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Supporting Iran in implementation of an integrated energy efficiency market

Technical Note No. 5

Trade in energy savings: Overview on the mechanisms of Article 12 and the M3E

Franziska Neumann, Hesam Ghadaksaz, Maryam Bakhshi

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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.

IREEMA
c/o DIW Econ GmbH
Mohrenstraße 58
10117 Berlin, Germany

Project Manager: Dr. Lars Handrich

Tel: +49 (30) 2060 9720
Fax: +49 (30) 2060 97299

service@ireema.com
www.ireema.com

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 انرژي فراهم گشته ولی ازآنجا که ساز و کارهای اجرایی این مشوق ها هنوز پیاده سازی نشده اند، 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 انرژي 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 انرژي 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 پروژه های 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 انرژي کمک رساند.

Executive Summary

Article 12[1] as well as the M3E (Market for Energy Efficiency and Environment) Bylaws[2] have been established to create the legal framework for a market environment which is characterized by very low consumer prices for energy. The artificially low prices, supported through government subsidies, currently encourage the wasteful use of energy and impede projects for energy efficiency improvement as the price distortion prevents consumers and potential investors from reaping the true economic benefits associated with reduced energy consumption. Consequently, many energy efficiency projects that are worthwhile from an overall economic perspective are currently not implemented because the associated cost savings for the consumer do not cover the investment costs.

The idea behind Article 12's provisions and the M3E is to incentivise energy efficiency investments which are otherwise unprofitable from an energy consumer's point of view: they assign an additional value to energy savings by reimbursing energy saved, or by allowing project owners to sell the savings to higher-tariff national or international consumers for a pre-defined period. The basis for this mechanism is the strongly differentiated system of energy tariffs currently in place in Iran.

Article 12 grants potential investors the opportunity to receive cash flows as repayment of energy efficiency investments through one of the following options:

- selling energy savings on international markets and obtaining the revenues,
- receiving payments in the amount of the (internal or export) market value for energy savings from the state.

Article 12 depends strongly on the state as a major stakeholder of the planned market for reimbursing energy savings, due to the difficulties connected with independently exporting products. As this is incompatible with key characteristics of a market-based mechanism and in order to remove executional obstacles and challenges on Article 12, the ideas regarding an energy efficiency market in Iran have been further developed: The Bylaws, passed in early 2018, further determine the regulatory setup for another option: selling energy savings independently to higher-tariff domestic consumers. They determine the general conditions under which an investor can obtain the amount of saved energy and sell this amount on the national market to other, higher-tariff customers. This setup for internal trade among domestic consumers is referred to as the M3E.

The relative differences across energy tariffs are substantial, regarding electricity as well as natural gas. Still, the major challenge for implementing the M3E stems from the fact that margins are still small in absolute values, as Iranian energy tariffs are generally very low compared to internationally customary prices. Therefore, from the perspective of any energy efficiency project, obtaining the export price margins is of course always more attractive than obtaining internal tariff margins.

Ultimately, M3E can be seen as the successor of Article 12 with somewhat different conditions and requirements. The types of energy saving projects addressed hence differ at some instances:

[1] Article 12 of the "Law on Elimination of barriers to competitiveness and improving the country's financial system", ratified in April 2015.

[2] The "Bylaws for creating the market for energy efficiency and environment", ratified by the Supreme Energy Council in March 2018.

- The M3E is a framework for state-independent trade in energy savings, currently only among domestic consumers. It is suitable for large projects as well as for smaller ones, where the amount of energy saved is too low to justify the high transaction cost of selling on international markets. Given that it builds on the internal price margins, the M3E's internal trade primarily addresses the "low-hanging fruits", i.e. energy savings achievable at low cost by consumers which are able to exploit the largest price differentials on the internal energy market. Thus, the M3E focuses on consumers in the lowest tariff groups, with the ability to reduce consumption easily.
- The option to consider export prices for savings as granted by Art. 12 involves more interaction with the state, possibly relatively high transaction cost and a risk of delayed repayment due to the dependence on dedicated budgets. For consumers/sectors that already face comparatively high energy tariffs and therefore low domestic opportunity cost to exploit price differentials within the M3E, selling energy savings at export rates is the only viable option. The possibility to export saved energy via Art. 12 (or possibly even the M3E framework in the future) may also cover energy savings in utilities, such as through the reduction of natural gas leakages and electricity losses in transmission and distribution networks, or flare gas reductions, that basically have no internal tariff.

