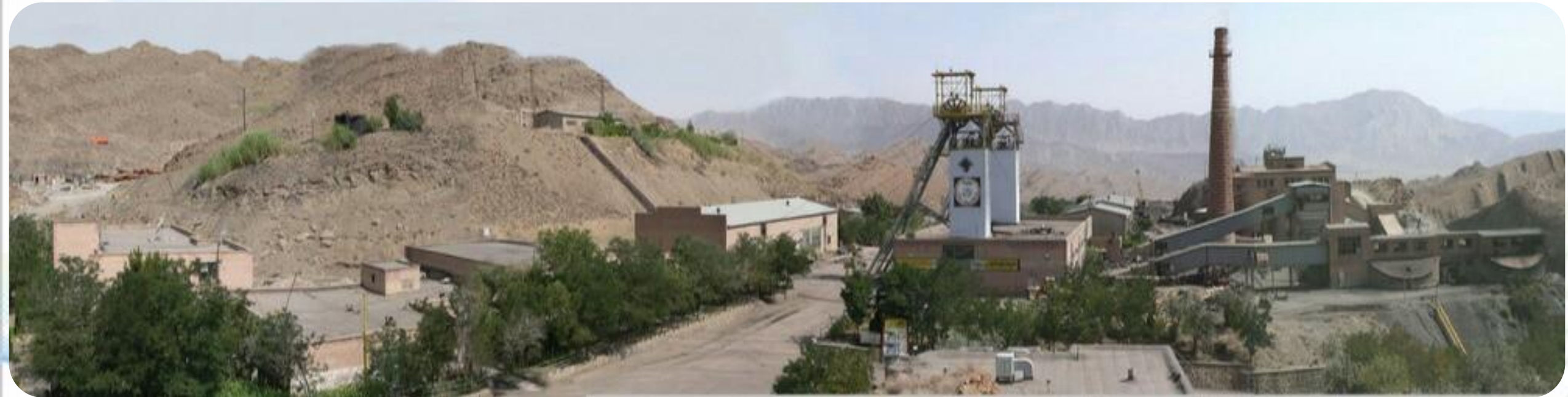


# Investment Opportunities in Kerman

## Coal Mining



## **Kerman Province:**

### **The Second Producer of Coal in IRAN**

**Rich in Active Coal Mines and Pristine Resources of Coal**



# Kerman Coal Mines Company

## **Established:**

From around 1974-75, along with establishing the Isfahan iron smelting plant to supply the coke for the blast furnace, the exploration and exploitation of coal mines was included in the government's plans .

According to the preliminary information and reports of geological experts who pointed out the existence of coal in the north of Kerman, geological studies in this area were started by Kerman Coal Mines Company, affiliated with Iran's National Smelter Company, in September 1966.

Kerman Coal Mines Company was established in 1974 as a private joint stock company.



# Kerman Coal Mines Company

## Activity:

The company currently has 11 active mines with 3000 workers in coal mines and headquarters. In addition to mining, the concentration of mined coal and the production of coal concentrate are also one of the main goals of establishing the company.

This goal was achieved with the construction of Zarand coal washing plant in 1978.



# The **strategic importance** of coal



According to the report of the International Energy Agency in September 2017 entitled "World Energy Outlook in 2040", although the direction of new investments in the world is moving towards the production of energy from renewable sources by taking advantage of government incentives, fossil fuels are still and at least until three next decade will be the main sources of energy production in the world.



About 5800 million tons of thermal coal are produced in the world annually. China, America, India, Japan, Germany, South Africa, South Korea, Australia, Russia and England are the first 10 countries that produce electricity from these sources. The high usage of coal resources in the production of electrical energy shows the strategic importance of these reserves for the developed countries of the world .



# The **strategic importance** of coal



More than 74% of steel production in the world is done by the blast furnace method. In this method, coke is used as one of the main fuels. This fact shows the high dependence of the steel industry on coal. The growth of coking coal production in the world in recent years also shows the large investments in this field in the world.



