Cold storage room Establishment

GUILAN FOREIGN INVESTMENT SERVICE CENTER

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Project's location

Province:

Guilan with area of 14042 square km is located in the north of Iran and south of Caspian Sea and it has dense woods with humid and mild climate. Rasht is the capital city which is 30km distant from the project. Guilan is an agricultural zone with most important products including rice, tea, olive, caviar, silk, chicken, fish, citrus, and special kinds of cookies.

The County:

Bandar-Anzali is one of the most active harbors among 5 countries on the border of Caspian Sea and the biggest port in the north border of Iran in which sailing has been current since 350 years ago. This harbor is close to Rasht by 30 km distance.

This city is of vital importance as it is located in the transit path of North-to-South, East South Asia countries, border of Persian Gulf, Middle Asia Republics, Qafqaz, Russia and Europe. Anzali port not only has commercial trade with the northern and southern harbors of Europe via Volga River, but also has special status in business transaction between Caspian sea courtiers and middle Asia (CIS countries) because of its adjacency to Astrakhan, Lagan at Russia, Crossnodesk at Turkmenistan, Aktao at Kazakhstan and Baku at Azerbaijan.

Project Location:

This project is located in Anzali in a vast land area of 3200 hectare and water land area of 40 square Km which includes Golshan region(Business Phase & Industry Phase), Hasanrood Industrial Town and harbor zone of Guilan Sailing & Harbors Organization. The area of industrial-Commercial free zone of Anzali includes:

1- Golshan region with 2091 hectare includes

appropriate natural lands with low population density and residential areas having access to suitable coasts and tourism and entertainment places and establishments.

2- Hasanrood industrial town and its surrounding area with 946 hectare include industrial town, national resources lands and adjacent lagoon.

3- Harbor area of Anzali free zone is around 106 hectare which has increased the industrial-commercial utility and attraction of Anzali free zone for providing facilities in the field of loading, unloading and etc.

This project is supposed to be established in the main area of industrial ranges and workshops with three-digit code S121. The above mentioned plan is going to be established in a land area of 3800 square meters and infrastructure of 1800 square meters.

(The access ways to the project) Row	Infrastructure Required	Distance to project location	The location of Infrastructure preparation
1	Water	Existed in project location	Water & Sewage of Guilan

2	Electricity	Existed in project location	Regional Power Company of Guilan
3	Gas	Existed in project location	Gas Company of Guilan
4	Telecommunication	Existed in project location	Telecommunication Company of Guilan
5	Main Road	Existed in project location	Organization Internal resources
6	Secondary Road	Existed in project location	Organization Internal resources
7	Airport	In 30 km distance	International Airport of Rasht Sardar Jangal
8	Harbor	About 5 km	Bandar Anzali
9	Railway Station	Preparation for connecting Anzali free zone to under construction railway of Rasht-Qazvin-Anzali is predicted	Organization Internal resources or private department participation

Technical Specifications of plan:

product:

-This project relates to establishing A two-circuit refrigerator. Developing industrial societies and need to preserve perishable food and create isolated rooms and reduce energy consumption, it is necessary to have short-term and long-term fridges for preserving food in these developing societies.

-There are various kinds of fridges which have different applications in different industries. Establishing different types of fridges necessitates a very complicated and special technology and it takes long time that a production group attains required scientific, operative and calculative ability to establish different kinds of fridges. Different types of fridges are used for preserving food, protein, vegetables and even for laboratory activities and preserving flowers and plants. Fridge is a place which has different and controlled temperature in its internal space and its internal temperature is constantly kept in an arbitrary scale Different types of fridges 1-Friut fridge: a) Ammonia fridge b)Far ion fridge 2-Shelter fridge(transportable fridge):a)Shelter fridge above zero b)Shelter fridge below zero.

Fruit fridges are large warehouses for preserving different fruits such as apple, citrus and etc. Refrigeration system in these fridges can be Ammonia or Far ion.

Transportable fridges or shelter and portable fridges have Far ion system which are above zero or under zero and can be used for preserving huge amount of materials such as foods, meat and ice.

