Pre-Feasibility Study to Establish a Heating, Ventilation & Air Conditioning A/C Units Assembly Plant

February 2019

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Market, Technical and Financial Analysis

Study Report

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إخلاء المسؤولية

حيث تبذل المنظمة جهوداً حثيثة في أدائها للخدمات الاستشارية، فإنها لا تقدم أي ضمان صريح أو ضمني بتحقيق نتائج ناجحة من تطبيق أي من التوصيات الواردة بها، وبدون تحديد لحصانات وامتيازات المنظمة بموجب القواعد القانونية الواجبة التطبيق، فإن المنظمة لا تكون مسؤولة تجاه العميل أو الغير، عن أي خسارة، أو تكلفة، أو أضرار، أو مسؤولية.

The following contributed to preparing the study: 1. Talal Abu Ghazleh & Co. 2. Eng. Suleiman Albalushi, GOIC	ساهم في إعداد الدراسة كل من: 1. شركة طلال أبو غزالة- سلطنة عمان 2. المهندس /سليمان البلوشي

EXECUTIVE SUMMARY

The potential for manufacture and assembly of HVAC systems and products as at medium given that competition dos not exist in Oman, although the branded products are by far superior in terms of reputation and experience this study allows the opportunity for an Omani product to be established in the market given the huge scope and demand in this sector. The selling price of the AC units in Oman is based on average prices of 150 RO for the 1.5 Ton and 250 RO for the 2.0 Ton units.

The cost of investment for plant and machinery amounts in the region of 397,000 / RO and the proposed capacity is estimated at 32,400 units per year based on the assembly of 12 A/C units per hour. In year 1 the assembly output is 35% utilization resulting in the assembly of 7,938 of 2 ton units and 3,402 of 1.5 ton units.

Year	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10
NP %	-6.03	1.11	3.24	4.71	5.78	6.43	6.64	6.46	6.27	6.07
GP %	17.30	19.37	20.69	21.59	22.25	22.75	22.88	22.74	22.59	22.43

PROJECT HIGHLIGHTS

Name of Project: Assembly Plant of AC units Oman.

Total Investment Cost: 881,545 OMR

Main Plant Cost: 397,000 OMR

Building Cost: 236,045 OMR

Plant Capacity: The proposed Plant will have & installed capacity of 32,400 of AC units per year. In 1st year operation the assembly output amount to 7,938 units.

Local Market Demand. The total estimated yearly demand in the region of 49 million RO in Oman (import substitution)

Source of finance: 60% Debt & 40% equity.

MAJOR COMPETTION IN OMAN: Currently no manufacture is present in Oman

Total Investment	Production capacity	Revenue
•744,045.00 OMR •Source of Finance: banking at 60%	•Year 1 = 35% •Year 2 = 45% •Year 3 = 55% •Year 4 = 65% •Year 5 = 75% •Year 6 = 85% •Year 7 = 90% •Year 8 = 90% •Year 9 = 90% •Year 10 = 90%	•Yr 1= 2.4 million OMR •Yr 2= 3.2 millionOMR •Yr 3= 3.9 Million OMR •Yr 4= 4.6 Million OMR •Yr 5= 5.3 Million OMR •Yr 6= 6.0 Million OMR •Yr 7= 6.4 Million OMR •Yr 8= 6.4 Million OMR •Yr 9= 6.4 Million OMR •Yr 10= 6.4 Million OMR

Broad Scope of Study & Methodology

This feasibility study covers three main areas to include marketing & market research, evaluation of the technical aspects and the financial analysis to determine the feasibility of the project.

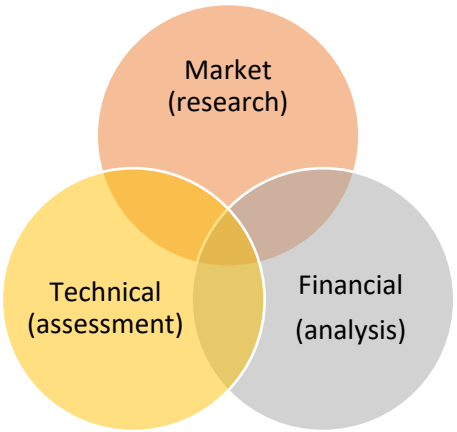
The Market Assessment consists of:

- Market size of A/C Units in Oman.
- Market survey of the A/C Units prices for the various A/C Products.
- Overview of the local competitors in Oman & GCC region.
- Supply & Demand: estimate the supply & demand of A/C Products to include import, export & review of competition in the GCC region.
- Market share of the proposed new plant.

The Technical Part of the Study comprises all technical requirements needed to render the A/C Products plant operational to include capacity utilization, raw material, staff requirements & process flow.

The Financial Analysis for the project covers the following:

- Cost of the project (total investment)
- Source of Finance (equity & debt)
- Financial assumptions
- Financial schedules comprising:
    - Projected Income Statement
    - Projected Balance Sheet
    - Projected Cash Flow Statement
    - Projected Revenue Stream
    - Depreciation Schedule
    - Salaries (Number of required employees & the expected Salaries)
    - Loan repayment Schedule
    - Finance Cost
    - Financial Ratios
    - Internal Rate of Return & Payback period.



Introduction

Heating, Ventilation & Air Conditioning (A/C Units)

A split system is an air-conditioning or heat pump system that uses refrigerant as the heat exchange fluid and has an evaporator, compressor, and condenser as separate components.

In most modern commercial applications, the compressor and condenser are combined into a single piece of equipment called a condensing unit. Refrigerant piping, custom-designed to meet the physical requirements of each individual application, connects the system components.

A typical residential central air-conditioning system is a split system. The compressor and condenser are combined as a single condensing unit mounted outdoors. The evaporator, a finned coil, is mounted in a section of ductwork downstream of the furnace blower. Two flexible refrigerant lines, one for gas and one for liquid, connect the components.

In the GCC region the population growth and the government investments in housing in the region are the two key factors supporting continues high demand for HVAC equipment across sectors including commercial, industrial, and residential.

Research has revealed that smart and green building standards, as well as increasing awareness among consumers of the benefits of using sustainable systems, is pushing HVAC suppliers to develop energy-efficient and technologically innovative products. The way forward in this sector is delivering efficiency and reducing energy consumption and consumers are more aware and looking for efficient and eco-friendly HVAC systems

1.1. Project Overview

Buildings and infrastructure development will increase mainly due to population growth and as a result the increased use and demand of HVAC systems will also continue to grow. This leads to continues research and development in heating air-conditioning and ventilation systems that will never stop probably until we have the most energy efficient and environmentally friendly systems. This leads to alternative energy options that will and are becoming more commercially viable and thus HVAC systems will incorporate more of smart technology in the near to middle term future, the realization is that the future is bright in this sector as it will continue to develop in an era of new technologies.

The nature and vast scope of products in this sector makes it a dynamic not only at the manufacturing stage and process but also the stage of installation, repairs, maintenance and servicing of the equipment all these processes need the involvement of back-office, customers and service technicians as customer demands are increasing and so is the need to evolve.

This project entails the set-up of a new assembly line Plant. The production output of the new proposed plants will focus on mainly the Oman market.

Target Market	
Oman 90%	Export 10%

Assumptions

- Market Rate Selling Price amount to 150 RO for 1,5ton & 250 RO for 2-ton unit.
- Target Market Local 90% Export 10% - New factory to export aim for 10% export so as to test and penetrate the regional markets.
- Ideal proposed location Sohar Free Zone near to Sohar port
- Omanization achievable at minimum rate of 90%.
- Welfare estimated at 15% cover for Ticket, Holidays & Other employee expenses.
- 1 shift system (9 hours shift)
- Working Capital for Raw material and Salaries is for 3 months

Production Capacity

Table 1-1: Production Capacity

PRODUCTION CAPACITY		
Total Installed Capacity	32,400	Units per year
No Hours	9	Per shift
Working Day Per Year	300	days

The proposed AC assembly Plant consist of 2 product types as follows:

Table 1-2: Product types

Si.No.	Description	Size Tons	Output Distribution
A	Split Unit	2.0	70%
B	Split Unit	1.5	30%

A Field survey was conducted at local distributers and agents and revealed the 2.0 ton A/C unit holds 70% of the preference from customers and respectively the 1.5 ton accounts for 30%.

Market Analysis

Market Analysis

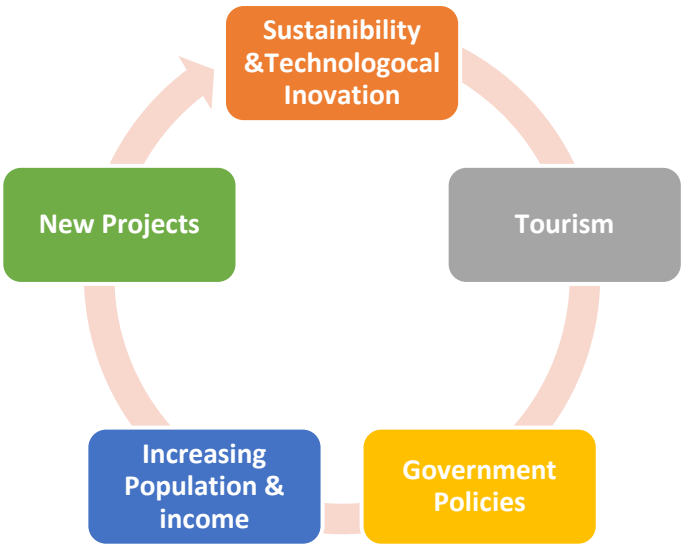
2.1. Market Overview

It is currently estimated that the HVAC industry in the GCC is worth in the region of 10.2 Billion USD and the entire Middle East and Africa (MEA) will exceed 16.2 Billion USD by 2020. [1]

The main driver for the growth in this sector is population and housing demand in the region, these two key factors have driven demand for HVAC equipment across segments to include residential, commercial and industrial.

This study research has revealed that Oman is moving towards smart and energy efficient standards (Green building Standard) and suppliers are demanded to provide more energy efficient systems by use of technological and innovative products as awareness is increasing among consumers and end users of the benefits in the use of sustainable systems. The predicament of sustainability is beginning to play a major role in the construction sector and HVAC systems being an important part of the entire construction aspect at every stage of the life cycle. It is for the HVAC suppliers to develop HVAC systems in reducing energy consumption at the same time delivering efficiency.

This trend presents a significant opportunity for the industry given the range of products that is required in a given complete HVAC system. This is a challenge for manufacturers to change and adopt a sustainable approach in developing these products and without applying this approach could ultimately result in the products not meeting standards and regulations and end user expectation. HVAC efficient systems include Variable Refrigerant Flow (VRF) a cost effective technology particular to cooling small spaces and Trane Variable Refrigerant (TVR): Five Main Drivers of HVAC systems in the GCC region.



[1] http://www.expotradeglobal.com

The Five Main Drivers for the demand in the GCC region for HVAC Systems (A/C units) to include new planned construction projects, development of more sustainable products, Increasing population and the demand for housing, Tourism development as diversification from oil and gas.

Table 2-1: Oman Heating, Ventilation & Air Conditioning (A/C Products) Exporting During the Period (2013-2017)

	2013	2014	2015	2016	2017	AGV
Value USD (000)	1,319	45	2,678	4,531	7,785	3,271.60
Weight in Ton	295	10	477	925	1,589	659.2

Product: 841510 Window or wall air conditioning machines, self-contained or "split-system"

Source: Trademap.com 841510 HS Code

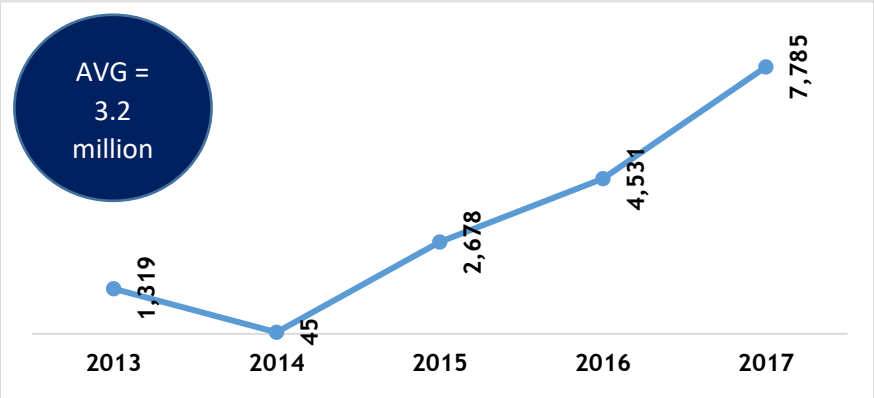


Figure 2-1: HS Code: 841510 - Exporting Value USD (000)

The export for HS Code 841510 amount to 1.3 million USD in 2013. In the following year 2014 the total decreased significantly to 45,000 USD. In 2015 the export increased significantly to 2.6 million USD, in 2016 the total export increased to 4.5 million USD. In 2017 the total export of HS Code 841510 increased to a total of 7.7 million USD.

