

# Original Article: Importance of Effects of Energy Carrier Management Challenges on National Security in Iran (A Mini Review)

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## ABSTRACT

Energy carriers as one of the important inputs of production and also consumer goods of households play a very important role in determining production costs and household expenditures. Fluctuations in the price of each of these carriers will cause fluctuations in production costs, consumer spending, and ultimately inflation. This gap between the price of energy carriers at home and its world price has caused its consumption trend to grow rapidly over the last decade and increase the share of carrier costs in the total consumption basket. In this regard, one of the important issues in explaining energy carrier price correction policy is to study the effects and consequences of the implementation of this policy on macroeconomic variables to identify the cause-and-effect relationships between the mentioned variables, the mechanism of providing correctional or supportive and institutional policy to reduce potential negative consequences. This paper examines the challenges of managing the consumption of energy carriers in Iran.

## Introduction

In the current situation, Iran with a population of about 70 million people consumes energy equivalent to more than one billion people, which is the largest amount of energy loss related to the construction sector [1-3]. In other words, the cost of energy consumption in the country is twice as much as the total annual budget. On the other hand, while Iran is the thirteenth most energy-intensive country in the world,

and despite generating more than 80 billion \$ in crude oil sales in 2008, the country's total overt and covert energy subsidies over the course of a year are about 80 billion \$, according to the latest figures [4-6]. Experts estimate that more than 410 million barrels are equivalent to crude oil, or about 41 percent of the country's total energy consumption (equivalent to 16 billion \$), of which about 70 percent is natural gas and 20 percent is petroleum products [7-9]. The Institute for International Energy Studies, referring to the

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poor state of consumption of energy carriers in Iran, has stated: If the price of energy carriers in Iran is realized to improve the energy pattern, there is a potential to reduce energy consumption to about 47% of current consumption [10-12]. The domestic sector of this reduction can be achieved up to 30% [13-15]. Undoubtedly, the first-degree defendant in non-optimal consumption and out of the pattern of energy consumption in our country is unaccounted subsidies that have turned energy consumption in Iran into an economic disaster. Given that energy subsidies account for a large part of the country's annual income, as well as the way the country consumes energy, which is five times as much as the global average, the need to pay serious attention to this problem to create solutions to optimize energy consumption in the country is vital, it is impossible though [16-18]. In such circumstances, it is predicted that if the pattern of energy consumption in the domestic and commercial sectors is not reformed and the current trend continues, energy consumption in these sectors in 2023 will reach more than 1400 million barrels of crude oil equivalent [19-21]. A 20-year outlook will

damage Iran's position in crude oil exports, which will also affect the country's economy and the environment [22-24].

### *Challenges in the field of energy*

Reducing energy waste is one of the categories that is closely related to energy pricing policies, as the use of price tools as one of the methods of consumption management in the world is considered a common method [25-27]. The energy intensity index is the energy needed to produce a certain amount of goods and services [28-30]. Energy intensity is calculated in terms of initial energy supply or final energy consumption, and this index is usually used on a macro level and shows the degree of optimization of energy use in a country [31-33]. According to this energy balance, the energy intensity in Iran is five times as much as the global average [34-36]. This situation, of course, is a matter of concern and a serious warning for the government and parliament to try to change economic policies to improve energy intensity by enacting laws [37-39].

**Table 1.** Final energy consumption in different parts of the country

Section	6.69	Million barrels of crude oil
Home and business	15.33	411.850
Agriculture	9.3	36.320
Transportation	6.69	260.440
Industry	2.72	302.450
Thermal power plants	5.9	279.900

Iran's distance from other countries confirms that the first priority of the government and parliament to reform the consumption pattern should be done in the field of consumption and economic policies to optimize energy consumption change beyond the previous methods [40-43]. Also, liberalizing the price of energy carriers without having a support plan to reform the consumption structure will cause the competitive opportunities of domestic production to be lost in comparison

with foreign production. The following strategies should be prioritized:

- a) Gradual liberalization of prices and prevention of energy waste in production, distribution, and consumption;
- b) developing a new model of energy consumption among the income deciles of society;
- c) encouraging the productive sectors to increase energy efficiency rates;

- d) implementing an action plan to prevent the growth of energy consumption in the public and private sectors;
- e) national investment and support for the promotion of energy efficiency index and energy storage;
- f) adopting transparent rules and regulations with an incentive and punishment approach in energy consumption; and
- g) requiring the government and government agencies to provide official statistics and reports on the process of reducing energy consumption [44-46].

