ireema TECHNICAL NOTE

Supporting Iran in implementation of an integrated energy efficiency market

Technical Note No. 6

Energy Efficiency and Environment Market (M3E): Players and Their Roles

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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, investment projects have not yet been implemented on a large scale.

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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درباره IREEMA

ایران در لیست ۱۰ کشور دارای بیشترین انتشار دی اکسیدکربن به جو قرار دارد و در میان تولیدکنندگان نفت و گاز، شدت انرژی اقتصاد ایران از همه بیشتر است. با اینحال، تعرفه های داخلی حامل های انرژی توسط دولت و به صورت یارانه ای معین می گردد. تعرفه های حاملهای انرژی در ایران بسیار پایین تر از قیمت صادراتی آنهاست. از این رو، در طی دهه گذشته، بهره وری انرژی در ایران به شدت افت کرده و دولت به اهمیت بهینه سازی مصرف انرژی پی برده است.

با تصویب ماده ۱۲ قانون «رفع موانع تولید رقابت پذیر و ارتقاء نظام مالی کشور» بستر قانونی مشوق‌های مالی برای سرمایه گذاری در امر بهینه سازی انرژی فراهم گشته ولی ازآنجا که ساز و کارهای اجرایی این مشوق ها هنوز پیاده سازی نشده‌اند، تاکنون سرمایه گذاری خاصی در این زمینه صورت نگرفته است.

پروژه ی IREEMA، معاونت علمی و فنآوری ریاست جمهوری ایران را در راستای ایجاد و توسعه ساز و کار بازار متمرکز بهینه سازی انرژی حمایت میکند.

لذا هدف این پروژه و ذینفعان مسوول، این است که در نهایت، ساز و کاری موثر و دارای کمترین هزینه جانبی، برای سرمایه گذاران بالقوه فراهم گردد. بعلاوه این پروژه در نظر دارد که رویکرد به دست آمده را به صورت عملی مورد آزمون قرار دهد؛ بدین صورت که پتانسیل بزرگ بالقوه بهینه سازی انرژی را در دو عرصه مهم اجرایی نماید: یک، در بخش گاز با تمرکز بر منطقه ویژه اقتصادی انرژی عسلویه؛ و دو، در بخش تامین پایدار انرژی در مناطق پایلوت روستایی منتخب. بر این اساس و در صورت نیاز، ساز و کار ایجاد شده با پروژه‌های واقعی سنجیده شده و در جهت رسیدن به بهترین شیوه و عملکرد، تغییرات لازم ایجاد می گردد. اجرای این مکانیسم، بنیان بازار متمرکز بهینه سازی انرژی را شکل خواهد داد و چنین ساز و کار موثری می تواند به ایران در اجرای اهداف INDC توافقنامه پاریس و به سیاست گذاران در رسیدن به اهداف بلند پروازانه بهره‌وری انرژی کمک رساند.

Executive Summary

The Market for Energy Efficiency & Environment (M3E) has been ratified to initiate structural changes in the energy market of Iran. The essence of the concept of the M3E is to promote demand for energy efficiency and facilitate the expansion of businesses on the supply of energy services. It is expected that highly subsidized energy consumers will enter the market. The M3E will also provide opportunities for existing and newly emerging energy service providers (i.e. ESCOs) and investors. Energy suppliers may be incentivized to facilitate the transfer of saved energy due to their benefits from reduced costs of supplying energy. In the meantime, developers of efficient technologies will receive demand for their products. Thus, a considerable number of stakeholders shall be involved in M3E and services will be provided through the cooperation of all stakeholders.

Stakeholder mapping is required to have a better overview of the Market for Energy Efficiency and Environment (M3E). This technical note identifies different players within the M3E from project host/owner to technical and financial service providers, and state-based specialized and technical institutions as well as policy-oriented players.

Moreover, the note addresses key responsibilities based on a classification of players. In effect, the responsibilities outline different steps in M3E implementation. The current report represents a step forward regarding the clarification of M3E players' roles and relationships. As a next step, there is a need for comprehensive discussions about responsibilities to achieve clear guidelines for a well-functioning market.

List of Abbreviations

CSR	Corporate Social Responsibility
DoE	Department of Environment
EPC	Engineering, procurement, and construction
ESC	Energy Saving Commission
ESCOs	Energy Service Companies
ICCIMA	Iran Chamber of Commerce, Industries, Mines and Agriculture
IFCO	Iranian Fuel Conservation Company
INSO	Iran National Standards Organization
IRENEX	Iran Energy Exchange Market
M3E	Market for Energy Efficiency and Environment
M&V	Measurement and Verification
MoP	Ministry of Petroleum
MoE	Ministry of Power (also known as Ministry of Energy)
MRUD	Iran Ministry of Roads & Urban Development
MRV	Measurement, Reporting, and Verification
NIGC	National Iranian Gas Company
NIOC	National Iranian Oil Company
NIORDC	National Iranian Oil Refining and Distribution Company
PBO	Plan and Budget Organization
SATBA	Renewable Energy and Energy Efficiency Organization
SEO	Securities and Exchange Organization
TAVANIR	Iran Power Generation, Transmission, and Distribution Company
VPST	Vice-Presidency of Science and Technology

