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Submitted to

MINISTRY OF COMMERCE, INDUSTRY AND INVESTMENT PROMOTION
SULTANATE OF OMAN

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PUBLIC ESTABLISHMENT FOR INDUSTRIAL ESTATES
SULTANATE OF OMAN

JUNE 2021

PRE-FEASIBILITY REPORT (DRAFT)

FOR

SETTING UP A POLY PROPYLENE RANDOM CO-POLYMER (PP-R) PIPES AND FITTINGS UNIT IN OMAN

CONTENTS

1. INTRODUCTION

1.1. PROJECT BRIEF

This report relates to a study on the feasibility of setting up a unit for the manufacture of **Polypropylene Random Copolymer (PP-R) pipes & fittings** in Sultanate of Oman.

The following is the Brief illustration of the project:

Name of Product		**Polypropylene Random Copolymer (PP-R) Pipes & Fittings**
Domestic Market Potential (as of 2019)		4,500 Tons/Annum
Export Potential (as of 2019)		Not considered
Annual Capacity of the Project		800 Tons of Pipes 100 Tons of fittings
Total Investment		RO 1,318,000
Equity Investment		RO 527,000
Key Appraisal Criteria:		
IRR on total investment		18.7%
IRR on Equity		27.4%
Payback period of Total Investment		5 years 11 months
Payback period on equity		5 years 2 months
Break Even Point (as % of Capacity)		71%
Cash Break Even Point (as % of Capacity)		59%
Debt Equity Ratio		1.5 : 1
DSCR		2.64
Manpower	Total	30
	Nationals	11

1.2. PROJECT RATIONALE

According to a new study from the Gulf Petrochemicals and Chemicals Association (GPCA), plastics production in the Arabian Gulf region is set to increase by around 3.2% annually until the end of the decade, with Oman's plastics sector enjoying the strongest growth of the region.

The broad application of petrochemical products is capable of helping the economic and industrial output of Oman overall because these raw materials can be moved upstream and turned into higher-cost consumer goods.

The competitive advantage of locating the plant in Oman is the expected lower cost of production. The product can be sold comparatively at a lower price considering the following:

- Major raw materials–Polypropylene is the major item for producing PP-R pipes and fittings is available in Oman.
- The regional and local demand for the products has grown and requires new capacity.
- The product demand is growing in construction activities both commercial and residential buildings.

2. INDUSTRY ANALYSIS

2.1. MACROECONOMIC CONDITIONS

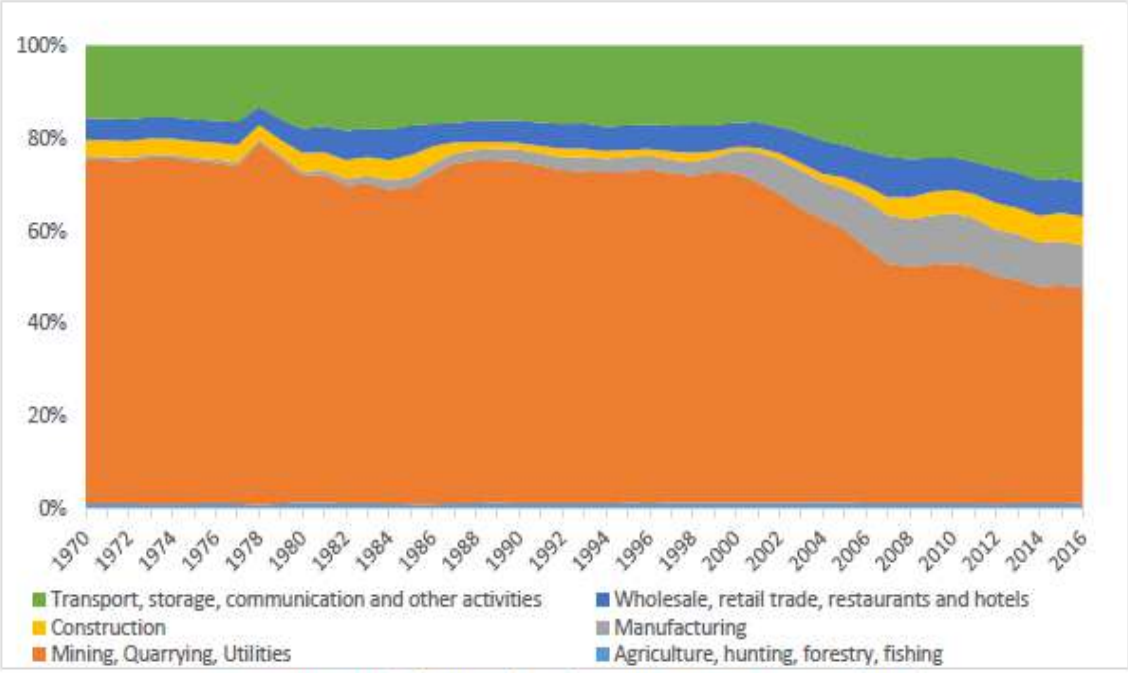
The recently published statistical bulletin from National Centre for Statistics and Information (NCSI) indicates that the GDP at market prices reduced by 15% during Year 2020 when compared to the Year 2019. This is mainly due to the dual impact of slump in oil prices and the COVID – 19 pandemic.

As per the World Bank outlook a revival is expected in 2021 and in 2022 on an average of around 4%. The estimated GDP of Oman considering the past trend, current situation and the expected recovery is illustrated below:

The average price of Oil for 2020 was USD 46/Barrel. We expect this to go up to USD 50/barrel in 2021 and USD 60/barrel in 2022.

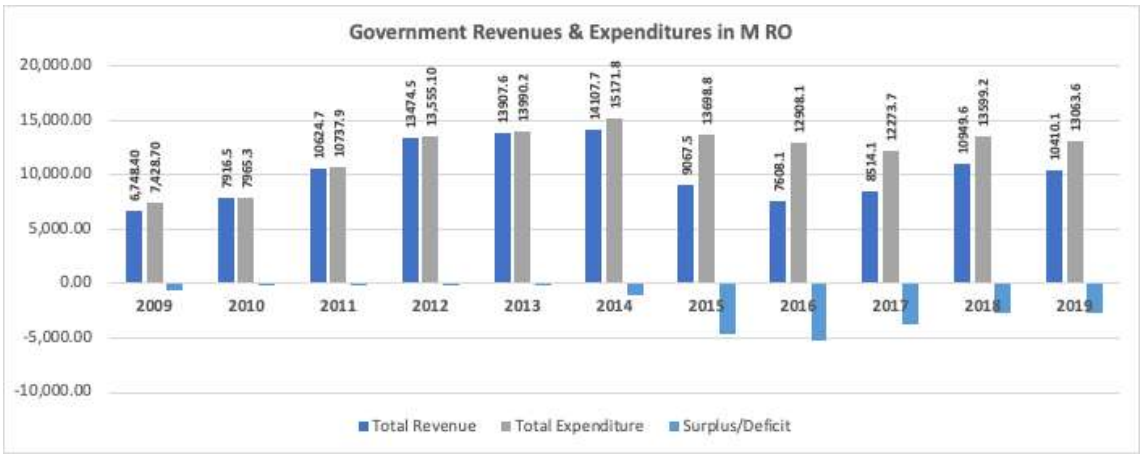
2.2. TREND IN ECONOMIC DIVERSIFICATION

Since the beginning of the millennium our economic activity has significantly moved away from oil as indicated below. The following graph gives data up to 2016. In 2019 Crude Petroleum contributed to 29.11% of GDP.

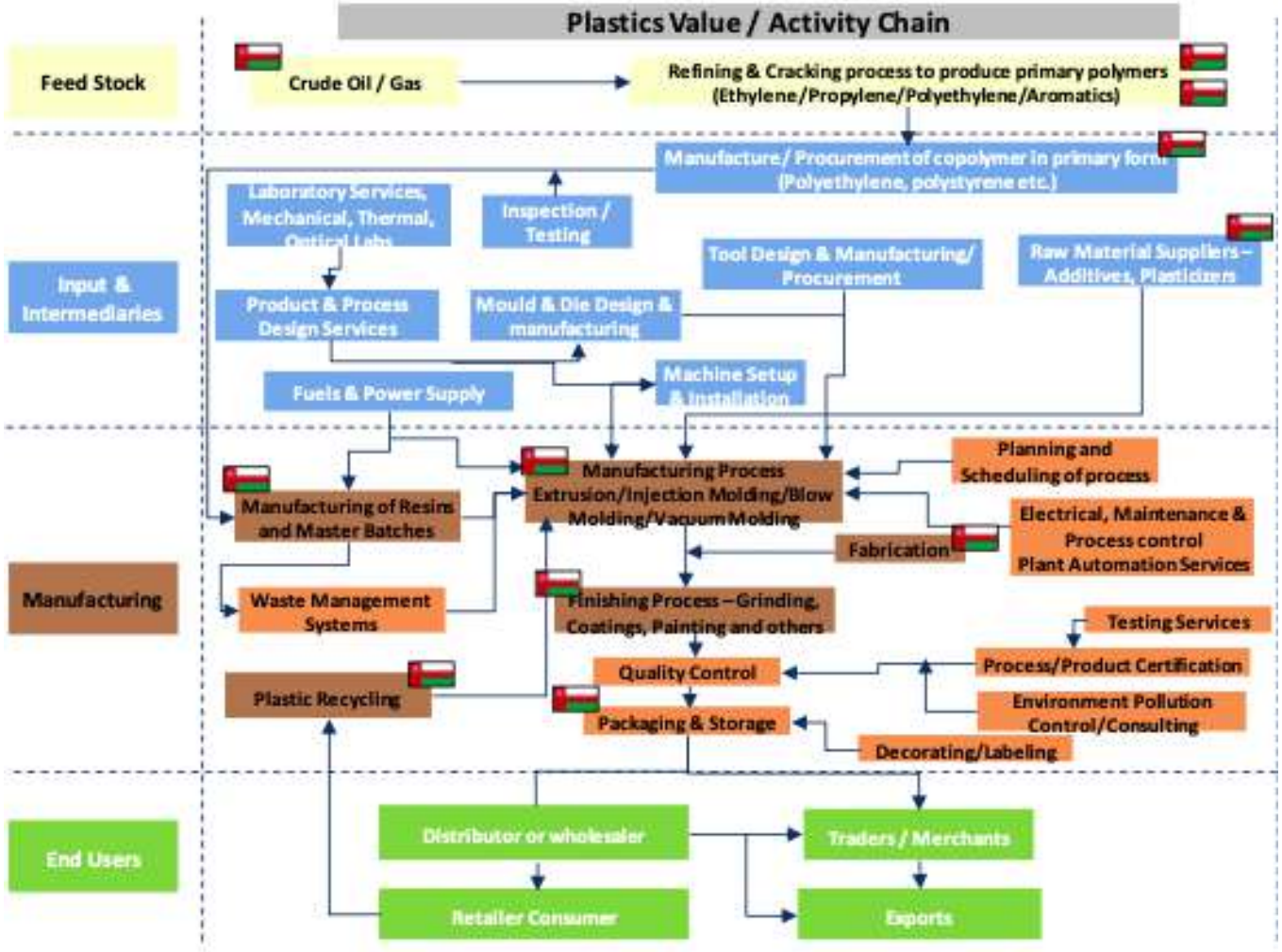


Source: UNIDO elaboration based on UN Statistics Division (2018)

However the Government income is still substantially dependent on Oil sector. The tightening of spending, introduction of VAT and increased revenues from Gas are expected to contain deficits to manageable levels by 2022.

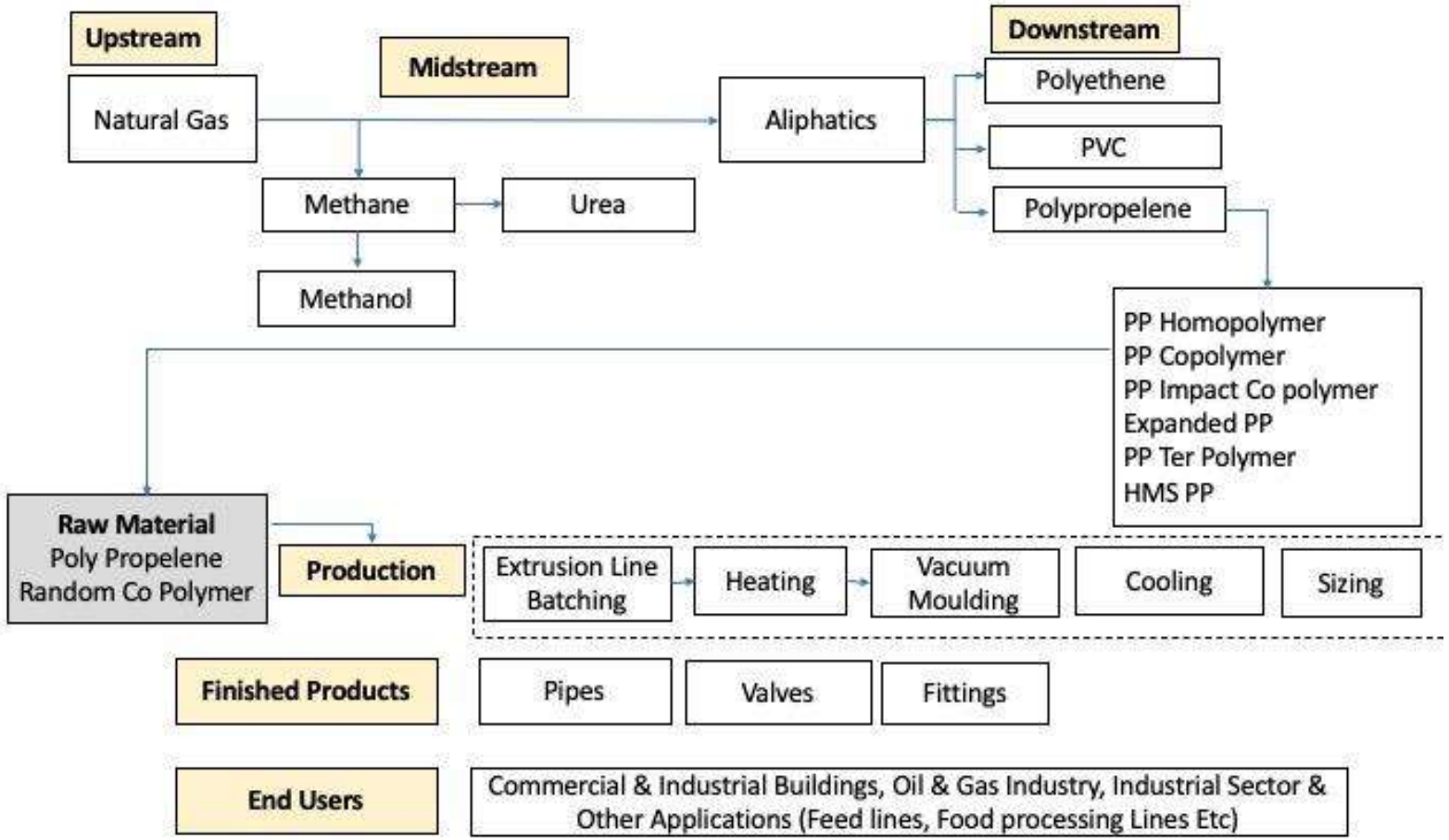


2.3. PLASTIC VALUE ACTIVITY CHAIN IN OMAN



2.4. VALUE-CHAIN OF PPR PIPE & FITTINGS AND USES

The following chart illustrates the overall value chain of PPR Pipes products:



2.5. REGIONAL (GCC) AND LOCAL VALUE-CHAIN

The activity is available in all GCC countries. Poly polypropylene is manufactured in KSA, UAE and Oman.

