Innovative energy efficiency instruments for the MENA region

Summary for Policy Makers

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

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Innovative Energy Efficiency Instruments for the MENA Region

Submitted by:
Kawther Lihidheb, Rafik Missaoui, Jamil Shariff

Econoler
160 Saint-Paul St.,
Quebec City,
QC G1K 3W1
Canada

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Köthener Straße 2
10963 Berlin, Deutschland

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Responsible:
Anita Richter, GIZ
René Kieselhorst, GIZ
Martin Neussel, GIZ

Design:
design-werk.com, Nikolai Krasomil

Cover photo:
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Introduction

The MENA region is a particularly interesting region for energy efficiency instruments. Due to high fossil fuel subsidies compared to other regions in the world, energy prices have been historically low. As a result, energy consumption and energy intensity per capita levels are comparatively high in this region and it is expected that population and economic growth will even further increase energy demand. Over the last few years, the energy markets in this region have opened up for private-sector involvement and existing energy subsidies have been reduced, which will increase costs for consumers and the industry. Reducing energy consumption is becoming more and more economically attractive and necessary and has big potential to reduce dependence on fossil fuels.

As a result, almost all the countries have already developed energy-reduction policies. Targeting energy consumption and implementing energy-efficiency measures can free up capital for other infrastructure investments and help these countries achieve national climate targets while minimizing the impact of energy-subsidy reforms.

Several countries in the MENA region have set energy efficiency (EE) targets to tap this potential and embedded them in National Energy Efficiency Action Plans (NEEAPs) or included energy efficiency in their Nationally Determined Contributions (NDCs) under the Paris Agreement for climate protection. However, the mix of instruments to reach the EE targets can be enriched to increase effectiveness. Most countries have defined sector-specific targets and try to lower, for example, energy consumption in buildings through building codes, efficient lighting, installing solar water heaters or standards for household appliances. The industrial sector is also targeted through energy audits and energy management systems.

Several innovative EE instruments are already in place worldwide and have proven that they are successful and transferable but are not common in the MENA region. In particular, there is potential to test and adapt instruments that can create market opportu-

Table 1: Overview of the Instruments and the Selection Criteria for the Region

#	Instruments	Is the instrument in place in the MENA region?	Simplicity of implementation	Transferability and replicability	Capacity of market transformation
1	Auction systems for EE	Practically nonexistent	Some barriers	Rather easily transferable	Rather large capacity
2	Mandatory EE targets	Practically nonexistent	Rather easy to put in place	Easily transferable	Rather large capacity
3	Utility-managed EE Programs	Practically nonexistent	Rather complex to put in place	Some barriers	Rather large capacity
4	EE Networks with Voluntary Goals	Only a few examples	Rather easy to put in place	Rather easily transferable	Medium capacity
5	DSM Electricity Pricing or Dynamic Electricity Prices	Only a few examples	Rather complex to put in place	Rather context specific circumstances	Rather large capacity
6	Mechanism for Accelerating Replacement of the Stock of Energy-using Equipment and Appliances	Only a few examples	Some barriers	Some barriers	Rather large capacity
7	Energy Savings Insurance Mechanism of an Energy Performance Contract	Practically nonexistent	Some barriers	Rather easily transferable	Medium capacity
8	Voluntary Agreement	In some countries	Some barriers	Rather easily transferable	Medium capacity
9	EE Tax-based Instrument	Practically nonexistent	Some barriers	Rather context specific circumstances	Rather large capacity
10	Super ESCO	In some countries	Some barriers	Rather easily transferable	Rather large capacity

nities for private-sector actors according to the conditions of the MENA countries. The DIAPOL-CE project for "Policy dialogue and knowledge management on low emissions development strategies in the Middle East and North Africa region" undertaken by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) commissioned Econoler to conduct a study on innovative EE instruments for the MENA region. The overall objective of this assignment is to identify and assess the potential relevance of innovative instruments for promoting EE in the MENA region, with a focus on five countries for case studies.

The study was carried out to support the implementation of cost-effective EE measures and help achieve a large-scale transformation of the region's economy. The general approach used to conduct the study was as follows: conducting interviews with key experts and a desk study to establish a long list of EE instruments to be considered; establishing a final list of the countries to be included in the study. A set of evaluation criteria was developed and applied to the list of instruments, first from the perspective of the entire region and then for the selected countries. From among the top-ranked policy instruments, four per country were chosen for more in depth study, resulting in ten studied policy instruments. Table 1 on previous page provides a general overview of the chosen instruments and some selected indicators. The full description of the methodology detailing all the selection criteria can be found in the comprehensive report.

This Summary for Policy Makers report is part of a larger and more comprehensive report and consists of factsheets for the ten policy instruments chosen for in-depth study. Each three-page factsheet includes a description of the instrument, key points relevant to implementing it in the MENA region, and a case study on potential implementation in one country. Table 2 below outlines the case studies presented in this summary document, along with the list of countries studied per instrument included in the comprehensive report.

The main goal of this report is to provide a convenient format to understand several important policy instruments and demonstrate the potential relevance of policies to MENA countries. The reader is directed to the main report entitled *Innovative Energy Efficiency Instruments for the MENA Region* for more details on the instruments, examples of best implementation practices, and additional case studies in the countries mentioned below.

Table 2: List of Countries Studied per Instrument

Instrument	Case Studies in this Summary for Policy Makers	Countries Covered in the Comprehensive Report
1. EE auction systems	Jordan	Morocco, Saudi Arabia, Egypt and Jordan
2. Mandatory EE targets	Saudi Arabia	Saudi Arabia and Egypt
3. Utility-managed EE programmes	Egypt	Oman, Morocco, Egypt and Jordan
4. EE networks with voluntary goals	Oman	Oman and Egypt
5. DSM electricity pricing	Jordan	Jordan
6. Mechanism for accelerating replacing the stock of energy-using equipment and appliances	Oman	Oman, Saudi Arabia and Jordan
7. Energy savings insurance (ESI) mechanism of an energy performance contract (EPC)	Morocco	Morocco
8. Voluntary agreement	Saudi Arabia	Saudi Arabia
9. EE tax-based instruments	Morocco	Morocco
10. Super ESCO	Egypt	Oman and Egypt

1 Description of the instruments

1.1 EEI #1 – Auction systems for EE

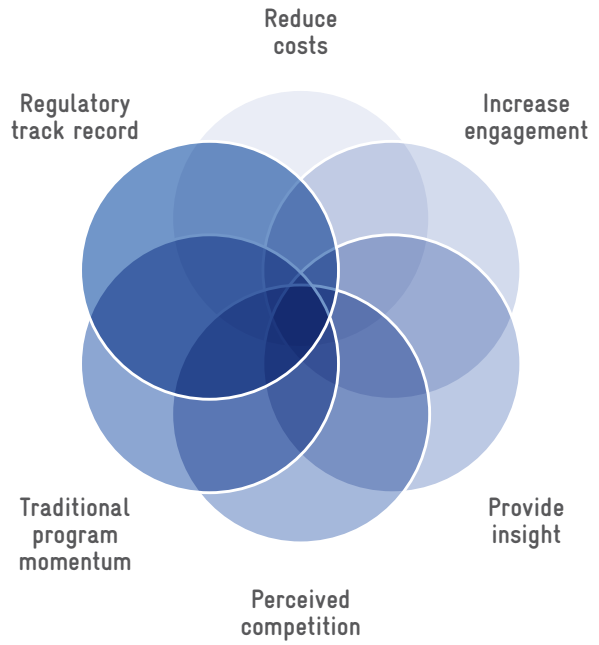
1.1.1 Description of the Instrument

Auctions are one of two main types of market-based instruments (MBIs) commonly used to increase EE. The other main type is an EE obligation.