Contents

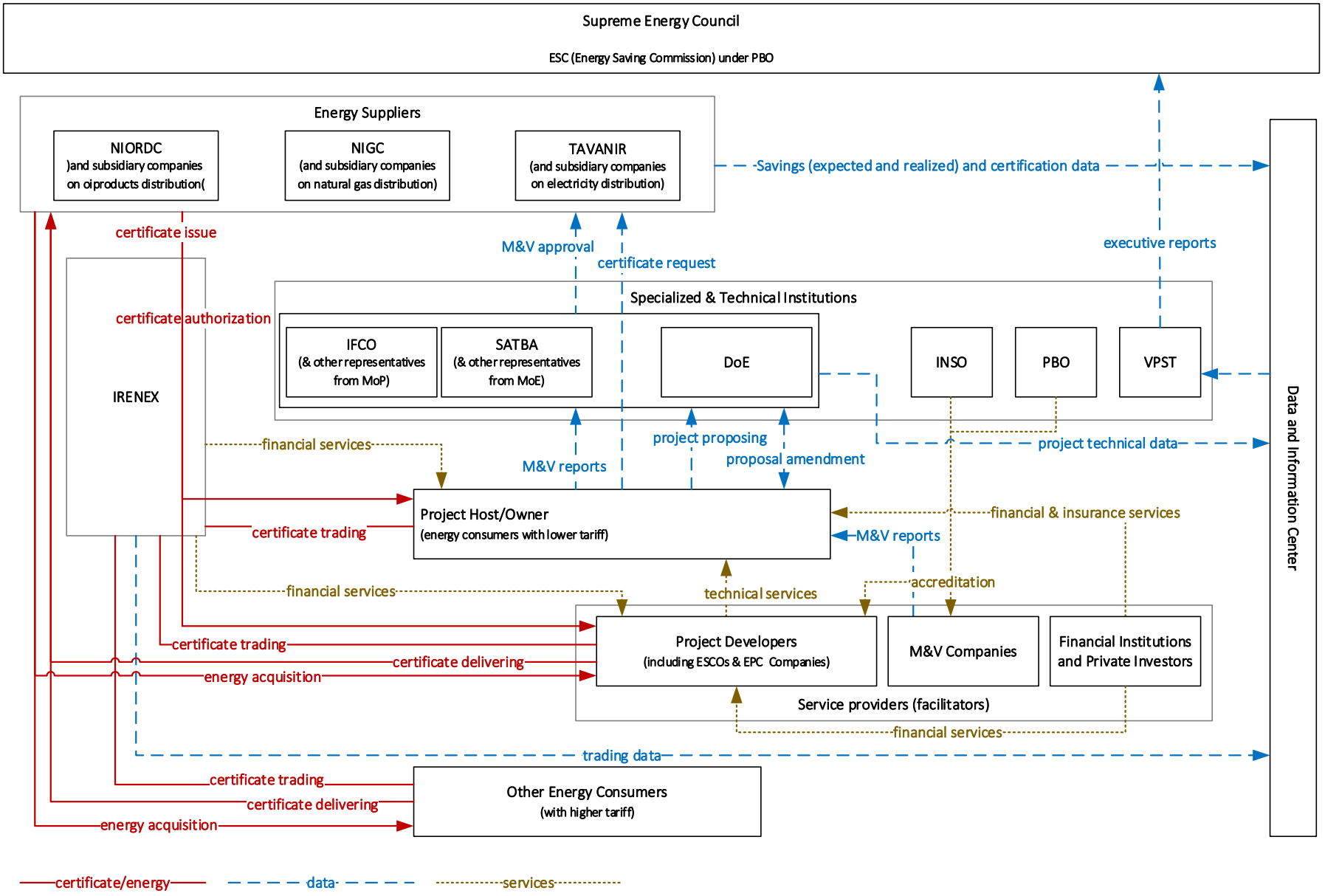
1 Introduction and overview

The law on "improvement of energy consumption pattern" acknowledges the Supreme Energy Council as the highest policy-making body for the Iranian energy sector. Based on the same law and Article 12 of the law on "elimination of barriers to competitiveness and improving the country's financial system," the proposal for establishing the Market for Energy Efficiency & Environment (M3E) was submitted to the Supreme Energy Council in 2015. After a long period of discussions among different stakeholders in a variety of technical committees from 2015 to 2018, the Supreme Energy Council finally approved the bylaws for "Establishing the Market for Energy Efficiency and Environment (M3E)" in February 2018.