2.6. VALUE CHAIN IN OMAN

The activity is available in Oman. PP is also manufactured in Oman. Colour master batches are also produced in Oman. The feed stock for producing PP ie Natural Gas is also available in Oman.

2.7. MISSING VALUE CHAIN ACTIVITIES IN OMAN

The equipment for manufacture of PPR tubes is not available in Oman.

3. MARKET ANALYSIS

According to a new study from the Gulf Petrochemicals and Chemicals Association (GPCA), plastics production in the Arabian Gulf region is set to increase by around 3.2% annually until the end of the decade, with Oman's plastics sector enjoying the strongest growth of the region.

The Sultanate's plastics industry has been growing robustly as a result of heavy investments from both the public and private sector in construction and infrastructure projects. This, in turn, fuels demand for plastic products and other industries based on oil-derivatives, including the products of refineries and petrochemicals, which caters to 80 per cent of the Sultanate's Polypropylene Random (PPR) market. The industry experts predict further growth in the sector with the increase in personal consumption of plastics in the region. The following sections provide details about the market aspects.

3.1. PRODUCT & ITS USES

3.1.1. Overview

Polypropylene Random Copolymer (PP-R) Pipe system is produced out of Polypropylene random copolymer referred to as Type III PPR-C (commonly known as PP-R). PP-R pipes and fittings are used in plumbing, mechanical and industrial applications. Following are some of the key aspects of PP-R pipes and fittings:

- Pipes made from PP-R are lightweight, do not corrode, rust, or scale.
- The PP-R pipes require PP-R fittings and such these are to be supplied together to the customers. In other words, to use PP-R pipes, PP-R fittings are also required.
- They are joined by heat fusion for permanent, leak free joints. The method of welding used to join pipes and fittings guarantee that there is no chance for leakage.

- These pipes are designed primarily for use inside the building but may be buried or installed outside also.

The following sections detail the different products that are to be manufactured.

3.1.2. Product Description

Polypropylene is used in double containment systems, chemical piping, and pure water systems. It is chemically resistant to many strong and weak acids. In addition, it is one of the few materials that are recommended for strong bases such as sodium hydroxide. It is not ideal for strong oxidizing acids, aromatics, and chlorinated hydrocarbons.

Polypropylene is a fairly ductile material at ambient temperatures and it demonstrates good impact strength. Polypropylene is available in two grades:

- ✓ Copolymer
- ✓ Homo polymer.

Copolymer polypropylene is a blend of (6%) ethylene and (94%) propylene. Copolymer resins generally exhibit better mechanical strength and offer higher safety factors into a system design. In addition, copolymer PP shows a greater purity level when tested in a static leach test, making it the ideal material for pure water systems.

3.1.3. Key Features

- Polypropylene pipes show high resistance against chemicals.
- Have high electrical insulation properties and are virtually non-conductive.
- It is also chemically inert and highly resistant to acidic and alkaline substances. These properties mean that there is minimal internal buildup of deposits from hard water with dissolved limestone.

- Lower thermal conductivity of Pipe System indicates that heat loss and condensation on the surface are much less than in metallic pipes made of iron, steel or copper.
- Does not allow the formation and growth of algae and bacteria in the surfaces.
- PPRC pipes of the inner surface are smooth because there is a chance of the fluid on the surface of the pipe-like grip.
- Flexible, unbreakable, portable and easy to lay.
- PPRC pipes can be used without any isolation in down light applications.
- PPRC pipe does not interact with materials such as cement.
- High-grade shows high resistance against heat. So used in heating installations at a temperature of 95 °C also can be used safely.
- At 20 ° C at a pressure of 25 ATM, the working life is estimated to be about 50 years.
- High welding performance. So, do not have any resources for narrowing diameter
- Due to the material's high sound insulation value, the noise level of the system is considerably reduced both with particularly high water flow speeds and when water hammers are present.

3.1.4. Product Performance/Advantages

- Increased pressure class with the same dimensioning
- Higher hydraulic capacity with same outer diameter
- Weight reduction (from 14% up to 25%) in pipe production versus regular PP-R
- Higher percentage of smaller pipes in actual installations (percentage depends upon specific design)
- Easier installation
- Existing extrusion and injection molding equipment can be utilized without major changes

- Optimized pipe dimensioning allow higher extrusion speed, resulting in lower production costs
- Greater possibilities to tailor your heating PP-R pipe design
- Enabling special applications such as larger diameter mains for high-rise air conditioning systems
- Compatible with known PP welding procedures
- Fully established in domestic as well as global standards including ISO, ASTM and DIN

3.1.5. Product specifications

Normally products are to conform to PN20, PN25 or PN16 classifications. PN refers to "Pression Nominal", which is the French equivalent of Pressure Nominal. "Pression Nominal" is the rating designator followed by a designation number indicating the approximate pressure rating in bars.

- *1 bar = $1x10^5$ Pa (N/m^2) = 0.1 N/mm^2 = 10,197 kp/m^2 = 10.20 m H_2O = 0.98692 atm = 14.5038 psi (lb_f/in^2)*

The PP-R Pipes and Fittings are manufactured according to specification in the following standards:-

Standards	Specification
DIN 8076	Piping in thermoplastic hoses under pressure. Compression metals pipe fittings.
DIN 8077	Polypropylene (PP) pipes dimensions.
DIN 8078	Polypropylene pipes, General quality features.

3.2. PRODUCT USES & APPLICATIONS

- **Construction/Housing Sector**

The demand for PPR pipe and fittings mainly required in connection with building construction sector:

✓ For Potable water supply installation inside residential complexes, independent houses for drinking water applications

- ✓ Schools, Hospitals, Laboratories
- ✓ Hotels, Resorts, Entertainment parks, Halls, Theatres
- ✓ Chemical Sewage & Drainage systems

- **Oil & Gas Industry**

PP-R Pipes are used to handle much kind of liquids and gases. In general, Oil and gas Industry use thermally insulated steel pipes. Metal pipes are heavy in weight and get corroded in many applications. So the industry faces many issues in installation, transportation and maintenance. Acceptability of PP-R is on the rise in oil and gas industry.

- **Industrial sector**

PP-R piping system finds application in:

- ✓ Liquid Chemicals Flow System,
- ✓ Food Processing Industries.
- ✓ Heating installations and for air-conditioning systems.
- ✓ Compressed Air piping

- **Other Applications**

- ✓ Hot and Cold Potable Water installation
- ✓ Food Processing lines
- ✓ Hydroponics
- ✓ Chiller Systems
- ✓ Chemical Feed Lines
- ✓ Geothermal Systems
- ✓ Industrial Applications
- ✓ Compressed Air and Vacuum Systems
- ✓ Process Water
- ✓ Rainwater Collection,
- ✓ Gray and Reclaimed Water

3.3. TARGET MARKET

The project is proposed to be situated Oman and the target market for the product is considered in Oman, other GCC Countries and leading marble importing countries in Asia. The following sections delineate the past, present and the future demand estimates in the target market.

3.4. INDUSTRY OVERVIEW

3.4.1. Global Scenario

PPR pipe is made of Polypropylene Random Copolymer (PPR-C) type 3, which is approved for the production of pipes according to DIN8078 standards, designed for the transportation of portable hot and cold water distribution system with a really long lifetime.

On the basis of type, the PPR Pipe market is segmented into Composite PPR Pipe, Hot and Cold Water PPR Pipe, and Other. The Hot and Cold Water PPR Pipe segment is expected to account for the larger share of the global market in 2016.

End-users, included in this market are Commercial Building, Residential Building, and Other Application. The Commercial Building application is expected to account for the largest share of the global market in 2016.

The global PPR Pipe market is valued at 5633.2 million US$ in 2020 is expected to reach 10030 million US$ by the end of 2026, growing at a CAGR of 8.5% during 2021-2026 according to 360 Research report.

3.4.2. Major Global Producers

The market for marble is highly competitive in nature owing to the presence of several major players.

Company	Country

1	Zhejiang Weixing New Building Materials	China
2	Ginde	
3	China Lesso	
4	Georg Fischer(GF Piping Systems)	UK
5	Kalde	Turkey
6	Ginde	China
7	AQUA-SCIE	Germany
8	Uponor	India
9	Pipelife	Czech Republic
10	Rifeng	Swedan

3.4.3. Global Trade

The Harmonized Tariff System code is 391722 for Rigid tubes, pipes and hoses of polymers of propylene.The following sections provide an overview of the global trade of the products.

3.4.3.1. Major Global Exporters

Major Exporting countries by quantity, Amount and Value per Ton is given below:

Country	2017			2018			2019		
	Tons '000	*USD '000*	*USD/ Ton*	*Tons '000*	*USD '000*	*USD Ton*	*Tons '000*	*USD '000*	*USD/ Ton*
Germany	55.70	196,064	3,520	56.85	210,886	3,710	54.07	192,190	3,554
Turkey	50.80	108,537	2,137	49.74	106,394	2,139	52.19	107,644	2,062
Poland	29.32	60,883	2,077	33.33	76,508	2,295	33.16	71,405	2,153
China	31.59	87,284	2,763	33.15	95,077	2,868	32.64	93,154	2,854
Italy	18.04	69,296	3,840	20.81	81,508	3,917	22.00	82,248	3,739
Austria	15.93	54,500	3,422	15.44	57,227	3,707	14.69	56,060	3,817
Czech Republic	12.42	40,823	3,286	11.81	39,482	3,343	11.57	37,817	3,269
Russian Federation	5.63	13,003	2,310	7.76	16,699	2,151	9.29	19,940	2,147
Sweden	10.21	27,913	2,735	11.38	31,918	2,805	8.17	27,472	3,363

Portugal	5.05	10,427	2,067	4.85	11,208	2,312	5.32	11,955	2,245
Others	86.00	306,361	3,562	-	326,474		-	304,325	
TOTAL	**320.69**	**975,091**	**3,041**	**NA**	**1,053,381**		**NA**	**1,004,210**	

3.4.3.2. Major Importers

Major Importing countries by Value are given in the following Table:

Country	**2017**			**2018**			**2019**		
	Tons	*USD '000*	*USD/ Ton*	*Tons*	*USD '000*	*USD Ton*	*Tons*	*USD '000*	*USD/ Ton*
Iraq	20,770	44,303	2,133	22,406	47,938	2,140	18,795	34,785	1,851
Germany	13,226	48,005	3,630	15,610	57,118	3,659	15,104	56,594	3,747
Denmark	11,929	48,005	4,024	10,260	32,560	3,173	13,928	30,825	2,213
Trssia	14,721	36,528	2,481	14,266	37,469	2,626	12,747	32,049	2,514
Ukraine	8,027	16,154	2,012	9,244	19,237	2,081	9,524	20,989	2,204
Netherlands	7,520	21,732	2,890	7,456	27,201	3,648	9,440	34,988	3,706
China	12,693	47,991	3,781	10,007	41,979	4,195	9,434	35,817	3,797
France	7,712	20,508	2,659	7,848	25,638	3,267	8,646	24,740	2,861
Czech Republic	8,149	20,569	2,524	9,344	26,308	2,815	8,624	24,400	2,829
Spain	6,545	32,322	4,938	7,456	34,268	4,596	8,367	34,736	4,152
Belgium	7,292	23,709	3,251	7,801	27,480	3,523	8,186	29,220	3,570
Italy	6,793	22,373	3,294	7,555	26,036	3,446	8,052	26,422	3,281
Sweden	6,668	20,113	3,016	6,643	20,693	3,115	7,344	21,745	2,961
USA	5,811	34,007	5,852	6,577	37,142	5,647	7,070	38,072	5,385
Others	Total Qty not available	448,033		Total Qty not available	525,190		Total Qty not available	502,478	
TOTAL		884,352			986,257			947,860	

3.5. DEMAND ESTIMATES FOR PP-R PIPES & FITTINGS

3.5.1. Domestic Demand

The market research indicates that the demand for PP-R product in Oman is met through local production as well as imports. The demand estimate has been arrived based on the assessment of both these supply channels.

3.5.1.1. Local Production

- **Major Manufacturers in Oman**

  Following are the Polypropylene Random Copolymers (PPR) pipes & fittings manufacturers in Oman are given below:

  - Techno Plastic Industry, Rusayl (brand: TECHNO)
  - United Plastics Manufacturing Company, Ma'bela (brand: UPMC, formerly UPTHERM)
  - Eurotherm, Salalah (brand: EUROTHERM)
  - National Plastic Factory, Barka (brand: HOTACE)
  - Amiantit Oman, Rusayl

- **Estimated Local Production**

  The local production estimate is based on the popular machine capacity, the expected hours of working, the number of manufacturers, etc. The detailed illustration follows:

Detail	Remarks	Unit
Standard capacity	0.250	TPH
No. of hours per day	16	Hours
No. of days per year	330	Days
Capacity	1,320	Tons per year
No. of manufacturers	5	Nos.
Expected capacity	6,600	Tons per year
Expected average Capacity Utilization	70%	
Expected annual production / sales	**4,620**	**Tons per year**

It is found that only one company in Oman is manufacturing Pipes of higher size than 63mm.

3.5.1.2. Net Foreign Trade

PP-R Pipes are imported / exported under:

- ✓ HS Code 391722 – Rigid tubes, pipes and hoses of polymers of propylene

3.5.1.3. Import Sources

The following Table details the import source of PP-R products.

