ENTERPRISE STUDIES

MNFG413

Module Assessment

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Group 22

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Executive Summary

This business model necessitates some upfront investment to support our product's research and development, which includes design, production, sales, and the implementation and maintenance of early facilities.

AIR2WA, a company uses metal organic frameworks to harvest water in any area including desert-like atmosphere. Air, which has unlimited resources of water can provide unlimited water by using MOF as a water absorber with providing water with no harmful substances that can consumed immediately.

Our target market is in the middle east which has the most water-stressed problem by constructing a water harvesting system that makes use of the innovative material MOF-303, an aluminum-based MOF, to aid in the extraction of water from the air. This method was created with arid area in mind, where water is scarce. We want to deliver this technique not only to desert areas, but also to rising populations in areas where water filtration and distillation are limited.

Capturing water from the air to serve the entire world is not a practical solution; thus, our long-term goal is to create new ways of water extraction, purification, and storage that will enable us to assist communities all over the world in better managing their water.

1.0 Introduction

Water is vital for the survival of humans around the global, in the UK water reserves are readily available but there are some places in the world that do not have that pleasure. Many places do not have water reserves that simply replenish themselves. This means they must filter their own water from rainwater or seawater by different methods. AIR2WA provide systems that use metal organic frameworks to absorb water from the humidity in the air, this process is more environmentally friendly and more efficient than the current alternatives.

The market for providing water in different countries is endless, where fresh filtered water is not available there is a big market for more environmentally friendly cheaper drinking water. Many places in the world are humid enough to use the AIR2WA system can therefore profit from the own humidity within the air.

In this report is a business pitch for the product. This will include the opportunity context, where research into the market and why the product will do well in the current market. The product description: where the product is described in detail from how it is used. The business strategy, where the business strategy and how the business will progress throughout the years. The prediction of the financial records, where different costs and sales are predicted showing the predicted profit and loss over a five-year scale. And finally, the investment amount is stated; this is how much we think the business needs to start up successfully. In this case the start-up costs are expensive meaning the investment is going to be big, but the profits are plentiful once the money is invested.

2.0 The Opportunity Context

Case 1 – Statistics of Worldwide Beverages in 2020

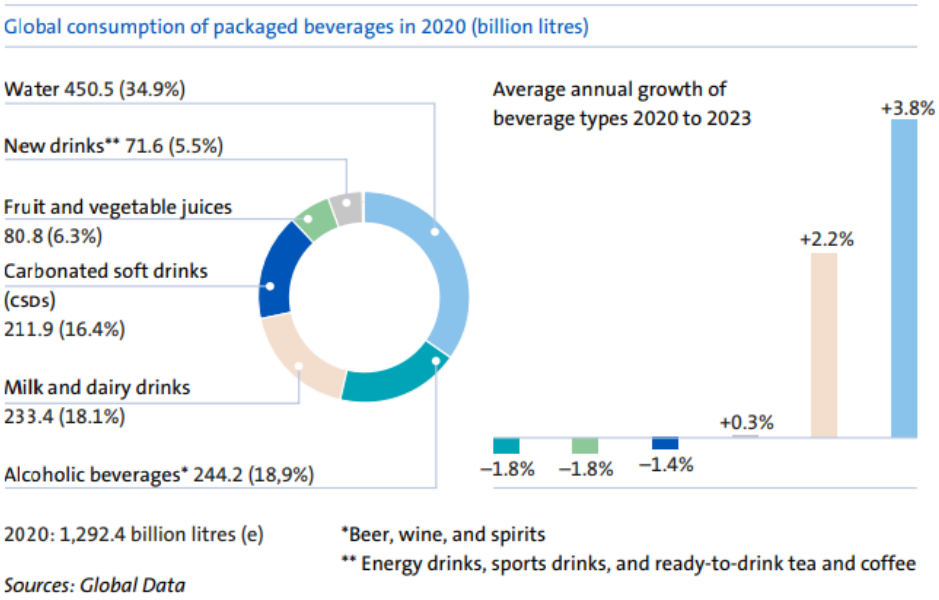

Figure 1 Global consumption of packaged beverages in 2020 (billion litres) (by types)

In comparison to earlier years, when worldwide packaged beverage consumption increased steadily, consumption dropped in 2020 (KRONES, 2020). The reason for this is the Covid-19 outbreak. The catering industry's lockdowns and limitations had a significant influence on beverage consumption in pubs and restaurants.

Bottled water consumption is forecasted to rise at a faster rate than all the market. By far the largest category of the global beverage industry, benefited from rising availability of clean drinking water in developing markets as well as the worldwide health trend. From 2020 through 2023, Global Data predicts a 3.8 percent annual increase in bottled water use. In 2020, worldwide demand will be 450.5 billion litres (compared to 458.8 billion litres in 2019). Water is consumed in 34.9 percent of all packaged beverages.

Worldwide consumption of packaged beverages*

	2020 (e)		2023 (e)		Average annual growth (%)
	Billion litres	%**	Billion litres	%**	2020–2023
Asia-Pacific	283.3	21.9	298.9	22.4	1.8
China	241.5	18.7	260.2	19.5	2.5
North America/Central America	183.7	14.2	185.6	13.9	0.3
South America	172.0	13.3	170.4	12.8	–0.3
Western Europe	137.2	10.6	137.9	10.3	0.2
Africa/Middle East	127.9	9.9	135.3	10.1	1.9
Russia/CIS/Eastern Europe	93.5	7.2	95.0	7.1	0.5
Central Europe	53.3	4.1	53.1	4.0	–0.1
Worldwide	**1,292.4**	**100.0**	1,336.4	100.0	**1.1**

*Rounding differences possible **Share of global consumption | (e) = expected Sources: Global Data

Figure 2 Worldwide consumption of packaged beverages (by location)

Parts of the developing world are causing the fastest growth in worldwide demand for packaged beverages. This is because the developments of population expansion, a growing economy, and urbanisation are mostly reflected in developing markets.

China is expected to expand the most, according to Global Data. Between 2020 and 2023, packaged beverage consumption is expected to increase by 2.5 percent annually on average. Experts predict a 1.9 percent average yearly growth rate for Africa and the Middle East.

Case 2 – Conflict Regarding Freshwater is Rising

The world has yet to observe its first freshwater war. Concerns regarding the linkages between war and water resources, however, have not completely vanished. They are, in fact, becoming more severe.

The core issue is obvious. Water demand is increasing as the population increases (Gideon Rachman, 2021). Meanwhile, climate change and industrial development are limiting fresh water supplies.

The scenario in Bangladesh, on the other hand, demonstrates one of the water supply and geopolitical contradictions. The country is concerned about both a lack of and an abundance of water. In one of the world's most densely populated countries, a lack of fresh water poses a danger to food supply. However, increasing sea levels because of climate change might make tremendous areas inaccessible in the future decades.

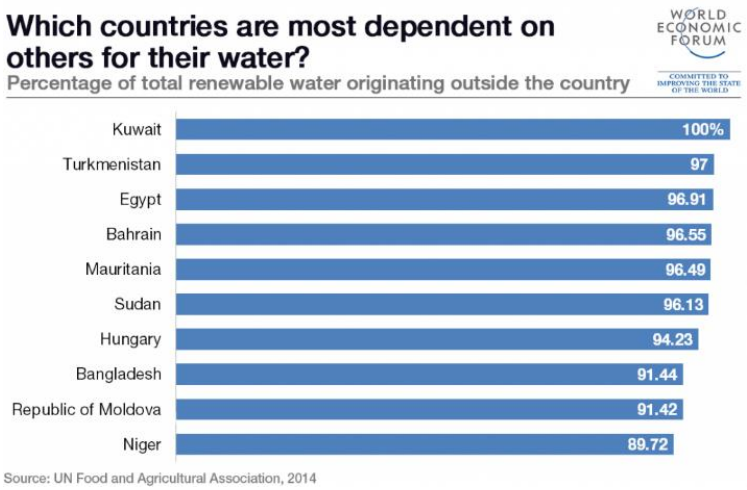

Figure 3 Which countries are most dependent on others for their water

Desert, dry, or grassland countries near Middle East comprise the top five rankings (Sebastian Brixey-Williams, 2015). Kuwait's freshwater supplies resources come entirely from nearby countries. Sudan and Egypt rely significantly on the Nile River, which is shared with nine other nations further upstream. Bangladesh is similarly reliant on the rivers Brahmaputra and Ganges, which both begin in India.

Case 3 - Increasingly water-stressed in the Middle East

Many places of the Middle East have a problem of running out of water (Frederik Pleitgen et al., 2021).

Drought has persisted in the region, and temperatures have reached dangerously high levels, making human existence impossible. When you combine climate change with poor water management and usage, the future for water in this region is terrible.

Several Middle Eastern nations, such as Iran, Iraq, and Jordan, are extracting enormous volumes of water from the underground for agriculture to boost their food self-sufficiency. This is occurring because of a reduction in rainwater.

Water stress, which happens when consumption of water exceeds availability, is already severe in the Middle East itself and neighbouring nations and is expected to worsen in the coming decade. Studies suggest that groundwater levels in certain sections of the nation are plummeting by more than one metre per year and flows of refugees from several countries in the middle east have added to the already stressed supply.

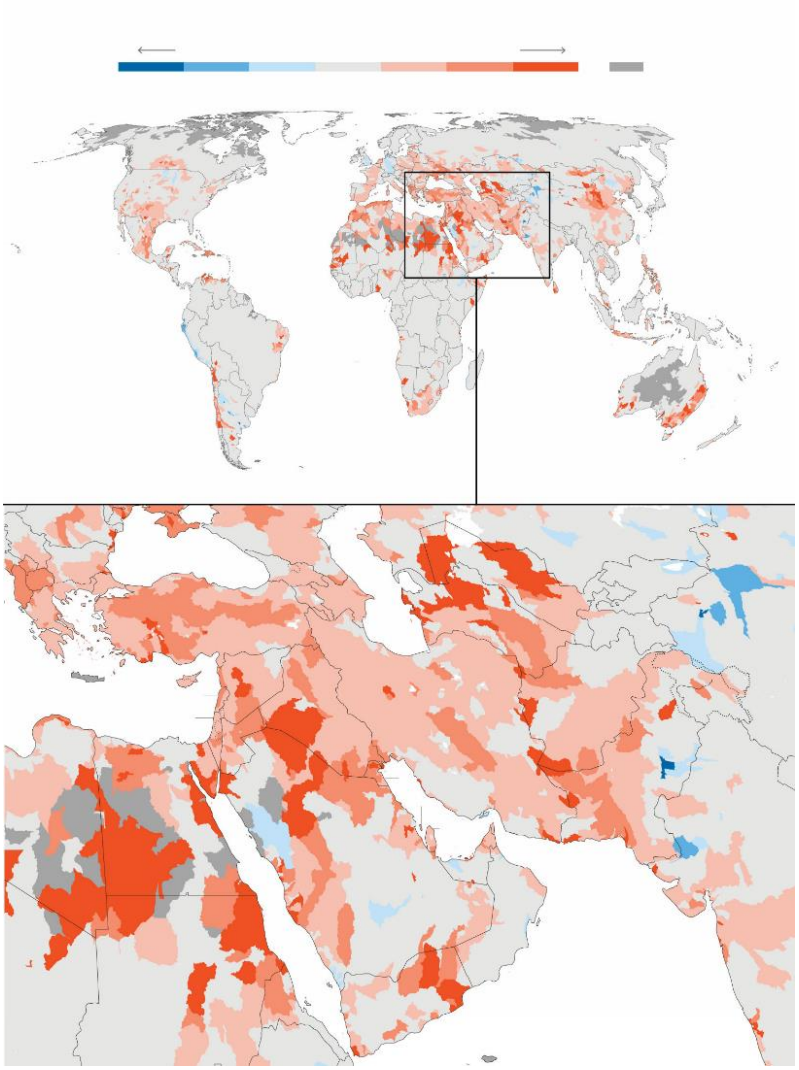

Figure 4 The map shows the most water- stressed area

2.1 The Opportunity to Innovate

How can those counties solve the problem of water storage? There might be several solutions including seawater desalination, recycling wastewater, collecting rainwater or importing water from neighbouring countries. However, those installation and implementation cost is high which most of the area might not be able to afford. Hence, metal-organic framework (MOF) is highly recommended for those regions for water harvesting, but why MOF?

1. MOF traps water molecules in low humidity area

Even at relative humidity levels as low as 20%, it adsorbs water molecules (Cole Loneker and Jamie Ley, 2018). This implies that even under desert-like circumstances, it may generate a large output of water. It is also quite stable and may be employed in several water adsorption/desorption cycles.