Developing the market for energy efficiency and environment requires comprehensive cooperation and collaboration among all the players at the administrative and business levels. Based on the M3E bylaws, which set an institutional frame for trading energy savings, as well as the project implementation scheme which has been discussed in the previous technical notes[1], the present technical note identifies the relevant M3E players at different levels, from project host/owner to the policymaker.

Energy consumers with lower tariffs will play the primary role in implementing energy efficiency improvement measures as the project host/owner. Several players support the project host/owner in project initiation and implementation, including financial institutions, private investors, ESCOs, M&V companies, as well as engineering, procurement and construction (EPC) companies. Besides, state-based technical departments support the project host/owner principally through proposal completion and approval, in addition to the M&V procedure. These departments are named as specialized and technical institutions under the bylaws. VPST may facilitate market implementation by collecting and analyzing data at a central registry. There are also energy suppliers with their regional subsidiaries that have the key role of issuing certificates upon the approval of M&V reports. The Iran Energy Exchange Market (IRENEX) will authorize the issued certificates, and it will provide the infrastructure for certificate trading.

[1] See IREEMA Technical Note No. 4, A draft scheme for project implementation in the Market for Energy Efficiency and Environment (M3E).


Supreme Energy Council
ESC (Energy Saving Commission) under PBO
Energy Suppliers
NIORDC
)and subsidiary companies
on oiproducts distribution(
NIGC
(and subsidiary companies
on natural gas distribution)
TAVANIR
(and subsidiary companies
on electricity distribution)
Savings (expected and realized) and certification data
certificate issue
M&V approval
certificate request
executive reports
Specialized & Technical Institutions
certificate authorization
IRENEX
IFCO
(& other representatives
from MoP)
SATBA
(& other representatives
from MoE)
DoE
INSO
PBO
VPST
Data and Information Center
financial services
M&V reports
project proposing
proposal amendment
project technical data
Project Host/Owner
(energy consumers with lower tariff)
certificate trading
financial & insurance services
M&V reports
financial services
technical services
accreditation
certificate trading
certificate delivering
energy acquisition
Project Developers
(including ESCOs & EPC Companies)
M&V Companies
Financial Institutions
and Private Investors
Service providers (facilitators)
financial services
trading data
certificate trading
certificate delivering
energy acquisition
Other Energy Consumers
(with higher tariff)
certificate/energy
data
services

The diagram maps the different players and their (primary) roles within the M3E. The subsequent sections of the technical note provide a full description of all the players and their functions.

2 Market players and their roles

2.1 Project host/owner

The project host/owner is an energy consumer with a low tariff, relative to others, who is willing to grasp the opportunities within the M3E framework for applying feasible energy efficiency measures or utilizing renewables. In other words, the project owner hosts an energy efficiency improvement project that is feasible within the M3E. It is supposed that energy consumers with higher tariffs have principally seized most energy efficiency improvement measures, which are financially viable within the current upper boundary of energy tariffs in Iran. By making the upper-boundary tariffs applicable to trade energy savings of low-tariff consumers, the M3E helps energy consumers with lower tariffs to make some energy efficiency improvement measures feasible.

The party could be either a non-obligated or an obligated[2] party who participates in the M3E by doing the following steps:

- The project host/owner identifies energy efficiency and environmental improvement opportunities that appear individually beneficial considering energy tariff differences, obligations on energy use, or the chance to export saved energy potentially in the future. The identification of energy efficiency potentials will be particularly straightforward when project hosts/owners have energy managing units in their plants;
- After identifying the project idea, the project host/owner must formulate the project proposal based on templates and submit it to the specialized and technical institutions[3]. The proposal should be submitted through the data registry (data and information center);
- There may be revisions by the project host/owner in case reconsideration is required based on the evaluation process via specialized and technical institutions;
- The project host/owner must select a company for M&V from the list of accredited companies;

[2] The M3E bylaws are based on the law on "improvement of energy consumption pattern" according to the bylaws introduction. Article 25 of this law asks ministries of energy and petroleum to introduce penalties for energy consumers that do not adhere to the standards determined by the Iranian National Standards Organization. Clause 2.4 of the M3E bylaws explicitly allows energy consumers who consume energy beyond the compulsory standard levels to legitimize the excess amount through buying certificates from the M3E.

[3] Specialized and technical institutes include PBO, VPST, DoE, Ministry of Petroleum (IFCO in particular and other representatives from the ministry), Ministry of Energy (SATBA in particular and other representatives from the ministry), and INSO.

