Drill Machine with Accessories**

A drill or drilling machine is a tool primarily used for making round holes or driving fasteners. It is fitted with a bit, either a drill or driver, depending on application,

secured by a chuck. Some powered drills also include a hammer function. Drilling machine requires electricity power of 0.55 KW. Figure 13 shows drill machine with accessories.

**Figure 13: Drill Machine with Accessories**



### **Digital Clamp Meter**

A clamp meter is an electrical test tool that combines a basic digital multi-meter with an electric current sensor. Clamp measure current and probes measure voltage. Having a hinged jaw integrated into an electrical meter allows technicians to clamp the jaws around a wire, cable or other conductor at any point in an electrical system, then measure current in that circuit without disconnecting it from power source. Figure 14 shows digital clamp meter.

**Figure 14: Digital Clamp Meter**



### **T Shaped Nut/Screw Driver**

A T shaped nut/screw driver is a tool for tightening nuts, screws and bolts. It consists of a socket attached to a shaft and T shaped handle and is similar in appearance and use to a screwdriver. It generally has a hollow shaft to accommodate a shank onto which a nut/screw is threaded. It is typically used for lower torque applications and is frequently used in the appliance repair and electronics industries. Figure 15 shows T shaped nut/screw driver.

**Figure 15 T Shaped Nut/Screw Driver****Combination Tool Set (Total 142 Pieces)**

Combination tool set includes hexagonal sockets, star sockets, flex handle, ratchet wrench, extension bar, universal joint, three-way adopter, spark plug socket, L-handle, spinner handle, nut spanner, hammer, combination pliers, curved jaw locked wrench, screw driver and flexible extension bar. Figure 16 shows combination tool set (142 Pieces).

**Figure 16 Combination Tool Set (142 Pieces)****Soldering Iron (Kavya)**

A soldering iron is a hand tool used in soldering. It supplies heat to melt solder so that it can flow into the joint between two work pieces. A soldering iron is composed of a heated metal tip and an insulated handle. Heating is often achieved electrically, by passing an electric current (supplied through an electrical cord or battery cables) through a resistive heating element. Figure 17 shows soldering iron.

**Figure 17 Soldering Iron (Kavya)****Hole Saw Cutter Set (11 Pieces)**

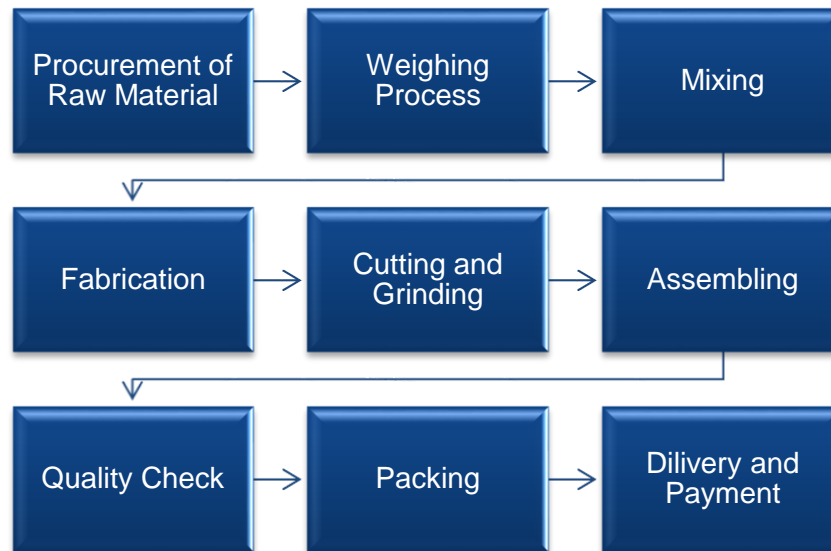
A hole saw (also styled hole saw), also known as a hole cutter is a saw blade of annular (ring) shape, whose annular kerf creates a hole in the work piece without having to cut up the core material. It is used in a drill. Hole saws typically have a pilot drill bit (arbor) at its center to keep the saw teeth from moving. Figure 18 shows hole saw cutter set.

**Figure 18 Hole Saw Cutter Set****Weigh Scale**

Weigh Scale is a device used to measure quantities of raw materials, which afterwards are mixed together in the mixer in specific ratios. Weigh scale used in the proposed project is shown in Figure 19.

**Figure 19 Weigh Scale****5.2. Process Flow of Production Unit for Household Vacuum Cleaner**

The process flow of production unit for vacuum cleaner is shown in Figure 20.

**Figure 20: Process Flow of Manufacturing Unit for House hold Vacuum Cleaner**

Brief description of the process flow is provided below:

### **Procurement of Raw Material**

Main raw material used to manufacture plastic parts of vacuum cleaner are Acrylonitrile Butadiene Styrene /ABS (plastic granules). Other components to be procured for manufacturing vacuum cleaner are electric motor, fan, power cord, plastic bag, handle, filter, screws, cable re-winder, extension wand, crevice tool, floor brush, sofa brush, axial fan, on/off power button, rechargeable batteries, charging cable, HEPA filter, small rotatory motor and fan (for handheld vacuum cleaner). Other than ABS, all other items are purchased from local markets as they are easily available in all major cities in Pakistan. The proposed unit will maintain raw material inventory for ABS material equal to 2 months of production and for other items equals to 15 days of production.

### **Acrylonitrile Butadiene Styrene (ABS)**

ABS is an opaque thermoplastic and amorphous polymer. “Thermoplastic” (as opposed to “thermoset”) refers to the way the material responds to heat. By contrast, thermoset plastics can only be heated once (typically during the injection molding process).

ABS offers a good balance of impact, heat, chemical and abrasion resistance, dimensional stability, tensile strength, surface hardness, rigidity and electrical characteristics. ABS plastic remains hard, rigid and tough even at low temperatures. It is available in fire-retardant, heat-resistant and palatable grades.

Generally, plastic granules are imported from international markets. Imported plastic granules are also available in local market, the granules are generally available in a packing of 25 kg bag. The proposed business maintains raw material inventory of two months. The payment to supplier is made on credit basis within 30 days of receipt of raw material.

**Figure 21: Acrylonitrile Butadiene Styrene (ABS)**

Following items will be purchased for assembling:

### **Parts for Sledge Vacuum Cleaner**

#### **Electric Motor**

An electric motor, with a fan, is the main component of the vacuum cleaner. Electric motor spins the fan, sucking the air and other particles and pushing it out to the other side into a dust bag to create vacuum. The proposed manufacturing unit will use motors of 1,800 watts, 2,000 watts and 2,200 watts. Figure 22 shows picture of electric motor, commonly used in vacuum cleaners.

**Figure 22: Vacuum Cleaner Electric Motor**

#### **Power Cable**

Power cable is the main cable that provides power to electric vacuum cleaner. The length of installed power cord in vacuum cleaner is approximately 8 meters. It is kept long to allow movement of the device in all parts of the room during cleaning operation. Figure 23 shows picture of power cable.



**Figure 23 Wire Used in Vacuum Cleaner****Cable Re-winder**

Cable re-winder operates on an automatic mechanism that allows the long cable of the vacuum cleaner to be collected inside the vacuum cleaner's case when it is not in use. Figure 24 shows picture of cable re-winder.

**Figure 24 Cable Rewinder****Axial Fan**

A vacuum cleaner's fan creates a pressure difference that generates suction. Directly after the fan, the air particles become denser, which leads to a high-pressure area. Since gases travel from areas of high pressure to low pressure, the air travels from the fan towards the exhaust port. Just as a high-pressure area is created after the fan, a low-pressure area is created before the fan. Therefore, an airstream travels from the relatively high-pressure inlet to the low-pressure area before the fan. Overall, this creates a stream of air that travels from the inlet to the exhaust. An axial fan has precise angles to optimize the amount of air it can displace. Figure 25 shows an axial fan.

**Figure 25 Axial Fan**

### Hose (Plastic Pipe)

A vacuum cleaner hose is a long cylindrical object which connects to a port on a vacuum. Once the hose is attached, the suction is pulled through the hose to remove dirt, dust and debris from the areas that may be hard to reach using the main section of the cleaner. The length of hose is around 5 meters. Figure 26 shows picture of hose (plastic pipe).

**Figure 26 Hose (Plastic Pipe)**



### Filter

The filter in vacuum cleaner separates the heavy, solid objects from the dust. Filter is important for regular functioning of vacuum cleaner. Filter helps to prevent large objects from either breaking the fan blades or punching holes in the dust bag.

Figure 27 shows filter.

**Figure 27 Filter**



### Dust Bag

Dust bags are made of woven material, having tiny holes which are large enough to let air particles pass, but too small for dirt particles to pass through it. When the air current flows into the bag, all the air flows through the bag, but the dirt and debris is collected in the bag. Figure 28 shows picture of dust bag.

**Figure 28 Dust Particles Bag**





## Handle

Handle is attached with the extension wand. On/off button is placed on the handle. Handle makes the vacuum easier to use. Figure 29 shows picture of Handle.

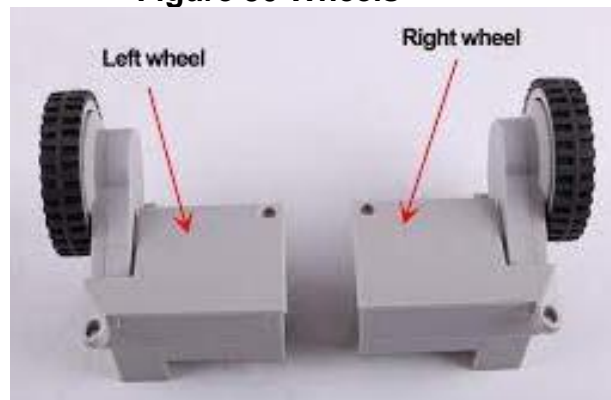
**Figure 29 Handle**



## Wheels

Wheels are attached at the bottom of vacuum cleaners. These wheels allow an easy movement of vacuum cleaner from one place to another, otherwise it becomes quite difficult to hold it while cleaning. Figure 30 shows picture of wheels.

**Figure 30 Wheels**



## Speed Adjustment Button

To control the function of vacuum cleaner, a button is fixed in its handle. This button allows to fix the sucking power and speed of the vacuum cleaner. Figure 31 shows picture of button.

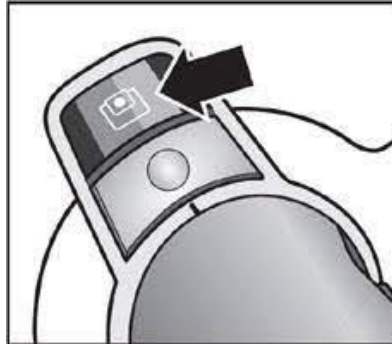
**Figure 31: Speed Adjustment Button**



### Dust Level Indicator

Dust bag is provided with an indicator, in the form of a small light installed in vacuum cleaner that indicates when the bag gets full. Figure 32 shows dust bag indicator.