With regard to the consumption rate of vegetables in the country, 10 percentage of consumption of provinces producing vegetables can be maintained in above-zero fridges.

These days refrigeration industry has wide application which can be named in 6 groups: 1-domestic refrigeration 2-commercial refrigeration 3-industrial refrigeration 4-transportation refrigeration 5-air conditioner 6-industrial ventilation .

- A two-circuit refrigerator is called a refrigerator that has the same functionality as both sub-zero and above-zero refrigerants.

  In double-freezer refrigerators, it is important to wash the refrigerator with nano disinfectants after discharging. Do not smell the refrigerator and release the unpleasant odor into the environment.

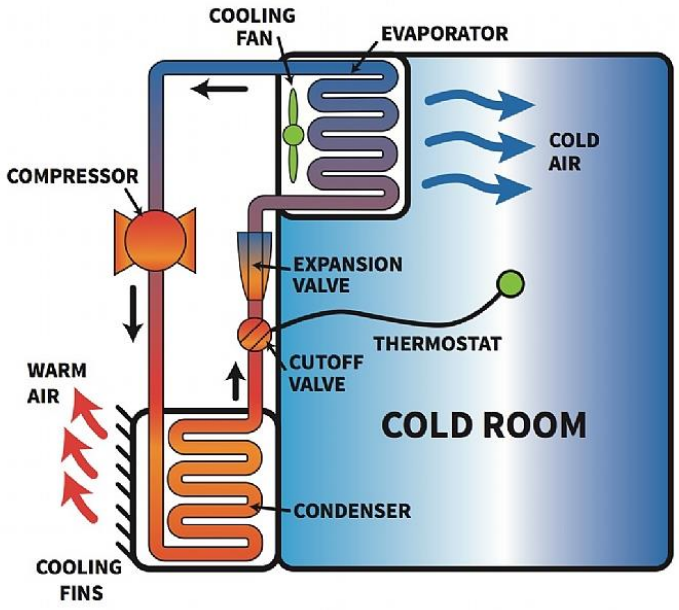
  Although it is preferable to use separate industrial refrigerators for storage of products, the construction of separate refrigerators is not economically justified.

Technical Specifications:

Refrigerators are called saloons or lockers, which are used to store food for long periods of time using air cooling and have a system similar to that of a refrigerator.

Refrigerator Components:

All cool room refrigeration systems have five main components:



1. The compressor, which compresses the refrigerant gas
2. The condenser, in which the hot gas is cooled to a liquid
3. An expansion valve, which controls flow of the liquefied gas and where liquid gas expands to vapour
4. Evaporator coils, where the liquid gas expands and boils. This process absorbs energy, cooling the coils
5. Fan or fans, to circulate air over the cold evaporator coils,

   thereby cooling the cool room. Air may also be circulated over pipes containing some type of liquid antifreeze, which have themselves been cooled using the evaporator. Fans also circulate air around the cool room to ensure even distribution of the cold air and reduce temperature variations within the room.

Insulation

Cool room panelling relies on trapping air, usually in a foam or polystyrene matrix, to prevent transfer of heat from the outside environment into the cool room inside. However, it is vitally important to keep this material dry. If the inside of the panelling becomes wet due to condensation and/or entry of humid air from the room then it will become ineffective. Seals around all cool room panels must be intact and waterproof enough to repel water used for cleaning (e.g. jet washing).

Concrete floors should include layers of insulating materials, and be thoroughly sealed against water from floor puddles or washing. Many commercial cool rooms do not have well insulated floors, even though good floor insulation can greatly reduce temperature leakage.

Cool room loading:

For the cool room to operate correctly, air must be able to circulate around the produce inside, whether it is already cool or not.

Produce should therefore never be stacked against the cool room wall. It is recommended to leave a gap of at least 10cm for air to circulate. A larger gap (10–15cm) should be left if the wall is exposed to the sun. These gaps will allow any heat transferring from the outside environment to be carried away in the room air before it can warm the product.

Likewise, a clear air space of 25cm or more should be left between the fan unit and the top of stacked pallets or bins. This will allow the cold air to move over the top of the store contents, rather than being blocked by products nearest to the refrigeration unit.