- Implementing the project and reporting project completion/commissioning is the main step after the above-mentioned preliminary steps. A project implementation contract should be signed among the project host/owner, investor(s), energy supplier and M&V company. By project commissioning, it shall be reported through the data registry. In the meantime, the M&V process, with developing energy and emission baseline being the first step, will be in progress that needs close cooperation of the project host/owner with the M&V company;
- By project commissioning, the project host/owner will realize energy savings. To request the issuance of energy saving certificates from the responsible energy supplier, the project host/owner should report the energy savings verified by the M&V company to the specialized and technical institutions for approval;
- The project host/owner will receive and trade the certificates through the Iran Energy Exchange Market (IRENEX)[4]. If the certificate owner is an obligated party, he should surrender certificates; if not, the options are to have the certified energy saving amount credited to the energy bill or to trade.

2.2 Service providers

Service providers support the project host/owner by facilitating project planning and execution technically and financially.

2.2.1 Project developers

Project developers participate in the market as engineering and financial professionals, cooperating with project hosts/owners to meet their targeted energy efficiency (and emission reduction) plans.

Energy Service Companies (ESCOs) play an essential role in the M3E context. The establishment of the M3E provides an opportunity to activate ESCOs in the Iranian energy market[5]. Growth in ESCOs' activities and assigning small and medium project developers a central role in the M3E will increase competition, which fosters the quality and variety of products and technical solutions as well as low costs.

To build trust and reliability, especially between private ESCOs and project hosts/owners, and prevent large-scale project failures due to inexperience, ESCOs need to be trained and certified/accredited by responsible public bodies, possibly among the specialized and technical institutions.

[4] There could also be a bilateral agreement for certificate trading; however, this kind of trade should be registered at IRENEX (possibly as long-term securities as it works currently especially for the petrochemical industry).

[5] According to article 17 of the law on "improvement of energy consumption pattern", the state should provide sufficient incentives for establishing and developing ESCOs. Following this, MoP and MoE have introduced energy performance contracts in which ESCOs play the key role.

Project developers, such as ESCOs, may offer a variety of services within the M3E, including the following:

- Energy auditing to identify energy efficiency and environmental improvement opportunities;
- Diagnosis of the host's compliance with the national/local standards on energy consumption and emission levels;
- Development of feasibility studies, technical and financial analyses, selection of the most appropriate solutions, design of energy efficiency measures, and provision of direct or indirect finance;
- Project implementation, e.g. through the purchase of equipment, installation, commissioning and testing;
- Monitoring the plants and guarantee of optimal performance;
- And preventive, corrective, ordinary and extraordinary maintenance of the plants for the agreed period, ensuring their efficiency.

The project host/owner may hire an ESCO to improve the energy efficiency in their premises and pay a fixed price on completion of the project. Also, ESCOs may be interested in obtaining certificates (upon an agreement with the project host/owner) and taking part in certificate trading. The ESCO may take full responsibility for the project, providing comprehensive technical (and financial) services, in exchange for receiving all certificates.

In principle, a specific way of sharing the revenues from the sales of certificates among the project host/owner, project developers and potentially a third-party investor is possible, and it may be agreed on by the parties involved. The agreement depends on the source of capital and allocation of risks. There is a range of specific types of agreements practiced worldwide between energy consumers (project hosts), ESCOs and third-parties based on energy performance contracts.

The coverage of services to be delivered by ESCOs may similarly vary. ESCOs could simply be structured to perform initial tasks, such as energy auditing, and leave the implementation to project owners/hosts. Offering more comprehensive packages, they may either self-deliver or outsource technical implementation and financial services. E.g., they may cooperate with engineering, procurement, and construction companies (EPCs) and provide third-party financing. When leaving the funding to the project owner, they may still present guarantees for easy access to bank loans. ESCOs and EPCs should be certified and accredited by the specialized and technical institutions.

2.2.2 M&V companies

M&V companies are third-party companies that provide measurement and verification of actual energy savings for energy efficiency projects. M&V companies need to be trained and certified/accredited by specialized and technical institutions.

The M&V company will be responsible for proposing an M&V plan, developing a baseline, evaluating project completion/commissioning, performing M&V of the realized energy saving, and supporting the project host/owner to report verified energy savings (to be approved by the specialized and technical

institutions), all based on agreed protocols. M&V costs are supposed to be paid from project revenues within the M3E. The payments need to be designed in a way to prevent any conflict of interest. The payments may be ex-ante and independent of the amount of energy savings.

2.2.3 Financial institutions

Financial institutions that may take part in the M3E include banks and insurance companies. Banks may provide financial support for project hosts/owners or project developers through loans, bank credits, and money transfers to facilitate project implementation. On the other hand, insurance companies may hedge project risks (this will be discussed in details within the next technical notes). Mitigating the risk of large financial loss due to unforeseen problems substantially lowers the barriers to market participation. Moreover, early negotiations with banks and insurance companies (before the M3E implementation) on interested projects within the M3E is strongly recommended.