- ***HSC 3917220***

Countries	2018			2019			
	Tons	*RO*	*RO/ Ton*	*Tons*	*RO*	*RO/ Ton*	*% of Ton.*
Austria	0.2	1,217	6,473	-	-		0.0%
Belgium	0.0	3	214	5.6	10,846	1,939	4.5%
China	4.6	2,328	504	18.6	9,002	483	15.0%
France	1.4	1,808	1,283	-	-		0.0%
Germany	65.8	186,520	2,836	0.0	106	3,533	0.0%
India	12.7	25,559	2,007	19.6	17,706	902	15.7%
Italy	3.4	7,551	2,200	8.4	12,297	1,457	6.8%
Holland	2.3	21,707	9,542	12.8	30,739	2,402	10.3%
Poland	4.5	4,426	993	-	-		0.0%
Qatar	46.6	16,712	358	11.6	9,133	787	9.3%
Slovenia	10.9	15,028	1,380	-	-		0.0%
Spain	-	-		6.6	26,275	3,965	5.3%
U.A.E.	205.9	343,298	1,667	39.3	53,378	1,359	31.5%
Others	0.7	4,391	6,211	2.0	4,324	2,115	1.6%
Total	**359.0**	**630,548**	**1,756**	**124.7**	**173,806**	**1,394**	**100.0 %**

3.5.1.4. Export

- ***HSC 3917220***

	2018			2019			
Countries	*Tons*	*RO*	*RO/ Ton*	*Tons*	*RO*	*RO/ Ton*	*% of Tons*
Australia	1.9	13,227	7,069	-	-	-	-
Bahrain	49.3	76,704	1,556	-	-	-	-
Djibouti	44.7	36,046	806	39.7	55,699	1,405	4.3%
India	-	-		9.1	3,619	398	1.0%
Iran	-	-		37.3	29,250	785	4.1%
Iraq	125.8	74,342	591	69.4	55,532	800	7.6%
Kuwait	474.1	1,003,588	2,117	243.8	192,135	788	26.5%
Lebanon	82.5	38,672	469	53.0	25,337	478	5.8%
Saudi	18.0	12,756	710	31.0	17,266	557	3.4%
Sudan	4.4	5,800	1,318	34.8	54,688	1,572	3.8%
U.A.E.	650.8	1,012,786	1,556	370.9	612,769	1,652	40.4%
Tanzania	-	-		22.7	6,761	298	2.5%
Others	3.3	7,717	2,368	7.2	2,132	296	0.8%
Total	**1,454.7**	**2,281,638**	**1,568**	**918.8**	**1,055,188**	**1,148**	**100.0%**

3.5.1.5. Summary of Net Import

Details	**2015**	**2016**	**2017**	**2018**	**2019**
	Figures in Tons				
Import	215	338	499	359	125
Export	79	37	1,842	1,455	919
Net Import	135	301	(1,343)	(1,096)	(794)

3.5.1.6. Summary of Import Quantity/Value/Unit Value

Details		Import quantity in Tons				
		2015	**2016**	**2017**	**2018**	**2019**
Import	RO	355,681	443,656	768,258	630,548	173,806
	Tons	215	338	499	359	125
Value per Ton	RO	1,658	1,313	1,540	1,756	1,394

As indicated in the table above the net-foreign trade of PP-R pipes is very limited. This confirms the views of the industry experts who had expressed that the import / export of these types of pipes are limited due to the transportation cost involved with the transport of hollow pipes.

Hence it may be concluded that the domestic demand is predominantly met by local manufacturers. Further details of the local manufacturers their capability and the overall demand estimate based on the industry capacity is provided in the following sections.

3.5.1.7. Estimated Local consumption

- **Consumption by weight (Tons)**

  As illustrated above, with limited net foreign trade, the local production has been considered as the local consumption. Hence,

  - Conservatively, the demand / consumption of rigid PP – R pipes in Oman during 2019 may be pegged at **4,500 tons**.
  - Discussions with the traders indicate that, the consumption of pipes of 20mm- 63mm diameter is estimated to be about 95% of the above i.e., about **4,275 tons** in 2019.

- **Consumption by length (Meters)**

  Consumption of PPR pipes in meters is calculated as below:

  - Weighted average per metre weight of pipes: 0.326 kg / m
  - Total length of various sized pipes = 4,275 *1000 /0.326
  - = 13,113,497 m
  - **Rounded to = 13 million meters**

3.5.2. DEMAND SEGMENTATION

The segmented consumption of PPR pipes of sizes ranging from 20mm to 63 mm is as follows.

Size in mm	% of Consumption by length of pipe	Weight per meter (kg)	Consumption	
			(meters)	Tons
20mm	45%	0.176	5,850,000	1,030
25mm	30%	0.270	3,900,000	1,053
32mm	15%	0.444	1,950,000	886
40mm	5%	0.686	650,000	446
50mm	3%	1.037	390,000	421
63mm	2%	1.689	260,000	439
Total	**100%**		**13,000,000**	**4,275**

3.5.3. DEMAND ESTIMATES FOR PP-R PIPES & FITTINGS

The PP-R pipes require PP-R fittings. The industry practice is that the manufacturer of the pipe supplies the fittings also as a single package to ensure that the "assembly" is leak-proof. Hence it is imperative that the local manufacturers supply the pipes as well as the fittings as a "package".

The demand / consumption estimate is arrived as follows:

- Estimated consumption of pipes (20 - 63mm) in 2019: 13 million meters
- Discussions with the traders as well as the plumbing contractors indicate that at an average for every meter of pipe one fitting is being used. Considering this the number of fittings consumed during 2019 has been estimated and provided below.

- The weighted average weight of fittings are worked out based on 4 fast moving products of the 6 sizes as below.

Detail	% of total number	Average weigh per piece in Grams					
		20 mm	25 mm	32 mm	40 mm	50 mm	63 mm
Major Items							
Coupler (socket)	35%	11	17	31	50	80	121
90 °Elbow	20%	14	23	50	87	139	223
45 °Elbow	16%	13	19	40	67	106	172
Equal Tee	15%	18	33	66	110	171	363
Average weight (Rounded)	-	14	23	46	78	123	217
Others							
Plastic Union	7%	91	127	295	318	595	-
Pipe clip/ clamp	5%	9	18	-	-	-	-
Pipe Plug	2%	9	18	59	73	114	-

- Based on the average weight of these fittings the consumption in tons has also been estimated and illustrated below:

Size in mm	Consumption of Pipes (meters)	Number of pipe fittings (1 fitting per meter of pipe)	Average weight of pipe fittings* (in grams)	Weight of fittings in tons
20mm	5,850,000	5,850,000	14	81.900
25mm	3,900,000	3,900,000	23	89.700
32mm	1,950,000	1,950,000	46	89.700
40mm	650,000	650,000	78	50.700
50mm	390,000	390,000	123	47.970
63mm	260,000	260,000	217	56.420
Total	**13,000,000**	**13,000,000**		**416.390**

3.5.4. SUMMARY OF DEMAND FOR PP-R PIPES & FITTINGS

In summary:

- The demand for PPR pipes in 2019 is estimated at 4,275 tons or 13 million meters.
- The demand / consumption of pipe fittings are estimated at 416 tons or 13 million numbers.

3.6. DEMAND PROJECTION

The following table provides the current demand, estimated future growth rates as the projected demand till 2026:

Details	2019	Growth Rate	2020	2021	2022	2023	2024	2025	2026	2027
			Figures in Tons							
PPR Pipes	4,275	3%	4,403	4,535	4,671	4,812	4,956	5,105	5,258	5,416
PPR Fittings	416	3%	429	442	455	469	483	497	512	527

3.7. STRUCTURE OF COMPETITION

As detailed above, the imports are limited and the demand is mainly catered to by local production. The major local manufacturers of the above products in Oman are detailed further in the following sections.

3.7.1. TECHNO PLASTIC INDUSTRY

Techno Pipe Systems is manufacturing and marketing PPR pipes and fittings under the brand name, "TECHNO". The products are made from Type 3 Polypropylene Random Copolymers. Pipe systems include a range of pipes and fittings from 20mm to 125mm of non-toxic, non-porous, low thermal conductivity, corrosion resistant material suitable for hot and cold water systems, heating and cooling systems, swimming pools, water treatment plants, food and beverage industries, & medical and laboratory industries. They were the first to introduce PPR piping system in Oman by introducing Italian made COPRAX pipe system.

3.7.2. NATIONAL PLASTIC FACTORY, BARKA

Being a well-known manufacturer of PVC fittings, conduits and pipes, National Plastic Factory has extended its product range to cover PPR pipes and fittings by setting up a factory in Barka. Size range manufactured by National Plastic Factory is 20mm-63mm

3.7.3. UNITED PLASTIC MANUFACTURING CO, MABELA

The company started manufacturing and marketing of PPR piping Systems since 2006. (Brand: UPMC; formerly UPTHERM).Size range 20mm-63mm

They offer wide range of PPR piping Systems for hot and cold water piping and fittings meeting quality standards as below.

- ✓ PN-20 Series
- ✓ PN-25 Series

3.7.4. EUROTHERM, SALALAH

PPR pipes and fittings are manufactured in the factory located in Raysut Industrial Estate situated in Salalah.

Eurotherm offers range of PPR pipes and fittings in dimensions of 20 mm to 63mm. Pipes are available in PN20 and PN25 pressure classes. All fittings are manufactured in the highest PN25 pressure range.

The factory has capacity to produce two-inch diameter pipe 250-kg per hour.

3.7.5. AMIANTIT, RUSAYL

Amiantit Oman was the first company in Sultanate of Oman to manufacture uPVC Pipes in 1975. The company manufactures pressure and non-pressure pipes for applications in sewage, water, chemical, waste and also for ducting & as electrical conduits. The pipes are manufactured in size range from 20mm to 323mm at its fully automatic plant confirming to BS, DIN, OMAN and GULF standards.

Amiantit Oman is now manufacturing and marketing PPR pipes and fittings of size range 20mm-63mm of PN 20

3.8. MARKETING MIX STRATEGY OF COMPETITORS

The project is generally manufactured and marketed by adhering to the standard DIN specifications with competitive pricing. The general marketing mix strategy of the competition is illustrated in the following sections.

3.8.1. Product Range

PPR pipes are manufactured in the diameters between 20-125 mm in standard length of 4 meters in dark blue or green color. Pipes, pipe fittings, PPR threaded fittings (with metal inserts) and valves are marketed as a set of product group to the customers. However, only products of size range 20- 63 mm are available with most of the dealers. Only one company in Oman manufactures higher size products. The common products available in the market are:

- ***Pipes***

The sizes of pipes available in general (**length 4M**) are as below.

- 20mm
- 25mm
- 32mm
- 40mm
- 50mm
- 63mm

The products follow the following or equivalent to the following specification:

- ✓ DIN 8076: Piping in thermoplastic hoses under pressure. Compression metals pipe fittings.
- ✓ DIN 8077: Polypropylene (PP) pipes dimensions.
- ✓ DIN 8078: Polypropylene pipes, General quality features.

- ***General Fittings***
  - Socket
  - Elbow 90 Degree
  - Elbow 45 Degree
  - Tee
  - Union
  - Reducer
  - Reducer Tee
  - Female Elbow
  - Male Elbow
  - Female Tee
  - Reducer Elbow
  - Male Adapter
  - Female Adapter
  - Male Adapter With Union
  - Female Adapter With Union
  - Bridge With Socket
  - Clip
  - Pipe Plug
  - End Cap
- ***Threaded Fittings***
  - Male Thread Adapter
  - Male Thread Tee
  - Female Thread Adapter
  - Female Thread Tee
  - Male Thread Elbow
  - Male Thread Union
  - Female Thread Elbow
  - Female Thread Union
- ***Valves***
  - Ball Valve
  - Stop Valve
  - Spherical Ball Valve
  - Double Union Ball Valve
- ***Welding Equipments***

The effectiveness and durability of the system depends in large part on the fusion welding techniques used in installing the pipes to ensure tightness and stability of its connections. Fusion only takes a few seconds. The manufacturers of the PPR pipe system directly or indirectly provide supply of equipment for welding of pipes and fittings.

3.8.2. Product Quality

The products are duly checked under the stringent quality tests. Selection of these parts will be strictly according to the quality standards specified by standards. The final assembly and finishing are as per the customer requirements indicated in the design / specification form. The testing is done at factory as per quality standards and set procedures.

3.8.3. Pricing Strategy of Competition

- ***Pricing of Pipes***

From the weight of pipes (standard PN 20), average price of pipes per ton has been calculated and illustrated below determined as below.

Size (mm)	Weight per meter (kg)	Price to retailers [RO per 4 meter]	Price to retailers [RO per m]	Price to retailers [RO per kg]
20	0.176	0.720	0.180	1.023
25	0.270	1.200	0.300	1.111
32	0.444	1.950	0.488	1.098
40	0.686	3.100	0.775	1.130
50	1.037	4.800	1.200	1.157
63	1.689	8.100	2.025	1.199

Depending on the volume of the sale and the terms of payment, the retailers have a markup of markup of 15% to 25%.

- ***Pricing of Pipe Fittings & Valves***

Price of some pipe fittings and other accessories are also given below. As can be seen there are a lot products in different sizes and types.

Product	Size / Price in RO per piece					
	20 mm	**25 mm**	**32 mm**	**40 mm**	**50 mm**	**63 mm**
Coupler (socket)	0.054	0.063	0.099	0.189	0.288	0.504
90 °Elbow	0.063	0.081	0.153	0.333	0.540	0.855
45 °Elbow	0.090	0.108	0.162	0.270	0.504	0.747
Equal Tee	0.081	0.099	0.171	0.414	0.666	1.080
Plastic Union	0.666	0.774	0.990	1.269	2.205	2.790
Pipe clip/ clamp	0.018	0.018	0.027	0.054	0.072	0.081
Pipe Plug	2.376	2.430	2.700	-	-	-
Bypass Bend	0.216	0.288	0.432	0.603	1.071	-
Chrome valve (concealed valve)	1.926	2.016	2.124	4.851	7.353	-
Plastic Ball Valve	0.054	0.059	0.068	-	-	-
Stop Valve	0.180	0.225	0.342	-	-	-
Spherical Ball Valve	3.510	3.609	5.670	10.755	13.257	19.035

3.8.4. Distribution

PPR is mainly used by the building/plumbing contractors who undertake the work/ are installing the same for various purposes. The distribution process for PPR products in Oman uses both - the 'direct to customer' as well as 'dealer network' for effective distribution. While some of the standard items are distributed through the dealer network, most of the products meant for industrial purposes are supplied directly to customers / contractors of the projects.

