

Islamic Republic of Iran
Organization for investment economic and technical assistance of Iran

"Summary of technical-economical prefeasible study"

The name:

Production of Sulfonic Acid (Alkyl Benzene Sulfonic Acid)

Sector: **industry** subsector: **Chemical industries** isic code: **2411512569**

The owner of:

**General Directorate of Economic and Financial Affairs of
Kermanshah Province**

Counselor plan:

Razi University of Kermanshah

The ADDRESS:

Kangavar, Kermanshah Province

Date of P.F.S:

August 2024

Manager of Iran Investment Opportunities
SHAHRIG Engineering Company

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1- Abstract :

PROJECT PROFILE - SUMMARY SHEET

Project Introduction			
1- Project title : Production of Sulfonic Acid(Linear Alkyl Benzene Sulfonate)			
2- Sector: Industry		Sub Sector: Chemical industries	
3- Products / Services: Sulfonic Acid(Linear Alkyl Benzene Sulfonate)			
4- location (address)			
Free Zone <input type="checkbox"/>	Economic Special Zone <input type="checkbox"/>	Industrial Estate <input checked="" type="checkbox"/>	Main Land <input type="checkbox"/>
5- Project description: <p>For this industrial unit with an annual capacity of 100,000 tons of Sulfonic Acid(Linear Alkylbenzene Sulfonic Acid) and derivatives, the required land is estimated to be 30,000 square meters. Considering the purchase price of 30 million Rials per square meter in kangavar Industrial Town, the total cost of land acquisition amounts to 900 billion Rials. The site preparation includes leveling 30,000 square meters, constructing 8,000 square meters of walls and fencing, installing one metal entrance gate, and creating 4,500 square meters of green space and lighting, with an estimated cost of 637.5 billion Rials.</p> <p>Construction includes the production hall (6000 square meters), raw material and parts warehouse (1500 square meters), product warehouse (1000 square meters), design unit (200 square meters), laboratory and quality control unit (300 square meters), administrative building (400 square meters), dining hall and canteen (400 square meters), security and caretaker rooms (100 square meters), power and generator room (100 square meters), and restrooms (150 square meters), totaling 10,050 square meters with a cost of 2022.5 billion Rials. Additionally, the infrastructure includes electricity (250 kW connection), water (1-inch connection), gas, diesel (5,000-liter tank), and gasoline (5,000-liter tank) with a cost of 5.2 billion Rials.</p>			

Project Status	
6- Local / internal raw material access: 70%	
7- Sale :	
- Anticipated local market : 40%	
- Anticipated export market : 60%	
8 – Project total time (from start of activities to start of commercial operation in years) : 15 months	
Schedule	Start of activities: Month 1 to 4 (4 months) Start of works at site : Month 5 to 10 (6 months) End of Works: Month 11 to 14 (4 months) Start of commercial operation: Month 15 (1 month)

9- 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 concluding with local /foreign investor? Yes No
- Financing agreement concluding? Yes No
- Agreement with local /foreign contractor(s) concluding? 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
- Purchases agreement machinery·equipment and know-how concluded? Yes No

Financial Table

10- Financial structure :

Descriptions	Local Currency Required			Foreign Currency Required Million Euro	Total Million Euro
	Million Rials	Rate	Equivalent in Million Euro		
Fix Capital	9019725	500000 Rial	18.04	44.34	62.38
Current Capital	11681886	500000 Rial	23.36	-	23.36
Total Investment	20701611	500000 Rial	41.40	44.34	85.74

- Value of foreign equipment / machinery 44.34 Million Euro
- Value of local equipment / machinery 0.2 Million Euro
- Value of foreign technical know-how - Million Euro
- Value of local technical know-how - Million Euro
- Net present value (NPV) 53.88 Million Euro
- Internal Rate of Return (IRR) 82.64 %
- Capital Rate of Return: 52.33 %
- Payback Period 2 years and 5 months

General Information

11 - Project type: Establishment ☒ Expansion and completion ☐

12- Company Profile

- Name (Legal / Natural persons): Industry, Mine and Trade organization
- Company's current activities: Government services
- Address: Next to the Blood transfusion organization, Shahid Beheshti Blvd., Kermanshah
- Tel: 08338239160 Fax: 08338239157
- E-mail: Web Site: www.ksh.mimt.gov.ir
- Company's legal structure:
 Government ☒ Non-Governmental ☐ Public non-governmental ☐

2- Project's location:

2-1- Province:



Kermanshah Province is a mountainous region in western Iran, covering an area of 25,900 square kilometers and sharing a 370-kilometer border with Iraq. It is bordered to the north by Kurdistan Province, to the south by Lorestan and Ilam Provinces, to the east by Hamadan Province, and to the west by Iraq. The provincial capital is Kermanshah city, and the province currently consists of 14 counties, 21 cities, 31 districts, 86 rural districts, and 2,793 inhabited villages, with

a population of about 2 million people. Kermanshah is strategically positioned on the main east-west and northwest-south routes of the country, making it a key transit corridor for goods and services to Iraq and for pilgrims traveling to holy sites in Iraq, with close proximity to major economic centers in Iran.

Due to its geographic location within the Zagros mountain range, Kermanshah experiences a variety of climates, earning it the nickname "the four-season province."

Kermanshah's extensive border with Iraq provides convenient access to land and air routes, and it boasts numerous technical and vocational training centers. It has a road network of 2,796 kilometers, is located along the Silk Road, and serves as a major healthcare and medical education hub for western Iran. The province also benefits from connections to the western railway line from Arak to Kermanshah and is home to key infrastructures, such as the Kermanshah Refinery, Bistoon Power Plant, oil and gas reserves, and the Shahid Ashrafi Esfahani International Airport (the largest airport in western Iran). Additionally, it offers opportunities for exporting engineering and technical services to Iraq, particularly in power, dam construction, energy, and infrastructure sectors.

Kermanshah has a skilled and unemployed workforce, a favorable social and economic environment for attracting domestic and foreign investment, and promotes economic and trade activities with Iraq and the Kurdistan Region. It lies on a key transit axis between northwest and southern regions and supports religious tourism to Karbala, with millions of pilgrims passing through annually. The province also supports infrastructure needs, such as water, electricity, and gas, in its 23 industrial parks and zones.

The province hosts official customs facilities at Khosravi and Parviz Khan in Qasr-e Shirin and various trade hubs at Shushmi, Nosood, Sheikh Saleh in Thalass Babajani, and Sumar. It has significant ecotourism potential due to its diverse climate, forests, and flora and fauna. Other notable features include the Qasr-e Shirin Free Trade-Industrial Zone, the Eslamabad-e Gharb Special Economic Zone, the western railway connecting to Iraq and Syria, and eight operational dams with a total capacity of 832 million cubic meters. These attributes position Kermanshah as a province with vast economic, industrial, and tourism potential.

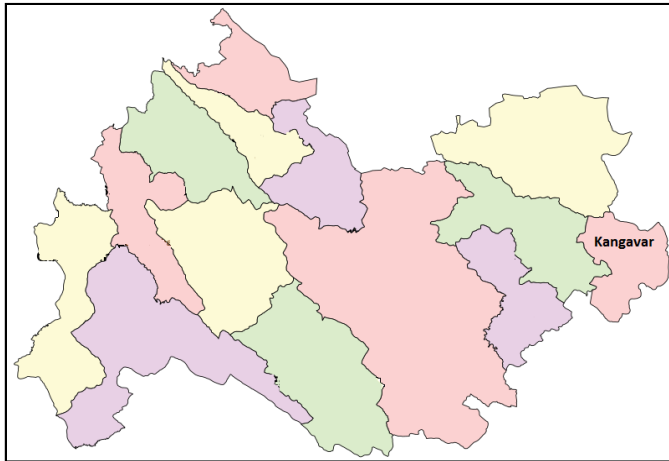
Kermanshah Province possesses significant industrial and mineral capabilities, including major industries such as the Bistoon Petrochemical Plant, Kermanshah Petrochemical Plant, Jahan Foad Gharb Steel Mill, Saman Cement, West Cement, the propylene production project, and the Kermanshah Refinery. The region is also rich in natural resources, with substantial reserves of oil and natural gas, various building material quarries (such as decorative stone, gypsum, rubble stone, and lime), and both metallic and non-metallic mineral deposits, including iron ore, silica, and feldspar. The province has a plentiful labor force, skilled designers, and experienced professionals in hand-woven carpets. Additionally, Kermanshah is distinguished by its reserves of natural bitumen (gilsonite and bitumen) and its potential for processing and exporting these resources. The unique mineral reserves of non-metallic minerals and upstream industries set Kermanshah apart from other provinces in western Iran.

The province's agricultural and livestock sector is also highly developed, with 22 storage dams and 9 billion cubic meters of water resources, 946,871 hectares of farmland (227,500 hectares of which are irrigated), 208 medicinal plant species, an average annual rainfall of 537 mm, 9,258,711 hectares of rangeland, and 527,404 hectares of forest. It supports the production of 20,281 tons of canola, 477,910 tons of wheat, 326,000 tons of barley, 208 tons of oilseed sunflowers, and 14,903 tons of sunflower seeds for nuts. There are also 1,038 industrial and semi-industrial units in livestock, dairy, and poultry farming, with a livestock population of 2,971,153 sheep and goats and 300,519 cattle. These produce 120,405 tons of red meat, 36,450 tons of poultry, 83,955 tons of chicken, fish, and other products annually, along with 182 agricultural processing units.

Kermanshah boasts a rich historical and cultural heritage, ranking third in Iran for historical sites after Shiraz and Susa, with landmarks like Bisotun and Taq Bostan located within the major city of Kermanshah. The province has six tourist zones and 14 tourism hubs, featuring over 100 tourist sites, including Taq Bostan, the traditional bazaar, Jameh Mosque, Sarab Nilofar, and historical sites like the Ganj Dareh mound, Darius Inscription, Shah Abbasi Caravanserai, Anahita Temple, and scenic areas such as Sarab Darband in Sahneh, Rijab River, Yazdegerd Castle, Abu Dujana Tomb, Quri Qaleh Cave, Sarab Ravansar, Rijab Waterfall, and Hajij and Shamsir villages.

