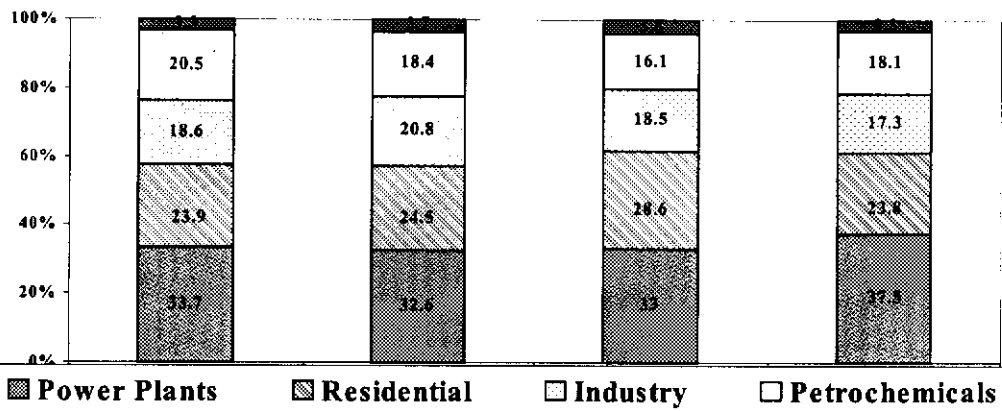
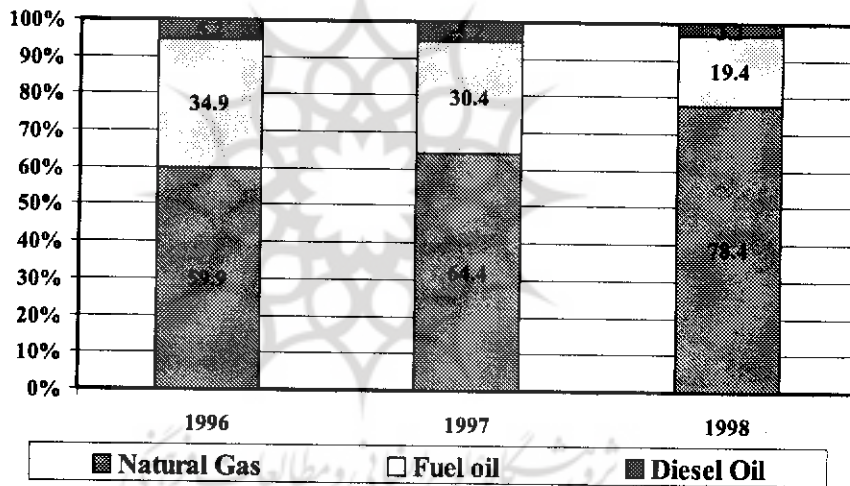


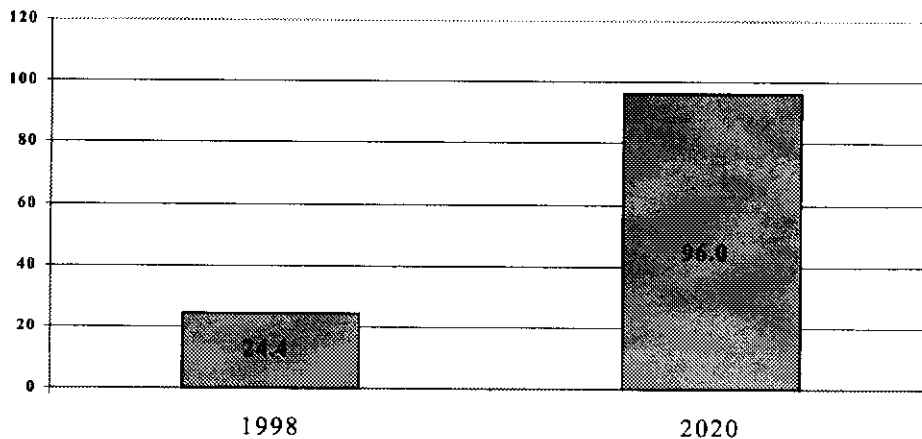
**Figure 2 : Natural Gas Consumption in the Different Iranian Economic Sectors**