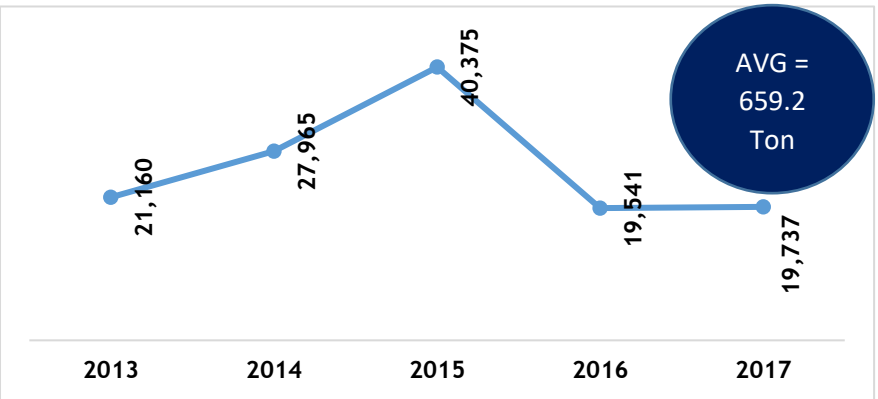


Figure 2-2: HS Code: 841510 - Importing Weight Ton

The export for HS Code 841510 amount to 259 tons in 2013. In the following year 2014 the total export decreased to 10 tons. In 2015 the export increased significantly to 477 tons, in 2016 the total export increased to equivalent 925 tons. In 2017 the total export of HS Code 841510 increased to a total of 1,589 tons.

Table 2-2; Oman Heating, Ventilation & Air Conditioning (A/C Products) Import During the Period (2013-2017)

	2013	2014	2015	2016	2017	AGV
Value USD (000)	107,341	148,716	201,208	92,903	89,316	127,897
Weight in Ton	21,160	27,965	40,375	19,541	19,737	25,756

Product: 841510 Window or wall air conditioning machines, self-contained or "split-system"

Source: Trademap.com 841510 HS Code

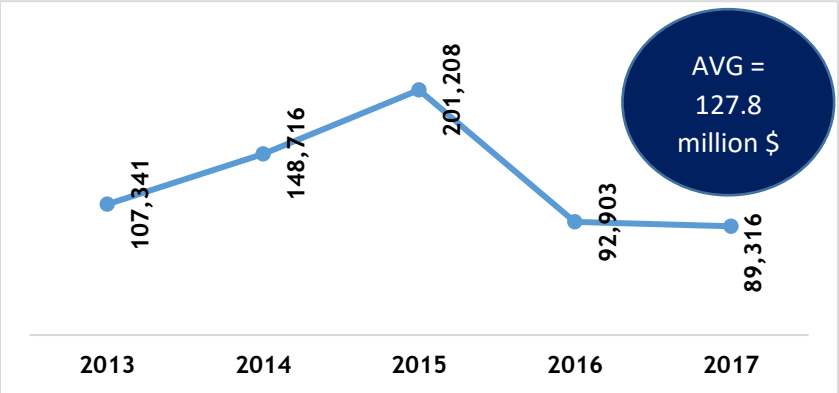


Figure 2-3: HS Code: 841510 - Importing Value USD (000)

The imports for HS Code 841510 amount to 107.3 Million USD in 2013. In the following year 2014 the total import increased to a total of 148.7 Million USD. In 2015 the import increased significantly to 201.2 Million USD, in 2016 the total import decreased significantly to a total of 92.9 Million USD. In 2017 the total import of HS Code 841510 amount reduced to a total of 89.3 Million USD.

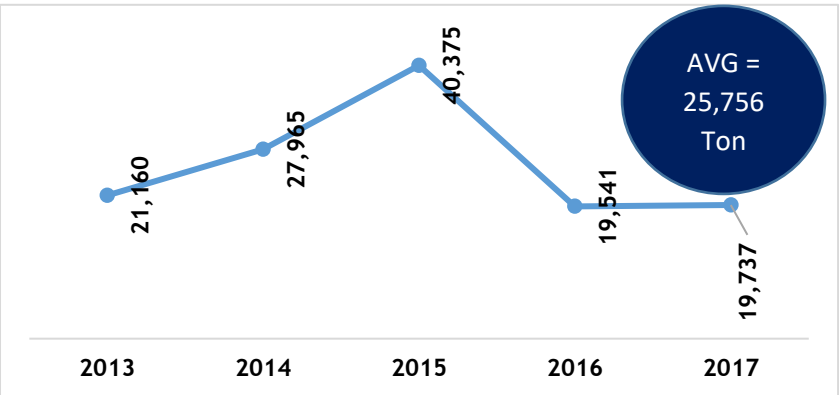


Figure 2-4: HS Code: 841510 - Importing Weight Ton

The imports for HS Code 841510 amount to 21,160 tons in 2013. In the following year 2014 the total import increased to a total of 27,965 tons. In 2015 the import increased significantly to 40,375 tons, in 2016 the total import decreased significantly to a total of 19,541 tons. In 2017 the total import of HS Code 841510 amount increased to a total of 19,737 tons.

Table 2-3: Oman Heating, Ventilation & Air Conditioning (A/C Products) Exporting During the Period (2013-2017)

	2013	2014	2015	2016	2017	AGV
Value USD (000)	54	0	107	0	2,957	623.60
Weight in Ton	16	0	8	0	859	176.6

Product: 841950 Heat-exchange units (excluding instantaneous heaters, storage water heaters, boilers and equipment without a separating wall)

Source: Trademap.com 841950 HS Code

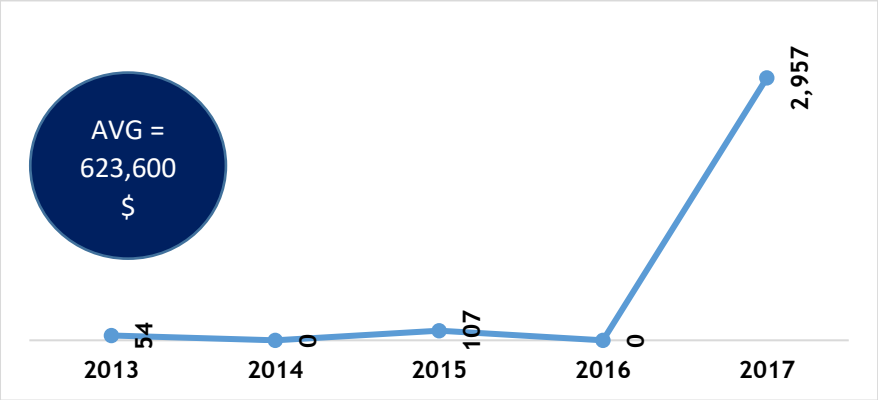


Figure 2-5: HS Code: 841950 - Exporting Value USD (000)

The export for HS Code 841950 amount to 54,000 USD in 2013. In the following year 2014 the total equal 0 USD. In 2015 the export increased to 107,000 USD, in 2016 the total export decreased to equivalent 0 USD. In 2017 the total export of HS Code 841950 increased significantly to a total of 2.9 million USD.

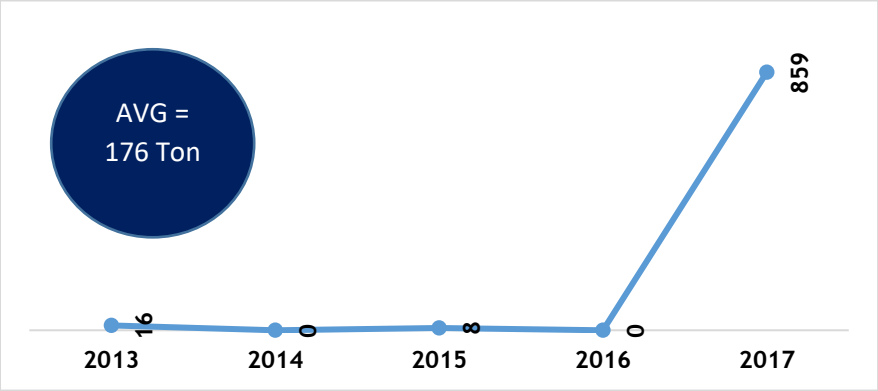


Figure 2-6: HS Code: 841950 - Exporting Weight Ton

The export for HS Code 841950 amount to 16 tons in 2013. In the following year 2014 the total export equivalent 0 tons. In 2015 the export increased to 8 tons, in 2016 the total export decreased to equivalent 0 tons. In 2017 the total export of HS Code 841950 increased to a total of 859 tons.

Table 2-4: Oman Heating, Ventilation & Air Conditioning (A/C Products) Import During the Period (2013-2017)

	2013	2014	2015	2016	2017	AGV
Value USD (000)	30,371	21,099	60,437	53,123	67,257	46,457
Weight in Ton	3,181	2,290	8,473	5,714	6,997	5,331

Product: 841950 Heat-exchange units (excluding instantaneous heaters, storage water heaters, boilers and equipment without a separating wall)

Source: Trademap.com 841950 HS Code

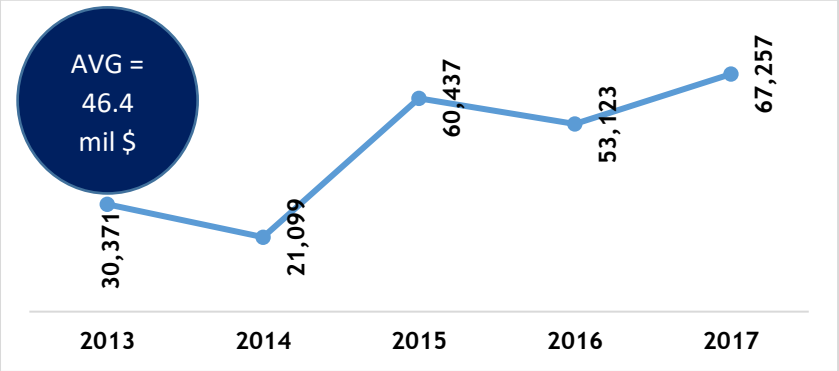


Figure 2-7: HS Code: 841950 - Importing Value USD (000)

The imports for HS Code 841950 amount to 30.3 Million USD in 2013. In the following year 2014 the total import decreased to a total of 21.0 Million USD. In 2015 the import increased significantly to 60.4 Million USD, in 2016 the total import decreased to a total of 53.1 Million USD. In 2017 the total import of HS Code 841950 amount increased to a total of 67.2 Million USD.

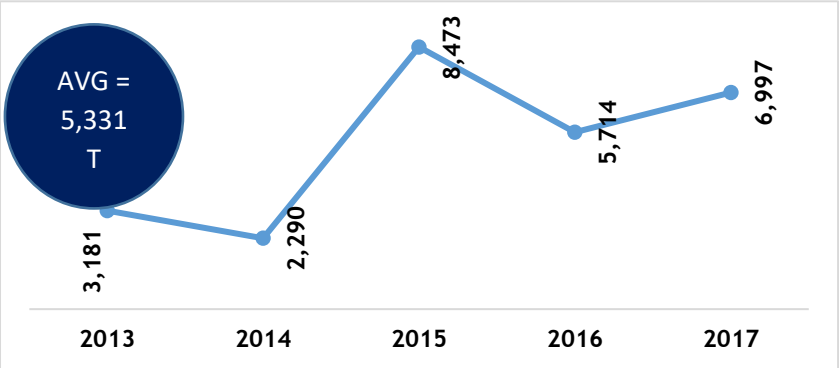


Figure 2-8: HS Code: 841950 - Importing Weight Ton

The imports for HS Code 841950 amount to 3,181 tons in 2013. In the following year 2014 the total import decreased to a total of 2,290 tons. In 2015 the import increased significantly to 8,473 tons, in 2016 the total import decreased to a total of 5,714 tons. In 2017 the total import of HS Code 841950 amount increased to a total of 6,997 tons.

Table 2-5: Oman Heating, Ventilation & Air Conditioning (A/C Products) Exporting During the Period (2013-2017)

	2013	2014	2015	2016	2017	AGV
Value USD (000)	323	0	937	1,038	2,811	1,021.80
Weight in Ton	141	0	228	118	425	182.4

Product: 841590 Parts of air conditioning machines, comprising a motor-driven fan and elements for changing the temperature and humidity, n.e.s.