Stacking products on pallets allows air circulation between the floor and the packed products. Aligning the pallet skids to run parallel to the direction of the cooling air (i.e. towards the refrigeration system) will create a more efficient air circulation.

project's requirements:

Space and infrastructure required:

The required land area for the project is about 3800 square meters and infrastructure of 1800 square meters and official-welfare buildings with area of 400 square meters.

escription	Amount(square meter)
Fridge	1400
Official-welfare buildings and other	400

Equipments and machinery:

When choosing machinery extreme attention is needed since inappropriate machines and failure in them not only would damage the quality of the goods in the fridges but will reduce the validity of fridge. Machinery in this plan is listed as follows:

Walls equipped with thermal insulators, different types of compressor and related articles, refrigerating systems, ventilator, fan, moisture distributor and etc.

Row	Machine name	Number
1	40 Hp Piston Compressor	8
2	Evaporator with 2 fans 50 cm	8
3	Condenser with 3 fans 45cm	8
4	Refrigerator circuit and valves and control devices	8
5	20 horsepower switchgear	8
6	Sandwich panel 10 cm double-sided galvanized sheet	3016
7	Adhesives, Fittings and Flushing Sandwich Panel	3016
8	10cm hinged door with 190 * 90 heels	8
9	Pallet Box	360

Row material and intermediate component

Although fridges are considered as industrial units but due to their industrial-service nature do not have basic raw materials and their consumed materials include Ammonia gas and probable spare parts for machinery.

Different types of food, meat, fruit and etc are preserved in fridges.

management and human resources:

No.	Skill level	Number	Salaries (wages) (Rials)
1	Expert	2	50.000.000
2	Skilled	4	25.000.000
3	non-skilled	19	17.000.000

Ownership and legal permission

Land ownership:

At present the land of this project belongs to Anzali free zone and is capable to be transferred according to investor's application and legal regulations of the zone. Provided that the project is accepted, economic deputy through investment management will ask department of civil and urban development to introduce appropriate options for project implementation.

Spiritual ownership and privileges:

The spiritual ownership is those rights which let its owners to exploit man's intellectual and creative activities. It has got economic value and is tradable but its subject is not a special material thing. From intellectual ownership one can refer to literature or art creators' rights known as author's right or propagation's right, invention's right, customer's rights such as goodwill of merchants and artisans due to their fame, commercial and industrial signs and commercial secrets known as commercial and industrial ownership.

In this project, spiritual rights are the same as exploitation right and brand of project's owners.

Brand or Commercial Sign includes every type of color, image and sign which represents a product and distinguishes that product or service from the other products and services. Having been registered, a brand will have legal validity and law protection.
Anzali free zone is one of the highly susceptible zones to internal and external investment due to its suitable rules such any tax exemption and creating security in invest and property. This zone intends to cause diverse activities in provinces with developing electronic commerce, virtual markets, IT and also holding international exhibitions.

legal permission:

The place of project implementation is in Anzali free zone which has got some processes for getting the required permissions for project establishment and exploitation according to following items:
- Referring to Article 11 of law about how to manage free and economic zones, issuing permission for any kind of allowable economic activity such as building structures and tenure of any occupation by rightful and lawful individuals in the zone's limit, is under the control of that zone. In addition, if the project requires other permissions from competent organizations and institutions such as Environment, Standard, Ministry of Health, Treatment and Medical Education (especially for medical products, food and projects like Health Village) and Agricultural Jihad, the zone will do necessary inquiries for getting these permissions and investor should only follow the issue.

Market study and Competition:

Introduce target market:

There is no import and export in refrigeration industry and basically it is not economical to use fridges out of country for preserving foods, fruits and vegetables or it is not common to provide refrigeration services for out of country. Often refrigeration services are provided in the area inside a province.
Refrigeration method is one method for long-term preservation of foods and edible stuffs. Therefore all the methods that can keep these materials for a long time can replace this method. But fridges have two main advantages. The first is that the nature of materials kept by this method does not exposure to changes and edible materials can be used as fresh product after placing in these fridges. The second advantage is that auxiliary substances are not added to the edible materials and materials are preserved in fridges under controlled temperature, moisture and other environmental factors.
Considering the situation of Caspian Sea region and also special situation of Anzali free zone in the recent commercial trades, it is a good privilege to create fridges for preserving goods and products for importing and exporting.

