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Power and Energy Group

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Saba Power and Energy Group belongs to the Islamic Revolution Mostazafan Foundation (IRMF) and was established in 2004 with the aim of producing, supplying, and trading electricity. As the first private company in the history of Iran's electricity industry, it moved toward privatization of the governmental power plants. Having 10 subsidiary companies, Saba Group conducts its activities in three main fields as follows:

1. **Investment in construction and purchase of power plants:** Saba Group owns all or part of 5 power plants including Zargan, Khoramshahr, Aliabad Golestan, Ghom, and Chabahar with a capacity of 3500 MW.

2. **Operation and Maintenance of power plants:** As a company capable of performing the operation and maintenance services for new power plants and by enforcing audited standards, Saba Group is responsible for the operation and maintenance of 6 power plants with a capacity of 4,100 MW in Iran. Saba Group has successfully performed more than 13 overhauls in different power plants and it plans for carrying out major overhauls of 13 other units in the current year.

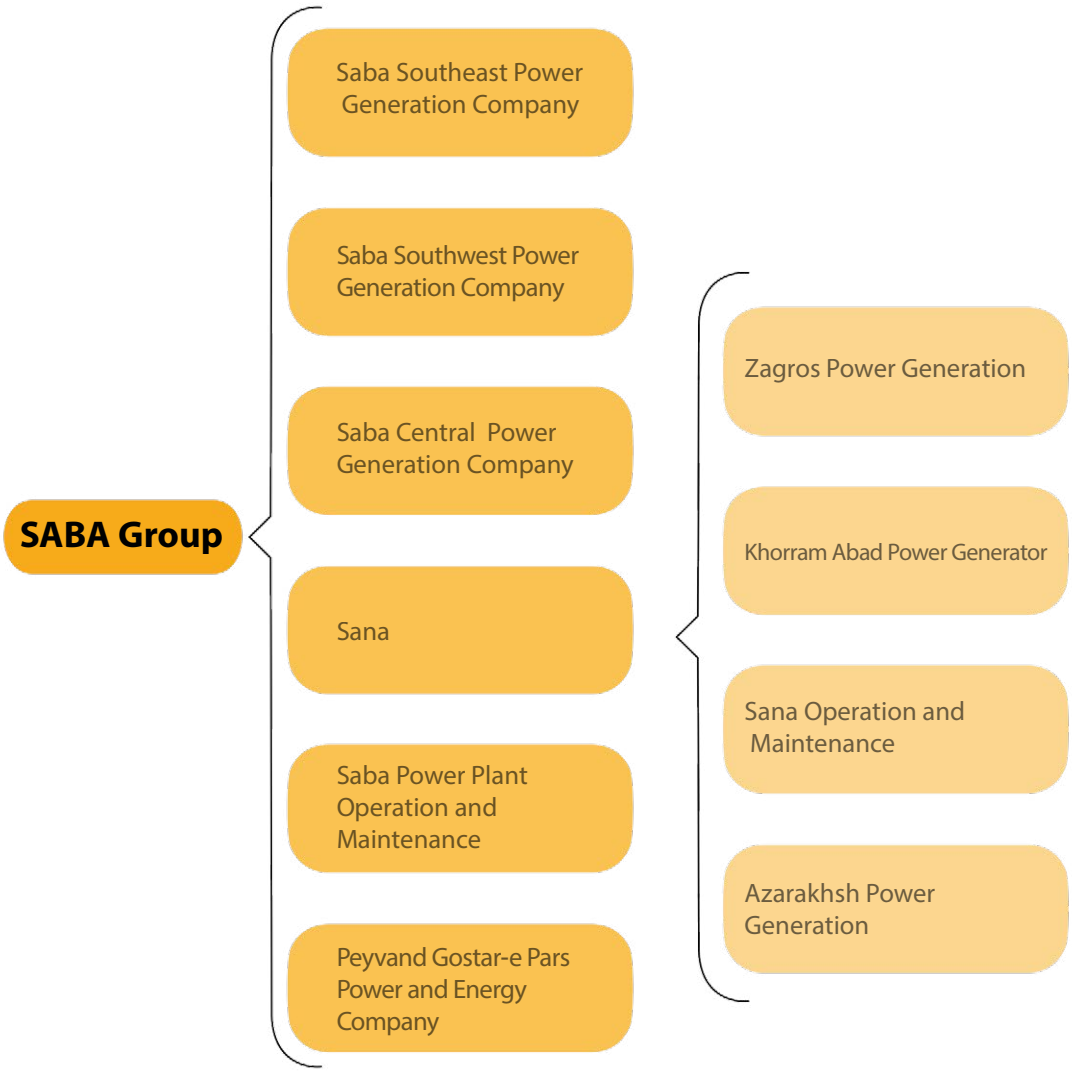
3. **Sales and Marketing:** Saba Group is responsible for selling the electricity produced by the power plants it owns in the electricity wholesale market, stock exchange, or in form of bilateral contracts.