Kermanshah has international trade infrastructure, such as the Khosravi and Parviz Khan borders, and offers investment opportunities in health tourism. The province's numerous attractions include the globally registered Bisotun complex, Taq Bostan complex, Anahita Temple, Taq-e Gara, protected areas ideal for ecotourism focused on native flora and fauna, and architectural marvels like the Moaven al-Molk Tekyeh and Biglar Beigi Tekyeh. The rich cultural and ethnic diversity offers anthropological tourism potential, featuring local traditions, attire, lifestyles, dialects, customs, religion, and music, enabling the creation of cultural and heritage tours. Natural attractions support sports tourism, including paragliding, climbing at Simreh cliffs, dam reservoir water sports, caving, and mountaineering, as well as notable tourist sites like Sarab Karand and the Bisotun-Taq Bostan tourism corridor. Key villages, like Shamsir and Fash, serve as ideal rural tourism destinations, positioning Kermanshah as a prime region for tourism development.

2-2- the County:

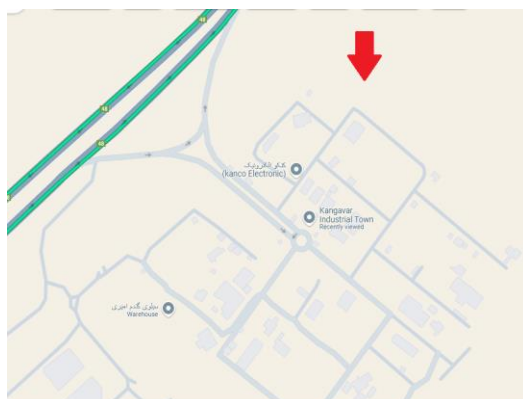


Kangavar is a city in the east of Kermanshah province, with a population of approximately 80,000 people. The Kangavar County is bordered to the north and east by Hamedan province, to the southwest by Lorestan province, to the northwest by the city of Sonqor, and to the west by Sahneh. The residents of Kangavar are Kurdish, Laki, Lur, and Turkish. The county consists of two cities, Kangavar and Godin, and four rural districts. Kangavar County

is home to historical sites such as the Anahita Temple, Godin Tepe, the old Tavakkol Bathhouse, the Grand Bathhouse, the Sari Aslani House, the Imamzadeh Mosque, the Jameh Mosque of Kangavar, the shrine of Shahzadeh Mohammad Ibrahim, Imamzadeh Seyyed Jamal al-Din, Imamzadeh Baqer, the Koucheh Bridge, Joda Hill, Borj Hill, Cheshmeh Yaar Qazvineh Hill, Cheshmeh Takht Qazvineh Hill, Gouri Hill, the Alah Deneh Mine, the Shal Maran Mine (Chel Maran), the Bagh Melli Mine, the prehistoric cemetery of Rostamabad, the Shah Abbasi Caravanserai, the Hassan Khan Bathhouse, the Qabar Agha Shrine, and the Gabr Girl Castle, as well as natural attractions like the Kangavar Sarab River, Abdol Spring, Hindi Abad Spring, and Dar Seifur Spring.

The primary job advantages of the area, in order of priority, include the food industry, animal husbandry, agriculture, conversion and complementary industries, services, fisheries, horticulture, industry, poultry, and handicrafts. Kangavar County is primarily based on agricultural and livestock production, with limited industrial activities. However, the main active industries in the Kangavar Industrial Town include non-metallic waste and scrap recycling, non-reinforced concrete wall blocks, ground grain products, meat products, the production of various plastic items, tissues, washing and grading of sand and gravel, pet food, dairy products, concrete, cement, and gypsum products, disposable paper and cardboard goods, fertilizers and nitrogen compounds, structural metal products, non-refractory building clay and ceramic items, electric motors, generators, and transformers. There is also potential for establishing chemical industries, including detergent production such as powder, liquid, and other related products.

2-3- the project:



The proposed location for the implementation of the Kangavar Industrial Town project, with the geographic coordinates UTM (34.1462, 45.9343), is recommended. This location offers convenient access to essential infrastructure, such as water, electricity, gas, and transportation routes, and aligns with environmental guidelines and recommendations.

2-4-access to the infrastructures:

No.	Needed infrastructures	distance to the project	The supply infrastructures
1	water	Less than 1 km	Kangavar Industrial Estate
2	electricity	Less than 1 km	Kangavar Industrial Estate
3	gas	Less than 1 km	Kangavar Industrial Estate
4	Telecommunications	Less than 1 km	Kangavar Industrial Estate
5	High way	Less than 1 km	Ministry of Roads and Urban Development - Kermanshah
6	Sub way	Less than 1 km	Ministry of Roads and Urban Development - Kermanshah
7	airport	97 km	Shahid Ashrafi Airport, Kermanshah
8	port	1525 km	Ports and Maritime Organization of Iran - Bandar Abbas
9	Rail way	97 km	Iranian Railways - Arak (Kermanshah)

3. Technical Specifications of plan:

3-1 –product: **Sulfonic Acid**

Linear Alkylbenzene Sulfonic Acid (LAS) or Linear Alkylbenzene Sulfonic Acid (LABSA) is one of the most commonly used chemicals in the detergent industry. This chemical compound, also known as sulfonic acid, plays a fundamental role in the production of cleaning products. Due to its anionic properties, which lead to the formation of negative ions in aqueous solutions, LABSA can effectively eliminate dirt and grease. This property has made LABSA one of the most widely used surfactants in the detergent industry. Moreover, the use of this material in various formulations optimizes production costs and enhances the performance of cleaning products, so much so that many producers prefer to use it as a raw material in their formulations due to its lower cost compared to other surfactants (Ahmed et al., 2018).



In terms of chemical structure, LABSA consists of a linear hydrocarbon chain (alkyl) attached to a benzene ring with a sulfonic group (SO_3H -) bonded to it. This specific structure imparts properties such as chemical stability, high solubility in water, and the ability to produce negative ions in aqueous solutions. Anionic surfactants, including LABSA, can interact with both polar and non-polar molecules, effectively removing oily contaminants and greases from surfaces and increasing cleanliness. These properties have made LABSA widely used in both

household and industrial cleaning products, such as dishwashing liquids, detergents, and cleaning agents (Gao et al., 2020).

One of the notable features of LABSA is its high foaming ability. The foam produced by this material effectively traps contaminants and greases, separating them from various surfaces. Therefore, LABSA is recognized as a key ingredient in the formulation of both industrial and household detergents. Additionally, its high solubility in water and many organic solvents enables it to function well in various environments. This feature allows LABSA to be used in a wide range of product formulations, from household cleaners to industrial degreasers and even emulsifiers in oil drilling (Sharma et al., 2021).

LABSA is produced through the sulfonation process of linear alkylbenzene. In this process, linear alkylbenzene reacts with sulfur trioxide (SO_3) in the presence of intermediates such as sulfur dioxide (SO_2) or sulfuric acid (H_2SO_4), and the sulfonic group is attached to the benzene ring. The sulfonation process is simple and cost-effective, allowing LABSA to be produced at low costs. These characteristics, along with the chemical stability and relative biodegradability of the material, make it an attractive option for detergent manufacturers. Furthermore, due to its stability in hard water and high efficiency in reducing surface tension, LABSA is one of the main choices for producing both industrial and household detergents (Ahmed et al., 2018).

Due to its diverse properties, LABSA is used in various industries. In the textile industry, LABSA serves as a wetting and cleaning agent. It can effectively clean fabrics and remove grease and contaminants from them. In the leather industry, LABSA is used as a degreasing agent to clean and prepare leather before subsequent processes. Additionally, in the oil industry, LABSA is used as an emulsifier in oil drilling operations, which helps facilitate the drilling process and enhance efficiency. Furthermore, in agriculture, LABSA is employed as a dispersing agent in pesticide and fertilizer formulations, which helps improve the distribution of these substances on various surfaces and increases their effectiveness (Li et al., 2020).

The implementation of a sulfonic acid and detergent powder production project in Kangavar County, Kermanshah Province, is notable from various aspects and can offer multiple benefits. One of these benefits is the easy access to raw materials required for the production of sulfonic acid. Kermanshah Province, due to its strategic geographic location and proximity to the western borders of Iran, particularly the Iraq border, can offer significant advantages in terms of importing raw materials. This proximity to the borders reduces transportation costs for raw materials such as alkylbenzene, which directly impacts the reduction in production costs and increases project profitability.

On the other hand, the strategic location of Kangavar County is also one of the main reasons this area is suitable for setting up such a production unit. Kangavar is connected to Iran's road and rail transport networks, allowing for the rapid transfer of products to domestic and foreign markets. Additionally, its proximity to large markets in neighboring countries, especially Iraq, facilitates the export of detergent products to these markets. These factors can contribute to the development of non-oil exports and strengthen Iran's position in international markets. On a regional level, the establishment of this production unit could have positive social and economic impacts. The high unemployment rate in Kermanshah Province is one of the region's major challenges, and industrial projects can lead to job creation for local residents. Creating direct and indirect employment not only helps reduce unemployment but also increases household income and improves the standard of living in the region.

Moreover, the Iranian government has provided favorable conditions for investment in underdeveloped areas like Kermanshah by offering financial incentives and tax exemptions to investors. These incentives can help reduce initial investment costs and speed up the establishment of the production unit. Taking advantage of these supports makes investing in this area economically attractive. From an infrastructure perspective, Kangavar has suitable potential for hosting industrial units. The availability of adequate energy resources, such as gas and electricity, as well as appropriate industrial infrastructure, are factors that facilitate the implementation of such projects. The development of industrial infrastructure and improved access to necessary production resources will enhance productivity and efficiency in manufacturing units.

3-2-project's requirements:

3-2-1-Space and infrastructure required:

A. Land: The minimum required land area is estimated to be 30,000 square meters. Considering the purchase price of 30 million rials per square meter in the Khangavar Industrial Park, the total cost of purchasing the land is estimated to be 900 billion rials, equivalent to 1.8 million euros.