2. Water absorption from the atmosphere by MOF is limitless

Water vapour in the atmosphere is believed to contain almost 13,000 trillion litres of water (Cole Loneker and Jamie Ley, 2018). The water in the atmosphere can be regarded an unlimited, renewable resource since it is continually refilled through evaporation from the seas and atmospheric circulation.

3. The mechanism of MOF water harvesting is simple

MOF uses gentle temperature from direct sun below one sun to absorb water from the air at ambient settings (Kim et al., 2017). The technology converts the collected water molecules into usable drinking water at night.

4. Efficiency of MOF water harvesting is high

Daily rates of up to 90 L of water per kilogramme of MOF have been recorded in areas with abundant water (Chennai, India) (Xu and Yaghi, 2020), whereas 7–20 L of water per kilogramme of MOF has been recorded in some of the world's driest deserts (Mojave and Atacama)

5. The quality of water harvested by MOF is high

The discharged water was analysed and found to be free of any metals or other dangerous materials (novoMOF, 2019), thus no additional treatment is required, and it may be consumed immediately.

6. The cycle stability of MOF is high

MOFs have excellent cycle stability, absorbing and releasing a steady quantity of water throughout time (novoMOF, 2019). As a result, water generation is predictable and long-term.

2.2 Environmental Forces and Market Change

Environmental and water pollution intensify, People who rely on tap water have begun to endanger their health, while MOF machines can filter out harmful substances in the tertiary water to protect their family's drinking water health and safety. The air sealing machine, as a novel method of consuming water, is cleaner than a bucket and safer than self-contained water. Although the air sealing machine does not become the current mainstream water technique, the industry is in the future with the scientific and technology day to know as an emerging home appliance business.

More than 40% of the world's population will be affected by a scarcity of water sources by 2045. To fulfil the rising demand, the globe will have to rely on contemporary technology such as saltwater, micro irrigation, sewage recovery, and rainfall collecting, which will reduce human reliance on freshwater water sources. Genetically engineered crops and robotics will allow farmers to utilise less land to produce more food. Because of the possibility of an increase in disputes over food and fresh water, R&D in this domain would become hotspots for innovative technology. As a result, it is predicted that air water will surely have a vast commercial growth potential.

2.3 Industry Dynamics

With the worsening of environmental and water pollution, MOF has become critical for people's existence in some locations, as a shortage of fresh water sources threatens people's health. While several filtration systems exist to remove dangerous elements from tap water and preserve the health and safety of drinking water for family members. MOF is a new method to consume water that is both fresher than bottled water and safer than tap water. Although the usage of MOFs has not yet become a mainstream method of generating drinking water, with the rapid advancement of science and technology, MOF-based water harvesters have a promising future in the home appliance market.

The development of MOF is quite significant. As the use of MOF-based technology implies, "where there is air, there is high quality drinking water," providing innovative and safe drinking water solutions for water shortage areas and areas with severe water pollution, as well as green, energy-saving, and advanced high-quality drinking water solutions for cities.

Most of the market is currently controlled by the usage of RO filtration machines not only for distillation but also for normal filtering requirements. The use of RO for filtration is innovative, but it has downsides that, like fossil fuels, might endanger the ecosystem in the long term.

Other methods of extracting fresh water include technologies that use temperature to purify water, which, while having a negligible impact on the environment, is an extremely energy intensive process because it involves either using heat to boil away water and then condense it or taking air from the atmosphere and then cooling it to dew point to condense water.

All these factors are starting to push MOF-based harvesters to go through the process of being unknown too hot to become a legend in the industry stage, MOF has been widely concerned by all walks of life since its launch, is developing rapidly from a stage of cultivation, the annual growth rate is stable at around 30%, and has a large room for development.

2.3.1 Competitors and Potential Competitors

Competitors

Shanghai has a famous valve company named Bojie, their defoamer compressed air gas-water separator is semi-fine filter tube as the main filter material, compressed air coarse filter (cyclone separation), semi-fine filter (wire mesh foam) two degreasing equipment, is the supporting equipment of oil lubrication air compressor and air source purification device, After oil removal and filtration separation, the gas source can obtain the temperament level of oil content lower than that of oil-free air compressor, and it has quite high dust removal and filtration accuracy and certain dehumidification and drying ability, and can also play a role of buffer, balance and energy storage in the gas pipe system. This company will be our main competitor. The product is shown in the picture below. Other companies like Lu Jia, Angel will also become our competitors.

Figure 5 The potential competitor of AIR2WA - Bojie

Potential competitors

Overall, the human resource reserve of air catcher industry is insufficient, and the transformation and industrialization of scientific and technological achievements are relatively slow. The industry's competitors are mainly foreign well-known environmental protection companies, such as American TFS, Metone, French Soviet environment and so on.

Advanced Watertek will be seen as a potential competitor, their product versatile Marine RO Water Maker (Fresh Water Maker) meets the Fresh Water needs of ocean vessels from supply vessels to ocean liners and livestock haulage.

Rainmaker's air-water device produces drinking water from the air - without the need for other water sources. Their products cover remote island communities, the bottle/beverage industry, building-medical, industrial (combined with WW technology) sectors.

2.3.2 Co-operators and Potential Collaborators

The fog-collecting netting, built by The Canadian non-profit Organisation "FogQuest", can collect an average of 12,000 litres of water a day. The netting is made of polypropylene mesh, each measuring 36 square metres (12 metres by three metres) and held up in the desert on two poles. The company can be a potential collaborator.

The entire water harvesting process requires no solar panels, batteries or additional energy. Zirconium is needed to make MOF, but the cost is so high that the team has had early success with designs that replace zirconium with aluminum. German chemical giant BASF has put the material into mass production. BASF can be a collaborator.

2.3.3 Customers (the Companies to which the Product will Sell).

At beginning the company will aim to sell the technology to existing packed drinking water manufactures well established in some countries just so the technology starts to get some recognition in the market. As the market grows more units could be sold to countries that have less RO facilities.

Figure 6 The companies to which AIR2WA will sell

2.3.4 Current Technologies

1. Reverse Osmosis (RO)

It is method of producing pure water via raw water passing through a semi-permeable membrane, removing impurities as it passes. The system uses advanced specially designed membranes that remove the impurities without the use of chemicals, resins or ion exchange beds. RO requires a high-pressure pump to drive the water through the membranes. This is due to it being able to remove more impurities effectively and quickly compared to other filtration processes. It is continuous process but demands high energy to pump the water through membrane. Purity of water obtained is good, but some amount of highly contaminated water is produced as waste. RO can run continuously for longer period and it is cost effective in comparison with other purification processes.

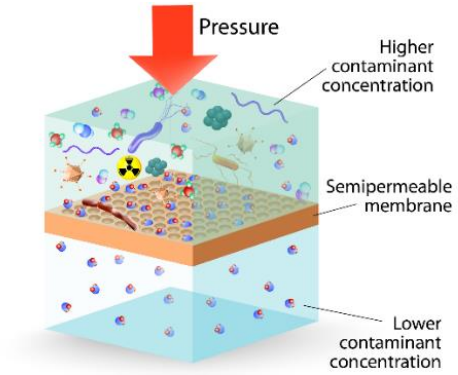

Figure 7 Explanation of RO process.

2. Filtration

A safe natural source water is filtered in which solid particles in water flow are removed using a filter medium that allows the water to pass through while retaining the solid particles and contamination. It may consist of a physical barrier, chemical, and/or a biological process. The removal of particles takes place with multistage processes including- straining, flocculation, sedimentation and surface capture to remove fluorine, chlorine and micro-organisms. Depending upon the quality of the water source, cost and energy for filtration is determined. Usually, it is very cheap and simple if water source is pure enough.

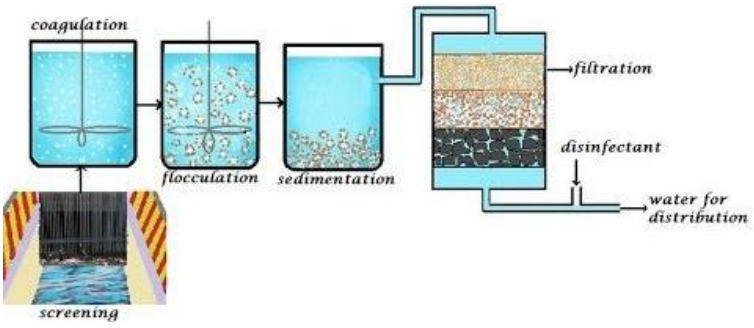

Figure 8 Different stages in Filtration Process.

3. Distillation

Distillation produces clean, pure water. It is an effective water treatment method for removing contaminants like bacteria, heavy metals, and chemicals easily. During distillation, water from source is boiled in a boiling chamber until it evaporates into steam. This steam is then captured and condensed into a clean container to obtain pure H_2O. The majority of inorganic compounds and non-volatile molecules are unable to evaporate with water and end up left behind in the boiling chamber.

Although distillation can work continuously, it is not a fast process as boiling water and condensing it requires long duration. Special machines are needed, and maintenance of distillery is also high.

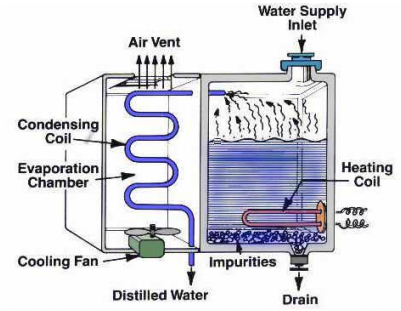

Figure 9 Brief diagram of Distillation Process.

3.0 Source of Innovation Opportunity and Market Potential

Unexpected weather changes are now frequently observed worldwide, with the global warming and increasing population, scarcity of drinking water is inevitable. There are lot of research is going on for getting pure water for drinking. Varity of desalination and water purification plants are being developed. Many laws and moments are taking place to protect and conserve current natural water sources. In addition, rainwater harvesting is being promoted and technology around it is developing. Considering this vast demand for drinking pure water, idea to extract water from natural resources was mooted. Many companies have tried to get water using non-traditional methods like condensation, algae extraction and nanotechnology while improving these technologies. Trying different techniques and adapting to the changes is the main motivation behind the idea. This research led to the use of powder metal material which can trap humidity effectively from air. Exploring this domain generated the idea of trapping the water molecules form air and collecting them to get fresh water. Although the technology is novel, it has good potential paired with another technologies. Incorporating this Metal Organic Framework (MOF) technology in containers with specific packaging and air pumping to get safe water periodically. Wherever there are few pure water bodies are available, this technology can be implemented to obtain water. Good quality packaged drinking water or water subscription can be provided to some residential areas. Also, there are many cities across the globe where majority of the population relies on packaged drinking water and meeting the demand is challenge. This market can be exploited as providing secondary option for resource of packaged drinking water.

4.0 Product Definition and Production Requirements

A designed unit which can harvest water from air by just keeping the product in open humid space. This unit is designed by AIR2WA and manufactured within the company with the shared contracts. The unit will consume minimal energy to obtain pure water over a day or the alternate unit design with fluidized bed will drastically improve the performance to obtain ample amount of water with slightly extra energy requirement. The product is large container unit which can provide pure water depending upon the surrounding environment conditions.

Core Material - Metal Organic Framework (MOF) 303:

Metal-organic framework (MOF) is a highly porous molecular powder that absorbs water. The internal surface is comprised of microscopic pores and micro-channels that expand the entire water-absorbing area. Chemically, MOFs are a family of porous crystalline materials composed of inorganic metal ions or metal clusters connected by organic ligands via coordination bonds.

MOF-303 is water-stable aluminum MOF (Al(OH)(HPDC); HPDC = 1H-pyrazole-3,5-dicarboxylate) which is constructed from infinite, rodlike Al(OH)(−COO)2 clusters linked through HPDC ligands. MOF 303 has many advantages over other MOF materials available. It is quite simple and economic to

manufacture. In addition, it has high water retention capacity and can desorb the water at lower temperatures like 70°C.

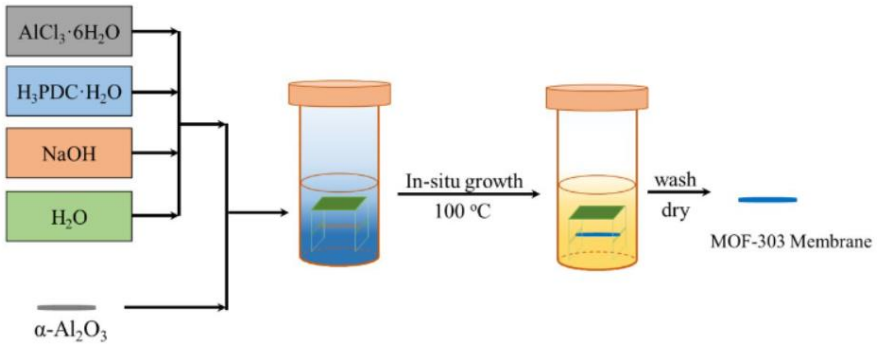

Figure 10 Brief manufacturing process of MOF-303.