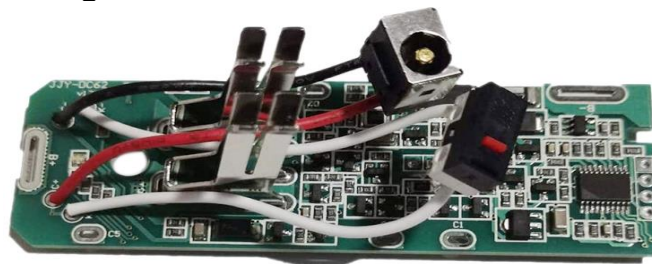
**Figure 32 Dust Bag Full Indicator**



### Printed Circuit Board

Printed circuit board is an electronic circuit consisting of thin strips of a conducting material such as copper, which have been etched from a layer fixed to a flat insulating sheet called a printed circuit. Printed circuit boards (PCBs) are used to mechanically support and electrically connect electronic components using conductive pathways. Figure 33 shows printed circuit board.

**Figure 33 Printed Circuit Board**



### On/Off Button

On/Off button is connected with circuit board through wires and it controls the on and off function of a vacuum cleaner. This button is used in both types of vacuum cleaners. Figure 34 shows on/off button.

**Figure 34 On/Off Button**



### Attachments

Most vacuum cleaners are supplied with numerous specialized attachments, such as tools, brushes and extension wands, which allow the vacuum cleaner to reach

otherwise inaccessible places or to be used for cleaning a variety of surfaces. The most common of these tools are:

- Floor brush
- Sofa brush
- Crevice tool

### Extension Wand

Extension wand is an attachment of vacuum cleaner. One end of this can be connected to handle and other to the brush. Extension wands are used to increase the length of brush. Figure 35 shows picture of extension wand.

**Figure 35 Extension Wand**



### Floor Brush

Floor brush is attached to extension wand. It cleans the dust particles by sucking action and transferring it to dust bag through hose pipe. This is used for cleaning the surface of floors and carpets. Figure 36 shows picture of floor brush.

**Figure 36 Floor Brush**



### Sofa Brush

Sofa brush is used to clean the dust of sofa sets. It is attached with the extension wand. It sucks the dust particles. Figure 37 shows picture of sofa brushes.

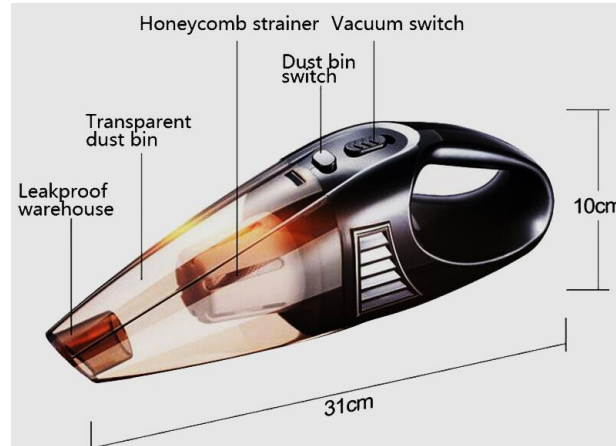
**Figure 37 Sofa Brushes****Crevice Tool**

Crevice is also a type of brush, which is used for narrow spaces on surfaces. Figure 38 shows picture of crevice tool.

**Figure 38 Crevice Tool****Parts for Cordless handheld Vacuum Cleaner**

Parts for cordless handheld vacuum cleaner include charging cable, on and off switch, rechargeable battery, motor, fan, and HEPA filter Figure 39 and Figure 40 shows parts of cordless handheld vacuum cleaner.

**Figure 39 Parts of Cordless handheld Vacuum Cleaner**

**Figure 40 Parts of Cordless Handheld Vacuum Cleaner**

### HEPA Filter

A HEPA filter is used to filter the dust in cordless handheld vacuum cleaner. **Figure 41** shows HEPA filter.

**Figure 41 HEPA Filter**

### Charging Cable

A charging cable is used to charge the cordless handheld vacuum cleaner. **Figure 42** shows charging cable.

**Figure 42 Charging Cable**

### Rechargeable Battery

Another important component of the cordless handheld vacuum cleaner is the rechargeable battery. The power in the battery limits the amount of suction capacity of the vacuum. Most cordless handheld vacuums use battery packs of about 12

volts. Most cordless handheld vacuums can create powerful suction for about 20 minutes. Figure 43 shows rechargeable battery.

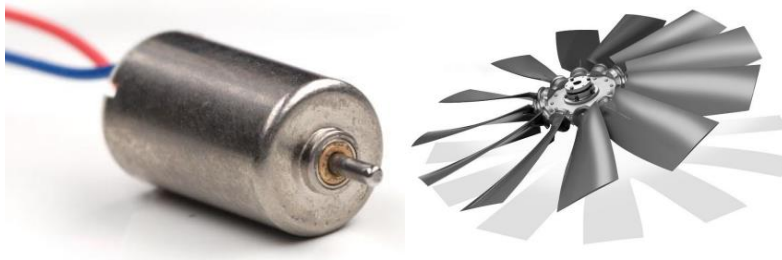
**Figure 43 Rechargeable Battery**



### **Rotatory Motor and Fan**

The motor is essential to the suction of the vacuum. A fan that creates the suction is connected to the axial shaft. Therefore, the faster the shaft rotates, the more suction the vacuum will create. The power of motor is 24 watts. Figure 44 shows rotatory motor and fan.

**Figure 44 Rotatory Motor and Fan**



### **Selection and Weighing Process**

ABS material-colored granules are selected according to the color of the final product. A weighing scale is used to measure the quantities of granules required for making the vacuum cleaners' body parts in a batch.

### **Mixing**

After weighing the granules, a mixing machine mixes the granules in the required proportion. Quantities are measured by a weighing scale. After uniform mixing, the mixed granules are ready to be filled into the feeding hopper of injection molding machine. The mixer used in the proposed project has a mixing capacity of 150 kg per hour. Mixing is done in batches as per need. Figure 45 shows granules mixing machine.



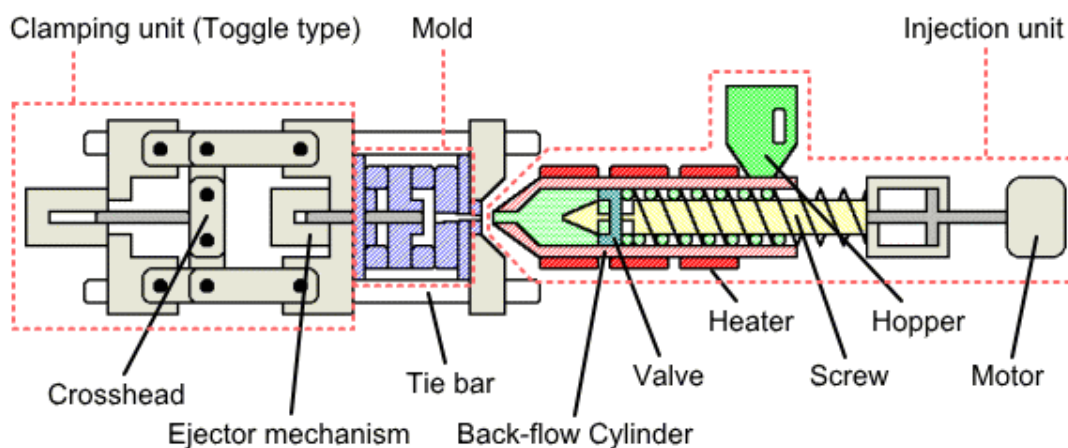
**Figure 45 Granules Mixing Machine****Fabrication**

- **Injection Molding**

Before starting the production process, a detailed computer-aided design (CAD) for each vacuum cleaner part is prepared by CAD engineers. Computer-aided design shows the details of product. Molds are custom designed according to the CAD diagram.

Injection molding is a method to make molded products by injecting plastic materials molten by heat into a mold and then cooling and solidifying them. Injection molding machine is divided into 2 units i.e., a clamping unit and an injection unit. The functions of the clamping unit are opening and closing a die and the ejection of products. The functions of the injection unit are to melt plastic granules by heat and then to inject molten plastic into a mold.

The screw of injection molding machine is rotated to melt plastic introduced from the hopper and to accumulate molten plastic in front of the screw. After the required amount of molten plastic is accumulated, injection process is started. Figure 46 shows the sections of injection molding machine.

**Figure 46: Injection Molding Machine**

While molten plastic is flowing in a mold, the machine controls the moving speed of the screw or injection speed. On the other hand, the machine controls dwell pressure<sup>2</sup> after molten plastic fills out cavities. The cycle of plastic injection molding is defined as follows.

Molding cycle  $t$  (sec) =  $t_1 + t_2 + t_3 + t_4$ , where,  $t_1$  is the injection time = injection time + dwelling time (sec),  $t_2$  is the cooling time (sec),  $t_3$  is the time (sec) needed to remove the molded product, and  $t_4$  is the time (sec) needed to open and close the mold. The cooling stage is normally the longest part of the molding cycle and can account for up to 80 percent of the total cycle time.

Table 1 shows parameters of injection molding machine.

**Table 1 Injection Molding Machine**

| Description  |     |
|--|-----|
| Cycle time per Vacuum Cleaner 1800 Watt (seconds)    | 80  |
| Cycle time per Vacuum Cleaner 2000 Watt (seconds)    | 100 |
| Cycle time per Vacuum Cleaner 2200 Watt (seconds)    | 120 |
| Cycle time per Handheld Vacuum Cleaner (seconds)     | 60  |
| Machine Setup Time per Mold (Hour)                   | 1   |
| Average No. of cavities per mold for Sledge Vacuum   | 1   |
| Average No. of cavities per mold for Handheld Vacuum | 2   |

## **Manufacturing of Outer Body**

### **Sledge Vacuum Cleaner**

The outer body of the vacuum cleaner in the proposed project is made by injection molding machine. Acrylonitrile Butadiene Styrene (ABS) is used as the raw material. Figure 47 shows outer body of vacuum cleaner.

**Figure 47: Outer Body of Vacuum Cleaner**



<sup>2</sup> Dwell pressure is the pressure that is applied during the period after the entire cavity has been filled with molten plastic until the gate has been sealed.



### **Cordless handheld Vacuum Cleaner**

Outer body and transparent plastic dustbin of cordless handheld vacuum cleaner is manufactured through injection molding. Figure 48 shows body of cordless handheld vacuum cleaner.

**Figure 48 Body of Cordless handheld Vacuum Cleaner**



### **Cutting and Grinding**

In this step, the extra plastic attached with the molded parts is removed manually using a plastic cutter. After cutting the extra plastic, the edges of the molded parts are ground using grinding machine to make the rough edges smooth.

### **Assembling**

Assembling process involves joining the molded parts with other parts of the vacuum cleaner. For assembling, workers are divided into 9 teams. Each team consists of two persons, 1 technician/ electrician and 1 helper. It takes 40 minutes to assemble a sledge vacuum cleaner and 15 minutes to assemble a cordless handheld vacuum cleaner.

### **Quality Checking**

Production supervisor monitors the assembly process and can reject parts and/or sub-assemblies which do not conform to the required quality standards. Production Supervisor may periodically or randomly select parts or sub-assemblies of the vacuum cleaners for inspection. Motors are tested before installation by digital clamp meter. At the end of the assembly process, each machine is inspected by quality checkers before it is sent for packing. Selected vacuum cleaners are also tested for operation before packing. Figure 49 shows completed Sledge vacuum cleaner and Figure 50 shows completed cordless handheld vacuum cleaner.