Land Area (m ²)	Unit Price (Billion Rials)	Total Cost (Billion Rials)	Total Cost (Thousand Euros)
30,000	0.03	900	1,800

B. Landscaping: The landscaping costs include leveling, wall construction, fencing, entrance gates, green spaces, etc. A detailed breakdown of these costs is presented in the table below:

No.	Description	Area (m ²)	Unit Price (Billion Rials)	Total Cost (Billion Rials)	Total Cost (Thousand Euros)
1	Leveling, Excavation, and Filling	30,000	0.005	150	300
2	Wall Construction, Fencing, and Landscaping	8,000	0.04	320	640
3	Street Construction, Sidewalks, Parking, and Asphalt (20% of Land Area)	6,000	0.03	180	360
4	Green Spaces and Lighting (15% of Land Area)	4,500	0.005	22.5	45
5	Metal Entrance Gate	-	1	1	2
Total				637.5	1,347

C. Building Construction Costs: Considering the dimensions of machinery and equipment, the minimum required working space is suggested as follows:

No.	Description	Built-Up Area (m ²)	Unit Price (Billion Rials)	Total Cost (Billion Rials)	Total Cost (Thousand Euros)
1	Production Hall	6,000	0.20	1,200	2,400
2	Raw Materials and Spare Parts Warehouse	1,500	0.15	225	450
3	Finished Product Warehouse	1,000	0.15	150	300
4	Design Unit	200	0.15	30	60
5	Laboratory and Quality Control	300	0.15	45	90
6	Office Building	400	0.20	80	160
7	Canteen and Self-Service	300	0.20	60	120
8	Guardhouse and Gatehouse	100	0.15	15	30
9	Electrical Room and Generator	100	0.15	15	30
10	Restroom	150	0.15	22.5	45
Total				2,022.5	4,045

D. Utilities and Infrastructure Costs: The maximum energy consumption for this unit is based on 270 working days and a single 8-hour shift, as proposed:

No.	Facility Title	Technical Specifications	Daily Consumption/Hour	Hour/Shift	Working Days	Overlap Factor	Maximum Energy Consumption in the Unit	Total Cost (Billion Rials)	Total Cost (Thousand Euros)
1	Electricity	250 kW	250	8 hours	270	0.8	43,200 kWh	5	10
2	Water	1-inch	16.5	1 shift	270	-	4,455 m ³	0.1	0.2
3	Gas	-	225	1 shift	270	-	60,750 m ³	0.04	0.08
4	Diesel	5,000-Lit tank	60	1 shift	270	-	16,200 Lit	0.03	0.06
5	Gasoline	5,000-Lit tank	60	1 shift	270	-	16,200 Lit	0.03	0.06
Total								5.2	10.4

3-2-2-Equipment and machinery:

The required equipment and machinery for this industrial unit, with an annual capacity of 10,000 tons, are estimated to cost approximately 22,270 billion rials, equivalent to 44,540 thousand euros, as detailed below:

No.	Equipment / Machinery	Specifications	Quantity	Unit Price (Billion Rials)	Total Price (Billion Rials)	Total Price (Thousand Euros)
1.	Sulfonation Reactor	Capacity: 10,000 tons/year, Material: Stainless steel, Working pressure: 10 bar	2	800	1600	3200
2.	Gas Absorption Tower	Material: Carbon steel with anti-corrosion coating, Height: 20 m	2	500	1000	2000
3.	Distillation Column	For precise separation of products	2	400	800	1600
4.	Transfer Pumps	Type: Centrifugal, Capacity: 100 L/min, Material: Stainless steel	8	80	640	1280
5.	Heat Exchanger	Heat transfer area: 400 m ²	2	300	600	1200
6.	Effluent Treatment Plant	Capacity: 40 m ³ /day, Includes mechanical and chemical systems	2	500	1000	2000
7.	Settling and Separation Unit	For liquid-liquid or liquid-solid separation	2	300	600	1200
8.	Main Mixer	Equipped with vacuum and heating system	4	200	800	1600
9.	Filters	For impurity separation	4	400	1600	3200
10.	Filling Machine	Automatic, multi-nozzle, adjustable	4	600	2400	4800
11.	Pasteurizer	For sterilizing the final product	4	400	1600	3200

12.	Raw Material Storage Tanks	Capacity: 100 m ³ , Material: Stainless steel	4	200	800	1600
13.	Packaging Unit	Type: Automatic, Capacity: 10 tons/hour	2	600	1200	2400
14.	Weighing and Packaging	Accuracy: 0.1%, Capacity: 10 bags/min	4	200	800	1600
15.	Cooling Tower	Capacity: 1000 tons, Counterflow system	1	200	200	400
16.	Air Compressor	Type: Rotary screw, Capacity: 10,000 L/min	1	300	300	600
17.	Final Product Storage Tanks	Capacity: 200 m ³ , Material: Stainless steel	4	300	1200	2400
18.	Intermediate Storage Tanks	Capacity: 100 m ³ , Material: Stainless steel	4	200	800	1600
19.	Water Treatment	Includes filters, reverse osmosis (RO), and water softening equipment	1	400	400	800
20.	Steam Boiler	Capacity: 20 tons/hour, Working pressure: 10 bar	1	400	400	800
21.	HVAC & Industrial Ventilation	Includes heating, cooling, and ventilation systems for work areas	1	200	200	400
22.	Overhead Crane	Capacity: 20 tons, Span: 20 m	1	400	400	800
23.	Material Handling	Includes conveyors, pallet jacks, and forklifts	1	500	500	1000
24.	Pipes and Fittings	Various (e.g., stainless steel, PVC)	-	300	300	600
25.	Control Systems	PLC, touch screen, sensors	1	300	300	600
26.	Laboratory Equipment	Various (e.g., ovens, analyzers)	10	60	600	1200
27.	Forklifts	4 tons, electric	4	100	400	800
28.	Electrical Distribution	Switchgear, cables, etc.	-	150	150	300
29.	Safety & Environmental	Fire extinguisher, safety showers, etc.	-	50	50	100
30.	Office Equipment	Table, chair, etc.	-	50	50	100
31.	Generator	1100 kW/h	1	150	150	300
32.	Heating & Cooling	Cooler, heater, etc.	-	100	100	200
33.	Communication	PBX system, IP phones, switches, routers, racks, passive network equipment (Ethernet), conference software and equipment, call recording systems, computers, implementation services, maintenance, CRM and other necessary software	-	100	100	200
34.	Overhead Crane	Capacity: 10 tons, Span: 20 m	1	200	200	400
35.	Light Trucks	Force 6-ton truck	1	20	20	40
36.	Service Vehicles	Dena Plus	1	10	10	20
Total					22,270	44,540

3-2-3- Raw materials and intermediate components:

For the production of sulfonic acid, the raw materials and intermediary components used in the production process are as follows:

❖ Main Materials

- **Linear Alkylbenzene (LAB):** This is the primary raw material produced from the combination of benzene and linear paraffins. Linear paraffins, derived from crude oil, are converted into linear alkanes in a dehydrogenation process, then react with benzene in an alkylation process to produce linear alkylbenzene.
- **Sulfuric Acid:** Used for sulfonating linear alkylbenzene, resulting in the final product, linear alkylbenzene sulfonic acid (LABS).

❖ Chemicals and Intermediary Components

- **Catalysts:** Employed in the alkylation process to accelerate the reaction. These catalysts can include phosphoric acid or other specific catalysts.
- **Additives:** Compounds such as antioxidants or antifoam agents, which are used to improve the final quality of LABS.

❖ Consumable Materials and Components

- **Filters:** Used to remove suspended particles and impurities in input and output streams.
- **Gaskets and Seals:** Utilized for maintaining sealing and preventing leaks in pipelines and equipment.
- **Lubricants and Industrial Oils:** Used for lubricating mechanical equipment and reducing friction and wear on components.

❖ Water and Fuel

- **Industrial Water:** Used for cooling, washing, and in some processing stages like steam generation for thermal processes.
- **Boiler Feed Water:** For steam generation in boilers, which serves as a heat and mechanical power source in various processes.
- **Natural Gas:** The most common fuel used in production units as an energy source for steam generation and heating.
- **Fuel Oil:** Used as an auxiliary fuel in some units when natural gas is scarce.

Table of Consumption Ratios or Quantities of Raw or Intermediary Components in the Production of One Ton of Sulfonic Acid

Materials/Components	Consumption per Ton (kg)	Approximate Unit Price per Ton (Million Rials)
Linear Alkylbenzene (LAB)	800	31
Sulfuric Acid	200	19
Catalysts (Phosphoric Acid)	5	125
Additives*	2	125
Filters	1	12
Gaskets and Seals	0.5	6
Lubricants and Industrial Oils	0.5	6

* Additives include: antioxidants, antifoam agents, viscosity modifiers, surfactants, stabilizers for chemical properties, pH adjusters, chelating agents to prevent negative effects of metal ions, preservatives to inhibit microorganism growth, and lubricants to reduce friction and wear.

3-2-4-management and human resources:

The table below estimates the required personnel for the startup of a production line with a nominal capacity of 100,000 tons per year. The production unit faces no challenges in terms of labor supply, and it will create significant employment opportunities in the region.

No.	Position	Activity Type	Skill Level	Number (People)	Basic Salary (Million Rials)	Annual Salary (Million Rials)
1	CEO	Non-Production	expert	1	150	1,800
2	Production Manager	Non-Production	expert	1	150	1,800
3	Process Engineer	Non-Production	expert	3	150	5,400
4	Quality Control Technician	Production	Skilled	3	130	4,680
5	Production Line Operator	Production	Skilled	30	130	46,800
6	General Worker	Production	Unskilled	40	120	57,600
7	Maintenance Technician	Production	Skilled	3	130	4,680
8	Laboratory and Quality Control Expert	Non-Production	Skilled	5	130	7,800
9	Health and Safety Officer	Non-Production	Skilled	3	130	4,680
10	Procurement and Logistics Officer	Non-Production	Skilled	2	130	3,120
11	Accountant	Non-Production	Skilled	2	130	3,120
12	Warehouse Manager	Non-Production	Skilled	1	130	1,560
13	Warehouse Worker	Non-Production	Skilled	3	130	4,680
14	Security Guard	Non-Production	Unskilled	4	120	5,760
15	Administrative Officer	Non-Production	Skilled	2	130	3,120
16	Administrative Staff	Non-Production	Unskilled	4	120	5,760
17	Cleaning and Services	Non-Production	Unskilled	3	120	4,320
18	Internal Transport Driver	Production	Skilled	5	130	7,800
Total				115		174,480
Employer Benefits and Insurance (60% of total salaries)						104,688
Total (Million Rials)						279,168

• Summary by Skill Level

No.	Skill Level	Number	Basic Salary (Rials)
1	expert	5	150,000,000
2	Skilled	59	130,000,000
3	Unskilled	51	120,000,000

- Number of skilled personnel required:: **59** persons
- Number of unskilled personnel required: **51** persons
- Number of expert personnel required: **5** persons

4. Ownership and legal permission:

4-1- ownership of land:

The proposed industrial unit will be located in Kangavar Industrial Town. The land ownership belongs to the Kermanshah Industrial Towns Company, which will transfer the land to investors under a support program for industrial units in underdeveloped regions. This transfer will be arranged with 10% of the payment upfront and the remainder in long-term installments. After the industrial unit obtains an operational license and completes trial production, the land deed will be transferred to the unit.

