

Policy Paper No. 3

## Review of Article 12

### Energy Efficiency Program in the Islamic Republic of Iran

*Science & Energy Technology – Tarasht Cco. (SE<sup>3</sup>T)*

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## About IREEMA

Iran belongs to the top ten greenhouse gases emitting countries in the world and the Iranian economy is the most energy intensive of all oil and gas producing nations. Domestic energy tariffs are set by administrative decree far below export market prices. Over the last decade, the energy productivity in Iran declined further. Iranian policy makers are aware of the need to the increase energy efficiency (EE) of the economy.

With the adoption of the Article 12 of the “Law on elimination of barriers to competitiveness and improving the country’s financial system” the legal basis was created for specific economic incentives for energy efficiency investments. Because the implementation mechanism is still to be developed no such investment projects have yet been implemented.

The IREEMA project shall support Iran’s Vice-Presidency for Science and Technology to implement an integrated energy efficiency market in practice.

The project therefore aims at developing together with the responsible Iranian stakeholders an efficient implementation mechanism and to lower transaction costs for potential investors. In addition, the project aims at testing this approach in practice by developing the huge energy efficiency potential in the country in two main areas: the gas sector with special focus on the South Pars Special Economic Energy Zone (PSEEZ) in Assaluyeh and the sustainable energy supply in selected rural pilot areas. In case of necessity, adjustments of the implementation mechanism will be suggested accordingly to ensure proper functioning. The implementation mechanism shall become the corner stone of the integrated market for energy efficiency in Iran. Such a functioning mechanism could foster the implementation of Iran’s INDC and even raise the ambitions of policy makers.

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## Executive Summary

Historical review of energy efficiency programs in the IR Iran in policy paper 1 showed that article 12 is the latest legal formulation of policies on energy efficiency. Therefore, a review of article 12 has been the focus of policy paper 2 which is presented here.

Assessment of article 12 indicates that there has been inherent contradiction in article 12. Although article 12 has been based on the concept of competitive production and improvement of efficiency, allocation of resources to energy efficiency program has been contained to administrative management of energy sector. Introduction of market mechanism, allocation of resources based on performance of energy efficiency projects and promotion of private sector have not given sufficient consideration. Implementation of article 12 has had weak linkage to laws on targeted subsidy reform act and improvement of energy consumption pattern. Little attention has been paid to competitive and efficient allocation of resources. Subjective evaluation of outcome of projects have substituted performance assessment of projects in many cases. Hence, amendment to article 12 was introduced when bylaw of article 12 was approved in July 2015 (1394). Article 3 of the bylaw put emphasis on trade or export of saved energy. This amendment provided a platform for establishment of a competitive and transparent environment for implementation of energy efficiency programs.

Analysis of article 12 and challenges related to its implementation provides a basis for formulation of the concept of Market for Energy Efficiency and Environment (M3E). Hence, the present policy paper discusses the linkage of article 12 to the approved laws on energy efficiency and development of M3E.

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## List of Abbreviations

MoP	Ministry of Petroleum
VPST	Vice Presidency for Science & Technology
MoE	Ministry of Power (also known as Ministry of Energy)
MoA	Ministry of Agriculture
CEEE	Committee for Energy Efficiency & Environment
IFCO	Iranian Fuel Conservation Company
SATBA	Renewable Energy and Energy Efficiency Organization
PBO	Plan and Budget Organization
NIOC	National Iranian Oil Company
FY	Fiscal year
MTOE	Million Tons of Oil Equivalent
IECP	Law for “Improvement of Energy Consumption Pattern”
TSRA	Law for “Targeted Subsidy Reform Act”

## Preface

Energy Efficiency (EE) has been targeted through different policies in the Islamic Republic of Iran. However, their implementation is involved with challenges such as high energy subsidies. One of the latest approved regulatory mechanisms on energy efficiency is Article 12 under the law on “Elimination of Competitive Production Barriers and Improvement of Financial System” which was approved and ratified in 2015. Development and implementation of energy efficiency programs could, therefore, be reviewed on the basis of article 12.

Article 12 is the last item in the process of formulation and implementation of policies on energy efficiency in the Islamic Republic of Iran that has started since 1992. A review of article 12 can be fully addressed if it is considered as the last chain of efforts and activities on energy efficiency. Hence, it is intended to have a short overview of development of article 12 in order to have a better understanding of potentials and shortcomings of article 12 for implementing energy efficiency programs.

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## 1 Article 12 and the bylaw

The law on Elimination of Competitive Production Barriers and Improvement of Financial System was approved and ratified on April 21<sup>st</sup>, 2015, by the Islamic Consultative Assembly (Iranian Parliament).