**Figure 49: Sledge Vacuum Cleaner**



**Figure 50 Cordless Handheld Vacuum Cleaner****Packing**

After quality checks, the vacuum cleaners are ready to be packed. The packing of vacuum cleaner includes thermopol (covering all the outside body of the vacuum cleaner), plastic wrapper, carton, and tape wrapping around the carton.

**Delivery and Payment**

After packing, the products are transferred to finished goods store for dispatching to the customers. Usually, the payments are made in cash but credit facility of an average 20 days is provided to regular customers (wholesalers and retailers). The proposed project delivers products to the customers using loader rickshaw.

**5.3. Installed and Operational Capacities**

The proposed unit has an annual capacity at 100% of producing 50,960 vacuum cleaners which includes 15,120 vacuum cleaners of 1,800-watt, 14,000 vacuum cleaners of 2000 watt, 8,400 vacuum cleaners of 2,200 watt and 13,440 cordless handheld vacuum cleaners in a year.

During the first year of operation, the project is assumed to attain 50% capacity utilization. It is assumed that the unit will manufacture total of 25,480 vacuum cleaners which include 7,560 vacuum cleaners of 1800-watt, 7,000 vacuum cleaners of 2000 watt, 4,200 vacuum cleaners of 2,200 watt and 6,720 vacuum cleaners of cordless handheld vacuum cleaner in the 1<sup>st</sup> year of operations. The production capacity utilization is assumed to increase at a rate of 5% per annum with a capacity at 90% of total capacity and it will achieve a maximum operational capacity of 90% in the 9<sup>th</sup> year. This project is financed through 100% equity. Table 2 and Table 3 shows details of maximum annual capacity and operational capacity utilization during 1<sup>st</sup> year of operations.

Table 2 Injection Molding Machine Capacity

| Description              | Production Ratio | Total Machine Hours | Total Machine Setup Time Hours | Total Available Machine Time Per Day (Hours) | Machine Hours Per Day | Available Machine Time Per Day (Minutes) | Available Machine Time Per Day (Seconds) | Machine Capacity / day (Units) |
|--------------------------|------------------|---------------------|--------------------------------|--|-----------------------|--|--|--------------------------------|
| Vacuum Cleaner 1800 Watt | 30%              | 8                   | 4                              | 4  | 1.2                   | 72                                       | 4,320                                    | 54                             |
| Vacuum Cleaner 2000 Watt | 35%              |                     |                                |  | 1.4                   | 84                                       | 5,040                                    | 50                             |
| Vacuum Cleaner 2200 Watt | 25%              |                     |                                |  | 1.0                   | 60                                       | 3,600                                    | 30                             |
| Handheld Vacuum Cleaner  | 10%              |                     |                                |  | 0.4                   | 24                                       | 1,440                                    | 48                             |
| <b>Total</b>             | <b>100%</b>      |                     |                                |  |                       |  |  | <b>182</b>                     |

Table 3: Product Wise Distribution

| Products                         | No. of Units Manufactured per day | No. of units Produces Per Year @ 100% Capacity | Initial Year Production @50% Capacity |
|----------------------------------|-----------------------------------|--|---------------------------------------|
| Vacuum Cleaner 1800 Watt         | 54                                | 15,120   | 7,560                                 |
| Vacuum Cleaner 2000 Watt         | 50                                | 14,000   | 7,000                                 |
| Vacuum Cleaner 2200 Watt         | 30                                | 8,400  | 4,200                                 |
| Cordless Handheld Vacuum Cleaner | 48                                | 13,440   | 6,720                                 |
| <b>Total</b>                     | <b>182</b>                        | <b>50,960</b>                                  | <b>25,480</b>                         |

## 6. CRITICAL FACTORS

Before making the decision to invest in “Manufacturing Unit for Household Vacuum Cleaner” business, one should carefully analyze the associated risk factors. The important considerations in this regard include:

- The parts/tools used for making the final product should meet the required quality standards
- Availability of trained and skilled staff is very critical for completing the assembling process
- Pricing and marketing strategy plays an important role in attracting the target customers
- The business must maintain consistent product quality for customer retention and attracting new customers.
- Timely response should be provided to meet market demand.

## 7. GEOGRAPHICAL POTENTIAL FOR INVESTMENT

Target customers for this proposed unit will be the wholesale market and retail market and household customers. The unit is proposed to be ideally located in any industrial areas of cities like Karachi, Lahore, Gujranwala, Multan, Faisalabad, Hyderabad, Sukkur, Peshawar, Quetta, Rawalpindi, etc. These areas are preferred for the proposed unit due to easy availability of skilled labor, raw materials and presence of industrial infrastructure. Locating the proposed unit in these cities provides the advantage of being close to buyers which will help in getting consistent orders.

## 8. POTENTIAL TARGET CUSTOMERS/MARKETS

Vacuum cleaner manufactured by proposed unit shall be sold to the customers through wholesalers. Rapid urbanization is expected to contribute to the growth of the vacuum cleaners in the forecast period. Pakistan’s current population is about one-third urban. However, that figure is expected to rise to nearly 50% by 2025.<sup>3</sup> This growth in the urban population, coupled with the rise in disposable incomes, and affordability among residents of cities, is expected to drive the demand for vacuum cleaners.

The global household vacuum cleaners market size was valued at \$15,313.3 million in 2020 and is estimated to reach \$29,133.8 million by 2031, registering a CAGR of 6.1% from 2022 to 2031<sup>4</sup>. The high demand is attributed to shifting consumer

<sup>3</sup> <https://www.files.ethz.ch/isn/159296/4c5b5fa0ebc5684da2b9f244090593bc.pdf>

<sup>4</sup> <https://www.alliedmarketresearch.com/household-vacuum-cleaners-market>

preferences toward advanced cleaning appliances over manual cleaning methods.

The cordless segment was the highest contributor to the market, with \$10,698.2 million in 2020 and is estimated to reach \$19,547.5 million by 2031, at a CAGR of 5.7% during the forecast period<sup>5</sup>.

According to sales type, the offline segment was valued at \$10,735.3 million in 2020 and is estimated to reach \$19,414.5 million by 2031, at a CAGR of 5.6% during the forecast period. Offline mode of sale covers superstores, hypermarkets, retail shops, and door-to-door selling. The proposed manufacturing unit will adopt offline sale segment by selling the products to super stores, hypermarkets, and retail shops. According to the household vacuum cleaners market opportunities, region wise, Asia-Pacific had the major household vacuum cleaners market share in 2020, and is expected to maintain its market share throughout household vacuum cleaners market forecast period<sup>6</sup>.

In 2020, Pakistan imported vacuum cleaners of worth USD 1.39 million under the HS code 8508.<sup>7</sup> For meeting local demand of vacuum cleaner, the proposed unit will play an effective role in Pakistan.

The major key players in household vacuum cleaners include Bissell, Inc., Dyson Ltd., Electrolux AB, Haier, Electronics Group Co., Ltd., iRobot Corporation, Koninklijke Philips N.V., LG Electronics, Inc., Miele & Cie. KG, Panasonic Corporation, and Samsung Electronics Co., Ltd.

Some notable vacuum cleaner brands in Pakistan include Dawlance, Haier, Dyson, Hoover, Anex, Westpoint and Panasonic. Among these brands, only Dawlance and Haier have their own manufacturing units in Pakistan.

## 9. PROJECT COST SUMMARY

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

The projected Income Statement, Cash Flow Statement and Balance Sheet are attached as annexure of this document.

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

### 9.1. Initial Project Cost

Table 4 provides fixed and working capital requirements for establishment and operations of the manufacturing unit of household vacuum cleaners.

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<sup>5</sup> <https://www.alliedmarketresearch.com/household-vacuum-cleaners-market>

<sup>6</sup> <https://www.alliedmarketresearch.com/household-vacuum-cleaners-market>

<sup>7</sup> <https://comtrade.un.org>

**Table 4: Project Cost**

| Description of Costs                           | Amount (PKR)      | Reference |
|--|-------------------|-----------|
| Land   | -                 | 9.1.1     |
| Building / Infrastructure                      | 1,676,180         | 9.1.2     |
| Machinery & equipment                          | 18,110,000        | 9.1.3     |
| Tools & Material Handling Equipment            | 920,900           |           |
| Furniture & fixtures                           | 1,205,000         | 9.1.4     |
| Office vehicles                                | 334,000           | 9.1.5     |
| Office equipment                               | 1,858,000         | 9.1.6     |
| Security against Building                      | 664,200           | 9.1.7     |
| Pre-operating costs                            | 785,283           | 9.1.8     |
| <b>Total Capital Cost</b>                      | <b>25,553,563</b> |           |
| Equipment spare part inventory                 | 301,833           |           |
| Raw material inventory- Equipment and Pachking | 6,230,051         |           |
| Raw material inventory- Plastic Granules       | 1,952,036         |           |
| Upfront building rent                          | 221,400           |           |
| Cash   | 1,000,000         |           |
| <b>Working Capital</b>                         | <b>9,705,319</b>  |           |
| <b>Total Project Cost</b>                      | <b>35,258,883</b> |           |

**9.1.1. Land**

The manufacturing unit of household vacuum cleaners will be established in a rented building to avoid the high cost of land. Suitable location for setting up a production unit for vacuum cleaner business can be easily found on rent. Therefore, no land cost has been added to the project cost. Total space requirement for the proposed unit has been estimated as 3,690 sq. feet. The breakup of the space requirement is provided in Table 5.

**Table 5: Breakup of Space Requirement**

| Description                      | % Break-Up | Area (Sq. Ft.) |
|----------------------------------|------------|----------------|
| Executive Office                 | 4%         | 150            |
| Accountant Office                | 5%         | 180            |
| HR and Admin Office              | 5%         | 180            |
| Sales and Marketing Staff Office | 5%         | 180            |
| Production Staff Office          | 5%         | 180            |

|                          |             |              |
|--------------------------|-------------|--------------|
| Quality Control Lab      | 4%          | 150          |
| Reception                | 3%          | 100          |
| Procurement Staff Office | 2%          | 56           |
| Production Hall          | 43          | 1,600        |
| Raw Material Store       | 11%         | 300          |
| Kitchen                  | 8%          | 64           |
| Washroom                 | 2%          | 150          |
| Executive Office         | 4%          | 150          |
| <b>Total</b>             | <b>100%</b> | <b>3,690</b> |

### 9.1.2. Building

There will be no cost of building construction since the proposed business will be started in rented premises. However, there will be a renovation cost required to make the building usable for the business. The proposed project requires electricity load of 47-48 KW for which an electricity connection under the Industrial Supply Tariff three phase will be required. Building rent of PKR 221,400 per month has been included in the operating cost. Table 6 provides details of building renovation cost.

