Pre-feasibility Study

MANUFACTURING UNIT FOR HOUSEHOLD LAUNDRY EQUIPMENT

November 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, andrevenues 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

Table of Contents

Table of Tables

Table of Figures

1. DISCLAIMER

This information memorandum is to introduce the subject matter and provide a general idea and information on the said matter. Although, the material included in this document is based on data/information gathered from various reliable sources; however, it is based upon certain assumptions, which may differ from case to case. The information has been provided on as is where is basis without any warranties or assertions as to the correctness or soundness thereof. Although, due care and diligence has been taken to compile this document, the contained information may vary due to any change in any of the concerned factors, and the actual results may differ substantially from the presented information. SMEDA, its employees or agents do not assume any liability for any financial or other loss resulting from this memorandum in consequence of undertaking this activity. The contained information does not preclude any further professional advice to be obtained by the user. The prospective user of this memorandum is encouraged to carry out additional diligence and gather any information which is necessary for making an informed decision, including taking professional advice from a qualified consultant/technical expert before taking any decision to act upon the information.

For more information on services offered by SMEDA, please contact our website:

www.smeda.org.pk

Document Control

Document No.	244
Prepared by	SMEDA-Punjab (OS)
Revision Date	November 2021
For information	helpdesk.punjab@smeda.org.pk

2. EXECUTIVE SUMMARY

Modern day inventions have made the human life very easy. Many household jobs which previously were done manually, are now done using different types of machines and appliances. One such appliance is the electric washing machine, used for washing clothes. Earlier electric washing machines were the ones in which an operator had to attend the operations like rinsing, washing, drying, etc. However, the modern-day washing machine is an automatic equipment which is controlled electronically and is smart enough to perform all the related operations by itself without any human involvement. Due to the busy urban lifestyle and lack of time for household work, the automatic washing machine quickly became popular in the market and a preferred choice of the affluent segment of the population. It is now considered to be the fastest-growing segment in home appliances industry.

A fully automatic washing machine is operated with a single motor that has the ability to perform all the required washing and whirling operations. The automatic washing machine performs all the washing tasks automatically without any human help or involvement.

Automatic washing machines work on the basic principle of agitating clothes rapidly in soapy water until they are cleaned of any dirt. In the next washing stage, the soapy water is replaced by the clean water to completely rinse the clothes. The next stage is drying in which water is removed from the clothes by centrifugal force. This final output of the laundry operations is clean clothes; which are free from all the dirt and stains.

Fully automatic machines are available in two variants; front load and top load machines. Top load machines are more convenient to use and offers the benefits of space-saving, and water and energy efficiencies.

The increased number of dual-income households with insufficient time for house work has led to the rising demand for automatic washing machines. Pakistan's laundry equipment imports, during the last twelve-years, have risen from $4.8 million in 2009 to $13.5 million in 2020.[1] Due to high local demand and insufficient number of manufacturing units in Pakistan, part of this demand has to be met through imported products. The situation provides the opportunity rationale for the investors to invest in the proposed business. Major players in Pakistan laundry equipment industry are Super Asia, Dawlance, Oreint, Heier and PEL.

This "Pre-feasibility Document" provides details for setting up "Manufacturing Unit for Household Laundry Equipment" (herein after referred to as the proposed unit), The proposed unit manufactures plastic body automatic washing machines of three different sizes; 8 kg, 10 kg and 12 kg. The unit has a capacity of manufacturing 12,166 automatic washing machines in a year, at a maximum capacity utilization of 100%, including 3,500

[1]https://trendeconomy.com/data/h2/Pakistan/8450

washing machines of 8 kg capacity, 5,040 washing machine of 10 kg capacity and 3,626 washing machines of 12 kg capacity. The initial capacity utilization in “Year One” is assumed to be 60%, which translates into 7,300 automatic washing machines including 2,100 washing machines of 8 kg capacity, 3,024 washing machine of 10 kg capacity and 2,176 washing machines of 12 kg capacity. The unit is expected to obtain a maximum capacity of 90% in the 7th operational year.

Manufacturing Unit for Household Laundry Equipment will be set up in a rented building with an area of 7,000 square feet (31 Marla). The project requires a total investment of PKR 58.42 million. This includes capital investment of PKR 43.90 million and working capital of PKR 14.52 million. This project is financed through 100% equity. The Net Present Value (NPV) of project is PKR 247.67 million with an Internal Rate of Return (IRR) of 54% and a Payback period of 2.80 years. Further, this project is expected to generate Gross Annual Revenue of PKR 217.45 million during 1st year, with Gross Profit (GP) ratio ranging from 21% to 40% and Net Profit (NP) ratio ranging from 4% to 20% during the projection period of ten years. The proposed project will achieve its estimated breakeven point at capacity of 44% at breakeven revenue of PKR 157.66 million (5,293 units) during first year.

The proposed project may also be established using leveraged financing. At 50% financing from debt sources at a cost of KIBOR+3%, the proposed manufacturing unit provides Net Present Value (NPV) of PKR 284.15 million, Internal Rate of Return (IRR) of 54% and Payback period of 2.81 years. Further, this project is expected to generate Net Profit (NP) ratio ranging from 4% to 20% during the projection period of ten years. The proposed project will achieve its estimated breakeven point at capacity of 45% with annual revenue of PKR 161.73 million (5,429 Units).

The proposed project will provide employment opportunities to 59 people. High return on investment and steady growth of business is expected with the entrepreneur having some prior experience or education in the related field of business.

The proposed project for Manufacturing Unit for Household Laundry Equipment shows reasonable profitability and is financially viable. The legal form of this project is proposed as “Private Company” or “Partnership Concern”.

3. INTRODUCTION TO SMEDA

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

With a mission "to assist in employment generation and value addition to the national income, through development of the SME sector, by helping increase the number, scale and competitiveness of SMEs", SMEDA has carried out ‘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 is 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 “Manufacturing Unit for Household Laundry Equipment”. 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 setup 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

Modern day inventions have made the human life very easy. Many household jobs which previously were done manually, are now done using different types of machines and appliances. One such appliance is the electric washing machine, used for washing clothes. The term washing machine is mostly applied to machines that use water as opposed to dry cleaning (which uses alternative cleaning fluids and is performed by specialist businesses) or ultrasonic cleaners.[2]

Washing machines may be of different types. The global residential washing machine market is segmented on the basis of product, design, machine capacity and geography. Based on product, the market is divided into fully automatic, semi-automatic and the washing machines having separate washers and dryers. Top load machines are loaded from the top and the front load machines are loaded from side of the machine. Top load washing machines are cheaper as compared to front load machines and easy to operate. Capacity is always measured in term of the weight of dry laundry and should not be confused with dryer capacity which is instead, measured by the weight of damp laundry. So, an 8 kg washing machine fits a maximum of 8 kilograms of dry laundry.

Automatic washing machine operates in three steps:

1. Washing
2. Rinsing
3. Drying

Washing- In the first step, the clothes are cleaned using water and detergent.

Rinsing- Rinsing is the second step in cleaning. its purpose is to remove the soapy water and dirt from the clothes using fresh, clean water.

Drying- After washing and rinsing, the final step is drying. Drying technologies either evaporate or mechanically remove residual liquid from the clothes.

Numerous technological advancements have been carried out in washing machines during the last decade, leading to higher efficiency in terms of saving water and electricity. This has also enabled key players like (Samsung, LG, Siemens AG, Haier, Whirlpool and Panasonic) to gain a significant market share in the washing machine market. Technological advancements and customer friendly modifications in their product leads these major key players to grasp significant market shares.

Global Residential/Domestic Washing Machine Market was valued at $36,648 million in 2016 and is projected to reach at $53,193 million by 2023, growing at a CAGR of 5.5% from 2017 to 2023.[3]. Increase in disposable incomes and improvements in rural

[2] Ultrasonic cleaning is a process that uses ultrasound (usually from 20–40 kHz) to agitate a fluid.
[3] https://www.alliedmarketresearch.com/press-release/residential-washing-machine-market.html

electrification drives the global residential washing machine industry. In addition, rising affordability of washing machines and increased urbanization has also fueled the demand for washing machines.

Proposed Products

The unit will manufacture plastic body automatic washing machines due to their rising demand in the local market. Automatic washing machines of three different tub sizes (8 kg, 10 kg and 12 kg) have been covered in this document. The proposed business will sell its products in the local wholesale market.

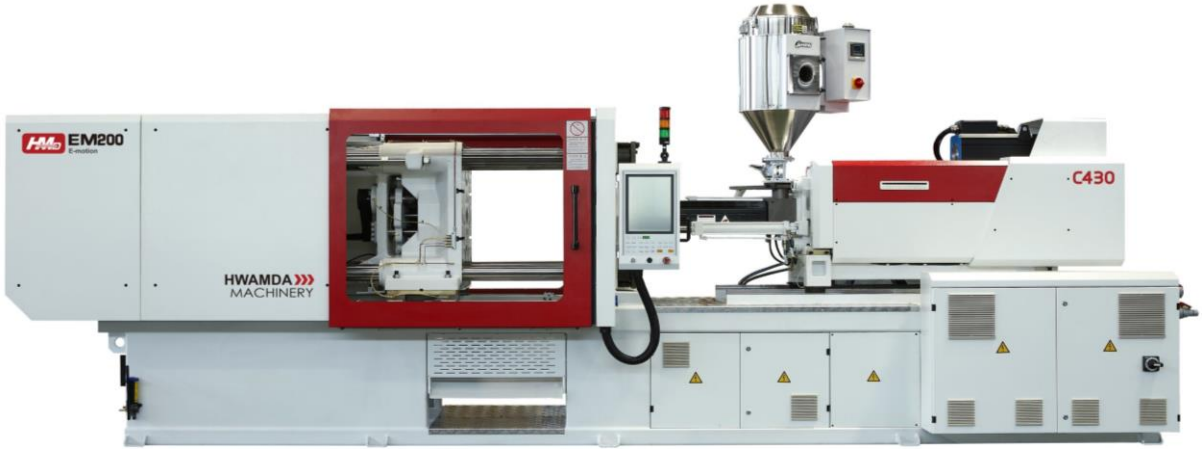
5.1. Machinery and Equipment

Details of the machines and equipment required for the proposed manufacturing unit are as follows:

Injection Molding Machine

The injection molding process involves heating and injecting plastic granules under pressure into a closed metal mold. The proposed project uses Acrylonitrile Butadiene Styrene (ABS) material The molten plastic cools and hardens into the required shape inside the mold, which is then opened to allow the moldings to be ejected or removed for inspection. The proposed injection molding machine has the clamping force of 4500 kN, injection rate of 863 g/s with an injector force of 133 kN and cycle time ranging between 60-120 seconds. The proposed molding machine produces the plastic body parts of the machine, including the inner drum, outer body, top cover, bottom cover, outer tub and pulsator. The injection molding machine requires a load of 100 KW. The proposed manufacturing unit will be using a new Chinese injection molding machine. Figure 1 shows an injection molding machine.