3.8.5. Promotion

The PPR products are industrial products which require certain types of promotional tools to reach the end users of it. The following sales promotional efforts are employed by the manufacturers.

- Personal selling – direct to the contractors/ Sub-contractors The sales personnel will maintain relationships with customers and civil engineering consultants.
- Brochures – gives the user a good insight about all product specification along with different product pictures for the product itself and, sometime, the installation process
- Participation in Trade shows/Building Materials Fairs
- One of the leading producers of PPR products effectively uses Hoardings to promote their products.
- After sales services
- In addition to the above, manufacturers also resort to advertising in Telephone/ Business Directories.

3.9. PROPOSED MARKETING MIX STRATEGY FOR THE COMPANY

3.9.1. Target Market

The proposed plant will be located at Oman. The target markets will be in all regions in Oman as well as the export market of Yemen.

3.9.2. Product Mix

The proposed project shall focus on the following range of products:

PPR Pipes

In Phase 1, to enter / test the market it is proposed to manufacture the most popular sizes i.e., sizes ranging from 20mm-63mm. However, options for going for manufacturing higher size products after stabilising production

/ market entry will be kept while establishing the factory layout / purchase of plant & machinery as well as establishing the other infrastructure.

Following is the proposed product mix for the project:

Size (mm)	% of total production by length (meters)
20	45%
25	30%
32	15%
40	5%
50	3%
63	2%

PPR Fittings

As listed in section on Marketing Strategy of Competitors the fittings need to be supplied along with the pipes. Hence initially, the size range for fittings shall be limited to the pipe sizes produced by the project i.e., 20mm-63mm. However, as further pipe sizes are included in the production, during later stages of expansion, the fittings range also would be enhanced. Following popular fittings are proposed in the initial phase of the project (as shown as shaded in the table below.):

Product	Selected Products					
	20 mm	25 mm	32 mm	40 mm	50 mm	63 mm
Coupler (socket)						
90 °Elbow						
45 °Elbow						
Equal Tee						
Plastic Union						
Pipe clip/ clamp						
Pipe Plug						

Coverage of possible range of products is key to successful marketing. In case of inability to offer some products, the company may outsource them and market under own brand, while mentioning the country of origin.

3.9.3. Product Quality

The Company will be offering products adhering to set industrial norms. The Quality experts may ensure that only high quality raw materials are used for production. The selection of machines and equipment and process control measures to ensure quality production shall be set in place. There will be facilities for testing and quality certification within the plant. The quality control and assurance procedures shall be rigorously implemented. It is proposed to produce products adhering to the following specifications which are most acceptable in Oman i.e., PN 20 for pipes and for fittings of PN 25.

3.9.4. Pricing

The proposed project may hold a competitive price in order to capture the market. Following factors have been kept in mind while arriving at the price of the products proposed by the project:

- The acceptability of the pricing of the products is also determined by the quality standards / specifications etc., required by the Industries/Contractors/ Consultants (depending on the application).
- The prices offered by competitors, sales volume and credit period also play a key role in arriving at the product pricing.

The pricing for tubes for the proposed project is provided in the table below.

Size (mm)	Price to retailers[RO per kg]	
	By the competition	By the project
20	1.023	0.921
25	1.111	1.000
32	1.098	0.988
40	1.130	1.017
50	1.157	1.041
63	1.199	1.079

As illustrated above, products of the proposed project will be competitively priced against the competition. It may also be noted that the prices will change with variations in price of the main raw material, Polypropylene.

Pricing of the fittings also be on similar lines, competitive against the other brands / products available in the market.

3.9.5. Distribution

The distribution process for PPR products in Oman uses both - the 'direct to customer' as well as 'dealer network' for effective distribution. While some of the standard items shall be distributed through the dealer network of building materials, most of the products for industrial applications are supplied directly to customers / contractors of the projects.

3.9.6. Promotion

Being a new entrant in the market, reaching out to potential end users, retailers as well as contractors / consultants is key to capturing market shares. The following sales promotional efforts are proposed.

- Personal selling – direct to the contractors/ sub-contractors
- Technical Brochures detailing the product characteristics, advantages, the quality certifications etc.
- Participation in Trade shows/Building Materials Fairs
- After sales services
- Training of the contractor's personnel / plumbers on using the PPR piping system (for joining pipe and fittings by fusion welding).

3.10. PROJECTED MARKET SHARE

The marketshare of the proposed project, based on the demand estimate and the expected sales are as indicated below.

Details	2023	2024	2025	2026
PPR – Pipes				
Projected Demand (Tons)	4,812	4,956	5,105	5,258
Expected sales (Tons)	361	496	638	789
Estimated Market Share (%)	7.5%	10.0%	12.5%	15.0%
PPR Fittings				
Projected Demand (Tons)	469	483	497	512
Expected sales (Tons)	35	48	62	77
Estimated Market Share (%)	7.5%	10.0%	12.5%	15.0%

Adopting suitable marketing strategy with sustained marketing efforts and competitive pricing in addition to creating a regular client base, the market share projected above can be achieved.

4. TECHNICAL ANALYSIS

4.1. LOCATION

The Plant is proposed to be located in Sohar Industrial City, where the Plastics Cluster is proposed.

4.2. LAND

Industrial land having an area of 5,000 Sq meters is required for the proposed project. Provisions for internal road, fencing, electrical line, sewage/drainage system etc are provided. Details are given as Annexure 1.1.

4.3. MANUFACTURING PROCESS – PP –R PIPES & FITTINGS

- The ***PPR Pipes Manufacturing Process***

PPR Pipes is manufactured using a process called extrusion method with Polypropylene random copolymer (PPR) material combined with some additives. This is a continuous extrusion process which results in hollow shape leads to pipe. The extrusion plant consists of main extruder, die with another small extruder attached within the die head(optional as required)&various down-stream equipment's like calibrator, extended cooling trough, haul-off unit, in-line thickness measurement/monitoring unit(optional as required), printing unit, cutting device, stacking frame, stacking, packing& storage.

The PPR granules and small percentages of additives (UV stabiliser, Flame retardant, colour masterbatch etc) are drawn from the storages, mixed very well and then are fed into the hopper of the extruder which goes into the heated cylinder of the extruder, where the granules melt and are conveyed (pumped) to the die exist. Simultaneously the different colour masterbatch mixed PPR material is fed into the small extruder attached within the main extruder die head wherein it melts & pass along with the melt from the main

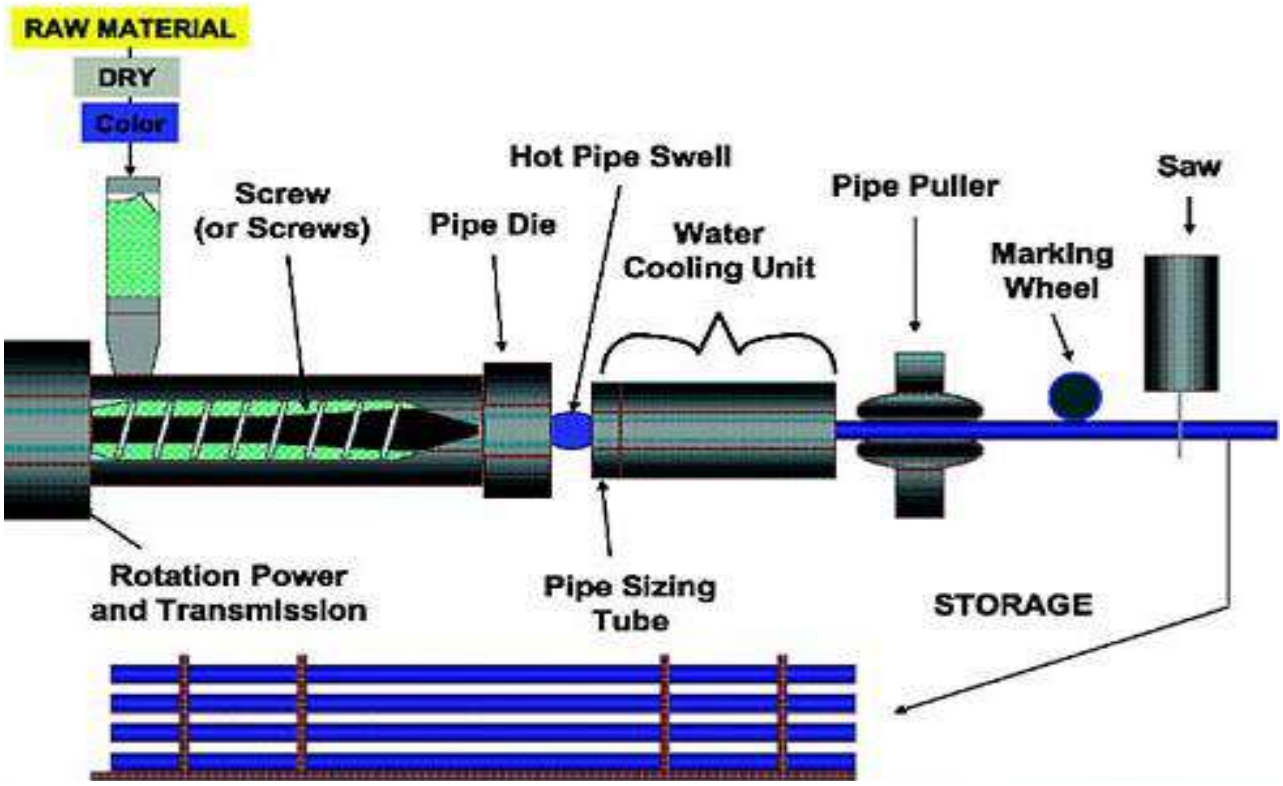
extruder through the die as marking line which can be made as optional also & plugged in case the marking line on the pipe is not required.

Under carefully controlled heat and pressure conditions, the melt passes through the die and takes the shape of the die i.e. circular shape and emerges from the exit of the die. It then passes through the calibrator and is forced to take the shape of the inside of the calibrator which is round in diameter by the inside air pressure. This melt solidifies and taken round shape in the calibrator, which is cooled by passing chilled water through it continuously. Now the solid pipe is taken out from the water and is drawn continuously from the die by the haul-off unit, then to the printing, cutting (~one meter length or more as required), stacking, packing& storage. The speed is adjusted according to the thickness of the pipe required and extruder output. In between the haul-off & printing units, in-line thickness Measurement/monitoring unit may be fixed (as optional) if required. The production line may be built with different level of automation right from the handling of raw materials to the final products delivery stage as required.

Automatic stacking & lifting, shrink packaging system etc may also be added in the production line if required.

PPR Pipes production line process flow diagrams are given below for ease of reference information:

TYPICAL PIPE EXTRUSION PROCESS



- ***PPR Pipes Fittings Manufacturing Process***

  Injection moulding is the most commonly used manufacturing process for the fabrication of plastic parts. A wide variety of products are manufactured using injection moulding, which vary greatly in their size, complexity, and application. The injection moulding process requires the use of an injection moulding machine, raw plastic material, and a mould.

  PPR pipe Fittings are moulded using Injection moulding machines and special multiple cavity moulds.

  Raw material required is polypropylene of Injection Moulding Grade.

  Moulding is carried out in optimised processing conditions to get better quality products.

  The operations required to produce plastics products by injection moulding include:

  1. Preparation of the moulding material
  2. Melting the material
  3. Forcing the material through a nozzle and into a mould

4. Ejecting the moulded product
5. Machining and finishing the product. Operations 1 through 4 may be performed without interruption on a single combination of processing machinery.

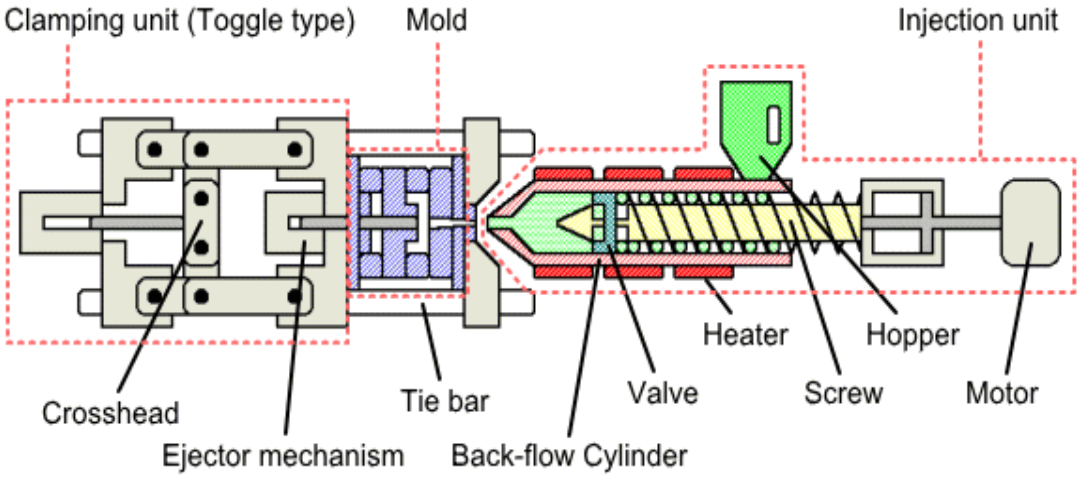
Moulding materials are frequently ready for immediate use when they are delivered by the supplier, but they may require pre-moulding preparation. Plastic material fed to the injection machine must be reasonably free of moisture if internal voids and surface defects are to be avoided. Consequently, drying may be necessary to remove moisture from the surface of moulding resins or, in the case of such hygroscopic materials to drive out adsorbed water.

Pre-moulding preparation may also require addition of colorants, lubricants, other resins, and scrap material which is to be reworked. These materials are generally blended into the virgin resin in some sort of tumbler. After any necessary preparation, the moulding material is transferred, either mechanically or manually, to a hopper which feeds the material to the heating cylinder of the injection-moulding machine. Heat and mechanical agitation convert the cold, granular feed material into a homogeneous plastic melt of controlled viscosity. Temperature in the cylinder is controlled by wraparound electrical resistance heaters. Mixing action is provided by forcing the melt by use of a rotating screw mechanism within the cylinder.