Among the different types of mineral resources available in the country, coal mines have a high potential to create jobs. Based on available calculations, the development of coal mines in the country has the potential to create nearly 30 thousand direct jobs and tens of thousands of indirect jobs.

# The **strategic importance** of coal



The importance of exploiting coal reserves in Iran has been severely neglected due to oil and gas reserves. Meanwhile, other competitors of Iran in energy reserves, such as the United States and Russia, despite having rich oil and gas reserves, have also invested heavily in their coal reserves.



According to the national geological documents, the probable reserves of coal in the eastern regions of the country are estimated between 11 and 14 billion tons. Such an amount of probable reserves, in case of more investment in the field of exploration, will place Iran among the first 15 countries with the largest coal reserves in the world.

# The state of Kerman coal mines

## Kerman Active Coal Mines (in operation)

### Private Sector

Number of mines: 11

Area: 154 km<sup>2</sup>

### Kerman Coal Mines Company

Number of mines: 11

Area: 235 km<sup>2</sup>

The reserves of Kerman coal mines have been determined based on additional exploration studies conducted by Soviet Union experts in the 1940s and 1950s. It is obvious that conducting deep exploration with today's technology will significantly increase the amount of proven reserves .





# Active mines under the ownership of Kerman Coal Mines Company

Mine Name	Status	Proven Reserve (million tons)
Pabadana (Kouhbanan)	Underground Mining	15
Hashoni (Kouhbanan)	Underground Mining	15
Bab Nizo (Zarand&Ravar)	Underground Mining	13
North Abnil (Chatrod)	Underground Mining	11.5
Hamkar (Ravar)	Underground Mining	10.2
South Saraparde (Zarand)	Open-pit mining -Need to design and equip for underground mining	8.7
Hojedk (Ravar)	Underground Mining	6.8
South Abnil (Chatrod, Kerman)	Underground Mining	3
West Sarapardeh (Zarand)	Has an exploitation license - Need to design and reopen	1.6
South Abnil 2 (Chatrod, Kerman)	Open-pit mining	1
Asadabad (Ravar)	Underground Mining	0.25
<b>Total</b>		<b>86.05</b>



# Investment Opportunities



## Exploration, Design, Construction, Extraction

### The Conditions for Investment in the Coal Mines in Kerman Province

- ❑ Admission of investment will be carried out within the framework of a contractual arrangement of the civil participation scheme with Kerman Coal Mines Company. According to the laws of the country, as a state-owned company, it will select the qualified investors through a public auction. The subject of the auction is the management of a coal mine, including design, construction, equipment and extraction with an annual production capacity of ... thousand tons of raw coal according to the terms of the contract and the attached technical specifications.
- ❑ Kerman Coal Mines Company's share of extracted coal is determined according to the coefficient proposed by investors participating in the auction based on the following formula:  $P=T*(K)$   
P= the company's share of the extracted coal (tons) T= the amount of extracted coal (tons) K= The coefficient proposed by the participant in the auction to determine the company's share of extracted coal (percentage)



# investment opportunities

## **The conditions for investment in the coal mines in kerman province**

- ❑ The contract period is 15 years (including 1 year for additional exploration (if the investor is recognized), design, preparation, repairs and equipping, and 14 years of exploitation period). The duration of the contract can be extended up to one more period if there is an extractable reserve and the company's satisfaction with the investor's performance and fulfillment of obligations in the first period, in compliance with the laws and regulations.
- ❑ The machines and equipment in the mines will be leased to the investor upon request. Also, supplies and equipment related to mining operations that are available in mine warehouses will be sold to investors if they request. The rent and sale price of equipment and machines will be determined by a judicial expert.