4.1 The Product Definition

AIR2WA provides a variety of water harvesting solutions in form of modular units depending on production requirements. The units contain MOF Capsules, Air flow unit like compressors or fans, heating element and Condenser. The MOF capsules are connected to condenser using pipes and enclosed securely in container. The water outlets for collecting pure water and control system for operation control is provided. Fans are for improved air flow into unit, this will boost the production capacity. There are 2 main designs of units depending upon the usage and requirement – Cartridge unit and Liquidizing bed unit.

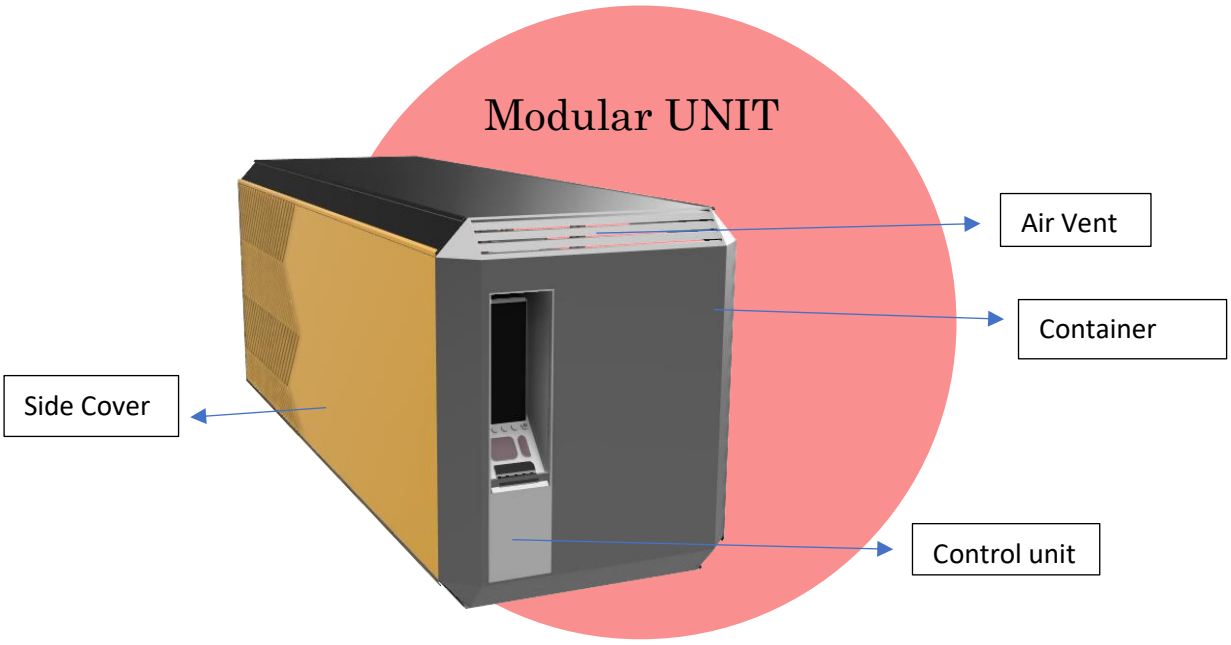

Figure 11 Simulation of a modular unit of water harvesting solution

The Cartridge unit:

This is simple basic unit designed for working at minimal energy. General size is 06×02×02m. It consists of MOF capsule with cartridge, heating element, condenser, and fans. The MOF 303 filled in capsule is designed in thin cartridge (thickness of ~5mm), which are stacked on each other alternately in orthogonal sets. This allows air to flow through half of the volume in adsorption phase while another half set of cartridges slowly propel the water vapour liberated during the desorption phase to the condenser. Then the roles of sets are reversed in next cycle. With this design arrangement, volume of

the MOF for capturing water is utilised efficiently and more cycles in day can be obtained. Heating strips are used to desorb the water from MOF in vapour state and then transferred to condenser.

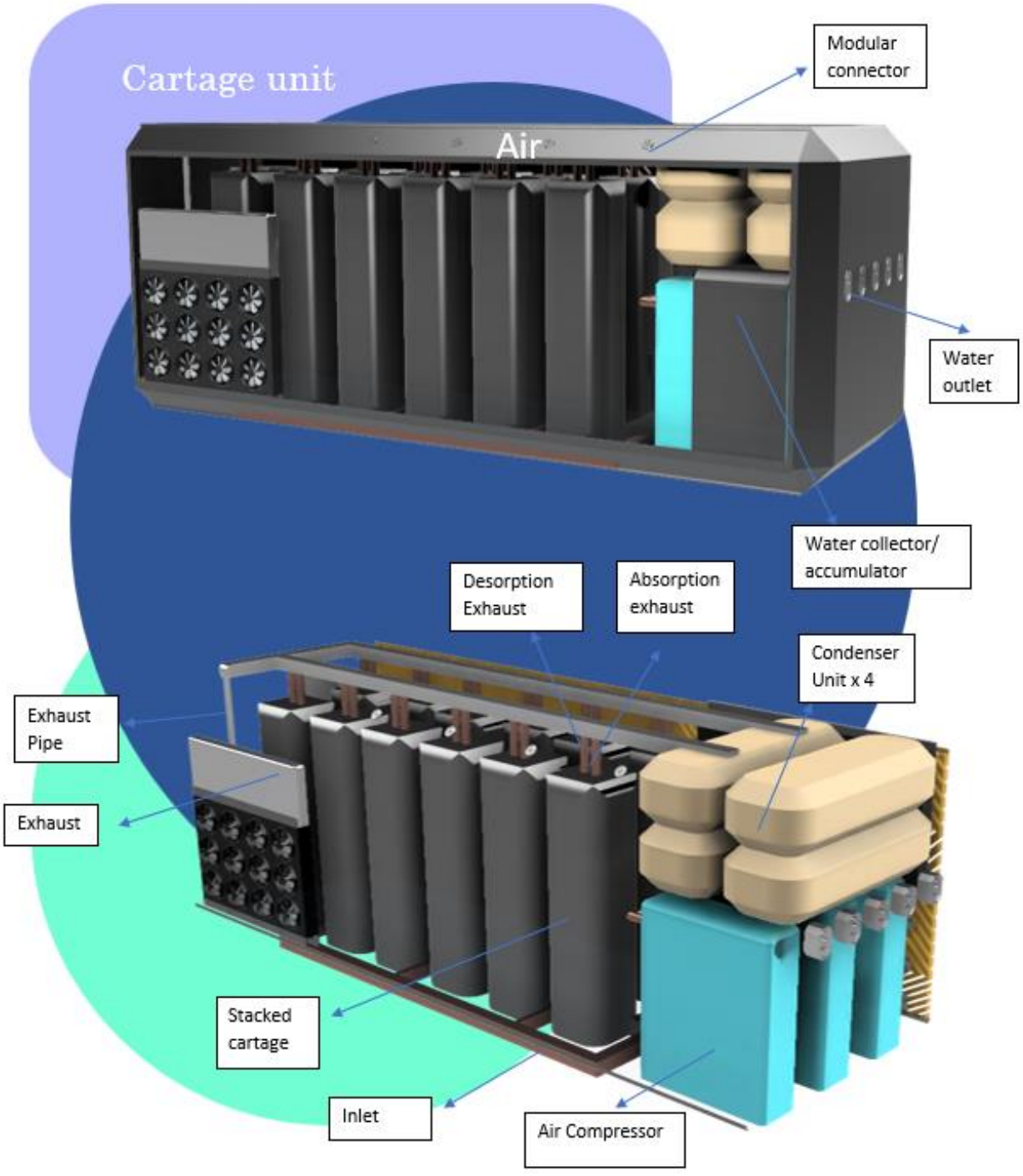

Figure 12 Simulation of the cartridge unit

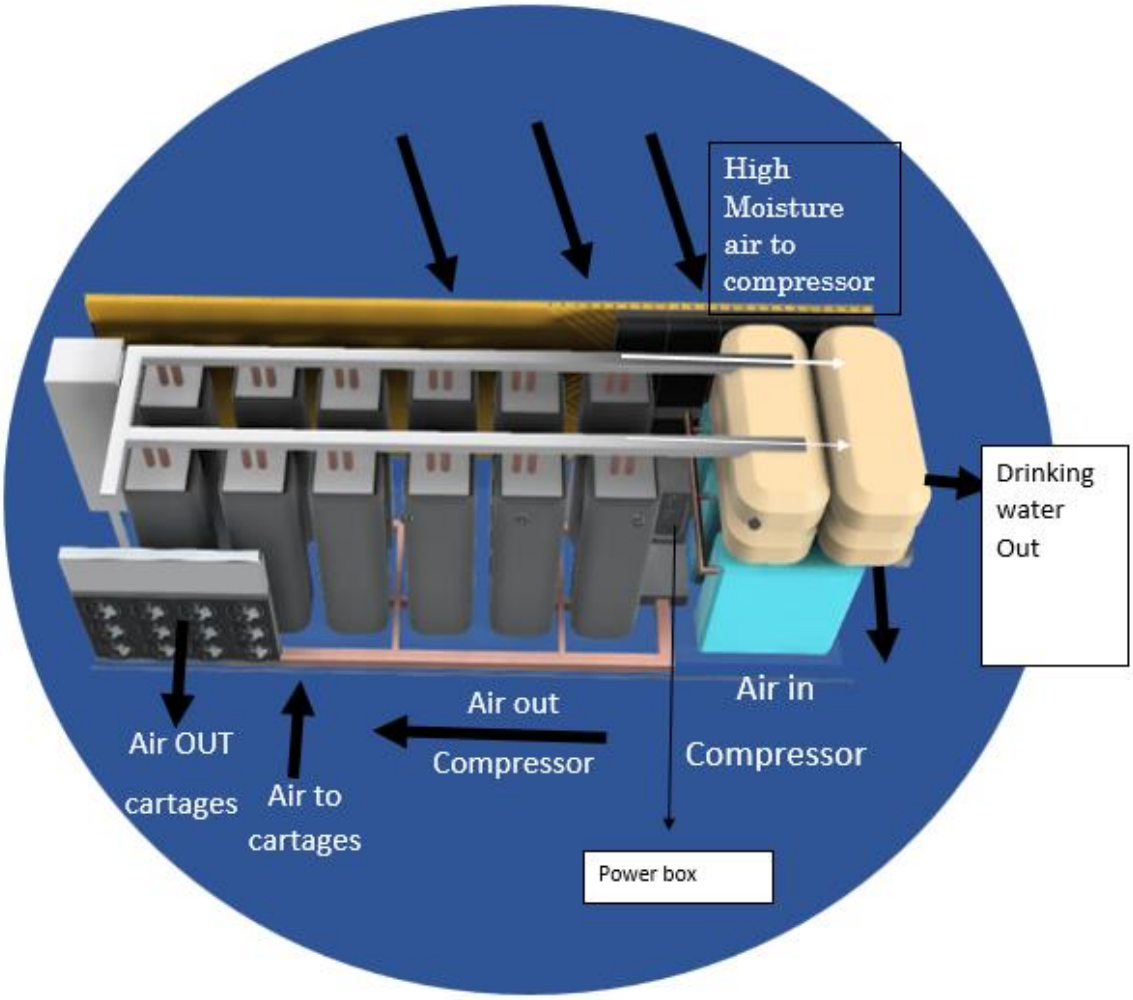

Figure 13 Mechanism of the cartridge unit of AIR2WA

The Liquidizing bed unit:

This is more energy intensive but high productive unit. This, 06×02×02m big unit includes MOF capsule as liquidizing bed, hot air pump, compressor, condenser, and fans. It uses liquidizing bed technology to pass more amount of air through MOF volume. As more air is passed through it, more amount of water is adsorbed in brief time and hence a greater number of cycles can be run in a day. Air pump passes the air at pressure into liquidizing bed and cycled back. The temperature of air is increased to attain desorption phase. The water vapours liberated in this phase are condensed in condenser. This unit requires more energy to run the air pump and condense faster.