Figure 1: Injection Molding Machine



In the proposed business, the injection molding machine will be operated in a single shift of 8 hours and will manufacture the plastic parts of 8 kg, 10 kg and 12 kg automatic washing machines. The proposed injection molding machine has a setting up time of 2 hours per mold and productive time will be 6 hours. Table 1, Table 2 and Table 3 shows the detail of Injection Molding Machine Capacity Parameters for 8 kg, 10 kg and 12 kg automatic washing machine respectively.

Table 1: Injection Molding Parameter for 8 kg Washing Machine

Body Part	Weight (kg)	Cycle Time (sec)
Outer Body	8	70
Inner Drum	10	90
Outter Drm	6	60
Pluster, top cover and bottom	6	60

Table 2: Injection Molding Parameter for 10 kg Washing Machine

Body Part	Weight (kg)	Cycle Time (sec)
Outer Body	10	90
Inner Drum	12	100
Outter Drm	8	70
Pluster, top cover and bottom	8	70

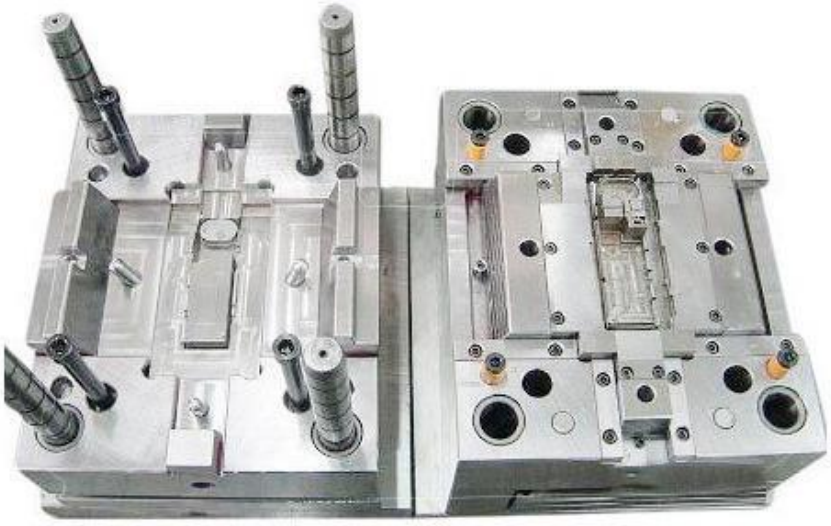
Table 3: Injection Molding Parameter for 12 kg Washing Machine

Body Part	Weight (kg)	Cycle Time (sec)
Outer Body	12	100
Inner Drum	14	120
Outter Drm	10	90
Pluster, top cover and bottom	10	90

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. There are many holes drilled in the block for temperature control by circulating water or oil or by using heaters. Molten plastic flows into the mold through a sprue and fills the cavities by way of runners and gates. The mold is opened after cooling 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 different parts of washing machines. These molds are imported and manufactured according to designs requirement of the market. Figure 2 shows molds used for making plastic parts of washing machines.

Figure 2: Molds



3-Ton Overhead Crane

An overhead crane is, generally equipped with an elevator, ropes or chains and sheaves that can be used both to move and to lift and lower materials horizontally (flexibility and movability). The proposed project requires a 3-ton overhead crane to change the molds

during the manufacturing of different parts in injection molding machine. Overhead crane requires electricity consumption of 8 KW. Figure 3 shows an overhead crane.

Figure 3: Overhead Crane

Crushing Machine

Crushed granules or flakes are reused in production as the recycled raw materials. Plastic crushers are specialized in crushing leftovers and waste materials into granules or flakes. This machine thus helps reduce the volume of plastic waste and save costs and resources. Crushing machine has a capacity to crush 100 kg of waste material per hour and requires electricity consumption of 18 KW. Figure 4 shows crushing machine.

Figure 4: Crushing Machine

Granules Mixing Machine

This machine is used for mixing the plastic granules of different colors. Mixing can be done in a short period of time, because of high performance of this machine. Both mixing barrel and the mixer are made up of stainless steel and polished. This mixing machine

has a capacity of mixing 150 kg of granule material per hour and has an electric power of 2 KW. Figure 5 shows granules mixing machine.

Figure 5: Granules Mixing Machine

Generator 150 KVA

The total load of the proposed unit is 130 KW. The proposed project require generator of 150 KVA as a backup when normal electricity supply is not available. Figure 6 shows generator 150 KVA.

Figure 6: Generator 150 KVA

Assembly Tools

Drill Machine with Accessories

A drill machine is a tool 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 power drills also include a hammer function. Drill machine requires an electric power of 0.55 KW. Figure 7 shows drill machine with accessories.

Figure 7: Drill Machine with Accessories

Adjustable Wrenches

Adjustable wrench is an open-end wrench with a movable jaw, allowing it to be used with different sizes of fastener heads (nut, bolt, etc.) rather than just one fastener sizes, as with a conventional fixed spanner. Figure 8 shows adjustable wrenches.

Figure 8: Adjustable Wrenches

Digital Multi-meter Clamp Meter.

A clamp meter is an electrical test tool that combines a basic digital multi-meter with an electric current sensor. Clamp measures 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 9 shows digital multi-meter clamp meter.

Figure 9: Digital Multi-meter 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 screw driver. 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 appliance repair and electronics industries. Figure 10 shows T shaped nut/screw driver.

Figure 10: T Shaped Nut/Screw Driver

Combination Tool Set (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,[4] curved jaw locked wrench,

[4] Pliers are hand-operated tool for holding and gripping small objects or for bending and cutting wire.

screw driver and flexible extension bar. Figure 11**Error! Reference source not found.** shows combination tool set (142 Pieces).

Figure 11: Combination Tool Set (142 Pieces)

Soldering Iron (Kavya)

A soldering iron is a hand tool used in soldering. It is known as 'Kaavya' in the local language. It supplies heat to melt solder[5] which 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 (electrical cord or battery cables) through a resistive heating element. Figure 12 shows soldering Iron kavya.

Figure 12: Soldering Iron Kavya

Hole Saw Cutter Set (11 Pieces)

The hole saws represent cylindrical shaped saw blades attachment designed to be used with power drills to cut out perfectly round holes. They are popular in electrical and plumbing trade, and are much more efficient than flat and twist drill bits in applications that require drilling big, deep holes or enlarging existing ones. Figure 13 shows hole saw cutter set.

Figure 13: Hole Saw Cutter Set

[5] Solder is a fusible metal alloy (tin and lead) used to create a permanent bond between metal workpieces.

Disc Cutter and Grinding Machine

A disc cutter is a specialized, often hand-held, power tool used for cutting hard materials. This tool is very similar to an angle grinder, chop saw, or even a die grinder, with the main difference being the cutting disc itself. Disc cutter is used to cut the extra plastic from the body after the fabrication process. Figure 14 shows disc cutter and grinding machine.

Figure 14: Disc Cutter and Grinding Machine

Machine Lifter Trolley

A lifting trolley is a mobile lifting table with a lowering function that allows the individual employee to work with heavy products at the correct ergonomic[6] working height. A lifting trolley increases productivity by easing both the work and the product movement. Figure 15 shows machine lifting trolley.

[6] relating to or designed for efficiency and comfort in the working environment.

Figure 15: Machine Lifter Trolley

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 raw materials to raw material store and production department as well as to carry the final products to finished goods store room. Figure 16 shows platform trolley.

Figure 16: Platform Trolley

Air Compressor

An air compressor is a pneumatic device that converts power (using an electric motor, diesel or gasoline engine, etc.) into potential energy stored in pressurized air (compressed air). In the proposed project, air compressor is used for leakage detection in motor using air pressure. Figure 17 shows air compressor machine.

Figure 17: Air Compressor

Electronic Weighing Scale

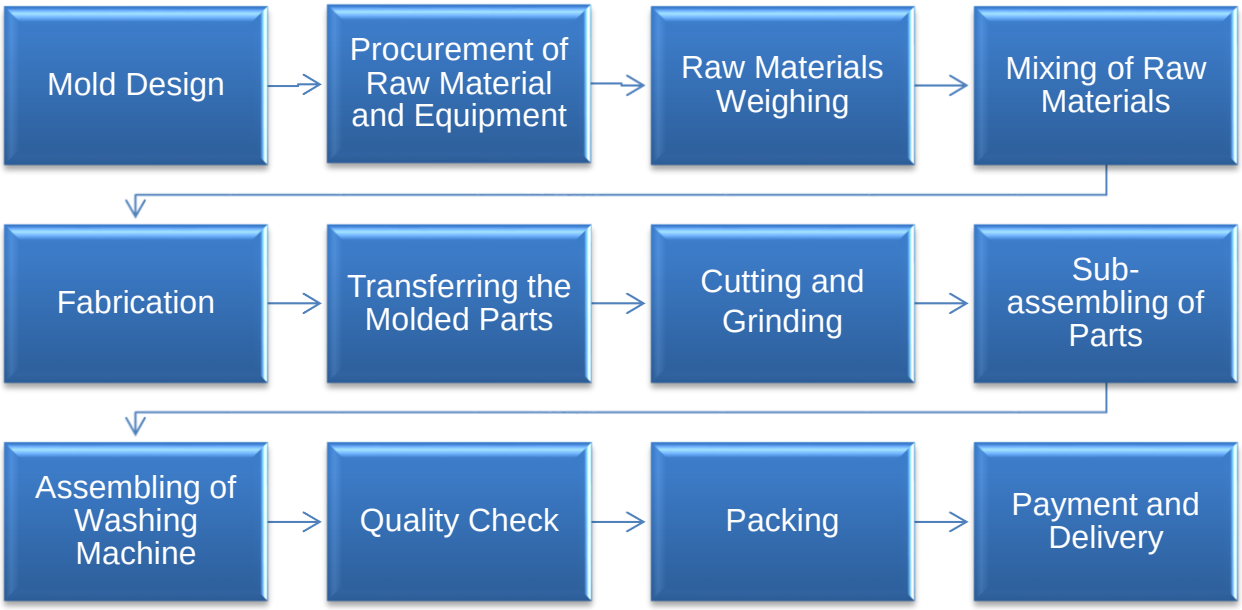
Weighing Scale is a device used to measure the quantities of raw materials, which afterwards are mixed together in the mixer in specific ratios. Figure 18 shows Electronic Weighing Scale.

Figure 18: Electronic Weighing Scale

5.2. Production Process Flow

Automatic plastic washing machine manufacturing process flow chart is shown in Figure 19.

Figure 19: Production Process Flow



Brief description of process flow is as follows:

Mold Design

Before starting the business, a detailed Computer-aided design (CAD) for each washing machine is designed by CAD engineers. Auto CAD is commonly used for designing and drafting of product. It allows the manufacturer to conceptualize ideas, product designs and drawings to the required level of technical accuracy, perform rapid design calculations and simulations. Computer-aided design shows the detail of product and where each of the part fits' it shows the length, width and thickness of each part and helps in calculating the material required for manufacturing each part. Without auto CAD design, the accurate weight of washing machine parts, material to be used and injection molding machine capacity cannot be calculated. Molds are custom designed according to the CAD figure.