Economic and Geographic Advantages

Existence of port installation, facilities and maritime transportation
On the direction of north-south international corridor of Nostrac which is the 21th century transit corridor of Asia-Europe Connects Helsinki port (North Europe) via Russia to the north & south ports of the Caspian Sea, then trough Persian Gulf to the south-eastern countries of Asia
Easy access to north & south ports of Europe through Volga River & Volga-Den (bay)

* Adjacent to ports of Astrakhan & Lagan in Russia, Kerasnodesk in Turkmenistan, Aktau in Kazakhstan and Baku in Azerbaijan

* Existence of access roads to the consumption markets of C.I.S countries

* Adjacency to the Rasht international airport

* International highway of Anzali – Rasht – Ghazvin

* Existence of specialist work force

* Adjacency to the vast gas & crude oil of the Caspian Sea

* Ghazin – Anzali – Astara railroad

* Closeness to Capital of Iran (Tehran about 360 km)

* Proximity to 5 power plans

* Possession of main infrastructures

Caspian port capacity:

Due to the launch of the Caspian Port and its high capacity, there will be a high economic cost of refrigeration for the storage of goods.
Caspian Port Complex in Anzali Free Zone, with a backlog of 350 hectares of 22 berth posts with an annual capacity of 15 million tonnes in a single shift and two breakwater of 6.2 km long and a 200 hectare pond area capable of mooring vessels. It has 5.7 meters capacity of 12,000 tons of commercial goods and 20,000 tons of petroleum products.

One of the major benefits of this port is that it has no restrictions on freelance development, having oil terminals, dry bulk, rail, container, along with the establishment of a repair center, support for domestic and foreign ships.

By connecting the Caspian Port to the national rail, we will see a boom in the transportation industry as one of the key pillars of development and transit of goods and passengers in the region. After the completion of infrastructure projects in the Anzali Free Zone area such as the port and its connection to the entire railway network, it is expected to witness a golden era in industry, commerce and tourism in the region and country as it links the national economy to the world economy and trade.

The first phase of the port has officially begun with the approval of the official and authorized maritime border for the exchange of goods, arrival and departure of passengers and vehicles. Also planned is the construction of a logistics park and an

industrial town at the rear of the port as a new generation port, which has begun the operation of connecting to national rail lines and building a dock.

Currently utilizing a multi-purpose dock and two dolphin docks for oil drainage and oil storage tanks, grain silos and roofed warehouses alongside open warehouses, various commodities such as wheat, corn, wood, livestock, livestock, goods Container: Various types of construction and mining materials have been unloaded or loaded at this port.

One of the most distinct advantages of this port is its location in the Anzali Free Zone and the possibility to use the legal advantages of the Free Zones of the country as well as to take advantage of the existing geographical and infrastructural advantages such as access to the railway, international airport, near Tehran. Specialized and cheap labor force, there are numerous and varied active production units in the region that can benefit from the capacity of these units.

Access to local markets as well as numerous commercial complexes in the region as well as the advantage of traveling with freight in the Anzali Free Zone have made it possible to consume many of the imported goods to the port in the region.

Cold Storage Warehouse Industry Growth:

In recent years, the supply of newly constructed cold storage warehouse space has increased. Increased adoption of newer technologies including cascade refrigeration systems, high-speed doors, energy-efficient walls and automated cranes have helped to increase efficiency and decrease operating costs.

Since 2000, the U.S. cold storage warehouse industry has experienced a 43% increase in capacity, largely due to investment in larger scale facilities exceeding 2.5 million cubic feet of space. Cold storage warehouse operating profits (reported as earnings before taxes divided by revenues) increased 83% in the five-year period ending in 2017. Leveraging low interest rates for the financing of new construction, REITS and other institutional investors have been able to ramp up investment and increase participation in the industry. In addition, use of sale-leaseback agreements enables warehouse owner-operators to redeploy capital to other areas of the business such as for expansion, innovative technologies and other higher-return projects.