# investment opportunities (Exploration, Design, Construction, Extraction)

## Pabadana Mine

City	Kuhbanan
Type of coal	Coking coal
Mine status	Active
Proven reserve (million tons)	15
Distance to coal washing plant (km)	52
Distance to the center of the province (km)	130
Investment required (million dollar)	9.5
Expected employment	850
Expected monthly production (tons)	25000
<b>Technical Specifications</b>	
Average ash content (%)	38
Average thickness of the workable main layer (m)	1.8
Layer slope (degree)	35
Plastometry (mm)	14

Pabadana coal mine is located 130 kilometers northwest of Kerman, with an area of approximately 11 square kilometers. Its exploration began in 1965, and in 1976, it was put into operation in the area of the initial mine of Pabadana, and in 1978, in the area of the large mine of Pabadana.

The current reserve of the mine is about 15 million tons of coking coal.

Its workable layers are D2-D3-D4-D5-D6 from coal zone D with a slope of 10 to 60 degrees and a thickness of up to 2.5 meters. The extraction method in this mine is long wall mining.



# investment opportunities (Exploration, Design, Construction, Extraction)

## Hashuni Mine

City	Kuhbanan
Type of coal	Coking coal
Mine status	Active
Proven reserve (million tons)	15
Distance to coal washing plant (km)	70
Distance to the center of the province (km)	150
Investment required (million dollar)	11/9
Expected employment	1000
Expected monthly production (tons)	35000
<b>Technical Specifications</b>	
Average ash content (%)	32
Average thickness of the workable main layer	2
Layer slope (degree)	35
Plastometry (mm)	15

Heshoni coal mine is located in 150 km northwest of Kerman, 30 km from Kuhbanan city and 5 km from Kianshahr (Pabadana). It has an approximate area of 18 square kilometers. Its exploration started in 1970 and it was put into operation in 1976. Its initial geological reserve is 22 million tons and the current mine reserve is 15 million tons of coking coal

Its workable layers are D2, D4, and D6 from coal zone D with a slope of 25 to 55 degrees and a maximum thickness of 3.5 meters. The extraction method in this mine is long wall mining.



# investment opportunities (Exploration, Design, Construction, Extraction)

## Hamkar Mine

City	Ravar
Type of coal	Coking coal
Mine status	Active
Proven reserve (million tons)	10.2
Distance to coal washing plant (km)	112
Distance to the center of the province (km)	180
Investment required (million dollar)	9.5
Expected employment	1000
Expected monthly production (tons)	25000
<b>Technical Specifications</b>	
Average ash content (%)	35
Average thickness of the workable main layer	1.5
Layer slope (degree)	40-75
Plastometry (mm)	18

Hamkar coal mine is in the central part of Kuhbanan city. The distance between this mine and the center of Kerman province is 180 km. The approximate area of this mine is 4.5 square kilometers. The exploration of this mine was carried out from 1971 to 1977 and it was put into operation in 1984. Its geological reserve is about 31.6 million tons of coking coal.

Its workable coal layers are located in two separate zones, D and E, with a maximum thickness of 3.35 meters. The mining technique is bench mining on slopes up to 50 degrees and on slopes of more than 50 degrees, it is cut and fill.



# investment opportunities (Exploration, Design, Construction, Extraction)

## Babnizu Mine

City Zarand & Ravar

Type of coal Coking coal

Mine status Active

Proven reserve (million tons) 13

Distance to the coal washing plant (km) 31

Distance to the center of the province (km) 94

Investment required (million dollar) 11.9

Expected employment 700

Expected monthly production (tons) 15000

### Technical Specifications

Average ash content (%) 20

Average thickness of the workable main layer 2.5

Layer slope (degree) 83

Plastometry (mm) 18



# investment opportunities (Exploration, Design, Construction, Extraction)

## Hojedk Mine

City	Zarand
Type of coal	Coking coal
Mine status	Active
Proven reserve (million tons)	6.8
Distance to the coal washing plant (km)	50
Distance to the center of the province (km)	72
Investment required (million dollar)	9.5
Expected employment	450
Expected monthly production (tons)	7000
<b>Technical Specifications</b>	
Average ash content (%)	28
Average thickness of the workable main layer	2
Layer slope (degree)	70
Plastometry (mm)	15