Establishing industrial units in industrial towns offers numerous benefits for production units and the national economy. These benefits include reduced production costs, easier access to markets, improved productivity, enhanced product quality, job creation, and sustainable development. Further advantages of setting up in industrial towns include:

❖ **Infrastructure and Service Benefits:**

- **Easy Access to Essential Infrastructure:** Industrial towns are typically equipped with essential networks such as water, electricity, gas, sewage, and telecommunications, reducing initial investment costs for production units.
- **Shared Facilities:** Many industrial towns provide shared facilities like wastewater treatment plants, fire stations, technical and engineering service centers, police stations, and medical centers, which help lower operational costs for production units.
- **Access to Efficient Transportation:** Most industrial towns are connected to road and rail networks, facilitating the transport of raw materials and finished products.
- **Availability of Ready-to-Use Land:** Industrial towns offer ready-to-use land designated for industrial use, allowing production units to secure the necessary land with minimal difficulty and time.
- **Research and Technology Centers:** Some industrial towns host research and technology centers that can assist in improving product quality and production processes.

❖ **Economic and Legal Benefits:**

- **Tax Incentives:** Production units located in industrial towns enjoy tax benefits, such as tax exemptions and investment incentives.
- **Streamlined Licensing:** The process of obtaining necessary permits for establishing an industrial unit is typically simpler and faster in industrial towns than in other regions.
- **Banking Facilities:** Access to banking facilities and the benefit of guarantee funds is easier for production units based in industrial towns.
- **Reduced Administrative Costs:** Being located in an industrial town streamlines the process of obtaining permits and carrying out administrative tasks, reducing related time and costs.
- **Formation of Industrial Clusters:** The concentration of similar or related production units within an industrial town enables the formation of industrial clusters, which can increase productivity, reduce costs, and enhance product quality.

❖ **Environmental and Social Benefits:**

- **Pollution Control:** Due to environmental regulations within industrial towns, it is easier to control industrial pollution and preserve the environment.
- **Job Creation:** Establishing production units in an industrial town creates employment opportunities in the region and boosts the local economy.
- **Improved Quality of Life:** The development of industrial towns and their social responsibility towards surrounding areas can contribute to improved infrastructure and raise the quality of life for nearby residents.

4-2- Intellectual property and incentives:

Intellectual property (IP) and privileges grant an individual or organization the exclusive right to protect their intellectual and intangible assets, such as inventions, industrial designs, utility models, trademarks, trade names, geographical indications, and copyright. Registering IP prevents copying of ideas, products, and processes, providing a competitive advantage. Strong IP not only boosts brand value and product credibility but also attracts investors. Additionally, revenue can be generated by licensing IP rights to others. In setting up an industrial unit for producing sulfonic acid, this concept is crucial and can significantly impact the business's success and growth. Below are some of the most important aspects of IP and privileges in this field:

- **Patents:** If a new or improved method for producing sulfonic acid or a specific device or equipment for this process is invented, a patent can be filed. Patents grant exclusive rights for the use, production, and sale of the invention.
- **Industrial Designs:** If the final product (sulfonic acid) or its packaging has a unique and attractive design, an industrial design registration can be sought, preventing the design from being copied.
- **Utility Models:** If a tool or device used in sulfonic acid production has a new and useful design, a utility model registration can be filed.
- **Trademarks:** The brand name, logo, and any other mark used to identify products and services should be registered as trademarks. This protects the brand identity and prevents unauthorized use.
- **Copyright:** Any written materials, instructions, or documentation created for the production of sulfonic acid are protected under copyright.
- **Technical Knowledge:** Technical knowledge and specialized information related to the sulfonic acid production process are valuable assets. Confidentiality agreements and other legal tools can help prevent the disclosure of this knowledge.

4-3-legal permission:

To establish and operate a sulfonic acid production unit in Kangavar Industrial Town, Kermanshah, several legal permits are essential. These permits are issued by various organizations and authorities to ensure compliance with environmental, safety, technical, and other regulatory standards. The primary permits required are:

- **Construction Permit (Establishment License):** Issued by the Industry, Mining, and Trade Organization of Kermanshah Province. This permit requires submission of a technical and economic feasibility study, company registration documents, and other necessary documents.
- **Environmental Permit:** Issued by the Environmental Protection Organization. An Environmental Impact Assessment (EIA) of the project and a waste management plan for the industrial unit are needed to obtain this permit.
- **Safety and Health Permit:** Issued by the Department of Cooperation, Labor, and Social Welfare of Kermanshah Province. Compliance with occupational safety and health standards is mandatory.
- **Fire Safety Permit:** Issued by the Fire Department. Compliance with fire safety standards for the building and equipment of the industrial unit is essential to secure this permit.
- **Electricity, Water, and Gas Permits:** Issued respectively by the Kermanshah Provincial Electricity Distribution Company, the Water and Sewerage Company, and the Gas Company. Detailed calculations of electricity, water, and gas consumption and adherence to relevant standards are required.
- **Construction Permit from the Industrial Towns Company:** Issued by the Kermanshah Industrial Towns Company, this permit is required for the construction and equipping of the industrial unit.
- **Industrial Operation License:** Issued by the Ministry of Industry, Mining, and Trade, this license provides the legal authorization for industrial operations.

Securing these permits will ensure that the sulfonic acid production unit complies with all regulatory requirements.

5. Market study and Competition:

Sulfonic acid, as a vital raw material for various industries, is crucial for the production of detergent powders and liquids, shampoos, soaps, degreasers, industrial cleaners (foam, motor, etc.), moisturizers, textile cleaning, leather degreasing and cleaning, drilling oil emulsifiers, pesticides, fertilizers, and more. The market for this product is influenced by various factors, including demand from consumer industries, raw material prices, production technology, and competition among manufacturers. Given the growth of consumer industries and increasing demand for products based on sulfonic acid, the market for this product is expected to continue expanding. However, manufacturers must focus on improving productivity, reducing costs, developing new products, and adhering to environmental standards to maintain their competitiveness. Therefore, understanding and analyzing the market can ensure and enhance the success of an industrial unit in this growing market.

A general market and competitive analysis in the sulfonic acid production industry involves evaluating various factors, including market trends, competitors, consumer needs, challenges, and opportunities. The following sections examine these aspects:

❖ Market Trends

- **Global demand for detergents:** LABS (Linear Alkylbenzene Sulfonate) is one of the most important surfactants used in detergent production. With population growth and increased health awareness, the demand for detergents worldwide has risen, which has led to increased demand for LABS in the global market. It is projected that the compound annual growth rate (CAGR) from 2024 to 2030 will be approximately 10-11%, with the average volume reaching around 4-5 million tons and the market value reaching around 15-20 billion dollars by 2030. The table below shows the production trends and market growth of sulfonic acid from 2014 to 2024 and the main growth factor each year:

Growth Driver	Market Volume (Million Tons)	Growth Rate (CAGR)	Year
Increased demand in the water and sewage industry	2.5	-	2014
Increased environmental and health awareness	2.7	8%	2015
Growth in the food and beverage industries	3	11%	2016
Increased consumption in the automotive and electronics industries	3.5	16%	2017
Increased demand in water treatment	4	14%	2018
Demand for activated carbon-based products in the pharmaceutical industry	4.5	12%	2019
Impact of COVID-19 and increased demand for hygiene products	5	11%	2020
Recovery of demand in various industries after COVID-19	5.5	10%	2021
Development of new technologies in production	6	9%	2022
Increased demand in the construction industry	6.5	8%	2023
Technological advancements and innovation in new applications	7	7%	2024

- **Sustainable and eco-friendly products:** With growing environmental concerns, the market is shifting towards detergents with less environmental impact. This trend may lead to increased demand for biodegradable LABS.
- **Increasing demand in the industrial and household detergent sectors:** The rising demand for industrial detergents (such as machine cleaners, industrial cleaners) and household detergents (like laundry powders and dishwashing liquids) has contributed to the growth of the LABS market.

- **Changes in health and safety regulations and standards:** Stricter health regulations and the need for high-performance products have compelled manufacturers to use higher-quality and more efficient LABS.
- **Focus on concentrated and efficient formulations:** Companies are focusing on developing detergents with concentrated formulas that require less volume and offer more efficiency, thus increasing the demand for higher-quality and more stable LABS.
- **Emerging market dynamics:** Growth in emerging markets in Asian, African, and Latin American countries presents new opportunities for the production and sale of LABS.

❖ **Competitors**

- **Key players:** The main producing countries and their market share in the global market are China (35%), India (18%), the United States (15%), Russia (10%), Brazil (8%), Western Europe (Germany, France, Italy) (7%), Egypt (3%), with Iran's share being less than 2%. Companies like BASF, Huntsman Corporation, Stepan Company, and Reliance Industries are major players in the global LABS market. These companies, leveraging advanced technologies and extensive distribution networks, hold a large market share. The most significant Iranian companies competing domestically include Paksan (50,000 tons), Paknam (40,000 tons), Toly-Pers (35,000 tons), Behdash (30,000 tons), Shimiya Behpak (25,000 tons), Kaf-Saz Sharq (20,000 tons), and Sulfo-Chemie (15,000 tons).
- **Regional competition:** In addition to global giants, regional and local producers are also active in the LABS market. These companies often focus on low production costs and local markets.
- **New competitors entering the market:** With increasing demand for LABS, new companies are entering the market, making the competition tougher, especially in regions with lower production costs.
- **Diverse marketing strategies:** Leading companies in the LABS market employ various marketing strategies, such as offering competitively priced products, strong after-sales services, and product availability in different packaging formats.
- **Investment in research and development:** Large companies continuously invest in R&D to develop new products with better performance and lower environmental impacts.
- **Mergers and acquisitions (M&A):** Some major companies have increased their market share and intensified competition for smaller companies through mergers and acquisitions.

