Justification of construction of nuclear power plants in Iran

In this section by presentation of short review of the latest status of the energy in Iran vis-à-vis socio-economic development as well as the role of nuclear power in global energy supply, one could better notice the justification of nuclear power as one of the sources of electricity supply in the energy- mix policy.

Iran’s Energy Demand and Supply

In 2011 the total primary energy consumption (supply) had been around 1601.2 million barrels equivalent of crude oil which compared to the 2010 around 3.5% Comparing past 10 years (2001-2011), it shows an average annual growth rate around 4.6%. This comparison shows an increase in consumption trend during the recent years.

In 2011 fossil resources provide 99.3% of primary energy of the country. Despite efforts and activities made utilization of other energy resources are negligible share of primary energy production.

At the end of 2011the total yield reserves of crude oil and gas condensates of Iran have been estimated around 156.53billion of barrels which this amount has been allocated around 9% of the reserves of world crude oil. In 2011 in the crude oil and oil by-product section the total production had been an equivalent amount of 1595.7, imports around 33.8, export around 1029.5 and final consumption around an equivalent amount of 421.3 million barrel of crude oil which compared to the previous year and past 10 years show growth rates of

-9.8% and 0.7% respectively. Considering rising trend of consumption and import and almost constant rate production of energy careers in the recent years, one might expect that in the future, the Iran's situation as one of the major oil exporter will be jeopardized, unless mix-energy policy is effectively implemented.

After crude oil, natural gas is the second source of primary energy production in Iran. In 2011 more than 37% of total primary energy production was provided by natural gas. Iran’s natural gas reservoir is 33.2 trillion cubic meters which is around 16.2% of world natural gas reservoir. In 2011 the total production of natural gas had been an equivalent amount of 947.8 and final consumption had been an equivalent amount of 652.1 million barrel of crude oil. Comparing past 10 years, production and consumption of gas have had an average annual growth rate of 9% and 11% respectively. Considering government’s vast program for the expansion of the gas network to the cities and villages, injection of this product to oil repository in order to increase the coefficient of recovering oil wells, and covering the need for petrochemical industries, the possibility of using of this energy career as the only source or exclusive source for providing fuel for the development in the country's electricity programs, at least in the next few years, would surely decrease. Cutting off the gas needed for many of the industrial unites, transportation and even country power plants and the use of other sources and fuels and oil by-products to compensate the lack of gas in cold seasons of years, will add to the concerns.

In 2011 among of energy careers, after crude oil and oil by-product and natural gas, electricity with an 9.3% has been allocated the highest share in the final energy consumption. Nominal capacity of country power plants has been reached to 65217 MW which compared to the previous year shows an increase of around 6.1%. Each share of various kinds of power plants includes: steam (around 24.3%), gaseous and combinatorial cycle (around 60%), diesel (around 0.6%), hydroelectric (around 13.4%), Reproducible and nuclear energies (around 1.7%), also country power plant unspecific production had been 240063 million kilo watt which compared to the previous year shows the growth rate of 3.1%.Compared to the past year electricity export has significant change and has had the growth rate of 29.2 and the import of electricity has increased by 21.2% and has been limited to 3656.1 million kwh. Regarding the combination of consumption fuel in power plants, one could say that in 2011 around 38901 million cubic meter of natural gas (around 79% of total consumption of country energy section and more than 25% of total country consumption natural gas), 9406.3 million liter of gasoil (around 25.8% of total country gasoil consumption),12018.9 million liter of kiln petroleum (around 74% of total consumption of country fuel oil) with the total heat value of 445970 billion Kcal have been used.

In 2010, Iran's energy intensity-energy consumption per GDP dollar- was 619.50 ton equivalent oil (teo)/million$. It is indicating that Iran is one of the most energy intensive countries of the world with energy intensity index 10 times that of Japan and 8.4 times that of EU. In 2011 per-capta energy consumption for Iran reached to 14.22 barrel equivalent of crude oil that is more than previous year. It should be explained that annual growth rate and average annual growth rate of energy consumption during the past 10 years had been 6.7 and 5.25% respectively.

On the other hand fossil resources also are the main source of country’s foreign exchanges earning and their export is the main economical provider of country projects.

Above statistics and factual information shows that the Islamic Republic of Iran has a large and complex challenge in a field of energy due to its speedy development. Disproportionally of technical, economic, and social factors of energy primary source, requirements of sustainable development, and multiple role of fossil resources in the development of country (Source of the country consumption fuel, providing fuel for the power plants, providing starting materials for refineries and petrochemical industries, the main source of country foreign exchanges earning), are various aspects of the energy challenge.

Current Status of Global Development of Nuclear Power Plants

As thoroughly explained in Part-I dealing with general nuclear issue, in depth studies and investigations based on factual international data, show that the process of relative growth of electricity production from nuclear power plants in the world during the next 20 year will be inevitable. At present 435 nuclear power plants with capacity of about 372 Giga watts are at work. More than 56% of nuclear power plants with the capacity of 233 Giga watts are located in the developed countries. France with production by 75 percent electricity through nuclear power plant is at the top of countries of the world.

It is predicted that by the year 2030, the world’s capacity of nuclear power plants, in the worst scenario reach to about 450 Giga watts and in the most optimistic scenario reach to about 691 Giga watts. This amount of increase is more important because during this period European countries will circuit out about 10 percent of its nuclear power plants, reaching their life time.

At present 72 nuclear power plants with capacity of about 68 Giga watts are under construction in the world where about 66 percent is in developing countries and more than 30 percent in developed countries is located. Many countries due to various reasons, including the relative stability in the price of fuel and economic competition ability, sustainable development requirements, environment issues such as greenhouse, the lack of an alternative source for growing demand of energy, are seriously looking for benefiting from nuclear energy.

In addition to the above facts which have an impact on decision making, the followings are other reasons for Iran to pursue utilization of nuclear energy for electricity production:

Energy Impact on Development

Perspective document and country development program consider, high, rapid and stable economic growth. Quantitative investigation and estimation done by different qualified institutions, shows that in 2025 this growth follow request for about two times for energy and at least three times for electricity. Study on the process of energy demand growth based on different process for growth of domestic impure production shows that in the case of continuance the growth process of domestic impure production in 2006, demand for electricity will reach to about 123000 megawatts and if domestic impure production grow based on the proper process of national perspective document (8.6%), in this case the amount of electricity demand will reach to 274000 megawatts. On this demand need to use all the country's energy production resources combined with major improvement in efficiency.