خلاصه مدیریتی

ماده ۱۲ [3]و همچنین آیین‌نامه [4] «ایجاد بازار بهینه‌سازی انرژی و محیط زیست» M3E چارچوبی قانونی برای یک محیط داد وستد ایجاد کرده اند که مشخصه آن قیمت‌های بسیار پایین انرژی برای مصرفکننده است. درحال حاضر، قیمت‌های پایین و غیرواقعی که از طریق یارانه‌های دولتی حمایت می‌شوند، استفاده ناکارآ از انرژی را تشویق می‌کنند و مانعی برای اجرای پروژه‌های بهبود کارآیی انرژی هستند، چرا که اختلال در قیمت‌ها، مصرف کنندگان و سرمایه گذاران بالقوه را از کسب مزایای اقتصادی واقعی مرتبط با کاهش مصرف انرژی منع می‌کند. در نتیجه، بسیاری از پروژه‌های بهینه‌سازی انرژی که از چشم‌انداز کلی اقتصادی ارزشمند هستند، از منظر هزینه‌های قابل صرفه‌جویی برای مصرفکننده، نمی‌توانند هزینه‌های سرمایه‌گذاری را پوشش دهند.

ایده اصلی ماده ۱۲ و M3E به حرکت درآوردن توسعه‌دهندگان پروژه و سرمایه گذاران بالقوه در جهت ارائه طرحها و ابزارهای مالی برای اجرای پروژه‌های توجیه پذیر بهبود کارآیی انرژی است: از طریق اختصاص ارزش اضافی به صرفه‌جویی انرژی با بازپرداخت مبلغ صادراتی معادل آن یا فراهم کردن امکان فروش صرفه‌جویی به مصرفکنندگان ملی یا بین‌المللی برای یک دوره از پیش تعیین‌شده توسط مالکان پروژه. اساس این مکانیسم، در حال حاضر بر مبنای سیستم بسیار متنوع تعرفه انرژی در ایران استوار است.

ماده ۱۲ برای سرمایه‌گذاران، فرصت دریافت جریان وجوه نقدی حاصل از سرمایه‌گذاری روی پروژه‌های بهینه‌سازی انرژی را ایجاد می‌کند که از طریق بازپرداخت انرژی صرفه‌جویی شده به کمک یکی از گزینه‌های زیر ممکن است:

- فروش انرژی صرفه‌جویی شده در بازارهای بین‌المللی و کسب درآمد،
- دریافت مابه‌التفاوت مبلغ معادل صرفه‌جویی انرژی با توجه به میزان ارزش بازار (داخلی یا صادراتی) از دولت

ماده 12 به شدت به دولت به عنوان نهاد ذینفع جهت بازپرداخت صرفه‌جویی انرژی وابسته است. ازآنجا که این امر با ماهیت مکانیسم مبتنی بر بازار در تضاد هست و همچنین به جهت رفع موانع و چالش‌های اجرایی ماده 12، ایده‌های مرتبط با بازار بهینه‌سازی انرژی توسعه یافت: آیین‌نامه‌ای که در اوایل سال 2018 تصویب شد چارچوب قانونی جهت گزینه دیگری را فراهم کرده است: فروش مستقل انرژی صرفه‌جویی شده به مصرف-کنندگان داخلی دارای تعرفه بالا. این سیستم داد و ستد بین مصرف-کننده‌های داخلی به عنوان M3E «بازار بهینه‌سازی انرژی و محیطزیست» شناخته می‌شود.

تفاوت‌های قابل توجهی بین تعرفه‌های انرژی وجود دارد. این مساله برای برق و گاز طبیعی صادق است. با این‌وجود، علی‌رغم تفاوت‌های فاحش، چالش اصلی ناشی از این حقیقت است که این اختلافها در مقادیر مطلق، بسیار کوچک هستند، چرا که تعرفه‌های انرژی در ایران به طور کلی در مقایسه

[3] ماده ۱۲ «قانون حذف موانع تولید رقابت‌پذیر و بهبود نظام مالی کشور»، که در آوریل ۲۰۱۵ به تصویب رسید

[4] «آیین نامه ایجاد بازار بهینه‌سازی انرژی و محیطزیست» که توسط شورای عالی انرژی در فوریه ۲۰۱۸ تصویب شد.