> There are two main auction mechanisms allowing market actors to submit bids: (1) through competitive tenders whereby the lowest priced bid wins; (2) within a framework that sets the price for each unit of energy savings and invites key market actors to submit proposals for generating savings at a given unitary price.

> EE Obligation Schemes (or EEOS for short; also known as energy-saving obligations, energy efficiency resource standards, energy efficiency performance standards or white certificates) require utilities to carry out a defined level of activity to deliver energy savings but allow utilities the freedom to use the methods that they find most appropriate for doing so.

Figure 1: EE Auction Programme Impacts



MBIs in general and EE auctions in particular are "instruments that set a policy framework specifying the outcome (e.g., energy savings and cost-effectiveness) to be delivered by market actors, without prescribing the delivery mechanisms and measures to be used."[1] They reduce programme costs by being integrated within existing programme approaches, as illustrated in Figure 1 below, and introduce certain key but addressable concerns and risks.

EE auctions are a policy instrument aimed at achieving energy savings at highly attractive prices. For example, the data available for the EU country auction programmes reveal that the average lifetime cost of saved energy ranges from USD 0.005/kWh to 0.04/kWh.

A commonly used type of auction is the competitive bidding procurement process. This auction mechanism allows market actors to submit bids to competitive tenders whereby the lowest-priced bid wins or within a framework that sets the price for each unit of energy savings and invites key market actors to submit proposals for generating savings at a given unitary price.

Auctions apply to various types of technologies and sectors. They can be conducted just for EE or be combined with other generation sources in energy auctions if applicable rules permit.

1.1.2 Key Relevant Points to Implementation in the MENA Region

International experiences demonstrate that designing and implementing any type of formal auction system requires a careful and candid assessment of the institutional and regulatory framework robustness in each country. The auction system is often considered better adapted to large EE markets even if countries would still benefit from the use of a competitive auction mechanism in a small and weak competitive market.

Key lessons learned from international experience implementing an auction system in the MENA region include:

> Public procurement codes may need changes to allow EE auctions;

> A strong and independent energy regulator can create an attractive investment environment;

> An auction mechanism should be designed in such a way that it does not discriminate against small-scale private investors by favouring large state-owned companies;

1 Rosenow, J. Cowart, R. Thomas, S. (December 2018). Market-based instruments for energy efficiency: a global review. Energy Efficiency, Volume 12, Issue 5, pp. 1379–1398. https://doi.org/10.1007/s12053-018-9766-x.

> Due to the tendering scheme's novelty and complexity, there can be a need for communication measures and training potential stakeholders;

> A way to increase transparency is to have a publicly available independent ex-post audit of the process.

1.1.3 Jordan Case Study

Overall, the EE auction system is suitable to Jordan's energy policy and focus on EE and renewable energy (RE). This policy is being operationalised through the following strategies, regulations, action plans and tools:

> The Government has adopted a new strategy for the energy sector for the 2015-2025 period to achieve the following general objectives:
  – Secure a sustainable future energy supply for Jordan;
  – Diversify the national energy mix and increase the share of local resources;
  – Reduce the dependence on external energy sources and decrease the national energy bill;
  – Contribute to the achievement of the GHG emission mitigation country target adopted in the Jordan NDCs.

> Renewable energy and energy efficiency are considered as important components in the government's strategy to reach the objective of having 20% of generated electricity from renewable energy by 2025 and reducing energy consumption by 20% compared to the business-as-usual scenario in 2020;

> Law No. 13 of 2012 concerning the Renewable Energy and Energy Efficiency Law (REEEL)[2] and its related bylaws aimed at rationalising energy use and improving energy efficiency across various sectors;

> The second National Energy Efficiency Action Plan (NEEAP) with the objective of reducing 2,000 GWh per year by 2020, which represents 17.5% of the five-year average baseline consumption (2006-2010);

> A public competitive bidding and direct proposal submission instrument for developing large-scale private RE projects.

EE auctions seem to be compatible with these Jordanian energy policies because such auctions are intended to help reduce energy consumption, thereby rationalising them through energy savings at highly attractive prices. A significant portion of the energy savings targeted by Jordan can be supported by an auction mechanism.

Moreover, Jordan has successfully implemented several RE projects through public competitive bidding and direct proposal submissions. So far, three rounds have been successfully tendered with good results and implemented projects are operational. Typically, the government seeks the most competitive prices submitted through an auctioning process after shortlisting the most qualified companies. The experience accumulated by the Jordanian government in this field may serve as a good basis for implementing an EE auction instrument.

RE auctions could be valuable in supporting the general framework conditions needed for EE auctions despite the lack of established specific regulatory and legal framework conditions. Jordan could develop legislation to support EE auction systems and enable EE to compete against generation through auctions. Jordan could also adopt several other measures to help develop EE auction systems, including:

> Strengthening the capacity of the Ministry of Energy and Mineral Resources (MEMR), the entity assigned to play the role of EE auctioneer;

> Strengthening the capacity of the Energy and Minerals Regulatory Commission (EMRC), which will ensure the role of monitoring the proper application of the rules of transparency and equal opportunities of the EE auction process;

> Strengthening the capacity of the assigned organisation/entity to fulfill the role of the implementor of the national EE strategy and action plan to support MEMR in implementing EE auctions;

> Training potential stakeholders by informing and educating them about the potential EE auction programmes to be implemented in various sectors;

> implementing a number of pilot projects before rolling out any large-scale auction programme.

2 International Labour Organization (ILO), Jordan Renewable Energy and Energy Efficiency Law, http://www.ilo.org/dyn/natlex/natlex4.detail?p_lang=en&p_isn=94599&p_count=96150&p_classification=01.06&p_classcount=2839. Consulted on July 10, 2019.

1.2 EEI #2 – Mandatory Energy Efficiency Targets

1.2.1 Description of the Instrument

Targets for energy savings or EE improvements have been widely used in different countries and jurisdictions all over in the world. Targets can support monitoring progress, setting achievable goals and reinforcing political commitment to making EE improvements and increasing energy savings. Many countries publish their national targets or determine their national commitments to emission reductions based on international agreements, including the Paris Agreement. Therefore, national energy savings targets can serve as the basis for determining local and sectoral targets to encourage actions toward achieving national targets.