Source: Trademap.com 841590 HS Code

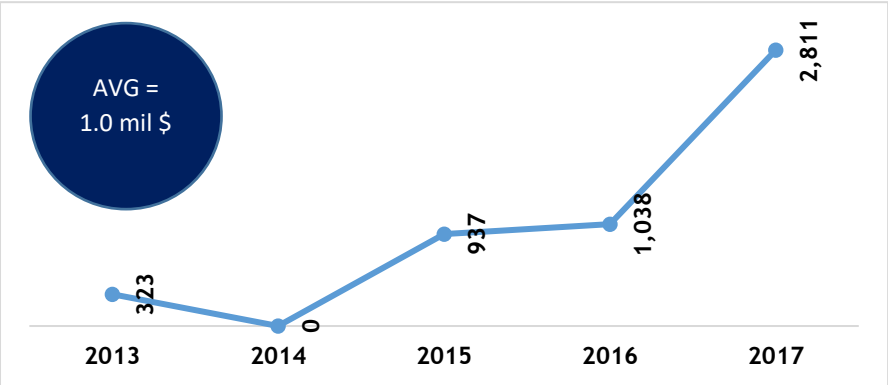


Figure 2-9: HS Code: 841590 - Exporting Value USD (000)

The export for HS Code 841590 amount to 323,000 USD in 2013. In the following year 2014 the total export decreased to equivalent 0 USD. In 2015 the export increased to 937,000 USD, in 2016 the total export increased to a total of 1.0 million USD. In 2017 the total export of HS Code 841590 increased to 2.8 million USD.

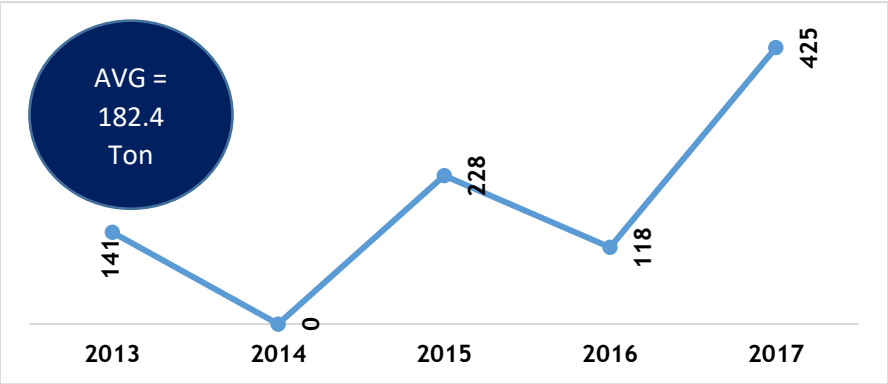


Figure 2-10: HS Code: 841590 - Exporting Weight Ton

The export for HS Code 841590 amount to 141 tons in 2013. In the following year 2014 the total export decreased to equivalent 0 tons. In 2015 the export increased to 228 tons, in 2016 the total export decreased to a total of 118 tons. In 2017 the total export of HS Code 841590 increased to 425 tons.

Table 2-6: Oman Heating, Ventilation & Air Conditioning (A/C Products) Importing During the Period (2013-2017)

	2013	2014	2015	2016	2017	AGV
Value USD (000)	29,711	28,700	24,363	27,767	21,925	26,493
Weight in Ton	3,480	4,093	3,984	3,754	2,805	3,623

Product: 841590 Parts of air conditioning machines, comprising a motor-driven fan and elements for changing the temperature and humidity, n.e.s.

Source: Trademap.com 841590 HS Code

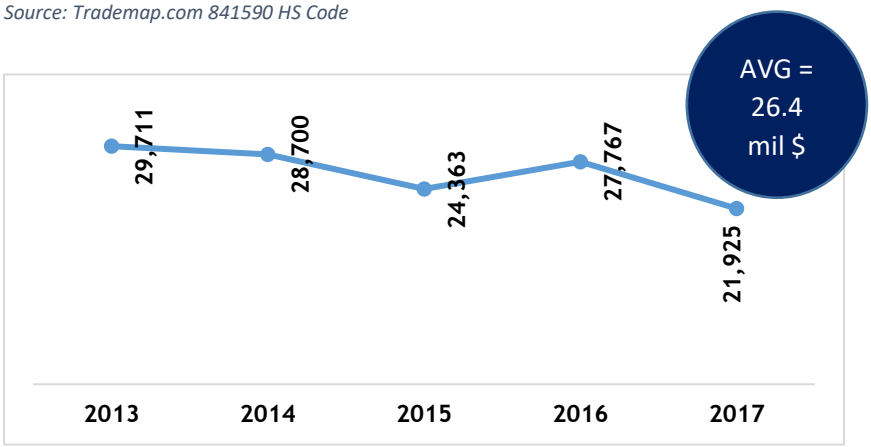


Figure 2-11: HS Code: 841590 - Importing Value USD (000)

The imports for HS Code 841590 amount to 29.7 Million USD in 2013. In the following year 2014 the total import decreased to a total of 28.7 Million USD. In 2015 the import decreased to 24.3 Million USD, in 2016 the total import increased to a total of 27.7 Million USD. In 2017 the total import of HS Code 841590 amount reduced to a total of 21.9 Million USD.

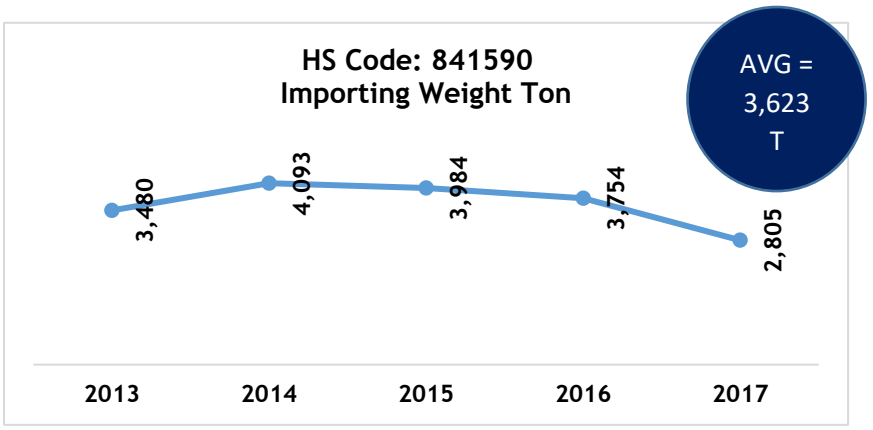


Figure 2-12: HS Code: 841590 - Importing Weight Ton

The imports for HS Code 841590 amount to 3,480 tons in 2013. In the following year 2014 the total import increased to a total of 4,093 tons. In 2015 the import decreased to 3,984 tons, in 2016 the total import decreased to a total of 3,754 tons. In 2017 the total import of HS Code 841590 amount reduced to a total of 2,805 tons.

Table 2-7: Oman Heating, Ventilation & Air Conditioning (A/C Products) Exporting During the Period (2013-2017)

	2013	2014	2015	2016	2017	AGV
Value USD (000)	19	78	140	123	309	133.80
Weight in Ton	9	79	58	14	124	56.8

Product: 761699 Articles of aluminium, n.e.s.

Source: Trademap.com 761699 HS Code

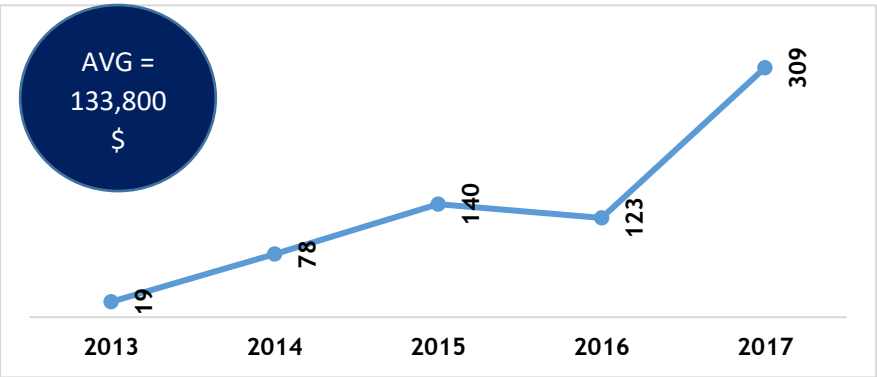


Figure 2-13: HS Code: 761699 - Exporting Value USD (000)

The export for HS Code 761699 amount to 19,000 USD in 2013. In the following year 2014 the total increased to 78,000 USD. In 2015 the export increased to 140,000 USD, in 2016 the total export decreased to a total of 123,000 USD. In 2017 the total export of HS Code 761699 increased significantly to a total of 309,000 USD.

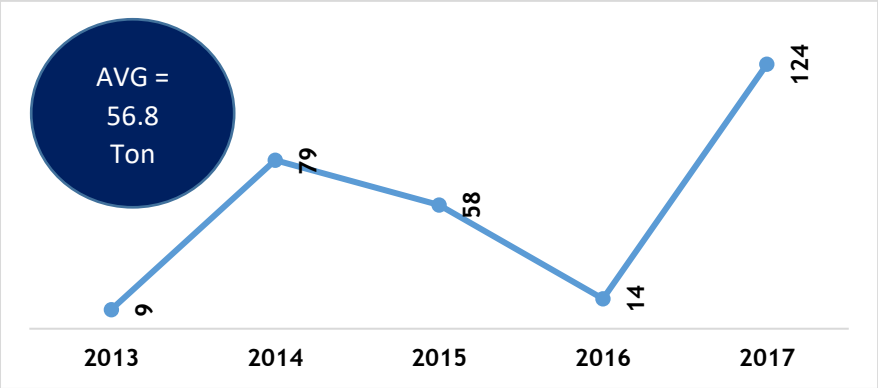


Figure 2-14: HS Code: 761699 - Exporting Weight Ton

The export for HS Code 761699 amount to 9 tons in 2013. In the following year 2014 the total export increased to 79 tons. In 2015 the export decreased significantly to 58 tons, in 2016 the total export decreased to a total of 14 tons. In 2017 the total export of HS Code 761699 increased to a total of 124 tons.

Table 2-8: Oman Heating, Ventilation & Air Conditioning (A/C Products) Import During the Period (2013-2017)

	2013	2014	2015	2016	2017	AGV
Value USD (000)	6,477	8,151	10,403	10,768	6,878	8,535
Weight in Ton	1,337	1,750	2,396	2,102	1,481	1,813

Product: 761699 Articles of aluminium, n.e.s.

Source: Trademap.com 761699 HS Code

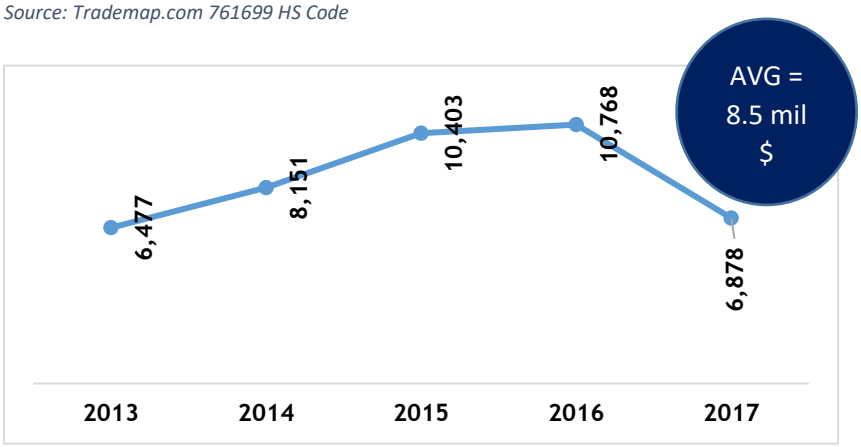


Figure 2-15: HS Code: 761699 - Importing Value USD (000)

The imports for HS Code 761699 amount to 6.4 Million USD in 2013. In the following year 2014 the total import increased to a total of 8.1 Million USD. In 2015 the import increased to 10.4 Million USD, in 2016 the total import increased to a total of 10.7 Million USD. In 2017 the total import of HS Code 761699 amount reduced to a total of 1.4 Million USD.

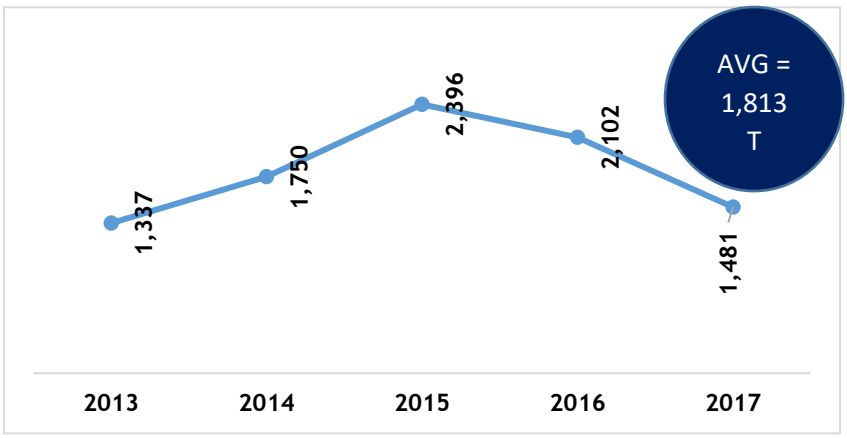


Figure 2-16: HS Code: 761699 - Importing Weight Ton

The imports for HS Code 761699 amount to 1,337 tons in 2013. In the following year 2014 the total import increased to a total of 1,750 tons. In 2015 the import increased to 2,369 tons, in 2016 the total import decreased to a total of 2,102 tons. In 2017 the total import of HS Code 761699 amount reduced to a total of 1,481 tons.