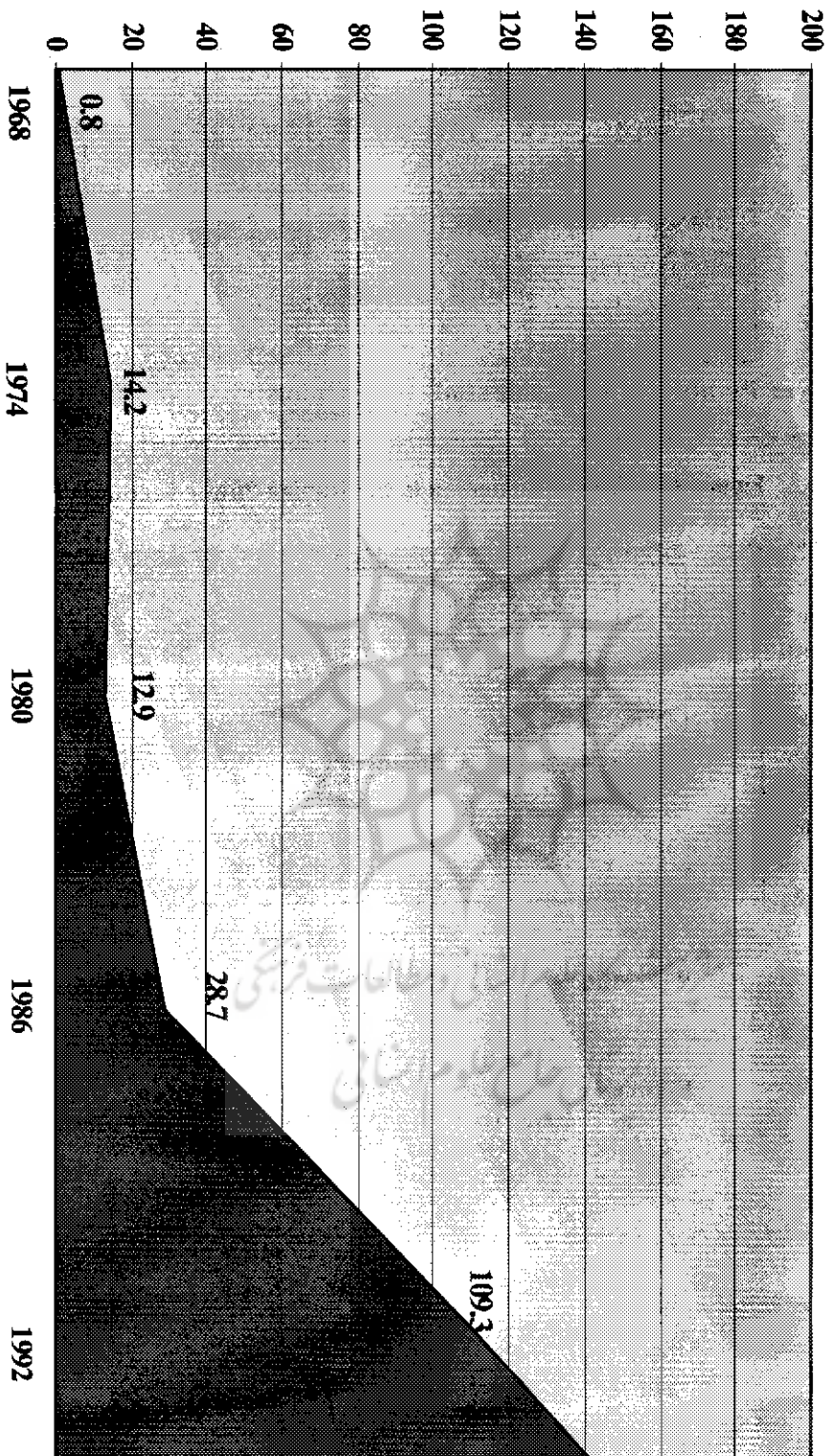
**Figure 3 : Fuel Consumption In the Iranian Power Sector**



**Figure 4 : Iran's Long Term Power Generation Capacity Demand ( 000 MW )**



**Figure 1: Natural Gas Demand in Iran (Mboe)**



quite time-consuming, and renewable energy being non-economic, and considering Western sensitivity towards Iranian access to nuclear energy, the Iranian energy policy makers' choice was "fossil fuelled thermal power". Accordingly, abundance of gas reserves, availability of gas transmission networks, favorable economics, and short lead time, pushed the planners towards natural gas fired power plants, keeping in mind that the emergency factor-caused by crippling powercuts-was central to such decision making process.