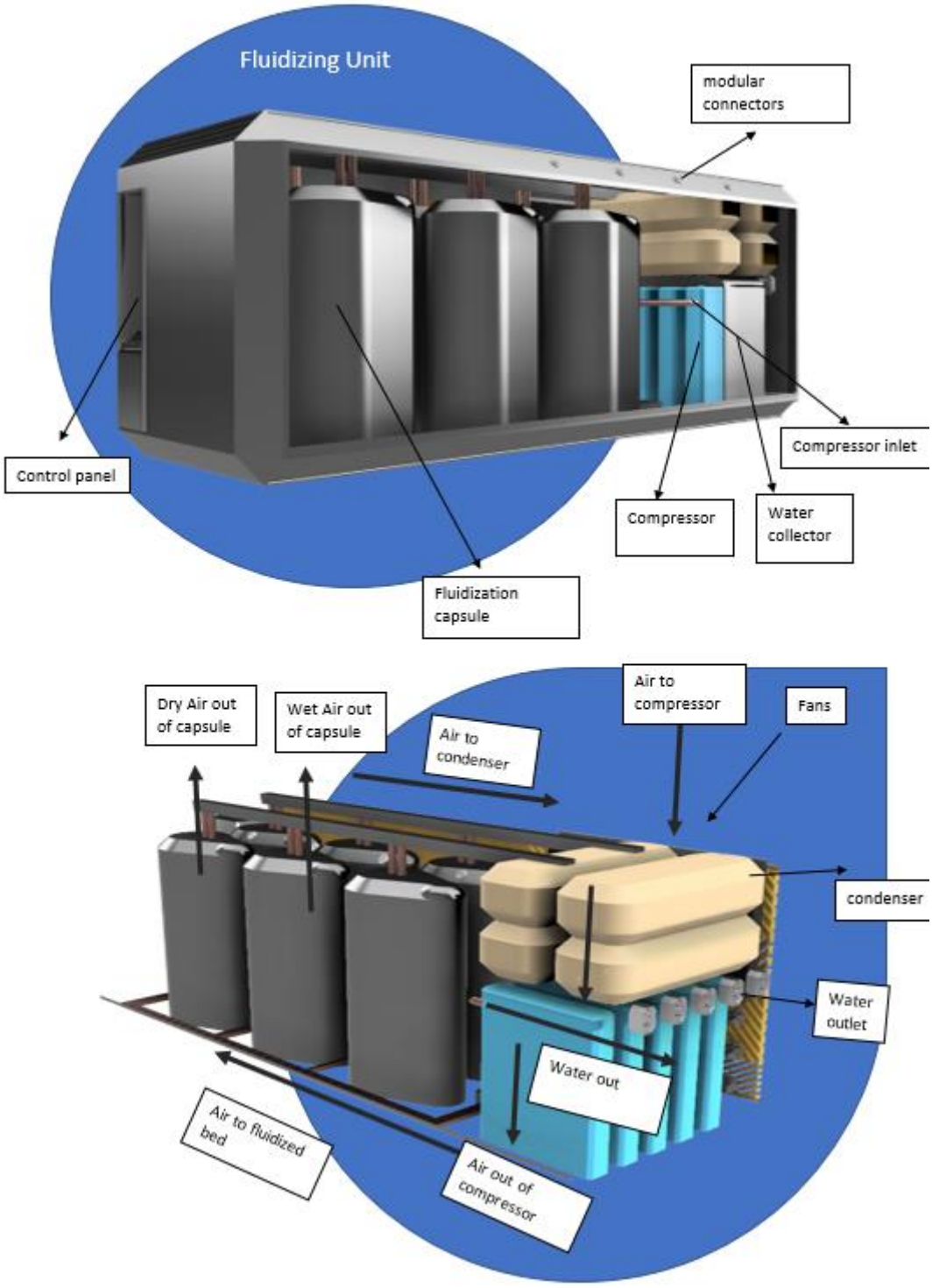

Figure 14 Simulation and mechanism of the fluidizing unit

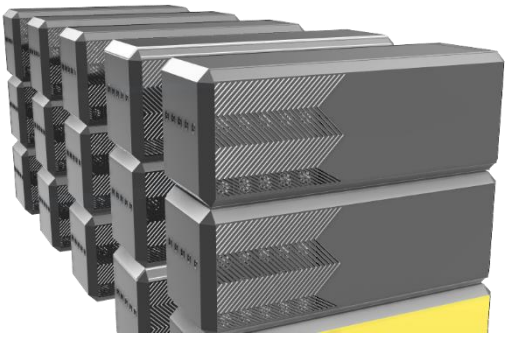

Figure 15 Simulation of units stacked together.

4.1.1 Intellectual Property

Any new technological advancements in during the research and design stage would need to be protected under trade secrets to ensure that competitors do not use the technology in rival products. For example, large unit capable of producing generous amount of water over a day with different options of working is unique concept, and any documents or designs can be protected as secret information. The units and manufacturing technique can be shared under License and Royalty Sharing Agreement with the government of counties, where units are to be installed on large scale.

The unit is intended to be manufactured from more eco-friendly materials, and any new compositions of materials to be used in the system would need to be patented. This will ensure that the legal rights for the new material would belong to the company, and any other companies that use or manufacture the material would be infringing upon the patent. This intellectual property would be protected for 15 years upon filing the patent.

The company name of AIR2WA would be registered as a trademark and a suitable domain name would be created for a company website. Through the research and official intellectual property websites, it was found that the company name is original. Although there are similar company names to be seen on internet, the domain of work and method is different. This company name would be protected indefinitely.

4.2 Product Production (Manufacturing Method)

Aim is to produce complete unit inhouse and to be installed or sold according to the requirements. Design and manufacturing layout are to be improved with help of more experts and consultants. More research is to be done for improvement of material, costing and working efficiency. Due to initial limitations, parts utilized are manufactured based on shared contract and other equipment to be outsourced but, in future, goal is to completely produce the unit under the AIR2WA company for modulating the unit design as per requirement and provide optimum solutions.

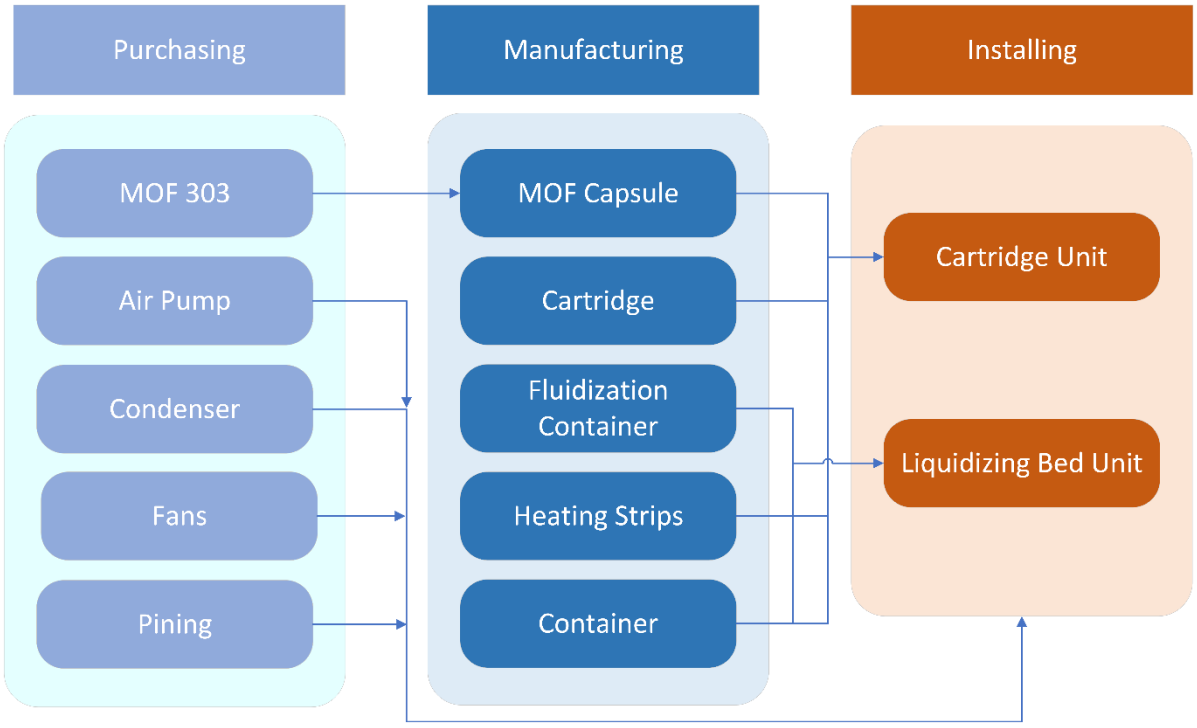

Figure 16 The basic outline of the business

The MOF 303 required can be purchased in bulk from other manufactures for convenience, but it will be packed and arranged into containers according to the unit type in company facilities. Heating stripes are assembled MOF capsules then, quality check and testing are done inhouse. These MOF capsules are assembled in container along with the with the outsourced air pump and condenser on site, to make unit ready for work.

Name	Material	Manufacturing	Future Scope
Metal Organic Framework	MOF 303	Outsourced	Manufacturing in India from bauxite
MOF capsule	HDPE	Injection moulding	Research on better materials
Cartridge	Acrylic/HDPE	Rolling	More lightweight material
Fluidization Container	Stainless Stell Sheet	Rolling, bending	More economic method
Heating Strips	Copper	Rolling, blanking	Cheaper substitute
Container	Aluminium Sheet	Rolling, welding	-
Piping	Stainless Steel	Extrusion	-
Air Pump	-	Outsourced	Manufacturing inhouse, efficient
Condenser	-	Outsourced	Manufacturing inhouse

Table 1 Manufacturing methods and scope of MOF solutions

4.2.1 Requirements

The AIR2WA need to be installed properly before it can start working. Flat ground with strong foundation is preferred and needs to be in open space. The design of the unit allows them to stack on each other, reducing the area of the ground covered. The water outlet needs to be connected properly to a tank for accumulation of water. Fans, Heating strips and condenser need electricity to function. Initial settings need to be done on control panel to set cycles and output. As for now, AIR2WA unit does not require any special maintenance to work efficiently, but weekly inspection of piping, fans and condenser is advised.

4.2.2 Product Installation Plan

The following calculations show the feasibility of supplying drinking water demand of selected cities across the globe with the help of AIR2WA unit. The cities are selected based on packaged drinking water demand, current method of purification in that city and weather condition (Relative Humidity). Installing the predicted number of units could provide the drinking water need of city. This is to show the potential of the product.

Weight of MOF in single unit = 5 ton = 5000 kg

0.223 L of water is adsorbed per kg of MOF per cycle

<u>For single unit</u>

Amount of water obtained per cycle = Weight of MOF in single unit × 0.223

= 5000 × 0.223 = 1,115 L

<u>For Liquidizing bed Unit</u>

1. ***For Muscat (Oman)***

Population of Muscat (Oman) = 1,622,620

Daily requirement of individual = 2L

Daily drinking water requirement of Muscat = 1,622,620 × 2 = 3245240 L

Avg Relative humidity per year = 42

Number of cycles per day = 40 …… (depends on relative humidity)

Amount of water obtained per day = Amount of water obtained per cycle by single unit × Cycles per day

= 1,115 × 40

= 44,600

Units to be installed in Muscat =

= = 72.75

≈ 73 units

Area requirement to install units = No of units × Base area of unit

= 73 × (6×2)

= 876 m^2

2. ***For Jeddah (Saudi Arabia)***

Population of Jeddah (Saudi Arabia) = 5,137,064

Daily requirement of individual = 2L

Daily drinking water requirement of Jeddah = 5,137,064 × 2 = 10,274,128 L

Avg Relative humidity per year = 55

Number of cycles per day = 50 …… (depends on relative humidity)

Amount of water obtained per day = Amount of water obtained per cycle by single unit × Cycles per day

= 1,115 × 50

= 55,750

Units to be installed in Jeddah =

= = 184.29 = 184.29

≈ 185 units

Area requirement to install units = No of units × Base area of unit

= 185 × (6×2)

= 2220 m^2

3. For Jakarta (Indonesia)

Population of Jakarta (Indonesia) = 11,074,811

Daily requirement of individual = 2L

Daily drinking water requirement of Jakarta = 11,074,811 × 2 = 22,149,622 L

Avg Relative humidity per year = 75

Number of cycles per day = 90 …… (depends on relative humidity)

Amount of water obtained per day = Amount of water obtained per cycle by single unit × Cycles per day

= 1,115 × 90

= 100,350

Units to be installed in Jakarta =

= = 220.23 = 220.23

≈ 220 units

Area requirement to install units = No of units × Base area of unit

= 220 × (6×2)

= 2640 m^2

4. For Chennai (India)

Population of Chennai (India) = 11,503,293

Daily requirement of individual = 2L

Daily drinking water requirement of Chennai = 11,074,811 × 2 = 23,006,586 L

Avg Relative humidity per year = 90

Number of cycles per day = 125 …… (depends on relative humidity)

Amount of water obtained per day = Amount of water obtained per cycle by single unit × Cycles per day

= 1,115 × 125

= 139,375

Units to be installed in Jakarta =

= = 165.04 = 165.04

≈ 165 units

Area requirement to install units = No of units × Base area of unit

= 165 × (6×2)

= 1980 m^2

ENERGY CALCULATIONS

The following calculations demonstrate that using AIR2WA unit can turn out to be a better option over RO desalination. The current RO plants in Oman consume 10 Wh per liter production of pure water. In addition, there is no running cost for AIR2WA unit, while RO or distillation plants demand lots of energy.