❖ **Consumer Needs**

- **Main consumers:** The main consumer countries of sulfonic acid and their market share globally are China (30%), India (20%), the United States (15%), Brazil (8%), Russia (7%), Indonesia (5%), Japan (4%), and Germany (4%). Iran holds a 2% share in the global consumption of this product.
- **Quality and performance:** End-users (detergent manufacturers) seek LABS with high quality, suitable thermal stability, and excellent performance in detergent formulations. The need for raw materials that can work effectively in powerful detergents is one of the most important consumer needs.
- **Affordable pricing:** The cost of raw materials is a critical factor for detergent manufacturers. Thus, a reasonable price for LABS and flexibility in supply are essential consumer needs.
- **Environmental compatibility:** With increasing public awareness of environmental issues, consumers are looking for detergents that cause less environmental damage, leading to a growing demand for biodegradable LABS.
- **Compatibility with various formulations:** Consumers require LABS that can be used in different formulations, such as liquid detergents, powders, and gels.
- **Product stability:** The need for LABS with high stability under various storage and usage conditions (such as high or low temperatures) is another essential consumer requirement.
- **Safety and hygiene:** Detergent manufacturers need LABS that ensure high performance while guaranteeing safety for humans and animals.

❖ Challenges

- **Currency fluctuations:** Changes in exchange rates can directly affect production costs and final product prices, especially for manufacturers reliant on imported raw materials.
- **Raw material price fluctuations:** Variations in raw material prices can directly affect the cost of LABS production and profitability. According to reports from ICIS, IHS Markit, and Platts, the average global price over the last five years (2019-2023) fluctuated between €5100 and €6100 per ton.
- **Environmental regulations:** Due to stricter environmental regulations, LABS producers must comply with environmental standards, which could increase production costs and necessitate investments in cleaner technologies.
- **Intense competition:** Fierce competition in the global and regional markets can reduce manufacturers' profit margins. To survive and grow in this market, companies must focus on innovation, process improvements, and cost reductions.
- **High investment needs:** Entering the LABS market requires high initial investments for setting up production units and sourcing equipment and raw materials, which can be a significant barrier for smaller companies.
- **Environmental impact:** Due to stringent pollution and industrial wastewater regulations, LABS producers must invest significantly to reduce their environmental impact.
- **Demand fluctuations:** The LABS market can be influenced by fluctuations in demand in end-user markets such as detergents. These fluctuations may occur due to economic, seasonal, or consumer behavior changes.
- **Dependence on imported raw materials:** Many LABS producers rely on imports for raw materials (like benzene and olefins), which could be affected by price fluctuations and supply chain issues.
- **Competition from substitute materials:** As alternative chemicals develop and new formulations emerge, the demand for LABS may decline.

❖ Opportunities

- **Market expansion in developing countries:** Economic growth and rising living standards in developing countries, such as India, China, and African nations, can increase the demand for detergents and, consequently, LABS.
- **Product innovation:** The development of new products and improving the biodegradability properties of LABS could open new markets and increase market share.
- **Strategic partnerships:** Collaborating with detergent manufacturers and raw material suppliers can help reduce costs, improve the supply chain, and enhance competitiveness.
- **Development of specialized markets:** Focusing on specialized products, such as LABS used in specific industrial formulations, could help companies tap into new markets.
- **Adoption of new technologies:** Using innovative technologies in production and process optimization can lead to reduced costs and enhanced product quality.
- **Expanding collaboration with end consumers:** LABS producers can improve their understanding of specific needs by working closely with detergent manufacturers to create customized products.
- **Advancements in recycling and reuse:** The development of recycling technologies for LABS and their derivatives can help reduce waste and improve the sustainability of LABS production.

5-1- Introduce target market:

The global target market for sulfonic acid, due to the unique characteristics of this substance, spans several industries. Each industry has specific uses for sulfonic acid, which determines its demand in various countries. Given these differences, sulfonic acid manufacturers must adjust their marketing strategies based on the specific needs of each target market. This important and strategic product's target market worldwide is divided into several categories, based on the type of use and major consumer countries, as detailed below. These markets have unique characteristics and requirements that affect the demand and consumption of this substance:

❖ Detergent Industry

- **Usage:** LABS (Linear Alkylbenzene Sulfonate) is used as the primary surfactant in the production of household and industrial detergents, such as powders, liquids, and gels. Due to its strong cleaning properties and ability to dissolve fats and impurities, it is one of the most important ingredients in detergent formulations.
- **Target Market:** China, India, USA, Brazil.
- **Growth Drivers:** Population growth, increased health awareness, and the development of emerging markets in developing countries have increased demand for detergents, leading to higher consumption of LABS. Additionally, with the rising demand for biodegradable and environmentally friendly detergents, the need for high-quality LABS has grown.

❖ Textile Industry

- **Usage:** In the textile industry, LABS is used as a cleaning agent and stain remover in fabric and fiber washing and cleaning processes. It helps remove impurities and fats from textile surfaces.
- **Target Market:** China, India, Turkey, Bangladesh.
- **Growth Drivers:** The expansion of the textile industry, especially in Asia, increased demand for high-quality fabrics and cleaner products, and the focus on sustainable and environmentally friendly production, has increased LABS consumption in this sector.

❖ Leather Industry

- **Usage:** LABS is used as an auxiliary material in leather cleaning, preparation, and processing. It helps improve the physical properties of leather and removes fats and impurities.
- **Target Market:** Italy, India, China, Brazil.
- **Growth Drivers:** The global demand for leather products, especially in fashion and apparel industries, coupled with a desire for higher-quality leather production, has increased LABS consumption in this sector.

❖ Oil & Gas Industry

- **Usage:** In the oil and gas industry, LABS is used as a surfactant in drilling processes and to enhance oil production efficiency. It reduces surface tension and improves fluid flow in oil reservoirs.
- **Target Market:** USA, Russia, Saudi Arabia, Canada.
- **Growth Drivers:** The increase in oil and gas exploration and extraction activities, especially in remote and challenging regions, has raised the demand for efficient materials like LABS to improve performance in these processes.

❖ Paper Industry

- **Usage:** LABS is used as an additive in paper production to enhance printability and water resistance. It is also used in cleaning processes for machinery and removing fats and deposits.
- **Target Market:** China, USA, Japan, Germany.
- **Growth Drivers:** The growth of the paper products market, especially in packaging and printing, combined with the rising demand for high-quality paper with specific characteristics, has led to increased LABS consumption in this industry.

❖ Metal Plating Industry

- **Usage:** In metal plating, LABS is used as a surfactant and cleaner to prepare metal surfaces before plating. It helps remove fats and surface impurities.
- **Target Market:** China, Germany, Japan, South Korea.
- **Growth Drivers:** The growth of automotive, electronics, and construction industries in industrialized countries, along with the need for high-quality metal products, has increased the demand for LABS in plating processes.

The table below shows the share of the total market, total value, and average annual growth (CAGR) in different industries from 2014 to 2024:

Consumption Sector	Market Share (%)	Total Value (Billion \$)	Average Annual Growth (CAGR)
Household Detergents	54%	5.5	4.5%
Industrial Detergents	18%	1.8	5%
Agricultural Chemicals	8%	0.8	4%
Textiles	6%	0.6	3.5%
Degreasers and Cleaners	7%	0.7	4.2%
Oil Drilling and Emulsifiers	4%	0.4	3%
Other Sectors (Pesticides, etc.)	3%	0.3	3.5%

Based on the above information, the most rational and expert decision for the target market of this project, which aims for active participation in market export development, would be to focus on the subsectors and countries where the industry is leading and holds a larger share of the total market. Moreover, given the importance of household and industrial detergents, the domestic market could also justify the establishment of such an industrial unit as economically viable.

6. Physical Progress of project: yes ☐ No ☒

This project, as one of the priority investment projects of the province, has been proposed to the private and non-governmental sector by the Investment and Economic and Technical Assistance Organization of Iran, the Kermanshah Governorate, the Ministry of Economic Affairs and Finance, and the General Directorate of Industry, Mining, and Trade of the province. It is currently in the stage of preparing the technical-economic feasibility pre-study.

7. Action plan and Implementation schedule:

Project Implementation Timeline

Phase	Activity Description	Duration	Notes
Market Analysis and Planning	<ul style="list-style-type: none"> - Market analysis and industry needs assessment - Competitor analysis and opportunity identification - Preparation of the economic justification plan 	1 month	Includes data collection, opportunity evaluation, and drafting of the business plan.
Financial Planning and Investment Attraction	<ul style="list-style-type: none"> - Preparation of financial plan - Attracting investors - Securing loans and necessary credit 	1 month	Requires preparation of financial documentation and negotiations with banks and investors.
Site Selection and Licensing	<ul style="list-style-type: none"> - Selection of appropriate location for the production unit - Obtaining necessary permits from legal authorities 	1 month	Includes land review, construction and operating permits, and environmental impact assessment.
Design and Engineering	<ul style="list-style-type: none"> - Designing architectural plans and layouts - Equipment and machinery selection - Engineering consultation 	1 month	Detailed design of the production unit, equipment selection, and planning for installation and startup.
Construction and Setup	<ul style="list-style-type: none"> - Construction and preparation of building - Installation of equipment and machinery - Initial testing and trials 	6 month	Involves physical construction, equipment installation, and initial tests to verify equipment performance.
Staffing and Training	<ul style="list-style-type: none"> - Recruitment of required staff - Providing necessary training - Preparing the operational team 	1 month	The process of hiring and training personnel to perform various tasks in the production unit.
Final Testing and Trials	<ul style="list-style-type: none"> - Conducting final tests and evaluating production performance - Troubleshooting and process optimization 	1 month	Comprehensive testing of equipment and processes to ensure proper performance and optimization.
Commissioning and Production Start	<ul style="list-style-type: none"> - Initiating trial production - Reviewing and adjusting production processes - Commencing official production 	2 month	Starting trial production to ensure proper functioning and then launching official production.
Marketing and Distribution	<ul style="list-style-type: none"> - Developing marketing strategies - Introducing the product to the market - Establishing distribution network 	1 month	Includes marketing, sales, and establishing distribution channels for the produced products.
Monitoring and Continuous Improvement	<ul style="list-style-type: none"> - Monitoring production performance - Collecting feedback and improving processes - Updating equipment and methods 	Ongoing	Continuous evaluation of production performance, gathering customer feedback, and ongoing improvement of processes and equipment.

According to the above schedule, the project implementation will take **15 months**.