Mandatory EE targets are one of the EE instruments that can be applied to translate the national targets to local and sectoral targets. Although this instrument can apply to major sectors such as industrial, commercial and transportation, large energy-intensive industrial sectors are the most commonly targeted by this instrument, including the electricity and oil-refining sectors.

The focus of this analysis is mandatory EE targets applied to large industrial sectors and enterprises or other relatively small groups. When large industrial sectors are required to achieve EE targets, the targets are often directly negotiated with energy consumers or sector associations. Setting measurable targets, mandatory or otherwise, serve to clearly identify priorities, allow comparisons and benchmarking and serve as a basis for actions. Although targets are intended to improve performance by challenging those organisations or entities to whom targets apply, they have to be realistic to be motivating. Targets range from being straightforward to more complex and can be partially or fully mandatory. They may be set after audits are conducted to identify those areas where feasible improvements would be cost-effective and achievable within a prescribed timeframe.

At first, certain relatively simple mandatory actions can be implemented in an industrial sector, such as: assigning a qualified energy manager; reporting actions taken; and publishing plans for energy conservation and management standards. The energy audit is a common initial mandatory action that helps firms determine their energy consumption and identify energy-saving opportunities. The knowledge gained from an energy audit helps a firm become comfortable with mandatory targets. While regular audits help establish appropriate and achievable targets, the government and relevant industry often negotiate to set both mandatory EE targets and implementation schedules.[3]

1.2.2 Key Relevant Points to Implementation in the MENA Region

Mandatory EE targets are frequently one element of a larger more comprehensive package of policy solutions. At minimum, political, stakeholder and resource commitments are needed to set proper targets and then translate these into action.

Targets need to balance achievability and ambition. If they are too low, they are meaningless. Conversely, if they are too high, key stakeholders are not likely to participate in the delivery process.[4] Mandatory programmes offer a degree of certainty about results, which is consistent with government aspirations to achieve ambitious targets for reducing greenhouse gas emissions.

This type of incentive is considered extremely cost-effective compared with other programme types and supply-side alternatives; it is also a means of reducing greenhouse gas emissions. The process of introducing regulations and administering these programmes generate considerable data on the energy performance of products and markets. Such detailed information allows scrutiny and analysis, which are often impossible with other programme types.

The following key points should be considered to encourage mandatory EE target programmes in the MENA region:

- Designate a public implementing entity that will be responsible for the design, implementation and follow up of the whole process and rules negotiated with obligated parties;
- Develop regulations and rules that are enforceable and economically viable, in close collaboration with large energy-consuming industries or other obligated parties;
- Inform obligated parties prior to adopting the regulations to ensure that all parties are fully aware of the requirements and have developed strategies to meet them;
- Design flexible mechanisms for energy-intensive clients that cannot reach targets;
- Develop incentive mechanisms to support obligated parties in achieving their EE targets;
- A formal and robust measurement, reporting and verification (MRV) system must be incorporated from programme outset;
- Voluntary targets or measures can be used before mandatory targets are imposed since the latter can be seen as a heavy-handed means of achieving targets.

3 For some examples, see the UNIDO Industrial Energy Efficiency database at http://unido.olbaid.dk and http://iepd.iipnetwork.org.

4 Wade, J. et. al. European Council for an Energy Efficient Economy.(2011). "National energy efficiency and energy-saving targets". Retrieved from the European Council for an Energy Efficient Economy, 2011. http://hpaba.com/pages/en/energy%20efficiency2.pdf. Consulted on July 18, 2019.

1.2.3 Saudi Arabia Case Study

The Kingdom of Saudi Arabia (KSA) has already set several national targets related to energy consumption and climate change. According to the Vision 2030 guidelines,[5] energy efficiency should play a role in meeting increasing energy demand, in addition to increasing production and diversifying energy sources.

The National Energy Efficiency Action Plan (NEEAP) 2005-2030 is being implemented to achieve ambitious objectives, including a 30 percent reduction in electricity intensity between 2005 and 2030 and a 50 percent reduction in peak demand growth.

Saudi Arabia's high and rapidly increasing energy consumption offers highly untapped energy-saving potential in several sectors that can be mobilised through targeted EE policies.

A mandatory target applied to specific sectors, such as large industrial enterprises, aligns well with the aspirations outlined by the Government of Saudi Arabia in Vision 2030. EE standards (energy intensity targets) for new and existing plants exist but are not effectively enforced. In addition, the existing Super ESCO provides a technical basis for determining and setting realistic targets that can be achieved within reasonable timeframes. Mandatory targets for specific sectors are an effective means of ensuring that high-level targets and plans are achieved, such as the NEEAP. As a new subject for many organisations, limited targets (such as having an energy manager at facilities of a certain size) would align well with the goals of the NEEAP and improve familiarity with mandatory energy efficiency targets.

This instrument could be targeted at large energy consumers such as energy-intensive industrial enterprises, which would align well with the energy consumption patterns in Saudi Arabia. The industrial sector accounts for 44 percent of final energy consumption and 70 percent of the industrial sector's total energy use is consumed by steel, petrochemical and cement factories. These industries have significant EE potential that can be targeted by a mandatory EE instrument.

Mandatory EE targets would require a limited number of major changes to the general framework conditions and would be consistent with the broad regulatory and legal conditions in place. Particularly, imposing targets on large industrial enterprises as part of typical requirements associated with operating permits and licences should be relatively straightforward and feasible in the short term once a sub-sector (e.g. steel or petrochemical) is defined and realistic targets are estimated.