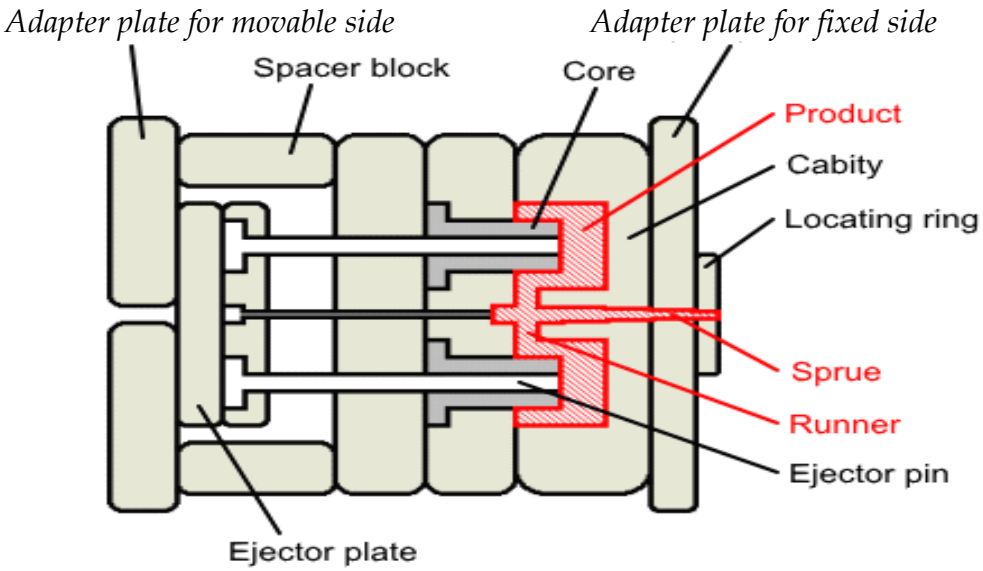
The plastic melt is forced through a nozzle and into the mould. Nozzle temperature is controlled to allow continued clean shots of plastic into the mould without hardening and breaking or drooling. The mould accepts a metered amount of plastic moulding material and cools it quickly and uniformly, usually by transferring the heat to water or some other medium which is circulated through channels provided in the mould.

When the moulding compound has set, the mould is opened and the moulded part is forced out of the mould cavity. The moulded part is as such stored or subject to finishing operations if required & stored for dispatch.

TYPICAL INJECTION MOULDING MACHINE



TYPICAL INJECTION MOULD



4.4. PLANT & MACHINERY

The project shall have an extrusion line for the pipes and injection moulding machines for the fittings. Details are provided in Annexure 1.3

4.5. PLANT CAPACITY

Production capacity:

PPR Pipes	:	800 Tons / year
PPR Fittings	:	100 Tons/year

4.6. POTENTIAL MACHINERY SUPPLIERS

Qingdao Xindacheng Plastic Machinery Co., Ltd. Email: Sales@extruder.cn Contact Number: +86-532-83232838 Fax: +86-532-83233777 Website: https://www.extruder.cn/contact.html
Jiangsu Xinrongplas Machinery Co., Ltd Address: No.2 Jinnan Road, Jinfeng Zhangjiagang, Jiangsu, China Contact Number: +86-532-83232838 Fax: +86-131-15119251 Website: https://xrextrusion.com/contact/
FAYGO UNION GROUP Email: hanzyan179@gmail.com Contact Number: +86-133-9419-1191 Website: https://www.extruder.cn/contact.html

4.7. BUILDING & CIVIL WORKS

A total building area required for the project is estimated at 3,400 Sq. Meters. Details are provided in Annexure 1.2.

4.8. VEHICLES

Three fork lift is proposed for internal transport at the plant. Apart from this vehicles have been considered for the office work as well as sales activities. Details are provided in Annexure 1.4.

4.9. RAW MATERIALS AND CONSUMABLES

The major raw materials used are polypropylene random co polymer, foaming agents, additives etc. As the raw material for fittings includes bought out inserts etc., the Raw material cost is considered at 30% of the sales revenue of fittings. This is in alignment with the industry standards. Details of raw materials are illustrated in Annexure 2.1 and Annexure 2.

4.10. UTILITIES

Utilities comprises of electricity and water. Power requirement is taken at 345 KW. Total water requirement is estimated at 7,044 cubic meters.

4.11. MANPOWER

It is estimated that 17 persons shall be required at the production /quality / maintenance department. The number of staff in the administration and accounts department is estimated at 10. Three persons are proposed for the sales department. Hence, the total numbers of staff will be 30.

4.12. PROJECT IMPLEMENTATION

The project shall commence commercial production in about 15 months from the date of financial closure.

5. FINANCIAL ANALYSIS

5.1. COST OF PROJECT

The total cost of the project is estimated at RO 1.318 million. Details are given in Annexure – I. The break-up is given below:

PROJECT COST	TOTAL COST (RO)
Land for Plant Site	41,000
Building & Civil Works	438,000
Plant & Machinery	338,000
Vehicles and Internal Transport	64,000
Furniture & Office Equipment	32,000
Pre- Operative Expenses	172,000
Contingency & Escalation	52,000
Sub Total	1,137,000
Working Capital	**181,000**
TOTAL	**1,318,000**

5.1.1. Land

As indicated earlier, the land is proposed to be leased out. The cost of land development such as soil testing, levelling, fencing, gate with gate house, paving/internal roads and provisions for roads, gas connection, electric line and water line is estimated at RO 41,000. Details are given in Annexure 1.1.

5.1.2. Building & Civil Works

The total cost of building and civil works is estimated at RO 438,000. Details are given in Annexure- 1.2.

5.1.3. Plant & Machinery

The total cost of plant and machinery is estimated at RO 338,000. The detailed break-up is given in Annexure 1.3.

5.1.4. Vehicles & Internal Transport

The total cost of vehicles and internal transport is estimated at RO 64,000. Details are given in Annexure- 1.4.

5.1.5. Furniture & Office Equipments

The total cost of furniture and office equipment is estimated at R.O 32,000. Details are given in annexure- 1.5.

5.1.6. Pre Operative Expenses

The pre-operative expenses include expenses for feasibility study, interest during project implementation, salaries and wages of project staff, travel and communication, legal fees, audit fees and other miscellaneous expenses. The total pre-operative expenses are estimated at R.O. 172,000. Details are given in Annexure- 1.6.

5.1.7. Contingency & Escalation

A provision of 5 % of the estimated cost of items including building, plant & machinery, vehicles, technical know-how fee etc., is provided in the Project cost towards price escalation and any unforeseen expenses. This works out to RO 52,000. Details are given in Annexure- 1.6.

5.1.8. Working Capital

The following assumptions are made in the computation of working capital.

Particulars	*Period*
Accounts Receivable	2 Months
Raw Materials	1 Month
Consumables & packing	1 Month

Particulars	*Period*
Utilities	1 Month
Factory Wages	1 Month
Administration Expenses	1 Month
Sales Expenses	1 Month
Work in Progress	2 Days
Finished Goods	15 Days
Finance Cost	1 Month

The working capital requirements for the first 4 years are given below. The working capital requirement in the first year comes to RO 181,000. Details are given in Annexure 1.8.

Particulars	Year 1	Year 2	Year 3	Year 4
Working Capital Requirement (RO '000)	181	223	266	310

5.2. MEANS OF FINANCE

It is proposed to finance the Project as indicated in the following table.

Details	*Total Cost (RO)*
Equity Capital	527,000
Bank Term Loan	682,000
Commercial Loan for Working Capital	109,000
TOTAL	**1,318,000**

It is proposed that the project cost of RO 1.318 million will be financed by owner's fund [equity] to the tune of RO 527,000, Term Loan of RO 682,000 and commercial borrowings for working capital at RO 109,000. Loan carries interest @6%. Details are given in Annexure- 1

5.3. COST OF SALES

The estimated cost of sale for first ten years of operation is given in Annexure-2 and those of first five years are summarized as below:

Details	Year 1	2	3	4	5
	Figures in RO '000				
Raw Material	273	375	483	596	596
Packing materials	14	19	24	30	30
Utilities	24	32	42	51	51
Factory Wages	91	94	96	99	102
PRIME COST	**401**	**520**	**645**	**777**	**780**
Factory Overheads	18	21	26	26	26
Rent for Land	5	5	5	5	5
Miscellaneous Factory Exp.	8	11	13	16	16
FACTORY COST	**432**	**556**	**689**	**824**	**827**
Administrative Salaries	71	74	76	78	80
Administrative Expenses	12	13	13	13	14
Total Admin expenses	**84**	**86**	**89**	**91**	**94**
Sales Salaries	22	22	23	24	25
Sales Expenses	2	2	2	2	2
Advt.& Business Promotion	13	18	23	28	28
Distribution Expenses	33	45	57	71	71
Total sales & distribution costs	**69**	**87**	**105**	**125**	**126**
OPERATING COST	585	729	883	1,041	1,047
Interest on Institutional finance	41	41	37	31	25
Interest on working capital	7	7	7	7	7
Total finance cost	**47**	**47**	**43**	**37**	**31**
Depreciation	95	95	95	95	95
Prelim Expenses written off	172	0	0	0	0
COST OF SALE	**900**	**872**	**1,022**	**1,173**	**1,174**

5.3.1. Raw Materials

Total cost of raw materials for pipes at installed capacity is estimated at RO 378,676. The cost of raw materials for the fittings is considered at 30% of the revenue. Details are given in Annexure 2.1 and Annexure 2.

5.3.2. Utilities

The total cost of utilities is RO 52,150. The basis of estimate and the break up are given in Annexure – 2.2.

5.3.3. Salaries & Wages

The cost of salaries and wages in the normal year of operation is RO 128,890. Details are given in Annexure 2.3.

5.3.4. Factory Overheads

The annual expenses include repairs and maintenance, civil repairs, cost of spares, spare parts, insurance and vehicle expense and the same is estimated at RO 17,525 for the first year, RO 20,905 for the second year and RO 25,975 from third year onwards. Details are given in Annexure- 2.4.

5.3.5. Administrative Expenses

The basis of estimates of administrative expenses inclusive of salaries & wages is given in Annexure 2.5 and it works out to RO 83,685 for the first year of operation. Administrative expense includes salaries and benefits, rents and rates, vehicle expenses, communication related expenses, stationery, postage, etc.

5.3.6. Sales Expenses

Total sales expenses are estimated at RO 23,604. Details given in Annexure-2.6. In addition to this a provision of 2% of sales revenue is provided for business promotion expenses and 5% of sales revenue is provided for distribution expenses. Details are provided in Annexure 2.

5.3.7. Depreciation

Depreciation works out to RO 95,300 each for first ten years. In addition, a preliminary expense amount of RO 172,000 is written off in the first year of operation. Depreciation calculation is given in annexure- 2.7. The following are the rates considered for the calculation of depreciation.

Assets	*Life (years)*	*% of depreciation*
Buildings	25	5
Plant & Machinery	10	10
Vehicles and Internal Transport	4	25
Furniture & Office Equipment	5	20
Contingency & Escalation		10

5.3.8. Loan & Interest Calculation

Interest rate for bank term loan working capital loan is taken at 6%. Details of interest calculations are given in Annexure- 2.8

5.4. INCOME TAX

No income tax is provided as the new units are exempted from tax for the first five years. From sixth year onwards, 15% tax is considered.

5.5. COST RATIOS

Major cost indicators as a % of sales realization are given in Annexure- 3.

Years of Operation	1	2	3	4	5
Raw Material / Total Sales	42%	42%	42%	42%	42%
Packing Materials/Sales	2%	2%	2%	2%	2%
Utilities / Total Sales	4%	4%	4%	4%	4%
Factory wages / Total Sales	14%	10%	8%	7%	7%
Prime Cost / Total Sales	62%	58%	56%	55%	55%
Factory exp. / Total Sales	4%	4%	3%	3%	3%
Factory Cost / Total Sales	66%	62%	60%	58%	58%
Admin exp. / Total Sales	13%	10%	8%	6%	7%
Selling exp. / Total Sales	11%	10%	9%	9%	9%
Finance Cost / Total Sales	7%	5%	4%	3%	2%
Non-Cash exp. /Total Sales	41%	11%	8%	7%	7%
Total Cost / Sales	138%	98%	89%	83%	83%

5.6. NET PROFIT AND PROFITABILITY ANALYSIS

As per the financial projection in Annexure – 3, the venture is financially viable. The summary of the analysis is given under:

	Year of Operation	1	2	3	4	5
	Capacity utilization for pipes	45%	62%	80%	99%	99%
	Capacity utilization for fittings	34%	47%	61%	75%	75%
	Sales quantity Tons - Pipes	361	496	638	789	789
	Sales quantity Tons - Fittings	35	48	62	77	77
No	**Item**					
1	**Operating Cost**	585	729	883	1041	1047
c	Total sales	650	893	1149	1420	1420
3	**EBIDTA**	**65**	**163**	**266**	**379**	**373**
4	Depreciation	95	95	95	95	95
5	Finance Cost	47	47	43	37	31
6	**Operating profit**	**-77**	**21**	**127**	**247**	**246**
7	Other income if any					
8	Prelim Expenses written off	172	-	-	-	-
9	Profit/Loss before tax	-249	21	127	247	246
10	Income Tax	0	0	0	0	0
11	**Profit after tax**	**-249**	**21**	**127**	**247**	**246**
12	Statutory reserve	0	2	13	25	25
13	Profit for appropriation	-249	19	114	222	222
14	Dividend	0	0	0	0	0
15	General reserve	-249	19	114	222	222
16	**Net cash accruals**	**18**	**116**	**222**	**342**	**341**

5.7. KEY APPRAISAL CRITERIA

The viability of the project based on major appraisal criteria is given below.

Detail	Value
IRR on total investment	18.7%
IRR on Equity	27.4%
Payback period of Total Investment	5 years 11 months
Payback period on equity	5 years 2 months
Break Even Point (as % of Plant Capacity)	71%
Cash Break Even Point (as % of Plant Capacity)	59%
Total debt equity ratio	1.5 : 1
DSCR	2.64

5.8. SENSITIVITY ANALYSIS

A sensitivity analysis has been carried out to determine the susceptibility of the project to changes in main variables as given below:

Effect on the IRR on equity investment, based on 10 years of operation due to change in various variables is as follows:

Particulars	Original	VolumeDown by 10%	RM Cost up by 10%	Sales Realization Down by 10%
IRR on Investment	18.7%	14.9	22.6	11.4
IRR on equity	27.4%	20.8	30.3	15.1

6. KEY SUCCESS AND PUSHBACK FACTORS

The following aspects are highlighted as the key success / pushback factors.