با قیمت‌های متعارف بین‌المللی بسیار پایین است. بنابراین، از منظر پروژه‌های بهینه‌سازی همواره کسب درآمد از طریق بازپرداخت ارزش صادراتی در مقایسه با اختلاف بین تعرفه‌ها جذابتر است.

نهایتا، بازار بهینه‌سازی انرژی و محیطزیست در امتداد ماده 12 و در ادامه آن ایجاد شده که شرایط و الزامات نسبتا متفاوتی با ماده 12دارد. انواع پروژه‌های بهینه‌سازی انرژی اشاره شده از برخی جوانب متفاوت هستند:

- چارچوب بازار M3E برای داد وستد صرفه‌جویی انرژی مستقل از دولت، مابین مصرف‌کننده‌های داخلی برای پروژه‌های کوچک و بزرگ مناسب است، مشخصا جایی که در آن مقدار انرژی ذخیره‌شده بسیار پایین است و هزینه معامله بالای فروش در بازارهای بین‌المللی را توجیه نمی‌کند. تجارت داخلی M3E و بین مصرف‌کننده‌های با تعرفه متفاوت عمدتا به پروژه‌های " سهل الوصول" توجه دارد، برای مثال دستیابی به صرفه‌جویی انرژی با اعمال هزینه پایین توسط مصرف کنندگان که با لحاظ بیشترین اختلاف تعرفه در بازار انرژی داخلی توجیه‌پذیر باشد. بنابراین، M3E بر روی مصرف کنندگان مقیاس کوچک در پایین‌ترین گروه‌های تعرفه، با توانایی کاهش آسان مصرف و انعطاف‌پذیری برای تغییر مصرف متمرکز است.

- گزینه مربوط به در نظرگرفتن قیمت‌های صادراتی برای صرفه جویی تحت ماده 12 شامل تعاملات بیشتر با دولت می‌باشد، احتمالا هزینه‌های معاملاتی بالایی دارد و ریسک تاخیر در بازپرداخت‌های دولتی وابسته به بودجه‌ها تخصیص داده شده را نیز بهمراه دارد. برای مصرف-کنندگان و بخش‌هایی که در حال حاضر با تعرفه‌های انرژی نسبتاً بالا مواجه هستند و بنابراین فرصت‌های داخلی کمی برای بهره‌برداری از تفاوت قیمت به‌واسطه M3E دارند، احتمالا استفاده از قیمت‌ها صادراتی تنها گزینه توجیه‌کننده پروژه خواهد بود. همچنین، فرصت صادرات در چارچوب ماده 12 (یا حتی در چارچوب بازار در آینده) می‌تواند پروژه‌های مرتبط با توزیع و عرضه انرژی مانند کاهش تلفات برق در شبکه، کاهش اتلاف گاز در سیستم توزیع و کاهش گاز فلر را که در واقع فاقد تعرفه داخلی می‌باشند نیز پوشش دهد.

Contents

1 Why an energy trading mechanism?

Article 12[5] as well as the M3E (Market for Energy Efficiency and Environment) Bylaws[6] have been established to create the legal framework for a market environment which is characterized by very low consumer prices for energy. The artificially low prices, supported through government subsidies, currently encourage the wasteful use of energy and impede projects for energy efficiency improvement as the price distortion prevents consumers and potential investors from reaping the true economic benefits associated with reduced energy consumption. Consequently, many energy efficiency projects that are worthwhile from an overall economic perspective are not implemented because the associated cost savings for the consumer do not cover the investment costs.

The idea behind Article 12's provisions and the M3E is to call project developers and potential investors into action to provide ideas and financial means to implement economically sensible projects for improving energy efficiency. In many instances, such plans exist and they are in a well advanced state, too – but their implementation is too costly to pay off through energy savings, given the current low tariffs. The regulations' target is to incentivise energy efficiency investments which are otherwise unprofitable from an energy consumer's point of view: they assign an additional value to energy savings by reimbursing energy saved or by allowing project owners to sell the savings to higher-tariff national or international consumers for a pre-defined period. The basis for this mechanism is the strongly differentiated system of energy tariffs currently in place in Iran (see section 3). As the mechanism is market-based, it supports energy productivity improvement by pushing the implementation of measures at the lowest possible cost.