The purpose of involving banks and other financial institutes is to channel financial resources towards energy efficiency improvements on a large scale. Energy consumers with considerable energy efficiency potential do not necessarily have sufficient capital right at hand to finance the necessary investments, but it is the task of banks to raise capital and make it available where the most considerable returns are achievable. Smoothly functioning financial sector is hence a precondition for the successful implementation of the M3E.

For banks and insurance companies to adequately assess the returns and risks associated with energy efficiency improvements, there is a need for gaining professional expertise and experience. Currently, there are no financial institutions specialized in financing energy efficiency services in Iran. Their development may need a transition from an asset-based lending approach to a cash-flow based one in the future.

2.3 Certificate buyers

Three groups are principally interested in receiving or buying energy-saving certificates:

i. non-obligated parties who want to seize the corresponding energy for their own use as they face higher tariffs (or who export equivalent energy in possible future steps of the M3E scheme). ESCOs are among the non-obligated parties;
ii. different dealers/brokers in the Iran Energy Exchange Market;
iii. and, obligated parties who have not met their individual obligations.

Certificate buyers could be public, private, or semi-private players.

2.4 Specialized and technical institutions

2.4.1 Iranian Fuel Conservation Company (IFCO)6 and Renewable Energy & Energy Efficiency Organization (SATBA)7

The Iranian Fuel Conservation Company (IFCO) and the Renewable Energy & Energy Efficiency Organization (SATBA) are two state-owned institutions working mainly on energy efficiency with similar roles but in different sectors, the former on oil and gas products and the latter on electricity.

IFCO is a subsidiary of the National Iranian Oil Company (NIOC) founded by the Ministry of Petroleum in 2000 (based on Article 121 of the third Five-Year Economic, Social and Cultural Development Plan). As the representative of the Ministry of Petroleum, IFCO is in charge of energy efficiency programs. IFCO has been tasked with (a) conservation of fuel in the transportation, industry, and building sectors; (b) supporting technological growth and quality improvement of energy conversion products for efficient energy use; (c) promoting energy-efficient behavior in society through the dissemination of books, magazines and articles as well as media programs; and (d) financial and scientific support for research projects in universities and scientific institutions on energy consumption management.

Besides, SATBA was formed in 2017 by merging the Renewable Energy Organization of Iran (SUNA) and the Energy Efficiency Organization of Iran (SABA), based on Article 8 of the "Improving Energy Consumption Pattern" act. The mission of this organization is to promote electric energy efficiency and increase the utilization of renewable and clean energy sources. Moreover, SATBA is responsible for supporting the private sector, especially knowledge-based companies, through providing incentive policies.

Since 2014, IFCO and SATBA have mainly focused on programs based on the regulation known as Article 12[8], which was the first step from the state on the promotion of market-based energy efficiency improvement policies. IFCO and SATBA have several responsibilities regarding M3E implementation in the oil and gas, and electricity sectors, respectively:

- Project proposal evaluation for eligibility: concerning the eligibility criteria[9] of projects within the M3E, a group of experts at IFCO and SATBA, together with other specialized and technical institutions, will evaluate the project proposals. They should support the project host/owner to apply the needed amendments and finalize the proposal. As a primary step, IFCO and SATBA need to provide clear eligibility criteria to support secure procedures of M3E project preparation and implementation;

[6] Ministry of petroleum (MoP), as a major partner in the M3E, contributes to the M3E implementation mainly through three of its sub-organizations: Iranian Fuel Conservation Company (IFCO), National Iranian Gas Company (NIGC), and National Iranian Oil Refining and Distribution Company (NIORDC). Other representatives from MoP may participate in the M3E as supervisory entities.

[7] Ministry of Energy (MoE), as a major partner in the M3E, contribute to the M3E implementation mainly through three of its sub-organizations: Renewable Energy and Energy Efficiency Organization (SATBA), and Iran Power Generation, Transmission, and Distribution Company (TAVANIR). Other representatives from MoE may participate in the M3E as supervisory entities.

[8] Please refer to the policy paper on Article 12.

[9] For more information, please refer to IREEMA Technical Note No. 3 on M3E eligibility criteria.

- Recommending certification periods: as projects within the M3E vary in economic feasibility and technical characteristics across the different sectors, IFCO and SATBA experts will provide recommendations to the Energy Saving Commission regarding the certification periods. The economic viability of various projects should be assessed to reach a list of standard projects with certain certification periods, which makes it interesting for project hosts and other stakeholders regarding the payback of investments;
- Establishing the MRV system[10]: a comprehensive MRV system including M&V protocols should be developed for the M3E as a consonant activity of IFCO, SATBA, and DoE;
- Supporting MRV system implementation: it is among the responsibilities of IFCO and SATBA (along with energy suppliers) to support the implementation of the MRV system including quality control and approval of M&V reports as well as handling M&V disputes;
- Capacity building and awareness-raising: IFCO and SATBA could play a mentoring role for private entities in the M3E, especially M&V companies and ESCOs. Holding training programs will be an essential part of capacity building activities within the M3E to strengthen ESCOs and M&V companies. Besides, IFCO and SATBA, together with the other specialized and technical institutions, should support the introduction of the M3E mechanism and its potential benefits to the appropriate audience, i.e. potential market participants in the first place. As state-based institutions, they should also contribute to raising awareness among state-related stakeholders to accompany private bodies collaboratively to facilitate project implementation within the M3E;
- And, periodic reporting on market implementation: regarding the fact that IFCO and SATBA are part of the specialized and technical institutions within the M3E, reporting the status of market implementation, especially on applications and energy savings, is among their key responsibilities.