### 1.1 Article 2 and procedure for its Implementation

According to Article 12, all ministries, specially MoP and MoE, and their subsidiaries and affiliated companies as well as other governmental bodies and institutions are allowed to sign contracts on energy efficiency by up to one hundred billion US Dollars (USD) along with five hundred thousand billion IRR every year, which will be adjusted to rate of inflation of the prior year annually. The supported investment or actions by individual or legal bodies, domestic or foreign companies, with priority of the private sectors or cooperatives should result in higher quantitative or qualitative production, savings or reduction in production costs, improvement of environment quality, or reduction in loss of life and property. The government is authorized to purchase the produced or saved commodities or services and the benefits or values in order to pay back the investment as well as other incurred expenses or related benefits. The purchase agreement will be determined case by case. Contracts must include the following subjects [1]:

- oil and gas projects including increase in production capacity;
- energy efficiency projects in different sectors including industrial sector with the energy intensive industries, urban and suburban public and rail transportation as well as buildings on the top priority;
- projects in power sector including new power plant construction with higher efficiency, increasing thermal efficiency with steam unit installation in combined cycle power stations as the top priority, utilizing combined heat and power (CHP) as well as combined cooling, heat and power (CCHP) and distributed generation in small scales (DG), developing renewable power plants, reducing energy loss in conversion, transmission and distribution, electrifying agricultural water pumps especially through renewable resources of energy including solar, switching from gas or petroleum products to electricity where it is technically and economically feasible, increasing portion of electricity export and over boundary transit, power generation through heat recovery at industrial plants;
- water related projects and waste water treatment;
- and also other projects which may lead to quality or quantity improvement in production of commodities and services, or savings as well as loss prevention in using resources, including human and financial resource, environment and time.

The bylaw describing the rules and directives governing the implementation of Article 12 is imparted on July 12<sup>th</sup>, 2015, by the first vice-president. The following scheme illustrates an overview of article 12 and its bylaw as procedure for implementation of projects emphasized in the Article 12 [2].

Scheme 1: Any project could be proposed by private sector or government organizations. The proposal should be submitted to respective government organization, which is responsible for the sector the project belongs to. Government organizations shall review the proposal.

Scheme 2: Final version of proposal would then be submitted to National Supreme Economic Council for approval and allocation of resources.

Scheme 3: As soon as the allocation of appropriate resources is approved the responsible state organization would conclude a contract with contractor for implementing the project. Contract would be implemented under supervision and monitoring of an appropriate affiliated state institution or company.

Scheme 4: Upon commencement of the operation of a project, a procedure of measurement, monitoring and verification should be formulated and implemented. Such a procedure for projects that improve the infrastructure (such as railway system) assumes that the byproduct of these projects would lead to improvement of energy productivity. The amount of saved energy has, therefore, been based on rough estimation and subjective judgement.

Scheme 5: Saved energy and other goods and services would then provide foundation for repayment to the contractor. The repayment for saved energy or projects related to oil & gas shall be the responsibility of National Iranian Oil Company (NIOC).

Figure 1 depicts the flow diagram of the process of above mentioned schemes.