75 kWh energy is required to liquidize 1 ton of MOF

So, for 1 unit, 5 × 75 = 375 kWh energy is required per day

For per liter,

1. ***In Muscat (Oman),***

Energy required per liter =

= 375 kWh / 44,600

= 8.40 Wh

2. ***In Jeddah (Saudi Arabia),***

Energy required per liter =

= 375 kWh / 55,750

= 6.73 Wh

3. ***In Jakarta (Indonesia),***

Energy required per liter =

= 375 kWh / 100,350

= 3.81 Wh

4. ***In Chennai (India),***

Energy required per liter =

= 375 kWh / 139,375

= 2.69 Wh

5.0 Business Strategy and Organisation Design

5.1 Vision and Long-term Objectives

Water is a key sign for scientists looking for life beyond our planet. Even though water covers 75% of our planet's surface, we are rapidly running out of clean drinking water. This company's mission is to have a global influence on how people obtain and manage water, so that the world has one less problem to worry about.

To achieve our goals, we decided to start our trip by developing a water harvesting device that uses the novel material MOF-303, an aluminum-based Metal Organic Framework, to help in water extraction from air. This technology was developed particularly for desert countries with scarce water supplies. We intend to bring this technology not only to arid desert regions, but also to growing populations in locations where water filtering and distillation are restricted.

Capturing water from the air to serve the entire globe is not a viable solution to the problem; hence, our long-term objective is to develop new methods of water extraction, purification, and storage that will allow us to aid communities all over the world in managing their water more efficiently.

5.1.2 Structure and Organization

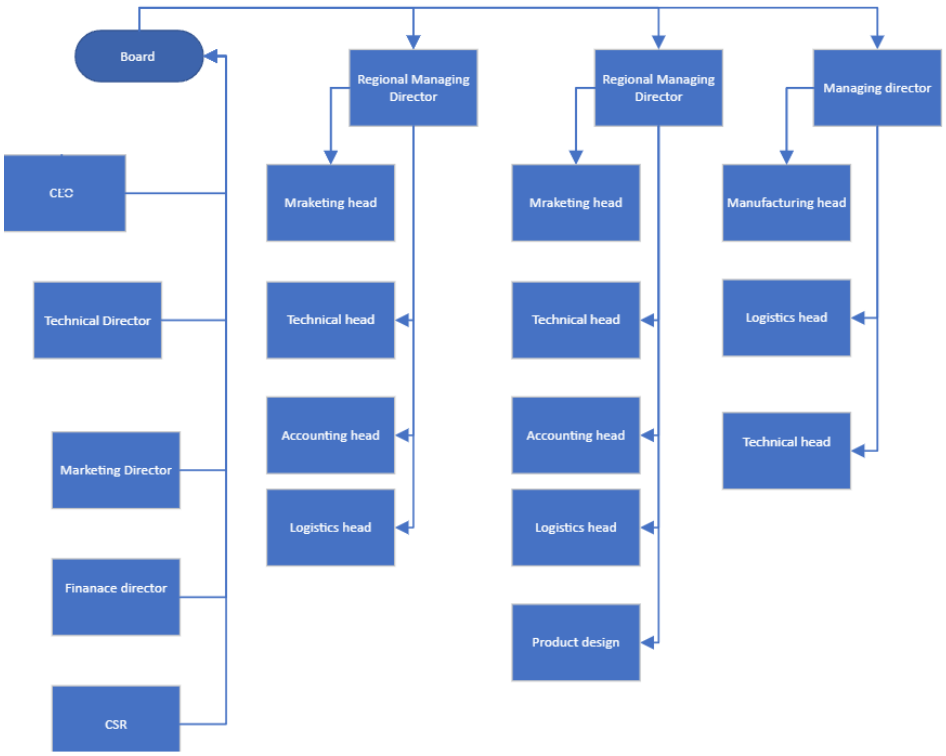

Figure 17 Organisation chart of AIR2WA

CEO- The CEO of the firm is the company's highest-ranking executive. The CEO is responsible for a wide range of duties. This includes making significant business decisions on behalf of the firm, interacting with the board of directors and shareholders, as well as the general public, and managing the company's overall operations and resources. He or she must also be informed of the market landscape

Technical Director- He or she oversees designing and implementing the technical part of the business, primarily engineering and product strategies, to accomplish business objectives. It is a position that combines technical and management tasks to ensure the smooth running of the organisation. They are also occasionally in charge of recruitment.

Marketing Director- They oversee marketing and communication strategies to improve overall branding and image in the public eye. They do market research to develop project strategies and budgets. They also collaborate closely with the sales department to determine pricing strategy.

Finance Director- They oversee a variety of activities such as allocating funds to various departments for their projects, keeping track of how money flows in and out of the firm, and developing financial plans to promote the company's health and growth. They are also in charge of developing ways to boost profitability and enhance financial operations.

Corporate Social Responsibility (CSR)- They are responsible for managing the business while keeping social, economic, and environmental implications, as well as human rights, in mind. They are also in charge of anti-corruption measures and the procurement of goods and supplies.

Regional managing director- They oversee budgets and daily operations, as well as formulating business and marketing plans, but are allocated to a certain region and exclusively handle regional operations.

Marketing head- They oversee generating and administering the marketing department's monthly, quarterly, and yearly budgets, as well as monitoring team goals. They also develop marketing strategies for teams such as digital, creative, advertising, and communications. Depending on the size of the company, they may also organise the sales organisation.

Technical head- They have comparable obligations as the technical director, but they work at a regional level and provide guidance on existing and new projects in that region. They, too, establish engineering plans, but may have more regional expertise than the technical director.

Logistics head- They are also known as distribution managers and oversee organising storage, keeping inventory in check, and managing transportation and delivery of goods.

Accounting head- They analyse financial data and provide reports for management, stakeholders, and third-party clients like as suppliers or lenders. They help other departments design and implement goals, as well as make decisions that may have a financial impact on the organisation. They also supervise the accounting department's daily operations and ensure that all tasks are finished by the deadline. In addition, they keep thorough and accurate financial records and participate in audits as needed.

Product designer- Their job is to create a product that meets or exceeds market criteria while also increasing the company's brand value and image. They must also consider the current trend and client requirements, as well as market research, when designing the product.

Manufacturing Head- They monitor production processes, establish quality standards, and change schedules to ensure that output is cost effective. They also assist in cost estimation by negotiating and agreeing on budgets with clients and management.

5.2. Business Strategy

5.2.1 Business Development.

Businesses are not established overnight, and several steps must be completed before they reach their objectives.

Research & Development- These are the foundations of every firm that wishes to capitalise on new technologies. The firm is now in this phase and has been working on building modular units of various sizes that may be stacked or distributed throughout an area to satisfy the required demand. These designs will have a utility patent for the modular joints and part functions, as well as a design patent for the unit's look. Energy needs, manufacturing capacity, compressor and condenser capacity must all be calculated further.

Prototyping- This step is critical since it will assist us in developing a model that can be presented to customers and investors. The prototype must resemble a downsized version and be portable in order to facilitate demonstrations. Personal funds will be used to construct the porotype.

Finding Investors- It is one of the most difficult aspects of launching a business. Participating in numerous events and conferences to get finance is one option, as is asking for start-up loans, utilising personal and family funds, and approaching investors with similar interests and expertise. A more innovative approach would be to leverage popular technology such as NFTs connected with smart contracts, which would grant the owner of the NFT ownership of a fixed number of shares in the firm.

Setting up production- It is one of the most challenging components of starting a business. Participating in a variety of events and conferences to obtain funding is one method, as is seeking start-up financing, using personal and family finances, and approaching investors with comparable interests and experience. A more inventive solution would be to use popular technology, such as NFTs linked to smart contracts, which would allow the NFT's owner ownership of a predetermined number of shares in the business.

Training program- Before being taught, a certain number of employees will be trained for the assembly and service of the units.

Marketing- Other phases include production and training. Marketing begins with identifying potential clients and approaching them to pique their interest. Some team members must travel for demonstrations, client interactions, and project evaluation.

Project setup- When overseas projects arrive, certain members of the team must go with skilled technicians. Contract engineers and labour should be hired. A civil and electrical engineer will be required. Local personnel receive maintenance training.

Events- Following the success of one or two initiatives, we will collaborate with NGOs and water charities such as Clean Water Fund, World Water Council, and The Water Project to raise awareness and finances for a charity project in poor nations. The corporation would do this on a regular basis for the benefit of the public and to instil trust in future consumers.

Expanding- Following the success of operating in various Middle Eastern nations, the organisation may acquire more finances to improve their position by taking on new projects, employing permanent staff, qualified professionals, and renting storage and office space. Following that, this business will begin seeking for expansion contracts in Asian countries.

Setting up Manufacturing- If the firm begins to acquire large-scale projects, it will need to establish a production plant in Asian countries to save shipping costs. We must begin producing our own MOFs since the supply is insufficient. Looking for suitable collaborators and manufacturing locations.

Setting up water packaging- The start-up will strive to collaborate with reputable bottling producers in order to market bottled drinking water. Hire a design studio to create a branding that is appropriate for the region. In other countries, we will offer our product through existing subscription-based water delivery businesses.

Setting Up R&D – Along the way, the firm will strive to boost R&D and design in order to avoid being left behind in the water technology field. This may be accomplished through collaboration with researchers and the hiring of more R&D personnel.

Looking for future potential- To expand our range, we will be able to supply purification and storage options in the future. MOF harvesters are intended to be integrated into urban architecture.

5.2.2 Business Plan

Phase-1

Water is everywhere, but drinking water is not; this is true for developed places as well, and we want to capitalise on this by beginning by delivering water generating solutions in these locations, such as the UAE, Kuwait, Qatar, and Oman. These nations rely significantly on RO plants for all their water demands, but our marketing will concentrate on selling our technology to malls, hotels, residential communities, and emerging towns located far from the ocean. We will also try to sell our technology to current water packaging firms so that they may sell it as a market-exclusive product.

Phase-2

These nations' experience would assist us obtain market reaction, consumer feedback, and technical challenges encountered throughout its operation. This data may be utilised to improve our operations before expanding to a larger market with a higher population density. The most significant benefit of operating in Gulf nations would be increased market recognition.

The next stage of growth will focus on Asian countries such as India, China, and Indonesia, among others. Although these nations have natural supplies of water in most locations, the growth in population has also increased water demand for agricultural and industrial usage, resulting in a deficit of drinking water supply. Because these nations have yet to wean themselves off of RO or other techniques of distillation, they are well suited for large-scale MOF harvesting projects that may be carried out in partnership with local government councils, as acquiring land and finance for the project will be easy. There is also the option of commercialising bottled drinking water and selling subscription-based big cans for family drinking requirements.

Phase -3

Large-scale projects would only be conceivable if we manufactured MOF ourselves because no supply could match our demand. New MOF manufacturing units might be established by cooperating with current manufacturers. India is the most suited place for the development of a MOF manufacturing facility since most raw materials are widely available, production costs are low, and it is near to all prospective markets.

Keeping our goal in mind, further R&D will be undertaken on ways to cleanse and store water, allowing us to become a full solution for water management. This would broaden the company's

offering, allowing us to access a larger market and grow our customer base. But it is equally critical not to overlook the areas who lack resources but are in desperate need of water.

The experiences and R&D would allow us to produce more economical solutions that would be more appropriate for the world's underdeveloped regions.

5.3. Management and Business Administration

The five founders of the organisation have knowledge in variety of fields, ensuring that they can make smart judgments when an issue occurs. We would want to hire numerous seasoned individuals in specific areas in addition to the initial personnel of a business. We intend to adapt the structure and management of the company based on its size and needs in the long run, and we value shareholder benefits. Initially, when working in several countries Professional freelancers or local experts can be employed on a project-by-project basis and may be granted permanent employment if they work with us on recurrent projects. Local contractors might be employed for labour and simple equipment work.

Following the expansion, each director will have greater discretion to recruit additional employees based on their needs and, further down the road, establish organisational systems in nations with potential for new projects.

5.4. Research and Development and Technical Support Services

The aim of the research and development department is to improve the present product while designing and producing a new one. The main part of product enhancement is that it allows our product to be more adaptable and with current technology, which is in line with client desire. Then, if a new product is not produced in response to client demand, we may miss out on an opportunity to expand our company's revenue. As a result, if the product is continuously updated in the market, it will fulfil many client expectations, resulting in an increase in sales as clients are drawn to the updated items.