**Table 6: Building Renovation Cost**

| Cost Item          | Unit of Measurement (UOM) | Total Units | Cost/Unit (PKR) | Total Cost (PKR) |
|--------------------|---------------------------|-------------|-----------------|------------------|
| Paint Cost         | Liter                     | 112         | 500             | 56,160           |
| Labour Cost- Paint | Sq. Feet                  | 11,232      | 10              | 112,320          |
| Tiles Cost         | Sq. Feet                  | 2,230       | 120             | 267,600          |
| Labour Cost- Tiles | Sq. Feet                  | 2,230       | 40              | 89,200           |
| Ceiling Cost       | Sq. Feet                  | 3,690       | 60              | 221,400          |
| Glass Partition    | Sq. Feet                  | 790         | 550             | 434,500          |
| Wall Racks         | No.                       | 30          | 15000           | 450,000          |
| Curtains           | No.                       | 15          | 3,000           | 45,000           |
| <b>Total</b>       |                           |             |                 | <b>1,676,180</b> |

### 9.1.3. Machinery and Equipment Requirement

Table 7 provides details of machinery and equipment required for establishing a manufacturing unit for house hold vacuum cleaner.

**Table 7: Machinery and Equipment Requirement**

| Cost Item  | No. | Unit Cost (PKR) | Total Cost (PKR)  |
|--|-----|-----------------|-------------------|
| Injection Molding Machine 550-ton (100-180 sec cycle time) | 1   | 15,000,000      | 15,000,000        |
| Molds 1800 watt Vacuum Cleaner                             | 1   | 180,000         | 180,000           |
| Molds 2000 Watt Vacuum Cleaner                             | 1   | 230,000         | 230,000           |
| Molds 2200 Watt Vacuum Cleaner                             | 1   | 270,000         | 270,000           |
| Molds handheld Vacuum Cleaner                              | 1   | 180,000         | 180,000           |
| Electric (static) Chain Pulley 500 kg                      | 1   | 150,000         | 150,000           |
| Granules Mixture Machine (120 kg/hr)                       | 1   | 600,000         | 600,000           |
| Generator (50 KVA)   | 1   | 1,500,000       | 1,500,000         |
| <b>Total</b>   |     |                 | <b>18,110,000</b> |

**Table 8 Hand Tools & Material Handling Equipment**

| Cost Item                          | No. | Unit Cost (PKR) | Total Cost (PKR) |
|------------------------------------|-----|-----------------|------------------|
| Drill Machine with Accessories     | 13  | 11,000          | 143,000          |
| Platform Trolleys                  | 13  | 5,000           | 65,000           |
| Grinding Machine                   | 13  | 12,000          | 156,000          |
| Digital Clamp Meter                | 13  | 1,500           | 19,500           |
| T Shaped Nut/Screw Driver          | 13  | 2,000           | 26,000           |
| Combination Tool Set ( 142 pieces) | 13  | 30,000          | 390,000          |
| Soldering Iron (Kavya) Set         | 13  | 1,500           | 19,500           |
| Hole Saw Cutter Set (11 Pieces)    | 13  | 4,000           | 52,000           |
| Plastic Cutter                     | 13  | 700             | 9,100            |
| Weigh Scale                        | 4   | 10,200          | 40,800           |
| <b>Total</b>                       |     |                 | <b>920,900</b>   |

#### 9.1.4. Furniture & Fixtures Requirement

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

**Table 9: Furniture and Fixtures Requirement**

| Cost Item    | No. | Unit Cost (PKR) | Total Cost (PKR) |
|--------------|-----|-----------------|------------------|
| Owner Tables | 1   | 30,000          | 30,000           |
| Owner Chairs | 1   | 20,000          | 20,000           |



|                    |    |        |                  |
|--------------------|----|--------|------------------|
| Staff Work Station | 13 | 25,000 | 325,000          |
| Staff Tables       | 15 | 25,000 | 375,000          |
| Staff Chairs       | 32 | 10,000 | 320,000          |
| Sofa Sets          | 3  | 45,000 | 135,000          |
| <b>Total</b>       |    |        | <b>1,205,000</b> |

#### 9.1.5. Office Equipment Requirement

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

**Table 10: Office Equipment Requirement**

| Cost Item                        | No. | Unit Cost (PKR) | Total Cost (PKR) |
|----------------------------------|-----|-----------------|------------------|
| LED TV (32 inch)                 | 1   | 40,000          | 40,000           |
| Water Dispenser                  | 2   | 20,000          | 40,000           |
| Ceiling Fan                      | 39  | 5,000           | 195,000          |
| Laptop                           | 5   | 80,000          | 400,000          |
| Printer                          | 2   | 40,000          | 80,000           |
| Wi-Fi                            | 1   | 5,000           | 5,000            |
| Invertor Air Conditioner (1 ton) | 7   | 90,000          | 630,000          |
| Desktop Computer                 | 11  | 30,000          | 330,000          |
| LED/LCD (Surveillance)           | 2   | 40,000          | 80,000           |
| Security Cameras - 2MP           | 17  | 2,000           | 34,000           |
| Digital Video Recorder (DVR)     | 2   | 12,000          | 24,000           |
| <b>Total (PKR)</b>               |     |                 | <b>1,858,000</b> |

#### 9.1.6. Office Vehicles Requirement

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

**Table 11: Office Vehicle Requirement**

| Cost Item                          | No. | Unit Cost (PKR) | Total Cost (PKR) |
|------------------------------------|-----|-----------------|------------------|
| Loader Rickshaw                    | 1   | 250,000         | 250,000          |
| Motor Cycle (70 cc)                | 1   | 80,000          | 80,000           |
| Registration Charges of Rickshaw   | 1   | 1%              | 2,500            |
| Registration Charges of Motorcycle | 1   | 1,500           | 1,500            |
| <b>Total</b>                       |     |                 | <b>334,000</b>   |

### 9.1.7. Security against Building

Details of security against building for the project are provided in Table 12.

**Table 12: Security against Building**

| Cost Item                 | Months | Unit Cost (PKR) | Total Cost (PKR) |
|---------------------------|--------|-----------------|------------------|
| Security against Building | 3      | 221,400         | 664,200          |
| <b>Total (PKR)</b>        |        |                 | <b>664,200</b>   |

### 9.1.8. Pre-Operating Cost

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

**Table 13: Pre-Operating Cost**

| Cost Item                    | Number / Months | Hiring before Year 0 | Unit Cost (PKR) | Total Cost (PKR) |
|------------------------------|-----------------|----------------------|-----------------|------------------|
| HR Manager                   | 1               | 1                    | 70,000          | 70,000           |
| Production Manager           | 1               | 1                    | 100,000         | 100,000          |
| Procurement Manager          | 1               | 1                    | 70,000          | 70,000           |
| Accountant & Finance Manager | 1               | 1                    | 70,000          | 70,000           |
| Quality Controller           | 1               | 1                    | 60,000          | 60,000           |
| Skilled Labor for IM Machine | 1               | 1                    | 40,000          | 40,000           |
| Skilled Labor for Assembling | 1               | 1                    | 36,000          | 36,000           |
| Mechanical Technician        | 1               | 1                    | 40,000          | 40,000           |
| Sales & Marketing Manager    | 1               | 1                    | 70,000          | 70,000           |
| Store Keepers                | 1               | 1                    | 40,000          | 40,000           |
| Office Boys                  | 1               | 1                    | 22,000          | 22,000           |
| Drivers                      | 1               | 1                    | 30,000          | 30,000           |
| Utilities Expenses           |                 |                      |                 | 115,283          |
| <b>Total</b>                 |                 |                      |                 | <b>785,283</b>   |

### 9.2. Breakeven Analysis

Breakeven analysis is provided in Table 14.

**Table 14: Breakeven Analysis**

| Particulars | Amount First Year (PKR) | Ratios |
|-------------|-------------------------|--------|
| Sales       | 209,903,750             | 100%   |

|                         |             |             |
|-------------------------|-------------|-------------|
| Variable Cost           | 179,942,362 | 86%         |
| Contribution            | 29,961,388  | 14%         |
| Fixed Cost              | 21,011,787  | 10%         |
| <b>Breakeven</b>        |             |             |
| Breakeven (Units)       |             | 17,869      |
| Breakeven Revenue (PKR) |             | 147,204,557 |
| Breakeven Capacity      |             | 35%         |

### 9.3. Revenue Generation

Table 15 provides details for revenue generation of the proposed unit during the first year of operations, based on 50% capacity utilization.

**Table 15: Revenue Generation of Vacuum Cleaner-Wholesale**

| Products                         | Total Production @ 50% (A) | Closing Stock (B) | Unit Sold (A-B) | Price per Unit (PKR) | Total Revenue (PKR) |
|----------------------------------|----------------------------|-------------------|-----------------|----------------------|---------------------|
| Vaccum Cleaner 1800 Watt         | 7,560                      | 315               | 7,245           | 9,375                | 67,921,875          |
| Vaccum Cleaner 2000 Watt         | 7,000                      | 292               | 6,708           | 10,500               | 70,437,500          |
| Vaccum Cleaner 2200 Watt         | 4,200                      | 175               | 4,025           | 12,375               | 49,809,375          |
| Cordless Handheld Vacuum Cleaner | 6,720                      | 280               | 6,440           | 3,375                | 21,735,000          |
| <b>Total</b>                     | <b>25,480</b>              | <b>1,062</b>      | <b>24,418</b>   |                      | <b>209,903,750</b>  |

Wholesale prices have been calculated on the basis of assumption of 25% retailer margin. The assumed retail prices are shown in Table 16.

**Table 16: Retail Prices of Vacuum Cleaners**

| Products                         | Retail Price (PKR per unit) |
|----------------------------------|-----------------------------|
| Vaccum Cleaner 1800 Watt         | 12,500                      |
| Vaccum Cleaner 2000 Watt         | 14,000                      |
| Vaccum Cleaner 2200 Watt         | 16,500                      |
| Cordless Handheld Vacuum Cleaner | 4,500                       |

#### 9.4. 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)   |
|--|--------------------|
| Body cost-Vacuum Cleaner 1800 Watt                               | 3,477,600          |
| Body cost-Vacuum Cleaner 2000 Watt                               | 4,293,333          |
| Body cost-Vacuum Cleaner 2200 Watt                               | 3,220,000          |
| Body cost-Handheld Vacuum Cleaner                                | 721,280            |
| Other Equipment Cost-Vacuum Cleaner 1800 Watt                    | 50,174,644         |
| Other Equipment Cost-Vacuum Cleaner 2000 Watt                    | 48,470,503         |
| Other Equipment Cost-Vacuum Cleaner 2200 Watt                    | 31,577,802         |
| Other Equipment Cost-Handheld Vacuum Cleaner                     | 15,778,000         |
| Packing Cost-vacuum cleaner                                      | 1,101,240          |
| Packing Cost-vacuum cleaner                                      | 1,187,375          |
| Packing Cost-vacuum cleaner                                      | 813,050            |
| Packing Cost-Handheld Vacuum Cleaner                             | 418,600            |
| Utilities Cost   | 732,709            |
| Direct Labor   | 13,680,000         |
| Machinery Maintenance – Cost                                     | 1,811,000          |
| Fuel Cost – Generator  | 89,620             |
| Communications expense ( internet, Telephone etc.)               | 627,840            |
| Office vehicles running expense                                  | 198,165            |
| Office expenses (stationery, entertainment, janitorial services) | 1,569,600          |
| <b>Total Variable Cost (PKR)</b>                                 | <b>179,942,361</b> |