Table 2-9: GCC Heating, Ventilation & Air Conditioning (A/C Products) Imports During the Period (2013-2017)

	2013		2014		2015		2016		2017	
	V (000)	Q (Ton)	V (000)	Q (Ton)	V (000)	Q (Ton)	V (000)	Q (Ton)	V (000)	Q (Ton)
Kuwait	727,925	142,558	614,151	126,286	1,090,129	221,789	879,898	189,017	667,819	158,905
Saudi Arabia	555,976	94,849	780,117	138,838	391,526	65,984	280,249	52,623	559,228	114,462
United Arab Emirates	149,809	23,906	150,599	23,746	179,095	28,645	143,443	24,292	122,784	No Quantity
Qatar	73,639	12,724	79,269	13,263	80,620	13,977	68,514	12,452	73,394	13,061
Bahrain	39,880	7,545	45,254	8,672	46,113	8,382	37,283	7,395	42,154	No Quantity
Total	1,547,229	281,582	1,669,390	310,805	1,787,483	338,777	1,409,387	285,779	1,465,379	286,428

Product: 841510 Window or wall air conditioning machines, self-contained or "split-system"

Source: Trademap.com 841510 HS Code

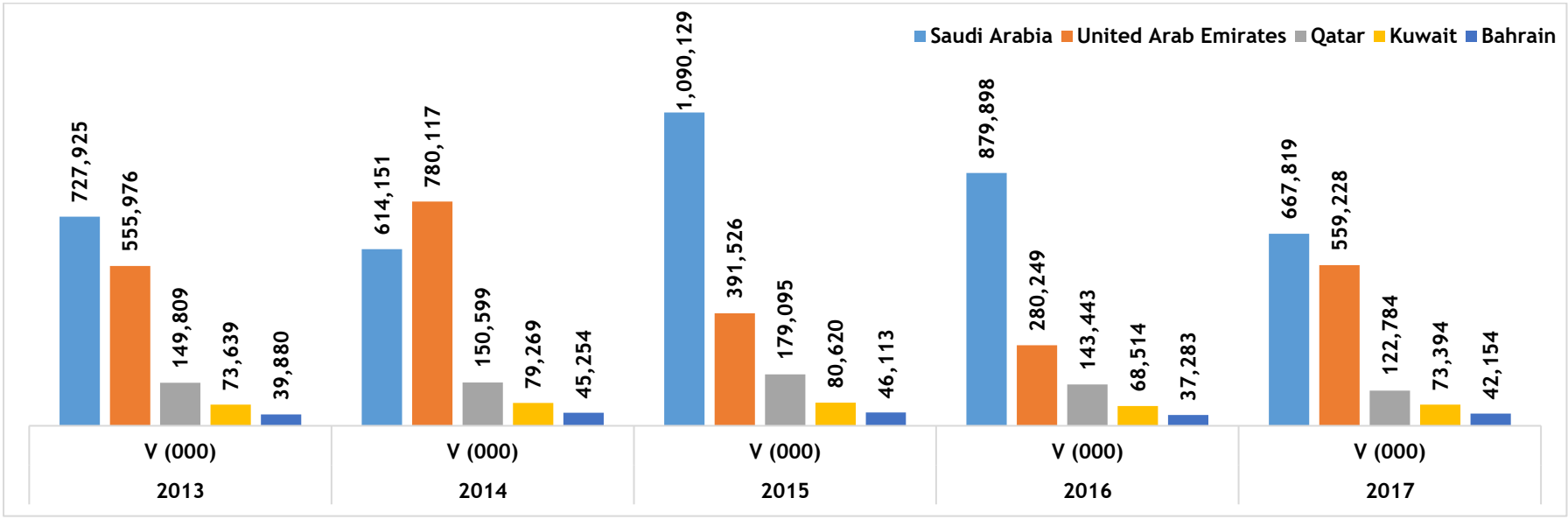


Figure 2-17: HS Code (841510) IMPORTS DURING THE PERIOD (2013-2017) – Value

Table 2-10: GCC Heating, Ventilation & Air Conditioning (A/C Products) Imports During the Period (2013-2017)

	2013		2014		2015		2016		2017	
	V (000)	Q (Ton)	V (000)	Q (Ton)	V (000)	Q (Ton)	V (000)	Q (Ton)	V (000)	Q (Ton)
Kuwait	10,696	621	55,133	3,616	47,820	5,405	177,578	30,514	229,134	35,204
Saudi Arabia	378,385	45,656	201,743	17,241	288,652	43,656	300,543	34,736	229,115	28,584
United Arab Emirates	141,437	9,204	240,715	20,091	261,095	11,053	174,746	9,474	211,532	14,284
Qatar	157,760	16,183	84,785	3,493	81,124	7,452	32,461	2,489	46,410	No Quantity
Bahrain	3,705	249	3,846	217	1,949	121	3,785	295	15,144	No Quantity
Total	691,983	71,913	586,222	44,658	680,640	67,687	689,113	77,508	731,335	78,072

Product: 841950 Heat-exchange units (excluding instantaneous heaters, storage water heaters, boilers and equipment without a separating wall)

Source: Trademap.com 841950 HS Code

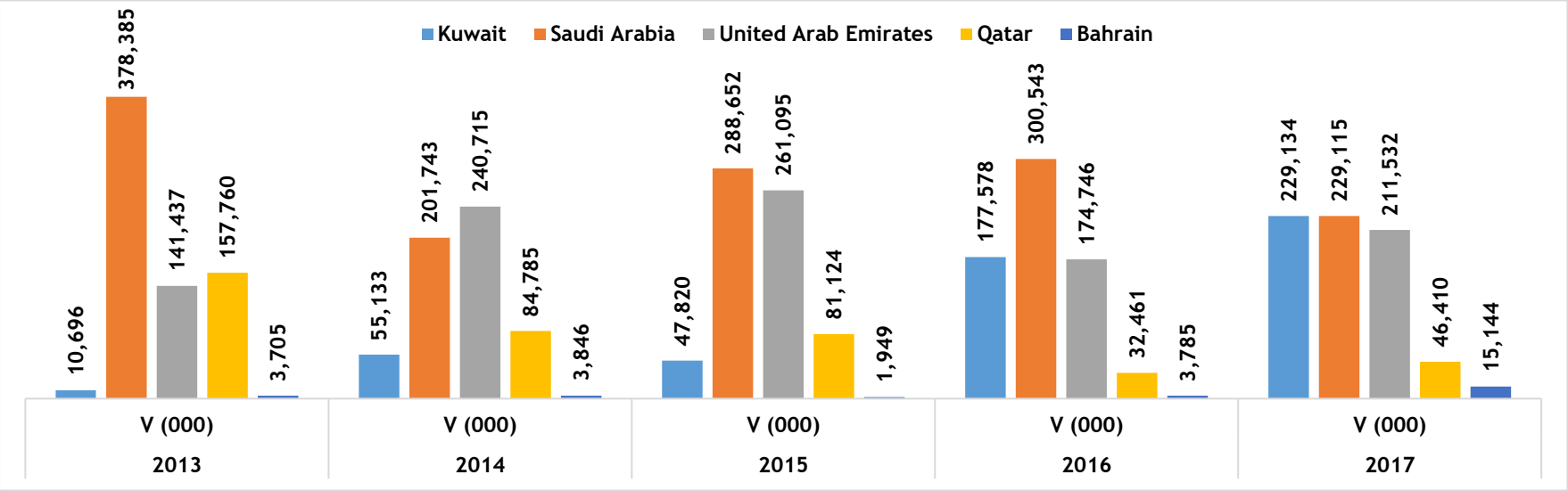


Figure 2-18: HS Code: 841950 -IMPORTS DURING THE PERIOD (2013-2017) - Value

Table 2-11: GCC Heating, Ventilation & Air Conditioning (A/C Products) Imports During the Period (2013-2017)

	2013		2014		2015		2016		2017	
	V (000)	Q (Ton)	V (000)	Q (Ton)	V (000)	Q (Ton)	V (000)	Q (Ton)	V (000)	Q (Ton)
United Arab Emirates	187,376	22,011	201,046	25,527	146,609	18,848	162,208	18,721	198,538	23,568
Saudi Arabia	175,307	21,673	180,823	20,496	208,794	24,807	118,917	15,145	102,300	14,159
Qatar	32,013	6,015	32,730	4,824	37,068	5,333	37,934	4,912	33,063	No Quantity
Kuwait	27,969	2,689	19,781	2,183	24,275	2,761	24,198	2,200	30,288	2,441
Bahrain	18,614	2,698	14,311	1,938	23,437	3,406	20,216	3,257	29,046	No Quantity
Total	441,279	55,086	448,691	54,968	440,183	55,155	363,473	44,235	393,235	40,168

Product: 841590 Parts of air conditioning machines, comprising a motor-driven fan and elements for changing the temperature and humidity, n.e.s.

Source: Trademap.com 841590 HS Code

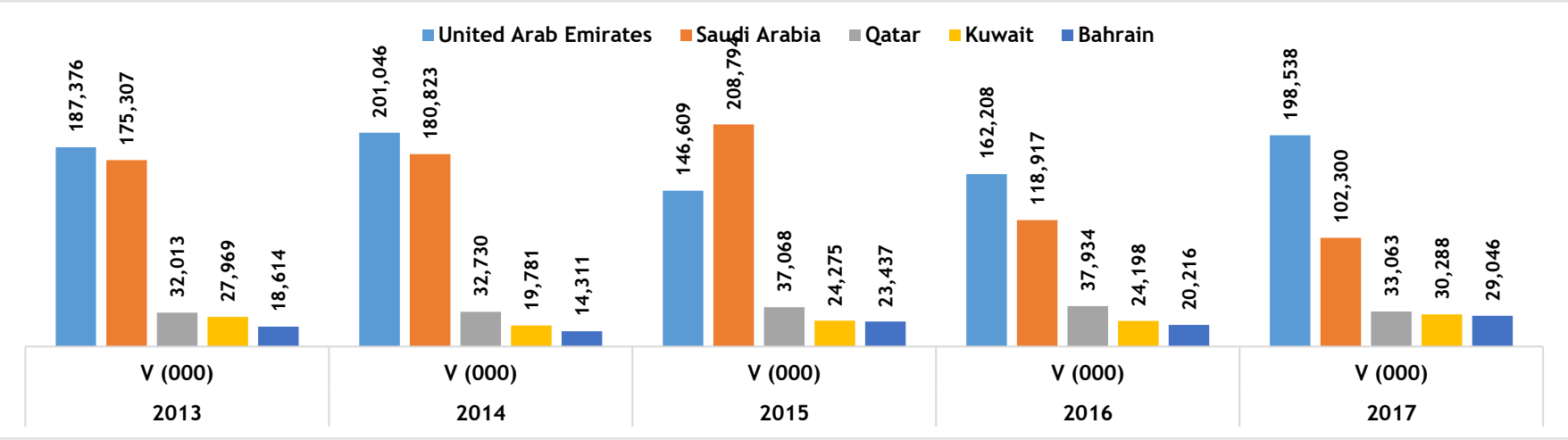


Figure 2-19: HS Code (841590) Imports During the Period (2013-2017) - Value

Table 2-12: GCC Heating, Ventilation & Air Conditioning (A/C Products) Imports During the Period (2013-2017)

	2013		2014		2015		2016		2017	
	V (000)	Q (Ton)	V (000)	Q (Ton)	V (000)	Q (Ton)	V (000)	Q (Ton)	V (000)	Q (Ton)
United Arab Emirates	54,362	10,380	63,947	12,458	50,647	9,566	50,628	8,200	68,226	10,057
Saudi Arabia	54,172	9,134	79,972	14,485	69,759	12,275	51,669	8,688	47,174	7,584
Kuwait	5,177	726	10,717	2,004	42,906	8,019	11,452	1,759	15,712	2,074
Qatar	15,262	3,559	19,148	3,087	18,561	2,981	19,762	3,610	14,872	No Quantity
Bahrain	4,894	1,002	5,304	745	7,039	1,102	6,117	1,156	3,883	No Quantity
Total	133,867	24,801	179,088	32,779	188,912	33,943	139,628	23,413	149,867	19,715

Product: 761699 Articles of aluminium, n.e.s.