Major money has been flowing into the refrigerated warehouse industry. Private equity investors have staked their claim and the flurry of M&A activity continues. Before the recent discovery by private equity investors, the U.S. cold storage warehouse industry was dominated by smaller refrigerated warehouse operators. Today, approximately 70% of the industry's total capacity is controlled by 10 companies. Of this, the top three cold storage warehouse operators own 48% of the market.

European powerhouse NewCold and third-ranked Preferred Freezer Services have been pouring hundreds of millions of dollars into new, large-scale cutting-edge warehouses. As is the case with fulfillment and distribution centers, cold storage warehouses are being built larger and taller, now to heights exceeding 100 feet. Increasing the vertical dimensions of a refrigerated warehouse makes sense as this facilitates increased amounts of efficiencies that can be created, driving more profit. With higher ceiling heights, cold storage warehouses can utilize more automation to decrease the cost of labor and aid in fresh-food e-commerce fulfillment efforts.

Innovative technology has already proven to be a game changer in cold storage operations. 48% of the cold storage inventory in the United States is comprised of pre-1980 warehouses, built before the introduction of full-automation. These older facilities are often inadequately insulated and suffer from higher energy consumption and shorter food shelf life. By contrast, newer automated cold storage warehouses with footprints half the size are able to reach the same storage volume with a reduction of up to 75% less labor and energy. Obsolescence is a noticeable challenge in an industry struggling to keep up with escalating demand.

The Economics of Cold Storage Warehousing:

By its very nature in providing the means to prevent decay and help ensure food integrity via refrigeration, the need for refrigerated cold storage warehouses, distribution centers and fulfillment centers is inexorably linked to agriculture and food processing operations. As food is essential for the population, the demand for food goods tends to be resistant to changes in the economy, providing stability for the cold storage warehouse industry.

As more goods are foregoing preservatives, the need to refrigerate more products has increased. Although the current rate of online grocery shopping remains low at around 3%, the field is growing and is anticipated to reach 20% by 2025. Not only popular with Millennials, with 10.000 Americans retiring in the United States every day, Baby Boomers are expected to join the trend.

The increasing consumer preference for fresh food products and goods without preservatives is fueling growth of the cold chain infrastructure from the field to the dining table. This may include the pre-cooling of perishable agricultural goods from the field, refrigerated transportation of perishables to processors, storage or delivery to wholesalers or retailers.

According to industry experts CBRE, currently refrigerated warehouses compose 1-3% of the total U.S. industrial real estate market. Owners and operators of cold storage warehouses are anticipated to realize a 4% compound growth rate from 2018 and 2022, according to the Global Cold Chain Alliance.

- **Cost:** The added complexity of the equipment, resources and infrastructure, both initially and ongoing for cold storage warehouses is daunting and may scare away inexperienced investors, developers, contractors and asset managers. Cold storage warehouses are more costly to build and operate de to the sophisticated equipment, insulation, reinforcement and construction materials needed. Energy and labor costs are very significant drivers.
- **Specialized expertise required:** As this is a niche category, there are a limited number of experienced cold storage warehouse developers, contractors and warehouse operators in the market.
- **Complicated nature of constructing cold storage warehouse facilities**
- **Risk to investment:** Rarely is speculative development available as cold storage warehouses are not typically constructed without having a tenant contracted for the space.

Physical Progress of project: None

According to the fact that the proposed project is an opportunity for investment, the related investment includes feasibility studies.

Action plan and Implementation schedule:

According to the steps considered for project implementation including preliminary studies, basic and descriptive engineering planning, construction and preparation of equipments and taking overlap time of the so called steps into account, the project will take 1 years to be implemented and 10 years to be exploited.