#### *The most important problems in the field of energy in Iran*

##### *Negligence in applying consumption standards*

One of the major challenges in optimizing energy consumption in the country is legal gaps. In this regard, even though standards have been developed by the Fuel Consumption optimization organization in the country, the application of these standards is neglected because these standards do not have the desired support and implementation guarantee [47-49]. The importance of this becomes clear when, according to the available statistics, considering the current 30 million young population of the country and considering the equal share of boys and girls in this population, about 15 million households will be added to the total households [50-52]. This account doubles the number of households in the country [53-55]. It is obvious that if the current trend of entering the current high-consumption devices enters the market, energy consumption will suddenly face a significant jump [56-58]. Therefore, if standards are not currently set and applied to a limited number of energy equipment manufacturers, in the future the need to save and use energy-efficient appliances for millions of households will have to be multiplied at a cost [59-61].

##### *Lack of planning and attention to regional potentials in providing energy to different parts of the country*

One of the key issues in providing energy to different consumers is having a plan to identify the most suitable carrier in each region, based on which the country's energy portfolio is determined. The more diverse this portfolio is, the greater the country's reliance on a particular energy carrier will be, the greater the security of energy, and the greater the possibility of conserving fossil energy resources, especially oil and gas [62-65]. Gas or injection of gas into oil reservoirs, which create high added value, is provided. The carrier should be selected for each part of the country and a suitable basket for the country's energy should be set up. It is very important to determine not only economic parameters, but also factors such as energy security, the impact of using that carrier in increasing exports and or creating added value with the help of oil and gas, the effect on social structures, environmental impacts [66-68]. Other factors must also be quantified and included in the development of this plan. Considering the total gas consumption of the country, the production of 2 phases of South Pars is 1.5 times as much as the consumption of the industrial sector, 3 times as much as the current export and 6 times as much as the consumption of petrochemicals, which has been considered as one of the challenges in the field of energy [69-71].

##### *Lack of management and planning of the energy unit in the country*

One of the most important issues in the field of responding to the needs of energy consumers is the lack of the management of the energy unit. In Iran, unsuccessful efforts have been made to create the management of the energy unit, the most important reasons for which can be:

- a) Entry of the Ministries of Oil and Energy into the fields of tenure, executive, and operational;
- b) lack of constructive understanding between the two Ministries of Oil and Energy, especially in the field of policy-making;

c) simplification of the category of energy unit management in the country by the officials; and

d) lack of transparency of the country's energy actors and the implementation of extra-organizational decisions [72].

#### *People and consumption management of energy carriers*

In reviewing the budget bill of 1989, the Islamic Consultative Assembly approved the revenue from targeted subsidies of 20,000 billion Tomans, and with this resolution, the process of implementing the bill was determined and the government's task for planning the implementation was determined. Thus, the people must prepare themselves for the implementation of this bill and its consequences.

Thus, although the prices of various energy carriers have not yet been determined, the gradual increase in these prices over a period of 5 years is definite; therefore, people must prepare for the new situation by planning to manage energy consumption. This calls for paying attention to the management strategies of different types of energy carriers and paying serious attention to the correct use of energy among families, a point that will reduce the potential problems of the people and will also help the success of the project [73-75].

At the household level, there are many cases that serious attention and planning to them can help manage consumption in the new situation, that is, after targeting subsidies [76-78]. The subsidy targeting plan is one of the key plans of Iran's economy, the legal history of which dates back to the early years after the imposed war, which was emphasized in several development programs but was not implemented until the government introduced the new bill. Help and support of the people, accuracy in the methods of implementation, and planning of the people for consumption management are among the key points in the implementation of the bill to target subsidies, which also helps the people to implement the plan. If so, they will be in a better position and

it will be important for the government to help in the implementation of this plan [79].

#### *Iran's economy and price reform of energy carriers*

In Iran's economy, due to the huge oil and gas resources and the relatively easy access to these resources, energy costs are low compared with other costs, and in this regard, there is not much sensitivity and incentive to save and use this gift wisely [82-84]. However, the price of energy carriers has always been lower than other goods and the price of energy carriers has not acted as a sign of economic activity. At the same time, a large part of the country's resources are allocated annually for direct and indirect subsidies for energy carriers, and the structure of consumption and utilization of this productive factor is formed in such a way that separation from this space leaves the government with a lot of economic, social and financial costs [80].