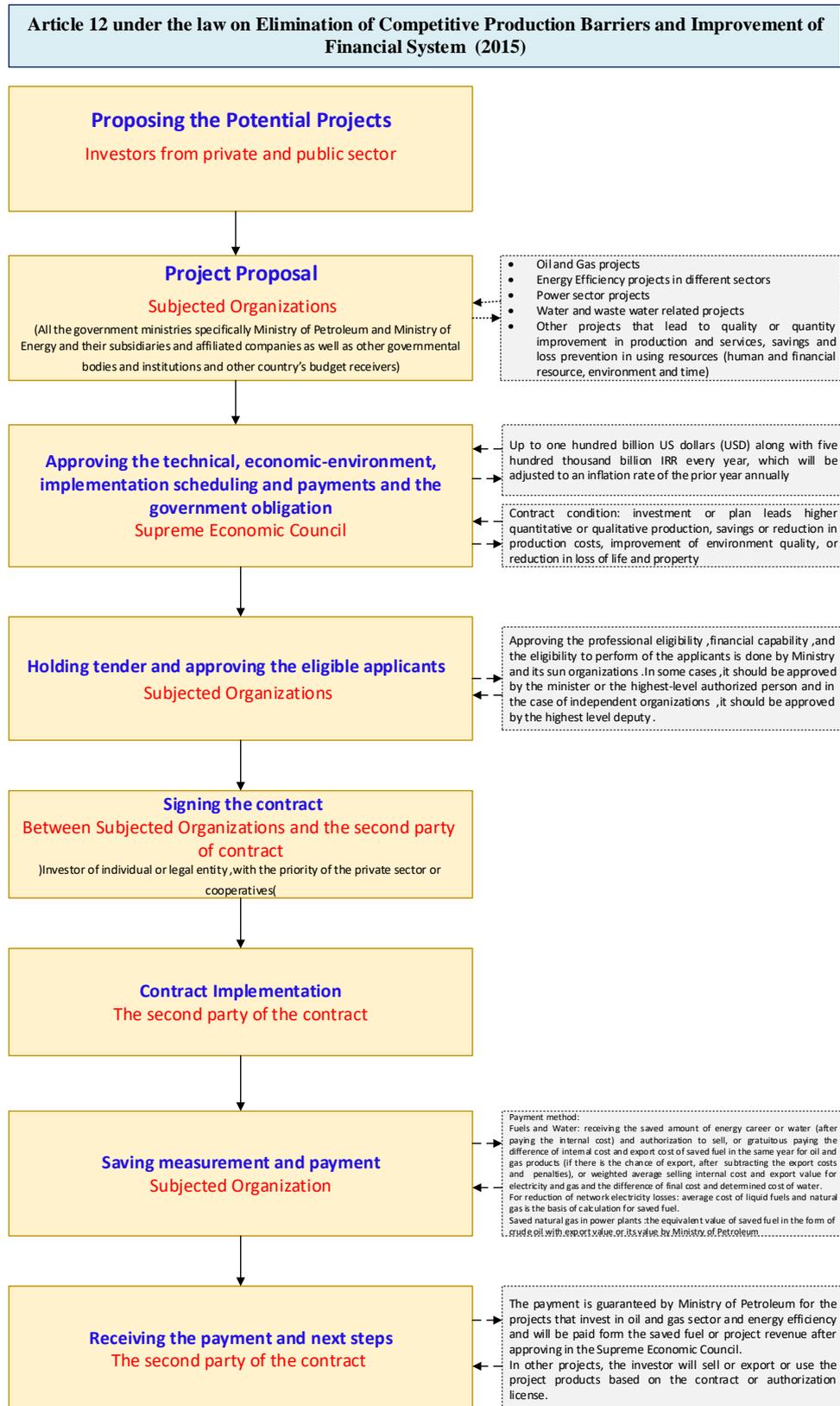


Fig. 1: Flow diagram of process for implementing approved schemes

## 1.2 Overview of programs approved under Article 12

Some projects have been approved by the Supreme Economic Council under Article 12. A short description of those programs targeted on energy efficiency, which are the focus of the present paper, is provided in the following section.

### **Performance upgrading of central heating systems in residential, public and commercial buildings**

This program is about the energy efficiency improvement of in-use central heating systems in 600,000 sets of buildings including 500,000 residential and 100,000 public and commercial sets using different methods. In order to implement the envisaged program, contracts have been signed as energy efficiency projects for upgrading 15,000 central heating systems with an investment value of 56 million Dollars.

### **Replacement of 65000 old and inefficient trucks**

There are 120 to 130 thousands vehicles in cargo truck fleet with an average life of over 25 years which result in excessive fuel consumption and air pollution. The program aims at replacing the domestic aging truck fleet (heavier than 10 tons and over 35 years old) with 65,000 new efficient ones. Implementation of this program would lead to decrease in fuel consumption and also reduction in emission of air pollutants and GHG emissions. New trucks will be financed via leasing, with 60-80% of the costs covered by government. The replacement of old trucks is presumed to result in energy efficiency. Return on the saved fuel is assumed to pay back the leasing of new truck over first five years of its operation. 2200 trucks have already been replaced and contracts were also signed for the replacement of additional 7700 trucks with the total investment value of 462 million Dollars. The number of replaced trucks is rather small compared to the plan which has been 65000 old trucks (i.e. 15%). Limited production capacity of new trucks, difficulty of raising the required capital and its financial burden on the state budget have been main factors that has slowed down the process of replacing the old trucks.

### **Renewal of city bus fleets**

The program aims at phasing out 17,000 old diesel-fueled buses (elder than 10 years) from city fleets to introduce the eco-friendly CNG-fueled vehicles over a span of five years. The provision of new CNG buses has been predicted to be accomplished in 4 years. Payments for fuel switching have been based on monthly trip of new buses in the fleet. To implement the program, contracts have been signed for the replacement of 1044 old city buses. This number of buses is 6% of the planned number of buses in 4 years. It indicates that the goal shall hardly be realized. Insufficient replacement of old buses is limited by production capacity of manufacturing buses, shortage of capital and constraints on the state budget.

### **Renewal of taxi fleets**

The program is aimed to replace 140000 old taxis (and vans) with fuel-efficient ones (gas-fueled/ electric/hybrids) in order to reduce local gasoline consumption which would lead to reduction in emission of pollutants and GHG. Share of gasoline in energy mix of transportation sector shall also be reduced and the energy efficiency of taxi fleet shall be improved. The provision of new taxies has been predicted to be accomplished in 3 years (2014-2016). Saving in fuel consumption through replacing every single taxi would enable the payback of investment in its first five years of operation. Similarly, saved fuel for every single taxi van would enable the repayment to the investor(s) in its seven years of

operation. In order to implement this program, contracts have been signed for the replacement of 2700 taxis and 8000 vans (about 7.6% of planned number in 3 years). Corrections were introduced to this program by the Supreme Economic Council. It is stated that the feasibility should be reviewed and its implementation ought to be delayed until a new reimbursement period is proposed. Shortage of capital and limited capacity for manufacturing and importing new taxis have forced the reformulation of the program.

#### **Promoting intercity rail transport system**

The goal of the program has been to renovate and expand the rail transportation fleet (freight and passenger) which shall lead to reduction in fuel consumption and emission of related pollutants and GHGs in the transportation sector. It has been assumed that private investors shall be active in supplying wagons up to the required number of wagons. But the planned number over a specific period has not been specified.