Source: Trademap.com 761699 HS Code

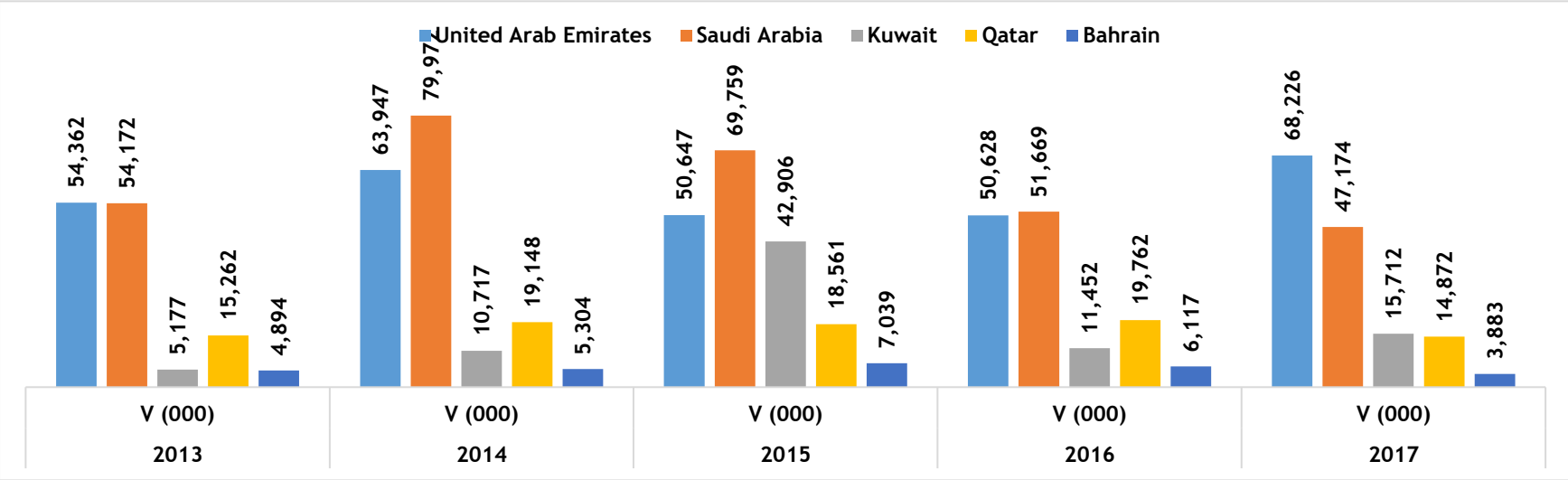
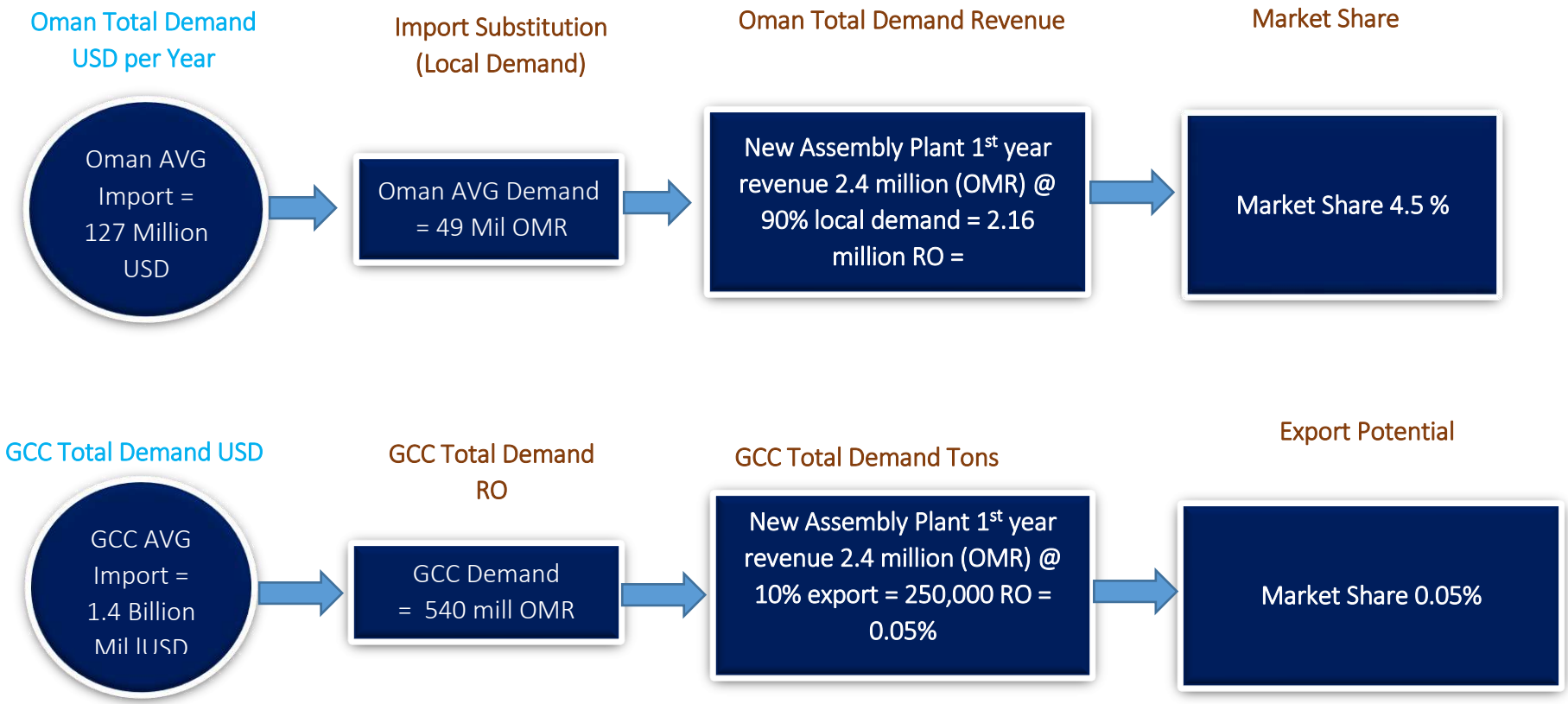


Figure 2-20: HS Code (761699) Imports During the Period (2013-2017) - Value

Supply & Demand



The Oman imports of AC split units is estimated at an average of 49 million RO per year and the new setup will require to achieve a market share of market 4.55

The GCC total imports amounts to 540 million USD and as 10% is aimed for the export market, the new assembly will require to achieve a mere 0.05% of market share.

Technical Evaluation

3.1. Production Stages of Air Conditioners

Process production line

It starts with the installation of the base and the condenser for the air conditioning, then the compressor and the coil, through the plastic fans, which are not corrosion or rust and available in the local market.

Internal unit assembly line

The first stage is the "primary assembly"

Includes base processing, fan installation, welding and evaporator testing, electric circuit installation.

The second phase is «tests»

Includes electrical insulation test, conductivity test, operation and performance test.

The third stage is the "final assembly"

Includes marking, installation of routers, installation of plastic parts, and then packaging phase.

External unit assembly line.

«Primary Collection»

Installation of compressor equipment, Installation of compressor equipment, Installation of compressor equipment.

The second phase

Is the "leak test", which includes helium charging, discharge of the device, re-helium of the station, and then "discharge" in 10 stages.

"Freon Shipping Environment Friendly"

Includes cutting and charging link, welding pipe charging.

Phase of tests

Shipment tests include, performance test, electrical insulation test, operating test,

Stage of "final assembly"

The assembly of the parts includes the sheeting, the assembly of the protective netting, and finally the packaging and packaging after ensuring that there is no leakage of gases or technical defects in the machine.

Manpower for the assembly line

"The production line will initially start with 24 employee's workers, technicians and engineers. It will assemble and produces 12 of air conditioning units per hour, which are delivered for distribution and marketing after all basic and final testing of manufacturing quality and

checking leakage, or technical errors that may result from assembly processes within the production line Different stages ".

3.2. Product Components

The air conditioner's main components include the following:

1. Compressor;
2. Capillary or Expansion Valve;
3. Condenser;
4. Evaporator;
5. Motor;
6. Fan;
7. Control system: Used to control the on/off and operation of the air conditioner, can be divided into electronic or mechanical types. Electronic control involves integrated circuit board unit or remote control device;
8. Refrigerant and copper pipe.

Other components:

1. Four-way valve;
2. Check valve; and
3. Others: e.g., air cleaning module.

Assembly line of air conditioning components

Mechanical parts include

- Compressor.
- Condenser.
- Dried filter.
- Tube.
- Evaporator.

This section is connected with copper pipes and is charged with Freon 22

Mechanical work:

- Compressor: The compressor withdraws the refrigerant gas from the evaporator and the pressure for Freon 22 is between 60 and 70 lb / 2 and press the boost to the condenser.
- Condenser: The condenser cooled the gas under constant pressure to a high pressure liquid and divided into three parts (first roasted laurel, second saturated gas and the third liquid cooled) and often cooled condenser by fan.
- Spinal tube or diffusion valve: The high pressure liquid passes through the capillary tube or the diffusion valve. The fluid can be controlled to the evaporator and the pressure is reduced.
- Evaporator: where the liquid turns into a gas that boils under very low degrees. When the fan propels the air through the cold evaporator, the air cooled and its temperature drops because the cold evaporator condenses the moisture on it. The fan rotates the air

in the room and pulls the air and cooled it into the room. The gas returns to the compressor. The circle repeats.

Electrical parts: include

- Compressor motor.
- fan motor.
- Compressor rotor compressor.
- Captor rotation fan.
- Thermostat.
- The primary key.
- Engine steering air fins.
- Electric heaters.

This part includes circuit and control.

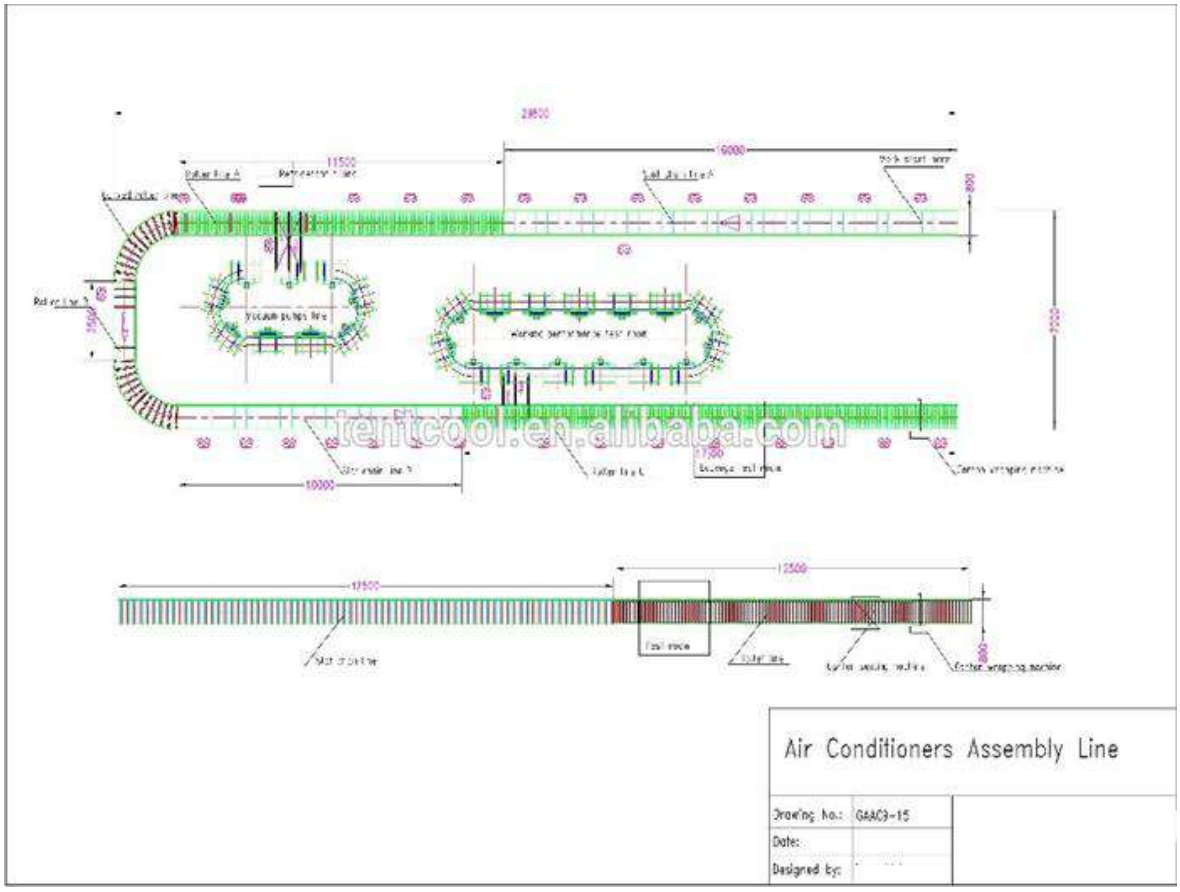
- Compressor motor: It consists of two files, the calendar file and the rotation file.