Step		Implementation duration	Months 1	Months 2	Months 3	Months 4	Months 5	Months 6	Months 7	Months 8	Months 9	Months 10	Months 11	Months
1st phase	1Levelling	2 Months												
	2.Fencing													
	3.Foundation													
	4- Orders of warehouse													
2nd phase	1. Orders of machinery	9Months												
	2. installation warehouse pillar													
	3. making warehouse													
	4.making wall													
	5. Flooring													

	6. Parquetry													
3rd phase	1. establishment	3 Months												
	2.official & guard building													
	3.surrrounding													
	4.installation of machinery													

Financial Projection

The cost estimate:

The cost estimate

No.	Subject	costs (million Rials)
1	Fixed investments	90960
2	Operating costs	173526

Fixed Investment Estimate

No.	Subject	costs (million Rials)
1	land purchase cost	9120
2	Site preparation and land improvement	2070
3	Civil works and building construction	16620
4	Machinery and Equipment Manufacturing	30570
5	Auxiliary and Service Equipments	21330
6	Pre-production expenditures	8700
7	Unpredicted Expenditure	2550
Total	90960	

Circulation Capital Estimate:

No.	Subject	costs (million Rials)
Current Expenditures		**216180**
1	Raw Materials	45900

2	Human Resource	112752
3	Other Current costs	57528
Fixed costs		**1123668**
4	Raw Material	107100
5	Human Resource	263088
6	Depreciation cost	619272
7	Other fixed costs	134208
Total Operating cost		**1339812**

Estimating Revenues:

The global cold storage market size was valued at USD 94.02 billion in 2018 and is projected to expand at a CAGR of 12.2% during the forecast period. The market has benefitted significantly from the stringent regulations governing the production and supply of temperature-sensitive products.

The project revenue in the first five years after exploitation (million Riasl)

No.	subject	Year 1	Year 2	Year 3	year 4	year 5
1	Sell Revenue	34,500	34,500	34,500	34,500	34,500

Duration of project exploitation:

The exploitation duration of the project is estimated as 10 years.

Cost-benefit Analysis:

The Table of Project Efficiency Indicators

732534	Present value of total cost of implementation and exploitation(Million Rials)
930276	Present value of total income of implementation and exploitation(million rials)
46032	Net present value (NPV) (Million Rials)
1.27	Benefit/Cost ratio B/C
36%	Internal Rate of Return (IIR)

Sensitivity Analysis of the Project:

Sensitivity Analysis Table

Change of Internal rate of return due to change of costs	Change of Internal rate of return due to change of revenues	Percentage changes
94%	0%	-20%
63%	9%	-10%
36%	36%	0%
12%	60%	10%
0%	83%	20%

Conclusion:

"Summary of Project Economic Issues"

Activity	**Exact title of activity**	**Product Name**	**Nominal Capacity (unit)**
Service	**Establishment of fridge**	**Establishment of fridge(stuff preservation)**	2200 tons
Implementation Duration	Total fix investment (Million Rials)	Annual Circulation Capital (million Rials)	Required Human Resources
1 year	90960	173526	25
Internal rate of return (IIR)	Net present value (million Rials)	Applicant Share (million Rials)	Benefit-cost ratio *B/C
36%	46032	30% of total investment	**1.27**

The Way of participation and preparation of the required capital:

For providing the project required capital, foreign investment participation is used for providing 70% of the fix capital needed and 50% of circulation capital needed.

Capital Payback period:

The capital payback period is approximately 3 years and 8 months.

Incentives, features and advantages of project:

This project is established in Anzali free zone and generally activity in free zones includes the following advantages and incentives:

- Rightful and legal individuals employed in different economic activities in the zone, are exempted from paying tax of income & property for any economic activity in free zone for 15 years from the exploitation time mentioned in the permission and this time has been increased to 20 years.
- Entry and exit of capital and profit acquired from economic activities are free in each region.

- Capital and legal rights of foreign investors, whose capital has been approved by ministry board, are fully guaranteed and protected by investment organization and technical-economic aids of Iran according to the protection law of foreign investment.
- Entry of machinery and raw materials to Anzali commercial-economic free zone is free from any customs or commercial profit.
- Entry of foreigners is possible without taking visa.
- Easy registration of companies, industrial and cultural institutes and spiritual ownership is according to regulations of the zone.
-Easy selling and renting land for Iranians and long-term rent of land for foreigners is possible in this zone.
- There are special regulations for monetary and bank operations in order to offer monetary and bank services.