**Table 18: Body Raw Material - Vacuum Cleaner 1800 Watt**

| Cost Item                             | Unit of Measurement | Quantity | Cost/Unit (PKR) | Total Cost (PKR) |
|---------------------------------------|---------------------|----------|-----------------|------------------|
| Acrylonitrile Butadiene Styrene (ABS) | Kg                  | 3        | 160             | 480              |

**Table 19: Body Raw Material - Vacuum Cleaner 2000 Watt**

| Cost Item                             | Unit of Measurement | Quantity | Cost/Unit (PKR) | Total Cost (PKR) |
|---------------------------------------|---------------------|----------|-----------------|------------------|
| Acrylonitrile Butadiene Styrene (ABS) | Kg.                 | 4        | 160             | 640              |

**Table 20: Body Raw Material - Vacuum Cleaner 2200 Watt**

| Cost Item                             | Unit of Measurement | Quantity | Cost/Unit (PKR) | Total Cost (PKR) |
|---------------------------------------|---------------------|----------|-----------------|------------------|
| Acrylonitrile Butadiene Styrene (ABS) | Kg                  | 5        | 160             | 800              |

**Table 21 : Body Raw Material – Handheld Vacuum Cleaner**

| Cost Item                             | Unit of Measurement | Quantity | Cost/Unit (PKR) | Total Cost (PKR) |
|---------------------------------------|---------------------|----------|-----------------|------------------|
| Acrylonitrile Butadiene Styrene (ABS) | Kg                  | 0.7      | 160             | 112              |

**Table 22: Total Raw Material Cost for Each Unit of 1800-Watt Vacuum Cleaner**

| Cost Item               | Unit of Measurement | Quantity | Cost/Unit (PKR) | Total Cost (PKR) |
|-------------------------|---------------------|----------|-----------------|------------------|
| Motor (1800 Watt)       | No.                 | 1        | 1,600           | 1,600            |
| Power Cord Cable        | No.                 | 1        | 250             | 250              |
| Plastic Pipe (Hose)     | No.                 | 1        | 200             | 200              |
| Dust Bag                | No.                 | 1        | 200             | 200              |
| Handle                  | No.                 | 1        | 280             | 280              |
| Floor Brush             | No.                 | 1        | 200             | 200              |
| Sofa Brush              | No.                 | 1        | 400             | 400              |
| Crevice Tool            | No.                 | 1        | 80              | 80               |
| Filter                  | No.                 | 1        | 500             | 500              |
| Axial Fan               | No.                 | 1        | 250             | 250              |
| Short Screws (1.5 inch) | No.                 | 30       | 3               | 100              |
| Long Screws (2.5 inch)  | No.                 | 8        | 6               | 47               |
| Medium Screws (2 inch)  | No.                 | 15       | 5               | 69               |
| Wheel (Pair)            | No.                 | 1        | 200             | 200              |
| Control Button          | No.                 | 1        | 150             | 150              |
| Speed Adjustment Button | No.                 | 1        | 150             | 150              |
| Dust bag full indicator | No.                 | 1        | 50              | 50               |
| Printed Circuit Board   | No.                 | 1        | 1,300           | 1,300            |
| Cable Rewinder          | No.                 | 1        | 700             | 700              |



|                |     |   |     |              |
|----------------|-----|---|-----|--------------|
| Extension Wand | No. | 1 | 200 | 200          |
| <b>Total</b>   |     |   |     | <b>6,925</b> |

**Table 23: Total Raw Material Cost for Each Unit of 2000-Watt Vacuum Cleaner**

| Cost Item               | Unit of Measurement | Quantity | Cost/Unit (PKR) | Total Cost (PKR) |
|-------------------------|---------------------|----------|-----------------|------------------|
| Motor (2000 Watt)       | No.                 | 1        | 1800            | 1,800            |
| Power Cord Cable        | No.                 | 1        | 250             | 250              |
| Plastic Pipe (Hose)     | No.                 | 1        | 200             | 200              |
| Dust Bag                | No.                 | 1        | 300             | 300              |
| Handle                  | No.                 | 1        | 280             | 280              |
| Floor Brush             | No.                 | 1        | 200             | 200              |
| Sofa Brush              | No.                 | 1        | 400             | 400              |
| Crevice Tool            | No.                 | 1        | 80              | 80               |
| Filter                  | No.                 | 1        | 500             | 500              |
| Axial Fan               | No.                 | 1        | 250             | 250              |
| Short Screws (1.5 inch) | No.                 | 30       | 3               | 100              |
| Long Screws (2.5 inch)  | No.                 | 8        | 6               | 47               |
| Medium Screws (2 inch)  | No.                 | 15       | 5               | 69               |
| Wheel (Pair)            | No.                 | 1        | 200             | 200              |
| Control Button          | No.                 | 1        | 150             | 150              |
| Speed adjustment Button | No.                 | 1        | 150             | 150              |
| Dust bag full indicator | No.                 | 1        | 50              | 50               |
| Printed Circuit Board   | No.                 | 1        | 1300            | 1,300            |
| Cable Rewinder          | No.                 | 1        | 700             | 700              |
| Extension Wand          | No.                 | 1        | 200             | 200              |
| <b>Total</b>            |                     |          |                 | <b>7,226</b>     |

**Table 24: Total Raw Material Cost for Each Unit of 2200-Watt Vacuum Cleaner**

| Cost Item               | Unit of Measurement | Quantity | Cost/Unit (PKR) | Total Cost (PKR) |
|-------------------------|---------------------|----------|-----------------|------------------|
| Motor (2200 Watt)       | No.                 | 1        | 2,000           | 2,000            |
| Power Cord Cable        | No.                 | 1        | 250             | 250              |
| Plastic Pipe (Hose)     | No.                 | 1        | 200             | 200              |
| Dust Bag                | No.                 | 1        | 400             | 400              |
| Handle                  | No.                 | 1        | 280             | 280              |
| Floor Brush             | No.                 | 1        | 200             | 200              |
| Sofa Brush              | No.                 | 1        | 400             | 400              |
| Crevice Tool            | No.                 | 1        | 80              | 80               |
| Filter                  | No.                 | 1        | 600             | 600              |
| Axial Fan               | No.                 | 1        | 270             | 270              |
| Short Screws (1.5 inch) | No.                 | 30       | 3               | 100              |
| Long Screws (2.5 inch)  | No.                 | 8        | 6               | 47               |
| Medium Screws (2 inch)  | No.                 | 15       | 5               | 69               |
| Wheel (Pair)            | No.                 | 1        | 200             | 200              |
| Control Button          | No.                 | 1        | 150             | 150              |
| Speed Adjustment Button | No.                 | 1        | 150             | 150              |
| Dust bag full indicator | No.                 | 1        | 50              | 50               |
| Printed Circuit Board   | No.                 | 1        | 1,500           | 1,500            |
| Cable Rewinder          | No.                 | 1        | 700             | 700              |
| Extension Wand          | No.                 | 1        | 200             | 200              |
| <b>Total</b>            |                     |          |                 | <b>7,845</b>     |

**Table 25: Total Raw Material Cost for Each Unit of Handheld Vacuum Cleaner**

| Cost Item                           | Unit of Measurement | Quantity | Cost/Unit (PKR) | Total Cost (PKR) |
|-------------------------------------|---------------------|----------|-----------------|------------------|
| On/Off Button                       | No.                 | 1        | 100             | 100              |
| Rechargeable Battery (12 volt Pack) | No.                 | 1        | 1,200           | 1,200            |
| Charging Cable                      | No.                 | 1        | 250             | 250              |

|                          |     |   |     |              |
|--------------------------|-----|---|-----|--------------|
| HEPA Filter <sup>8</sup> | No. | 1 | 250 | 250          |
| Motor 24 Watt            | No. | 1 | 500 | 500          |
| Axial Fan                | No. | 1 | 150 | 150          |
| <b>Total</b>             |     |   |     | <b>2,450</b> |

**Table 26: Direct Labor**

| Post                           | No. of Employees | Monthly Salary (PKR) | Annual Salary (PKR) |
|--------------------------------|------------------|----------------------|---------------------|
| Production Manager             | 1                | 100,000              | 1,200,000           |
| Production Supervisor          | 1                | 70,000               | 840,000             |
| Quality Controller             | 2                | 60,000               | 1,440,000           |
| Skilled Labor for IM Machine   | 1                | 40,000               | 480,000             |
| Unskilled Labor for IM Machine | 1                | 30,000               | 360,000             |
| Skilled Labor for Assembling   | 13               | 30,000               | 4,680,000           |
| Unskilled Labor for Assembling | 13               | 25,000               | 3,900,000           |
| Mechanical Technician          | 1                | 40,000               | 480,000             |
| Mechanical Helper              | 1                | 25,000               | 300,000             |
| <b>Total</b>                   |                  |                      | <b>13,680,000</b>   |

**Table 27: Machinery Maintenance Cost**

| Cost Item          | Machinery Cost (PKR) | Rate | Total Cost (PKR) |
|--------------------|----------------------|------|------------------|
| Maintenance Cost   | 18,110,000           | 10%  | 1,811,000        |
| <b>Total (PKR)</b> |                      |      | <b>1,811,000</b> |

**Table 28: Packing Cost**

| Cost Item                | Packing cost per Unit (PKR) |
|--------------------------|-----------------------------|
| Vacuum Cleaner 1800 Watt | 152                         |
| Vacuum Cleaner 2000 Watt | 177                         |
| Vacuum Cleaner 2200 Watt | 202                         |

<sup>8</sup> HEPA filter, also known as high-efficiency particulate absorbing filter and high-efficiency particulate arrestee filter, is an efficiency standard of air filter.

|                         |    |
|-------------------------|----|
| Handheld Vacuum Cleaner | 65 |
|-------------------------|----|

**Table 29: Vehicle Maintenance Cost**

| Particulars              | Loader Rickshaw<br>KM Per Year | Motorcycle<br>km Per Year | Motorcycle    | Loader Rickshaw | Total Cost (PKR) |
|--------------------------|--------------------------------|---------------------------|---------------|-----------------|------------------|
| Fuel cost                | 19,600                         | 11,200                    | 41,440        | 116,032         | 157,472          |
| Mileage (KM)             |                                |                           | 40            | 25              |                  |
| Oil & Tuning Cost (PKR)  |                                |                           | 9,333         | 31,360          | 40,693           |
| Oil & Tuning KM          |                                |                           | 1,200         | 2,500           |                  |
| No of Vehicles           |                                |                           | 1             | 1               | 2                |
| <b>Yearly Cost (PKR)</b> |                                |                           | <b>50,773</b> | <b>147,392</b>  | <b>198,165</b>   |

**Table 30: Variable cost Assumptions**

| Description of Costs   | Rate | Rationale             |
|--|------|-----------------------|
| Communications expense ( phone,mail, internet, etc.)                   | 6%   | of management expense |
| Office expenses (stationery, entertainment, janitorial services, etc.) | 15%  | of management expense |

### 9.5. Fixed Cost Estimate

Details of fixed cost for the project are provided in Table 31.