Procurement of Raw Material and Equipment

Main raw material used to manufacture plastic parts of automatic washing machine is Acrylonitrile Butadiene Styrene (ABS) (plastic granules). Other components required for manufacturing washing machine are

- Gear box

- Main motor
- PCB kit
- Pressure sensor
- Drum shocks set
- Drain water pump
- Motor
- Inlet water pump
- water inlet pipe
- Drain hose
- Belt
- Plug
- Wheel set
- Four core cable 0.5 mm² (1/0.44)
- Main lead power cord 2 pin
- Fitting accessories (screws, fitting, cable, tie and glue etc.).

These materials are purchased from local markets since they are easily available in all major cities in Pakistan. The proposed project maintains raw material inventory for 30 days.

- ***Acrylonitrile Butadiene Styrene (ABS)***

ABS is an opaque thermoplastic and amorphous polymer. “Thermoplastic” refers to the way the material responds to heat. A thermoplastic is plastic material which melts into a soft, pliable form above a certain temperature and solidifies upon cooling.

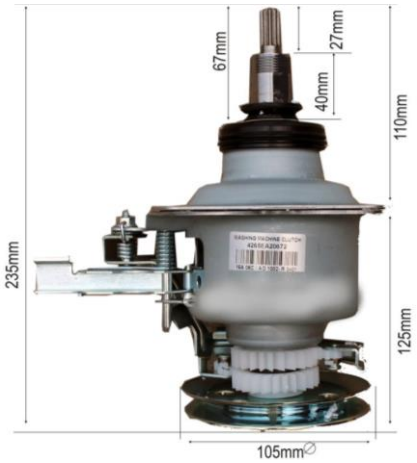
ABS offers a good balance of impact, heat, chemical and abrasion resistance, dimensional stability, tensile strength, surface hardness, rigidity and electrical characteristics. ABS plastic is a good insulating material. It remains hard, rigid and tough even at low temperatures. It is available in fire-retardant, 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 sold in a 25 kg bag packing. The payment to supplier is made on credit basis within 45 days of receipt of raw material. Figure 20 shows Acrylonitrile Butadiene Styrene (ABS).

Figure 20: Acrylonitrile Butadiene Styrene (ABS)

- ***Gear Box***

A gearbox is an integrated mechanical component involves in power transmission. It consists of a series of mating gears contained in a housing with shafts and bearings (to support and resolve loads) and in many cases a flange for motor mounting. The gearbox is one of the sophisticated parts of the washing machine. When motor spins the pulley on the gearbox in one direction, the inner shaft turns slowly back and forth, reversing direction about every half-revolution. When motor spins the pulley in the other direction, the flange spins at high speed, spinning the whole tub with it. Figure 21 shows the gear box used in an automatic washing machine.

Figure 21: Gear Box



- ***Washing Machine Motor***

The washer motor is usually installed at the bottom of the washer in top load models. The most common type of motors used in washing machines are direct drive The direct drive

motor is attached directly to the wash basket, while the belt drive motor is fixed independently and uses a belt to turn the wash basket. This is combined with the agitator or the disc that turns the drum to produce a rotary motion. This mechanism operates the washing machine. Motor is installed in the lower part of plastic body in a space specified for that purpose. Motor is fixed in that space with nuts and bolts. T shaped nut/screw driver is used to properly fix the nuts and bolts. Figure 22 shows automatic washing machine motor.

Figure 22: Washing Machine Motor

- ***Printed Circuit Board (PCB) Kit***

A printed circuit board (PCB) is a board with electronic parts required for controlling the machine's operations. PCB functions like the brain of a washing machine. Nearly every function performed by the washing machine is controlled by the circuit board. The board on simple washing machines just tells the washing machine when to fill with water or rinse clothes, but complex washing machines normally will have more advanced boards. This board is not safe from water and may short out if splashed. Without a circuit board, most washing machines cannot function. PCB kit comes with the complete circuit board, touch panel and timer switch. Figure 23 shows printed circuit box.

Figure 23: Printed Circuit Board

- ***Pressure Sensor***

The pressure sensor uses a pressure switch to detect the water level in the tub. This switch controls how high the tub fills with water. The larger end of the hose connects to the bottom of the tub, while the smaller end connects to the switch. Simply a pressure sensor is used to monitor water level. Figure 24 shows pressure sensor.

Figure 24: Pressure Sensor

- ***Drum Shocks Set***

Shock absorbers or dampers are the tubular parts of a washer. These are made of a combination of metal and plastic and are crucial for appliance to work smoothly. These are designed to moderate/reduce the vibration and shaking of the tub during spin cycles. Figure 25 shows drum shocks set.

Figure 25: Drum Shocks Set

- ***Washing Machine Drain Pump***

The water drain pump is in the bottom of the washer usually in the back side of the machine. The drain pump controls the removal of water from the tub throughout the washing cycle, draining the tub after the main wash, after the first rinse and during the final spin. Figure 26 show washing machine drain pump.

Figure 26: Washing Machine Drain pump

- ***Inlet Water Pump***

Water inlet pump circulates the water through the machine, rotating in two directions. It is used for circulating the water through the wash cycle and also for draining the water during the spin cycle. Figure 27 shows inlet water pump.

Figure 27: Inlet Water Pump

- ***Water Inlet Pipe***

Water inlet pipe is a pipe that brings water into a machine. Figure 28 shows water inlet pipe.

Figure 28: Water Inlet Pipe

- ***Drain hose***

The drain hose exists in the washing machine toward the bottom and travels up to the nearby sink or standpipe. It is usually made of corrugated plastic (polypropylene plastic).

It is used to drain water from the washing machine. Drain hoses are largely universal and come in widths from 1 to 1.25 inches in diameter. Figure 29 shows drain hose.

Figure 29: Drain Hose

- ***Belt***

  V-belts are used because of their ability to wedge tightly into the grooves of the pulley. This creates higher friction between the surfaces which reduces slip and power loss. In washing machine, v-belts fits between the motor and the drum pulley. This is the part that allows the drum to turn during the wash cycle. Figure 30 shows belts.

Figure 30: Belts

Raw Material Weighing Process

A weighing scale is used to measure the quantities of raw materials. White and colored granules are measured in proportional quantities according to the color of the final products. After weighing, the granules are ready to be mixed and processed.

Raw Material Mixing Process

Before going to the production line, white granules and colored granules are mixed in a mixer machine. After uniform mixing, the granules are ready to be loaded into the hopper of the molding machine. The mixer used the proposed project have a capacity of 150 kg per hour. Mixing is done in batches as per need.

Fabrication

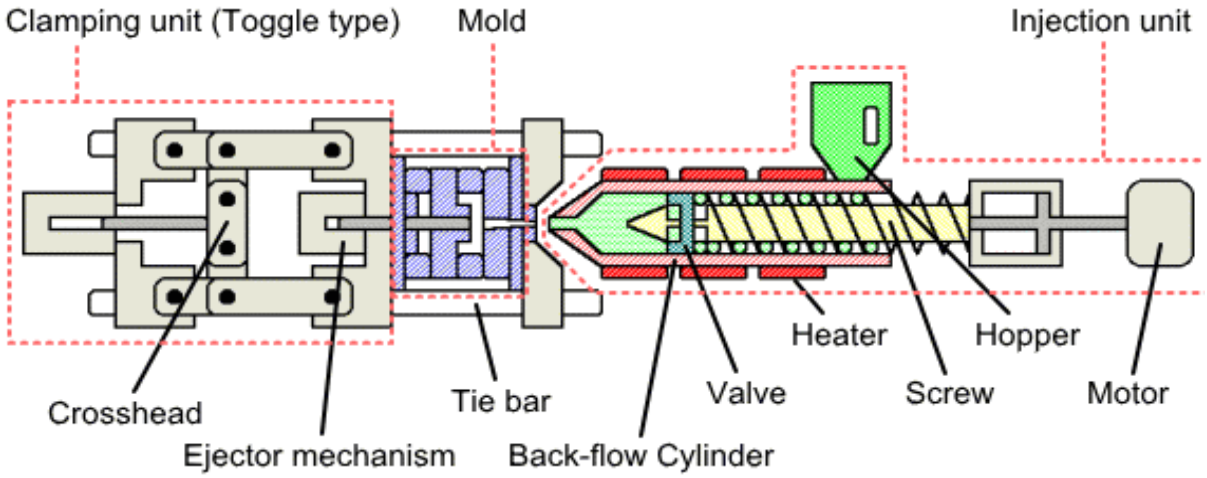
Fabrication is the process of manufacturing products by combining typically standardized parts using one or more individual processes. Plastic parts are produced using a range of processes such as molding, cutting/grinding and assembling.

Injection Molding

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

The screw of molding machine is rotated to melt plastic introduced from the hopper and to accumulate molten plastic in front of the screw (to be called metering). The mechanical energy supplied by the turning screw, together with frictional heaters, converts the plastic granules into a molten state. After the required amount of molten plastic is accumulated, injection process is stared. Figure 31 shows the sections of injection molding machine.

Figure 31: 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, it controls dwell pressure[7] after molten plastic fills out cavities. Washing machine components that are made through injection molding machine are outer body, inner drum, top cover, bottom cover, pulsator and outer tub.

Automatic Washing Machine Body Parts Made by Injection Molding Machine

[7] The dwelling 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 (the gate has solidified) so that the plastic does not flow back from the gate. Its unit is MPa or kgf/cm2.

Automatic Washing Machine Body

The main parts of the automatic washing machine body are top cover, bottom cover and outer body as shown in Figure 32.

Figure 32: Washing Machine Body

Washing Machine Drums

Washing machines have two tubs. The tub in which the clothes are loaded is the inner drum, which moves around the washing machine and is punched with holes to allow the water in and out. The outer tub does not have holes which stops water from leaking into the rest of the machine. It also supports the inner drum.

- ***Inner Tub***

Inner tub is the space where clothes are loaded. Its sides are perforated with holes so that when the tub spins, the water can leave. Figure 33 shows inner drum/tumbler.

Figure 33: Inner Drum/Tumbler

- ***Outer Tub***

The outer tub is placed outside the inner drum and holds the water while the agitator or the washer rotates. This part is always airtight to make sure that no water leaks out of automatic washing machine, Figure 34 shows outer tub.

Figure 34: Outer Tub

- ***Pulsator***

This is located inside the tub of the washing machine and helps perform the cleaning of the clothes. Pulsator or impeller is a diminished rotating hub that is used instead of an agitator. When the pulsator rotates, the vanes of the pulsator generate turbulent currents in the washing water. These currents spin the clothes through the water. The spinning back and forth cleans the fabric. Figure 35 shows a pulsator.

Figure 35: Pulsator

Transferring the Molded Parts

After completing the fabrication process, all the molded parts are transferred to sub assembling department using platform trolleys to assemble the washing machine.