At startup, both power supply are fed and after the engine takes about 75% of the power

The speed of the calendar files is removed from the circuit and the engine is rotated only by rotation files. · Export files

Calendar of the circuit by the relay or the cabestor.

- Propeller Engine: The fan is characterized by the type of nets that have an x-axis of the front and have a centrifugal feather that rotates the air through the evaporator to the room. The second is a regular feather that rotates the air around the outside-side capacitor and the propeller motor has two-speed or three-speed speeds.
- Capstan Duran Compressor: It is responsible for starting compressor circulation and improving performance.
- Capstan Duran Propeller: It is also responsible for starting fan rotation and improving its performance.
- Thermostat: It controls the temperature of the room by selecting the desired situation in the compressor separator and continue the fan in circulation.
- Key operation key: Through the operation of the air conditioner can be controlled
- It has different situations as follows:
- Ventilation only where the fan works to change the room air.
- Low cooling in which the fan operates at low speed with the compressor.
- High cooling where the fan works at high speed with the compressor.
- Low heating in which the fan operates at low speed with heaters.
- High heating and faithful fan works at high speed with heaters.
- Air-fin flap motor: A small engine that runs when needed, directing the air in the middle of the fins regularly in the room.
- Electric heaters: They are responsible for heating during the winter when choosing the heating mode.



3.3. Raw Material Composition

Air conditioners are made of different types of components metal, plastic and other nontraditional materials are used to reduce weight and cost. Copper or aluminum tubing are critical ingredients in many air conditioner components, provide superior thermal properties and a positive influence on system efficiency. Various components in an air conditioner will differ with the application, but usually they are comprised of stainless steel.

The assembly plant will source the parts and components from the far-east to include China, Taiwan and Malaysia's due to availability and reduced cost.

The air conditioners include a range of air conditioning equipment with the main features of air cooling, heating, dehumidifying, cleaning and ventilation. These air conditioners can be further classified based on the differences in their body type (unitary/integrated or split unit), compressor control (fixed-frequency or variable-frequency), or cooling method (water-cooled or air-cooled).

Product components

The air conditioner's main components include the following:

1. Compressor
2. Capillary or Expansion Valve
3. Condenser
4. Evaporator
5. Motor

6. Fan
7. Control system: Used to control the on/off and operation of the air conditioner, can be divided into electronic or mechanical types. Electronic control involves integrated circuit board unit or remote control device
8. Refrigerant and copper pipe.

Other components:

1. Four-way valve
2. Check valve; and
3. Others: e.g., air cleaning module.

3.4. Manpower

Table 3-1: Direct cost Manpower requirements

DIRECT COST MANPOWER REQUIREMENTS						
	Position	Numbers	Salary Per Month	Salary Per Year	Welfare Expenses @15%	Grand Total
1	GM	1	3,000	36,000	5,400	41,400
2	Operations Manager	1	2,500	30,000	4,500	34,500
3	Supervisor	1	1,200	14,400	2,160	16,560
4	Electrician	2	700	16,800	2,520	19,320
5	Skilled Workers	15	600	108,000	16,200	124,200
6	Semi-Skilled Workers	3	450	16,200	2,430	18,630
7	Cleaners	2	200	4,800	720	5,520
Total		24	8,650	226,200	33,930	260,130

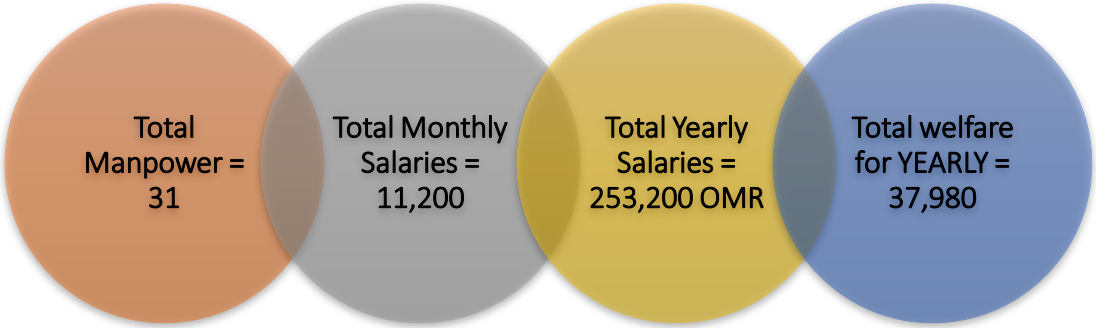
Table 3-2: Indirect cost Manpower requirements

INDIRECT COST MANPOWER REQUIREMENTS						
	Position	Numbers	Salary Per Month	Salary Per Year	Welfare Expenses @15%	Grand Total
1	Accounts & Admin Supervisor	1	600	7,200	1,080	8,280
2	Accounts Purchaser	1	450	5,400	810	6,210
3	Salesman	2	600	14,400	2,160	16,560
4	Security	2	500	12,000	1,800	13,800
5	PRO	1	400	4,800	720	5,520
Total		7	2,550	27,000	4,050	50,370

The manpower requirements are based on company industry experts experience to deem the plant operational.

The Omanization percentage will be a minimum of 70% given the laborers account for 5 employees of the total 42 workforces.

Direct staff include employees responsible for the operational and production of the Bitumen product and indirect staff include office staff.



3.5. Organization Chart

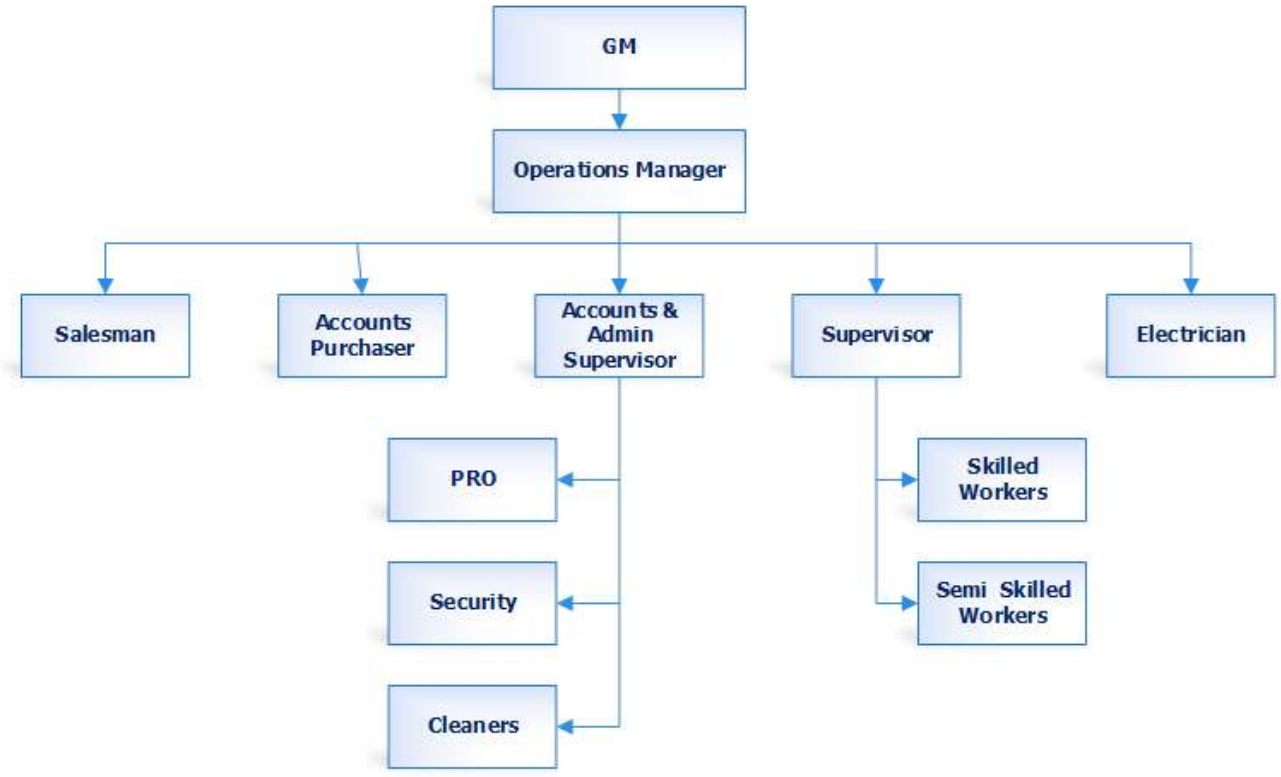


Figure 3-1: Organization chart

3.6. Project Time Frame

Table 3-3: Project time frame

ACTIVITIES	TIME IN MONTHS								
PLANT	1	2	3	4	5	6	7	8	9
• Design									
• Manufacture									
• Purchase									
• Shipment									
• Installation									
• Commissioning									
• Civil work									

The implementation of the project starts initially with the drawing of overall plant layout followed by civil works, procurement, delivery and installation. This requires a time frame of 9 months.

3.7. Product Range

6	AC Split Unit	
7	Fan Coil Units (Commercial AC)	
8	Evaporator & Condenser Coils	 
9	Air Distribution Products (Grills, Diffusers & Dampers)	
10	Pre Insulated Ducts A) Non Decorative (Inside False ceiling) B) Decorative (Exposed Area)	
11	Pre Insulated Pipes	

Source: ***https://www.hvacapprenticeships.org/hvac-system-components/***

The product range of the HVAC systems covers an array of components and parts allowing for diversification of assembly serving the residential, commercial and industrial sectors.

Evaporator Coil

Evaporator Coils are literally the exact opposite of Heat exchangers, serving to cool down any warm air that enters the system. Located within a metal enclosure inside the furnace, they allow for rooms to be cooled down when needed, just like a conventional Air Conditioning unit.

Ducts

When a building is being built, It will often have heating ducts installed in the ceiling or roof, connecting a network of rooms, pipes, and vents together. The ducts are pretty much the highway of the whole system, allowing air to travel to where it's needed.

Heat Exchanger

The heat exchanger is the component inside the Furnace that does the actual heating, turning cool, cold air into warm air incredibly quickly, allowing it to then be blown throughout the building by the furnace. The actual heating is done very much like a hair dryer, using a metal coil that is heated up electrically, warming any air that goes over it.

Refrigerant Lines

As I'm sure you can figure out from the name, Refrigerant lines are tubes, constructed of metal, that carry the coolant liquid to the evaporator coil, and then return the gas back to the condensing unit. They are manufactured out of durable, weatherproof Aluminum or Copper that is designed to work under extreme temperature.

Condensing Unit

Unlike the past two components, the Condensing unit is not part of the Furnace and, instead, it is found on the outside of the building, utilizing a unique coolant gas that is cooled with the outside air, turning it into a liquid that is then run through the Evaporator Coil, causing warm air to be displaced.

Thermostat

Just like with most modern heating systems, the thermostat is the control hub of the whole thing, allowing you to easily change the temperature settings, as well as set up certain temperature profiles. If it's a particularly warm day, all you have to do is press a conveniently placed button and you can relax in the cool breeze.

Vents

Vents connect to the ducts that we mentioned above and, while they are mainly found in the ceiling, it's not uncommon to find them along the walls. As chilled or heated air travels along the ducts, the vents allow it to escape into the rooms where it is needed.

Financial Analysis

4.1. Cost of Investment Capex

The total cost of Main machinery amounts to 397,000 /RO sourced from a local machinery supplier.

Building cost is costed at minimum with a contingency of 3% for reasons of price fluctuation in construction material cost.

The total cost of vehicles amounts to 51,000 /RO source from a local vehicle supplier.