[10] For more information, please refer to the technical note on establishing an MRV System for M3E.

2.4.2 Department of Environment (DoE)

The main goal of establishing the Department of Environment (DoE) was to achieve the fiftieth principle of the Constitution of the Islamic Republic of Iran, which is devoted to the conservation of the environment and proper utilization of environmental resources for improving human life quality while keeping balance in the ecosystem. Following the main goal brings several duties for DoE, including the provision of environmental standards, control and prevention of environmental pollution and degradation, as well as research and studies on sustainable development.

The DoE participates in the M3E through:

- Project proposal evaluation: regarding the eligibility criteria for projects within the M3E, a group of DoE experts will evaluate the project proposals from the environmental point of view. The DoE should also contribute in determining clear eligibility criteria;
- Developing and establishing the MRV system on GHG/pollutant emissions reduction associated with energy savings: a comprehensive MRV system should be prepared for the M3E projects as a consonant activity of DoE, IFCO, and SATBA. DoE will contribute mostly by providing specifics for the MRV system on GHG/pollutant emissions reduction for different types of projects within the M3E;
- Supporting the MRV system implementation: MRV system implementation, including the evaluation of emission reduction reports provided by the M&V companies, is among DoE's duties;
- Capacity building: DoE will play a mentoring role for private agents, specifically M&V companies and ESCOs, to increase their knowledge of emission reduction measurement/calculation by holding training programs;
- And, utilizing environmental and social drivers: while environmental and social norms are generally not as binding as regulation and economic constraints, they could play a key role in promoting sustainable development, in general, and emission reduction, in particular. The DoE may promote voluntary activities to save energy and reduce pollutant/GHG emissions through raising awareness, activating NGOs and encouraging companies' activities regarding corporate social responsibility (CSR).

2.4.3 Plan and Budget Organization (PBO)

Since 1948, the Plan and Budget Organization (PBO) has been the main responsible body to provide annual budgets. The preparation of medium- and long-term development plans/policies is also part of PBO's activities. Within the M3E, PBO will host meetings of the Energy Saving Commission. Besides, PBO as a non-executive organization is recommended to host the registry for all market data and

information. PBO is also supposed to accredit and possibly rank ESCOs and M&V companies. Currently, there exists a system at PBO which assigns ESCOs three different grades based on criteria like past performance, current activities, financial strength, and the number of trained personnel[11]. This helps to build trust among energy service providers and their clients.

As the secretariat of the Supreme Energy Council, PBO may also develop capacity-building programs for the right related audiences, and raise awareness about potential energy-saving gains and the M3E mechanism. This could be done in close cooperation with other specialized and technical institutions, particularly VPST, IFCO, SATBA, and DoE.

2.4.4 Iran Energy Exchange (IRENEX)

The Iran Energy Exchange was established in 2012 as a public stock company under the supervision of the Securities and Exchange Organization (SEO). Iran Energy Exchange is a self-disciplined commodity exchange market providing the trading platform for physical energy carriers (including oil, oil products, gas, electricity, etc.) and commodity-based securities. IRENEX hosts the majority of energy trade in Iran today, and all the relevant market players (including energy suppliers, traders, and large-scale customers) are present there.

IRENEX is the central trading platform of energy saving certificates within the M3E. Trading mechanisms and platforms at IRENEX are already being developed. Furthermore, IRENEX should provide the rules of trading. Moreover, IRENEX is expected to follow the tasks outlined below:

- Supporting the registry of each certificate and each transaction: Every transaction should be notified to the organization that has issued the certificate. Transfer of ownership of the certificates should be recorded in the central registration system (data registry);
- Organizing that each certificate redeemed is deleted, i.e. taken out of the system;
- Content design of the certificates (information requirements);
- And, deciding on allowing (limited) borrowing[12] of certificates upon the approval of the supervisory entities.

Although exchange trading via IRENEX will benefit the M3E through facilitating liquidity (both in terms of supply and demand) and providing transparency, bi-lateral over-the-counter or off-exchange trading is recommended for the early stages of M3E implementation.