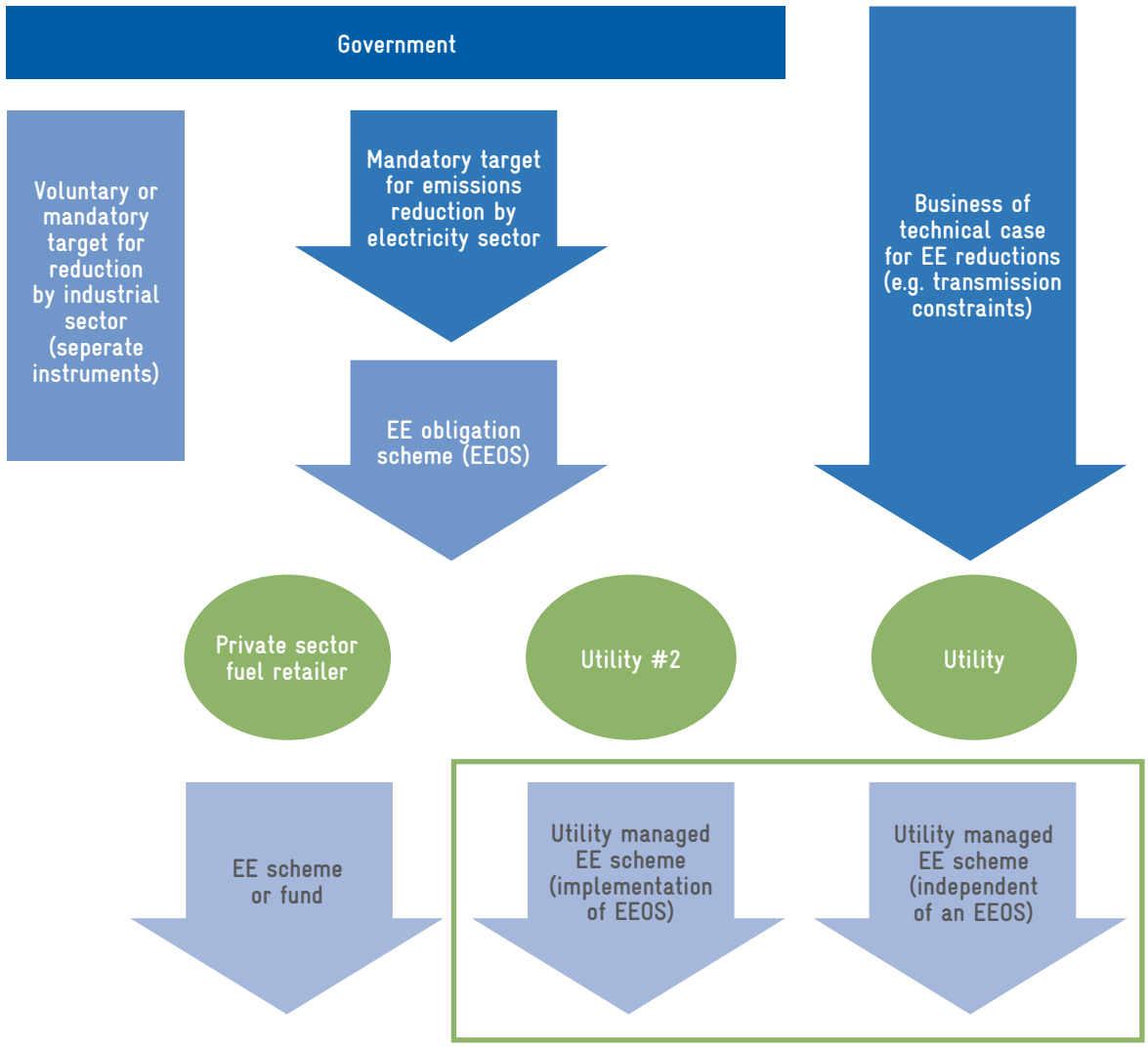
1.3 EEI #3 – Utility-managed EE Programmes

1.3.1 Description of the Instrument

The utility-managed EE programme instrument involves employing relevant regulations to require energy suppliers, distributors or retailers to reduce their customers' consumption by supporting the implementation of EE measures. Targets for energy savings can be mandatory or voluntary, driven by external regulation or for internal reasons such as to defer capital spending on equipment upgrades or for social and environmental responsibility. Utility-managed EE programmes are one way of reaching mandatory EE targets by subsidising the implementation of a portion of an EE intervention at their customer's premises. A utility-managed EE programme is one way of implementing an EEOS – discussed in the EEI #1 section above as one of two types of MBIs – and can also be implemented for internal cost-saving reasons. These separate motivations for adopting this instrument are illustrated in Figure 2 on the next page.

5 Saudi Energy Efficiency Center (SEEC) website. Retrieved from https://www.seec.gov.sa/en. Consulted on July 18, 2019.

Figure 2: Motivation for Utility-managed EE Schemes



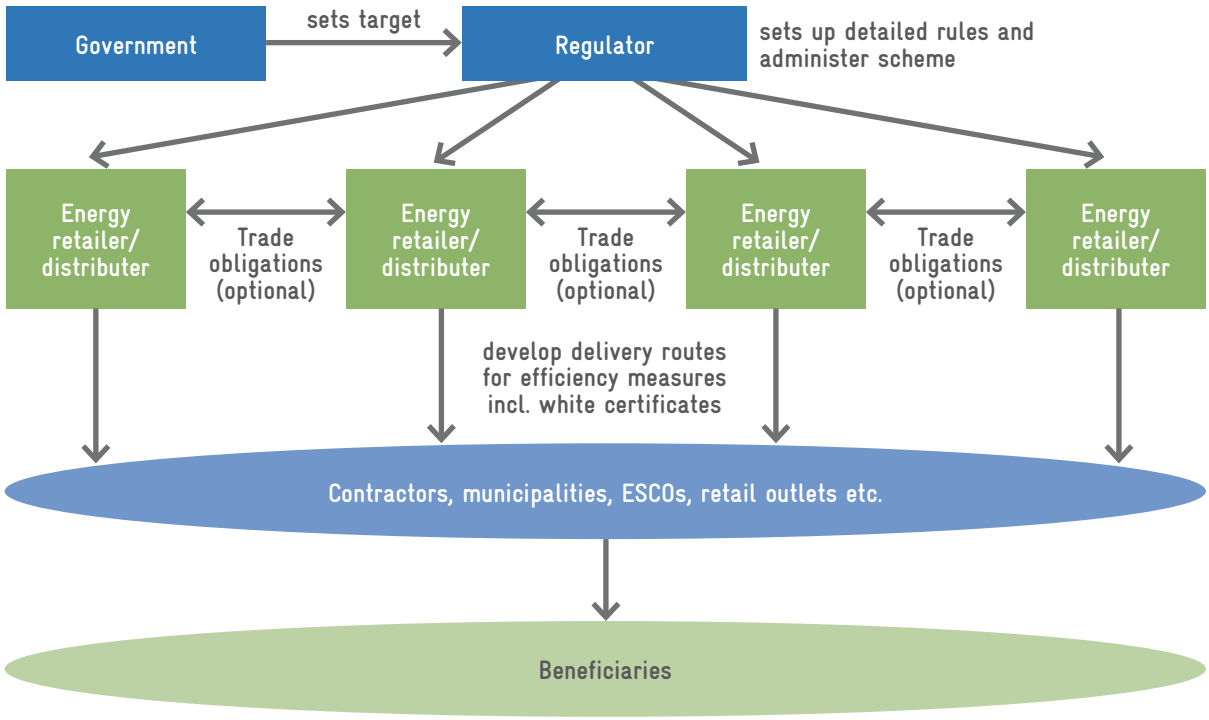
EE programmes are managed by utilities that use various means to attain targets, including directly providing EE improvements to end users, working with contractors to deliver energy savings, and collaborating with third parties such as municipalities, ESCOs, etc.

In most cases, the energy regulator supervises and monitors EE obligation schemes (EEOS) on behalf of the government. Schemes with various characteristics have been applied in many countries including Europe. Some EEOS allow for trading among obligated parties (utilities) and third parties, sometimes through white certificates that represent units of energy savings. A diagram of main stakeholders is presented in Figure 3 below.[6]

The cost of EEOS is borne by obligated parties that pass it on to end users, i.e. their customers. Cost recovery is possible through rate increases, government revenues, or other means. However, it should be mentioned that effective EEOS require a robust monitoring and verification system that imposes penalties if targets are not met.

