

PROJECT PROFILE – SUMMARY SHEET

Project Introduction

1. Project title: **PVA production**

2. Sector: Manufacture of chemicals and chemical products (24)

Sub sector: Manufacture of plastics in primary forms and of synthetic rubber (2413)

3. Products/Services: **Polyvinyl alcohol**

4. Location: Free zone Economic special zone Industrial Estate Main Land

5. Project description:

Poly vinyl alcohol is a unique resin which was first produced in industrial scale by Kuraray. The PVA is an industrial polymer with highlighted properties and its water solubility is the most important feature of this product. The PVA has artificial diverse features such as adhesion, film formation properties, emulsifying features and strength against oil. Using these properties PVA is applicable in industry in areas such as vinylon artificial fibers, POVAL films, stabilizers in PVC polymerization, regulation of coverage dimensions and paper dimensions used. The PVA properties are under the effect of polymerization level and hydrolyze.

The main goal of this plan is to establish a PVA production unit in order to supply a part of factories requirements, prevention from currency exit and employment in Lorestan province.

6. Annual capacity: 10000 t/year

Project Status

7. Local / internal raw material access: 100%

8. Sale:

Anticipated internal market: 10%

Anticipated export market: 90%

9. Construction Period: 24 months

Schedule

Beginning of activity:

In-site beginning of activity:

End of project:

Commercial activity beginning:

10. Project Status:

- Feasibility study available? Yes No
- Required land provided? Yes No
- Legal permissions (establishment license, foreign currency quota, environment, etc) taken? Yes No
- Partnership agreement concluded with local/foreign investor? Yes No
- Financing agreement concluded? Yes No
- Agreement with local / foreign contractor(s) concluded? Yes No
- Infrastructural utilities (electricity, water supply, telecommunication, fuel, road, etc) procured? Yes No
- List of know-how, machinery, equipment, as well as seller / builder companies defined? Yes No
- Purchase agreement for machinery, equipments and technology concluded? Yes No

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**Financial Structure****11. Finance**

Description	Local Currency Required			Foreign Currency Required Million Dollar	Total Million Dollar
	Million Rials	Rate	Equivalent in Million Dollar		
Fix Capital	91511	Each dollar is 32500 Rials	2.82	20	22.82
Working Capital	29943		0.92	0	0.92
Total Investment	121454		3.74	20	23.74

- Value of foreign equipment/machinery: 20 million dollars
- Value of local equipment/machinery: 0.065 million dollars
- Value of foreign technology: million dollar
- Value of local technology: million dollar
- Net Present Value (NPV): 1151512.18 Million Rials for 10 Year, discount rate: 20%
- Internal Rate of Return (IRR): 47.79%
- Payback Period (PP): 54.64%

General Information

12. Project Type: Establishment Expansion and completion

13. Company Profile:

- Name (legal /natural persons):
- Company Name:
- Address:
- Tel: Fax:

-E-mail:	Web site:
-Sector: private sector <input type="checkbox"/> public sector <input type="checkbox"/> other <input type="checkbox"/>	

<i>Please attach follow documents if available</i>
<ul style="list-style-type: none">- Pre-feasibility study <input checked="" type="checkbox"/>- Feasibility study <input type="checkbox"/>- Legal permissions (establishment license, foreign currency quota, environment, etc) <input type="checkbox"/>

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Management and Planing Organization of Lorestan Province

The summary of pre-feasibility studying of poly vinyl alcohol production plan

Plan: poly vinyl alcohol production

Product's introduction

The main goal of this plan is to establish a poly vinyl alcohol production unit to supply some parts of the factories' requirements, prevention of currency payment in foreign countries and employment in Lorestan province. The ISIC code is 2413412418 from chemicals and chemical products and subgroup of plastic products production in primary form and artificial rubber production as well as acetate vinyl polymers or of other vinyl esters in primary form.

The polyvinyl alcohol is exported and imported based on sub-chapters of tariff 3905 of Iranian custom regulations as vinyl acetate polymers or from vinyl acetate in primary form, other vinyl polymers in primary form with sub-tariff 39053000poly (alcohol Vynilic) even containing non-hydrolyzed acetate groups. The conditions under which this is permitted to be imported obtained from trade ministry and mines and industries ministry are to pay 5% import fees in 2016 (custom fee: 4% and trading fee: 1%). Based on trade ministry perspectives, there is no imitation on exporting this product.

Products application

The most important application of poly vinyl alcohol in industry is in textile, glue producing, protective collides for emulsion polymerization and poly vinyl butyrate production as well as paper coating.

This polymer is high quality glue with high strength against solvents, oils and grease. The films of poly vinyl alcohol are of high tension power and their special strength is high. This contains a very suitable barrier to prevent from oxidation of materials in fully dry form.