8. Financial projection:

8-1- The cost estimate:

The cost estimate

No.	subject	costs (million Rials)
1	Fixed investments	31,189,725
2	Operating costs	11,681,886
3	Financial costs	-

Fixed investment

No.	subject	costs (million Rials)	
1	land purchase	900,000	
2	Site preparation and development	637,500	
3	Civil works, structures and buildings	2,022,500	
4	Plant machinery and equipment	22,170,000	
5	Auxiliary and service plant equipment	50,000	
6	Environmental protection	50,000	
7	Incorporated fixed assets (project overheads)	2,583,000	
8	Pre-production expenditures (net of interest)	Studies	516,600
		Management and organization	516,600
		license	258,300
9	contingencies costs	1,485,225	
Total Fix investment		31,189,725	

Operating cost

Row	Item	Distribution Ratio	Cost (Million Rials)
	Current Expenses		4,273,108
1	Raw Materials*	100%	3,000,000
2	Workforce*	30%	83,750
3	Marketing (excluding workforce)	100%	280,000
4	Depreciation		
5	Other Current Expenses		
	- Energy*	85%	4,420
	- Maintenance*	20%	235,590
	- Unforeseen (2.5% of items*)	20%	669,348
	Fixed Expenses		7,408,778
6	Raw Materials*		
7	Workforce*	70%	195,418
8	Marketing (excluding workforce)		
9	Depreciation	100%	2,477,250
10	Other Fixed Expenses		
	- Energy*	15%	780
	- Maintenance*	80%	942,360
	- Unforeseen (2.5% of items*)	80%	3,792,970
	Total (Million Rials)		11,681,886

Notes:

- Marketing expenses are calculated as 2% of the total annual revenue at nominal capacity.
- Depreciation rates considered: 10% for machinery and equipment, 10% for buildings, 20% for vehicles, and 20% for office equipment.
- Maintenance rates considered: 5% for machinery and equipment, 2% for buildings, 10% for vehicles, and 10% for office equipment.

8-2- Estimated revenues:

Project revenues

Product and Related Subject	Season 1	Season 2	Season 3	Season 4	Year 1 Total	Year 2	Year 3	Year 4	Year 5
Realization of Nominal Capacity	15%	15%	15%	15%	60%	70%	80%	90%	100%
Actual Capacity	1,500	1,500	1,500	1,500	6,000	7,000	8,000	9,000	10,000
Price per Ton (Euro)	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600	5,600
Revenue (thousand Euros)	8,400	8,400	8,400	8,400	33,600	39,200	44,800	50,400	56,000
Revenue (billion Rials)	4,200	4,200	4,200	4,200	16,800	19,600	22,400	25,200	28,000

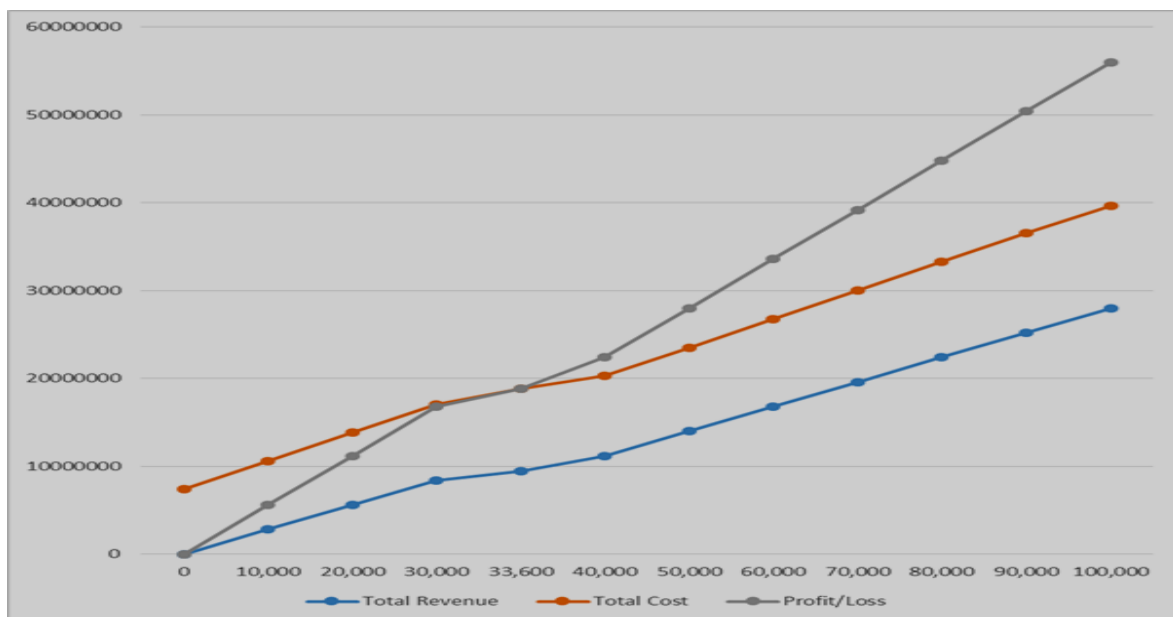
8-3-Duration of project operation:

Considering the various factors influencing the economic lifespan of industrial projects, such as sulfonic acid production, including raw material reserves, localized technology, market fluctuations, and government support policies, the optimal operational period for this project is estimated to be 10 years with a discount rate of 18%. This timeframe is determined by factoring in the desired return on investment for investors, projected maintenance and repair costs, as well as sensitivity analysis regarding changes in key parameters.

8-4-Break- even analysis:

The break-even analysis for the sulfonic acid production project indicates that profitability will be reached by producing and selling a minimum of 33,600 tons of sulfonic acid per year, equivalent to 33.6% of the project's nominal capacity. This point has been calculated by considering fixed costs, including initial investment, general expenses, fixed production costs, and variable production costs per ton of sulfonic acid. Given the plant's production capacity and market forecasts, it is expected that the project will quickly reach the break-even point and enter a phase of sustainable profitability. The table below presents the break-even analysis:

Production Quantity (tons)	Total Revenue (Million Rials)	Total Cost (Million Rials)	Profit/Loss (Million Rials)
0	0	7,408,778	-7,408,778
10,000	2,800,000	7,826,088	-5,026,088
20,000	5,600,000	8,243,398	-2,643,398
30,000	8,400,000	8,660,708	-260,708
33,600	9,408,000	9,408,000	0
40,000	11,200,000	9,078,018	2,120,182
50,000	14,000,000	9,524,332	4,475,668
60,000	16,800,000	9,970,668	6,829,332
70,000	19,600,000	10,437,008	9,162,992
80,000	22,400,000	10,881,768	11,518,232
90,000	25,200,000	11,326,528	13,873,472
100,000	28,000,000	11,639,886	16,360,114



8-5- Cost-benefit analysis:

The table of project efficiency indicators

total fixed investment Present value	91,425,905 million Rials
total net revenue Present value	118,364,327 million Rials
Net present value (NPV)	26,938,422 million Rials
benefit - Cost ratio B/C	1.29
Internal rate of return (IRR)	%40.5

- **Net Present Value (NPV):**

The project's Net Present Value stands at 26,938,422 million Rials, indicating its profitability. A positive NPV shows that after deducting investment and operational costs from total revenues, the project yields a return greater than the invested capital. In other words, the project's incoming cash flow surpasses its outgoing cash flow, generating added value for investors.

- **Benefit-Cost Ratio (B/C):**

The B/C ratio of 1.29 implies that for every unit of cost, the project generates 1.29 units of revenue. A B/C ratio greater than 1 suggests that the project is economically viable and capable of generating revenue beyond its initial and operational costs. This ratio serves as a decisive criterion for project implementation, clearly highlighting the project's economic value.

- **Internal Rate of Return (IRR):**

The IRR of 82.64% demonstrates the high profitability of the project. This metric indicates that the project's returns are significantly higher than typical market interest rates. Given this high IRR, the project is attractive to investors as it exceeds the minimum expected return.

- **Payback Period:**

The payback period for this project is 2 years and 5 months, meaning investors can recover their initial investment in a relatively short time through positive cash flows. This quick payback period enhances the project's appeal and lowers its risk for investors.

- **Conclusion:**

The analysis of these indicators demonstrates that the sulfonic acid production project is

highly profitable and economically justified. The high IRR and short payback period make it an attractive and feasible option for investors.

8-6- Sensitivity analysis of IRR:

A. Based on Annual Revenue:

The table below presents the sensitivity analysis of the industrial unit project for producing sulfonic acid based on annual revenue. This analysis examines the impact of revenue fluctuations on the project's economic indicators, including NPV (Net Present Value), IRR (Internal Rate of Return), and payback period. The percentage changes in revenue, ranging from -30% to +30%, are detailed in the table as follows:

Revenue Change (%)	New Revenue (Million Rials)	NPV (Million Rials)	IRR (%)	Payback Period (Years)
-30%	19,600,000	-1,886,706	28.82	4.72
-20%	22,400,000	3,996,790	43.29	3.56
-10%	25,200,000	9,880,286	58.82	2.95
0%	28,000,000	26,938,422	82.64	2.46
+10%	30,800,000	34,069,958	116.28	2.11
+20%	33,600,000	42,904,954	166.67	1.85
+30%	36,400,000	51,739,950	243.90	1.66

Comprehensive Analysis:

Impact of Revenue Decline on Economic Indicators:

- **30% Revenue Decrease:** With revenue falling to 19,600,000 million rials, NPV drops to -1,886,706 million rials, and IRR decreases to 28.82%. The payback period extends to 4.72 years. This significant revenue drop adversely affects the project's profitability, even leading to a negative NPV, indicating the project would be loss-making under these conditions.
- **20% Revenue Decrease:** The new revenue reaches 22,400,000 million rials, lowering NPV to 3,996,790 million rials and IRR to 43.29%, while the payback period extends to 3.56 years. The project remains profitable, though profitability visibly decreases.
- **10% Revenue Decrease:** With NPV reducing to 9,880,286 million rials and IRR to 58.82%, the payback period rises to 2.95 years. A 10% decline still retains acceptable profitability for the project.