This instrument applies to various types of technologies to achieve significant EE increases in buildings, processes and equipment used in the residential, commercial, industrial, public and institutional sectors. It may include penalties for non-compliance as well as tradable certificates or other flexible means to meet commitments. In practice, most EEOS have targeted low-cost energy-saving measures and small-scale energy consumers.

Figure 3: Architecture of Utility-managed EE Schemes



6 From Rosenow, J. "Energy Efficiency Obligations – A Global Review." Presentation for ERRA Educational Workshop: Energy Efficiency and Regulation, March 13-14, 2017, Budapest, Hungary.

1.3.2 Key Relevant Points to Implementation in the MENA Region

Internationally, a wide range of schemes have been used for several decades, and a large number of them are being used in Europe.[7] Implementing the utility-managed EE programme instrument in the MENA region should factor in the following key lessons learned:

- Keep policy objectives simple, clear and focussed on achieving energy savings;
- Use a carefully selected combination of legislation, regulations and administrative processes to establish and operate the utility-managed EE programme;
- Decide on the types of fuel or energy sources to be covered by the utility-managed EE programme scheme, according to the overall policy objectives of the scheme and estimated energy efficiency potential for the different types of fuel or energy sources. Start with one or two fuels and then expand;
- Decide on the end-use sectors and types of facilities to be covered by the utility-managed EE programme scheme, according to the overall policy objectives of the scheme and estimated energy efficiency potential for different sectors and various types of facilities;
- Set the energy savings targets for the utility-managed EE programme scheme according to the overall policy objectives of the scheme and aim to strike a balance between the targets, costs to be borne by consumers and which savings are achievable based on EE potential assessments;
- Consider restricting obligations to large energy providers. Allocate individual energy savings targets to each obligated party based on the market share of energy sales. Consider the possibility of implementing carve-outs for energy-intensive and trade-exposed industries or other specified groups of end users;
- Consider enabling energy savings trading among obligated parties and third parties;
- Utility-managed EE programmes are also a good mechanism to fight against fuel poverty by targeting measures dedicated to low-energy consumers, particularly in the power sector;
- It is difficult to implement this instrument when the country does not have an energy regulator;
- The implementation of this instrument may encounter barriers due the reluctance of utilities when they are privately owned. In fact, the utilities do not accept easily to reduce their revenue by making EE for their clients. In this case, the EE target and the instrument should be included in the concession contract.

1.3.3 Egypt Case Study

Like many countries in the region, electricity shortage is often due to the cost and availability of imported fuel and is therefore a key motivator for improving EE. Relieving the energy shortage requires balancing more expensive supplies with the demand of sectors most responsible for increasing electricity use, i.e. the industrial, residential and service sectors. Obligating utilities to invest in EE in those sectors would be well aligned with existing policy needs.

The new Egyptian Electricity Law (No. 87) adopted in 2015 introduced the obligation for network operators and electricity distribution licensees to submit an annual plan to be approved by the regulatory agency for the purposes of implementing EE projects and demand-side management (DSM) programmes targeting electricity end users. When issuing a licence validity certificate, the agency should verify the extent to which the annual plan has been implemented.

Egypt has implemented a limited energy-using equipment replacement programme for CFL bulbs. The programme was implemented by distribution companies and achieved measurable success.[8] To launch a mandatory EE scheme, the Egyptian government will need to establish an EEO regulation and procedures, design and set up an EEO accounting and monitoring system and, above all, approve policies that render EEO mandatory. The EEO regulation could be based on Article 49 of the Electricity Law (No. 87).

Once the system is in place, eligible actions and obligation levels for each actor need to be defined. A top-down approach can be used by first setting obligations at the national level based on the government's EE targets. Then, obligations can be set for every kind of entity in each sector. These obligations are defined according to the method chosen for accounting for and measuring energy savings. Obligations can be set for a period of two years to allow the mechanism to become firmly established. A monitoring system should be used to help ensure consistency between achieving targets for both energy-efficient products and obligated entities.

7 Bengtson, A. (June 2012). Best Practices in Designing and Implementing Energy Efficiency Obligation Schemes. The Regulator Assistance Project.

8 See UNDP Project Document, "Improving the energy efficiency of lighting and other building appliances". Retrieved from https://info.undp.org/docs/pdc/Documents/EGY/00060162_Final%20Draft%20-%20Project%20Document.pdf.

1.4 EEI #4 – EE Networks with Voluntary Goals

1.4.1 Description of the Instrument

Energy efficiency networks (EENs) are platforms and mechanisms that bring companies together to share experiences, collaborate to increase their EE know-how, and undertake steps together to improve efficiency. EENs can be formed in a region across various sectors, on a sector-specific basis and as internal networks (e.g. different sites of a corporation working together). EENs operate on a voluntary basis but are often incentivised by existing regulatory and policy frameworks. As such, they exist with or without government intervention. Such networks function as platforms for analysing EE potential in sub-sectors, setting and monitoring joint energy consumption targets and jointly implementing EE measures. EENs are flexible, thus allowing them to be implemented in many forms in terms of structure, focus, scope and policy context.

The usual EEN process consists of three phases as illustrated in Figure 4 below.[9] The initiation phase (Phase 0) establishes the network. The EEN process begins with an energy review (Phase 1) whereby participants individually decide on their own efficiency targets, which are confidential, and also commit to a voluntary energy savings target for the whole network and regular experience-sharing among network peers. The targets set in Phase 1 are to be reached in the network operation phase over a period of at least the ensuing three to four years.

Before launching an EEN, enough interested companies (usually between eight and 15 companies) should agree to participate. Once launched, participating companies contract an energy consultant to conduct an energy audit to take stock of their individual energy-saving potential. With results in hand, companies then agree on both individual and network-wide, non-binding EE targets. Based on the agreed-on targets and measures, companies start implementing them and meet regularly to hold discussions, share experiences and insights, conduct site visits, and monitor progress.

1.4.2 Key Relevant Points to Implementation in the MENA Region

EENs offer an effective platform that gathers companies and is a mechanism to share experience and facilitate EE measure planning and implementation in participating companies.

These networks create a positive environment for peer-to-peer learning and allow for sharing good practices and monitoring progress toward agreed upon targets.