Implementing this program may increase the amount of freight railway transport (excluding international transit) from 21.7 to 75.8 billion ton-kilometers and the passenger transport from 17.4 to 34.2 billion passenger-kilometers in the period of 2013- 2024. In order to implement this program, contracts have been signed for supplying 375 freight wagons with an investment value of 879 billion IRR. It is assumed that fuel consumption shall be reduced with the expansion and renovation of rail system and it will pay back the investment. It has been a subjective assumption and it is hardly compatible with a factual feasibility analysis.

#### **Development of urban rail transport system in Tehran and 8 other mega cities**

The aim of this program has been to expand urban rail transport system in Tehran and 8 other megacities by adding new wagons to the current system in order to increase the quality of transportation in megacities. Implementation of this program should lead to decrease in fossil fuel consumption and reduction in emission of related pollutants and GHGs. In order to implement this program, a memorandum of understanding (MoU) has signed between IFCO and Tehran municipality. The signed MoU provides a framework for cooperation between IFCO and Tehran municipality and the extent of payment and the method and means of payback has been assumed to be defined later.

#### **Replacing old cars with new energy efficient engine based cars**

The goal of this program is to replace 500,000 old cars with new ones that would meet specific standards of fuel efficient engines in order to reduce fuel consumption and emission of related pollutants. It is aimed at manufacturing 3-cylinder cars and replacing the old existing Sedans throughout the country with new efficient ones. No contract has been signed for implementation of this program yet. It is not clear whether sufficient capacity and capital would be available for replacement of 500,000 old cars. The method and framework of investment and payback for the invested amount has been left to be defined.

#### **Electrifying agricultural water pumping systems**

The goal of this program is to transform 130,000 diesel fueled agricultural well pumps into the electric well pumps by using different methods including utilization of gas to power generators, connection to the grid, or utilizing renewable energy resources (wind and solar). It is hoped that this program will help to control water and energy consumption by a smart metering, improve energy efficiency, and it may lead to reduction in emission of pollutants. In order to implement the program, contracts were

signed for 100 wells as a pilot project. Although this number is very small, the investor has been assumed to be private sector. Framework for repayment of the investment is also limited by the availability of capital. Limited capital and insufficient potential of private sector are main barriers to rapid expansion of this program.

**Dismantling and replacement of one millions of ordinary heaters with higher efficiency gas powered heaters (smart hermetic heaters)**

The goal of this plan is dismantling and replacing one million ordinary heaters (gas/LPG) with higher efficiency gas powered heaters (smart hermetic heaters) in order to decrease energy consumption in residential buildings, schools, universities, governmental bodies, military organizations and private sector. Schools in cold regions of the country have been given the first priority. But no contract has been signed yet. Only 3 recalls have been announced. This limited measure indicates that implementation of the envisaged program is involved with considerable challenges.

The above mentioned programs that have been formulated by MoP and MoE are summarized in table 1.

Table 1: Progress Report of different programs initiated according to Article 12

No	Program title	Proposal approval	Sample contract making	Developing M&V method	Accessibility to online platform (BehSama)	Program implementation
1	Performance upgrading of central heating systems in residential, public and commercial buildings	Done	Done	Done	Done	Contracts have signed with 11 investors with the value of 56 million Dollars to upgrade the performance of around 15,000 heating systems.
2	Replacement of 65000 old and inefficient trucks	Done	Done	In progress	In progress	Contracts have been signed with 4 investors to replace 7,700 trucks with a value of 462 million Dollars. 2,222 trucks are already replaced and 4.2 million Dollars has been paid to the investors.
3	Renewal of city bus fleets	Done	Done	Done	In progress	Contracts have been signed with 2 investors to replace 1044 buses. Also, contract signing is in progress for replacing other 2,700 buses.
4	Renewal of taxi fleets	Done	Done	In progress	In progress	Contracts have been signed with 5 investors to replace 8,700 taxis.
5	Promoting intercity rail transport system	Done	Done	Done	In progress	A contract has been signed with Railway Transportation Company to add 200 wagons to the railway system with the value of 428.7 billion IRR. Another contract has signed with an investor company to add 175 wagons (for freight) to the railway system with the value of 450.412 billion IRR.