Hojedk coal mine is located in 70 km northeast of Kerman. It also includes Ashkli and Asadabad areas. After exploration in 1976, Hojedk coal mine was put into operation. It has 6.8 million tons of proven reserve of coking coal. Its workable layers are D1 and D2 from coal zone D with a slope of 65 to 80 degrees and with a thickness of up to 2 meters. The mining method in this mine is cut and fill with an average slope of 35 degrees.





# investment opportunities (Exploration, Design, Construction, Extraction)

## Asad abad Mine

City Zarand

Type of coal Coking coal

Mine status Active

Proven reserve (million tons) 0.25

Distance to the coal washing plant (km) 45

Distance to the center of the province (km) 77

Investment required (million dollar) 5.9

Expected employment 250

Expected monthly production (tons) 5000

### Technical Specifications

Average ash content (%) 28

Average thickness of the workable main layer 1.5

Layer slope (degree) 70

Plastometry (mm) 15

The design of Asadabad coal mine was carried out from 1997 to 1999 and it was put into operation in 1999. The area of the range is about 5.8 square kilometers. It is located at a distance of 5 km from Hojedk Mine and 8 km from Babnizu. Its extractable coal layer is D2. It is a steep layer with an average slope of 80 degrees and an average thickness of 2 meters. The mining method in this mine is cut and fill.



# investment opportunities (Exploration, Design, Construction, Extraction)

## South Saraparde Mine

City	Zarand
Type of coal	Coking coal
Mine status:	Need to design and equip
Proven reserve (million tons)	8.7
Distance to the coal washing plant (km)	57
Distance to the center of the province (km)	130
Investment required (million dollar)	8.3
Expected employment	450
Expected monthly production (tons)	15000
<b>Technical Specifications</b>	
Average ash content (%)	35
Average thickness of the workable main layer	2
Layer slope (degree)	45
Plastometry (mm)	16

South Saraparde coal mine is located in 120 kilometers north of Kerman city, south of East Saraparde mine, near Isa Abad village, in Zarand.

The proven reserve of the mine is 8.7 million tons. The mine is being exploited in the open pit .



# investment opportunities (Exploration, Design, Construction, Extraction)

## West Saraparde Mine

City	Zarand
Type of coal	Coking coal
Mine status:	Need to design and equip
Proven reserve (million tons)	1.6
Distance to coal washing plant (km)	57
Distance to the center of the province (km)	130
Investment required (million dollar)	4.7
Expected employment	250
Expected monthly production (tons)	3000
<b>Technical Specifications</b>	
Average ash content (%)	45
Average thickness of the workable main layer	1
Layer slope (degree)	40
Plastometry (mm)	14

West Saraparde coal mine is located 125 kilometers north of Kerman, north side of Bab Shagun mine and near Dareh-Gaz village, in Zarand city .

The operating license of the mine is valid for 18 years from 2017. The probable reserve of the mine is 1.6 million tons .



# investment opportunities (Exploration, Design, Construction, Extraction)

Abnil coal mines are located in 56 km north of Kerman. The approximate area of this mine is 4.5 square kilometers. After the initial discoveries in 2013, it was put into operation as open-pit mine. Its total reserves are about 27.5 million tons of thermal coal. The extraction method in this mine is long wall mining with an average slope of 25 degrees .