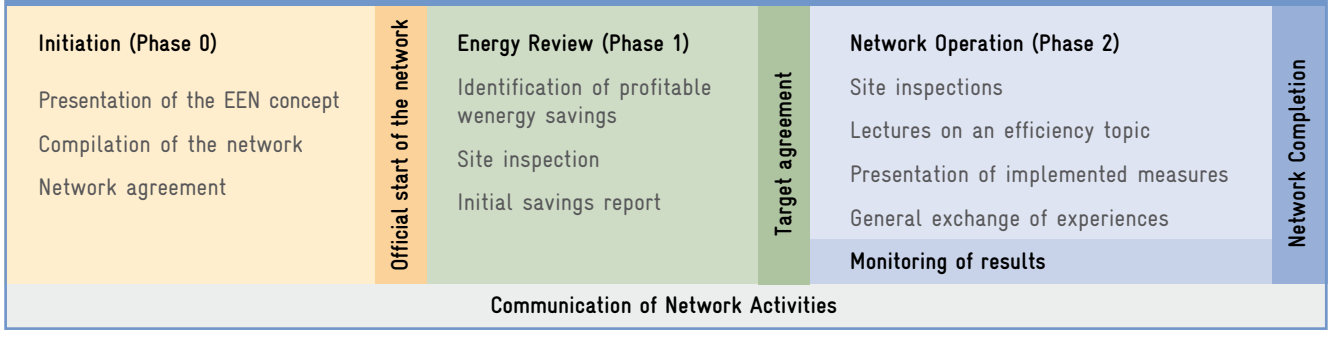
EENs exist with or without government intervention. However, one of the key success factors for expanding EENs is the existence of an enabling policy framework. The government can stimulate network generation and activities by providing complementary financial incentives and enabling policy frameworks to foster the achievement of EE potential and targets.

By taking into account basic requirements to ensure the success of the instrument, disseminating the EEN concept in the MENA region is a conceivable and desirable goal to support countries in accelerating and scaling up their EE markets. Nevertheless, the EEN process needs to be adapted to each country according to the dynamic development and demands of local industry.

Certain efforts are encouraged to put in place EENs in the MENA regional context.

- It requires close cooperation between government and industry to demonstrate the benefits of EENs to companies and establish a culture for EE;
- Since EENs can draw skepticism from companies, for them to participate actively requires trust relationships among all stakeholders;
- Concerted efforts must be made for the network to continue activities over the long term.
- Providing technical support and incentive mechanisms to EEN participants will accelerate the achievement of EE objectives and encourage reluctant stakeholders to join the initiative.

Figure 4: The EEN Process



9 Schlomann, B. (November 2016). Energy Efficiency Networks. Odyssee - MURE, Policy Brief.

1.4.3 Oman Case Study

Energy demand in Oman has been growing rapidly in recent years as a result of economic and demographic growth. It has been forecasted that Oman's primary energy consumption will probably increase by four times by 2025 compared to 2011 levels.[10] The industrial sector is the largest end-use sector, representing 59 percent of the 2014 energy balance,[11] followed by the transportation sector (26%), building sector (12%), and non-specified sectors (3%). At minimum, the industrial sector should be the focus of EE efforts. Creating networks with voluntary goals in this sector would contribute to reducing industrial energy demand and realising the untapped EE potential.

With Oman's national strategies and policies sending generally weak signals about EE, the creation of EENs would be a challenging instrument to implement. If the regulatory and policy frameworks do not provide financial incentives or subsidies for network participation, particularly at network launch, the instrument could collapse rapidly.

Nonetheless, companies that want to participate collaboratively may develop an EEN together without any help or intervention from the government, but they would have to bear all related costs.

However, there is potential among large consumers in the petrochemical and aluminum industrial sectors since they account for the largest share of energy consumption in the country (59%). In fact, to be more competitive in the region, they should reduce consumption by setting their own EE objectives in anticipation of foreseeable energy price increases. In this sense, it is also worth mentioning that some companies have started to implement the ISO 50001 energy standard.

EENs would require making almost no major change to the general framework conditions and would be aligned with the major regulatory and legal conditions in place, even if EE is not emphasized in the Oman national strategies and policies.

Nonetheless, if the government provides financial incentives and subsidies for network participation, particularly during an EEN pilot demonstration phase, a strong EE regulatory and policy framework would be set up, including tracking procedures and providing training and tool support to network operators, consulting engineers and moderators.

Introducing EEN in the Oman context could factor in the following key lessons learned:

- Since the government budget is restricted, EENs cannot count on governmental incentives to contract energy consultants to conduct energy audits and take stock of energy savings potential and other activities.
- Participating companies would pay a membership fee to address the lack of government incentives and help launch the network.
- The network operator or moderator may channel support from funding agencies such as the United Nations Industrial Development Organization (UNIDO).

1.5 EEI #5 – DSM Electricity Pricing or Dynamic Electricity Prices

1.5.1 Description of the Instrument

Dynamic electricity pricing is an advanced type of demand response that establishes a link between the retail and wholesale markets via the energy component of a retail bill. Generally, dynamic retail electricity prices correspond to the prices on the electricity wholesale market over a given period of time. As the wholesale prices evolve over time, they create incentives that may influence energy-consumption behaviours. The more closely retail prices follow wholesale prices, the more dynamic they are. There are several different types of pricing schemes used to pass on part of the benefits of the wholesale market dynamism to retail customers.

The most commonly employed options include:

- Time-of-use (ToU) pricing is a rate whereby the price per kWh depends on the time of the day electricity is consumed. It can be a simple day and night price or on-peak and off-peak hours splitting the day into several slack periods. It can also be seasonal. Usually, periods and prices are known well in advance, but the definition of the day/night intervals may change according to day-ahead spot prices;
- Critical peak pricing (CPP) is a kind of top-up rate where electricity prices substantially increase for the few days a year when wholesale prices are the highest, but prices are lower than average during the rest of the year. For example, the French Tempo tariff is a contract with a fixed price for the entire year except for a maximum of 20 days with very high prices. Customers are notified about these days the day before this rate comes into effect;

10 "Delivering Energy Efficiency in the Middle East and North Africa", ESMAP/WB, May 2016.

11 International Energy Agency (IEA). (2014). "Oman Energy Balances".

> With real-time pricing (RTP), wholesale electricity prices are directly passed on to final consumers and bills are calculated based on at least hourly consumption metering or with higher granularity (e.g. 15 minutes). The price of such offers is composed of the wholesale electricity price plus a supplier margin.

Both dynamic pricing models and peak load control devices can be applied to a range of sectors and technologies. Typically, the acceptance of dynamic pricing and the incentive to offer flexibility differs among different types of customers due to their varying risk aversion levels, i.e. whether they are willing to become exposed to wholesale market price volatility or prefer stable energy prices.