**Table 31: Fixed Cost Estimate**

| Description of Costs                | Amount (PKR)      |
|-------------------------------------|-------------------|
| Management Staff                    | 10,464,000        |
| Administration benefits expense     | 724,320           |
| Building rental expense             | 2,656,800         |
| Utilities                           | 163,489           |
| Promotional expense                 | 3,148,556         |
| Depreciation expense                | 3,697,565         |
| Amortization of pre-operating costs | 157,057           |
| <b>Total Fixed Cost</b>             | <b>21,011,787</b> |

**Table 32: Fixed Cost Assumption**

| Description of Costs                                  | Rate | Rationale                   |
|---|------|-----------------------------|
| Promotional expense                                   | 1.5% | of revenue                  |
| Administration benefits expense                       | 3%   | of HR Salaries              |
| <b>Depreciation</b>                                   |      |                             |
| Building  | 10%  | of Building Renovation Cost |
| Machinery and Equipment                               | 15%  | of Cost                     |
| Production Tools                                      | 33%  | of Cost                     |
| Office Equipment/Office Vehicle/Furniture and Fixture | 15%  | of Cost                     |

### 9.6. Financial Feasibility Analysis

The financial feasibility analysis provides the information regarding projected Internal Rate of Return (IRR), Net Present Value (NPV) and Payback period of the study, which is shown in Table 33.

**Table 33: Financial Feasibility Analysis**

| Description                | Project     |
|----------------------------|-------------|
| IRR                        | 45%         |
| NPV (PKR)                  | 123,528,417 |
| Payback Period (years)     | 3.40        |
| Projection Years           | 10          |
| Discount Rate used for NPV | 15%         |

### 9.7. Financial Feasibility with 50% Debt Financing

The financial feasibility analysis provides the information regarding projected IRR, NPV and payback period of the study on the basis of Debt: Equity Model (50:50), which is shown in Table 34.

**Table 34: Financial Feasibility Debt Financing**

| Description                | Project     |
|----------------------------|-------------|
| IRR                        | 43%         |
| NPV (PKR)                  | 139,839,150 |
| Payback Period (years)     | 3.61        |
| Projection Years           | 10          |
| Discount Rate used for NPV | 13%         |

### 9.8. Human Resource Requirement

For the 1<sup>st</sup> year of operations, the human resource requirements are projected in Table 35.

**Table 35: Human Resource Requirement**

| Post                           | No.of Employees | Monthly Salary (PKR) | Annual Salary (PKR) |
|--------------------------------|-----------------|----------------------|---------------------|
| HR Manager                     | 1               | 70,000               | 840,000             |
| Production Manager             | 1               | 100,000              | 1,200,000           |
| Production Supervisor          | 1               | 70,000               | 840,000             |
| HR and Admin officer           | 1               | 40,000               | 480,000             |
| Procurement Manager            | 1               | 70,000               | 840,000             |
| Procurement Officer            | 1               | 40,000               | 480,000             |
| Accountant and Finance Manager | 1               | 70,000               | 840,000             |
| Accountant and Finance Officer | 2               | 40,000               | 960,000             |
| Quality Controller             | 2               | 60,000               | 1,440,000           |
| Skilled Labor for IM Machine   | 1               | 40,000               | 480,000             |
| Unskilled Labor for IM Machine | 1               | 30,000               | 360,000             |
| Skilled Labor for Assembling   | 13              | 30,000               | 4,680,000           |
| Unskilled Labor for Assembling | 13              | 25,000               | 3,900,000           |
| Mechanical Technician          | 1               | 40,000               | 480,000             |
| Mechanical Helper              | 1               | 25,000               | 300,000             |
| Sales and Marketing Manager    | 1               | 70,000               | 840,000             |
| Sales and Marketing Officer    | 2               | 40,000               | 960,000             |
| Store Keepers                  | 2               | 40,000               | 960,000             |
| Helpers for Loading/Unloading  | 3               | 22,000               | 792,000             |
| Office Boys                    | 2               | 22,000               | 528,000             |
| Drivers                        | 1               | 30,000               | 360,000             |
| Security Guards (Day+Night)    | 6               | 22,000               | 1,584,000           |
| <b>Total</b>                   | <b>58</b>       |                      | <b>24,144,000</b>   |



## 10. CONTACT DETAILS

Details of suppliers of machinery and equipment for the proposed business are provided in Table 36.

**Table 36: Contact Details**

| Name of Supplier / Manufacturer                     | Contacts Number | Email Address  |
|---|-----------------|--|
| Engineering Pk (Gujranwala)                         | 0300-1510014    | -  |
| SAMA Engineering (Karachi)                          | 0345-2266203    | <a href="http://www.samaengineering.com">www.samaengineering.com</a>                   |
| Abdullah Packing Machinery (Lahore)                 | 0345-4635761    | <a href="http://www.abdullahpackingmachinery.com">www.abdullahpackingmachinery.com</a> |
| Saleem & Sons Engineering (Lahore)                  | 0321-9052399    | <a href="http://www.saleemengineering.com">www.saleemengineering.com</a>               |
| V7 Packaging (Islamabad)                            | 0313 1722899    | <a href="http://www.v7packaging.com">www.v7packaging.com</a>                           |
| Alsaif Plastic Wholesaler(Quetta)                   | 0315-2856456    | -  |
| Shahzad Plastic Store (Peshawar)                    | 0315-9888787    | -  |
| Raja Shabeer Karyana Store (Azad Jammu and Kashmir) | 0334-8613142    | <a href="http://www.rahshiplog.com">www.rahshiplog.com</a>                             |
| Yousaf Packing Machines (Rawalpindi)                | 0334 5859029    |  |

## 11. USEFUL LINKS

**Table 37: Useful Links**

| Name of Organization  | E-mail Address  |
|---|---|
| Small and Medium Enterprises Development Authority (SMEDA)        | <a href="http://www.smeda.org.pk">www.smeda.org.pk</a>                |
| National Business Development Program (NBDP)                      | <a href="http://www.nbdp.org.pk">www.nbdp.org.pk</a>                  |
| Government of Pakistan  | <a href="http://www.pakistan.gov.pk">www.pakistan.gov.pk</a>          |
| Pakistan Plastic Manufacturers Association                        | <a href="https://www.pakplas.com.pk/">https://www.pakplas.com.pk/</a> |
| Ministry of National Health Services Regulations and Coordination | <a href="http://www.nhsrhc.gov.pk">www.nhsrhc.gov.pk</a>              |
| Pakistan Electronics Manufacturers Association – PEMA             | <a href="http://pema.org.pk/">http://pema.org.pk/</a>                 |
| Government of Punjab  | <a href="http://www.punjab.gov.pk">www.punjab.gov.pk</a>              |
| Government of Sindh   | <a href="http://sindh.gov.pk/">sindh.gov.pk/</a>                      |

|  |   |
|--|---|
| Government of Balochistan  | <a href="http://balochistan.gov.pk/">balochistan.gov.pk/</a>  |
| Government of KPK  | <a href="http://kp.gov.pk/">kp.gov.pk/</a>  |
| Government of Gilgit Baltistan                                   | <a href="http://gilgitbaltistan.gov.pk/">gilgitbaltistan.gov.pk/</a>  |
| Government of Azad Jammu & Kashmir                               | <a href="http://ajk.gov.pk/">ajk.gov.pk/</a>  |
| Trade Development Authority of Pakistan                          | <a href="http://www.tdap.gov.pk">www.tdap.gov.pk</a>  |
| Securities & Exchange Commission of Pakistan                     | <a href="http://www.secp.gov.pk">www.secp.gov.pk</a>  |
| State Bank of Pakistan   | <a href="http://www.sbp.gov.pk">www.sbp.gov.pk</a>  |
| Federal Board of Revenue   | <a href="http://www.fbr.gov.pk">www.fbr.gov.pk</a>  |
| Federation of Pakistan Chambers of Commerce and Industry (FPCCI) | <a href="http://www.fpcci.com.pk">www.fpcci.com.pk</a>  |
| Pakistan Stock Exchange (PSX)                                    | <a href="http://www.psx.com.pk">www.psx.com.pk</a>  |
| Pakistan Standards and Quality Control Authority (PSQCA)         | <a href="http://www.psqca.com.pk">http://www.psqca.com.pk</a>   |
| Punjab Small Industries Corporation                              | <a href="https://www.psic.gop.pk/">https://www.psic.gop.pk/</a>   |
| Sindh Small Industries Corporation                               | <a href="https://ssic.gos.pk/">https://ssic.gos.pk/</a>   |
| Government of KPK  | <a href="https://small_industries_de.kp.gov.pk/">https://small_industries_de.kp.gov.pk/</a>   |
| Government of Balochistan Industries & Commerce                  | <a href="https://balochistan.gov.pk/departments-download/industries-and-commerce/">https://balochistan.gov.pk/departments-download/industries-and-commerce/</a> |