In the following, section 2 presents a more detailed outline of the regulatory setup of Art. 12 and the M3E. Section 3 provides an overview on the current Iranian energy tariffs, to enable a better understanding of trading options for energy savings.

2 Regulatory setup of Article 12 and the M3E

Article 12 of the "Law on Elimination of barriers to competitiveness and improving the country's financial system", was ratified in April 2015 as a permanent law on the basis of paragraph Q of 2014's budget law. The budget law in 2014 and precedent years had provided the opportunity for investors to receive reimbursements of energy savings based on the difference between local tariffs and export values.

Article 12 grants potential investors the opportunity to receive cash flows as repayment of energy efficiency investments through one of the following options:

- selling energy savings on international markets and obtaining the revenues,
- receiving payments in the amount of the (internal or export) market value for energy savings from the state.

[5] Article 12 of the "Law on Elimination of barriers to competitiveness and improving the country's financial system", ratified in April 2015.

[6] The "Bylaws for creating the market for energy efficiency and environment", ratified by the Supreme Energy Council in March 2018.

Article 12 depends strongly on the state as a major stakeholder of the planned market for reimbursing energy savings, due to the difficulties connected with independently exporting products. As this is incompatible with key characteristics of a market-based mechanism and in order to remove executional obstacles and challenges on Article 12, the ideas regarding an energy efficiency market in Iran have been further developed: The Bylaws, passed in early 2018, further determine the regulatory setup for another option: selling energy savings independently to higher-tariff domestic consumers. They determine the general conditions under which an investor can obtain the amount of saved energy and sell this amount on the national market to other, higher-tariff customers. This setup for internal trade among domestic consumers is referred to as the *Market for Energy Efficiency and Environment (M3E)*.

In the following, subsection 2.1 explains in greater detail the possibilities granted by Article 12 and the institutional processes of the mechanism. Subsection 2.2 succeeds with the same information regarding the M3E.

2.1 Specifics of the Article 12 mechanism

Article 12 of the "Law on Elimination of barriers to competitiveness and improving the country's financial system", ratified in April 2015, specifies that an amount of USD 100 billion and an additional IRR 500,000 billion (inflation-indexed) should be made available each year for measures to improve the efficiency of production in the country, with a particular focus on energy. The figures build on the premise that investments of this magnitude would soon pay off, through production cost savings in general and energy savings in particular.

Projects eligible for Article 12 need to increase the quality or quantity of production, reduce the cost of production, minimize environmental damage or improve health or property. The major focus however is on energy saving, which is considered to have the greatest potential for productivity gains in Iran. To repay the incurred investment costs, the Government is entitled to purchase the additional outputs or saved inputs.

The regulation is addressed to all Iranian ministries and other governmental institutions, but particularly the Ministry of Petroleum (MoP) and the Ministry of Energy (MoE), including their subsidiaries and subordinate organizations. Their task is to support and advance investments in energy efficiency measures made by individuals or legal entities, by signing contracts of repayment through governmental funds in the abovementioned amounts. The focus of support is on private-sector initiatives.

The institutional process for the implementation of energy efficiency projects under the framework of Article 12 includes the following steps:

- Any individual person, legal entity or governmental organization may propose a project via an online proposal form. The proposal is subject to evaluation by the responsible governmental organization, which is the potential contracting partner. Approval by the Supreme Economic Council is further required.
- The project must provide proof of energy savings or improved outputs, i.e. there is need for implementing a monitoring, verification and reporting procedure. In some cases of

improvements in outputs or, e.g., infrastructure, the calculation of savings might be hypothetical.[7]

- There are two options for the project owner to collect the equivalent value of the savings:
  1. receiving the saved amount of energy carrier (against paying one's own tariff) and the authorization to sell it on international markets[8],
  2. obtaining the monetary difference between the average export price[9] and one's own tariff, reduced by exporting costs and penalties.
- Repayment is guaranteed by MoP, according to the future additional incomes or cost reductions from saving energy.

