The effectiveness of gas rationing in reducing fuel consumption and air pollution

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Abstract — Gas rationing as an economic policy have been numerous ecological and social consequences that are needed to evaluate the frequency. In the absence of a sharp increase in environmental pollution and even decreased with the increasing entry of vehicles in large cities, as a result of the implementation of this policy is to assess. Before rationing gasoline consumption than other petroleum products has increased so that nearly doubled the per capita energy consumption has increased more or less constant rate.

Keywords — rationing, petrol, fuel, pollution

I. INTRODUCTION

Fuel management, given the importance of the transport sector as one of the major sectors of energy use in energy management is particularly important in this regard gas as the dominant fuel production vehicles, increasing the production of vehicle the world is a strategic commodity.

Providing gasoline consumption in Iran has always been one of the major issues. In recent years, several scenarios on how pricing and fuel distribution system that can be used in the country has been gradually increasing its price subsidy removal fuel, and the release of its price and gasoline rationing Cited.

Gasoline and fuel rationing scheme using smart cards in different institutions within countries were presented, so that during the negotiations on the 1383 budget legislation in Parliament in 1382 last days of the approval of the Sixth

Parliament passed first text proposed offices discussed in open session control and supply of gasoline consumption by fuel smart cards proposed and adopted in the context of budget was in 1383(1).

Gasoline rationing decisions with respect Islamic Consultative Assembly Government and infrastructure to prepare the country specific conditions (such as cards Fuel for the gas stations owners of vehicles Card riders and to increase the device status. This gas hr) twenty-four fifth day of July, 1386, came into force.

According to published statistics, per capita consumption of 310 liters of gasoline equivalent per year, the equivalent of Iran in 1382 8/0 liters a day in 1385 to 386 this figure is equivalent to 06 liters / L at day 1 has been the amount growth on 5/24% on a three-year period (2).

According to 1385 statistics, the average daily consumption of 74 million liters of petrol in the refinery gasoline production capacity of the country, about 40 per cent of the imports of spending huge foreign exchange is provided. Due to the low level of energy price on in our country, the enormous sums spent each year on subsidies to energy, especially fuel. In 1385 the amount of subsidy for petrol, which had $ 15 billion of its $ 6 billion and $ 9 billion it cost subsidy for gasoline imports for domestic consumption of 74 million liters per day (2).

In these conditions, according to the energy balance of the tenth docile income share of the subsidy on petrol 7/32% and the share of the first docile 3/1% and the 50% of the total amount of the subsidy on petrol, the opposition has the ninth and tenth deciles the top docile income share are much greater than the fuel subsidy. Looking at the trend of energy consumption and energy efficiency measures such as energy intensity and energy consumption per capita can be concluded that the policy is not expected energy savings in the success (3).

In addition to these issues, issues such as smuggling of gasoline, traffic, pollution, caused gasoline rationing plan aims to eliminate or reduce the problem of distribution and consumption of gasoline will be applied. Implementing a plan to the extent and effects of the strong reflections can leave behind, now that two years have passed since the
implementation of this question is to what extent have the objectives for which the project is expected to meet? Whether the project could still be the answer to the question of petrol?

Today, in addition to issues of social impact assessment and key indicators such as access to basic components of the Project acceptance that people are dealing great deal of attention.

Thus, gasoline rationing plan is directly related to the degree of social acceptance of people associated with the project and its important role in the success of the project.

"Now the question that arises is what the level of social acceptance rationing plan is? And what factors affect it?

In the current situation rationing plan, the framework for determining the amount of gasoline vehicle owners, but the contribution of human and social factors influencing consumer behavior has not diminished since gasoline is a strategic commodity of all economic strata political, social, and ... They are affected by of any change in price or distribution method, it will affect all levels of society.

Development of new approaches such as the theory of sustainable development, stability and efficiency of the role of people in development projects is emphasized. The economic process in a vacuum does not always fit in a social context and shape the direction and outcome affects them (4).

Scheme is determined by factors that also recognized the influence and contribution of each factor is determined. Energy consumption in many studies has been conducted with the technical and economic approach, but it has not been enough attention to the social effects.

In the case of gasoline rationing plan analysis and survey results are not scientific research and more economical approach to this issue has been dealt with. Although the concept of social acceptance of foreign research attention, but mostly relies on the concept of technology acceptance and less social aspects are considered.

Due to the broadness of a subject such as gasoline rationing plan, three poles should be involved in this one. Two political poles. Economic hub 3. Pole social - cultural. So that the poles represent the political and military power rationing plan and make decisions and measures to implement it. Motivating factor in the economic hub due to the rationing plan is so how essential fuels, particularly gasoline as a commodity economy in recent years involves country.

The cultural hub of social - as admitting that the events that occur in the context of any behavior or act that is done in this context will be directly related to the fate of the gasoline rationing plan.