Si. No.	Description	Quantity	Cost Per Unit OMR	Total Cost OMR
	Main Plant & Machinery			
A1	pre-assembly line			77,000
A2	vacuum line			50,000
A3	test line			50,000
A4	packing line			65,000
A5	Brazing machine			20,000
A7	Flaring Machine			10,000
A8	Coil Bending Machine			15,000
A9	Nitrogen Flushing Machine			15,000
A10	Welding, cutting and fitting equipment			15,000
A11	Electrical Parameter Tester			25,000
A12	Pallet Transfer System			55,000
			Sub Total	**397,000**
	GRAND TOTAL			**397,000.00**
	Equipment Cost			
	Packing ,Forwarding ,Insurance, Freight			50,000
	Erection and Installation			65,000
	Cost of Transformer			15,000
	Molds and Assembly			7,500
	Total			**137,500**
	Building			
B1	Land@ Baiza 0.250 /M2 + 10% registration expenses	2000	0.25	500
B2	Work shed @ RO 5/500 sq/ft	1500	5.5	8,250
B3	Boundary wall	2000	25.51	51,020
B4	Office @ Ro 6/800 sq.ft.	500	60	30,000
B5	Security office and Gate			20,000
B6	Staff room and Toilet			45,000
B7	Laboratory Room @ Ro5.500/- sq.ft.	800	5.5	4,400
B8	Land development			20,000
B12	Generator Room			50,000
	Sub Total			**229,170**
			Contingency @ 3%	6,875
	Total Cost			**236,045**

Si. No.	Description	Quantity	Cost Per Unit OMR	Total Cost OMR
	Vehicles			
1c	Car Pick Up	2	8000	16,000
1d	Company Vehicle	5	7000	35,000
Total Transportation Vehicle Cost				**51,000**
	Office Furniture & Equipment			
1a	Computer ,Printer ,UPS ,Fax,			20,000.00
			Total	20,000.00
1b	Furniture Desk & Chairs			10,000.00
1c	Electrification & Air Conditioning			20,000.00
1e	Misc			10,000.00
Total				**40,000.00**
Grand Total				**744,045.10**

4.2. Investment Cost

Si.No.	Investment Cost	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
1a	Plant	397,000										
	Equipment	137,500										
1a	Building	236,045										
1a	Vehicles	51,000						51,000				
1a	Computers	20,000				20,000						
1a	Office Furniture & Equipment	40,000							40,000			
Total Investment Cost (Fixed Assets)		881,545	-	-	-	20,000	-	51,000	40,000	-	-	-
	Acc. Cost	881,545	881,545	881,545	881,545	901,545	901,545	952,545	992,545	992,545	992,545	992,545

Manpower

DIRECT COST MANPOWER REQUIREMENTS						
Si.No	Position	Numbers	Salary Per Month	Salary Per Year	Welfare Expenses @15%	Grand Total
1	GM	1	3,000	36,000	5,400	41,400
2	Operations Manager	1	2,500	30,000	4,500	34,500
3	Supervisor	1	1,200	14,400	2,160	16,560
4	Electrician	2	700	16,800	2,520	19,320
5	Skilled Workers	15	600	108,000	16,200	124,200
6	Semi Skilled Workers	3	450	16,200	2,430	18,630
7	Cleaners	2	200	4,800	720	5,520
Total		25	8,650	226,200	33,930	260,130

INDIRECT COST MANPOWER REQUIREMENTS						
Si.No	Position	Numbers	Salary Per Month	Salary Per Year	Welfare Expenses @15%	Grand Total
1	Accounts & Admin Supervisor	1	600	7,200	1,080	8,280
2	Accounts Purchaser	1	450	5,400	810	6,210
3	Salesman	2	600	14,400	2,160	16,560
4	Security	2	500	12,000	1,800	13,800
5	PRO	1	400	4,800	720	5,520
Total		7	2,550	27,000	4,050	50,370

The manpower requirements are based on company industry experts experience to deem the plant operational.

The Omanization percentage will be a minimum of 90% given the expats account for 3 semi-skilled workers employees of the total 32 workforces.

Direct staff include employees responsible for the operational assembly of the AC units and indirect staff include office staff.

4.3. Profit & Loss

Particulars	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Capacity	35%	45%	55%	65%	75%	85%	90%	90%	90%	90%
Grand Total Revenue OMR	2,494,800	3,207,600	3,920,400	4,633,200	5,346,000	6,058,800	6,415,200	6,415,200	6,415,200	6,415,200
Cost of Revenue (Direct Cost)										
Assembly Parts	1,613,739	2,074,807	2,535,875	2,996,943	3,458,012	3,919,080	4,149,614	4,149,614	4,149,614	4,149,614
Manpower	260,130	267,934	275,972	284,251	292,779	301,562	310,609	319,927	329,525	339,411
Utilities	39,690	51,030	62,370	73,710	85,050	96,390	102,060	102,060	102,060	102,060
Maintenance	149,688	192,456	235,224	277,992	320,760	363,528	384,912	384,912	384,912	384,912
Total Direct Cost	2,063,247	2,586,227	3,109,441	3,632,896	4,156,600	4,680,560	4,947,195	4,956,513	4,966,111	4,975,996
Gross Profit	431,553	621,373	810,959	1,000,304	1,189,400	1,378,240	1,468,005	1,458,687	1,449,089	1,439,204
Indirect Expenses										
Depreciation	(74,362)	(74,362)	(74,362)	(74,362)	(74,362)	(74,362)	(74,362)	(74,362)	(74,362)	(74,362)
Manpower Indirect	(50,370)	(51,881)	(53,438)	(55,041)	(56,692)	(58,393)	(60,144)	(61,949)	(63,807)	(65,721)
Warranty Expence @ 3% of Revenue	(74,844)	(96,228)	(117,612)	(138,996)	(160,380)	(181,764)	(192,456)	(192,456)	(192,456)	(192,456)
Marketing, Adv & Promotion @ 7% of Revenue	(174,636)	(224,532)	(274,428)	(324,324)	(374,220)	(424,116)	(449,064)	(449,064)	(449,064)	(449,064)
Lease Office and Stores	(6,000)	(6,000)	(6,000)	(6,000)	(6,000)	(18,000)	(18,000)	(18,000)	(18,000)	(18,000)
Telephone Internet & Fax	(1,500)	(2,000)	(2,500)	(3,000)	(3,500)	(4,000)	(4,500)	(5,000)	(5,500)	(6,000)
Audit Charges	(1,500)	(2,000)	(2,500)	(3,000)	(3,500)	(4,000)	(4,500)	(5,000)	(5,500)	(6,000)
Waste Disposal	(48,412)	(62,244)	(76,076)	(89,908)	(103,740)	(117,572)	(124,488)	(124,488)	(124,488)	(124,488)
Misc Exp	(25,000)	(26,500)	(28,000)	(29,500)	(31,000)	(32,500)	(34,000)	(35,500)	(37,000)	(38,500)
Insurance	(4,000)	(4,200)	(4,410)	(4,631)	(4,862)	(5,105)	(5,360)	(5,628)	(5,910)	(6,205)
Pre-Operating Expenses	(67,500)									
Total Expenses	(528,124)	(549,948)	(639,326)	(728,762)	(818,257)	(919,812)	(966,875)	(971,448)	(976,088)	(980,797)
PBIT/PBT										
PBIT	(96,571)	71,426	171,633	271,542	371,143	458,428	501,130	487,239	473,002	458,406
Finance Interest Main Loan	(37,025)	(29,620)	(22,215)	(14,810)	(7,405)	-	-	-	-	-

Particulars	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Finance Interest O/Draft W. Capital	(16,737)	(13,390)	(10,042)	(6,695)	(3,347)	-	-	-	-	-
PBT	(150,333)	41,806	149,418	256,732	363,738	458,428	501,130	487,239	473,002	458,406
Income Tax @ 15%	-	(6,271)	(22,413)	(38,510)	(54,561)	(68,764)	(75,169)	(73,086)	(70,950)	(68,761)
PAT	(150,333)	35,535	127,005	218,222	309,178	389,664	425,960	414,153	402,051	389,645

The projections reveal the project will incur a net loss of 150,333/RO in the first year of operation and a marginal profit of 35,535 OMR in the 2nd year mainly due to the lower capacity utilization of 35% in year 1, 45% in year 2. The profitability is improved in the 3nd year of operation mainly due to the increase in capacities to 55% resulting in a net profit of 127,005 /RO and net profit is predicted to increase in excess of 218,222/RO in the 4th year with a revenue of 309,178 RO in the 5th year and from then onwards the net profit will average in the region of 375,000 RO per year.

4.4. Capacity Utilization

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Capacity Level %	**35%**	**45%**	**55%**	**65%**	**75%**	**85%**	**90%**	**90%**	**90%**	**90%**
Total No. of Combined Units (2 Ton & 1.5 Ton)	11,340	14,580	17,820	21,060	24,300	27,540	29,160	29,160	29,160	29,160
2 Ton units	70% of Production Capacity									
Production Output No. of Units	7,938	10,206	12,474	14,742	17,010	19,278	20,412	20,412	20,412	20,412
Revenue OMR	1,984,500	2,551,500	3,118,500	3,685,500	4,252,500	4,819,500	5,103,000	5,103,000	5,103,000	5,103,000
1.5 Ton units	30% of Production Capacity									
Production Output No. of Units	3,402	4,374	5,346	6,318	7,290	8,262	8,748	8,748	8,748	8,748
Revenue OMR	510,300	656,100	801,900	947,700	1,093,500	1,239,300	1,312,200	1,312,200	1,312,200	1,312,200
Grand Total Revenue OMR	**2,494,800**	**3,207,600**	**3,920,400**	**4,633,200**	**5,346,000**	**6,058,800**	**6,415,200**	**6,415,200**	**6,415,200**	**6,415,200**

The capacity utilisation will start with 35% in year of operation and is forecasted to increase gradually by 10% y-o-y, 1st year output amounts to 11,340 Units and reaching a capacity of 29,160 units in the 7th year of operation.

The 2 ton units will account for 70% of the total assembly output target mainly for the local market; this production output in year 1 will produce 7,938 units and will generate a revenue of 1.9 million RO and due to capacity increase no AC units will reach an optimum of 20,412 units in year 7 revenues of 5.1 million RO is forecasted to be achieved.

The 1.5 ton units will account for 30% of the total assembly output target mainly for the local market; this production output in year 1 will produce an output of 3,402 units and will generate a revenue of 510,300 RO and due to capacity increase optimum no of units will reach 8,748 units in year 7 and generate are revenue of 1.3 million RO is forecasted to be achieved.

Field survey at local distributers and agents revealed the 2.0 ton A/C unit holds 70% of the preference from customers and respectively the 1.5 ton accounts for 30%.

4.5. Cash Flow

Particulars	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Operating Activity											
Profit Before Tax PBT		(150,333)	41,806	149,418	256,732	363,738	458,428	501,130	487,239	473,002	458,406
Depreciation		74,362	74,362	74,362	74,362	74,362	74,362	74,362	74,362	74,362	74,362
Interest on Loan ODB		37,025	29,620	22,215	14,810	7,405	-	-	-	-	-
W. Capital Interest O/draft		16,737	13,390	10,042	6,695	3,347	-	-	-	-	-
Cash Flow Operating Activity	-	(22,209)	159,178	256,037	352,599	448,853	532,790	575,492	561,602	547,364	532,768
Investing Activity											
Purchasing of Fixed Assets	(881,545)	-	-	-	(20,000)	-	(51,000)	(40,000)	-	-	-
Working Capital & Pre-op	(402,243)										
Finance Activity											
Owners Contribution	352,618										
Pre-Op Owner Contribution	67,500										
Debt Loan	528,927										
Working Capital Overdraft	334,743										
ODB Loan Payment											
Loan Payment		(105,785)	(105,785)	(105,785)	(105,785)	(105,785)	-	-	-	-	-
Interest		(37,025)	(29,620)	(22,215)	(14,810)	(7,405)	-	-	-	-	-
Commercial Loan WC											
Loan Payment		(66,949)	(66,949)	(66,949)	(66,949)	(66,949)	-	-	-	-	-
Interest		(16,737)	(13,390)	(10,042)	(6,695)	(3,347)	-	-	-	-	-
Tax paid		-	-	(6,271)	(22,413)	(38,510)	(54,561)	(68,764)	(75,169)	(73,086)	(70,950)
Sub Total	1,283,788	(226,496)	(215,744)	(211,262)	(216,652)	(221,996)	(54,561)	(68,764)	(75,169)	(73,086)	(70,950)
Net Cash Flow	402,243	(248,705)	(56,566)	44,775	115,947	226,857	427,229	466,728	486,432	474,278	461,818
Open Cash equivalents	-	402,243	153,538	96,972	141,747	257,695	484,552	911,781	1,378,509	1,864,941	2,339,219

Particulars	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Closing Cash Equivalents	402,243	153,538	96,972	141,747	257,695	484,552	911,781	1,378,509	1,864,941	2,339,219	2,801,037

The cash flow is showing positive of 402,243 RO in year 1 and throughout the period of 10 years as cash flow is projected to be positive.