Due to the need for considering exporting opportunities, the provisions of Art. 12 to sell saved energy on international markets imply comparatively high transaction costs per project – for project owners as well as the contracting governmental organizations. Profitability is conditional on a broad knowledge of (international) energy markets and on the relevant infrastructure base. Thus, the exporting opportunity provided in Art. 12 is a more relevant option in cases of large-scale investment at large companies with very high savings potential, e.g. in the energy sector (South Pars Special Economic Zone in Assaluyeh).

2.2 Specifics of the M3E mechanism for internal trade in energy savings

The *Bylaws for Creating the Market for Energy Efficiency and Environment* set an institutional frame for trade in energy savings in the domestic market only (at current). The market design addresses internal price differences due to time, location, and type of consumer. At the core of the M3E are tradable certificates that project owners obtain against the proof of energy savings. An energy saving certificate (ESC) demonstrates ownership of a certain amount of energy carrier and can be sold to other consumers in the market. Buyers of certificates, upon delivering them to their energy suppliers, may receive the claimed amount of energy carriers or count it against their bill.

Main addressees with regard to investment projects within the M3E framework are, on the one hand, small, medium and large businesses with substantial use and savings potential of energy. On the other hand, potential buyers of saved energy include businesses that face higher tariffs (see section 3).

The M3E mechanism in itself does not provide adequate opportunities for projects at individual households. Their energy saving potential is usually limited to small amounts, while transaction costs of project implementation, savings measurement and verification as well as trading costs and risks are high. Given the overall low level of energy prices, Iranian households are not likely to engage in the

[7] The calculation of hypothetical savings will be necessary, e.g., when actual energy consumption rises through energy efficiency measures which are associated with a scale-up of production. Another case in which savings must be calculated hypothetically is the improvement of public transport, as reductions in demand for individual transport must be estimated.

[8] Alternatively, project owners may put the amount of energy carriers that they receive to their own use or sell it on the internal market.

[9] In case of electricity and natural gas savings, the monetary return may be determined by the revenue obtainable with equivalent exports of oil.

M3E individually. Projects in households may be attractive for investors if sampled to bundles of projects (to so-called "programs of activities") to increase investment volumes while keeping transaction costs low, exploiting scale effects.

Importantly, trading opportunities in the M3E currently cover natural gas and electricity savings only. The Ministry of Petroleum (MoP) has determined that petroleum products are excluded from the M3E for the time being.[10] There is no reason in principle to refuse widening the scope of the M3E to include also petroleum products.

The trade in energy savings within the M3E framework concerns final energy consumption. This is evident based on the background of using differences in consumer prices for energy carriers such as electricity and natural gas. Trade among consumers, drawing electricity and natural gas from the grids at their own premises, makes it necessary to take into account, measure and report savings in terms of final energy consumption.

Following discussions with Iranian stakeholder institutions and organizations in early 2019, fuel switches will generally not be accepted in the given framework, with the exception of off-grid renewable solutions. This implies that trading saved energy carriers will only be possible if the measure does not replace it with another conventional carrier.[11] In other words, savings in grid-supplied electricity or natural gas achieved by replacement with off-grid renewable installation will be eligible for trade under the mechanism; though a list of definite and clear eligibility criteria has not been agreed on so far. However, there is a broad consensus that projects must serve the goal of reducing energy intensity with regard to conventional carriers. This means that projects need to directly save grid-supplied electricity or natural gas, and that the savings must be measurable, verifiable and reportable.[12]

The Bylaws determine that IFCO and SATBA are responsible for setting up measurement, reporting and verification (MRV) systems for fuel and electricity savings, respectively. Savings shall be reported monthly. Besides energy savings, the Bylaws further demand a monthly reporting of greenhouse gas emissions and pollutants.

The Bylaws state that the basis for savings calculations at an entity that produces goods or services includes the following variables:

- production volumes with regard to a certain product and
- energy (fuel or electricity) intensity of the product according the relevant Iranian standards at the time of implementation of the project.

A more standard approach, which is also currently discussed among stakeholder institutions, is to consider actual energy consumption before energy saving measures have been implemented (pre-

[10] Article 12 does not exempt any specific carriers of energy.