In the case of AIR2WA, because the device is modular, it must be assembled on-site with the assistance of qualified experts. We require the R&D staff to be responsive in developing solutions to any difficulties that may occur during the site inspection. There is also the issue of separate units generating varied amounts of water depending on the humidity level in the region, making it hard to satisfy demand with the same size everywhere. As a result, they must design the configuration based on the project's requirements and location. They would also need to establish means for another individual to easily learn the same item in order to deliver a speedy response to customers.

To protect the confidentiality of its work, R&D must provide sufficient training for technical support, and these personnel must be engaged by the corporation under an NDA. To provide speedier technical assistance, skilled personnel must remain or be employed in the place of operation. Customers might contact us for assistance via service email or the live chat box available to registered clients on our website or app. Certain devices may include a detection system connected through WIFI that will notify the customer and firm if the type of problem and alert is required prior to the service date.

Some areas may require specialised changes, such as filters and wipers for Middle Eastern countries to keep sand out of the system. R&D must increase at a high rate for the organisation to be able to provide water management services. Water treatment plants, storage tanks, and so forth.

5.5 Marketing and Sales Operation

Our operation focus is to improve the market visibility of air catcher products through offline and online activities.

Later, we will fully integrate company contacts, channel resources, learning seminars and consulting activities held by invited experts, elaborate on the application of air trap water machine products exquisite brochures, slowly training and incubation group's understanding of the product and the customer approval, strengthen the awareness of their consumption, and then different industry cooperation actively, to realize the marketing of the final.

In terms of operation direction, we will combine resource advantages and take institutions, schools and key enterprises as the breakthrough point.

5.6 Develop a Marketing Strategy

1. Set marketing performance targets. Set goals that are both reasonable and challenging, in accordance with the principle of jump to reach.
2. Clear market positioning. To fully understand the price, model, cost, model of our MOF, competitor's product information and customer information. Accurate positioning can aim at the target.
3. Make use of differentiated marketing to compete with competitors and set the price more carefully: first, to be aggressive; Second, there should be a reasonable profit margin; The third is to leave room for future price manoeuvre.
4. Formulate reasonable promotion plans. Promotion plan formulation, in line with the right amount, a small amount, optimization of the principle, and must consider the proportion of input and output. There are a variety of promotion methods, various products, different regions have different methods. In the formulation of promotion programs, we must consider the promotion methods of competitors, for its shortcomings, promotion theme cannot often change, to avoid consumers' cognition of the product is not clear enough.
5. Make a marketing action plan. Once all the activities have been identified, make a behaviour plan. What time, what place, what thing to do, what person to participate in, what person is responsible for, should be arranged separately, according to this table in the future, control progress.
6. Make marketing budget tables. As with the action plan, all activities should be included a budget table, reasonable arrangement of expenses, do business work must learn to budget, without a budget of the market starting plan is incomplete.

Marketing strategy must consider competitors' factors: first, consider competitors' market development policies; Second, consider what your competitors will do to fight back. Considering all kinds of factors, to ensure that the market development program in the implementation of good results.

6.0 Financial Requirements

The financial requirements for this project are tricky to predict as the plans predict that the company will be working in many different countries that will have their own demands as well as different rules and regulations. For this company the start-up costs is massive, this involves buying the land and the materials to make the MOF frame works, from then on in the costs are quite low meaning profits are quite high. Another issue with this type of company is that it is a service for the external water companies meaning all the stock which is produced is instantly shipped out to the company, this makes it tricky when evaluating how much the company is worth and cash-flow and balance

sheets as the only thing the company owns is the plants that produce the water and the transportation systems.

6.1 The Cash Flow Forecast

The cash flow forecast is a forecast showing the amount of available cash a company has at any point, this is very complex in this case as the investment into the company is massive with the money being made being reinvested into assets so more profits can be made. It is also very strange as most of the costs for the company all come at one time when building the plant. SO, masses amount of cash will leave as a result of building a new plant and then will come back in small doses.

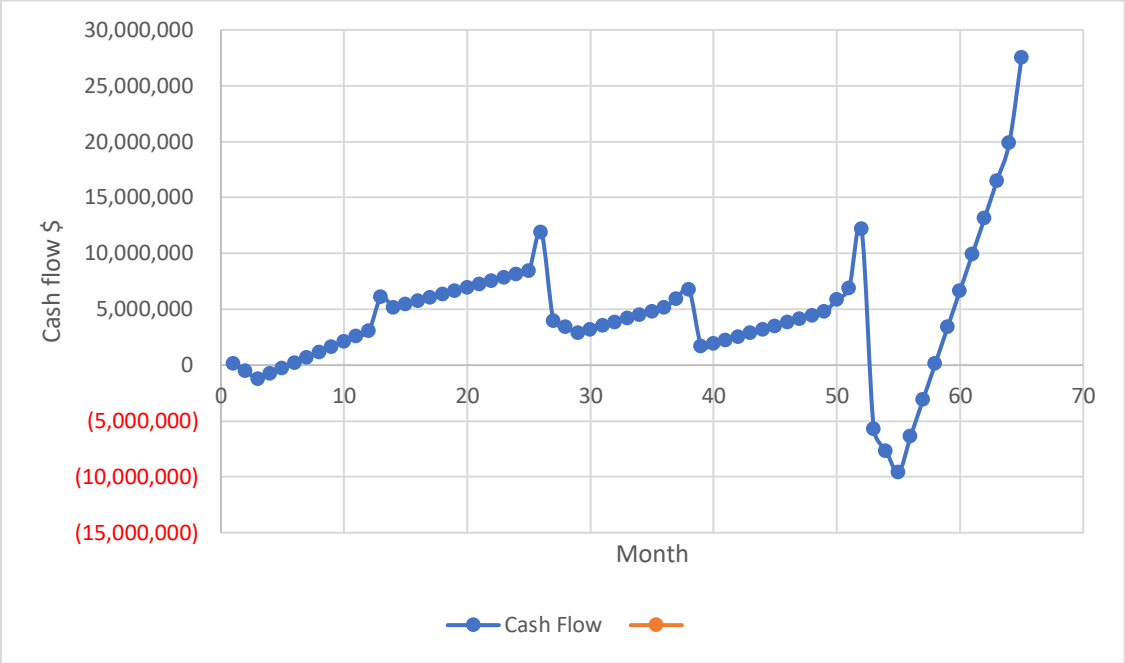

Figure 18 The cash flow throughout the system

In the first year, there isn't any sales from the first three months as the building of the first site is underway. Once this is built and collecting water then the cash is coming in and then can be reinvested into the company. This is seen as negative cash on the graph as the expenditure of the company is still going on there is no money being made. Only in month seven does this become positive. Once the set-up costs are covered the expenditure of the company massively decreases due to small running costs, this can be seen in the rise from month 7 to month 25 where another site is being built therefore some of the cash is being removed from the company. This then slowly increases as the company earns more money until month 48 where two more bigger sites in Asia are built where there is a massive decrease but as they start to make money the graph shows its general upwards trend with a steeper gradient as all five locations are running at the same time. The cash inflow and out flow can be quite tricky to predict and research due to the company running in Asia, different fees such as land price and sales from the water selling have been thoroughly researched. After year 5 more and more cash must be invested into opening different plants to ensure the survival of the company.

6.2 The Break-even Point Calculation

The breakeven calculation point is the number of units needed to sell to break even versus the fixed costs, these are the costs that are independent to selling price, such as rent and maintained. This can

be tricky in this case as this company provides a service to an existing company to harvest the water though this can be calculated as the number of litres of water needed to be sold to breakeven. This is shown in the table below

$$Break\ even\ calculation = \frac{Fixed\ cost}{Sales\ price} = \frac{695{,}058}{0.2} = \$3.475m$$

$$Time = \frac{3{,}475{,}000}{1{,}170{,}000} = 2.9months$$

The breakeven point is a quite a short time, even though the start-up costs to build a plant are high, these plants don't have large running costs, providing the humidity stays constant, according to our calculations and if a drinking water distribution company on board with the company the breakeven point isn't very far. Due to the plant only being built after investment from a existing water company there isn't a big risk in building the sales of the company as the method of extracting water is cheaper and more environmentally friendly than existing methods meaning the selling price can be a lot less than existing ones on the market.

6.3 Profit and Loss (P&L) Forecast and Balance Sheet for Each Year

Table 2 The first year's profit and loss calculations and balance sheet

Year 1						
				Debit		Credit
				$		$
Capital invested						4,500,000.00
Mortgage						1,000,000.00
creditors						
Debtors						
Drawings				-		
Land				2,000,000.00		
Materials				2,500,000.00		
Wages				3,600,000.00		
Other expenditure				4,700,000.00		
Sales						10,530,000.00
Tax				100,000.00		
Total				12,900,000.00		16,030,000.00
Credit - Debit						3,130,000.00
Sales						
Cost of sales						

	Open stock	0				
	Purchases					
	Total					
	Closing stock	0				
Gross profit		10,530,000				
Net profit		-2,370,000.00				
Balance sheet						
Net current assets		4,500,000.00				
Total assets		15,030,000.00				
Financed by	Captial	4,500,000				
	Sales	10,530,000				
	Mortgage	1,000,000				
Closing balance	6,078,608					

Table 3 The second year's profit and loss calculations and balance sheet

Year 2						
				Debit		Credit
				$		$
Capital invested						-
Mortgage						-
creditors				1,000,000.00		-
Debtors						
Cash				-		6,078,608.00
Land				600,000.00		
Materials						
Wages				3,600,000.00		
Other expenditure				5,000,000.00		
Sales						14,040,000.00
Tax				140,000.00		
Total				10,340,000.00		20,118,608.00
Credit - Debit						9,778,608.00
Sales						
Cost of sales						
	Open stock	0				
	Purchases					
	Total					

	Closing stock	0				
Gross profit		14,040,000				
Net profit		3,700,000.00				
Balance sheet						
Net current assets		4,500,000.00				
Total assets		20,718,608.00				
Financed by	Cash	6,078,608				
	Sales	14,040,000				
Closing balance	11,898,608					

Table 4 The third years profit and loss calculations and balance sheet

Year 3						
				Debit		Credit
				$		$
Capital invested						
Mortgage						
creditors						
Debtors						
Cash				-		11,898,608.00
Land				5,000,000.00		
Materials				2,500,000.00		
Wages				6,600,000.00		
Other expenditure				16,000,000.00		
Sales						22,788,000.00
Tax				220,000.00		
Total				30,320,000.00		34,686,608.00
Credit - Debit						4,366,608.00
Sales						
Cost of sales						
	Open stock	0				
	Purchases					
	Total					
	Closing stock	0				
Gross profit		22,788,000				
Net profit		- 7,532,000.00				
Balance sheet						
Net current assets		12,000,000.00				
Total assets		30,288,000.00				
Financed by	Cash	11,898,608				
	Sales	22,788,000				
Closing balance	1,694,400					

Table 5 The fourth years profit and loss calculations and balance sheet

Year 4						
				Debit		Credit
				$		$
Capital invested						
Mortgage						
creditors						
Debtors						
Cash				-		1,694,400.00
Land				2,200,000.00		
Materials				-		
Wages				6,600,000.00		
Other expenditure				11,601,800.00		
Sales						25,704,000.00
Tax				100,000.00		
Total				20,501,800.00		27,398,400.00
Credit - Debit						6,896,600.00
Sales						
Cost of sales						
	Open stock	0				
	Purchases					
	Total					
	Closing stock	0				
Gross profit		25,704,000				
Net profit		5,202,200.00				
Balance sheet						
Net current assets		30,288,000.00				
Total assets		27,904,000.00				
Financed by	Cash	1,694,400				
	Sales	25,704,000				
Closing balance	12,204,400					

Table 6 The fifth years profit and loss calculations and balance sheet

Year 5						
				Debit		Credit
				$		$
Capital invested						
Mortgage						
creditors						
Debtors						
Cash						12,204,400.00
Land				10,200,000.00		
Materials				6,000,000.00		

Wages				14,000,000.00		
Other expenditure				39,031,200.00		
Sales						76,896,000.00
Tax				100,000.00		
Total				69,331,200.00		89,100,400.00
Credit - Debit						19,769,200.00
Sales						
Cost of sales						
	Open stock	0				
	Purchases					
	Total					
	Closing stock	0				
Gross profit		76,896,000				
Net profit		7,564,800.00				
Balance sheet						
Net current assets		44,104,000.00				
Total assets		123,384,000.00				
Financed by	Cash	12,204,400				
	Sales	76,896,000				
Closing balance	27,529,600					

6.3.1-Discussion of Profit and Loss and Balance Sheets

Year 1

The start of the company involves a high amount of investment for not much return, this is shown in the profit and loss with the company taking an overall loss, though the start-up year could have been worse as the company has a stable income as well as owning most of its assets due to the investment. The Start-up costs with the land and the materials include everything from building upon the land and processing the material.