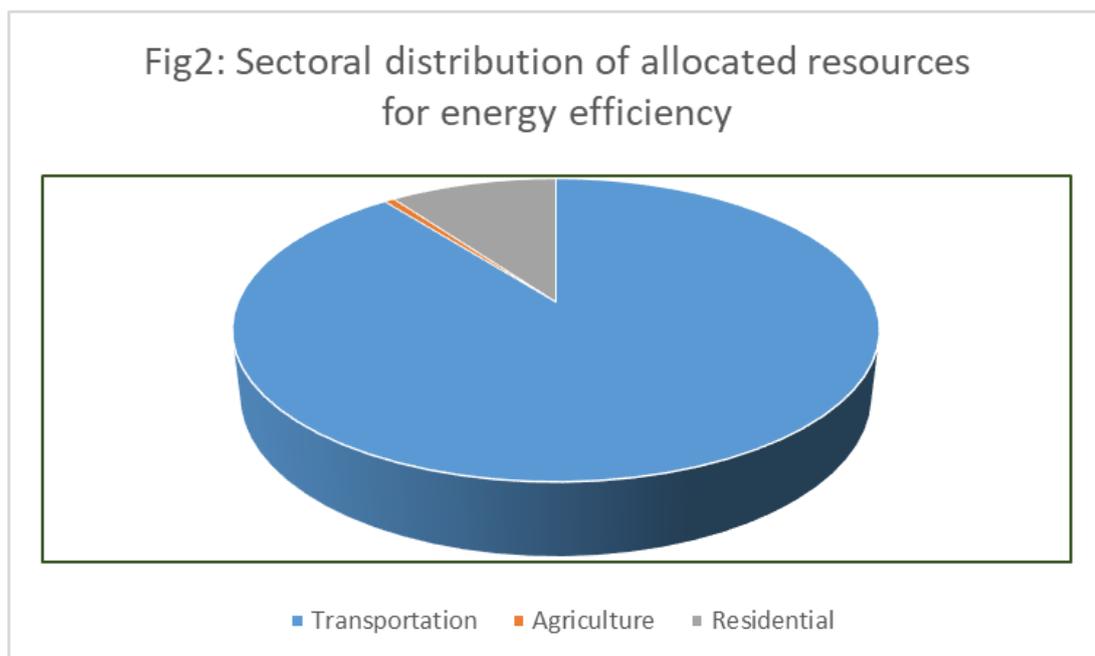
No	Program title	Proposal approval	Sample contract making	Developing M&V method	Accessibility to online platform (BehSama)	Program implementation
6	Development of urban rail transport system in Tehran and 8 other mega cities	Done	In progress	In progress	In progress	There is a Memorandum of Understanding between IFCO and Tehran Municipality to add 1000 new wagons to the subway system. Contract signing is in progress to add 20, 25, and 40 new wagons to the subway systems in Isfahan, Qom and Tabriz, respectively.
7	Replacing engines of old cars with new low fuel consuming engines	Done	Done	In progress	In progress	Contract signing with an investing company is in progress for replacing 100,000 car engines.
8	Electrifying agricultural water pumping systems	Done	In progress	Done	In progress	A contract has been signed to electrify 100 wells. There is also a Memorandum of Understanding between IFCO, Jihad Nasr Institute, and Jihad Nasr investing company for electrifying 50,000 wells. Evaluating proposals from other investors is also in progress.
9	Junking and replacement of one million common heaters with higher efficiency gas powered heaters (smart hermetic heaters)	Done	In progress	In progress	In progress	A contract has been signed with a local manufacturer for replacement of 200,000 heaters in public schools. The investor has a production line and by installing any heater it will get back the total capital for the heater. So, the contract is kind of a guarantee of purchase agreement. In other words, the state supports and subsidizes technology development.

## 2 Assessment of Implementation of Article 12

Article 12 was ratified in 2015 and it was planned that each year a credit of 100 billion US\$ should be allocated for further development of energy sector and improvement of energy efficiency. Such statement in article 12 means that the allocation of resources would not be equivalent to donation. It is assumed that the implementation of article 12 would lead to saving in energy consumption. The return on Saved energy consumption would then enable repayment for the used credit. The payback of the investment was presumed to take place with the help of revenues generated through energy efficiency. According to the plan it was supposed that about 300 billion US\$ of credit should have been allocated for renovation and development of energy sector and implementation of energy efficiency programs in the period 2016-18.

### 2.1 Review of signed and envisaged contracts

A review of signed and envisaged contracts related to energy efficiency programs indicate that total amount allocated to implementation of energy efficiency programs sums up to almost 1.7 billion US\$ within 3 years of time period. This is about 0.6% of planned resources that should have been allocated for further development of energy sector and implementation of energy efficiency programs. The sectoral distribution of resource allocation for energy efficiency could be observed in figure 1.



The approximate share of transportation sector in energy efficiency program has been 89.6% which involved reducing the consumption of petroleum products, such as gasoline and gas oil.

Share of agriculture in the resource allocation has been 0.6% which involved fuel switching from petroleum products to electricity for water pumps.

Almost 10% of resources for energy efficiency has been devoted to manufacturing high quality and efficient heaters and improvement of energy efficiency in building sector (0.33%).

When figures related to committed and envisaged contracts are compared to the planned allocation of resources, it can be observed that share of allocated resources for reducing relative consumption of

petroleum products has been 0.54% and the share of improving energy efficiency related to natural gas has been 0.06%. Practical implementation of energy efficiency program indicates that projects related to energy efficiency are at the end of priority lists when state owned resources are allocated for further development of energy system.

It is to be noted that improving energy efficiency of systems using petroleum products are considered as top priority. Such an outcome may be due to various reasons that could be summarized as follows.