Vision

A prestigious, dynamic group of five large nongovernmental enterprises in the region

Mission

Production and sale of electricity with optimal investment and maximum availability of the power plants



Power plants

- **Zargan Power Plant**

With a capacity of 418 MW, Zargan Power Plant is located in 5th km of Ahvaz-Masjed Soleyman road, in an area of about 27 hectares. The plant consists of two steam units manufactured by GEC, each with a nominal capacity of 145 MW and 4 gas units manufactured by ACG with a nominal capacity of 32 MW. Zargan Power Plant of Ahvaz is located at the center of the 230 kV power grid of Khouzestan province and plays a crucial role in the network stability and voltage control of the region, especially in Ahwaz.

- **Khorramshahr Combined Cycle Power Plant**

With a capacity of 972 MW, Khorramshahr Combined Cycle Power Plant is located in the 8th km of Khorramshahr-Ahvaz road, in Arvand Free Zone, in an area of 130 hectares. The project was defined in three phases and its construction began in 2007. It consists of 6 V94.2 gas units each with a nominal capacity of 162 MW and 3 steam units each with a nominal capacity of 160 MW. The first gas unit of this power plant was added to the circuitcommercial operation was in 2008. Currently, the first and second phases, including 6 gas units, are fully integrated into the circuit, and the company is planning to build the steam unit of the power plant for the combined cycle.

- **Ghom Combined Cycle Power Plant**

With a capacity of 714 MW, Qom Combined Cycle Power Plant is located in the 14th km of Qom-Arak road in an area of 220 hectares and has 2 combined cycle blocks consisting of 4 gas units manufactured by MITSUBISHI, each with a nominal capacity of 128.8 MW, as well as 2 steam units manufactured by ABB with a nominal capacity of 100 MW.

- **Chabahar Combined Cycle Power Plant**

With a nominal capacity of 415 MW, Chabahar Combined Cycle Power Plant is located in the 15th km of Chabahar-Iranshahr Road in an area of 80 hectares. It consists of 4 GE-F5 gas units each with a nominal capacity of 25 MW and two V94.2 gas units, each with a nominal capacity of 157.5 MW. Currently, an EPC contract has been concluded and operationalized for the steam unit with capacity of 160 MW in order to convert V94.2 gas units into the combined cycles.

- **Aliabad Golestan Combined Cycle Power Plant**

Aliabad Golestan Combined Cycle Power Plant has been defined with capacity of 972 MW in Aliabad, Golestan Province. It consists of six V94.2 gas units each with a nominal capacity of 162 MW and 3 steam units, each with a nominal capacity of 160 MW in two phases. The first phase of the plant including 6 gas units started in 2010. The second phase of the plant, involving the construction of the steam units, is currently on the agenda.

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Honors

- 20-rank improvement in the index of sales in 2016 compared to the previous year; ranking 84th among the 500 top Iranian companies (IMI-100)
- Receiving a letter of appreciation from the 14th National Conference on Corporate Excellence by Sena Company
- Ranking first in the rapid growth index in the energy group by the Industrial Management Organization in 2015
- Ranking first in the energy group among the 500 largest companies in Iran by the Industrial Management Organization in 2014
- Receiving a letter of appreciation from the Fifth National Productivity Festival in 2014
- Celebrating as the best industrial entity of Arvand Free Zone in 2013
- Receiving a letter of appreciation for construction of the Khorramshahr Power Plant for management and for organization in statistical activities in 2011
- Ranking first in the first National Productivity Festival for Khorramshahr Power Plant project in 2010
- Being distinctive in the Electricity Industry in early commissioning of Khorramshahr and Ali Abad Combined Cycle Power Plants
- Receiving a letter of honour for the Premier Project for Khorramshahr Combined Cycle Power Plant in the Third National Productivity Festival
- Unrivalled regeneration of one Steam Unit of Zargan Power Plant in an over speed catastrophic damage
- Receiving a letter of appreciation from the Ministry of Energy for repairing and maintenance of three Gas Units of Khorramshahr Power Plant and gaining unprecedented record for the shortest hot path section in Iran.
- Receiving a letter of appreciation from the Ministry of Energy for carrying outrepairing boiler repairs at one Steam Unit of Zargan Power Plant boiler in a short time in spite of sultry and inappropriate troublesome atmospheric weather conditions.

Projects

1- Ongoing projects:

• Construction of Khorramabad Combined Cycle Power Plant

Construction of Khorramabad Combined Cycle Power Plant with capacity of 484 MW consisting 2 gas units, each with a nominal capacity of 162 MW and one steam unit with a nominal capacity of 160 MW. The physical progress of the project is by far 35%.