Impact of Revenue Increase on Economic Indicators:

- **10% Revenue Increase:** The new revenue rises to 30,800,000 million rials, pushing NPV to 34,069,958 million rials and IRR to 116.28%. The payback period decreases to 2.11 years.
- **20% Revenue Increase:** NPV reaches 42,904,954 million rials and IRR hits 166.67%, with the payback period reducing to 1.85 years. A revenue increase significantly enhances project returns.
- **30% Revenue Increase:** With revenue reaching 36,400,000 million rials, NPV increases to 51,739,950 million rials, and IRR to 243.90%, while the payback period shortens to 1.66 years. This change reflects extraordinarily high returns in case of increased revenue.

Conclusion:

- **Project Stability:** The sensitivity analysis reveals that the sulfonic acid production project faces serious challenges with revenue declines, especially with a 30% decrease, where it could turn loss-making. However, with revenue increases, the project's profitability rises significantly.

- **Risk Management:** This analysis enables decision-makers to develop strategies for addressing potential revenue decreases and capitalizing on revenue growth. Additionally, identifying the project's strengths and vulnerabilities in various economic conditions is crucial.

B. Based on Annual Production Costs

The table below presents a sensitivity analysis for the industrial unit project producing sulfonic acid, based on annual production costs. This analysis examines the impact of changes in costs on the project's economic indicators, including NPV (Net Present Value), IRR (Internal Rate of Return), and payback period. The percentage variations in annual production costs, ranging from -30% to +30%, are presented in the table as follows:

Percentage Change	New Cost (Million Rials)	NPV (Million Rials)	IRR (%)	Payback Period (Years)
-30%	2,991,176	35,903,049	250.00	1.65
-20%	3,418,486	32,128,028	192.31	1.77
-10%	3,845,797	28,337,838	153.85	1.90
0%	4,273,108	26,938,422	82.64	2.46
+10%	4,700,418	25,539,006	61.73	2.87
+20%	5,127,728	24,139,590	48.78	3.30
+30%	5,555,039	22,740,174	40.82	3.70

- **Comprehensive Analysis:**
 - **Impact of Cost Reductions on Economic Indicators:**
 - **30% Cost Reduction:** With a 30% decrease in cost to 2,991,176 million rials, NPV rises to 35,903,049 million rials, and IRR increases to 250%. The payback period shortens to 1.65 years. This cost reduction significantly enhances the project's profitability, demonstrating its strong performance under lower-cost conditions.
 - **20% Cost Reduction:** New cost decreases to 3,418,486 million rials. NPV falls to 32,128,028 million rials, IRR decreases to 192.31%, and the payback period extends to 1.77 years. The project remains profitable, though the rate of return declines noticeably.
 - **10% Cost Reduction:** NPV drops to 28,337,838 million rials, and IRR declines to 153.85%, with the payback period reaching 1.90 years. This reduction still provides acceptable profitability for the project.
 - **Impact of Cost Increases on Economic Indicators:**
 - **10% Cost Increase:** New cost rises to 4,700,418 million rials, reducing NPV to 25,539,006 million rials and IRR to 61.73%. The payback period extends to 2.87 years.
 - **20% Cost Increase:** NPV drops to 24,139,590 million rials, and IRR falls to 48.78%, while the payback period reaches 3.30 years. The increased cost has a significant negative impact on project returns.
 - **30% Cost Increase:** With a cost of 5,555,039 million rials, NPV decreases to 22,740,174 million rials, and IRR reduces to 40.82%, extending the payback period to 3.70 years. These changes indicate a substantial decline in project returns under higher costs.
- **Conclusion:**
 - **Project Resilience:** The sensitivity analysis shows that the sulfonic acid production project remains reasonably profitable under cost reductions, with lower costs enhancing returns. However, profitability is significantly impacted by cost increases, leading to a longer payback period.

- **Risk Management:** This analysis allows decision-makers to develop suitable strategies for cost management and project optimization to mitigate the adverse effects of rising costs on profitability.

C. Based on Initial Investment Cost

The table below presents a sensitivity analysis of the industrial unit project for producing sulfonic acid, based on the initial investment cost. This analysis examines the impact of revenue fluctuations on the project's economic indicators, including NPV (Net Present Value), IRR (Internal Rate of Return), and Payback Period. Percentage changes in the initial investment cost, ranging from -30% to +30%, are detailed in the table:

Percentage Change	New Cost (Million Rials)	NPV (Million Rials)	IRR (%)	Payback Period (Years)
-30%	21,832,807	50,919,117	400.00	1.50
-20%	24,951,780	46,793,842	277.78	1.61
-10%	28,070,752	42,668,568	204.08	1.74
0%	31,189,725	26,938,422	82.64	2.46
+10%	34,308,698	13,208,117	44.44	3.50
+20%	37,427,670	-3,522,188	-	-
+30%	40,546,643	-20,252,493	-	-

- **Comprehensive Analysis:**
 - **Impact of Reducing Initial Investment Cost on Economic Indicators:**
 - **30% Cost Reduction:** With costs reduced to 21,832,807 million rials, NPV rises to 50,919,117 million rials, and IRR increases to 400%, with the payback period shortened to 1.50 years. Lowering initial costs significantly enhances project profitability, demonstrating robust performance under reduced costs.
 - **20% Cost Reduction:** New cost reaches 24,951,780 million rials. NPV decreases to 46,793,842 million rials, IRR to 277.78%, and the payback period extends to 1.61 years. The project remains profitable, but with a noticeable drop in return.
 - **10% Cost Reduction:** NPV decreases to 42,668,568 million rials, IRR to 204.08%, and the payback period extends to 1.74 years, yet still ensuring acceptable profitability.
 - **Impact of Increasing Initial Investment Cost on Economic Indicators:**
 - **10% Cost Increase:** New cost rises to 34,308,698 million rials, reducing NPV to 13,208,117 million rials and IRR to 44.44%, while the payback period extends to 3.50 years.
 - **20% Cost Increase:** NPV decreases to -3,522,188 million rials, and IRR becomes negative, indicating a loss-making project under these conditions.
 - **30% Cost Increase:** With costs at 40,546,643 million rials, NPV decreases to -20,252,493 million rials, rendering the project entirely loss-making. These changes demonstrate a significant reduction in project profitability with rising initial costs.
- **Conclusion:**
 - **Project Resilience:** Sensitivity analysis reveals that the sulfonic acid production project remains reasonably profitable if initial investment costs are reduced. However, profitability is significantly impacted by any increase in these costs, potentially leading to project losses.
 - **Risk Management:** This analysis enables decision-makers to develop strategies for managing initial investment costs and optimizing project operations to mitigate the negative impact of rising costs on profitability.

8-7- Summarize table:

"Summary of economic issues"

activity	International Standard Industrial Classification (ISIC Code)	product name	Nominal capacity (unit)
Manufacturing	2411512569	Sulfonic Acid	100,000 tons
Activity duration	Fix investment (million Rials)	Variable investment (million Rials)	Human resources
15 months	31,189,725	11,681,886	115 people
Internal rate of return (IRR)	Net present value (million Rials)	Owners share (million Rials)	Benefit-cost ratio *B/C
82.64%	26,938,422	8,574,322	1.29

❖ **Economic and Strategic Analysis of the Sulfonic Acid Production Project**

- **Internal Rate of Return (IRR):** The IRR of 82.64% for this project indicates a high level of profitability. This return rate is above current bank interest rates and inflation, reflecting a quick capital recovery, strong short-term profitability, and attractiveness for investors.
- **Net Present Value (NPV):** An NPV of 26,938,422 million rials clearly shows that the project not only covers all investment costs but also achieves considerable profitability. This number confirms the project's robust economic value and potential for capital growth.
- **Benefit-Cost Ratio (B/C):** The B/C ratio of 1.29 means that for every 1 unit of cost, 1.29 units of benefit are generated. This ratio underscores that the project covers its costs and yields additional benefits, enhancing its appeal to investors.
- **Payback Period:** With a payback period of 2 years and 5 months, the project has a short timeframe for recovering the initial investment. This rapid payback reduces investment risk and provides greater confidence for investors. Beyond the payback period, the project will generate profit, indicating a high profit potential both short-term and long-term.
- **Annual Working Capital and Workforce:** Requiring 11,681,886 million rials in annual working capital and employing 115 people highlights the project's scale and potential for local economic stimulation. Additionally, hiring 115 individuals not only supports regional economic growth but also creates job stability and new employment opportunities.

❖ **Market Opportunities**

Sulfonic acid has a high demand in various industries, especially in the production of detergents and cleaners. Due to its unique properties, such as strong cleaning power and environmental compatibility, it is widely used in domestic and international markets. Growth in consumer industries and the increasing need for sustainable, high-quality products ensure stable demand and an expanding market capacity for sulfonic acid.

❖ **Competitive Analysis**

With optimized production processes and the use of modern technology, this project can produce high-quality products at a competitive price. Local resource availability and reduced transportation costs offer a competitive advantage. Additionally, the annual production capacity of 100,000 tons of sulfonic acid provides opportunities for entering international markets and export.

❖ **Conclusion**

The sulfonic acid production project, with strong economic indicators like a high IRR (82.64%), positive NPV, and favorable B/C ratio (1.29), represents an attractive and profitable investment opportunity. The short payback period (2 years and 5 months) further reduces investment risk and increases investor confidence. This project, due to its high profitability and favorable market opportunities, promises excellent returns.

Additionally, by creating jobs and supporting the local economy, the project can significantly contribute to regional economic development.

8-8-Estimation of exchange rate changes during the project implementation:

To analyze the impact of exchange rate fluctuations on the establishment of a sulfonic acid production plant, different scenarios can be used, each covering essential aspects of the project, including costs, financing, and management of exchange rate risks. This approach helps minimize the negative impacts of exchange rate changes (USD) on the project and achieve desirable profitability:

❖ **Cost Analysis Considering Exchange Rate Fluctuations**

- **Import Costs:** With the increase in exchange rates from 30,000 Toman in 2019 to 60,000 Toman in 2024, the import costs for raw materials (excluding benzene and linear paraffins), such as sulfuric acid, catalysts (phosphoric acid), additives, filters, seals, lubricants, and industrial oils, as well as most equipment (due to high-tech requirements unavailable domestically), will significantly increase. This may lead to a considerable rise in both fixed and variable project costs.
- **Operating Costs:** Due to the increase in exchange rates, operating costs, such as wages, maintenance, and energy, will also be impacted and are likely to rise in parallel with the exchange rate.