According to the statistics of the Ministry of Energy, the energy price index inside (liters-Rials) during the years 2001-2007 grew by an average of 9.2 percent per year, while the growth of the energy price index abroad (liters-Rials) during this period, annually was 37.6 percent; that is, the growth of energy carrier prices abroad during the period under review has been nearly four times as much as the growth of the energy price index in the country [35]. This difference between the energy price index at home and abroad has caused the total final energy consumption (billion liters) to grow by about 6.2% during the mentioned period. The gradual increase in the consumption of energy carriers is due to the relatively low price of these products and population growth. The government has been spending large sums of money annually on subsidies for energy carriers. In 2007, the number of subsidies for energy carriers reached about 88 billion \$, which is about 26.7% of the country's GDP. The growth of subsidies for energy carriers during the years 2001-2007 averaged 57.3% per annum (in dollars 35.6%), which is an important part of current government expenditures. With this

description, with the continuation of the current trend, this situation is not only not commensurate with the country's energy production capacities, but with the growth of energy carrier consumption in recent years, in the coming years, the main current government expenditures will be subsidized by these carriers. The process will not be possible in the future due to the government's revenue and financial resources.

#### *Key macroeconomic indicators*

With the implementation of the energy carrier pricing policy, many economic variables may be directly and indirectly affected, but some economic variables, due to their weight and importance among other variables, are more significant and emphasized, as the side effects of these variables. Other economic variables double their importance in the implementation of energy carrier pricing policy [36]. Based on past studies, it is natural for each economic market to be affected by energy carrier pricing, but within these markets, the key indicators that are considered in macro-policies are more strongly influenced and are the focus of policymakers. [37].

#### *Macroeconomic effects of price correction*

To know and be aware of the effects of energy carrier price reform on macroeconomic variables in the policy-making environment of the country, it is necessary to make a logical analysis in terms of quantity and quality. In fact, the existence of inflation means that the prices of most consumer goods and services in the economy are more or less constantly increasing. Studies show that the increase in the price of energy carriers has a positive effect on the general level of prices. This effect can be studied directly and indirectly, while it should be noted that the effect of rising energy carrier prices on the general level of prices depends on the range of change or correction of the price of these carriers. At the same time, among the macroeconomic key variables, energy carrier price correction shows that inflation is the core of the effectiveness of this

policy and other variables are affected by inflation. Correction of carrier prices, depending on the type of carriers in the final consumption or intermediary, can play a role in changing the general level of prices. In other words, the price correction of some energy carriers in the final consumption basket of households directly changes the Consumer Price Index (CPI), while some of these carriers are used as intermediate goods for their corporations. It affects the producer price index (PPI) and finally, the change in the PPI index can be effective in increasing the price of goods produced by firms.

Thus, the type of energy carrier on the one hand and its direct and indirect effects on the general level of prices, on the other hand, is an issue that is significant in this section. In addition, the change in the price of energy carriers, followed by an increase in the price of intermediate consumer goods and, finally, the general level of prices (inflation rate), in turn, leads to the formation of inflation expectations (PE) and exacerbates inflation. Of course, inflationary expectations of people in society are formed over a relatively long period of time. It is important to note that the experience of some countries has shown that inflation due to expectations has been significant and, in some cases, constitutes a major part of the increase in prices due to the implementation of this policy because expectations are part of the indirect effects. Much of this experience has been observed in developing or transition countries following economic liberalization, especially price liberalization, because the key element in recognizing rising prices as inflation is the continued growth of the commodity and services price index. The effect may be neutralized in a short time, but the psychological effect of rising prices will prevent this shock from being neutralized [16].

As mentioned, an increase in the price of energy carriers will lead to an increase in the consumer price index and the producer price index, but due to the formation of inflation expectations, its effect can intensify the inflation rate. Given that with the immediate

implementation of the policy of reforming the prices of energy carriers, people and economic actors will not expect price increases as in the year of implementation of the plan in subsequent years, price increases will not occur due to rising inflation expectations in the coming years [12].