[11] I.e., switching from natural gas to electricity or vice versa will not be a viable option for trade in energy savings.

[12] For a set of standard projects which are easy to keep track of and with comparatively small quantities, there might be relaxed rules for measurement and verification. However, this is still subject to discussion among the responsible specialized and technical institutes.

retrofit).[13] Furthermore, it is suggested that other determinants of energy use besides production volumes may also be considered for the calculation of a baseline scenario. Decisions are pending.

The Bylaws appoint the suppliers of energy carriers as publishers of certificates, having obtained approval by the Energy Saving Commission (ESC). Issuance of certificates for savings as reported and verified is against the payment of the respective consumer's tariff at the time that energy is saved.

Before any project can receive certificates under the M3E, a formal application is necessary, indicating the project's characteristics and eligibility for the mechanism. It is envisaged that a central data registry and an online proposal toolkit will be established. The project proposal needs evaluation and approval by a commission set up by the specialized and technical institutes for the M3E.[14]

3 Overview on the Iranian energy tariff system

Electricity and natural gas tariffs in Iran vary in many dimensions, and the differences are substantial. The present section is intended to provide an initial orientation, including some exemplary rates. Note that the structure of energy tariffs for non-residential consumers differs from the one for residential consumers.

Regarding petroleum products, rates vary much less. Power plants pay a lower price for diesel and mazut (fuel oil) than other consumers (see Table 3-1).

Table 3-1: Prices for petroleum products, 2019 rates

Type	Price (IRR/Liter)
Regular Gasoline	10,000
Premium Gasoline	12,000
Diesel for Power Plants	2,100
Diesel for other sectors	3,000
Mazut for Power Plants	1,300
Mazut for other sectors	3,000
Kerosene (white oil)	1,500

3.1 Residential consumers

For residential consumers, the tariff system considers the following features:

- **climate zone** (electricity: "normal" regions as opposed to four categories of warm regions; natural gas: four climate zones) and **season** (electricity: warm regions have lower tariffs in the warmest months; natural gas: tariffs are generally lower in the cold season),

[13] Otherwise, there would be no energy saving incentive from the mechanism for producers with below-standard energy efficiency, as they would not be able to claim the improvement as savings.

[14] The Bylaws specify the following bodies as specialized and technical institutes for the M3E: Ministry of Petroleum (which includes IFCO and supply companies), Ministry of Energy (which includes SATBA and supply companies), Vice-Presidency for Science and Technology (VPST), Department of Environment, Iranian National Standards Organization (INSO) and the Planning and Budget Organization (PBO).

- **consumption volumes** (with higher tariffs for large-scale consumers and, additionally, higher rates for those consumers who exceed the defined monthly consumption pattern),
- **load profile** (electricity only, applicable only to consumers with time-of-use meters, considerable surcharges for peak consumption and discounts for off-peak consumption).

The monthly consumption pattern as outlined in Table 3-2 below defines standard volumes of per household consumption. The standards for warm seasons differ substantially across regions, as consumers in the warmest regions have a high need for cooling.

Table 3-2: Monthly consumption patterns for residential consumers

Region/season		Monthly Consumption Pattern (kWh)
Normal Regions	22nd May to 22nd September	300
	Rest of the year	200
Non-warm seasons of all types of warm regions		200
Warm Region Type 4		400
Warm Region Type 3		1,000
Warm Region Type 2		2,000
Warm Region Type 1		3,000

The range of electricity tariffs applicable to residential consumers, before surcharges and discounts, is between 175 IRR/kWh (small-scale consumers in warmest regions during warm months) and 4319 IRR/kWh (large-scale consumers in normal regions).[15] Table 3-3 below presents an exemplary outline of the electricity tariffs for residential consumers in normal regions (applicable also to consumption in warm regions during the colder months), disregarding timing (load).

Natural gas tariffs for residential consumers range between 414 IRR/m^3 (small-scale consumers in the cold season) and 4830 IRR/m^3 (large-scale consumers in the cold season). Table 3-4 further below provides an overview of natural gas tariffs for residential consumers in the warm season, differentiated with regard to consumption ranges.