### Future Prospects

The future projections for Iranian electricity demand are quite high. Demand is expected to almost quadruple by 2020 (Figure 4).

Despite country's considerable hydropower potentials (between MW. 20,000 to 25,000), considering very limited expectations for expansion of renewable energy applications in an oil prone country like Iran, and finally, the foreseeable continued Western restrictions on Iranian access to nuclear energy, fossil fuels are expected to form the major primary energy source for power generation in Iran, while, due to the aforementioned factors (abundance, economics and environmental aspects) natural gas shall form the dominant majority.

The recent USD. 1 billion contract for purchase of gas turbines and the adjacent domestic manufacturing technology transfer contract, concluded between Iran and European companies, is an indication of Iran's long term intention to concentrate on natural gas, as the main fuel of future for power generation.

## Table 1: Natural Gas Prices in Iran

Sector	Cent/CM <sup>2</sup>
Power Plants	0.50
Residential	1.20
Industry	2.50
Commercial	2.50

USD.1= Rls. 3000

Source: "Energy Balance of the I.R. Iran-1998"

Energy Planning Office, Ministry of Energy

## Table 2: Power Generation Costs Per Fuel Type in Iran

Power Plant Type	Cent/KW.h	Socio-Environmental Externalities
Natural Gas (Combined Cycle)	2.00	+
Natural Gas (Gas turbine)	2.13	+
Natural Gas (Steam Gas turbine)	2.70	+
Coal	3.00	-
Fuel Oil	4.00	-
Gas Oil	6.25	-
Geothermal	2.90	+
Small Hydro	3.60	+
Wind	5.30	+
Nuclear	9.00	-
Solar	63.00	+

Source: Energy Planning Office,

Ministry of Energy, I.R. Iran

# Gas Utilization in the Iranian Power Sector

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6th. Annual Middle East Gas Summit  
Oct. 9-12, Doha, Qatar

## Iran: A Huge Potential Gas Supplier and Gas Market

Iran's proven natural gas reserves are put at 26 trillion cubic meters, or around 18% of the world total. However, share of Iran's gas production out of the total world is only 2.5%. Thus, Iran is yet to play its actual role in the world gas markets.

Meantime, regarding domestic markets, Iran has been quite active in substituting consumption of oil products with natural gas, mainly in residential, commercial and power plants consuming sectors. During the last two decades, and due to the following reasons, Iran's domestic gas consumption has been constantly growing (Fig 1):

- 1- Abundance of domestic gas resources
- 2- High economic compatibility (Tables 1&2)
- 3- Environmental concerns
- 4- Hard currency savings

While the first three factors seem to be clear, on the fourth item, it should be explained that each year, by substituting domestic oil products consumption with natural gas, Iran has

managed to release hundreds of million dollars of oil products for export and hard currency earning purposes.

## Natural Gas Consumption in the Iranian Power Sector

Power sector in Iran is the largest consumer of natural gas. In 1998, Power Sector consumed 38.5% of the country's total marketed gas production (Figure 2). Meantime, within the sector itself, gas has the highest share among the different fuels used for power generation (Figure 3).

The growing trend for gas consumption in the power generation worldwide is due to the following internationally known factors:

- Gas is cleaner environmentally
- Gas is abundant in supply
- Gas prices are competitive
- Economics for gas-fired power plants compare favorably with those for other fossil-fuelled plants
  - Gas-fired plants are smaller and more efficient, and have short lead times
  - Reliable gas transportation arrangements can be tailor-made to fit specific needs of power generators.

However, while taking all the above mentioned advantages into account, the

inter-related factor which actually triggered Iran's rapid concentration on gas for power generation, was rather a military-political cause: The Iran-Iraq war.

## How The Iranian Power Sector "Survived" on Natural Gas?

8 years of war between Iran and Iraq caused severe damages to the Iranian economy. Many industrial infrastructures were destroyed during the conflict, with the power plants being no exception. Such damages made the country face with crippling powercuts at the ending year of the war (up to 16 hours per day!) and put the crucial challenge of rebuilding heavily damaged power generation facilities in front of the economic decision makers, during the early years of post-war period.

As far as primary energy utilization was concerned, there were certain options available in front of the Iranian power industry planners, including:

- Hydro
- Thermal (Fossil)
- Nuclear
- Renewable

With hydropower projects being