### *Benefits of targeting energy subsidies*

Targeting energy carrier subsidies is one of the government's policies that can have the following benefits:

- a) Decreasing the share of high-income classes and increasing the share of low-income classes from subsidies;
- b) rationalizing the consumption of energy carriers and preventing the smuggling of this type of goods;
- c) reforming relative prices, increasing productivity and economic competitiveness;
- d) transparency of government budget and reduction of waste of resources;
- e) gradual replacement of social welfare schemes with subsidies;
- f) reforming the structure of income - the cost of enterprises producing subsidized goods;
- g) economization of energy supply projects from renewable sources;
- h) improving the technology of production of energy carriers; and
- i) helping to reduce government budget imbalances.

### **Conclusion**

Energy carriers as one of the important inputs of production and also consumer goods of households play a very important role in determining production costs and household expenditures. Price fluctuations in each of these carriers will cause fluctuations in production costs, consumer spending, and ultimately inflation. The extent of this fluctuation, depending on the importance and share of each carrier, can be examined in the

total basket or in the issues of production and consumption. In this regard, among the important issues in explaining the policy of energy carrier pricing, the effects and consequences of this implementation policy are based on macroeconomic variables to identify the cause-and-effect relationships between these variables, to determine the mechanism of corrective or supportive and institutional policies to reduce the potential negative consequences and put the economy on the path to increasing the efficiency of factors of production. Undoubtedly, the low prices of energy carriers (oil, gas, gasoline, diesel, electricity, water) in recent years have led to extravagance and wasteful growth and waste of national resources, and intensified environmental degradation. Although with the generalization of the culture of saving and teaching the correct ways of consumption, we can hope to reduce the costs of energy consumption in the country, let us not forget that due to the very high consumption of energy carriers in Iran, even in the most optimistic state (10 to 15%), the amount of people's savings will not be significant because currently the energy consumption in our country is much higher than the global average and these have very adverse and destructive effects on the country's economy. In such circumstances, the price of energy carriers is the best way to reform the consumption pattern and deal with waste and waste of national resources, and will promote productivity and competitiveness in the economy and expand economic and industrial infrastructure. One of the four main goals of the subsidy's targeting bill is the proper management of energy consumption and its resources in the country, due to the long experience that has been consolidated and put into practice over the years. In this bill, the government has proposed the rates of energy carriers, including gasoline, kerosene, gas oil, water, electricity, gas, etc., over a period of up to three years, at regional rates, and to compensate for the inflationary effects of the implementation of this bill, part of its subsidy should be reimbursed to the lower deciles of society on a priority basis. Obviously, inflation due to the implementation of carrier price

reform of energy resources can be adjusted over time and with government support measures, but inflation from the issuance of new and unsupported banknotes (due to the removal of targeted subsidies from the 88 budget) has a deeper impact and puts a lot of pressure on the lower deciles of society. Reducing the consumption of fossil fuels will protect the country's oil resources and future generations will have more reserves of this divine gift. On the other hand, equalizing the prices of gasoline and diesel with the countries of the region will play a significant role in preventing the smuggling of national wealth. In the case of water and electricity used in industry and agriculture, the Iranian Majlis can reform the water supply networks and improve irrigation methods and protect surface water reserves by enacting laws and taking into account the necessary funds. It can also help the country's underground and make the modernization of the electricity transmission network and the prevention of electricity loss on the route between the power plants to the place of consumption a priority for the ministry of energy. The nation's lawyers can also make the use of energy-saving light bulbs and smart valves in government institutions a legal obligation, and with careful planning and monitoring, the government should focus on increasing energy efficiency and improving productivity, and improving production technology in the automotive industry. In addition, the parliament can carefully allocate the current budget of governmental and non-governmental institutions and institutions, while preventing the irrational increase of the budget of some special institutions, and with the permission of the supreme leader of the revolution, closely monitor the correct use of resources and facilities. All that has been said will be possible only with the coordination and empathy of the officials in the three powers and the people, which can ultimately lead to the acceleration of the country's economic development process and the rapid and great movement towards progress and justice and achievement. The objectives of the document will be overshadowed. The existence of a comprehensive energy plan for the proper

management of the country's energy is essential because, without accurate and comprehensive information, decisions will be a matter of taste and trial and error, and not only impose high costs on the country as a whole, but also misses opportunities process. In the comprehensive energy plan of the country, the real share of each of the energy sectors and the diversity of energy carriers and the potentials of each, as well as the best options according to the climate of different regions of the country, should be determined. Fortunately, some general information such as the amount, distribution, and type of oil and gas available and electricity generated in different parts of the country needed to develop this plan is available.

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