The approach that "the social construction of technology" (SCOT) is called gasoline rationing plan to change the behavior of the passive behavioral intervention, social acceptance gasoline rationing plan and how to understand people's behavior in the case of this project, it will be successful, based on the findings of this study the rate of 7/49 of 100 with SD 43/15 respectively. So that it can be stated that social acceptance gasoline rationing plan, the people in Tehran, is far below average. Gas rationing as an economic policy have been numerous ecological and social consequences that are needed to evaluate the frequency.

In the absence of a sharp increase in environmental pollution and even decreased with the increasing entry cars to big cities as a result of the implementation of these policies is evaluated. In this regard, it was clear that the reduction of air pollution in Tehran and Iran to the extent of 35-25% due to the reduction of fuel consumption has been growing. Improve traffic and traffic saving of $ 800 billion in environmental damages of air pollution in the country, 3,350 billion dollars in subsidies for energy saving and increasing government financial support for public transport and reducing dependence on imported petroleum to the national economy is. Introduction of petrol rationing started in 1384 and entered into force in 1386.

During the 10 years before rationing gasoline consumption has increased relative to other petroleum products, which is almost twice.

See the necessity of rationing of energy intensity and fuel subsidies:

Daily gasoline consumption per car in about 11 liters of petrol rationing in the day. Terms of the environmental big cities put at risk. While fuel consumption of 1.9 liters per day France and Germany in less than 3 liters per day. Recent developments in America as well as making use of 2.3 liters per hundred kilometers by car are possible. The subsidies are a heavy burden on the economy, leading to energy dissipation is also no incentive for efficient use of it does not. Because energy waste and increasing its negative effects on the environment are not only polluting but he does not lose the subsidy awarded.

Fuel subsidy effect on traffic:

Intercity traffic fell after gas rationing as well as inter-urban traffic flow has decreased somewhat over time and not the solutions The alternative is to travel to the starting point for shipping demand son, then and will growth will continue This fact should not be ignored when waiting for the traffic problem urgently implement such policies without creating the infrastructure of public transportation is virtually impossible It should also be noted that the project was well received in its first month of bus metro 20-10% has been increased. Fuel consumption and emissions of air pollutants with currently available technology and vehicle type, fuel consumption, emission of 430 grams per liter of local pollutants (CO, HC,
PM 10, SO\(_x\), NO\(_x\)) leads. According to the daily consumption of 11 liters per day (average) per kg 5 daily vehicle emissions to be released. Fuel consumption and emission reduction measures (expanding public transportation, technical, vehicle upgrades and development of natural gas vehicles) - Rising gasoline prices and gasoline rationing plan ahead to improve the situation are.

Implementation of mitigation measures to reduce consumption and energy price scenarios run until the year 1400:

CO of 30%, NO\(_x\) equal to 43%, PM10 reduced to 6% reduction in low-sulfur diesel production depends SO\(_x\) (ppm 50) from the Ministry of Petroleum According to studies cited by doing a reducing (improving fuel inspection, vehicles, expanding public transportation, mandatory new standards, etc.) emissions and reduced fuel consumption, but if confined to initiatives and do price reform, the rate in 1400 is still the year 1380 (base year) will be higher. Overall, the combination of measures and price adjustment could reduce consumption and pollution emission levels well under control in 1380. The statistical estimates of the price elasticity of various forms of energy (DOE) show that gasoline demand with respect to small changes in prices in the short run elasticity is not so with little change, the demand will not decrease.

Ways to reduce demand in the short term include:
1) a sharp increase in short-term price
2) quota.

Due to the lack of practical policy perspective inflationary impact of price changes in the short term, the quota (only short term) is justified. Air pollution data from monitoring stations in 1386 compared to 1385 has been marked changes due to the reduction of pollutant concentrations due to gasoline rationing plan. According to the generalized emissions based on fuel consumption (JICA) and the statistics reduce fuel consumption, emissions can be estimated. Reduce emissions of carbon monoxide and unburned hydrocarbons as one of the most important sources of environmental air pollutants can implement this plan.

Environmental and economic impacts of the quota in a month after rationing in the country:

Anticipated impact on reducing gas rationing (or increase) decrease in gasoline emissions originating in Tehran:

<table>
<thead>
<tr>
<th>Contaminants</th>
<th>Anticipated reduction of pollutants released in Tehran% a year</th>
<th>Anticipated emission reduction per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfur dioxide</td>
<td>3</td>
<td>2135</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>10</td>
<td>19217</td>
</tr>
<tr>
<td>Carbon monoxide</td>
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<td>498225</td>
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<tr>
<td>Hydrocarbons</td>
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<tr>
<td>Particulate</td>
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<td>1851</td>
</tr>
<tr>
<td>Sum</td>
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<td>6111091</td>
</tr>
</tbody>
</table>

II. CONCLUSIONS

With regard to environmental issues and also save on subsidies, these projects total 4150 million dollars a year will have environmental benefits energy that underlie the
evolution of transportation, distribution, as well as subsidies for energy to reduce the emission of air pollution was. Due to the short-term effectiveness of the quota policy, it is necessary to choose alternatives such as rail and public transport in the urban and suburban area of interest for further investment.

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