## 12. ANNEXURES

### 12.1. Income Statement

| Income Statement  |                    |                    |                    |                    |                    |                    |                    |                    |                    | SMEDA                |
|---|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------------|
|   | Year 1             | Year 2             | Year 3             | Year 4             | Year 5             | Year 6             | Year 7             | Year 8             | Year 9             | Year 10              |
| <b>Revenue</b>  | <b>209,903,750</b> | <b>266,902,657</b> | <b>323,879,778</b> | <b>390,271,747</b> | <b>467,472,769</b> | <b>557,071,251</b> | <b>660,875,815</b> | <b>780,944,699</b> | <b>919,618,987</b> | <b>1,024,988,974</b> |
| <i>Cost of sales</i>  |                    |                    |                    |                    |                    |                    |                    |                    |                    |                      |
| Body cost-Vacuum Cleaner 1800 Watt                                    | 3,477,600          | 4,306,614          | 5,089,681          | 5,973,069          | 6,968,037          | 8,087,020          | 9,343,752          | 10,753,390         | 12,332,659         | 13,387,258           |
| Body cost-Vacuum Cleaner 2000 Watt                                    | 4,293,333          | 5,316,808          | 6,283,557          | 7,374,160          | 8,602,514          | 9,983,975          | 11,535,496         | 13,275,790         | 15,225,505         | 16,527,480           |
| Body cost-Vacuum Cleaner 2200 Watt                                    | 3,220,000          | 3,987,606          | 4,712,668          | 5,530,620          | 6,451,886          | 7,487,982          | 8,651,622          | 9,956,843          | 11,419,128         | 12,395,610           |
| Body cost-Handheld Vacuum Cleaner                                     | 721,280            | 893,224            | 1,055,638          | 1,238,859          | 1,445,222          | 1,677,308          | 1,937,963          | 2,230,333          | 2,557,885          | 2,776,617            |
| Other Equipment Cost-Vacuum Cleaner 1800 Watt                         | 50,174,644         | 63,799,459         | 77,419,067         | 93,289,166         | 111,743,023        | 133,160,325        | 157,973,398        | 186,674,236        | 219,822,443        | 245,009,708          |
| Other Equipment Cost-Vacuum Cleaner 2000 Watt                         | 48,470,503         | 61,632,563         | 74,789,592         | 90,120,677         | 107,947,764        | 128,637,645        | 152,607,962        | 180,334,000        | 212,356,355        | 236,688,156          |
| Other Equipment Cost-Vacuum Cleaner 2200 Watt                         | 31,577,802         | 40,152,686         | 48,724,292         | 58,712,262         | 70,326,340         | 83,805,486         | 99,421,786         | 117,484,881        | 138,346,963        | 154,198,765          |
| Other Equipment Cost-Handheld Vacuum Cleaner                          | 15,778,000         | 20,062,482         | 24,345,326         | 29,335,863         | 35,138,893         | 41,873,812         | 49,676,571         | 58,701,883         | 69,125,723         | 77,046,151           |
| Packing Cost-Vacuum Cleaner 1800 Watt                                 | 1,101,240          | 1,400,279          | 1,699,204          | 2,047,523          | 2,452,551          | 2,922,621          | 3,467,222          | 4,097,152          | 4,824,693          | 5,377,507            |
| Packing Cost-Vacuum Cleaner 2000 Watt                                 | 1,187,375          | 1,509,804          | 1,832,110          | 2,207,673          | 2,644,381          | 3,151,218          | 3,738,415          | 4,417,616          | 5,202,063          | 5,798,116            |
| Packing Cost-Vacuum Cleaner 2200 Watt                                 | 813,050            | 1,033,832          | 1,254,530          | 1,511,695          | 1,810,729          | 2,157,783          | 2,559,864          | 3,024,944          | 3,562,091          | 3,970,235            |
| Packing Cost-Handheld Vacuum Cleaner                                  | 418,600            | 532,270            | 645,896            | 778,298            | 932,256            | 1,110,938          | 1,317,950          | 1,557,397          | 1,833,948          | 2,044,082            |
| Direct Utilities Cost   | 732,709            | 852,882            | 988,791            | 1,142,298          | 1,315,475          | 1,510,622          | 1,730,296          | 1,977,337          | 2,254,896          | 2,458,664            |
| Direct Labor  | 13,680,000         | 15,006,960         | 16,462,635         | 18,059,511         | 19,811,283         | 21,732,978         | 23,841,077         | 26,153,661         | 28,690,566         | 31,473,551           |
| Machinery Maintenance - Cost  | 1,811,000          | 1,961,313          | 2,124,102          | 2,300,402          | 2,491,336          | 2,698,117          | 2,922,060          | 3,164,591          | 3,427,253          | 3,711,714            |
| Fuel Cost - Generator   | 89,620             | 114,820            | 146,517            | 186,303            | 236,145            | 298,474            | 376,294            | 473,308            | 594,081            | 712,974              |
| <b>Total cost of sales</b>  | <b>177,546,757</b> | <b>222,563,602</b> | <b>267,573,606</b> | <b>319,808,380</b> | <b>380,317,835</b> | <b>450,296,303</b> | <b>531,101,729</b> | <b>624,277,361</b> | <b>731,576,251</b> | <b>813,576,588</b>   |
| <b>Gross Profit</b>   | <b>32,356,993</b>  | <b>44,339,055</b>  | <b>56,306,171</b>  | <b>70,463,367</b>  | <b>87,154,934</b>  | <b>106,774,948</b> | <b>129,774,086</b> | <b>156,667,338</b> | <b>188,042,736</b> | <b>211,412,386</b>   |
| <i>General administration &amp; selling expenses</i>                  |                    |                    |                    |                    |                    |                    |                    |                    |                    |                      |
| Management Staff  | 10,464,000         | 11,479,008         | 12,592,472         | 13,813,942         | 15,153,894         | 16,623,822         | 18,236,332         | 20,005,256         | 21,945,766         | 24,074,506           |
| Administration benefits expense                                       | 724,320            | 794,579            | 871,653            | 956,204            | 1,048,955          | 1,150,704          | 1,262,322          | 1,384,768          | 1,519,090          | 1,666,442            |
| Building rental expense   | 2,656,800          | 2,922,480          | 3,214,728          | 3,536,201          | 3,889,821          | 4,278,803          | 4,706,683          | 5,177,352          | 5,695,087          | 6,264,595            |
| Indirect Utilities  | 163,489            | 190,303            | 220,628            | 254,880            | 293,521            | 337,064            | 386,079            | 441,201            | 503,133            | 548,600              |
| Communications expense (internet, Telephone etc.)                     | 627,840            | 688,740            | 755,548            | 828,836            | 909,234            | 997,429            | 1,094,180          | 1,200,315          | 1,316,746          | 1,444,470            |
| Office vehicles running expense                                       | 198,165            | 218,114            | 240,071            | 264,238            | 290,838            | 320,116            | 352,341            | 387,809            | 426,849            | 469,818              |
| Office expenses (stationery, entertainment, janitorial services, etc) | 1,569,600          | 1,721,851          | 1,888,871          | 2,072,091          | 2,273,084          | 2,493,573          | 2,735,450          | 3,000,788          | 3,291,865          | 3,611,176            |
| Promotional expense   | 3,148,556          | 4,003,540          | 4,858,197          | 5,854,076          | 7,012,092          | 8,356,069          | 9,913,137          | 11,714,170         | 13,794,285         | 15,374,835           |
| Depreciation expense  | 3,697,565          | 3,697,565          | 3,697,565          | 3,802,602          | 3,793,393          | 3,793,393          | 2,856,202          | 6,790,087          | 6,790,087          | 6,971,812            |
| Amortization of pre-operating costs                                   | 157,057            | 157,057            | 157,057            | 157,057            | 157,057            | -                  | -                  | -                  | -                  | -                    |
| <b>Subtotal</b>   | <b>23,407,392</b>  | <b>25,873,237</b>  | <b>28,496,789</b>  | <b>31,540,127</b>  | <b>34,821,888</b>  | <b>38,350,972</b>  | <b>41,542,727</b>  | <b>50,101,748</b>  | <b>55,282,908</b>  | <b>60,426,253</b>    |
| <b>Operating Income</b>   | <b>8,949,601</b>   | <b>18,465,817</b>  | <b>27,809,382</b>  | <b>38,923,240</b>  | <b>52,333,046</b>  | <b>68,423,975</b>  | <b>88,231,358</b>  | <b>106,565,590</b> | <b>132,759,829</b> | <b>150,986,132</b>   |
| Gain / (loss) on sale of machinery & equipment                        | -                  | -                  | -                  | -                  | -                  | -                  | 4,527,500          | -                  | -                  | -                    |
| Gain / (loss) on sale of office equipment                             | -                  | -                  | -                  | -                  | -                  | -                  | 464,500            | -                  | -                  | -                    |
| Gain / (loss) on sale of office vehicles                              | -                  | -                  | -                  | -                  | -                  | -                  | 83,500             | -                  | -                  | -                    |
| <b>Earnings Before Interest &amp; Taxes</b>                           | <b>8,949,601</b>   | <b>18,465,817</b>  | <b>27,809,382</b>  | <b>38,923,240</b>  | <b>52,333,046</b>  | <b>68,423,975</b>  | <b>93,306,858</b>  | <b>106,565,590</b> | <b>132,759,829</b> | <b>150,986,132</b>   |
| <b>Earnings Before Tax</b>  | <b>8,949,601</b>   | <b>18,465,817</b>  | <b>27,809,382</b>  | <b>38,923,240</b>  | <b>52,333,046</b>  | <b>68,423,975</b>  | <b>93,306,858</b>  | <b>106,565,590</b> | <b>132,759,829</b> | <b>150,986,132</b>   |
| <b>Tax</b>  | <b>2,623,797</b>   | <b>5,583,036</b>   | <b>8,853,284</b>   | <b>12,743,134</b>  | <b>17,436,566</b>  | <b>23,068,391</b>  | <b>31,777,400</b>  | <b>36,417,957</b>  | <b>45,585,940</b>  | <b>51,965,146</b>    |
| <b>NET PROFIT/(LOSS) AFTER TAX</b>                                    | <b>6,325,804</b>   | <b>12,882,781</b>  | <b>18,956,098</b>  | <b>26,180,106</b>  | <b>34,896,480</b>  | <b>45,355,584</b>  | <b>61,529,458</b>  | <b>70,147,634</b>  | <b>87,173,889</b>  | <b>99,020,986</b>    |