2.4.5 Vice-presidency of science and technology (VPST)

VPST was established in 2006 with the primary goal of supporting scientific and technological activities. Wealth creation and improving the quality of life through increased technological capabilities and innovation; development of the knowledge-based economy; facilitating exchange between the technology and innovation supply and demand sectors; commercialization of technological

[11] The basis for ranking is presented in the following address: https://sajat.mporg.ir

[12] Borrowing means owning an amount of certificates prior to the implementation of the project. It refers to the possibility that the project owner receives certificates before proving savings in advance, so that they are better able to finance the investment.

achievements; and advancing the international scientific, technological and innovative relations, are among the critical activities of VPST.

Regarding the M3E bylaws, VPST is to collect data from the specialized and technical institutions, the energy suppliers, and IRENEX, to process them and report on M3E implementation, which could happen via the data registry. The primary data of interest for VPST are on applications, proposed (technological) measures, energy savings, emission reductions, certification, trading, and transactions. Data analysis by VPST is expected to yield information on market performance to improve the design of future amendments and revisions.

Moreover, VPST, as a scientific and technological organization, may facilitate introducing new technologies to the market, mainly via supporting knowledge-based SMEs and manufacturers to introduce innovative solutions in the energy sector.

2.4.6 Iranian National Standards Organization (INSO)

Established in 1953, INSO is the main body to develop and promote standardization in Iran. INSO joined the International Organization for Standardization (ISO) in 1960. The INSO actively participates in most ISO technical committees and subcommittees.

INSO is in charge of providing standards on energy consumption and GHG/pollution emissions in different economic sectors. INSO may accordingly propose obligations on certain groups of energy consumers based on the national standards in future steps. According to article 26 of the law on "improvement of energy consumption pattern," industrial units that violate communicated standards, based on the recognition by the ministries of Petroleum and Energy as well as Iranian National Standards Organization, will face penalties. The cabinet approved the related bylaws in 2014; however, it has rarely been implemented over the past years. For the support of efficient outcomes of an active obligations and penalties scheme, the M3E may help to allocate energy savings where they are attainable at the lowest cost.

2.5 Energy suppliers

The National Iranian Gas Company (NIGC) and the National Iranian Oil Refining and Distribution Company (NIORDC) are the main energy suppliers in the Iranian oil and gas sector. Similarly, the Iran Power Generation, Transmission, and Distribution Company (TAVANIR) is the leading electricity supplier in Iran.

While developing supply plans for meeting the energy demand, energy efficiency improvement may significantly help to meet the increased demand and to reduce the pressure on supply infrastructures. It is crucial to include energy suppliers in the initial stages of market development and implementation to well identify energy-saving potentials and implications on supply chains.

Energy suppliers play a critical role within the M3E as they are responsible for issuing energy saving certificates, as well as for redemption and invalidation of certificates. Upon approving the M&V report of energy savings, the energy supplier issues certificates and asks IRENEX to authorize the certificates to be tradable on the exchange. Issued and authorized certificates should be registered at the data registry.

By redeeming the certificate, the certificate owner asks energy suppliers to obtain the equivalent energy commodity. In practice, this means for energy consumers with higher tariffs that the equivalent energy volume and fee will be cleared from the energy bill. The physical delivery of energy carriers by

the energy suppliers will rather be relevant in cases that export is possible in future steps. Finally, any certificate should be invalidated, and registered at the data registry.

2.6 Iran Chamber of Commerce, Industries, Mines and Agriculture

Established in 1884, Iran Chamber of Commerce, Industries, Mines and Agriculture (ICCIMA) is a non-profit and non-governmental organization that represents the private sector, aiming at facilitating economic growth and development in Iran. ICCIMA collaborates with executive bodies on encouraging investment and offers particular pieces of training on business.

Relying on the knowledge and experience of its members, ICCIMA would make proposals on amending and improving the guidelines/regulations of the M3E. Moreover, ICCIMA may encourage private sector companies to get actively involved in market initiation and implementation. ICCIMA may also present M3E investment opportunities to domestic and foreign financing entities.

2.7 Data registry (data and information center)

Although not as a market player, a universal data registry supported by all relevant stakeholder institutions will be an essential element to help the efficient and responsive steering of the M3E. A single user-friendly portal, documenting M3E with data on the number and types of projects, energy and financial savings of concluded projects as well as potential savings expected from applied projects, and trading figures, would not only allow easy access to information for all the players but also develop an interactive platform for different M3E players seeking to engage with each other. Making project information publicly available would allow for transparency and open debate on improvements, knowledge transfer and possible partnerships for future projects.

It is recommended to design and introduce an innovative MRV scheme for the M3E based on bottom-up data recording. Such a scheme requires active contributions by different players and building horizontally and vertically integrated multi-institutional arrangements for the M3E data registry.

It is furthermore vital to develop an IT-based infrastructure that enables automated data collection and processing with all the players having access to an online platform. The supervisory entity of the M3E may run the platform. That entity will be in charge of managing the database and authorization of (limited) access for every player.