6.1. KEY SUCCESS FACTOR

- There is a local demand for PPR pipes and Fittings that the project can leverage.
- The project shall be able to effectively leverage on the government incentives including low cost well developed industrial land, utilities etc.
- The incentives in terms of price preference to local manufacturers in Government procurement could also be leveraged by the project.

6.2. KEY PUSHBACK FACTOR

The project shall face stiff competition from the domestic players as well as the imports. Prudent investment decisions and optimising the operating costs shall enhance the commercial success of the project.

7. CONCULSION

The IRR on Total Investment for the project is 18.7% and the IRR on Equity Investment is 27.4%. Based on the various analyses done on the project, the project is found to be technically feasible and financially viable.

Annexures – Financial Projections

ANNEXURE- 1					
PP-R PIPE PRODUCTS					
ESTIMATED PROJECT COST					
S.No.	**Item**	**Refer**	**Amount**		**Remarks**
		App.	**RO**		
A1	**PROJECT COST**				
1	Land for Plant Site	1.1	41,000		Estimates
2	Building etc.	1.2	438,000		Estimates
3	Plant & Machinery	1.3	338,000		Estimates
4	Vehicles and Int. Transport	1.4	64,000		Estimates
5	Furniture & Office Equip.	1.5	32,000		Estimates
6	Pre- Operative Expenses	1.6	172,000		Estimates
7	Contingency & Escalation	1.7	52,000		Estimates
8	Sub Total		1,137,000	**1,137,000**	
A2	**WORKING CAPITAL**	1.8	181,000	**181,000**	
A3	**TOTAL CAPITAL**			**1,318,000**	
B	**MODE OF FINANCE**				
1	Equity			527,000	**40%**
2	Bank Term Loan			682,000	**60%**
3	Total			**1,209,000**	
4	Commercial Borrwings for Working Capital			109,000	**60%**
	TOTAL CAPITAL			**1,318,000**	

ANNEXURE- 1.1						
PP-R PIPE PRODUCTS						
ESTIMATED COST OF LAND & SITE DEVELOPMENT						
S.No.	**Item**	**Unit**	**Q'ty**	**Rate**	**Amount**	**Remarks**
				RO	**RO**	
A	**LAND**					
1	Land for Plant	Sq. M	**5,000**		-	On lease
B	**SITE DEVELOPMENT**					
1	Soil Testing				3,000	
2	Levelling	Sq. M	3,000	1	3,000	
3	Fencing	M	283	35	9,899	Concrete / Chain link
4	Paving /Roads	Sq. M	500	10	5,000	Int-O-Lock Tiles
5	Gate ,Gate House & Misc.	Set			5,000	Lumpsum
6	Sewerage/Drainage					
8	Prov for Electric line				15,000	Lumpsum
9	Prov for Water line fron ring main					
C	**TOTAL**				40,899	
	Say				**41,000**	Sum (B1 to B10)

ANNEXURE- 1.2						
PP-R PIPE PRODUCTS						
ESTIMATED COST OF BUILDING & CIVIL WORKS						
S.No.	**Item**		**Area**	**Rate**	**Amount**	**Remarks**
			(SqM)	**RO**	**RO**	
A	**MAIN PLANT BUILDINGS**					
1	Factory Bulding	Sq. M	800	120	96,000	Masonary wall & steel roof
2	RM Storage	Sq. M	600	120	72,000	Masonary wall & steel roof
3	Finished goods store	Sq. M	600	120	72,000	Masonary wall & steel roof
	Sub Total		**2,000**		**240,000**	Sum (A1 to A7)
B	**UTILITIES & MAINTENANCE**					
1	Compressor Room	Sq. M	30	120	3,600	Masonary wall & steel roof
2	Generator	Sq. M	0	120	-	Masonary wall & steel roof
3	Chilling Plant	Sq. M	0	120	-	Masonary wall & steel roof
4	Scrap Grinder	Sq. M	20	120	2,400	Masonary wall & steel roof
5	Cooling Tower	Sq. M	20	120	2,400	Masonary wall & steel roof
6	Workshop	Sq. M	40	120	4,800	Masonary wall & steel roof
7	Laboratory	Sq. M	30	120	3,600	Masonary wall & steel roof
	Sub Total		**140**		**16,800**	Sum (B1 to B4)
C	**ADMINISTRATIVE BUILDINGS**					
1	Office	Sq. M	250	150	37,500	RCC
	Sub Total		**250**		**37,500**	Sum (D1 to D2)
D	**NON FACTORY BUILDINGS**					
1	Canteen	Sq. M	50	150	7,500	Masonary wall & steel roof
2	Change Room	Sq. M	50	150	7,500	Masonary wall & steel roof
3	Security Room		20	150	3,000	
	Sub Total		**120**		**18,000**	Sum (E1 to E2)
E	**OTHER CIVIL WORKS**					
1	Water Tank	Set			5,000	
2	Other Misc. Civil Works				3,000	
3	Associated Electro-mechanical works		2,510	40	100,400	
	Sub Total				108,400	
	Total	**Sq. M**	**2510**		**420,700**	
F	**ENGINEERING FEES**					
1	Design				8,414	At 2% on built up area cost
2	Supervision				8,414	At 2% on built up area cost
	Sub Total				16,828	
G	**TOTAL**				437,528	
	Say				**438,000**	

ANNEXURE- 1.3				
PP-R PIPE PRODUCTS				
ESTIMATED COST OF PLANT & MACHINERY				
S.No.	**Item**	**Amount**		**Remarks**
		USD	**RO**	
	MAIN PLANT & MACHINERY		**0.385**	
A	**EXTRUSION PLANT unit for producing PPR Pipes 20, 25,32,40,50 & 63 mm dia**			
I	**One Extrusion line**			
1	Output rate of 150-200 kg/hr			
2	Hopper dryer, loader			
3	Die head with bush(6 nos.),mandrel(6 nos.), calibrator(6 nos.)[complete die sets for 20,25,32,40,50,63 mm dia pipes.			
4	Co-extruder attachment in main extruder for making colour line within the pipe	57,555		
5	Vacuum tank			
6	Cooling tank			
7	Water sealing device			
8	Vacuum sealing device			
9	Haul-off			
10	Printer			
11	Dust free cutter			
12	Stacker			
13	Standard spares			
	Total	**57,555**		
II	**ANCILLIARY PLANT**			
1	Mixer Blender			
2	Cooling Tower 50 T, 1.5 kw(1 no.)			
3	Chilling plant(1 no. 50 HP or two nos. 25 H	19,250		
4	Compressor 11 kw(capacity-2.0m^3 (1 no.)			
5	Scrap grinder/crusher 15 kw (1 no.)			
	Sub Total	**19,250**		
	Total	**76,805**	**29,570**	
B	**INJECTION MOLDING UNIT**			
1	Three Injection Moulding(IM) Machines wirh Hydraulic Core pull attachments			
i	Injection Moulding(IM) Machines with hyd			
ii	120 -150Tons- 1 no.			
iii	180 -200 Tons- 1 no	185,000		
iv	250 -275 Tons-1 no.			
v	Auto dryer, loader for each machines(i.e.,			
vi	Standard spares /Tools			
2	Mixer/Blender for mixing	19,000		
3	Moulds - 39 nos.	399,750		
	Sub Total	**603,750**		
II	**ANCILLIARY PLANT**			
1	Gantry Crane 3 Tons	3000		
2	Trolleys for handling Moulds & materials	1000		
3	Cooling Tower ~ 300 LPM	800		
4	Chillers	7500		
5	Air Compressor 5 HP, 5-8 bar	750		
6	Scrap Grinder ~ 50 kg/hr	2738		
7	Weighing Scales (500 g, 1000 g, 5000 g & 10	3000		
	Sub Total	**18,788**		
	Sub Total	**622,538**	**239,677**	

ANNEXURE- 1.3				
PP-R PIPE PRODUCTS				
ESTIMATED COST OF PLANT & MACHINERY				
S.No.	**Item**	**Amount**		**Remarks**
		USD	**RO**	
III	**Materials & product testing equipments for both Pipes & Fittings Unit**			
1	Melt flow index tester	30,000		
2	Density measuring apparatus			
3	Hydrostatic pressure testing machine			
4	Heat reversion tester			
5	Impact bending tester			
6	Hot-air Oven			
7	Dimensions measurement instruments			
8	Pipe Welding equipment with welding too			
9	Pipe Cutting Devices and other accessories			
	Sub Total	30,000	11,550	
	TOTAL of Imported Machinery	**729,343**	**280,797**	
IV	**MAINTENANCE WORKSHOP/OTHERS - Local**			
I	Workshop Equipments		5,000	Lumpsum
	Total		**5,000**	
V	**ELECTRIFICATION - Local**			
1	HV Supply		20,000	
2	HV Panel			
3	1000 KVA Transformer			
4	MV Switchboard			
5	Switch Boards / Distribution Boards			
6	Lighting Fixtures			
7	Cables			
8	PF Correction			
9	Diesel Generator			
10	Lighting Conductors & Earthing			
11	Installation			
12	Other expenses			
	Sub Total		**20,000**	Lumpsum
VI	**AT SITE COST**			
a	Total Plant (Imported)		280,797	Sum A & B
1	Spares - Import			Included in the offe
2	Packing, Insurance Forwarding & Freight - Import		5,616	2% of cost
3	C I F Cost		286,413	
4	Import duty		-	
5	Clearing & Transport to Site		2,864	At 1% of G5
	At Site Cost of Ompoted Mahinery		**289,277**	
b	**Local Equioments**			
1	Workshop Equipments & Electrification		25,000	
2	Spares Local		3,000	
	Sub Total of Local Machinery		**28,000**	
VII	**ERECTED COST**			
1	At Site Cost		317,277	
2	Cost of erection - Local		15,864	5% of Machinery C
3	Technical Supervision -Import			Included in the offe
4	Accommodation, Food Etc.		5,000	Lumpsum
5	**TOTAL ERECTED COST**		**338,141**	
	Say		**338,000**	

ANNEXURE- 1.4					
PP-R PIPE PRODUCTS					
ESTIMATED COST OF VEHICLES & INTERNAL TRANSPORT					
S.No.	**Item**	**Q'ty**	**Amount**		**Remarks**
		(Nos.)	**RO**		
A	**VEHICLES**				
1	Car Saloon	1	12500	12,500	
2	Car - Small	2	8500	17,000	For office use
3	Car - Small	1	8500	8,500	For sales
4	Pick Up	1	9500	9,500	For Production / Sales
	Sub Total	**5**		**47,500**	
B	**TRANSP. EQUIPMENT**				
1	Fork lift truck (3T)	1	12,000	12,000	
2	Pallet truck	4	300	1,200	
	Sub Total	**5**		**13,200**	
C	**REGISTRATION FEE**				
	Registration, Painting, Spares etc			3,430	10% of the above
	Sub Total			**3,430**	
D	**TOTAL**	10		64,130	
	Say			**64,000**	

ANNEXURE- 1.5					
PP-R PIPE PRODUCTS					
ESTIMATED COST OF FURNITURE & OFFICE EQUIPMENT					
S.No.	**Item**	**Q'ty**	**Rate**	**Amount**	**Remarks**
			RO		
A	**OFFICE**				
1	P.C with Printer	10	250	2,500	Lumpsum
2	Photocopier	1	1,500	1,500	Lumpsum
3	Fax, Telephone	Set		1,500	Lumpsum
4	Other Office Equipment	Set		5,000	Lumpsum
5	Air Conditioners	10	200	2,000	Lumpsum
6	Office Furnitures	Set		8,000	Lumpsum
7	Board room			5,000	Lumpsum
	Sub Total			**25500**	
C	**FACTORY**				
1	Furniture / Fittings	Set		3,000	Lumpsum
	Sub Total			**3,000**	
D	STAFF FURNITURE				
	Furniture & Equipments			3,800	
	Sub Total			**3800**	
E	**TOTAL**			**32,000**	Sum A + B+C

ANNEXURE- 1.6				
PP-R PIPE PRODUCTS				
ESTIMATED COST OF PRE-OPERATIVE EXPENSES				
S.No	**Item**		**Amount**	**Remarks**
		RO	**RO**	
1	Preliminary Expenses		3,000	Upto formation of Co.
2	Feasibility Studies		10,000	DPR
3	Project Management Expenses		72,000	RO 4000/18 months
4	Company Employees			
a	Salary & benefits - CEO	3,360		3 Months
b	Salary & benefits - Production Staff	3,787		1Month (50% Staff)
c	Salary & benefits - Admin. Staff	2,975		1 Month (50% Staff)
d	Salary & benefits - Sales Staff	1,820		1 Month
	Sub-Total		11,942	
e	Visa, Passage etc.			
a	Low level	10	9,000	@ RO 900 per employee including passage
b	Middle level	9	9,900	@ RO 1100 per employee including passage
c	Senior Management	1	2,500	@ RO 2500 per employee including passage
5	Financing Cost			
a	Institutional Loan Interest	20,460		At 6% for 6months
b	Mortgage & Gurantee Expenses	7,910		At 1% on Institu: Loan
c	Other Bank Charges	1,000		Lumpsum
	Sub Total		29,370	
6	Communication		2,400	RO 100/M for 12 Months
7	Travel		3,000	Lumpsum
8	Recruitment Charges		3,800	Lumpsum
9	Audit Fees, Legal Fees		1,000	Lumpsum
10	Insurance		3,104	At 0.4 % of Plant & Bldg.
11	Start Up Expenses		5,000	Estimate
12	Product Launching, Advt. etc.		3,000	Provision
13	Miscellaneous		2,000	Provision
	Total		171,016	
	Say..		**172,000**	

ANNEXURE- 1.7					
PP-R PIPE PRODUCTS					
ESTIMATES OF CONTINGENCY AND ESCALATION					
S.No.	**Item**	**Cost**	**Rate**	**Provision**	**Remarks**
		(RO)	**(%)**	**(RO)**	
A	**FIXED ASSETS**				
1	Land for Plant Site	41000	0.0	-	
2	Building etc.	438000	5.0	21,900	
3	Plant & Machinery	338000	5.0	16,900	
4	Technical Know-How	0	5.0	-	
5	Vehicles and Int. Transport	64000	5.0	3,200	
6	Furniture & Office Equip.	32000	5.0	1,600	
7	Pre- Operative Expenses	172000	5.0	8,600	
	TOTAL			52,200	
				52,000	say