Year 2

This is a profitable year as the business carries on growing from the last year, the only real expense of this year is the running costs of the business which are relatively low in comparison to the sale margin within the business. Overall, there is a profit shown which is making up for some losses from the previous years and there is a reserve of cash at the end of the year in order to build a new plant in Saudi Arabia.

Year 3

This year doesn't show a massive profit, this is due to the start of a new plant of similar size of the existing one in Saudi Arabia. The reserve of cash was enough to pay for this new plant and there are promising signs for big profits in the coming years. This also shows a big increase in the assets of the company making it more valuable.

Year 4

This shows big profits from the two existing plants, as explained above once the start-up costs for the plant is fronted the business can be very profitable.

Year 5

The opening of two new plants in India and Indonesia cause massive losses for the company at the start of the year, meaning an overdraft is gone in to, this isn't ideal for the company but the room to invest will show massive profits for the future, which is shown by the 7.8Million dollars in sales that are coming in every month. Overall, once the infrastructure is built the company can be very profitable.

7.0 The Investment Requirement

The investment needed in the company is all in aid of setting up the first plant, once this is carried out then the money gained from this plant can be reinvested back into the company. The land in which the first plant will be built on will be put on a mortgage which is a long-term loan from the bank with lower interest rates than normal, but these interest rates will cost the company more over time. This is vital to build the first plant though. The material cost will be a big chunk of the investment money as the price of the material is $3 per kg and we need approximately 365 tons. As the plant will only be built on the contract of selling the water to a company the investment will be safe though this is a big amount of money. The investment will be around $4.5 million. This is due to the large scale nature of the project and how much water is going to be provided from the plant and how much money it will be making from the start, there will be no risk in building a plant this size as there will already be an agreement in place to sell the water, even at the lower price the return on this investment will be massive once the different plants are built around Asia.

The main allocation of the investment will be going into paying for the material as well as paying for the infrastructure of the business; this includes legal fees as well as building transport links between the collection site and the external packaging and distribution site. This investment will provide the infrastructure the company needs to be getting an impressive income once up and running.

8.0 Assessing the Risks

8.0.1 Market Saturation

In the targeted countries, the gulf countries at first as they have more money to invest into new systems, there are already many well-established drinking water collection systems, though they use a lot more energy to collect the water, they may not want to replace these systems at a great price. Though there may be a drinking water crisis developing countries may look at systems that have been used more around the world as a safe bet. This is the reason the investment in the companies in the gulf countries is vital in order for this company to be successful.

The business plan of only collecting the water and selling it to already established water companies can be a massive risk. The water that is collected via MOF frameworks is cheaper than existing water collecting services, there would be large investment cost to set up these large plants to meet the demand of these ever-growing cities, these companies may not want to pay for the plants and transport of the water from the plants to the packaging and distribution centres when they already have systems in place.

Solution

The marketing team will have to show the massive amount of potential within the product to collect and extract water out of the air with smaller energy cost than the original method is a huge USP of this product. Another way to keep the cost down is to make the product in a cheaper country, for example India or China, the set-up costs to produce this product may be quite high but the service life is 5 years, but the running and manufacturing costs will reduce as a result.

8.0.2 Bottlenecks

The amount of water collected by the system is dependent on the humidity and has a limited amount it can make, during periods of the year where the humidity may fluctuate this value meaning the water produced will be lower meaning the requirements needed will not be met.

Solution

Have more units in place so that during periods of lower humidity the requirements are still met and during higher humidity periods a reserve can be held for emergencies.

8.1-SWOT Analysis

Strength

A strength of this product is that there are no systems like this on the market. This means that there are little competitors that can collect water from air. The existing systems either collect rainwater or sea water and then use high-cost systems to filter it in order for it to be safe to drink, this system has a smaller cost and all it needs is humidity within the air, most countries in Asia meet this humidity requirement so the customer market is endless. Another positive is the water is sold not the system this means that there will always be money entering as it is not a one-off fee.

Weaknesses

The main weakness of the product is it relies on the humidity of the air which changes from day to day meaning it can be quite hard to predict how much water is going to be collected on a certain day; when dealing with external clients, this can be very tricky as they want to know what they are buying and how much we can provide.

Another weakness is the start-up costs of the company, this is very high for a start up thought he profits could be massive

Opportunities

The opportunity of the company is massive, the amount of humid countries throughout Asia that need different methods of collecting water is massive, if one of these plants are built in each country the opportunity is endless.

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Appendices

Appendix A – Full Cash Flow of First Five Years

Month	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
Round to whole $'s	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	
INCOME													
SALES	$0.00	$0.00	$0.00	$1,170,000.00	$1,170,000.00	$1,170,000.00	$1,170,000.00	$1,170,000.00	$1,170,000.00	$1,170,000.00	$1,170,000.00	$1,170,000.00	10,530,000
INVESTMENT FROM DIRECTORS	4,500,000												4,500,000
OVERDRAFT (short term loan)	1,000,000												1,000,000
GRANTS (e.g. councils/Princes Trust)													0
OTHER SHAREHOLDER EQUITY													0
TOTAL INCOME	**5,500,000**	**0**	**0**	**1,170,000**	**1,170,000**	**1,170,000**	**1,170,000**	**1,170,000**	**1,170,000**	**1,170,000**	**1,170,000**	**1,170,000**	**16,030,000**
EXPENDITURE													
DIRECT COSTS													
Land	2,000,000	0	0	0	0	0	0	0	0	0	0	0	2,000,000
MATERIALS to make units	2,500,000	0	0	0	0	0	0	0	0	0	0	0	2,500,000
Transportation of goods	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	900,000
Maintaince	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	900,000
OVERHEADS													
EMPLOYEES WAGES	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	3,000,000
SUB-CONTRACTED EMPLOYEES	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	600,000
TRAVEL EXPENSES													
Travel to clients	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	120,000
Hotels	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	60,000
OTHER TRAVEL	250	250	250	250	250	250	250	250	250	250	250	250	3,000
OFFICE AND RELATED COSTS													
RATES													0
HEAT/LIGHT/POWER	103,908	103,908	103,908	103,908	103,908	103,908	103,908	103,908	103,908	103,908	103,908	103,908	1,246,896
OFFICE RELATED INSURANCES	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	120,000
TELECOMS & WEB SITE COSTS													
LAND LINE	300	300	300	300	300	300	300	300	300	300	300	300	3,600
MOBILE	300	300	300	300	300	300	300	300	300	300	300	300	3,600
BROADBAND CONNECTION	300	300	300	300	300	300	300	300	300	300	300	300	3,600
WEB SITE CREATION & RELATED	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	60,000
OTHER EXPENSES													0
BANK CHARGES	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	120,000
PROFESSIONAL FEES (legal company set up)	250,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	1,350,000
LOAN INTEREST	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EXPENDITURE (B)	**5,345,058**	**695,058**	**695,058**	**695,058**	**695,058**	**695,058**	**695,058**	**695,058**	**695,058**	**695,058**	**695,058**	**695,058**	**12,990,696**
NET IN FLOW (A-B)	154,942	(695,058)	(695,058)	474,942	474,942	474,942	474,942	474,942	474,942	474,942	474,942	474,942	3,039,304
OPENING BALANCE	0	154,942	(540,116)	(1,235,174)	(760,232)	(285,290)	189,652	664,594	1,139,536	1,614,478	2,089,420	2,564,362	3,039,304
CLOSING BALANCE	**154,942**	**(540,116)**	**(1,235,174)**	**(760,232)**	**(285,290)**	**189,652**	**664,594**	**1,139,536**	**1,614,478**	**2,089,420**	**2,564,362**	**3,039,304**	**6,078,608**

Figure 19 Full cash flow figures for the first year of the business

CASHFLOW FORECAST (Marketing co)													
Month	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
Round to whole $'s	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	
INCOME													
SALES	$1,170,000.00	$1,170,000.00	$1,170,000.00	$1,170,000.00	$1,170,000.00	$1,170,000.00	$1,170,000.00	$1,170,000.00	$1,170,000.00	$1,170,000.00	$1,170,000.00	$1,170,000.00	14,040,000
INVESTMENT FROM DIRECTORS													0
OVERDRAFT (short term loan)													0
GRANTS (e.g. councils/Princes Trust)													0
OTHER SHAREHOLDER EQUITY													0
TOTAL INCOME	**1,170,000**	**1,170,000**	**1,170,000**	**1,170,000**	**1,170,000**	**1,170,000**	**1,170,000**	**1,170,000**	**1,170,000**	**1,170,000**	**1,170,000**	**1,170,000**	**14,040,000**
EXPENDITURE													
DIRECT COSTS													
Land	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	600,000
MATERIALS to make units	0	0	0	0	0	0	0	0	0	0	0	0	0
Transportation of goods	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	900,000
Maintance	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	900,000
OVERHEADS													
EMPLOYEES WAGES	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	3,000,000
SUB-CONTRACTED EMPLOYEES	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	600,000
TRAVEL EXPENSES													
Travel to clients	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	120,000
Hotels	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	60,000
OTHER TRAVEL	250	250	250	250	250	250	250	250	250	250	250	250	3,000
OFFICE AND RELATED COSTS													
RATES													0
HEAT/LIGHT/POWER	103,908	103,908	103,908	103,908	103,908	103,908	103,908	103,908	103,908	103,908	103,908	103,908	1,246,896
OFFICE RELATED INSURANCES	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	120,000
PRINTING/STATIONERY RELATED (e.g. ink/toner)													0
POSTAGE													0
ADVERTISING/PUBLICITY (non-web)													0
TELECOMS & WEB SITE COSTS													
LAND LINE	300	300	300	300	300	300	300	300	300	300	300	300	3,600
MOBILE	300	300	300	300	300	300	300	300	300	300	300	300	3,600
BROADBAND CONNECTION	300	300	300	300	300	300	300	300	300	300	300	300	3,600
WEB SITE CREATION & RELATED	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	60,000
OTHER EXPENSES													0
BANK CHARGES	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	120,000
PROFESSIONAL FEES (legal company set up)	250,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	1,350,000
LOAN INTEREST	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	300,000
VAT	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	1,200,000
TOTAL EXPENDITURE (B)	**1,020,058**	**870,058**	**870,058**	**870,058**	**870,058**	**870,058**	**870,058**	**870,058**	**870,058**	**870,058**	**870,058**	**870,058**	**10,590,696**
NET IN FLOW (A-B)	149,942	299,942	299,942	299,942	299,942	299,942	299,942	299,942	299,942	299,942	299,942	299,942	3,449,304
OPENING BALANCE	5,000,000	5,149,942	5,449,884	5,749,826	6,049,768	6,349,710	6,649,652	6,949,594	7,249,536	7,549,478	7,849,420	8,149,362	8,449,304
CLOSING BALANCE	**5,149,942**	**5,449,884**	**5,749,826**	**6,049,768**	**6,349,710**	**6,649,652**	**6,949,594**	**7,249,536**	**7,549,478**	**7,849,420**	**8,149,362**	**8,449,304**	**11,898,608**

Figure 20 Figure 10.0.2- Full cash flow figures for the second year of the business