Cutting and Grinding

In this step, the extra plastic attached with the molded parts is cut using disc cutter. After

cutting the extra plastic, edges of the molded parts are ground using grinding machine to make rough edges smooth.

Crushing

These plastic bits are mixed with raw material directly for reuse. Due to its purity, it is easy to re-use. The leftovers, waste material produced in the first batch (products not meeting the required specifications) are crushed to small particles again using the crushing machine.

Sub-Assemblies of Automatic Washing Machine

The washing machine parts are assembled manually by workers who bolt, snap or press (tight fit) several shafts and gears together using T shaped nut/screw driver, adjustable wrenches and combination tool set.
The production and assembly of washing machines will be done by 4 teams. Each team consists of two skilled technicians to do electrical and mechanical connections and one helper to assemble the parts of machine.

Sub-assembly is divided into three parts.

1. Assembly of Upper panel
2. Assembly of Drum
3. Assembly of Lower Body

Workers add a metered amount of oil and bolt the different parts together. The motor is assembled manually. Soldering iron (kaavya) is used for making electrical connections and clamp meter is used to test voltage. Workers place the impeller and seals in the cover and body and seal the motor. Some manufacturers use heat and others vibration (which generates heat) as a sealant.

A washing machine has flat, non-metallic balance weights attached with bolts and spring washers to a drum made of thermoplastic material. Balance weight is mounted on a tub of a washing machine, which balances the tub, and reduces the vibration of the tub. The balance weight comprises a plurality of weight plates piled up and at least one coupling member securing the weight plates to the tub.

Assembling of Automatic Washing Machine

After installing all the necessary parts in the sub-assemblies, final assembly of all the sub-assemblies and the remaining parts such as machine tub, motor, drain pump, water inlet valve, washer drain hose and washer console is done to complete the assembly. After assembly, some parts of washing machine (timer, wheels, circuits, paddles) are installed manually using drill machine and other tools. Holes are made using drill machine and saw cutter machine in pre-determined marked areas and these parts are assembled with the

main body through screws and bolts. After screwing together all parts, the equipment is ready for testing.

Figure 36 shows automatic washing machine.

Figure 36: Finished Automatic Washing Machine

Quality Check

All parts that are purchased from outside manufacturers are spot checked by the procurement officer through the observation before use and most sub-assemblies are checked by the quality controller. Washing machines are tested for operation, noise, and vibration. Motor is tested for water leakage manually by using air compressor machines.

Once the washing machine is completely assembled, the machine is filled with water and tested for noise, vibration, visual defects, and all the functional controls and mechanisms.

Packing

After quality assurance checks, the washing machine is packed manually by labor. Packing of automatic washing machine includes thermopol (covering all the outside body of the machine), plastic wrapper, carton box and plastic strap is stretch to the whole washing machine.

Finished Goods Store

After completion of assembling and packing, the packed machines are transferred to finished goods store by machine carry trolleys. The machines are stored at designated

places in the store and are managed by the storekeeper to protect those from any damage. A finished goods inventory of 15 days' production is maintained.

Delivery and Payment

Finished products (automatic washing machines) are delivered to the market through loader rickshaw or loader truck. Sales are made to customers on an average credit period of 25 days.

5.3. Installed and Operational Capacities

The total manufacturing capacity is based on the injection molding machine production capacity. The proposed manufacturing unit shall operate at maximum capacity of 100% and will manufacture 12,166 automatic washing machines annually. This includes 3,500 washing machines of 8 kg capacity, 5,040 washing machine of 10 kg capacity and 3,626 washing machines of 12 kg capacity. During first year of operation, the manufacturing unit is expected to attain 60% of installed capacity.

The injection molding machine and the assembly line operates in a single 8-hour shift. Based on 280 working days in a year, the unit shall produce 7,300 automatic washing machines during initial year 60% capacity, which includes 2,100 washing machines of 8 kg capacity, 3,024 washing machine of 10 kg capacity and 2,176 washing machines of 12 kg capacity. Based on the current market trend, the production ratio of each product is shown in tables below. Table 4 depicts injection molding machine production capacity for 8 kg washing machine, Table 5 depicts the injection molding machine production capacity for 10 kg washing machine, Table 6 injection molding machine production capacity for 12 kg washing machine. Table 7 shows annual installed and operational capacity.

Table 4: Injection Molding Machine Production Capacity- 8 kg Washing Machine

Production Parts	Time Divisuon Ratio per Mold	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) (A)	Cycle Time (sec) (B)	Machine Capacity / day (Units) (A/B)
Outer Body	27%	6	2	4	1.1	64.8	3,888	70	56
Inner Drum	31%				1.2	74.4	4,464	90	50
Outer Drum	21%				0.8	50.4	3,024	60	50
Pluster, Top cover and bottom	21%				0.8	50.4	3,024	60	50
	100%				**4**	**240**	**14,400**		

Table 5: Injection Molding Machine Production Capacity- 10 kg Washing Machine

Production Parts	Time Divisuon Ratio per Mold	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) (A)	Cycle Time (sec) (B)	Machine Capacity / day (Units) (A/B))
Outer Body	27%	6	2	4	1.1	64.8	3,888	90	43

Inner Drum	31%				1.2	74.4	4,464	100	45
Outer Drum	21%				0.8	50.4	3,024	70	43
Pluster, Top cover and bottom	21%				0.8	50.4	3,024	70	43
	100%				**4**	**240**	**14,400**		

Table 6: Injection Molding Machine Production Capacity- 12 KG Washing Machine

Production Parts	Time Divisuon Ratio per Mold	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) (A)	Cycle Time (sec) (B)	Machine Capacity / day (Units) (A/B)
Outer Body	27%	16	2	14	1.1	64.8	3,888	100	39
Inner Drum	31%				1.2	74.4	4,464	120	37
Outer Drum	21%				0.8	50.4	3,024	90	34
Pluster, Top cover and bottom	21%				0.8	50.4	3,024	90	34
	100%				**4**	**240**	**14,400**		

Table 7: Annual Installed and Operational Capacity

Products	Production Ratio	Total Production Days	Production Days per Washing Machine	Production per Day	Production Capacity @100%	Initial Year Production Capacity @60%
Washing Machine (8 kg Capacity)	25%	280	70	50	3,500	2,100
Washing Machine (10 kg Capacity)	40%		112	45	5,040	3,024
Washing Machine (12 kg Capacity)	35%		98	37	3,626	2,176
Total	**100%**		**280**	**132**	**12,166**	**7,300**

6. CRITICAL FACTORS

Following factors should be taken into account while making the investment decision:

- Sound technical knowhow and basic knowledge of the business
- Availability of quality raw materials
- Effective market linkages
- Availability of specialized workforce
- Regular and strict checks on quality standards
- Up-to-date knowledge of technological innovations
- Rigorous supervision of the production process at all process stages
- Regular checks on the machinery and equipment for proper working

7. GEOGRAPHICAL POTENTIAL FOR INVESTMENT

The market of laundry equipment industry is segmented into different sections such as washers and dryers, dry cleaners, commercial laundry storages, and others, such as iron and finishing equipment, etc. Washers and dryers segment includes various washing and drying equipment.

Target customers for this proposed unit are the household customers, hospitals, hotel, other institutions and industries through wholesale and e-commerce platforms/distribution channels. The unit is proposed to be ideally located in any industrial areas of large cities like Karachi, Lahore, Gujranwala, Multan, Faisalabad, Hyderabad, Peshawar, Quetta, Islamabad, Rawalpindi, etc. These areas are preferred due to easy availability of skilled labor, raw materials and industrial infrastructure. Locating the proposed unit in these cities provides the advantage of being close to buyers which helps in getting consistent orders. Such units may also be established in other smaller cities where the basic requirements like raw material availability, skilled man power availability, market access, etc. can be fulfilled.

8. POTENTIAL TARGET MARKETS/CUSTOMERS

Laundry equipment manufactured by the proposed unit shall be sold to household customers, hospitals and hotels through wholesale and online distribution channels.

Rapid urbanization, coupled with the rise in disposable incomes and affordability among residents of cities, is expected to drive the demand for household laundry equipment. Globally, the percentage of population living in urban areas is expected to increase from 55% in 2018 to 68% by 2050.[8] Pakistan's current population comprises

[8] https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html

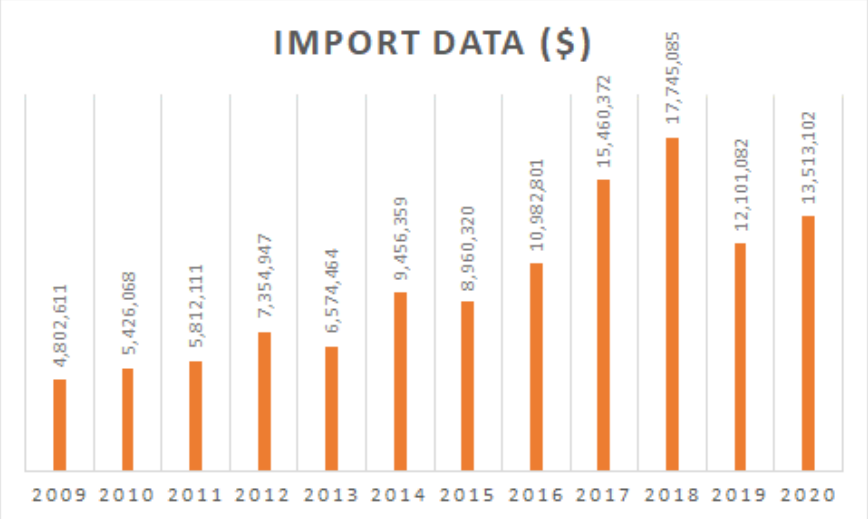
of about one-third urban households. It is expected to reach around 50% by 2025.[9]

In Pakistan, imports of laundry equipment increased from $4.8 million in 2009 to $13.5 million in 2020.[10] Increasing imports indicate that the local manufacturing industry is unable to meet the local demand.

Earlier electric washing machines were the ones in which an operator had to attend the operations like rinsing, washing, dying, etc. However, the modern-day washing machine is an automatic equipment which is controlled electronically and is smart enough to perform all the related operations by itself without any human involvement. Due to the busy urban lifestyle and insufficient time for house work, the automatic washing machine quickly became popular in the market and a preferred choice of the affluent segment of the population. It is now considered to be the fastest-growing segment in home appliances industry.

Future prospects of Pakistan's laundry equipment manufacturing industry appear promising. The proposed project offers good investment opportunities for potential investment. In Pakistan there are around 100 small, medium and large enterprises engaged in manufacturing of laundry equipment. Most of these units are located in Lahore, Karachi, Gujranwala and Rawalpindi. Current local production of laundry equipment is not sufficient to meet the rising demand of laundry equipment. To fulfill the increasing demand high quality Laundry equipment are also imported from different countries Figure 13 shows a graph of laundry equipment import of previous twelve years.