- a. Increased consumption of gasoline and gas oil leads to imbalances in the domestic petroleum market and import of light petroleum products for transportation sector becomes inevitable. Any improvement of fuel efficiency or fuel switching could help establishment of fuel balance with less costs of importation of fuels.
- b. Saving in consumption of petroleum products could lead to reduced importation or increased export potential. In both cases, a positive impact on foreign trade balance is expected. Therefore, saving in consumption of petroleum products would enable reducing pressure on foreign exchange balances.
- c. It is understood that air pollution in mega cities is mainly due to emission of pollutants in transportation sector. In addition, heavy traffic congestion in urban areas is observed as a major social and health issue. Such consequences of consumption of petroleum products and social perception of issues and problems has encouraged decision makers to consider saving in consumption of petroleum products as top priority in energy efficiency programs.

Although natural gas contributes to more than 61% of final energy consumption and specific consumption of natural gas in households, transport sector and commercial sector is relatively higher than specific consumption of petroleum products, improvement of efficiency of natural gas consumption has been considered at the end of priority list of energy efficiency program.

Improvement of boiler houses in buildings and manufacturing energy efficient heaters have been considered as major elements of energy efficiency programs because it could reduce peak load of natural gas consumption which takes place in winter. Reduction in natural gas peak load could be beneficial for reliable supply of natural gas in winter and it could help reducing the investment costs of natural gas network. Therefore, easing the burden on supply side of natural gas has been main motivation for identification of projects and concluding contracts. Increasing load factor of natural gas has been the practical subject of article 12 when energy efficiency program is planned.

Summing up, the review of energy efficiency programs and of the respective allocation of resources based on article 12 indicate that achievement of immediate objectives of energy supply side, improving short term foreign trade balance and fulfilling commitments of state owned companies related to the development of energy supply system have been paramount criteria for allocation of resources founded on article 12. It is, of course, true that improved energy efficiency would be a byproduct when above projects are implemented.

## 2.2 Institutional System for Implementing Article 12 and its shortcomings

Article 12 has been formulated as part of a law for elimination of barriers to competitive production. Article 12 has envisaged that annual credit of 100 billion US\$ would be allocated for further development of efficient production systems and energy supply together with implementing energy efficiency programs. Allocation of resources and project formulation have been assumed to be founded on performances so that the pay back of investment would be achieved properly.

Practical implementation of article 12 indicates that all projects have been based on state commitment. Performance of each project has been evaluated subjectively and there has been no general accepted, approved and transparent approach for measuring the performances of projects, except in the case of improving the efficiency of boiler houses in buildings and utilizing GPS system for tracking the movement of new trucks that would be purchased with the support of article 12. It is stated that measuring and monitoring the distance of transportation by each truck would indicate how much had been the reduction in energy consumption. In other words, displaced distance and average improved energy intensity would be basis for estimation of saved fuel. The repayment of investment shall then be fulfilled by NIOC based on the saved fuel.

Subjective assumptions and bureaucratic justification of projects have been major process of formulating and approving projects. No practical mechanism is in place that would guarantee competitiveness and better performance of projects.

Regulation of procedures and monitoring the whole process has not been stated clear enough. It seems that the traditional system of monitoring projects through ministries and Plan & Budget Organization (PBO) has been adopted. Traditional system of monitoring has been based on expenditure. Expenditure of allocated resources has been assumed as an indication of the performance of a project.

Bureaucratic regulation of the whole process of initiation, appraisal, approval and implementation of projects is common procedure in a system of planned economy and it is hardly compatible with the background concept of competitive system which has been the foundation of article 12. On the other hand, considerable number of projects are supply oriented within a state monopoly energy market where the subjective understanding of administration provides basis for formulation and prioritizing projects. NIOC guarantees the repayment for saved fuels and it is a state organization. Hence, government accepts all responsibilities on future cash flow of the projects. Implementation of programs would be subject to financial ability of the state.

Present and future governments are committed to return back the investment which is based on expected economic outcome of projects instead on measured and verified achieved outcome. Expected yields of projects are involved with uncertainties and the financial ability of next administration due to changes in social and economic systems. Reducing risk aversion of project yields has not been defined explicitly. Such a state of affairs undermines the sustainability of the whole scheme and implementation of article 12. Therefore, implementation of energy efficiency programs is hardly expected to be continued steadily.

### 2.3 Expectation of involved experts of Article 12

Conception of responsible administration and main contractors involved with the existing contracts could enable an assessment of the sustainability of schemes under article 12. For this reason, personal and individual meeting with experts and discussion with some authorities took place in winter 2019<sup>1</sup>. Main issues that have been discussed with experts have been as follows.

- Are the allocated resources really related to energy efficiency?
- Is the implementation of programs technically and economically feasible?
- What would be the achievements of implementing the programs under article 12?
- How efficient are mechanism and procedures for implementing approved programs?
- Would the implementation of programs encourage further involvement of private sector in the business of energy efficiency?
- What would be the most efficient mechanism and procedure for improving energy efficiency?