## 12.2. Balance Sheet

| Balance Sheet                                     |                   |                   |                   |                   |                   |                    |                    |                    |                    |                    |                    |
|---|-------------------|-------------------|-------------------|-------------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
|   | Year 0            | Year 1            | Year 2            | Year 3            | Year 4            | Year 5             | Year 6             | Year 7             | Year 8             | Year 9             | Year 10            |
| <b>Assets</b>                                     |                   |                   |                   |                   |                   |                    |                    |                    |                    |                    |                    |
| <i>Current assets</i>                             |                   |                   |                   |                   |                   |                    |                    |                    |                    |                    |                    |
| Cash & Bank                                       | 1,000,000         | 654,659           | 2,343,259         | 3,369,685         | 5,559,868         | 7,382,506          | 43,351,350         | 52,910,397         | 112,498,318        | 186,845,814        | 189,193,222        |
| Accounts receivable                               | -                 | 18,741,406        | 23,830,594        | 28,917,837        | 34,845,692        | 41,738,640         | 49,738,505         | 59,006,769         | 69,727,205         | 82,108,838         | 66,596,163         |
| Equipment spare part inventory                    | 301,833           | 358,158           | 424,992           | 504,299           | 598,404           | 710,071            | 842,575            | 999,806            | 1,186,376          | 1,407,762          | -                  |
| Raw material inventory- other equipment and parts | 6,230,051         | 8,579,317         | 11,274,885        | 14,713,766        | 19,087,169        | 24,633,403         | 31,649,144         | 40,503,342         | 51,654,357         | 62,351,467         | -                  |
| Raw material inventory- Plastic Granules          | 1,952,036         | 2,618,018         | 3,350,855         | 4,258,837         | 5,380,620         | 6,762,992          | 8,462,528          | 10,547,577         | 13,100,639         | 15,401,246         | -                  |
| Finished Goods                                    | -                 | 7,397,782         | 9,273,483         | 11,148,900        | 13,325,349        | 15,846,576         | 18,762,346         | 22,129,239         | 26,011,557         | 30,482,344         | 33,899,024         |
| Pre-paid building rent                            | 221,400           | 243,540           | 267,894           | 294,683           | 324,152           | 356,567            | 392,224            | 431,446            | 474,591            | 522,050            | -                  |
| <b>Total Current Assets</b>                       | <b>9,705,319</b>  | <b>38,592,880</b> | <b>50,765,963</b> | <b>63,208,009</b> | <b>79,121,255</b> | <b>97,430,755</b>  | <b>153,198,672</b> | <b>186,528,575</b> | <b>274,653,043</b> | <b>379,119,522</b> | <b>289,688,410</b> |
| <i>Fixed assets</i>                               |                   |                   |                   |                   |                   |                    |                    |                    |                    |                    |                    |
| Building/Infrastructure Renovation                | 1,676,180         | 1,508,562         | 1,340,944         | 1,173,326         | 1,005,708         | 838,090            | 670,472            | 502,854            | 335,236            | 167,618            | -                  |
| Machinery & equipment                             | 18,110,000        | 15,393,500        | 12,677,000        | 9,960,500         | 7,244,000         | 4,527,500          | 1,811,000          | 34,329,509         | 29,180,083         | 24,030,657         | 18,881,230         |
| Tools & Material Handling Equipment               | 920,900           | 617,003           | 313,106           | 1,220,498         | 811,564           | 411,838            | 1,605,360          | 1,067,476          | 541,704            | 2,111,581          | 1,404,085          |
| Furniture & fixtures                              | 1,205,000         | 1,024,250         | 843,500           | 662,750           | 482,000           | 301,250            | 120,500            | 2,284,211          | 1,941,579          | 1,598,948          | 1,256,316          |
| Office vehicles                                   | 334,000           | 283,900           | 233,800           | 183,700           | 133,600           | 83,500             | 33,400             | 508,883            | 432,551            | 356,218            | 279,886            |
| Office equipment                                  | 1,858,000         | 1,579,300         | 1,300,600         | 1,021,900         | 743,200           | 464,500            | 185,800            | 3,522,045          | 2,993,738          | 2,465,431          | 1,937,125          |
| Security against building                         | 664,200           | 664,200           | 664,200           | 664,200           | 664,200           | 664,200            | 664,200            | 664,200            | 664,200            | 664,200            | 664,200            |
| <b>Total Fixed Assets</b>                         | <b>24,768,280</b> | <b>21,070,715</b> | <b>17,373,150</b> | <b>14,886,874</b> | <b>11,084,272</b> | <b>7,290,878</b>   | <b>5,090,732</b>   | <b>42,879,178</b>  | <b>36,089,091</b>  | <b>31,394,653</b>  | <b>24,422,841</b>  |
| <i>Intangible assets</i>                          |                   |                   |                   |                   |                   |                    |                    |                    |                    |                    |                    |
| Pre-operation costs                               | 785,283           | 628,227           | 471,170           | 314,113           | 157,057           | -                  | -                  | -                  | -                  | -                  | -                  |
| Legal, licensing, & training costs                | -                 | -                 | -                 | -                 | -                 | -                  | -                  | -                  | -                  | -                  | -                  |
| <b>Total Intangible Assets</b>                    | <b>785,283</b>    | <b>628,227</b>    | <b>471,170</b>    | <b>314,113</b>    | <b>157,057</b>    | <b>-</b>           | <b>-</b>           | <b>-</b>           | <b>-</b>           | <b>-</b>           | <b>-</b>           |
| <b>TOTAL ASSETS</b>                               | <b>35,258,883</b> | <b>60,291,821</b> | <b>68,610,283</b> | <b>78,408,996</b> | <b>90,362,583</b> | <b>104,721,634</b> | <b>158,289,404</b> | <b>229,407,753</b> | <b>310,742,134</b> | <b>410,514,175</b> | <b>314,111,251</b> |
| <b>Liabilities &amp; Shareholders' Equity</b>     |                   |                   |                   |                   |                   |                    |                    |                    |                    |                    |                    |
| <i>Current liabilities</i>                        |                   |                   |                   |                   |                   |                    |                    |                    |                    |                    |                    |
| Accounts payable                                  | -                 | 18,707,134        | 23,747,108        | 28,869,918        | 34,873,550        | 41,899,436         | 50,111,623         | 59,700,513         | 70,887,260         | 83,485,413         | 83,456,936         |
| <b>Total Current Liabilities</b>                  | <b>-</b>          | <b>18,707,134</b> | <b>23,747,108</b> | <b>28,869,918</b> | <b>34,873,550</b> | <b>41,899,436</b>  | <b>50,111,623</b>  | <b>59,700,513</b>  | <b>70,887,260</b>  | <b>83,485,413</b>  | <b>83,456,936</b>  |
| <i>Other liabilities</i>                          |                   |                   |                   |                   |                   |                    |                    |                    |                    |                    |                    |
| <b>Total Long Term Liabilities</b>                | <b>-</b>          | <b>-</b>          | <b>-</b>          | <b>-</b>          | <b>-</b>          | <b>-</b>           | <b>-</b>           | <b>-</b>           | <b>-</b>           | <b>-</b>           | <b>-</b>           |
| <i>Shareholders' equity</i>                       |                   |                   |                   |                   |                   |                    |                    |                    |                    |                    |                    |
| Paid-up capital                                   | 35,258,883        | 35,258,883        | 35,258,883        | 35,258,883        | 35,258,883        | 35,258,883         | 35,258,883         | 35,258,883         | 35,258,883         | 35,258,883         | 35,258,883         |
| Retained earnings                                 | -                 | 6,325,804         | 9,604,293         | 14,280,196        | 20,230,151        | 27,563,315         | 72,918,899         | 134,448,357        | 204,595,991        | 291,769,879        | 195,395,433        |
| <b>Total Equity</b>                               | <b>35,258,883</b> | <b>41,584,687</b> | <b>44,863,175</b> | <b>49,539,078</b> | <b>55,489,034</b> | <b>62,822,198</b>  | <b>108,177,782</b> | <b>169,707,240</b> | <b>239,854,873</b> | <b>327,028,762</b> | <b>230,654,315</b> |
| <b>TOTAL CAPITAL AND LIABILITIES</b>              | <b>35,258,883</b> | <b>60,291,821</b> | <b>68,610,283</b> | <b>78,408,996</b> | <b>90,362,583</b> | <b>104,721,634</b> | <b>158,289,404</b> | <b>229,407,753</b> | <b>310,742,134</b> | <b>410,514,175</b> | <b>314,111,251</b> |

### 12.3. Cash Flow Statement

| 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     |
| <i>Operating activities</i>                        |              |              |             |             |             |             |             |              |              |              |             |
| Net profit   |              | 6,325,804    | 12,882,781  | 18,956,098  | 26,180,106  | 34,896,480  | 45,355,584  | 61,529,458   | 70,147,634   | 87,173,889   | 99,020,986  |
| Add: depreciation expense                          |              | 3,697,565    | 3,697,565   | 3,697,565   | 3,802,602   | 3,793,393   | 3,793,393   | 2,856,202    | 6,790,087    | 6,790,087    | 6,971,812   |
| amortization of pre-operating costs                | -            | 157,057      | 157,057     | 157,057     | 157,057     | 157,057     | -           | -            | -            | -            | -           |
| Accounts receivable                                |              | (18,741,406) | (5,089,188) | (5,087,243) | (5,927,854) | (6,892,948) | (7,999,864) | (9,268,265)  | (10,720,436) | (12,381,633) | 15,512,675  |
| Equipment Spare parts inventory                    | (301,833)    | (56,324)     | (66,835)    | (79,307)    | (94,106)    | (111,666)   | (132,504)   | (157,230)    | (186,571)    | (221,386)    | 1,407,762   |
| Raw Material Inventory                             | (6,230,051)  | (2,349,267)  | (2,695,568) | (3,438,881) | (4,373,403) | (5,546,234) | (7,015,742) | (8,854,197)  | (11,151,015) | (10,697,111) | 62,351,467  |
| Raw material inventory- Plastic Granules           | (1,952,036)  | (665,982)    | (732,837)   | (907,982)   | (1,121,783) | (1,382,372) | (1,699,536) | (2,085,048)  | (2,553,062)  | (2,300,607)  | 15,401,246  |
| Finished goods inventory                           | -            | (7,397,782)  | (1,875,702) | (1,875,417) | (2,176,449) | (2,521,227) | (2,915,770) | (3,366,893)  | (3,882,318)  | (4,470,787)  | (3,416,681) |
| Pre-paid building rent                             | (221,400)    | (22,140)     | (24,354)    | (26,789)    | (29,468)    | (32,415)    | (35,657)    | (39,222)     | (43,145)     | (47,459)     | 522,050     |
| Accounts payable                                   | -            | 18,707,134   | 5,039,973   | 5,122,810   | 6,003,632   | 7,025,886   | 8,212,187   | 9,588,890    | 11,186,747   | 12,598,152   | (28,477)    |
| Other liabilities                                  |              | -            | -           | -           | -           | -           | -           | -            | -            | -            | -           |
| Cash provided by operations                        | (8,705,319)  | (345,341)    | 11,292,893  | 16,517,911  | 22,420,334  | 29,385,953  | 37,562,092  | 50,203,695   | 59,587,921   | 76,443,145   | 197,742,841 |
| <i>Financing activities</i>                        |              |              |             |             |             |             |             |              |              |              |             |
| Issuance of shares                                 | 35,258,883   | -            | -           | -           | -           | -           | -           | -            | -            | -            | -           |
| Purchase of (treasury) shares                      |              |              |             |             |             |             |             |              |              |              |             |
| Cash provided by / (used for) financing activities | 35,258,883   | -            | -           | -           | -           | -           | -           | -            | -            | -            | -           |
| <i>Investing activities</i>                        |              |              |             |             |             |             |             |              |              |              |             |
| Capital expenditure                                | (25,553,563) | -            | -           | (1,211,289) | -           | -           | (1,593,247) | (40,644,648) | -            | (2,095,649)  | -           |
| Acquisitions                                       |              |              |             |             |             |             |             |              |              |              |             |
| Cash (used for) / provided by investing activities | (25,553,563) | -            | -           | (1,211,289) | -           | -           | (1,593,247) | (40,644,648) | -            | (2,095,649)  | -           |
| NET CASH   | 1,000,000    | (345,341)    | 11,292,893  | 15,306,622  | 22,420,334  | 29,385,953  | 35,968,844  | 9,559,047    | 59,587,921   | 74,347,496   | 197,742,841 |

## 13. KEY ASSUMPTIONS

### 13.1. Operating Cost Assumptions

**Table 38: Operating Cost Assumptions**

| Description                        | Details |
|------------------------------------|---------|
| Furniture and fixture depreciation | 15%     |
| Vehicle depreciation               | 15%     |
| Office equipment depreciation      | 15%     |
| Inflation rate                     | 10.1%   |
| Wage growth rate                   | 9.7%    |
| Electricity price growth rate      | 9.0%    |
| Office equipment price growth rate | 9.6%    |
| Office vehicle price growth rate   | 6.2%    |

### 13.2. Revenue Assumptions

**Table 39: Revenue Assumptions**

| Description                  | Details |
|------------------------------|---------|
| Sale price growth rate       | 11.2%   |
| Initial capacity utilization | 50%     |
| Capacity growth rate         | 5%      |
| Maximum capacity utilization | 90%     |

### 13.3. Financial Assumptions

**Table 40: Financial Assumptions**

| Description                              | Details |
|--|---------|
| Project life (Years)                     | 10      |
| Debt: Equity                             | 0:100   |
| Discount Rate used for NPV (100% Equity) | 15%     |

### 13.4. Debt-Related Assumption

**Table 41: Debt-Related Assumption**

| Description of Cost  | Details |
|----------------------|---------|
| Project Life (Years) | 10      |
| Debt: Equity         | 50:50   |



|                          |         |
|--------------------------|---------|
| Discount Rate            | 13%     |
| Debt Tenure              | 5 years |
| Grace Period             | 1 Year  |
| Interest Rate (KIBOR+3%) | 11.3%   |

### 13.5. Cash Flow Assumption

**Table 42: Cash Flow Assumption**

| Description               | Days |
|---------------------------|------|
| Accounts receivable cycle | 25   |
| Accounts payable cycle    | 30   |

# Small and Medium Enterprises Development Authority

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