2.8 Supervisory entities

2.8.1 Supreme Energy Council

The Supreme Energy Council is the highest-level body in Iran for policy and decision making on the energy sector, and the secretariat of this council is located in the PBO.

According to the M3E bylaws, the Supreme Energy Council, as the chief decision-maker on M3E establishment and implementation, asks the Energy Saving Commission (ESC) to provide the required guidelines and infrastructure to initiate the M3E (within maximum three months after the dissemination of the bylaws). Moreover, the supervisory role by the Supreme Energy Council includes reviewing the periodic reports of M3E performance presented by the Energy Saving Commission to the council.

The Supreme Energy Council may also decide on national or sector-wise energy saving targets to be met by M3E implementation. The targets may be defined either in terms of financial outcomes, (primary/final) energy consumption, or emission reductions in the sector(s) covered by the scheme.

The definition of a target point (temporal content of the target), and possibly a rate of increase, is vital for investment security, as it marks political support for the scheme.

2.8.2 Energy Saving Commission (under the Supreme Energy Council)

In addition to the members of the Supreme Energy Council, representatives from the Iran Ministry of Roads & Urban Development (MRUD), Iran Chamber of Commerce, Industries, Mines and Agriculture (ICCIMA), Iran Energy Exchange Market (IRENEX), and Securities and Exchange Organization (SEO) constitute the Energy Saving Commission. The responsibilities of the commission within the M3E are defined as outlined below:

- Preparing and providing the required M3E implementation guidelines and infrastructure including certification periods, eligible projects[13], etc. ;
- Approving the M&V/MRV system of energy savings and emission reductions;
- Supervising the M3E implementation and presenting periodic reports and feedbacks to the Supreme Energy Council;
- Overseeing the certification and MRV systems;
- Determining energy carrier prices to pay for getting certificates in case there is no transparent tariff of savings;
- Dispute resolution between different players;
- And, publishing annual reports on the results delivered by the M3E with proposals to improve its effectiveness.

[13] For more information, please refer to the technical note on M3E eligibility criteria.

3 Conclusions and recommendations

The Market for Energy Efficiency & Environment (M3E) has been ratified to initiate structural changes in the energy market of Iran under low energy prices. The essence of the concept of the M3E is to promote demand for energy efficiency and facilitate the expansion of businesses in the supply of energy services. It is expected that highly subsidized energy consumers will enter the market. The M3E will also provide opportunities for existing and newly emerging energy service providers (i.e. ESCOs) and investors. Energy suppliers may be incentivized to facilitate the transfer of saved energy due to their benefits from reduced costs of supplying energy. The successful implementation of energy saving measures will also ease the financial burden of reliable energy supply on the public budget. In the meantime, developers of efficient technologies will receive demand for their products.

A considerable number of stakeholders shall hence be involved in M3E and services will be provided through the cooperation of all stakeholders. Successful collaboration to reduce energy intensity would lead to higher economic productivity and thus additional value added, reduced emission of pollutants and GHGs and decreased social costs of the energy system.

When working properly, the M3E creates an environment that supports competition among service providers in reducing the costs of energy services. Stakeholders should cooperate in providing reliable, high quality and viable energy services. Ideally, each stakeholder provides an element of integrated responsibilities to meet the demand for energy services with high overall efficiency.

The emerging M3E, by its nature and due to the energy market characteristics in Iran, involves uncertainty in players' interactions with one another. To establish the M3E, the market initially requires special efforts in two specific areas for keeping barriers to participation and risks low: at first, proposing and maintaining a limited range of standard projects with a network of buyers, sellers, institutions, etc., and, later, the configuration of this network to facilitate the coordination between different players. Effective relationships and trust between market players are critical for the success of the M3E.

The present technical note has outlined M3E players and their roles based on the M3E bylaws besides further suggestions. As a next step, there is a need for comprehensive discussions about individual and shared responsibilities to achieve clear guidelines for a well-functioning market, detailed analysis of responsibilities of every stakeholder, and their integration in the framework of M3E that shall follow the present technical report. The writers kindly welcome comments and suggestions to improve the note.

4 List of recent Technical Notes

1. Technical Note No. 1 – The benefits of guidelines for project implementation in the Market for Energy Efficiency and Environment (M3E)

2. Technical Note No. 2 – Establishing an MRV system in accordance with the rules of the Market for Energy Efficiency and Environment (M3E)

3. Technical Note No. 3 – Eligibility criteria for projects in the Market for Energy Efficiency and Environment (M3E)

4. Technical Note No. 4 – A draft scheme for project implementation in the Market for Energy Efficiency and Environment (M3E)

5. Trade in energy savings: Overview on the mechanisms of Article 12 and the Market for Energy Efficiency and Environment (M3E)

5 References

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