Figure 13 Pakistan Import Graph of Pervious Twelve Years



This graph shows the import data of laundry equipment of Pakistan in past twelve years under the HS code 8450.[11]

[9] https://www.files.ethz.ch/isn/159296/4c5b5fa0ebc5684da2b9f244090593bc.pdf
[10] https://trendeconomy.com/data/h2/Pakistan/8450
[11] https://comtrade.un.org/

The Global Household Appliance Market is fragmented with a large number of big players contributing a fair share to the global revenue. Some of the major global companies include Haier, Whirlpool, Samsung, LG, Bosch, Sony, Philips and Panasonic. Popular local brands are Super Asia, Haier, Dawlance, Orient and PEL.

9. PROJECT COST SUMMARY

A detailed financial model has been developed to analyze the commercial viability of Household Laundry Equipment Manufacturing Unit. 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.

Project is proposed to be financed through 100% equity. Total project cost has been estimated as PKR 59.08 million which comprises of capital investment and working capital of PKR 44.56 million and PKR 14.52 million respectively.

9.1. Project Cost

The details of initial project cost calculated for the Manufacturing unit are shown in Table 8.

Table 8: Initial Project Cost

Cost Item	Cost (PKR)	Details Reference
Land	-	9.1.1
Building / Infrastructure	1,823,665	9.1.2
Molds	2,585,000	
Other Machinery and equipment	22,700,000	9.1.3
Production Tools	642,000	
Furniture & fixtures	1,575,000	9.1.4
Office vehicles	9,131,300	9.1.5
Office equipment	2,437,000	9.1.6
Pre-operating costs	1,667,557	9.1.7
Incorporation and License costs	79,000	9.1.8
Security against Building	1,260,000	
Total Capital Cost	**43,900,522**	
Working Capital		

Equipment spare part inventory	105,354	
Material Inventory	12,497,035	
Upfront building rent	420,000	
Cash	1,500,000	
Total	**14,522,389**	
Total Project Cost	**58,422,911**	

9.1.1. Land

The proposed unit will be established on a rented land having an area of 7,000 square feet (31 Marla). Total rental cost has been estimated as PKR 420,000 per month. The breakup of the space requirement is provided in Table 9.

Table 9: Breakup of Space Requirement

Production Area	Number	Length	Width	Area (Sq. Ft.)
Raw Material Store Room	1	15	15	225
Production & Packing Department	1	50	45	2,250
Finished Goods Store Room	1	25	25	625
Office Block				
Executive Office	1	10	12	120
Accounts Department	1	20	25	500
Quality Control Department	1	12	10	120
Procurement Department	1	20	25	500
HR and Admin Department	1	20	25	500
Conference Room	1	20	16	320
Sales and Marketing Department	1	25	25	625
Electrical and Mechanical Workshop	1	15	15	225
Security Guard Room	1	8	10	80
Reception	1	10	15	150

Kitchen	1	10	12	120
Washrooms	10	8	8	640
Total Area				**7,000**

9.1.2. Building

There will be no cost of building construction since the manufacturing unit for household laundry equipment will be started in a rented building having an area of 7000 square feet. However, there will be a renovation cost required to make the building usable for the business. Building rent of PKR 420,000 per month has been included in the operating cost. The proposed project requires electricity load of around 125 KW for which an industrial electricity connection will be required. Table 10 provide details of building renovation cost.

Table 10: Building Renovation Cost

Cost Item	Unit of Measurement	Total Units	Cost/Unit (PKR)	Total Cost (PKR)
Paint Cost	Liter	191	500	95,705
Wall Racks	Units	19	8,000	152,000
Labour Cost	Feet	19,141	10	191,410
Glass partition	Square Feet	1,701	550	935,550
Ceramic Floor Tiles	Square Feet	3,900	110	429,000
Curtains	Units	4	3000	12,000
Blinds	Units	4	2000	8,000
Total				**1,823,665**

9.1.3. Machinery and Equipment Requirement

Table 11 provides details of machinery and equipment required for the project:

Table 11: Machinery and Equipment Requirement

Cost Item	Unit	Unit Cost (PKR)	Total Cost (PKR)
Injection Moulding Machine 1800-ton (200 Mould per day)	1	20,000,000	20,000,000
Overhead Crane 3 ton	1	500,000	500,000
Granules Mixer Machine - 150Kg/ Hour (4000 watts)	1	350,000	350,000

Crusher Machine - 100Kg/Hour (6400 watts)	1	350,000	350,000
Generator 150 KVA	1	1,500,000	1,500,000
Total			**22,700,000**

Table 12 shows detail of the molds required for the project.

Table 12: Molds

Cost Item	Unit	Unit Cost (PKR)	Total Cost (PKR)
Mold For Inner drum (8 kg Machine)	1	175,000	175,000
Mold For Inner drum (10 kg Machine)	1	220,000	220,000
Mold For Inner drum (12 kg Machine)	1	260,000	260,000
Mold For Outer Body (8 kg Machine)	1	200,000	200,000
Mold For Outer Body (10 kg Machine)	1	240,000	240,000
Mold For Outer Body (12 kg Machine)	1	280,000	280,000
Mold For pluster, Top Cover and bottom (8 Kg Machine)	1	160,000	80,000
Mold For pluster, Top Cover and bottom (10 Kg Machine)	1	200,000	200,000
Mold For pluster, Top Cover and bottom (12 Kg Machine)	1	240,000	240,000
Mold For outer tub (8 Kg Machine)	1	170,000	170,000
Mold For outer tub (12 Kg Machine)	1	240,000	240,000
Mold For outer tub (12 Kg Machine)	1	280,000	280,000
Total			**2,585,000**

Table 13 shows details of production tools required for the project.

Table 13: Production Tools

Cost Item	Unit	Unit Cost (PKR)	Total Cost (PKR)
Drill Machine with Accessories	5	11,000	55,000

Adjustable Wrench Set	5	4,500	22,500
Digital Multimeter Clamp Meter	5	1,500	7,500
T Shaped Nut/Screw Driver	5	2,000	10,000
Total 142 Pcs Combination Tool Set	5	30,000	150,000
Soldering Iron Kavya Set	5	1,500	7,500
Machine Lifter Trolly	5	27,000	135,000
Platform Trolley	5	30,000	150,000
Air Compressor Machine	5	2,500	12,500
11 Piece Hole Saw Cutter Set	5	4,000	20,000
Electronic Weight Scale (100Kg)	2	10,500	21,000
Disc-Cutter & Granding Machine	5	17,000	51,000
Total			**642,000**

9.1.4. Office Equipment Requirement

Table 14 presents the office equipment requirement proposed for the unit.

Table 14: Office Equipment Requirement

Cost Item	Units	Unit Cost (PKR)	Total Cost (PKR)
LED TV-32"	5	40,000	200,000
Water Dispenser	3	20,000	60,000
Ceiling Fan	22	5,000	110,000
Exhaust Fan	12	3,000	36,000
Laptops	5	80,000	400,000
Desktop Computers	9	45,000	405,000
Laser Printer	3	40,000	120,000
Wi-Fi / Internet Router	2	5,000	10,000
Air Conditioners	10	90,000	900,000
Air Cooler (Assembly Line)	6	15,000	90,000
LED Bulbs	56	250	14,000
Bracket Fan	3	8,000	24,000

CCTV Cameras (2MP)	22	2,000	44,000
DVR	2	12,000	24,000
Total			**2,437,000**

9.1.5. Furniture and Fixture Requirement

Table 15 gives details of the furniture and fixture required for the project.

Table 15: Furniture and Fixtures Requirement

Cost Item	Units	Unit Cost (PKR)	Total Cost (PKR)
Executive Table	1	30,000	30,000
Executive Chair	1	20,000	20,000
Visitors Chairs	16	10,000	160,000
Staff Table	14	25,000	350,000
Reception Counter	1	40,000	40,000
Work Table For Assembly Line	5	30,000	150,000
Office racks	10	15,000	150,000
Staff Chairs	50	10,000	500,000
Sofa Sets	5	35,000	175,000
Total			**1,575,000**

9.1.6. Vehicle Requirement

Details of vehicles required for the project is given in Table 16.

Table 16: Vehicle Requirement

Cost Item	Unit	Unit Cost (PKR)	Registration fee	Total Cost (PKR)
Loader Rickshaw	1	250,000	2,500	252,500
Moter Cycle (70 cc)	2	94,900	3,000	192,800
loader Truck	1	3,200,000	32,000	3,232,000
Car (1000cc)	2	2,700,000	54,000	5,454,000
Total Cost				**9,131,300**

9.1.7. Pre-Operating Cost Requirement

Details of pre operating cost required for the project is given in Table 17.

Table 17: Pre-Operating Cost Requirement

Description	No.of Months	Unit Cost (PKR)	Total (PKR)
Marketing Manager	1	150,000	150,000
Production Manager	1	150,000	150,000
Accounts Manager	1	80,000	80,000
Admin and HR manager	1	150,000	150,000
Quality Controler	1	75,000	70,000
Procurement Officer	1	75,000	75,000
Skilled Labour-Assembly	1	35,000	70,000
Skilled Labour- Molding	1	17,500	17,500
Raw Material Store Room Incharge	1	50,000	50,000
Engineering Manager	1	150,000	150,000
Mechanical Technician	1	40,000	40,000
Electrical Technician	1	40,000	40,000
Office boy	1	22,000	22,000
Security Guard	1	22,000	44,000
Others			220,000
Utilities expense.			250,057
Autocad Charges for prepartion of Machine Design			89,000
Total (PKR)			**1,667,557**

9.1.8. Incorporation and License Cost

Details of company Incorporation and License costs as shown in Table 18.

Table 18: Incorporation and License costs

Particular	Amount
Trade Mark Registration	
Professional charges for registration of trade mark	30,000

Trade Mark search fee	500
Trade Mark application fee	1,000
Trade Mark Certificate fee	3,000
Miscellaneous Expenses	1,500
Total	**36,000**
Company Registration Charges -SECP	
Professional charges for registration	40,000
Company Incorporation fee	3,000
Total	**79,000**

9.1.9. Working Capital Requirement

Details of working capital required for the project is given in Table 19.

Table 19: Working Capital Requirement

Cost Item	Month	Total Cost (PKR)
Equipment spare part inventory	1	105,354
Material Inventory	1	12,497,035
Upfront building rent	1	420,000
Cash		1,500,000
Total Initial Working Capital Cost		**14,522,389**

9.2. Breakeven Analysis

Table 20 shows calculation of break-even analysis.

Table 20: Break-Even Analysis

Description	Amount First Year (PKR)	Ratios
Sales (PKR) – A	217,448,403	100%
Variable Cost (PKR) – B	173,192,310	80%
Contribution (PKR) (A-B) = C	44,256,093	20%
Fixed Cost (PKR) – D	32,088,628	15%
Contribution Margin	20%	
Breakeven		

Breakeven Revenue	157,664,638	
Breakeven Units	5,293	
Breakeven Capacity	44%	

9.3. Revenue Generation

Based on 60% capacity utilization, sales revenue during the first year of operations is shown in Table 21. The revenue is generated from wholesale channel.