Generally, the most substantial variation of tariffs is with regard to consumption volumes.

Table 3-3: Electricity: exemplary tariffs for residential customers in normal regions, 2019 rates

	Average monthly consumption (kWh)	0-100	101-200	201-300	301-400	401-500	501-600	>600
Tariff (IRR/kWh)	Below-pattern* average monthly consumption	524	611	1,310	-	-	-	-
	Above-pattern average monthly consumption	603	702	1,506	2,710	3,113	3,916	4,319

* The pattern foresees consumption of 300 kWh in summer (22 May to 22 September) and 200 kWh in the rest of the year.

[15] By May 2019, Persian year 1398.

Table 3-4: Natural gas: exemplary tariffs for residential consumers in warm seasons (Apr-Nov), 2019 rates

Range	1	2	3	4	5	6	7	8	9	10	11	12
Monthly consumption range (m^3)	<45	46-95	96-145	146-195	196-245	246-295	296-345	346-395	396-445	446-495	496-545	>545
Tariff (IRR/m^3)	1,081	1,311	1,656	2,116	2,576	2,806	3,151	3,496	3,726	3,956	4,186	4,301

3.2 Non-residential consumers

With regard to **electricity tariffs**, there are ranges of two to three sub-categories for each category of non-residential consumers (public/governmental, agriculture/water, industry/mining, and other). The sub-categories relate to specific branches or type of energy usage (e.g. pumps for irrigation). Besides, the electricity tariff system considers the following features:

- **contracted power** (electricity only; constant monthly power subscription fees for consumers surpassing the threshold of 30 kW),
- **load profile** (electricity only, with considerable surcharges for peak consumption and discounts for mid-peak and off-peak consumption, applicable only to consumers with proper meters).
- Furthermore, there are some **specific modifications**. E.g. for all non-residential customers, a 20 percent surcharge is added to the bill in the summer months. Other rules consider the type of energy usage (production vs. non-production use) or if producers contribute to network balancing, e.g. by switching off their installations at peak hours.

In some instances, electricity consumers can choose between different tariff options that shift between per-unit charges of energy consumed and power subscription fees: by paying a higher subscription fee, consumers can reduce their per-unit price. In any case, it is important that project developers consider the actual specific rates applied to the relevant consumer.

Electricity tariffs are generally lowest for agricultural producers. In off-peak hours, agricultural producers are, e.g., charged 70 IRR/kWh for running water pumps for irrigation, at peak hours the charge is 282 IRR/kWh. Electricity consumers from industry and mining pay up to 1,642 IRR/kWh at peak hours, but generally less than 500 IRR/kWh at off-peak hours. The largest per-unit charges are at 4,952 IRR/kWh, for ministries and governmental organizations as well as inner-city road lighting at peak hours.

Table 3-5: Electricity: exemplary tariffs for non-residential consumers, agriculture and water, 2019 rates

Tariff Code		Power more than 30 kw				Power less than 30 kw			
		Subscription (IRR/kw)	Energy Tariff (IRR/kwh)			Subscription (IRR/kw)	Energy Tariff (IRR/kwh)		
			peak	mid peak	off peak		peak	mid peak	off peak
3-A		--	282	141	70	--	282	141	70
3-B		20,965	546	273	136	--	682	341	170
3-C	Choice1	34,940	714	357	178	--	1,068	534	267
	Choice 2	--	1,068	534	267	--			

Code	Explanation
3-A	Water pumps for irrigation (agriculture, second pumps, pressure and gravity irrigation) Water pumps for horticulture, livestock farms, mushroom, flower plants and fish production) Electric busses and trains
3-B	Non-pumping consumption of livestock farms (poultries, animal farms), Silk caterpillar production, bees, etc. Drinking water pumps, water and wastewater treatment plants, etc.
3-C	Non-pumping consumption for mushroom and flower production Tea plants, Cool Houses, rice and corn processing units, rural flour units

Regarding **natural gas tariffs**, there is an extensive list of activities with specific tariffs. In some instances, they differ regarding

- **season** (warm vs. cold season), and
- **consumption scale** (high-pressure consumers have higher tariffs in the warm season).