ANNEXURE- 1.8							
PP-R PIPE PRODUCTS							
ESTIMATES OF WORKING CAPITAL REQUIREMENTS							
S.No.	**Item**	**Req.**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Remarks**
			In RO '000				
1	Acct. Receivable	2 Months	105	129	154	180	Cost of sales - Non C Ex.
2	Raw Materials	1 Months	24	33	42	52	
3	Utilities	1 Month	2	3	3	4	
4	Factory Wages	1 Month	8	8	8	8	
5	Admn. Expenses	1 Month	7	7	7	8	
6	Sales Expenses	1 Month	6	7	9	10	
7	Work in Progress	2 Days	2	3	4	5	At Factory Cost
8	Finished Goods	0.5 Month	23	29	34	40	At total Cost-Non cash-Selling and Distrbn
9	Finance Cost	1 Month	4	4	4	3	At Finance Cost
10	Total		181	223	266	310	
	Say		**181**	**223**	**266**	**310**	

ANNEXURE- 2

PP-R PIPE PRODUCTS

COST OF SALE

Year of Operation			1	2	3	4	5	6	7	8	9	10	
Prodn Capacity -Pipes		**Tons**	**800**	**800**	**800**	**800**	**800**	**800**	**800**	**800**	**800**	**800**	
Prodn Capacity -Fittings		**Tons**	**102**	**102**	**102**	**102**	**102**	**102**	**102**	**102**	**102**	**102**	
Capacity Utilization-Pipes		%	**45%**	**62%**	**80%**	**99%**	**99%**	**99%**	**99%**	**99%**	**99%**	**99%**	
Capacity Utilization-Fittings		%	**34%**	**47%**	**61%**	**75%**	**75%**	**75%**	**75%**	**75%**	**75%**	**75%**	
Prodn - Pipes		**Tons**	**361**	**496**	**638**	**789**	**789**	**789**	**789**	**789**	**789**	**789**	
Prodn - fittings		**Tons**	**35**	**48**	**62**	**77**	**77**	**77**	**77**	**77**	**77**	**77**	
No	**Item**		**In RO '000**										**Remarks**
1	**Raw material**												
a	For pipes		171	235	302	373	373	373	373	373	373	373	Refer Annexure 2.1
b	For Fittings		102	140	180	223	223	223	223	223	223	223	Considered at 30% of the sales realisation
c	**Total Raw Material**		**273**	**375**	**483**	**596**	**596**	**596**	**596**	**596**	**596**	**596**	
2	Packing materials		14	19	24	30	30	30	30	30	30	30	
3	Utilities		24	32	42	51	51	51	51	51	51	51	
4	Factory Wages		91	94	96	99	102	105	109	112	115	119	
5	**PRIME COST**		**401**	**520**	**645**	**777**	**780**	**783**	**786**	**789**	**793**	**796**	
6	Factory Overheads		18	21	26	26	26	26	26	26	26	26	
7	Rent for Land		5	5	5	5	5	5	5	5	5	5	
8	Misc. Factory Exp.		8	11	13	16	16	16	16	16	16	16	
9	**FACTORY COST**		432	556	689	824	827	830	833	837	840	844	
10	Admin. Salaries		71	74	76	78	80	83	85	88	90	93	
11	Admin. Expenses		12	13	13	13	14	14	15	15	16	16	
12	Total Admin expenses		84	86	89	91	94	97	100	103	106	109	
13	Sales Salaries		22	22	23	24	25	25	26	27	28	28	
14	Sales Expenses		2	2	2	2	2	2	2	2	2	2	
15	Advert.& Business Promotion		13	18	23	28	28	28	28	28	28	28	
16	Distribution Exp		33	45	57	71	71	71	71	71	71	71	
17	Total sales & dist: costs		69	87	105	125	126	127	128	128	129	130	
18	**OPERATING COST**		585	729	883	1,041	1,047	1,054	1,061	1,068	1,075	1,083	
19	Int on Institutional finanace		41	41	37	31	25	19	13	7	1	0	
20	Int on working capital		7	7	7	7	7	7	7	7	7	7	
21	Total finance cost		47	47	43	37	31	26	20	14	8	7	
22	Depreciation		95	95	95	95	95	95	95	95	95	95	
23	Prelim Expenses written off		172	0	0	0	0	0	0	0	0	0	
24	**COST OF SALE**		**900**	**872**	**1,022**	**1,173**	**1,174**	**1,175**	**1,176**	**1,177**	**1,179**	**1,185**	

ANNEXURE- 2.1							
PP-R PIPE PRODUCTS							
ESTIMATED COST OF RAW MATERIALS							
S.No.	**Item**	**RM Proportion**	**Unit**	**Qty**	**Rate**	**Amount**	**Remarks**
					Per Ton	***RO***	
A	**PPR Pipes**						
1	Polypropylene Random Copolymer	100%	MT	784	462	362,199	98% of Output
2	Colour Master batch with UV stabilizer	0.5 - 2.0	MT	8	558	4,466	1% ofOutput
3	Additives Masterbatch (Anti-fungus, Flame retardant)	0.1 – 6.0	MT	16	751	12,012	2% of Output
	Sub Total			**808**		**378,676**	

ANNEXURE- 2.2					
PP-R PIPE PRODUCTS					
ESTIMATED COST OF UTILITIES					
S.No.	**Item**	**Unit**	**Qty**	**Rate**	**Amount**
B	**UTILITIES**			RO	
1	Water	Cu M	7,044	0.78	5,494
2	Electricity	KWH	1,555,200	0.030	46,656
	TOTAL				**52,150**

ANNEXURE- 2.3							
PP-R PIPE PRODUCTS							
ESTIMATES OF ANNUAL SALARIES AND WAGES							
S.No.	**Item**	**No ofpersonnel**		**MonthlySalary**		**Amount**	**Remarks**
		Nos		**RO**		**RO**	
		Omani	Expat	Omani	Expat		
A1	**PRODUCTION**						
1	Head of operations		1		1250	15,000	
2	Production Supervisors	0	2	500	350	8,400	
3	Skilled Technicians	0	2	400	250	6,000	
4	Semi skilled Technicians	1	1	350	200	6,600	
5	Unskilled workers	2	4	330	150	15,120	
	Sub Total	**3**	**10**			**51,120**	
A2	**R&D & QUALITY**						
1	Quality Supervisor		1		350	4,200	
2	Skilled Technician		1		250	3,000	
3	Semiskilled		0		0	-	
4	Unskilled		0		150	-	
	Sub Total	**0**	**2**			**7,200**	
A3	**MAINTENANCE / SAFETY**						
1	Maintenance Supervisor		1		350	4,200	
2	Electrical / Mechanical		1		200	2,400	
3	Unskilled		0		200	-	
7	**Sub Total**	**0**	**2**			**6,600**	
b	**Total Manpower Cost**						
1	Total Salary	3	14	0	0	64920	
2	Other Benifits					25,968	At 40 % of Salary
A4	**TOTAL PRODUCTION**	3	14			**90,888**	
B	**ADMINISTRATION & ACCOUNTS**						
a	**Administration**						
1	Admin Manager	1	0	800	0	9,600	
2	Accountants Manager	0	1		700	8,400	
3	Secretary/clerk/computer opera	1	0	400	300	4,800	
4	Personel Officer/PRO	1	0	500	0	6,000	
5	Assistants	1	1	400	250	7,800	
6	Office Boy/ Messenger	0	1	300	150	1,800	
7	Gate Keeper	3		350	0	12,600	
	Sub Total	7	3			51,000	
c	**Total Manpower Cost**						
1	Total Salary	7	3	-	-	51,000	
2	Other Benifits					20,400	At 40 % of Salary
3	Total Cost	**7**	**3**	**-**	**-**	**71,400**	
C	**SALES**						
a	**Sales**						
1	Marketing Manager	0	1	0	600	7,200	
2	Sales Executives	1	1	400	300	8,400	
3	Helpers	0	0	0	200	-	
4	Sub Total	1	2			15,600	
b	**Total Manpower Cost**						
1	Total Salary	1	2			15,600	Sum of above a5
2	Other Benifits					6,240	At 40% of Salary
3	Total Cost	**1**	**2**	**-**	**-**	**21,840**	
D	**GRAND TOTAL**	**11**	**19**	**-**	**-**	**128,890**	
			37%				

ANNEXURE- 2.4					
PP-R PIPE PRODUCTS					
ESTIMATES OF ANNUAL FACTORY EXPENSES					
S.No.	**Item**	**Year**	**Year**	**Year**	**Remarks**
		1	**2**	**3**	
		RO			
1	Repairs & Maintenance	1690	3380	6760	At 0.5 , 1% & 2% of erected cost of P & M
2	Civil Repairs	1095	1095	1095	At 0.25 % of cost of Building and Civil Works
3	Spare Parts	3,380	5,070	6,760	At 1%, 1.5% and 2% of 'at-site' cost of P & M
4	Insurance	7,760	7,760	7,760	At 1 % of cost Building, Plant and
					Machinery
5	Vehicle Expenses				
a	Cars (6 Nos)	1800	1800	1800	At RO 50 pm
b	Pickups (1 nos)	1200	1200	1200	At RO 50 pm
c	Forklifts (3 nos)	600	600	600	At RO 50 pm
6	**TOTAL**	**17,525**	**20,905**	**25,975**	

ANNEXURE- 2.5				
PP-R PIPE PRODUCTS				
ESTIMATES OF ANNUAL ADMINISTRATIVE EXPENSES				
S.No.	**Item**		**Amount**	**Remarks**
		RO	**RO**	
	ADMINISTRATION			
1	Salaries & Benefits		71,400	
2	Rents and Rates		-	
3	Vehicle Expenses & Petrol			
a	Cars (6Nos)	1800		At RO 50/Month
	Sub Total		1,800	
4	Telephone, Fax etc.		2,400	At RO 200 /Month
5	Stationery, Postage etc.		2,400	At RO 200 /Month
6	Medical Expenses		-	Incl. in Staff Benefits
7	Travel & Recruitment		-	Lumpsum
8	Legal, Audit Fees		1,500	Lumpsum
9	Utilities outside Plant		600	At RO 50/Month
10	Insurance		3,000	Lumpsum
11	Miscellaneous		585	At 5 % of above
	Total		**83,685**	

ANNEXURE- 2.6				
PP-R PIPE PRODUCTS				
ESTIMATES OF ANNUAL SALES EXPENSES				
S.No.	**Item**		**Amount**	**Remarks**
		(RO)	**(RO)**	
	SALES			
1	Salaries		21,840	See Annexure 2.3
2	Advertisement		-	Provided separately
3	Business Promotion		-	Provided separately
4	Export Travel		-	Lumpsum
5	Vehicle Expenses & Petrol			
a	Car (1No)	720		At RO 60/Month
b	Pickup (1 No)	960		At RO 80/Month
c	Sub Total		1,680	
6	Miscellaneous Expenses		84	At 5 % of above
	Total		**23,604**	

ANNEXURE- 2.7						
PP-R PIPE PRODUCTS						
DEPRECIATION CALCULATIONS						
	Item	**Cost**	**Rate**	**S.V.**	**Amount**	**Renewals**
		RO	**(%)**	**(RO)**	**(RO)**	
A	**FIXED ASSETS**					
1	Land for Plant Site	41,000	-	-	-	Nil
2	Building etc.	438,000	5	219,000	21,900	Nil
3	Plant & Machinery	338,000	10	-	33,800	Year 11
4	Technical Know-How	-	10	-	-	Nil
5	Vehicles and Int. Transp.	64,000	25	32,000	16,000	Years 5, 9
6	Furniture & Office Equip.	32,000	20	-	6,400	Years 6, 11
7	Contingency & Escalation	172,000	10	-	17,200	Nil
8	**Sub Total**	**1,085,000**		**251,000**	**95,300**	
B	**PRELIM &PRE OPE: EXP**	172000	100	0	**172,000**	Nil
C	**WORKING CAPITAL**					
1	Working Capital	310000	0	310000	-	
D	**TOTAL**			**561,000**	**267,300**	
	Less Balance Loan			**-**		
E	**SALVAGE VALUE**			**561,000**		
	Note: S.V. = Salvage Value at the end of 10th year.					

ANNEXURE- 2.8								
PP-R PIPE PRODUCTS								
LOAN & INTEREST CALCULATIONS								
		Term Loan			Bank		Annual	
No	Year	Prn	Int	Rep	Prn	Int	Int	Rep
	7		6%			6%		
1		682	20.5	0	109	3.3		
2	1	682	20.5	0	109	3.3	**47.5**	**0**
3		682	20.5	0	109	3.3		
4	2	682	20.5	49	109	3.3	**47.5**	**49**
5		633	19.0	49	109	3.3		
6	3	585	17.5	49	109	3.3	**43.1**	**97**
7		536	16.1	49	109	3.3		
8	4	487	14.6	49	109	3.3	**37.2**	**97**
9		438	13.2	49	109	3.3		
10	5	390	11.7	49	109	3.3	**31.4**	**97**
11		341	10.2	49	109	3.3		
12	6	292	8.8	49	109	3.3	**25.5**	**97**
13		244	7.3	49	109	3.3		
14	7	195	5.8	49	109	3.3	**19.7**	**97**
15		146	4.4	49	109	3.3		
16	8	97	2.9	49	109	3.3	**13.8**	**97**
17		49	1.5	49	109	3.3		
18	9	0	0.0		109	3.3	**8.0**	**49**
19		0	0.0		109	3.3		
20	10	0	0.0	0	109	3.3	**6.5**	**0**
20	10	0	0.0	0	109	3.3	**6.5**	**0**

ANNEXURE- 3												
PP-R PIPE PRODUCTS												
ESTIMATED WORKING RESULTS												
	Year of Operation	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
	Capacity utilisation for pi	45%	62%	80%	99%	99%	99%	99%	99%	99%	99%	
	Capacity utilisation for fitt	34%	47%	61%	75%	75%	75%	75%	75%	75%	75%	
	Qty Tons - Pipes	361	496	638	789	789	789	789	789	789	789	
	Qty Tons - Fittings	35	48	62	77	77	77	77	77	77	77	
No	**Item**	**Figures in RO '000**										**Remarks**
1	**Operating Cost**	585	729	883	1041	1047	1054	1061	1068	1075	1083	
2	Expected Sales											
a	Pipes sales	358	492	633	783	783	783	783	783	783	783	
b	Fittings sale	292	401	516	637	637	637	637	637	637	637	
c	**Total sales**	**650**	**893**	**1149**	**1420**	**1420**	**1420**	**1420**	**1420**	**1420**	**1420**	
3	**Profit before Int & dep**	**65**	**163**	**266**	**379**	**373**	**366**	**359**	**352**	**345**	**337**	
4	Depreciation	95	95	95	95	95	95	95	95	95	95	
5	Finance Cost	47	47	43	37	31	26	20	14	8	7	
6	**Operating profit**	**-77**	**21**	**127**	**247**	**246**	**245**	**244**	**243**	**241**	**235**	
7	Other income if any											
8	Prelim Expenses written off	172	-	-	-	-	-	-	-	-	-	
9	Profit/Loss before tax	-249	21	127	247	246	245	244	243	241	235	
10	Income Tax	0	0	0	0	0	37	37	36	36	35	
11	**Profit after tax**	**-249**	**21**	**127**	**247**	**246**	**208**	**207**	**206**	**205**	**200**	
12	Statutory reserve	0	2	13	25	25	21	21	21	21	20	
13	Profit for appropriation	-249	19	114	222	222	188	187	186	185	180	
14	Dividend	0	0	0	0	0	0	0	0	0	0	
15	General reserve	-249	19	114	222	222	188	187	186	185	180	
16	**Net cash accruals**	**18**	**116**	**222**	**342**	**341**	**304**	**303**	**302**	**300**	**295**	