Dynamic pricing combined with RTP has been quite commonly adopted by industrial customers. In a number of countries, households and small commercial customers have been offered simplified forms of ToU and CPP. So far, RTP has only been offered to residential consumers in the Nordic, Estonian and Spanish electricity markets.[12]

1.5.2 Key Relevant Points to Implementation in the MENA Region

Dynamic tariffs can fit well with the variety of market structures present in the MENA region, and there is a significant amount of experience in the region with varying levels of dynamic pricing. For example, Tunisia has implemented some form of dynamic tariffs since 1974, starting with the introduction of time-of-use (ToU) pricing for all medium voltage industrial and commercial customers and eventually implementing mandatory ToU pricing for all high voltage and medium voltage customers by 2003. In the 2005 iteration, different rates changed according to the season and time of day. An interruptible tariff was also offered for more than a decade up to 2003 to reduce evening peak demand, but the voluntary tariff had very low demand and was eventually removed. However, interruptible tariffs for special applications – such as water heater rates on agricultural pumping systems that are curtailed during peak hours – have become popular. Among the lessons learned from the experience in Tunisia is the attractiveness of ToU rates for large customers, whereas medium and smaller enterprises prefer a simpler flat rate.[13]

Experience in the region and from around the world suggests that consumers can be interested in dynamic pricing and DSM pricing if they are well informed and the schemes are designed in an easy-to-use manner to render energy bill reductions achievable. Without information about their level of exposure to price volatility, i.e. without knowing when electricity prices increase, consumers may potentially face significant bill increases during certain months, which could lead to a backlash. Other important barriers routinely encountered when implementing dynamic pricing, which are likely to be relevant in the region, include utility concerns about reducing sales, the desire not to deprive customers of energy as this appears contradictory to the objectives of electrification, and regulator concerns about programme cost recovery including meters and support for billing software. Solutions to all these barriers are available.

1.5.3 Jordan Case Study

Jordan is already applying a diverse range of ToU pricing systems to various consumer classes, including seasonal tariffs and varying peak times. Completely dynamic tariffs have not yet been implemented for any customer class.

Given the range of partially dynamic tariffs in place, further improving dynamic tariffs seems to be in line with all relevant policies. Several prerequisites need to be put in place before that can happen, and dynamic prices may be more suitable to some customers than others, including industrial customers with flexibility and resources to react to rapid changes in prices due to increasing amounts of variable renewable energy generation expected as projects come online.

Few changes are expected except for typical regulatory procedures to review the tariff structure. Regulatory changes to account for the information produced by smart meters may be necessary and new tariff classes are likely to be introduced.

In general, greater dynamism is well suited for introduction into the Jordanian market. In addition, the use of simple automated devices that limit usage during peak periods has the potential to enable customers to limit their bills and enable the utility to achieve peak load reductions before upgrading to smart meters. The main barriers are the lack of advanced equipment on the networks, and the potential for poor customer relations as pricing changes must be designed to be sensitive to customer challenges and their willingness to alter behaviours in response to price signals.

12 Eurelectric. (February 2017). Dynamic pricing in electricity supply. Retrieved from https://www3.eurelectric.org/media/309103/dynamic_pricing_in_electricity_supply-2017-2520-0003-01-e.pdf.

13 Charles River Associates "Applications of Dynamic Pricing in Developing and Emerging Economies" The World Bank, p. 47. Available from http://siteresources.worldbank.org/INTENERGY/Resources/ApplicationsofDynamicPricing.pdf. Accessed 19-11-04.

1.6 EEI #6 –Mechanism for Accelerating Replacement of the Stock of Energy-using Equipment and Appliances

1.6.1 Description of the Instrument

The mechanism for accelerating replacement of the stock of energy-using equipment and appliances provides incentives to encourage consumers to upgrade and properly dispose of their aging appliances. Incentives and penalties are essential policy tools to move the market toward energy-efficient products.[14] They offer a favourable complement to mandatory standards and labelling policies by accelerating the market penetration of energy-efficient products that are above the equipment standard requirements and by preparing the market for increased future mandatory requirements.

Concretely, programmes involving incentives and penalties can sway purchase decisions and, in some cases, production decisions and retail stocking decisions toward energy-efficient products. Such programmes are structured according to the local regulatory environment, financing models, how incentives are targeted and who administers them. Any agency can launch such programmes.

This mechanism has to overcome the risks perceived by different stakeholders to facilitate investments in energy-efficient equipment and appliance programmes. Efficient equipment and appliances are typically more expensive on a first-cost basis and less expensive throughout the product life cycle. Financing schemes are thus valuable tools for increasing and accelerating market adoption of more efficient products.

Preconditions to implementing this instrument include existing test procedures, an implementing agency, a funding scheme and a conducive regulatory environment. An agency starts building the structure to implement incentive and penalty programmes in line with a country's regulatory framework, the way such programmes are financed, how the incentives are targeted, and who administers such programmes. The regulator needs to set up the structure to implement the incentive and penalty programmes, as well as develops and validates implementation procedures manual by involving the main stakeholders. A common structure is where the regulator supervises EE programmes and utilities design, manage and implement programmes. In such a case, each utility carries out and manages its own EE programme within its concession area under the supervision of the regulator.

All utility EE programmes should comprise a measurement and verification (M&V) component to quantify the results of EE investments as well as improve governance and accountability. Depending on national regulations, EE programmes could be fully financed by electricity consumers, or partly with the help of national energy utilities and distributors. If not, the national regulatory agency should ask banks to provide direct financing.

The utility or other programme implementor must also be in charge of disposing and recycling replaced equipment and appliances. Financiers and debt recovery services have to finance EE programmes targeted at accelerating replacement of the stock of energy-using equipment and appliances either explicitly or through a programme implementor. The disposal regulator has to ensure the proper and safe disposal of old equipment and appliances and recycling processes must be certified.

1.6.2 Key Relevant Points to Implementation in the MENA Region

The instrument is well adapted to being piloted in the MENA region where most old equipment and appliances are over 10 years old. Moreover, there is high energy-saving potential in this region because the number of appliances in use (such as refrigerators, air-conditioners, etc.) in developing and emerging economies is projected to increase significantly over the next 15 years.

Some key lessons learned from international experience suggest pre-conditions and requirements are needed to successfully put in place the mechanism in the MENA region:

- Roles and responsibilities should be well defined and distributed among the different stakeholders involved in the technical implementation of the programme;
- The programme and stakeholders should be supervised, and systems must be put in place to prevent the programme from being unfairly taken advantage of;
- A strong quality control and test procedure needs to be implemented for selecting EE appliances and technology providers;
- Programme cost-effectiveness depends highly on the appropriateness of the financial incentives to the local market. Without strong design, incentives can be unfairly taken advantage of, which would result in excessive costs;
- A recycling branch must exist in the market. Otherwise, the country will face high technical risks to implement such an EE programme.

14 SEAD Incentives Working Group. (August 2013). A Global Review of Incentive Programs to Accelerate Energy-Efficient Appliances and Equipment. Retrieved from https://ies.lbl.gov/sites/all/files/lbnl-6367e.pdf.

1.6.3 Oman Case Study

Overall, the mechanism for accelerating replacement of the stock of energy-using appliances fits well with Oman's long-term EE strategy, and improving energy performance of appliances is, in fact, a key measure in Oman's energy action plan.