1. It is used in construction industry to large extend and volume as additive to the cement of joint concrete.
2. It can be used in cosmetics, coating industries and production and coating the printing pages to prevent from corrosion.
3. In textile starching
4. Producing protective colloids for emulsion polymerization
5. Fibbers and poly vinyl butyrate production
6. Paper starching
7. Producing concrete additives and cement joints in construction
8. In pesticides, herbicides and chemical fertilizers' formula
9. As emulsifier in cosmetics to few extent
10. Temporary protective coating
11. Increasing soil viscosity to prevent from erosion
12. It is used highly in photography paper.

Proposed places

Based on advantages of being placed in industrial parks and zones, the Lorestan industrial park is proposed for implementing the plan.

Raw, auxiliary and consuming materials

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The raw materials of this unit are different chemicals which are supplied by petrochemical complexes or via importation.

Raw materials

Unit price (rial)	Scale	Raw, auxiliary and consuming materials	No
55,250,000	t	Vinyl Acetate	1
2,200,000	t	Sulfuric acid	2
12,500,000	t	Methanol	3
56,000,000	t	isopropanol	4
64,700,000	t	Ethyl Acetate	5
160,000,000	t	Sodium hydroxide	6
50,000,000	t	Packing materials	7

Sales plan

Based on investigations and enquiring the price of products sales, the factory price is as follow. This is based on demand/supply of export target market.

Sales

Price (Rials)/Kg	Description	No.
102000	Poly vinyl alcohol	1

Annual sales

Year 5	Year 4	Year 3	Year 2	Year 1	Description
90%	90%	90%	80%	70%	Production percentage
9000	9000	9000	8000	7000	Poly vinyl alcohol (t)

The annual nominal and practical capacities

Studying and investigating the machineries capacity and investing as well as economic studying of the plan confirm that production capacity of 10000 T annually is suitable for this unit. Accordingly, the products annual production capacity in 3 working shifts each with 8 hours working daily during 300 days per year is about 10000 T. Since the nominal capacity of production is for ideal situations, considering the unpredictable factors such

The summary of pre-feasibility studying of poly vinyl ancohol production plan

as work stop and repair and maintenance, the efficiency of this unit is 90% which is set to be 9000 T annually.

Production procedure and technology used

In producing process of poly vinyl alcohol, first the vinyl acetate is polymerizes in Azo procedure in bulk process in 20C and 18h in a autoclave reactor equipped with temperature and pressure controller and a fluid cooling rotator with output signals. The molecular weight is 1.1×10^6 . Then the sample is hydrolyzed in alcohol solution and is changed to poly vinyl alcohol with molecular weight of 61×10^5 . To determine that this polymer is fully linear, this is sterilized again and is changed to poly vinyl alcohol with minimum molecular weight of 75.1×10^6 . Producing this polymer with this application has just been started since recent years. The chemical formula of this product is as follow:

Synonym: Poly(vinyl alcohol)

Linear Formula: $[-CH_2CHOH-]_n$

Plan investment costs

The fixed plan investment cost is 741.5 billion Rials and the working capital of plan is estimated to be 29 billion Rials.

%	Total (million rials)	Required				Description
		Required total (million rials)	Rial (million rials)	Rial equivalence	Currency	
0%	3,500	3,500	3,500	0	0	Land
0%	1,350	1,350	1,350	0	0	Landscaping
2%	19,022	19,022	19,022	0	0	Building
84%	650,000	650,000	0	650,000	20,000,000	Complex required equipment
3%	25,021	25,021	25,021	0	0	Installations
0%	400	400	400	0	0	Vehicles
0%	87	87	87	0	0	Workshop equipment
0%	387	387	387	0	0	Service and administrative equipment
5%	34,988	34,988	2,488	32,500	0	Unexpected and miscellaneous
95%	734,754.68	734,754.68	52,254.68	682,500	20,000,000	Total fixed assets

The summary of pre-feasibility studying of poly vinyl ancohol production plan

%	Total (million rials)	Required				Description
		Required total (million rials)	Rial (million rials)	Rial equivalenc e	Currency	
1%	6,756.41	6,756.41	6,756.41	0	0	Pre-exploitation costs
96%	741,511.08	741,511.08	59,011.08	682,500	20,000,000	Fixed investment costs
4%	29,943.06	29,943.06	29,943.06	0	0	Working capital
0%	0	0	0	0	0	Other assets
100%	771,454.14	771,454.14	88,954.14	682,500	20,000,000	Total plan investment costs

The plan production costs

The annual production costs are estimated to be 496.73 billion riials.

Costs (million riials)	Description	No.
361315.05	Consumer materials	1
10676.4	Production salary and wage	2
5769.45	Water, electricity, fuel and communication	3
1459.23	Insurance	4
29036.89	Repair and maintenance	5
10200	Marketing and ads	6
12247.71	Production unpredicted and miscellaneous	7
66027.37	Depreciation	8
496732.1		Total

Economic indices

Value-measurement scale	Description
1151512.18 million riials	NPV
47.79%	IRR
1.83 year	PBP