Table 21: Revenue Generation

Products	Unit Sold	Cost per Unit (PKR) (A)	Sale Price (PKR) (A*(1+45%))	Revenue (PKR)
Washing Machine (8 kg Capacity)	2,013	19,155	27,775	55,896,684
Washing Machine (10 kg Capacity)	2,898	21,445	31,095	90,114,035
Washing Machine (12 kg Capacity)	2,085	23,630	34,264	71,437,684
Total	**6,995**			**217,448,403**

9.4. Cost of Goods Sold Estimate

Based on 60% capacity utilization, the calculation of cost of goods sold during the first year of operations is shown in Table 22.

Table 22: Cost of Goods Sold Estimate

Product	Total Cost of Goods Sold (PKR)	Reference
Raw Material Cost		
Washing Machine (8 kg Capacity)	9,660,000	Table 23
Washing Machine (10 kg Capacity)	17,619,840	
Washing Machine (12 kg Capacity)	15,345,232	
Machinery and Component Cost		
Washing Machine (8 kg Capacity)	28,185,063	Table 24

Washing Machine (10 kg Capacity)	43,513,470	
Washing Machine (12 kg Capacity)	33,192,404	
Packing Cost	2,448,408	Table 25
Transportation Cost	1,499,644	
Utilities Cost	2,334,306	
Generator Fuel cost	432,094	
Direct Labor	15,840,000	Table 30
Machinery Maintenance - Cost	1,264,250	Table 31
Total Cost of Goods Sold	**171,334,710**	

Table 23: Total Raw Material Cost

Products	Quantity Sold (Units)	Material cost per unit (PKR)	Total Cost (PKR)	Reference
Washing Machine (8 kg Capacity)	2,013	4,800	9,660,000	Table 26
Washing Machine (10 kg Capacity)	2,898	6,080	17,619,840	Table 27
Washing Machine (12 kg Capacity)	2,085	7,360	15,345,232	Table 28
Total	**6,995**		**42,625,072**	

Table 24: Total Equipment Cost

Products	Quantity Sold (Units)	Material cost per unit (PKR)	Total Cost (PKR)	Reference
Washing Machine (8 kg Capacity)	2,013	14,005	28,185,063	Table 26
Washing Machine (10 kg Capacity)	2,898	15,015	43,513,470	Table 27
Washing Machine (12 kg Capacity)	2,085	15,920	33,192,404	Table 28
Total	**6,995**		**104,890,937**	

Table 25: Total Packing Cost

Products	Quantity Sold (Units)	Packing cost per unit (PKR)	Total Packing Cost (PKR)	Reference
Packing Cost	6,995	350	2,448,408	Table 29

Table 26: Raw Material and Equipment Cost Washing Machine (8 Kg capacity)

Cost Item	Unit of Measurement	Cost/Unit/Feet(PKR)	Quantity/KG	Total Cost (PKR)
Acrylonitrile Butadiene Styrene (ABS) for Outer Body	kg	160	8	1,280
Acrylonitrile Butadiene Styrene (ABS) for Inner Drum			10	1,600
Acrylonitrile Butadiene Styrene (ABS) for Outer Drum			6	960
Acrylonitrile Butadiene Styrene (ABS) for pulsator, top cover and bottom			6	960
Total Raw Material Cost				**4,800**
Gear Box		2,000	1	2,000
Electric Motor Copper Wire-220v, 50Hz & 60W 1400 Rpm	Units	2,200	1	2,200
Printed Circuit Board Kit	Units	2,500	1	2,500
Pressure Sensor	Units	260	1	260
Drum Shocks set	Units	1,300	1	1,300
Drain Water Pump and motor	Units	1,650	1	1,650
Inlet Water Pump	Units	380	1	380

Water inlet pipe	Units	290	1	290
Drain hose	Units	200	1	200
V Belt	Units	110	1	110
weight balance	Units	1,500	1	1,500
Power plug	Units	50	1	50
Wheel Set	Units	1,000	1	1,000
Four Core Cable 0.5mm² (1/0.44)	Meter	90	2	135
Main lead Power Cord 2 Pin	Meter	60	3	180
Fitting Accessories (srews,shafts, gearsfitting,cable tie, glue etc.)		250	1	250
Total Equipment Cost				**14,005**
Total				**18,805**

Table 27: Raw Material and Equipment Cost – Washing Machine (10 kg Capacity)

Cost Item	Unit of Measurement	Cost/Unit/Feet(PKR)	Quantity/KG	Total Cost (PKR)
Acrylonitrile Butadiene Styrene (ABS) for Outer Body	KG	160	10	1,600
Acrylonitrile Butadiene Styrene (ABS) for Inner Drum			12	1,920
Acrylonitrile Butadiene Styrene (ABS) for Outer Drum			8	1,280
Acrylonitrile Butadiene Styrene			8	1,280

(ABS) for pulsator, top cover and bottom				
Total Raw Material Cost				**6,080**
Gear Box	Units	2,400	1	2,400
Electric Motor Copper Wire-220v, 50Hz & 60W 1400 Rpm	Units	2,500	1	2,500
Printed Circuit Board Kit	Units	2,500	1	2,500
Pressure Sensor	Units	300	1	300
Drum Shocks set	Units	1,500	1	1,500
Drain Water Pump and motor	Units	1,650	1	1,650
Inlet Water Pump	Units	420	1	420
Water inlet pipe	Units	290	1	290
Drain hose	Units	200	1	200
V Belt	Units	140	1	140
Weight Blance	Units	1,500	1	1,500
Power plug	Units	50	1	50
Wheel Set	Units	1,000	1	1,000
Four Core Cable 0.5mm² (1/0.44)	Meter	90	2	135
Main lead Power Cord 2 Pin	Meter	60	3	180
Fitting Accessories (srews,shafts, gearsfitting,cable tie, glue etc.)		250	1	250
Total Equipment Cost				**15,015**

Total				**21,095**

Table 28: Raw Material and Equipment Cost – Washing Machine (8 kg Capacity)

Cost Item	Unit of Measurement	Cost/Unit/Feet(PKR)	Quantity/KG	Total Cost (PKR)
Acrylonitrile Butadiene Styrene (ABS) for Outer Body	KG	160	12	1,920
Acrylonitrile Butadiene Styrene (ABS) for Inner Drum			14	2,240
Acrylonitrile Butadiene Styrene (ABS) for Outer Drum			10	1,600
Acrylonitrile Butadiene Styrene (ABS) for pulsator, top cover and bottom			10	1,600
Total Raw Material Cost				**7,360**
Gear Box	Units	2,700	1	2,700
Electric Motor Copper Wire-220v, 50Hz & 80W 1600 Rpm	Units	2,700	1	2,700
Printed Circuit Board Kit	Units	2,550	1	2,550
Pressure Sensor	Units	340	1	340
Drum Shocks set	Units	1,550	1	1,550
Drain Water Pump and motor	Units	1,700	1	1,700
Inlet Water Pump	Units	470	1	470
Water inlet pipe	Units	290	1	290
Drain hose	Units	200	1	200

V Belt	Units	170	1	170
Weight Balance	Units	1,550	1	1,550
Power plug	Units	60	1	60
Wheel Set	Units	1,030	1	1,030
Four Core Cable 0.5mm² (1/0.44)	Meter	100	2	150
Main lead Power Cord 2 Pin	Meter	70	3	210
Fitting Accessories (srews,shafts, gearsfitting,cable tie, glue etc.)		250	1	250
Total Equipment Cost				**15,920**
Total				**23,280**

Table 29: Packing Cost

Cost Item	Unit of Measurement	Cost/Unit (PKR)	Quantity (kg)	Total Cost per unit (PKR)
Packing Cost (plastic,plastic Strap, wrapper, thermopol, carton)	Units	350	1	350

Table 30: Cost of Goods Sold Assumption – Direct Labor

Post	No of personnel	Monthly Salary (PKR)	Annual Salary (PKR)
Production Manager	1	150,000	1,800,000
Production Supervisor	1	80,000	960,000
Quality Controler	3	70,000	2,520,000
Skilled Labour-Assemblly	8	35,000	3,360,000

Unskilled Labour-Assemblly	4	25,000	1,200,000
Skilled Labour- Molding	2	35,000	840,000
Unskilled Labour-Molding	3	25,000	900,000
Engineering Manager	1	150,000	1,800,000
Mechanical Technician	1	40,000	480,000
Electrical Technician	1	40,000	480,000
Packing labour	5	25,000	1,500,000
Total Direct Labor (PKR)	**30**		**15,840,000**

Table 31: Cost of Goods Sold Assumption – Machinery Maintenance Cost

Cost Item	Cost of Machinery (PKR)	Machinery Maintenance Rate	Total Cost (PKR)
Maintenance Cost	25,285,000	5%	1,264,250
Total Cost (PKR)			**1,264,250**

9.5. Variable Cost Estimate

Variable costs of the project have been provided in Table 32.

Table 32: Variable Cost Estimate

Description of Costs	Amount (PKR)
Raw Material	
Washing Machine (8 kg Capacity)	9,660,000
Washing Machine (10 kg Capacity)	17,619,840
Washing Machine (12 kg Capacity)	15,345,232
Equipment	
Washing Machine (8 kg Capacity)	28,185,063
Washing Machine (10 kg Capacity)	43,513,470
Washing Machine (12 kg Capacity)	33,192,404
Packing Cost	2,448,408

Transportation Cost	1,499,644
Utilities Cost	2,334,306
Direct Labor	15,840,000
Machinery Maintenance – Cost	1,264,250
Fuel Cost – Generator	432,094
Communications expense (internet, Telephone etc.)	619,200
Office vehicles running expense	619,200
Office expenses (stationery, entertainment, services, etc.)	619,200
Total	**173,192,310**

9.6. Fixed Cost Estimate

Table 33 shows the estimated fixed cost of the project.

Table 33: Fixed Cost Estimate

Description of Costs	Amount (PKR)
Management Staff	15,480,000
Administration benefits expense	1,252,800
Building rental expense	5,040,000
Promotional expense	2,174,484
Amortization of Legal & License Fee	15,800
Depreciation expense	6,158,472
Utilities	546,319
Amortization of pre-operating costs	333,511
Bad debt expense	1,087,242
Total	**32,088,628**

9.7. 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 34.

Table 34: Financial Feasibility Analysis

Description	Project
IRR	54%
NPV (PKR)	247,671,069
Payback Period (years)	2.80
Projection Years	10
Discount rate used for NPV	15%

9.8. Financial Feasibility Analysis with 50% Debt

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) with the interest rate of KIBOR+3%, which is shown in Table 35.

Table 35: Financial Feasibility Analysis with 50% Debt

Description	Project
IRR	54%
NPV (PKR)	284,145,708
Payback Period (years)	2.81
Projection Years	10
Discount rate used for NPV	13%

9.9. Human Resource Requirement

For the 1st year of operations, the proposed unit shall require the workforce at a salary cost shown in Table 36.