# investment opportunities (Exploration, Design, Construction, Extraction)

North Abnil mine		South Abnil mine		South Abnil 2 mine	
City	Kerman (Chatrod)	City	Kerman (Chatrod)	City	Kerman (Chatrod)
Type of coal	Thermal	Type of coal	Thermal	Type of coal	Thermal
Mine status	Active	Mine status	Active	Mine status	Active
Proven reserve (million tons)	11.5	Proven reserve (million tons)	3	Proven reserve (million tons)	13
Distance to the coal washing plant (km)	56	Distance to the coal washing plant (km)	56	Distance to the coal washing plant (km)	56
Distance to the center of the province (km)	70	Distance to the center of the province (km)	70	Distance to the center of the province (km)	70
Investment required (million dollar)	8.3	Investment required (million dollar)	8.3	Investment required (million dollar)	8.3
Expected employment	500	Expected employment	550	Expected employment	450
Expected monthly production (tons)	10000	Expected monthly production (tons)	20000	Expected monthly production (tons)	15000
<b>Technical Specifications</b>		<b>Technical Specifications</b>		<b>Technical Specifications</b>	
Average ash content (%)	15	Average ash content (%)	15	Average ash content (%)	15
Average thickness of the workable main layer	2	Average thickness of the workable main layer	2	Average thickness of the workable main layer	2
Layer slope (degree)	22	Layer slope (degree)	22	Layer slope (degree)	22

# investment opportunities



## Exploration, Design, Construction, Extraction

- ❖ The investment made in the exploration of Iran's coal mines has been very small. In addition, the depth of exploration studies in coal-rich areas is very low. More investment and increasing the depth of exploratory drilling are the most important priorities for the development of coal mines.
- ❖ The discoveries made in the coal mines of Kerman are related to the 1960s and 1970s by Russian (Union Soviet) experts. According to the technology of that day, the depth of the exploration operations was a maximum of 800 meters. Thus, making new exploration by using modern technology can significantly increase the proven coal reserves.
- ❖ The reports of previous discoveries are available in Kerman Coal Mines Company and they can be made available to investors.
- ❖ Exploration areas designated for investment have exploration licenses. If it is necessary to renew or amend the license ,the company will provide the necessary cooperation.



# investment opportunities (Exploration, Design, Construction, Extraction)

Dahrud Mine	
City	Zarand
Type of coal	Thermal
Mine status	Exploration permit
Area (km <sup>2</sup> )	4
Probable reserve (million tons)	2.5
Distance to the coal washing plant (km)	45
Distance to the center of the province (km)	120
Investment required (million dollar)	8.3
Projected employment	550
Expected monthly production (tons)	20000
Technical Specifications	
Average amount of coal ash (percentage)	30
The average thickness of the workable main layer	2
Layer slope (degree)	47
Amount of exploration	40 trenches

Dahrud area is located in 120 kilometers northwest of Kerman city ,in the south side of Pabadana mine, near Dehroud village of Zarand city.

The area of this mine is about 4 square kilometers and the probable reserve of the mine is 2.5 million tons .

Exploration operations have already been carried out: 40 trenches



# investment opportunities **(Exploration, Design, Construction, Extraction)**

## North Godar Mine

City	Zarand
Type of coal	coking coal
Mine status	Exploration permit
Area (km <sup>2</sup> )	39
Probable reserve (million tons)	1
Distance to the coal washing plant (km)	68
Distance to the center of the province (km)	140
Investment required (million dollar)	8.3
Projected employment	500
Expected monthly production (tons)	10000
<b>Technical Specifications</b>	
Average amount of coal ash (percentage)	25
The average thickness of the workable main layer	1.5
Layer slope (degree)	65

The North Godar mine is located 125 kilometers northwest of Kerman city, on the north side of the South Sarapardeh mine in Zarand.

The area of the mine is about 39 square kilometers and the probable reserve of the mine is about 1 million tons .

Exploration operations have already been carried out: 14 trenches and 5 boreholes.