• Construction of steam section of Chabahar combined cycle power plant

Due to an urgent need of the national electricity grid in Sistan and Baluchestan province and the priority of promoting the efficiency due to diesel consumption at this power plant, construction of a 160 MW steam unit and conversion of the two existing gas units to combined cycles has been defined as a national project. By completing this project, the total power of the plant will amount to 575 MW and its efficiency will improve by more than 45%. Currently, the physical progress of this project is 27%.

• Construction of CCHP units

Combined cooling, heat and power (CCHP) systems have the advantages of high efficiency, high reliability, and short construction time. In its medium-term plan for the period 2016-2019, Saba Group has planned the construction of 10 MW CCHP units. In the first phase of this project, construction of 3 MW is being conducted at the central building of the Mostazafan Foundation. Currently, the physical progress of this project is 46%.

• Renewable power plant construction

In pursuance ofFollowing the its major goals of theregarding investment activity in the construction of power plants and as well as given the need to preserve the natural fossil fuel resources of the country andto protect the environment, in its medium-term program (2016-2019), Saba Group has planned the construction of 50 MW of renewable energypower plant, including solar and wind in its medium-term program (2016-2019), either by forming as a joint venture and or by obtaining financeattraction of foreign investors.

At the moment, construction of two wind power plants on Khaf and Sarab sites, each with a capacity of 25 MW, has been put on the agenda. The wind test facilitiesmeasuring masts are installed on both sites to extract the meteorological data.

Also, the project for the construction of a photovoltaic power plant in Ghaleh Ganj city with a capacity of 4 MW (expandable) has been in progress. So far, the land has been purchased and all necessary licenses are being taken.

2. Future projects and collaborative opportunities

• Construction of 3 steam units in Khorramshahr Combined Cycle Power Plant

The project includes the construction of 3 steam units, each with a nominal capacity of 160 MW, and converting the 6 current gas units into combined cycle units. With the installation of the steam section of this power plant, the total power of the power plant will increase to 1452 MW and its efficiency will enhance by more than 45%, which will bring significant savings in the consumption of gas reserves in Iran. All of the necessary permissions are now available, including the environmental and network connectivity permissions.

• Construction of 3 steam units in Aliabad Golestan Combined Cycle Power Plant

The project includes construction of 3 steam units each with a nominal capacity of 160 MW, and converting the 6 current gas units into combined cycle units. With the installation of the steam section of this power plant, the total power of the power plant will increase to 1452 MW and its efficiency will increase by more than 45%.

• Construction of renewable power plants

In its medium-term program of 2016-2019, Saba Group has planned the construction of 50 MW of renewable energy, including solar and wind, either by forming a joint venture or by obtaining finance.as a joint venture and by attraction of foreign investors.

• Construction of CCHP units

In its medium-term program of 2016-2019, Saba Group has planned the construction of 10 MW CCHP units.

• Cooling inlet air of gas turbine units in Khorramshahr Power Plant

Due to increased temperatures and reduced air density in summer, the power capacity of gas power plants is sharply reduced while the consumption of electricity by domestic and industrial customers increases. In this regard, the technical and economic feasibility study for cooling the inlet air of the compressor units of Khorramshahr gas plant was conducted in order to increase power in warm seasons. As a result, the use of the media evapotranspiration was chosen as the best plan in technical and economic terms.

• Cooling inlet air of gas turbine units in Chabahar Power Plant

Chabahar Power Plant has a particular condition for the simultaneous installation of GE-F5 and V94.2 gas turbine units each with a capacity of 25 MW and 160 MW respectively as well as locating in an area with a long and sultry summer. Along with power decrease in hot days and also water crisis in the region, a technical and economic feasibility study for cooling down the intake air of V94.2 gas units by using an absorption chiller is being carried out. It is supposed that the chiller would run with dissipated exhaust heat of the GE-F5 units and water produced in a chiller cold water coil would be a by-product.

Water consumption control of Zargan Power Plant

Water crisis in Iran is very serious and in most areas the groundwater level has fallen sharply, while the water levels of the lakes and dams have also fallen dramatically. Therefore, saving water is crucial. One of the most consuming parts of Zargan Power Plant is its wet cooling tower, which extracts over 1000 cubic meters of water per hour from Karun River. At present, the water consumption reduction plan for the cooling tower of Zargan Power Plant is under development.

Plan for upgrading gas units

Power and efficiency of gas units have increased given the advancement of technology in the application of modern methods of manufacturing hot components, use of thermal resistant coatings, and geometrical optimization of blades. In this regard, negotiations are being conducted with domestic and foreign manufacturing companies in order to improve the power and efficiency of the existing gas units and the recommendations are under review.


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