Table 36: Human Resource Requirement

Post	No. Of Employees	Monthly Salary (PKR)	Annual Salary (PKR)
Marketing Manager	1	150,000	1,800,000
Sales & Marketing officer	2	80,000	1,920,000
Production Manager	1	150,000	1,800,000
Production Supervisor	1	80,000	960,000
Accounts Manager	1	80,000	960,000
Accounts Assistant	1	50,000	600,000

Admin and HR manager	1	150,000	1,800,000
Admin and HR Exacutive	1	45,000	540,000
Quality Controler	3	70,000	2,520,000
Procurement Officer	1	75,000	900,000
Procurement Assistant	1	50,000	600,000
Skilled Labour-Assembly	8	35,000	3,360,000
Unskilled Labour-Assembly	4	25,000	1,200,000
Skilled Labour- Molding	2	35,000	840,000
Unskilled Labour-Molding	3	25,000	900,000
Raw Material Store Room Incharge	1	50,000	600,000
Finished Goods Store Room Incharge	1	50,000	600,000
Engineering Manager	1	150,000	1,800,000
Mechanical Technician	1	40,000	480,000
Electrical Technician	1	40,000	480,000
Packing labour	5	25,000	1,500,000
Receptionist	1	40,000	480,000
Driver	2	30,000	720,000
Office boy	3	22,000	792,000
Security Guard	10	22,000	2,640,000
Sweeper	2	22,000	528,000
Total	**59**		**31,320,000**

The labor will work in a single shift of 8 hours.

10. CONTACT DETAILS

The contact details of all the major suppliers of machinery and equipment and raw materials are given in Table 37.

Table 37: Details of Suppliers

Name Of Supplier	Location	Cost Item	Contact No	E-mail/Web Address
Overhead Crane supplier	China	Overhead Crane	0336 4263318	cranehouse.com.pk
Tianjin Yihezhongwei Precision Machine Co., Ltd.	China	Injection Molding Machine		https://zoweimachinery.en.made-in-china.com/
GUANGDONG JIEMAN TECHNOLOGY CO.,LTD	China	Molds		https://injectionmachine.en.made-in-china.com/
YIZUMI	China	Mold		https-Injection-Moulding-Machine-Plastic-
Backup generator	Lahore		0421111 11087	powerzone.com.pk
Engi Plastic Co	Lahore	ABS Plastic	(042) 3529753 4	
SAMAD PLASTIC STORE	Lahore	ABS Plastic	0300 9425441	
S.S.Plastic Works	Karachi	ABS Plastic		
ABS PRODUCTS PAKISTAN (PVT) LTD.	Karachi	ABS Plastic	(021) 3506464 4	
Plastic abs dana	Karachi	ABS Plastic		https://plastic-abs-dana
ILYAS PLASTIC INDUSTRIES	Peshawar	ABS Plastic	0314 9192926	
MKB Enterprises (Pvt) Ltd	Peshawar	ABS Plastic	0313 0522323	
A One Electronics	Lahore	Electrical parts	(042) 3735158	
Bobby Electronics	Lahore	Electrical parts	(042) 3724653 5	

Electronics Pro (epro.pk)	Karachi	Electrical parts	0301 5755775	
Nadeem Electronics	Karachi	Electrical parts	(021) 36658781	
A to Z Electronics Center	Peshawar	Electrical parts	0312 9126698	
City Electronics	Gujranwala	Electrical parts	(055) 4222234	

11. USEFUL LINKS

Table 38: Useful Web Links

Name of Organization	E-mail Address
Small and Medium Enterprises Development Authority (SMEDA)	www.smeda.org.pk
National Business Development Program (NBDP)	www.nbdp.org.pk
Government of Pakistan	www.pakistan.gov.pk
Pakistan Plastic Manufacturers Association	https://www.pakplas.com.pk/
Pakistan Electronics Manufacturers Association – PEMA	http://pema.org.pk/
Government of Punjab	www.punjab.gov.pk
Government of Sindh	sindh.gov.pk/
Government of Balochistan	balochistan.gov.pk/
Government of KPK	kp.gov.pk/
Government of Gilgit Baltistan	gilgitbaltistan.gov.pk/
Government of Azad Jammu & Kashmir	ajk.gov.pk/
Trade Development Authority of Pakistan	www.tdap.gov.pk
Securities and Exchange Commission of Pakistan	www.secp.gov.pk
State Bank of Pakistan	www.sbp.gov.pk
Federal Board of Revenue	www.fbr.gov.pk
Federation of Pakistan Chambers of Commerce and Industry (FPCCI)	www.fpcci.com.pk
Pakistan Stock Exchange (PSX)	www.psx.com.pk

Pakistan Standards and Quality Control Authority (PSQCA)	http://www.psqca.com.pk
Punjab Small Industries Corporation	https://www.psic.gop.pk/
Sindh Small Industries Corporation	https://ssic.gos.pk/
Government of KPK	https://small_industries_de.kp.gov.pk/
Government of Balochistan Industries and Commerce	https://balochistan.gov.pk/departments-download/industries-and-commerce/

12. ANNEXURES

12.1. Income Statement

Calculations

Income Statement **SMEDA**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue										
Revenue (PKR)-Washing Machine (8 kg Capacity)	55,896,684	70,039,356	83,894,086	99,973,702	118,602,785	140,150,713	165,037,623	183,947,641	204,549,777	227,459,352
Revenue (PKR)-Washing Machine (10 kg Capacity)	90,114,035	112,914,191	135,250,143	161,172,953	191,205,894	225,944,460	266,065,979	296,551,831	329,765,636	366,699,387
Revenue (PKR)-Washing Machine (12 kg Capacity)	71,437,684	89,512,454	107,219,226	127,769,471	151,578,013	179,116,928	210,923,165	235,090,751	261,420,915	290,700,058
Total Revenue	**217,448,403**	**272,466,001**	**326,363,455**	**388,916,126**	**461,386,692**	**545,212,101**	**642,026,766**	**715,590,223**	**795,736,328**	**884,858,797**
Cost of sales										
Raw Material Cost										
Washing Machine (8 kg Capacity)	9,660,000	11,788,455	13,752,124	15,960,550	18,440,838	21,222,900	24,339,747	26,421,106	28,614,057	30,989,024
Washing Machine (10 kg Capacity)	17,619,840	21,502,142	25,083,873	29,112,044	33,636,088	38,710,570	44,395,698	48,192,097	52,192,041	56,523,980
Washing Machine (12 kg Capacity)	15,345,232	18,726,354	21,845,707	25,353,866	29,293,885	33,713,285	38,664,499	41,970,807	45,454,384	49,227,098
Machinery and Component Cost										
Washing Machine (8 kg Capacity)	28,185,063	34,395,273	40,124,685	46,568,231	53,804,986	61,922,233	71,016,282	77,089,080	83,487,474	90,416,934
Washing Machine (10 kg Capacity)	43,513,470	53,101,096	61,946,440	71,894,299	83,066,753	95,598,555	109,638,389	119,013,870	128,892,022	139,590,059
Washing Machine (12 kg Capacity)	33,192,404	40,505,917	47,253,213	54,841,515	63,363,948	72,923,301	83,632,992	90,784,680	98,319,809	106,480,353
Packing Cost	2,448,408	2,758,894	2,971,799	3,184,704	3,397,609	3,610,514	3,823,419	3,832,290	3,832,290	3,832,290
Transportation Cost	1,499,644	1,827,781	2,129,778	2,469,152	2,850,041	3,277,014	3,755,110	4,073,039	4,407,921	4,770,597
Utilities Cost	2,334,306	2,694,948	3,101,708	3,559,976	4,075,739	4,655,646	5,307,079	5,786,662	6,309,584	6,879,760
Generator Fuel cost	432,094	498,851	574,145	658,973	754,443	861,788	982,372	1,071,145	1,167,941	1,273,484
Direct Labor	15,840,000	17,376,480	19,061,999	20,911,012	22,939,381	25,164,501	27,605,457	30,283,186	33,220,656	36,443,059
Machinery Maintenance - Cost	1,264,250	1,369,183	1,482,825	1,605,899	1,739,189	1,883,542	2,039,876	2,209,185	2,392,548	2,591,129
Total cost of sales	171,334,710	206,545,374	239,328,296	276,120,222	317,362,900	363,543,849	415,200,920	450,727,149	488,290,725	529,017,768
Gross Profit	46,113,693	65,920,627	87,035,159	112,795,904	144,023,792	181,668,252	226,825,847	264,863,074	307,445,603	355,841,029
General administration & selling expenses										
Management Staff	15,480,000	16,981,560	18,628,771	20,435,762	22,418,031	24,592,580	26,978,060	29,594,932	32,465,641	35,614,808
Administration benefits expense	1,252,800	1,374,322	1,507,631	1,653,871	1,814,296	1,990,283	2,183,341	2,395,125	2,627,452	2,882,315
Building rental expense	5,040,000	5,544,000	6,098,400	6,708,240	7,379,064	8,116,970	8,928,667	9,821,534	10,803,688	11,884,056
Utilities	546,319	630,724	725,922	833,174	953,883	1,089,604	1,242,065	1,354,307	1,476,691	1,610,134
Communications expense (internet, Telephone etc.)	619,200	679,262	745,151	817,430	896,721	983,703	1,079,122	1,183,797	1,298,626	1,424,592
Office vehicles running expense	619,200	681,533	750,140	825,655	908,770	1,000,253	1,100,946	1,183,797	1,302,966	1,434,131
Office expenses (stationery, entertainment, etc.)	619,200	679,262	745,151	817,430	896,721	983,703	1,079,122	1,183,797	1,298,626	1,424,592
Promotional expense	2,174,484	2,724,660	3,263,635	3,889,161	4,613,867	5,452,121	6,420,268	7,155,902	7,957,363	8,848,588
Amortization of Legal & License Fee	15,800	15,800	15,800	15,800	15,800	24,949	24,949	24,949	24,949	24,949
Depreciation expense	6,158,472	6,158,472	6,158,472	6,231,698	6,225,278	6,225,278	4,400,179	10,966,131	10,966,131	11,092,820
Amortization of pre-operating costs	333,511	333,511	333,511	333,511	333,511	-	-	-	-	-
Bad debt expense	1,087,242	1,362,330	1,631,817	1,944,581	2,306,933	2,726,061	3,210,134	3,577,951	3,978,682	4,424,294
Miscellaneous expense 1										
Subtotal	33,946,228	37,165,436	40,604,401	44,506,314	48,762,877	53,185,506	56,646,854	68,442,223	74,200,813	80,665,280
Operating Income	12,167,465	28,755,190	46,430,758	68,289,590	95,260,915	128,482,746	170,178,993	196,420,851	233,244,789	275,175,749
Gain / (loss) on sale of machinery & equipment	-	-	-	-	-	-	6,321,250	-	-	
Gain / (loss) on sale of office equipment	-	-	-	-	-	-	609,250	-	-	
Gain / (loss) on sale of office vehicles	-	-	-	-	-	-	2,282,825	-	-	
Earnings Before Interest & Taxes	12,167,465	28,755,190	46,430,758	68,289,590	95,260,915	128,482,746	179,392,318	196,420,851	233,244,789	275,175,749
Earnings Before Tax	12,167,465	28,755,190	46,430,758	68,289,590	95,260,915	128,482,746	179,392,318	196,420,851	233,244,789	275,175,749
Tax	3,378,613	9,184,317	15,370,765	23,021,356	32,461,320	44,088,961	61,907,311	67,867,298	80,755,676	95,431,512
NET PROFIT/(LOSS) AFTER TAX	**8,788,852**	**19,570,874**	**31,059,993**	**45,268,233**	**62,799,595**	**84,393,785**	**117,485,007**	**128,553,553**	**152,489,113**	**179,744,237**