ANNEXURE- 3.1						
PP-R PIPE PRODUCTS						
ESTIMATES OF SALES REALISATION						
S.No.	**Item**	**Qty**		**Rate/ton**	**Amount**	**Remarks**
		Meter	Tons	**RO**		
A	**PPR Pipes**					
1	20 (Dia. mm)	1,104,300	194	921	178,944	
2	25 (Dia. mm)	736,200	199	1,000	198,754	
3	32 (Dia. mm)	368,100	163	988	161,508	
4	40 (Dia. mm)	122,700	84	1,017	85,603	
5	50 (Dia. mm)	73,620	76	1,041	79,497	
6	63 (Dia. mm)	49,080	83	1,079	89,453	
	Sub Total	**2,454,000**	**800**		**793,760**	
B	**PPR Fittings**	**Nos**				
1	Coupler	1,400,000			120,708	
2	90º Elbow	800,000			100,440	
3	45º Elbow	640,000			90,086	
4	Equal Tee	600,000			92,448	
5	Plastic Union	280,000			242,424	
6	Pipe clip/ clamp	200,000			4,806	
7	Pipe Plug	80,000			199,741	
	Sub Total	**4000000**			**850,654**	
C	**TOTAL**				**1,644,413**	
	Say				**1,644,413**	

ANNEXURE- 4													
PP-R PIPE PRODUCTS													
PROJECTED CASH FLOW STATEMENT													
	Year of Operation	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
	Capacity Utilization for pipes		45%	62%	80%	99%	99%	99%	99%	99%	99%	99%	
	Capacity Utilization for fittings		34%	47%	61%	75%	75%	75%	75%	75%	75%	75%	
No	**Item**	**In RO '000**											**Remarks**
A	**CASH INFLOW**												
1	Equity	527	0	0	0	0	0	0	0	0	0	0	
2	Profit bef tax & int		-202	68	170	284	278	271	264	257	249	242	
3	Depreciation	0	95	95	95	95	95	95	95	95	95	95	
4	Prel exp written off		172	0	0	0	0	0	0	0	0	0	
5	Bank Term Loan	682	0	0	0	0	0	0	0	0	0	0	
6	Increase in W C loan	109	0	29	30	31	0	0	0	0	0	0	
7	**Sub Total**	**1,318**	**65**	**193**	**296**	**410**	**373**	**366**	**359**	**352**	**345**	**337**	
B	**CASH OUTFLOW**												
1	Capital Project expenditure	965	0	0	0	0	64	32	0	0	64	0	
2	Other normal cap exp	172											
3	Increse in Working Cap:	181		42	43	44	0	0	0	0	0	0	
4	Decrease in Institu:Loan	0	0	49	97	97	97	97	97	97	49	0	
5	Interest on term loans		41	41	37	31	25	19	13	7	1	0	
6	Interest on work cap loan		7	7	7	7	7	7	7	7	7	7	
7	Income Tax	0	0	0	0	0	0	37	37	36	36	35	
8	Dividend	0	0	0	0	0	0	0	0	0	0	0	
9	**Sub Total**	**1,318**	**47**	**138**	**184**	**179**	**193**	**192**	**154**	**148**	**157**	**42**	
C	**OPENING BALANCE**	0	0	18	72	185	416	596	770	976	1,180	1,368	
D	**SURPLUS**	**0**	**18**	**55**	**112**	**232**	**180**	**174**	**205**	**204**	**188**	**295**	
E	**CLOSING BALANCE**	**0**	**18**	**72**	**185**	**416**	**596**	**770**	**976**	**1,180**	**1,368**	**1,663**	

ANNEXURE- 5													
PP-R PIPE PRODUCTS													
INTERNAL RATE OF RETURN ON TOTAL CAPITAL													
	Year of Operation		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
	Capacity utilisation for pipes		45%	62%	80%	99%	99%	99%	99%	99%	99%	99%	
	Capacity utilisation for fittings		34%	47%	61%	75%	75%	75%	75%	75%	75%	75%	
No	**Item**	**In RO'000**											**Remarks**
A	**CASH INFLOW**												
1	Net Profit bef. Tax		-249	21	127	247	246	245	244	243	241	235	
2	Depreciation	0	95	95	95	95	95	95	95	95	95	95	
3	Prelim Exp written off		172	0	0	0	0	0	0	0	0	0	
4	Finance Cost	0	47	47	43	37	31	26	20	14	8	7	
5	Salvage Value	0	0	0	0	0	0	0	0	0	0	1,945	
6	Sub Total	0	65	163	266	379	373	366	359	352	345	2,282	
B	**CASH OUTFLOW**												
1	Capital Project expenditure	965	0	0	0	0	64	32	0	0	64	0	
2	Other normal cap exp	172	0	0	0	0	0	0	0	0	0	0	
3	Working Capital	181	0	42	43	44	0	0	0	0	0	0	
4	Income Tax		0	0	0	0	0	37	37	36	36	35	
5	Sub Total	1,318	0	42	43	44	64	69	37	36	100	35	
C	**NET CASHFLOW (AT)**	**-1,318**	**65**	**121**	**223**	**335**	**309**	**297**	**322**	**316**	**244**	**2,247**	
E	**INTERNAL RATE OF RETURN ON TOTAL INVESTMENT**										**18.7%**		

ANNEXURE- 6													
PP-R PIPE PRODUCTS													
INTERNAL RATE OF RETURN ON EQUITY CAPITAL (AFTER TAX)													
	Year of Operation	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
	Capacity utilisation for pipes		45%	62%	80%	99%	99%	99%	99%	99%	99%	99%	
	Capacity utilisation for fittings		34%	47%	61%	75%	75%	75%	75%	75%	75%	75%	
No	**Item**	**In RO '000**											**Remarks**
A	**CASH INFLOW**												
1	Net Profit before Tax	0	-249	21	127	247	246	245	244	243	241	235	
2	Depreciation	0	95	95	95	95	95	95	95	95	95	95	
3	Prelim Exp written off	0	172	0	0	0	0	0	0	0	0	0	
4	Salvage Value	0	0	0	0	0	0	0	0	0	0	1,945	
5	Sub Total	0	18	116	222	342	341	341	339	338	337	2,276	
B	**CASH OUTFLOW**												
1	Equity	527	0	0	0	0	0	0	0	0	0	0	
2	Fixed Assets	0	0	0	0	0	64	32	0	0	64	0	
3	Working Capital	0	0	42	43	44	0	0	0	0	0	0	
4	Loan Instalment	0	0	49	97	97	97	97	97	97	49	0	
5	Income Tax	0	0	0	0	0	0	37	37	36	36	35	
6	Sub Total	527	0	91	140	141	161	166	134	134	149	35	
C	**NET CASHFLOW**	**-527**	**18**	**25**	**82**	**201**	**180**	**174**	**205**	**204**	**188**	**2,241**	
D	**INTERNAL RATE OF RETURN ON EQUITY INVESTMENT**								**27.40%**				

ANNEXURE- 7

PP-R PIPE PRODUCTS

PROJECTED BALANCE SHEET

	Year of Operation		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
	Capacity utilisation for p		45%	62%	80%	99%	99%	99%	99%	99%	99%	99%	
	Capacity utilisation for fittings		34%	47%	61%	75%	75%	75%	75%	75%	75%	75%	
No	**Item**	**In RO '000**											**Remarks**
A	**ASSETS EMPLOYED**												
1	Fixed Assets												
a	Gross Fixed Assets	965	965	965	965	965	1,029	1,061	1,061	1,061	1,125	1,125	
b	Preliminary expenses	172	0	0	0	0	0	0	0	0	0	0	
c	Acc. Depreciation	0	95	191	286	381	477	572	667	762	858	953	
d	Net Fixed Assets	1,137	870	774	679	584	553	489	394	299	267	172	
2	Current Assets												
a	Cash	0	18	72	185	416	596	770	976	1,180	1,368	1,663	
b	Other Cur. Assets	181	181	223	266	310	310	310	310	310	310	310	
c	Total Cur. Assets	181	199	295	451	726	906	1,080	1,286	1,490	1,678	1,973	
3	Less: Cur. Liabilities	0	0	0	0	0	0	0	0	0	0	0	
	TOTAL	**1,318**	**1,069**	**1,070**	**1,130**	**1,310**	**1,459**	**1,570**	**1,680**	**1,789**	**1,945**	**2,145**	
B	**FINANCED BY**												
1	Equity	527	527	527	527	527	527	527	527	527	527	527	
2	Statutory reserve		0	2	15	39	64	85	106	126	147	167	
3	General reserves	0	-249	-231	-116	106	327	515	702	887	1,072	1,252	
4	Bank Term Loan	682	682	633	536	438	341	244	146	49	0	0	
5	Bank Borrowings	109	109	138	169	199	199	199	199	199	199	199	
	TOTAL	**1,318**	**1,069**	**1,070**	**1,130**	**1,310**	**1,459**	**1,570**	**1,680**	**1,789**	**1,945**	**2,145**	
		0	0	0	0	0	0	0	0	0	0	0	

ANNEXURE 8											
PP-R PIPE PRODUCTS											
DEBT SERVICE COVERAGE RATIO											
Years of Operation	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Production in (%)		45%	62%	80%	99%	99%	99%	99%	99%	99%	99%
Item	**In RO '000**										
Profit after tax		-249	21	127	247	246	208	207	206	205	200
Depreciation		95	95	95	95	95	95	95	95	95	95
Prelimnery exp. Written off		172	0	0	0	0	0	0	0	0	0
Interest		47	47	43	37	31	26	20	14	8	7
Total		**65**	**163**	**266**	**379**	**373**	**329**	**322**	**316**	**308**	**302**
Annual repayment		0	49	97	97	97	97	97	97	49	0
Interest		47	47	43	37	31	26	20	14	8	7
Total		**47**	**96**	**141**	**135**	**129**	**123**	**117**	**111**	**57**	**7**
D.S.C.R		1.38	1.70	1.89	2.82	2.89	2.68	2.75	2.84	5.44	46.13
WT. AVERAGE D.S.C.R	**2.64**										

ANNEXURE- 9					
PP-R PIPE PRODUCTS					
BREAK EVEN ANALYSIS					
S.No.	**Item**	**Year 1**		**Year 6**	**Remarks**
		RO '000			
A	**FIXED COST**				
1	Production Wages	91		105	Refer Annexure - 2
2	Factory Overhads	23		31	Refer Annexure - 2
3	Misc. Factory Exp.	8		16	Refer Annexure - 2
4	Admin. Expenses	84		97	Refer Annexure - 2
5	Sales Expenses	69		127	Refer Annexure - 2
6	Depreciation	95		95	Refer Annexure - 2
7	Prelim. Expenses written off	172		0	Refer Annexure - 2
8	Financing Cost	47		26	Refer Annexure - 2
9	Income Tax	0		37	Refer Annexure - 2
10	Sub Total	589		534	
B	**VARIABLE COST**				
1	Raw materials	287		626	Refer Annexure - 2
2	Utilities	24		51	Refer Annexure - 2
3	Misc. Expenses	0		0	
4	Sub Total	310		678	
C	**SALES**	650		1420	Refer Annexure - 3
D	**CONTRIBUTION**	340		742	Difference C - B
E	**BREAK EVEN POINT**	173.4		71.9	As % of Production
		78.2		70.9	As % of Plant Capacity
F	**CASH BEP**	94.8		59.1	As % of Production
		42.7		58.3	As % of Plant Capacity

ANNEXURE- 10						
PP-R PIPE PRODUCTS						
SENSITIVITY ANALYSIS (IRR FOR 10 YEARS)						
		Projection	**Change in One**			
S.No.	**Item**	**No Change**	**Variable at a Time**			**Combined**
A	**VARIABLE**		Volume	R. M	Sales	
			Tons	Cost	Value	All three
	Value- Original		808	273	650	
B	**PESSIMISTIC**					
	Change		**-10%**	**10%**	**-10%**	All three
	- New Value		727	300	585	
C	**I R R - PESSIMISTIC PROJECTION**					
1	**I R R on Investment**	18.7%	14.9	22.6	11.4	
2	**I R R on Equity**	27.4%	20.8	30.3	15.1	

ANNEXURE- 11													
PP-R PIPE PRODUCTS													
RATIO ANALYSIS													
	Years of Operation		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Remarks**
A	**COST RATIOS**													
1	Raw Material / Total Sales			42%	42%	42%	42%	42%	42%	42%	42%	42%	42%	
2	Packing Materials			2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	
3	Utilities / Total Sales			4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	
4	Factory wages / Total Sales			14%	10%	8%	7%	7%	7%	8%	8%	8%	8%	
5	Prime Cost / Total Sales			62%	58%	56%	55%	55%	55%	55%	56%	56%	56%	
6	Factory exp. / Total Sales			4%	4%	3%	3%	3%	3%	3%	3%	3%	3%	
7	Factory Cost / Total Sales			66%	62%	60%	58%	58%	58%	59%	59%	59%	59%	
8	Administrative exp. / Total Sales			13%	10%	8%	6%	7%	7%	7%	7%	7%	8%	
9	Selling exp. / Total Sales			11%	10%	9%	9%	9%	9%	9%	9%	9%	9%	
10	Finanace Cost / Total Sales			7%	5%	4%	3%	2%	2%	1%	1%	1%	0%	
11	Non-Cash exp. /Total Sales			41%	11%	8%	7%	7%	7%	7%	7%	7%	7%	
12	Total Cost / Sales			138%	98%	89%	83%	83%	83%	83%	83%	83%	83%	