CASHFLOW FORECAST (Marketing co)													
Month	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
Round to whole $'s	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	
INCOME													
SALES	$1,170,000.00	$1,170,000.00	$1,170,000.00	$2,142,000.00	$2,142,000.00	$2,142,000.00	$2,142,000.00	$2,142,000.00	$2,142,000.00	$2,142,000.00	$2,142,000.00	$2,142,000.00	22,788,000
INVESTMENT FROM DIRECTORS													0
OVERDRAFT (short term loan)													0
GRANTS (e.g. councils/Princes Trust)													0
OTHER SHAREHOLDER EQUITY													0
TOTAL INCOME	**1,170,000**	**1,170,000**	**1,170,000**	**2,142,000**	**2,142,000**	**2,142,000**	**2,142,000**	**2,142,000**	**2,142,000**	**2,142,000**	**2,142,000**	**2,142,000**	**22,788,000**
EXPENDITURE													
DIRECT COSTS													
Land	5,000,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	100,000	100,000	7,000,000
MATERIALS to make units	2,500,000	0	0	0	0	0	0	0	0	0	0	0	2,500,000
Transportation of goods	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	75,000	75,000	1,650,000
Maintance	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	1,800,000
OVERHEADS													
EMPLOYEES WAGES	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	250,000	250,000	5,500,000
SUB-CONTRACTED EMPLOYEES	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	50,000	50,000	1,100,000
TRAVEL EXPENSES													
Travel to clients	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	240,000
Hotels	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	120,000
OTHER TRAVEL	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	12,000
OFFICE AND RELATED COSTS													
RATES													0
HEAT/LIGHT/POWER	299000	299000	299000	299000	299000	299000	299000	299000	299000	299000	299000	299000	3,588,000
OFFICE RELATED INSURANCES	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	120,000
TELECOMS & WEB SITE COSTS													
LAND LINE	300	300	300	300	300	300	300	300	300	300	300	300	3,600
MOBILE	300	300	300	300	300	300	300	300	300	300	300	300	3,600
BROADBAND CONNECTION	300	300	300	300	300	300	300	300	300	300	300	300	3,600
WEB SITE CREATION & RELATED	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	60,000
OTHER EXPENSES													0
BANK CHARGES	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	240,000
PROFESSIONAL FEES (legal company set up)	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	1,200,000
LOAN INTEREST	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	600,000
VAT	100,000	100,000	100,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	2,100,000
TOTAL EXPENDITURE (B)	**9,015,900**	**1,715,900**	**1,715,900**	**1,815,900**	**1,815,900**	**1,815,900**	**1,815,900**	**1,815,900**	**1,815,900**	**1,815,900**	**1,340,900**	**1,340,900**	**27,840,800**
NET IN FLOW (A-B)	(7,845,900)	(545,900)	(545,900)	326,100	326,100	326,100	326,100	326,100	326,100	326,100	801,100	801,100	(5,052,800)
OPENING BALANCE	11,800,000	3,954,100	3,408,200	2,862,300	3,188,400	3,514,500	3,840,600	4,166,700	4,492,800	4,818,900	5,145,000	5,946,100	6,747,200
CLOSING BALANCE	**3,954,100**	**3,408,200**	**2,862,300**	**3,188,400**	**3,514,500**	**3,840,600**	**4,166,700**	**4,492,800**	**4,818,900**	**5,145,000**	**5,946,100**	**6,747,200**	**1,694,400**

Figure 21 Full cash flow figures for the third year of the business

CASHFLOW FORECAST (Marketing co)													
Month	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
Round to whole £'s	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	
INCOME													
SALES	$2,142,000.00	$2,142,000.00	$2,142,000.00	$2,142,000.00	$2,142,000.00	$2,142,000.00	$2,142,000.00	$2,142,000.00	$2,142,000.00	$2,142,000.00	$2,142,000.00	$2,142,000.00	25,704,000
INVESTMENT FROM DIRECTORS													0
OVERDRAFT (short term loan)													0
GRANTS (e.g. council/Princes Trust)													0
OTHER SHAREHOLDER EQUITY													0
TOTAL INCOME	**2,142,000**	**2,142,000**	**2,142,000**	**2,142,000**	**2,142,000**	**2,142,000**	**2,142,000**	**2,142,000**	**2,142,000**	**2,142,000**	**2,142,000**	**2,142,000**	**25,704,000**
EXPENDITURE													
DIRECT COSTS													
Land	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	100,000	100,000	2,200,000
MATERIALS to make units	0	0	0	0	0	0	0	0	0	0	0	0	0
Transportation of goods	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	75,000	75,000	1,650,000
Maintance	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	1,800,000
OVERHEADS													
EMPLOYEES WAGES	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	250,000	250,000	5,500,000
SUB-CONTRACTED EMPLOYEES	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	50,000	50,000	1,100,000
TRAVEL EXPENSES													
Travel to clients	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	120,000
Hotels	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	60,000
OTHER TRAVEL	250	250	250	250	250	250	250	250	250	250	250	250	3,000
OFFICE AND RELATED COSTS													
RATES													0
HEAT/LIGHT/POWER	299000	299000	299000	299000	299000	299000	299000	299000	299000	299000	299000	299000	3,588,000
OFFICE RELATED INSURANCES	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	120,000
PRINTING/STATIONERY RELATED (e.g. ink/toner)													0
POSTAGE													0
ADVERTISING/PUBLICITY (non-web)													0
TELECOMS & WEB SITE COSTS													
LAND LINE	300	300	300	300	300	300	300	300	300	300	300	300	3,600
MOBILE	300	300	300	300	300	300	300	300	300	300	300	300	3,600
BROADBAND CONNECTION	300	300	300	300	300	300	300	300	300	300	300	300	3,600
WEB SITE CREATION & RELATED	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	60,000
OTHER EXPENSES													0
BANK CHARGES	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	240,000
PROFESSIONAL FEES (legal company set up)	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	1,200,000
LOAN INTEREST	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000	75,000			750,000
VAT	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000			2,000,000
TOTAL EXPENDITURE (B)	**1,825,150**	**1,825,150**	**1,825,150**	**1,825,150**	**1,825,150**	**1,825,150**	**1,825,150**	**1,825,150**	**1,825,150**	**1,825,150**	**1,075,150**	**1,075,150**	**20,401,800**
NET IN FLOW (A-B)	316,850	316,850	316,850	316,850	316,850	316,850	316,850	316,850	316,850	316,850	1,066,850	1,066,850	5,302,200
OPENING BALANCE	1,600,000	1,916,850	2,233,700	2,550,550	2,867,400	3,184,250	3,501,100	3,817,950	4,134,800	4,451,650	4,768,500	5,835,350	6,902,200
CLOSING BALANCE	**1,916,850**	**2,233,700**	**2,550,550**	**2,867,400**	**3,184,250**	**3,501,100**	**3,817,950**	**4,134,800**	**4,451,650**	**4,768,500**	**5,835,350**	**6,902,200**	**12,204,400**

Figure 22 Full cash flow figures for the fourth year of the business

CASHFLOW FORECAST (Marketing co)													
Month	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
Round to whole £'s	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	Budget	
INCOME													
SALES	$2,142,000.00	$2,142,000.00	$2,142,000.00	$7,830,000.00	$7,830,000.00	$7,830,000.00	$7,830,000.00	$7,830,000.00	$7,830,000.00	$7,830,000.00	$7,830,000.00	$7,830,000.00	76,896,000
INVESTMENT FROM DIRECTORS													0
OVERDRAFT (short term loan)													0
GRANTS (e.g. council/Princes Trust)													0
OTHER SHAREHOLDER EQUITY													0
TOTAL INCOME	**2,142,000**	**2,142,000**	**2,142,000**	**7,830,000**	**7,830,000**	**7,830,000**	**7,830,000**	**7,830,000**	**7,830,000**	**7,830,000**	**7,830,000**	**7,830,000**	**76,896,000**
EXPENDITURE													
DIRECT COSTS													
Land	10,200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	100,000	100,000	12,200,000
MATERIALS to make units	6,000,000	0	0	0	0	0	0	0	0	0	0	0	6,000,000
Transportation of goods	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	3,600,000
Maintance	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	3,600,000
OVERHEADS													
EMPLOYEES WAGES	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	12,000,000
SUB-CONTRACTED EMPLOYEES	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	2,400,000
TRAVEL EXPENSES													
Travel to clients	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	120,000
Hotels	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	60,000
OTHER TRAVEL	250	250	250	250	250	250	250	250	250	250	250	250	3,000
OFFICE AND RELATED COSTS													
RATES													0
HEAT/LIGHT/POWER	1576450	1576450	1576450	1576450	1576450	1576450	1576450	1576450	1576450	1576450	1576450	1576450	18,917,400
OFFICE RELATED INSURANCES	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	480,000
TELECOMS & WEB SITE COSTS													
LAND LINE	300	300	300	300	300	300	300	300	300	300	300	300	3,600
MOBILE	300	300	300	300	300	300	300	300	300	300	300	300	3,600
BROADBAND CONNECTION	300	300	300	300	300	300	300	300	300	300	300	300	3,600
WEB SITE CREATION & RELATED	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	60,000
OTHER EXPENSES													0
BANK CHARGES	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	480,000
PROFESSIONAL FEES (legal company set up)	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	1,200,000
LOAN INTEREST	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	1,200,000
VAT	200,000	200,000	200,000	700,000	700,000	700,000	700,000	700,000	700,000	700,000	700,000	700,000	6,900,000
TOTAL EXPENDITURE (B)	**20,077,600**	**4,077,600**	**4,077,600**	**4,577,600**	**4,577,600**	**4,577,600**	**4,577,600**	**4,577,600**	**4,577,600**	**4,577,600**	**4,477,600**	**4,477,600**	**69,231,200**
NET IN FLOW (A-B)	(17,935,600)	(1,935,600)	(1,935,600)	3,252,400	3,252,400	3,252,400	3,252,400	3,252,400	3,252,400	3,252,400	3,352,400	3,352,400	7,664,800
OPENING BALANCE	12,200,000	(5,735,600)	(7,671,200)	(9,606,800)	(6,354,400)	(3,102,000)	150,400	3,402,800	6,655,200	9,907,600	13,160,000	16,512,400	19,864,800
CLOSING BALANCE	**(5,735,600)**	**(7,671,200)**	**(9,606,800)**	**(6,354,400)**	**(3,102,000)**	**150,400**	**3,402,800**	**6,655,200**	**9,907,600**	**13,160,000**	**16,512,400**	**19,864,800**	**27,529,600**

Figure 23 Full cash flow figures for the fifth year of the business

CVs of the team

CV of Managing Director - Patra, Swaraj

Robert Goldsworthy

Personal Summary

My name is Rob, I am a biomedical engineering masters student studying at the University of Liverpool. I have a first class honors degree from University of Salford in mechanical engineering.

SKILLS

- Excellent attention to detail
- Great communication skills
- Fast learner
- Good problem solving skills
- Willingness and an interest to learn new skills
- Hard worker
- Able to work well in a fast-paced working environment
- Great customer facing skills
- Self motivating
- Very practical based worker with a good balance of academic
- Determination to succeed
- Flexible working hours

EDUCATION

GCSEs 2016-

Alder Grange School

A- Mathematics, B- Additional science, Core Science and Statistics, C-English Language, French, Psychology, D-English Literature

A-levels 2018 -

Alder Grange Sixth Form A- Extended Project Qualification, B-Biology, C-Mathematics, D-Physics

Undergraduate degree 2021 -

First class degree with honours in Mechanical engineering from The University of Salford

CV of Technical Director - Kurde, Aadeesh Atul

CV of Marketing Director - Liu, Guangming

Curriculum Vitae of Guangming Liu

Personal Information

Name: Guangming Liu
Phone: +44 7857 092XXX
Email Address: guangmingliu306@gmail.com

Academic Qualification

From	To	Institution of Learning	Qualification/Awards/Distinction	Major
2021	2022	University of Liverpool		MSc in Advanced Manufacturing Systems and Technology
2013	2017	University of Jianqiao		Mechanical design, manufacturing and automation

Personal Particulars

Microsoft Offices, ABB Robotstudio, CREO, Solidworks

Curriculum Vitae of CHAN Tsz Wing

Personal Information

Name: Tsz Wing, CHAN
Phone: +44 7878xxxxxx
Email Address: t.chan13@liverpool.ac.uk

Academic Qualification

From	To	Institution of Learning	Qualification/Awards/Distinction	Major
2021	Now	University of Liverpool		MSc in Advanced Manufacturing System and Technologies
2014	2018	The Open University of Hong Kong	Awards: Dean's List (2014) Dean's List (2017) Hon: Second-Upper Class	BSc (Hons) in Testing and Certification Year 4 (Physical & Mechanical) *

Working Experience

From (MM/YYYY)	To (MM/YYYY)	Name of Employee	Appointment Held	Nature of work
04/2021	09/2021	The Open University of Hong Kong	Temporary Research Assistant	Conducting experiments and analysis in the science and engineering laboratories; Preparing the specimen and operating the injection moulding machine
10/2018	01/2021	The Hong Kong and China Gas Company Limited	Assistant Engineer	Explore & develop new business opportunities of kitchen cabinet projects for residential developments

Other Information

Membership of Organizations and Clubs		
From (MM/YY) to (MM/YY)	**Name of Organizations / Clubs**	**Capacity**
01/20 to 12/20	The IET Hong Kong Younger Members Section	Marketing and Communication Coordinator
10/18 to 12/19	The IET Hong Kong Younger Members Section	CPD Coordinator
11/17 to 09/18	Institution of Mechanical Engineers OUHK Student Chapter	Committee Member
10/17 to 09/18	The IET Hong Kong Students Section	Event Coordinator
01/16 to 02/17	Testing and Certification Society, OUHKSU	Public Relations

Personal Particulars

Microsoft Word, Excel, PowerPoint, C++ (Visual Studio), PLC, CAD/CREO drawings, SolidWorks;