The range is from free-of-charge natural gas (religious facilities) up to 4,500 IRR/m³ (CNG suppliers serving final consumers). The petrochemical industry, which uses natural gas as a feedstock, pays an even higher price, following a dedicated calculation formula that partly considers prices on export markets. This price is subject to regular, three-monthly updates. Currently, the tariff is at 9,000 IRR. Converted to USD by the official SANA exchange rate, this has been around 0.09 to 0.13 USD lately.[16]

Table 3-6: Natural gas: exemplary tariffs for non-residential consumers, 2019

Consumer	Tariff (IRR/m3) Warm season	Tariff (IRR/m3) Cold season
Rural and urban mosques, religious centres etc.	free	
Power plants	607	
Education and sports places	926	
Brick industry, sugar, aluminium, copper, hotels, mechanized bakeries and others	1,000 (large-scale cons.: 1,500)	1,000
Agriculture	1,150	690
Commercial services and retail (for space heating)	1,495	
Steel industry	2,600	
Governmental and public institutions	2,990	1,495
CNG stations (serving final consumers)	4,500	

[16] https://www.sanarate.ir/.

4 Conclusion

Against the background of highly subsidized energy tariffs in Iran, raising energy efficiency needs an innovative approach. A market-based mechanism may be successful in realizing opportunities for energy efficiency improvement.

With regard to internal trade of energy savings under the M3E, section 3 demonstrated that the relative differences across energy tariffs are substantial. This holds for electricity as well as natural gas. For example, governmental organizations pay 4,952 IRR per kilowatt-hour in peak hours while agricultural producers are charged only 282 IRR – these rates differ by factor 17.5. Natural gas is even free of charge in some instances, while governmental organizations pay 2,990 IRR per cubic meter (in the warm season) and CNG stations serving final consumers pay 4,500.

Despite the tremendous relative differences, the major challenge for implementing the M3E stems from the fact that margins are still small in absolute values, as Iranian energy tariffs are generally very low compared to internationally customary prices.[17] Therefore, energy savings that are contingent on the acquisition of expensive technology might not pay off in many instances, even if the sales value of savings is many times as high as one's own tariff. The case is more difficult when a project requires investment in foreign currency such as Euro or US Dollar, as the Iranian Rial has been subject to high inflation rates recently.

From the perspective of any energy efficiency project, obtaining the export price margins is of course always more attractive than obtaining internal tariff margins. Even if project owners are not capable of trading energy internationally themselves, applying for compensations from the Government, which consider international market prices, promises higher margins than internal trade. However, previous experience proves that the Government sets high requirements for the approval and monitoring of projects that receive compensation oriented at export prices and the administrative effort is high. Furthermore, the budget for compensation from the Government under Art. 12 is limited – in contrast to trade in energy savings among consumers, which does not strain the Government's budget.

Ultimately, M3E can be seen as the successor of Article 12 with somewhat different conditions and requirements. The types of energy saving projects addressed hence differ at some instances:

- The M3E is a framework for state-independent trade in energy savings, currently only among domestic consumers. It is suitable for large projects as well as for smaller ones, where the amount of energy saved is too low to justify the high transaction cost of selling on international markets. Given that it builds on the internal price margins, the M3E's internal trade primarily addresses the "low-hanging fruits", i.e. energy savings achievable at low cost by consumers which are able to exploit the largest price differentials on the internal energy market. Thus, the M3E focuses on consumers in the lowest tariff groups, with the ability to reduce consumption easily.
- The option to consider export prices for savings as granted by Art. 12 involves more interaction with the state, possibly relatively high transaction cost and a risk of delayed

[17] Using an exchange rate of 100,000 IRR/USD, the highest tariffs mentioned above translate into 0.11 USD/kWh (4,628 IRR/kWh) and 0.07 USD/m³ (2,990 IRR/m³) respectively.

repayment due to the dependence on dedicated budgets. For consumers/sectors that already face comparatively high energy tariffs and therefore low domestic opportunity cost to exploit price differentials within the M3E, selling energy savings at export rates is the only viable option. The possibility to export saved energy via Art. 12 (or possibly even the M3E framework in the future) may also cover energy savings in utilities, such as through the reduction of natural gas leakages and electricity losses in transmission and distribution networks, or flare gas reductions, that basically have no internal tariff.

5 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)