12.2. Balance Sheet

Calculations **SMEDA**

Balance Sheet

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Assets											
Current assets											
Cash & Bank	1,500,000	9,380,235	18,805,518	28,275,468	39,646,036	52,076,569	64,666,484	111,480,168	239,540,631	388,191,918	645,000,340
Accounts receivable	-	19,415,036	24,327,321	29,139,594	34,724,654	41,195,240	48,679,652	57,323,818	63,891,984	71,047,886	79,005,250
Equipment spare part inventory	105,354	125,014	148,342	176,024	208,872	247,848	294,099	348,980	414,102	491,376	-
Raw material inventory	12,497,035	16,495,726	20,816,614	26,136,773	32,672,600	40,685,465	50,490,792	59,311,178	69,515,266	81,479,364	-
Finished Goods Closing Stock		7,138,555	8,605,948	9,972,247	11,504,379	13,223,182	15,147,807	17,300,670	18,780,984	20,346,190	22,043,212
Pre-paid building rent	420,000	462,000	508,200	559,020	614,922	676,414	744,056	818,461	900,307	990,338	-
Total Current Assets	14,522,389	53,016,566	73,211,944	94,259,126	119,371,463	148,104,719	180,022,890	246,583,276	393,043,274	562,547,072	746,048,802
Fixed assets											
Building/Infrastructure	1,823,665	1,641,299	1,458,932	1,276,566	1,094,199	911,833	729,466	547,100	364,733	182,367	-
Machinery & equipment	25,285,000	21,492,250	17,699,500	13,906,750	10,114,000	6,321,250	2,528,500	47,930,516	40,740,939	33,551,361	26,361,784
Production Tools	642,000	430,140	218,280	850,863	565,777	287,111	1,119,167	744,184	377,646	1,472,076	978,849
Furniture & fixtures	1,575,000	1,338,750	1,102,500	866,250	630,000	393,750	157,500	2,985,587	2,537,749	2,089,911	1,642,073
Office vehicles	9,131,300	7,761,605	6,391,910	5,022,215	3,652,520	2,282,825	913,130	13,912,470	11,825,599	9,738,729	7,651,858
Office equipment	2,437,000	2,071,450	1,705,900	1,340,350	974,800	609,250	243,700	4,619,603	3,926,663	3,233,722	2,540,782
Total Fixed Assets	42,153,965	35,995,494	29,837,022	24,522,994	18,291,296	12,066,018	6,951,463	71,999,459	61,033,328	51,528,166	40,435,346
Intangible assets											
Pre-operation costs	1,667,557	1,334,046	1,000,534	667,023	333,511	-	-	-	-	-	-
Legal, licensing, & training costs	79,000	63,200	47,400	31,600	15,800	124,744	99,795	74,846	49,898	24,949	196,975
Total Intangible Assets	1,746,557	1,397,246	1,047,934	698,623	349,311	124,744	99,795	74,846	49,898	24,949	196,975
TOTAL ASSETS	**58,422,911**	**90,409,305**	**104,096,900**	**119,480,743**	**138,012,070**	**160,295,481**	**187,074,148**	**318,657,581**	**454,126,499**	**614,100,187**	**786,681,123**
Liabilities & Shareholders' Equity											
Current liabilities											
Accounts payable		27,591,968	33,691,339	39,536,510	46,194,382	53,775,384	62,405,751	71,722,486	78,637,851	86,122,425	78,959,125
Total Current Liabilities	-	27,591,968	33,691,339	39,536,510	46,194,382	53,775,384	62,405,751	71,722,486	78,637,851	86,122,425	78,959,125
Other liabilities											
Total Long Term Liabilities	-	-	-	-	-	-	-	-	-	-	-
Shareholders' equity											
Paid-up capital	58,422,911	58,422,911	58,422,911	58,422,911	58,422,911	58,422,911	58,422,911	63,204,603	63,204,603	63,204,603	63,204,603
Retained earnings		4,394,426	11,982,650	21,521,321	33,394,777	48,097,186	66,245,486	183,730,492	312,284,045	464,773,159	644,517,395
Total Equity	58,422,911	62,817,337	70,405,561	79,944,233	91,817,689	106,520,097	124,668,397	246,935,095	375,488,648	527,977,761	707,721,998
TOTAL CAPITAL AND LIABILITIE	**58,422,911**	**90,409,305**	**104,096,900**	**119,480,743**	**138,012,070**	**160,295,481**	**187,074,148**	**318,657,581**	**454,126,499**	**614,100,187**	**786,681,123**

12.3. Cash Flow Statement

Calculations **SMEDA**

Cash Flow Statement

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Operating activities											
Net profit		8,788,852	19,570,874	31,059,993	45,268,233	62,799,595	84,393,785	117,485,007	128,553,553	152,489,113	179,744,237
Add: depreciation expense		6,158,472	6,158,472	6,158,472	6,231,698	6,225,278	6,225,278	4,400,179	10,966,131	10,966,131	11,092,820
amortization of pre-operating costs		333,511	333,511	333,511	333,511	333,511	-	-	-	-	-
amortization of License Cost		15,800	15,800	15,800	15,800	15,800	24,949	24,949	24,949	24,949	24,949
Accounts receivable		(19,415,036)	(4,912,285)	(4,812,273)	(5,585,060)	(6,470,586)	(7,484,412)	(8,644,167)	(6,568,166)	(7,155,902)	(7,957,363)
Equipment inventory	(105,354)	(19,660)	(23,328)	(27,682)	(32,847)	(38,977)	(46,250)	(54,881)	(65,122)	(77,274)	491,376
Raw Material Iventory	(12,497,035)	(3,998,692)	(4,320,888)	(5,320,159)	(6,535,827)	(8,012,864)	(9,805,328)	(8,820,386)	(10,204,087)	(11,964,098)	81,479,364
Closing Inventory	-	(7,138,555)	(1,467,393)	(1,366,298)	(1,532,132)	(1,718,804)	(1,924,624)	(2,152,863)	(1,480,314)	(1,565,206)	(1,697,022)
Pre-paid building rent	(420,000)	(42,000)	(46,200)	(50,820)	(55,902)	(61,492)	(67,641)	(74,406)	(81,846)	(90,031)	990,338
Accounts payable		27,591,968	6,099,371	5,845,171	6,657,872	7,581,002	8,630,367	9,316,735	6,915,365	7,484,574	(7,163,300)
Cash provided by operations	(13,022,389)	12,274,661	21,407,933	31,835,715	44,765,346	60,652,463	79,946,123	111,480,168	128,060,463	150,112,256	257,005,398
Issuance of shares	58,422,911	-	-	-	-	-	-	4,781,691	-	-	-
Purchase of (treasury) shares											
Cash provided by / (used for) financir	58,422,911	-	-	-	-	-	-	4,781,691	-	-	-
Capital expenditure	(43,900,522)	-	-	(844,443)	-	(124,744)	(1,110,723)	(69,448,176)	-	(1,460,969)	(196,975)
Cash (used for) / provided by investir	(43,900,522)	-	-	(844,443)	-	(124,744)	(1,110,723)	(69,448,176)	-	(1,460,969)	(196,975)
NET CASH	1,500,000	12,274,661	21,407,933	30,991,272	44,765,346	60,527,719	78,835,400	46,813,684	128,060,463	148,651,287	256,808,423

13. KEY ASSUMPTIONS

13.1. Operating Cost Assumptions

Table 39: Operating Cost Assumptions

Description	Details
Cost growth rate	11.2%
Transportation Cost	1% of material cost
Machinery Maintenance – Cost	5% of Cost of Machinery
Genertor Fuel cost	15% of Utility cost
Operating costs growth rate	8.3%
Administration benefits expense	4% of HR Salaries
Commuication expense	4% of Management staff expense
Office vehicles running expense	4% of Management staff expense
Office expenses (stationery, entertainment, janitorial services, etc.)	4% of Management staff expense
Advertisment and Promotional Expense	1% of revenue
Furniture and fixture depreciation	15%
Vehicle depreciation	15%
Office equipment depreciation	15%
Inflation growth 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 40: Revenue Assumptions

Description	Details
Sale price growth rate	11.3%
Initial year capacity utilization	60%

Capacity growth rate	5%
Maximum capacity utilization	90%

13.3. Financial Assumptions

Table 41: Financial Assumptions

Description	Details
Project life (Years)	10
Debt: Equity	0:100
Discount Rate	15%

13.4. Debt-Related Assumptions

Table 42: Debt Related Assumption

Description of Cost	Details
Project Life (Years)	10
Debt: Equity	50:50
Discount Rate	13%
Debt Grace Period	1 Years
Interest Rate (KIBOR+3%)	11.3%

13.5. Cash Flow Assumption

Table 43: Cash Flow Assumption

Description	Details
Accounts receivable cycle (in days)	25 Days
Accounts payable cycle (in days)	45 Days

Small and Medium Enterprises Development Authority

HEAD OFFICE

4th Floor, Building No. 3, Aiwan-e-Iqbal Complex, Egerton Road, Lahore
Tel: (92 42) 111 111 456, Fax: (92 42) 36304926-7

www.smeda.org.pk, **helpdesk@smeda.org.pk**

REGIONAL OFFICE PUNJAB	REGIONAL OFFICE SINDH	REGIONAL OFFICE KPK	REGIONAL OFFICE BALOCHISTAN
3rd Floor, Building No. 3, Aiwan-e-Iqbal Complex, Egerton Road Lahore, Tel: (042) 111-111-456 Fax: (042) 36304926-7 helpdesk.punjab@smeda.org.pk	5TH Floor, Bahria Complex II, M.T. Khan Road, Karachi. Tel: (021) 111-111-456 Fax: (021) 5610572 helpdesk-khi@smeda.org.pk	Ground Floor State Life Building The Mall, Peshawar. Tel: (091) 9213046-47 Fax: (091) 286908 helpdesk-pew@smeda.org.pk	Bungalow No. 15-A Chaman Housing Scheme Airport Road, Quetta. Tel: (081) 831623, 831702 Fax: (081) 831922 helpdesk-qta@smeda.org.pk