4.6. Balance Sheet

Particulars	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Current Assets											
Cash & Cash Equivalents	402,243	153,538	96,972	141,747	257,695	484,552	911,781	1,378,509	1,864,941	2,339,219	2,801,037
Working capital		-	-	-	-	-	-	-	-	-	-
Sub Total	402,243	153,538	96,972	141,747	257,695	484,552	911,781	1,378,509	1,864,941	2,339,219	2,801,037
Non-Current Assets											
Fixed Assets	881,545	807,183	732,821	658,458	604,096	529,734	506,372	472,009	397,647	323,285	248,923
Sub Total	881,545	807,183	732,821	658,458	604,096	529,734	506,372	472,009	397,647	323,285	248,923
Total Assets	**1,283,788**	**960,721**	**829,793**	**800,206**	**861,791**	**1,014,286**	**1,418,153**	**1,850,519**	**2,262,588**	**2,662,504**	**3,049,960**
Liabilities											
Current liabilities											
Loan (Short Term) ODB	528,927	105,785	105,785	105,785	105,785				-	-	-
Loan Short Term WC ODB	334,743	66,949	66,949	66,949	66,949			-	-	-	-
Provision for taxation		-	6,271	22,413	38,510	54,561	68,764	75,169	73,086	70,950	68,761
Total current liabilities	863,670	172,734	179,005	195,147	211,244	54,561	68,764	75,169	73,086	70,950	68,761
Loan Long Term ODB		317,356	211,571	105,785	-	-	-	-	-	-	-
Long term ODB w.c.loan		200,846	133,897	66,949	-	-	-	-	-	-	-
Total current liabilities	**-**	**518,202**	**345,468**	**172,734**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Shareholders											
Shareholders Capital	420,118	420,118	420,118	420,118	420,118	420,118	420,118	420,118	420,118	420,118	420,118
Legal Reserve											
Profit & Loss Account		(150,333)	(114,798)	12,207	230,429	539,607	929,271	1,355,231	1,769,384	2,171,436	2,561,081
Total equity	**420,118**	**269,785**	**305,320**	**432,325**	**650,547**	**959,725**	**1,349,389**	**1,775,349**	**2,189,502**	**2,591,554**	**2,981,199**
Total Liabilities	**1,283,788**	**960,721**	**829,793**	**800,206**	**861,791**	**1,014,286**	**1,418,153**	**1,850,519**	**2,262,588**	**2,662,504**	**3,049,960**

4.7. Payback Period

Appraisal on Equity Investment											
Particulars	Investment	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Yearly Cash flow (OMR '000)	(352,618)	(248,705)	(56,566)	44,775	115,947	226,857	427,229	466,728	486,432	474,278	461,818
IRR	23.67%										
NPV @ EQUITY	698,182										
Pay Back period	4	Years	26	Months							

Appraisal on Total Investment											
Particulars	Investment	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Yearly Cash flow (OMR '000)	(1,283,788)	(105,895)	78,839	172,776	236,543	340,047	427,229	466,728	486,432	474,278	461,818
IRR	13.18%										
NPV @ WACC	255,168										
Pay Back period	4	Years	32	Months							

Cost		
Owners' Equity	15.00%	40.00
Finance	7.00%	60.00
Total		100.00
Weighted Average Cost	10.20%	

The IRR on total investment is resulting in 13.18%,

NPV results in 255,168 /RO & payback period is 6 years and 7 months.

4.8. Depreciation

Si.No	Particulars	Amount	Years	Percentage	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
1a	Plant	397,000	10.00	10%	39,700	39,700	39,700	39,700	39,700	39,700	39,700	39,700	39,700	39,700

1b	Building	236,045	20.00	5%	11,802	11,802	11,802	11,802	11,802	11,802	11,802	11,802	11,802	11,802
1c	Vehicles	51,000	5	20%	10,200	10,200	10,200	10,200	10,200	10,200	10,200	10,200	10,200	10,200
1d	Computers	20,000	3.00	33%	6,660	6,660	6,660	6,660	6,660	6,660	6,660	6,660	6,660	6,660
1e	Office Furniture & Equipment	40,000	6.67	15%	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
Total		744,045	Total Depreciation		74,362	74,362	74,362	74,362	74,362	74,362	74,362	74,362	74,362	74,362
	Accumulated depreciation				74,362	148,725	223,087	297,449	371,811	446,174	520,536	594,898	669,260	743,623
	Net book value				807,183	732,821	658,458	604,096	529,734	506,372	472,009	397,647	323,285	248,923

4.9. Raw Material Cost

Raw Material Cost 2.0 Ton Units

Si. No	Description	Cost for 2 Ton units	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
1a	Compressor	20	20	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
1b	Condenser	40	40	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
1c	filters	3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
1d	copper pipes	9	9	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
1e	Evaporator	25	25	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
1f	Compressor motor	7	7	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
1g	fan motor	5	5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
1h	indoor cover	10	10	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1i	outdoor cover	9	9	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
1j	Captor rotation fan	6	6	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
1k	Electric heaters	10	10	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1l	Thermostat	3	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
1m	The primary key	4	4	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
1n	Engine steering air fins	8	8	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	Total	159.00	1,262,142	1,622,754	1,983,366	2,343,978	2,704,590	3,065,202	3,245,508	3,245,508	3,245,508	3,245,508

Raw Material Cost 1.5 Ton Units

Cost Per Unit OMR												
Si. No	Description		Cost for 1.5 Ton units	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
1a	Compressor		13	13	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
1b	Condenser		26	26	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
1c	filters		1.95	1.95	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
1d	copper pipes		5.85	5.85	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
1e	Evaporator		16.25	16.25	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3	16.3
1f	Compressor motor		4.55	4.55	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
1g	fan motor		3.25	3.25	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
1h	indoor cover		6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
1i	outdoor cover		5.85	5.85	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
1j	Captor rotation fan		3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
1k	Electric heaters		6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
1l	Thermostat		1.95	1.95	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
1m	The primary key		2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
1n	Engine steering air fins		5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
	Total		103	351,597	452,053	552,509	652,965	753,422	853,878	904,106	904,106	904,106	904,106
Grand Total cost per Year				1,613,739	2,074,807	2,535,875	2,996,943	3,458,012	3,919,080	4,149,614	4,149,614	4,149,614	4,149,614

4.10. Pre-Operating Expenses

Si.No	Particulars	Amount
1a	Company formation and legal expenses	15,000.00
1b	Project Report ,Technical assistance ,Civil Plan & Estimates	10,000.00
1c	Travelling expenses	7,500.00
1d	Consultancy	35,000.00
Total		67,500.00

4.11. Working Capital

The working capital for the initial start of the project is mainly for the raw material for a period of 3 months amounting to 229,810 RO and salaries at 2 months amounting to 15,698 RO

Working capital is obtained as an overdraft facility from the banks at the interest rate of 5% over a period of 5 years.

Working Capital Loan

Sl.No	Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
1a	Loan Opening Balance	334,743	267,794	200,846	133,897	66,949
1b	Interest @ 5%	16,737	13,390	10,042	6,695	3,347
1c	Installments	66,949	66,949	66,949	66,949	66,949
1d	Closing Balance	267,794	200,846	133,897	66,949	-

4.12. Source of Finance

Source of finance consists of 40% contribution by owners and remainder 60% is obtained by a loan facility from bank at the interest rate of 7%

Sl.No.	Particular	Percentage	Amount
1a	Owner Contribution	40%	352,618.04
1b	Loan	60%	528,927.06
Total		100%	881,545.10

4.13. Loan Schedule

Si.No.	Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
1a	loan Opening Balance	528,927	423,142	317,356	211,571	105,785
1b	Interest @ 7%	37,025	29,620	22,215	14,810	7,405
1c	Installments	105,785	105,785	105,785	105,785	105,785

1d	Closing Balance	423,142	317,356	211,571	105,785	-

4.14. Utility Costs

Description	Cost Per unit	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Electricity Per Kw	3.500	39,690	51,030	62,370	73,710	85,050	96,390	102,060	102,060	102,060	102,060
Total Utility Cost		39,690	51,030	62,370	73,710	85,050	96,390	102,060	102,060	102,060	102,060

Plant Demand p/hour	Unit	P/Unit Usage
Electricity	KW/hour	0.2

4.15. Rental Lease

Si. No	Description Lease/Rental Premises	Size sq/m	Cost per Month	Cost per Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
1a	Land	2000	0.25	6,000	6,000	6,000	6,000	6,000	6,000	18,000	18,000	18,000	18,000	18,000
2b	land rent after 5 years	2000	0.75	18,000										

4.16. Capacity & Selling Price

Installed Assembly Per Hour/Units	No of Hrs/Per Shift	No of Shifts Per Day	Working Day's Per Month	Working Months Per Year	Total units Per Year
12	9	1	25	12	32,400

Products	Product Name	Unit	quality	Percentage Distribution	Selling Price OMR
A	split unit 2 ton	1	Standard	70%	250.000
B	split unit 1.5 ton	1	Standard	30%	150.000
Total Percentage Distribution				100%	

4.17. Conclusion

- The production capacity in the 1st year is 35% and increases to a capacity of 45% in the 2nd year, thereafter the capacity utilization increases 10% y-o-y to reach 85% capacity utilization in the 6th year& will reached to 90% in the 7th year; these capacity utilizations results in the following revenues:
- 1st year revenue amounts to **2.4 million OMR**
- 2st year revenue amounts to **3.2 million OMR**
- 3rd year revenue amounts to a total of 3**.9 Million OMR**

  Reaching **6.4 Million OMR** in the 10th year.

The above revenue stream reveals the following net profit results:

- The 1st year net profit amounts to **(150,333) OMR**.
- 2nd year net-profit amounts to **35,535 OMR**.
- 3rd year net-profit amounts to **127,005 OMR**.
- 4th year net-profit amounts to **218,222 OMR.**
- 5th year net profit will be in region of **309,178 OMR**.
- 10th year net profit will be in region of **389,645 OMR**

Internal Rate of Return **(IRR) =13.18 %.**

NPV = 255,168 OMR.

Pay Back Period = 6 years 7 month.

(Above is the normal case scenario starting at 35% capacity)

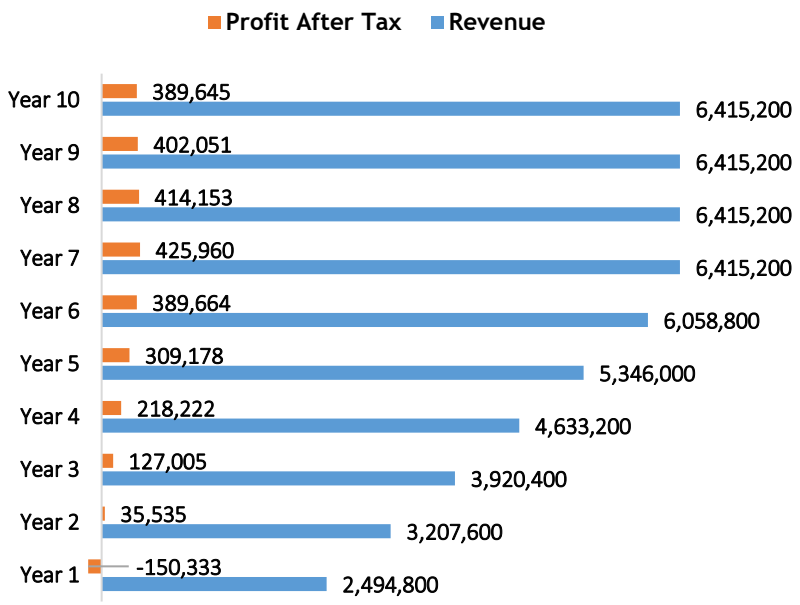


Figure 4-1: Projections Main Scenario - Revenue & Profit After Tax

Financial Analysis Schedule Summary											IRR	NPV	Payback Period
Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	13.18%	255,168 OMR	6 Years & 7 Months
Capacity	35%	45%	55%	65%	75%	85%	90%	90%	90%	90%			
Revenue	2,494,800	3,207,600	3,920,400	4,633,200	5,346,000	6,058,800	6,415,200	6,415,200	6,415,200	6,415,200			
Profit After Tax	(150,333)	35,535	127,005	218,222	309,178	389,664	425,960	414,153	402,051	389,645			

- The project has a viability at medium level mainly due to the competition of major imported brands.
- HVAC products have a good product range and is a necessity in terms of demand quantity locally and regionally
- New products can be developed and introduced in the market; trend is in energy efficiency products for manufacturers and suppliers to produce energy efficient units and systems.
- The demand in GCC region is high, although branded products are the preferred product in the market it is an opportunity and challenge for Oman manufacturing to bring about an Omani product in the HVAC product range.
- The local competition is none existent in Oman and provides an opportunity for this new entrant to establish themselves.
- The net profit is negative in year 1 at (6.03%) & 1.11% in year 2 increases at relatively good levels as it reaches 3.24% in year 3, 4.71% in year 4, 5.78% in year 5 and reaching 6.43% net profit in year 6.
- IRR is acceptable @ 13.18% and payback is acceptable within 6 year & 7 months.