❖ **Financing and Loan Repayment**

- **Foreign Currency Loans:** If financing is obtained through foreign currency loans, an increase in exchange rates could result in higher loan repayment costs. This necessitates precise planning for loan repayment based on different exchange rate projections.
- **Financial Programs:** Selecting the right financing source and using appropriate financial tools, such as currency hedging or foreign exchange forward contracts, can help mitigate financial risks.

❖ **Managing Exchange Rate Risks**

- **Use of Financial Instruments:** To reduce the adverse impacts of exchange rate fluctuations, financial tools such as currency forward contracts, options, and swaps can be utilized.
- **Financial Planning:** Financial planning, considering various exchange rate scenarios and their impact on the project's costs and revenues, can assist in managing exchange rate risks and achieving adequate profitability.

❖ **Suggested Scenarios**

- **Conservative Scenario:** Assume the exchange rate increases to 80,000 Toman between 2024 and 2026. In this scenario, severe increases in import costs and higher foreign currency loan repayment costs should be considered.
- **Optimistic Scenario:** Assume the exchange rate remains stable at 60,000 Toman between 2024 and 2026. In this case, import and loan repayment costs will remain under control, and the project's profitability is expected to improve.
- **Realistic Scenario:** Assume the exchange rate reaches 70,000 Toman between 2024 and 2026. In this scenario, a balance should be struck between increased costs and the impact on loan repayments, with risk management strategies implemented.

❖ **Sensitivity Analysis of Exchange Rate Changes**

The following sensitivity analysis can help evaluate the impact of exchange rate fluctuations on overall costs and profitability. By examining various scenarios and predicting their effects, the best strategy for financial management and currency risk mitigation can be chosen:

A. Import Costs

- **Conservative Scenario (Exchange rate of 80,000 Toman):**
 - Increased Import Costs: The cost of importing raw materials and equipment will increase by 1.33 times (compared to the rate of 60,000 Toman).
 - Impact on Total Costs: If 50% of the total project costs are related to imports, the increase in exchange rate to 80,000 Toman will lead to a 33% rise in import costs.
- **Optimistic Scenario (Exchange rate of 60,000 Toman):**

- Stable Import Costs: Import costs remain unchanged at the current exchange rate.
- **Realistic Scenario (Exchange rate of 70,000 Toman):**
 - Increased Import Costs: Import costs will increase by 1.17 times.
 - Impact on Total Costs: A 17% increase in import costs.

B. Operating Costs

- **Conservative Scenario:**
 - Increased Operating Costs: The rise in exchange rates to 80,000 Toman can lead to operating costs rising by 1.33 times, assuming they are directly influenced by the exchange rate.
- **Optimistic Scenario:**
 - Stable Operating Costs: Operating costs remain unaffected by exchange rate fluctuations.
- **Realistic Scenario:**
 - Increased Operating Costs: Operating costs will increase by 1.17 times.

C. Loan Repayment Costs

- **Conservative Scenario:**
 - Increased Repayment Costs: A high exchange rate will lead to foreign currency loan repayment costs increasing by 1.33 times. This may put significant financial pressure on the project.
- **Optimistic Scenario:**
 - Stable Repayment Costs: Loan repayment costs will remain unaffected by exchange rate fluctuations.
- **Realistic Scenario:**
 - Increased Repayment Costs: An increase in the exchange rate to 1.17 times will result in higher repayment costs.

D. Financing and Financial Programs

- **Conservative Scenario:**
 - Increased Financing Needs: A higher exchange rate may necessitate additional financing, leading to increased debt and pressure on financial programs.
- **Optimistic Scenario:**
 - Adequate Financing: Financing costs remain stable at the fixed exchange rate.
- **Realistic Scenario:**
 - Moderate Financing Needs: Financing requirements may increase moderately.

E. Financial Tools for Exchange Rate Hedging

- **Conservative Scenario:**
 - Use of Hedging Tools: To mitigate the impacts of a high exchange rate, tools such as forward contracts and swaps should be used.
- **Optimistic Scenario:**
 - Minimal Hedging: With a stable exchange rate, the need for hedging tools is reduced.
- **Realistic Scenario:**
 - Balanced Hedging: A moderate use of hedging tools will be effective in managing exchange rate risks.

F. Exchange Rate Financial Planning

- **Conservative Scenario:**
 - Detailed Financial Planning: Accurate financial planning is required to manage the effects of a high exchange rate and adjust financial and loan repayment strategies accordingly.
- **Optimistic Scenario:**
 - Standard Financial Planning: Financial planning remains straightforward, with minimal adjustments required.
- **Realistic Scenario:**

- Moderate Financial Planning: Financial planning should account for moderate exchange rate fluctuations and include risk management strategies.

9. Capital needs, the supply and **guarantees** method:

9-1- Foreign currency needed:

Due to the fact that the raw materials (except for benzene and linear paraffins), such as sulfuric acid, catalysts (phosphoric acid), additives, filters, gaskets and seals, lubricants, industrial oils, and most equipment, must be imported due to their advanced technology, which is not available domestically, it is necessary to secure these through imports. Additionally, to provide the investor with sufficient time to secure financial resources for acquiring these materials, particularly equipment and machinery, an equivalent foreign currency requirement for production equipment and machinery has been estimated at approximately €44,340,000 (22,170 billion rials). This amount is projected over the two-year implementation period as follows:

No.	year	The required amount of foreign currency (thousand euros)
1	first	22,170
2	second	22,170
3	third	
4	fourth	
5	fifth	

9-2- The Way of participation and finance method:

Given the inherent risks in any industrial project, particularly in the production of sulfonic acid—which requires significant initial investment—choosing an appropriate financing method is crucial. The optimal financing approach depends on various factors, such as the amount of capital needed, the project development stage, investors' risk tolerance, and market conditions. Below are some of the best financing methods and key points for this project:

❖ **Financing through Banks and Financial Institutions:**

- **Bank Loans:** With a strong feasibility study and adequate guarantees, it is possible to benefit from bank loans at a set interest rate.
- **Credit Lines:** For working capital and raw material procurement, credit lines from banks can be utilized.
- **Letters of Credit and Currency Credits:** Letters of credit can be beneficial for importing equipment and raw materials.

❖ **Attracting Investor Participation:**

- **Venture Capital Investors:** These investors are interested in high-risk, innovative projects and may participate in the early stages of the project.
- **Angel Investors:** Typically experienced and wealthy individuals, angel investors are willing to invest in small and medium-sized companies.
- **Institutional Investors:** Large companies and organizations such as Social Security Investment Company, Barekat Foundation, and IMIDRO may invest in sulfonic acid production projects due to strategic or social benefits.

❖ **Utilizing Government Facilities:**

- **Subsidies and Grants:** The government may allocate subsidies to support small and medium-sized industries for this project.

- **National Development Fund Facilities:** This fund provides support for large industrial and infrastructure projects.
- **Guarantee Fund Facilities:** These funds provide guarantees, facilitating access to bank loans for investors.

The best financing approach for the sulfonic acid production project is a mixed strategy, involving private sector participation, attracting investors, using bank loans, credit lines, and letters of credit for foreign exchange resources, and leveraging government facilities in less-developed regions. This strategy not only enables the required capital acquisition but also helps mitigate the financial risks associated with the project.

9-3- Payback period:

Based on the conducted studies and forecasts, the payback period for this project is estimated to be 2 years and 5 months. This estimate considers multiple factors, including the initial investment, operational costs, projected revenues, discount rate, and inflation rate. Additionally, a sensitivity analysis of changes in key parameters indicates that the project demonstrates reasonable resilience against market fluctuations and changes in production costs.

10. Incentives, features and advantages of project:

Given the region's potential and the growing demand for sulfonic acid, establishing a production unit in Kangavar Industrial Town, Kermanshah Province, can open numerous opportunities for economic and industrial development. Below, the incentives, features, and advantages of this project are discussed:

❖ Incentives

Governmental Support:

- Financial and credit facilities provided by the government and banks for investment in this project.
- Tax and customs exemptions for importing the necessary equipment and raw materials.
- Support for producing and exporting high value-added products.
- Encouragement of research and development aimed at producing higher-quality sulfonic acid.
- Inclusion of foreign machinery with a 90% value factor in the banking system for deprived areas.
- Ten-year tax exemption for underdeveloped and deprived areas.
- Payment of only 10% of the land value with long-term installments in industrial towns within underdeveloped and deprived areas.

Regional Potential:

- Abundant natural resources such as hardwood (oak), coal, and agricultural waste that can be used as raw materials for sulfonic acid production.
- Proximity to Iraq and other neighboring countries, creating good export opportunities to access domestic and international markets for the products.
- Available infrastructure, including water, electricity, gas, roads, and transportation facilities essential for setting up production units.
- Access to skilled and affordable labor in the region.

Market Demand:

- Increasing demand for sulfonic acid across various industries, including water and wastewater, oil and gas, petrochemical, pharmaceutical, and food industries.
- Lack of high-capacity sulfonic acid production units in the region.

❖ Project Features

Use of Modern Technology:

- Utilizing modern sulfonic acid production methods to enhance quality and reduce production costs.
- Optimizing energy consumption and reducing environmental pollution.

Production of Various Types of Sulfonic Acid:

- Producing sulfonic acid with different characteristics for diverse applications.
- Adapting products to meet the needs of both domestic and foreign markets.

Job Creation:

- Generating direct and indirect employment opportunities for a significant number of people in the region.

Value Chain Development:

- Developing the sulfonic acid production value chain through the establishment of raw material processing units and by-product manufacturing.

❖ Advantages of Establishing the Project

Regional Economic Development:

- Increasing the region's gross domestic product (GDP).
- Creating high value-added products from low-cost, locally sourced raw materials.
- Promoting related industries and generating sustainable employment.
- Expanding related production, such as water and air filters, respiratory masks, and other related products.
- Attracting and encouraging additional investors to invest in the region, boosting the economy.

Reducing Dependency on Imports:

- Reducing sulfonic acid imports and saving foreign exchange.
- Increasing self-sufficiency in the production of this product.

Environmental Protection:

- Utilizing agricultural and industrial waste as raw materials.
- Reducing environmental pollution caused by waste disposal and improving the quality of life.

Technical Knowledge Enhancement:

- Transferring technical knowledge and technology to the region.
- Improving the scientific and technical skills of the workforce.

Establishing this sulfonic acid production unit in the region can be seen as a golden opportunity for economic and industrial development. Considering the governmental incentives, regional potential, market demand, and numerous benefits of this project, investing in this area could lead to high value-added, job creation, and sustainable regional development.