#### **Outcome of these meetings and discussion may be summarized as follows:**

- It is understood that implemented projects related to railway system and public transportation and completion of natural gas upstream projects would have positive impact on the energy productivity. About 60% of experts and authorities indicated that allocation of resources could be considered as energy efficiency program. 35% of those asked for opinion believed that the support of railway expansion and completion of natural gas upstream projects are important for development of infrastructure and improvement of total productivity. But they cannot be considered as explicit energy efficiency programs.
- All experts considered the implementation of present contracts related to article 12 as feasible. It was argued that the majority of projects were related to government plans and uncompleted projects and the rest were projects that would be implemented by state affiliated companies. It was assumed that government would pursue implementation of related contracts. The risk of project implementation was conceived to be accessibility of technology and availability of capital.
- Independent experts believed that article 12 has enabled Ministry of Petroleum to combat immediate issues related to the shortage of capital. About 30% of experts and authorities have been the opinion that article 12 has helped transformation of resources to energy productivity. About 40% of participants in the discussion argued that implementation of projects related to support of private investment in power

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<sup>1</sup> The meeting and discussion was carried out by authors in the period of December 2018 till April 2019. Direct discussion was based on individual meetings with 27 experts that were involved directly in implementing article 12. In addition, some authorities were also asked about their views on article 12. In addition, conclusion of various meetings, where the authors had attended, related to implementation of article 12 has been included in the summary.

sector has been faced with difficulties. It was then argued that it was an indication of sectoral view of decision making in the energy sector.

- About 74% of experts argued that the mechanism of identification of projects, allocation of resources, monitoring and reporting the performance of projects under article 12 were vague. It was pointed out that there were lack of transparency and inefficient regulation of the whole process.
- When support of private sector in the course of implementing the projects based on actual performance was discussed, 90% of experts believed in that article 12 has been formulated in a way that only state owned (totally or partially) companies would be able to be involved in projects related to article 12. Requirement for involvement in the projects, financial difficulties of private sector and difficulty in building joint venture with foreign companies are barriers that hinder further involvement of private sector.
- Direct participation of private sector in projects related to article 12 was assumed as hardly possible. Almost 90% of participants in the discussion expected very little role for private investors.
- When the availability of the regulatory, institutional and legal framework for implementing energy efficiency program was asked, 97% (except 2 persons) believed that there was no reliable infrastructure. Shortcomings were indicated to be non-competitive energy market, lack of existence of a reliable platform for active involvement of energy service companies (ESCO), shortage of capital, difficulty of accessing efficient technologies and non-existence of an efficient registry and regulatory system.
- All participants indicated that energy supply companies would hardly accept any private competition. Smooth supply and delivery of saved energy by state owned (totally or partially state owned) companies to the investor was not believed to be conceivable.
- About 83% of participants in the discussion believed that establishment of a competitive market and participation of private sector in energy efficiency would be the best solution. But 97% believed that under present bureaucratic condition it would not be possible to establish a functioning market mechanism. It is believed that state organizations are not ready to hand over the supply of energy to private sector. Private investors shall face with many difficulties when they apply for permits on energy efficiency.
- Trade of saved energy in the framework of Market for Energy Efficiency and Environment according to bylaw of article 12 was considered by 97% of participants in the discussion as a difficult undertaking and its success was expected to be less than 30%.
- About 87% of participants were the opinion that economic feasibility of energy efficiency programs under low energy prices and non-existence of possibility for export of saved energy was under question.
- When the importance of energy efficiency program was discussed all experts believed that implementation of energy efficiency could be an important driver for sustainable development. But it was pointed out that according to the perspective of decision

makers, immediate economic and financial outcomes of projects were preferred. It was understood that energy efficiency would not be in the top priority in the foreseeable immediate future. Tackling immediate issues of energy balances and achievement of positive balance of foreign trade would remain as the first priority of decision makers in the energy sector.

## 2.4 Immediate Issues and Challenges of Implementing Article 12

Implementation of article 12 is also associated with immediate challenges and issues. Persistence of main challenges may endanger the implementation of energy efficiency programs and it might lead to increased risks of energy efficiency projects. Major issues related to implementation of article 12 may be summarized as follows.

### **Fluctuation of oil prices and foreign exchange rate**

Contracts related to Article 12 are projects that the state agrees to pay for saved energy in foreign currency (or better: at export market rates). Devaluation of domestic currency as well as low oil prices, which would limit state's revenue, are determining parameters that could reduce the willingness to pay for the saved energy. Besides, most of the approved projects are kind of fuel switching or finishing uncompleted projects that enhance the economic infrastructure, such as intra- and inter-city railway system programs or projects related to displacing old and inefficient buses or trucks, in which most of the required equipment are imported into the country. So, devaluation of domestic currency would have considerable impact on the feasibility of projects in absence of functioning risk sharing mechanisms or agreements.