# investment opportunities (Exploration, Design, Construction, Extraction)

## Dare Gar mine

City Zarand

Type of coal thermal

Mine status Exploration permit

Area (km<sup>2</sup>) 6

Proven Reserve (million tons) 9

Distance to the coal washing plant (km) 62

Distance to the center of the province (km) 135

Investment required (million dollar) 8.3

Expected employment 650

Expected monthly production (tons) 20000

### Technical Specifications

Average amount of coal ash (percentage) 22

The average thickness of the workable main layer 1.5

Layer slope (degree) 45

Dareh Gar mine is located in 120 kilometers northwest of Kerman city, on the south side of South Sarapardeh mine, near Bab Gohar village, in Zarand.

The area of this mine is about 6 square kilometers and the definite reserve is 9 million tons.

Exploration operations have already been carried out: 36 trenches, 60 boreholes, 3 exploration tunnels and 17 exploration cross cut.



# investment opportunities



## Coal processing

**Project title:** Production of calcined coke (capacity: 3600 tons annually)

**Brief description of the plan :** By performing the calcination process, part of the volatile materials and moisture in the thermal coal is removed and Its weight percentage of carbon increases. Calcined coke is small and dense. It has favorable electrical characteristics for the production of anodes and electrodes .

**Application of the product:**

- ❖ As solid fuel in boilers of power plants and cement kilns
- ❖ Aluminum industries
- ❖ steel Industries
- ❖ Casting industries and ...



# investment opportunities



## Coal processing

**Proposed location:** Zarand - Coal Washing Plant

**Required investment :** 2 million dollars

**Advantages of the proposed plan:**

- ❖ Availability of required infrastructure including water, electricity and a suitable shed
- ❖ Availability of the required coal at the project location
- ❖ Existence of a favorable domestic market for the product

# investment opportunities



## coal market

### The strategic importance of coal

- Fossil fuels are still the main sources of energy supply in the world for at least the next three decades.
- The use of coal resources in providing electrical energy in many countries.
- High dependence of the steel industry on coking coal.
- High potential of coal mines in job creation.
- The importance of diversifying sources of energy production, like other countries with huge oil and gas resources.



# investment opportunities



## Coal Market

### Domestic Market

- ❑ The main consumption of coal is in the form of (metallurgical) coke for the production of steel by the blast furnace method .
- ❑ Coke production capacity in Iran's coking plants is about 3.5 million tons. To produce this amount of coke, 4.8 million tons of concentrate are needed, and to produce this amount of concentrate, about 10 million tons of raw coal are needed .
- ❑ Iran's current production of coking coal is about 4 million tons and concentrate production is about 1.9 million tons .
- ❑ In 2020, Iran imported about 1.5 million tons of coal, coke and other coal derivatives (worth 793 million dollars).
- ❑ Currently, Iran's steel production is about 30 million tons. The goal set for 2025 is to produce 55 million tons of steel. With this production growth, the demand for coke will increase significantly.



# investment opportunities



## Coal Market

### **The presence of a guaranteed buyer near the mining site**

- ❑ Kerman Coal Mines Company has the capacity to purchase all the mined coal from the investor to provide the raw materials needed by the Coal Washing Plant.



# Investment incentives



## **Tax Exemption**

Income tax exemption for 5 years and in less developed areas for 10 years from the start date of extraction and sale contract (Kuhbanan city is less developed).



## **Providing Infrastructure**

All the required infrastructure including water, electricity and access roads have been provided in all the company's active mines.

# Investment incentives



## **The Possibility of Using Existing Mining Equipment**

Machines and equipment in the mines will be leased to the investor upon request.



## **Guaranteed Purchase of Mined Coal**

Kerman Coal Mines Company has the capacity to buy all extracted coal for the production of concentrate.







## Zarand Coal Washing Plant

Zarand Coal Washing Plant is located 75 kilometers from Kerman, at the beginning of Zarand. The operation of this factory started in 1978 in order to produce concentrate. This factory is built on a land of 24,600 square meters area. It has the capacity to process 2 million tons of coal per year.





# Zarand Coal Washing Plant





# Zarand Coal Washing Plant



# THANK YOU