### **Changes in Regulation**

Before approving the FY 1397 (2018-2019) National Budget law, National Iranian Oil Company was allowed to reimburse the projects approved under Article 12 from oil export revenues. But currently, National Iranian Oil Company cannot seize the export revenues and the revenue should directly be deposited to the national treasury. Payment for energy efficiency projects will be possible only through the national treasury after realizing revenue increase or cost decrease by implementing energy efficiency measures. This makes the reimbursement procedure more bureaucratic and then, both NIOC and MoP might be reluctant to accept full responsibility and to guarantee reimbursement further. The related increase in risks for investors would be not acceptable for them at all.

### **International Politics**

International politics and related sanctions cause problems in the project implementation directly and indirectly. Foreign investors such as VOLVO and SCANIA Groups (party for the replacement of 65000 old and inefficient trucks program) left IR Iran after sanctions were intensified in November 2018. Besides, importing equipment has been rather difficult under political sanctions.

### **Issues regarding the role of state**

One party of the contracts related to Article 12 is the state. Inefficiencies in the state bureaucratic system could impose barriers to the implementation of this law. Here are some of the state related issues:

Every approved project intensifies financial commitment of the state and it increases the burden on state expenditure. This specifically affects the projects that are applied on small scale.

Private sector is usually insecure about repayments by the state. When state owned companies and organizations face financial difficulties, it might lead to huge amount of debt and it might discredit the

state which could deter implementation of projects. Therefore, private investors are hardly interested in Article 12. Moreover, MoE does not provide any kind of valid guarantee for investors while MoP provides NIOC Cooperate Guarantee. MoE has faced with shortage of liquidity and it is not in a situation to pay back for improved energy efficiency.

### **Investment support for project implementation**

Implementation of large-scale projects requires considerable amount of initial (up-front) investment and investors need to have access to sufficient financial resources. There should be real financial support for large scale programs. According to the law, there is possibility of providing loans for both private and public investors (to cover capital investment) from the National Development Fund of IR Iran as well as major banks, in case those projects are technically and economically feasible and are listed as priorities. However, investors were not able to get any loan on energy efficiency projects from either the National Development Fund or banks. Business related to energy efficiency is hardly acknowledged by banking system. In addition, high rate of interest on loans reduces the economic feasibility of projects on energy efficiency and the Internal Rate of Return (IRR) of projects becomes very low when the investor is not permitted to export the saved energy.

### **Bureaucratic process of project appraisal and approval**

Long procedure needs to be paved in order to have a project to be approved. First, a program is defined by a group of experts at IFCO and SATBA based on proposals initiated by investors. Next, the program should be approved by the related ministry at different levels. It is then submitted to PBO and after that, it should be approved by the Supreme Economic Council. It happens in many cases that the total investment amount or supporting budget in many approved programs would be different from the proposed amount by experts at IFCO and SATBA. This alters the feasibility of programs and it makes the implementation of the proposed projects infeasible.

### 3 Conclusion

Improvement of total productivity has been conceived as the central element of the economic growth and sustainable development in the last decade. It has been presumed that enhancement of productivity is subject to introduction of economic and financial reform which could lead to structural changes in the economic system. Competition and reconstruction of transparent and effective financial and banking system have then been considered as important macro policies. Therefore, law on “Eliminating barriers to competitive production and improving financial system” was approved in April 2015. Implementation of energy efficiency programs has also been included in this law which is identified as article 12.

Article 12 aims at implementation of energy efficiency programs and further development of energy supply system. It has been formulated to overcome the energy bottlenecks, to accelerate further development of natural gas upstream, to support expansion of economic infrastructure and to implement energy efficiency programs.

A review of article 12 indicates that its formulation is based on supply side. Fulfilling the implicit state commitment for maintaining energy balances has been given the paramount preference. Envisaged and planned projects in the period 2014-18 reveal that energy efficiency has been given the least priority. Projects on improvement of energy efficiency of transportation sector has received considerable share of resources allocated to energy efficiency programs. The reason has been to reduce imbalances in the domestic market of petroleum products and to increase potential of net export of petroleum products. Energy efficiency as means of reducing internal and external destruction of natural resources has played a secondary and complementary role when projects were formulated and financial resources were allocated.

Article 12 has been formulated in a such a way that state commitment and financial obligation of the government were taken as a prerequisite for implementing projects. Such an assumption is hardly compatible with the nature and logics of law on elimination of barriers to competitive production. Resources are allocated through state bureaucracy. Market mechanism plays rarely a role in the process of allocating resources.

Energy consumer would have difficulty in utilizing resources that would be available according to article 12. Development of energy service business through active involvement of private sector has not been given due consideration in article 12.

## 4 List of recent Policy Papers

1. Policy Paper No. 1 – Market-based instruments for energy efficiency worldwide. A review.
2. Policy Paper No. 2 – Energy Efficiency Funds: Insights from international experience
3. Policy Paper No. 3 – Review of Article 12: Energy Efficiency Program in the Islamic Republic of Iran
4. Policy Paper No. 4 – Review of experiences of energy efficiency program in the Islamic Republic of Iran
5. Policy Paper No. 5 –Market for Energy Efficiency & Environment (M3E): Energy Efficiency Program in the Islamic Republic of Iran

## 5 References

1. <http://rc.majlis.ir/en>
2. <http://ifco.ir/>