Due to fast economic development in the Sultanate of Oman, the electricity sector has undergone substantial growth. Rising appliance use in the residential sector means that it now accounts for 48 percent of demand. According to United for Efficiency (U4E), there is potential for 1.8 TWh in annual savings by 2030 by focussing on only five kinds of appliances (lighting, refrigerators, air-conditioners, transformers and electric motors).

Oman has one of the lowest electricity prices of the MENA region because of high fossil-fuel subsidies and a lack of cost incentives to encourage real EE improvements. Under such conditions, it is difficult to foster the penetration of a mechanism for replacing existing stocks. Indeed, because efficient equipment and appliances are typically more expensive on a first-cost basis, the payback period is perceived as long if cost incentives are not offered.

Oman could first choose to implement a set of minimum energy performance standards (MEPS) for electrical appliances before implementing any appliance replacement programme. Indeed, Oman intends to set up an energy performance labelling scheme and a MEPS in 2019. Ministerial Decision No. 107/2018 adopted GCC Standard GSO 2530/2016 as an obligatory Omani regulation for energy labelling and minimum energy performance standards (MEPS) for air conditioners (ACs). The Oman Ministry of Commerce and Industry (MOCI) has made energy efficiency labels for ACs mandatory since July 2019. Implementing the MEPS can be considered as an important prerequisite to introducing the energy-using appliance stock replacement instrument. Now that the prerequisite of the MEPS is in place, implementing the mechanism for accelerating replacement of the stock of energy-using equipment and appliances should include the following key features:

> Financial incentive mechanisms to encourage consumers to replace low performance appliances;

> Eligibility requirements applicable to old appliances;

> A market control and monitoring mechanism;

> Environmental safeguard tools, etc.

Implementing the instrument will typically require setting up a public subsidy for the purchase of energy-efficient appliances to replace low-energy-efficiency units and serve to address the issue of low profitability for end users. To this end, the government should allocate a budget to provide the subsidy. This subsidy may also be profitable for the government thanks to the avoided public subsidies related to saved energy resulting from the programme.

1.7 EEI #7 – Energy Savings Insurance Mechanism of an Energy Performance Contract

1.7.1 Description of the Instrument

The energy savings insurance (ESI) instrument is intended to stimulate investments in EE by mitigating the risks associated with the possibility that small and medium enterprise (SME) investments do not pay for themselves if actual energy savings end up being lower than anticipated. The main purpose of this instrument is to provide assurance to investors and their financiers that EE projects will generate projected financial savings.

ESI is implemented as part of an EE project between an energy service provider (ESP) and a SME, and it includes an energy performance contract (EPC). This instrument establishes an energy-savings objective and a performance guarantee. An independent external entity validates the project before the parties sign the contract and before equipment is installed; it then verifies the energy savings once the project is implemented. Performing technical validation, which involves validating balances and equations for calculating energy consumption, energy savings and monetary savings for a specific measure, is rather difficult and complex, depending on the measure. Therefore, qualified technical and financial experts are needed. The complexity of this process has led to problems with EPC savings insurance internationally.

In a functioning ESI market, an insurance process for qualified ESPs would include the following main features:

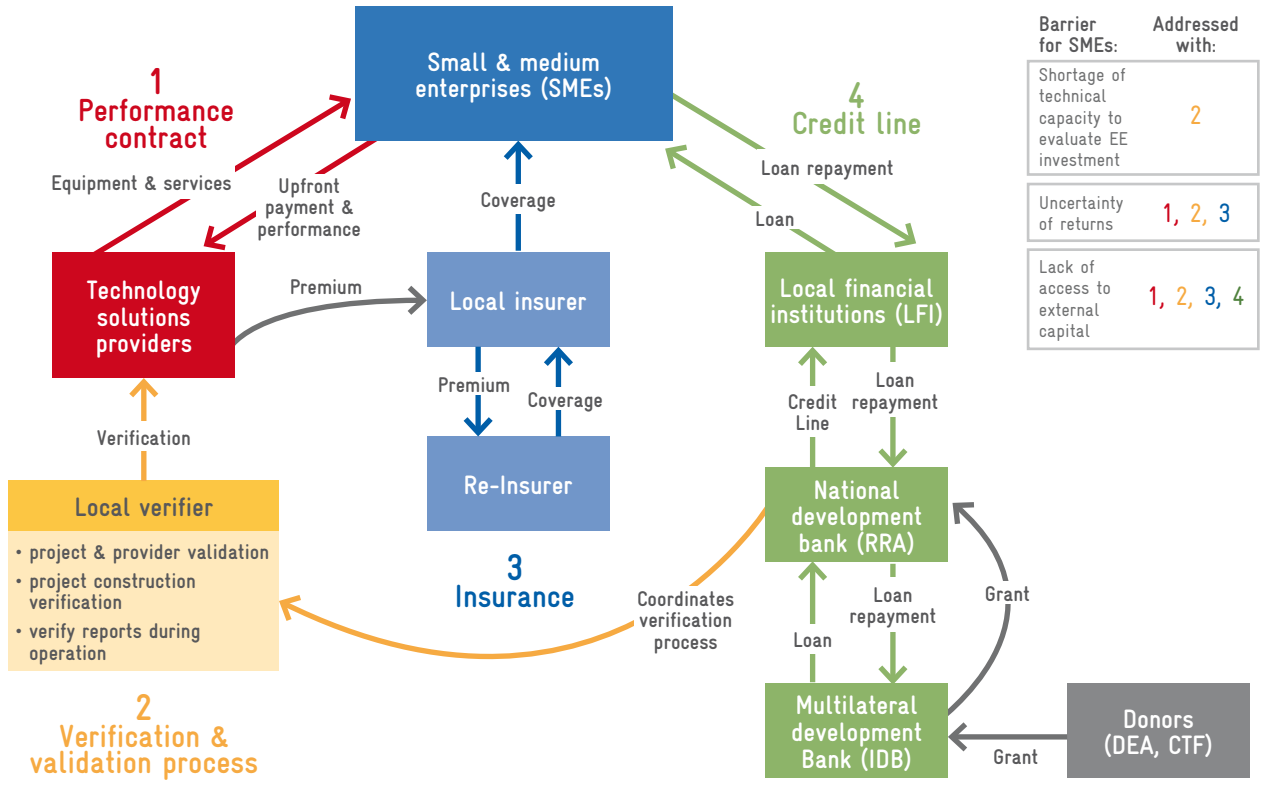
> The contractor installs new equipment in a building or at an industrial facility to reduce annual energy expenditures. Certain measures are much easier to predict and forecast than others. How appliances or rooms are used throughout contract duration has to be very accurately defined in accordance with the given measures. User behaviour is one critical parameter, which may lead to disputes. It is much easier to make predictions about simple measures (e.g. replacement of pumps) because they are easier to verify;

> The contractor guarantees the amount of annual savings expected from installed equipment;

> The insurer is contractually obligated to repay the guaranteed savings in the event that savings do not occur.

Typically, the main components of this instrument are an insurance product and a package of complementary measures. The figure below illustrates the main actors, roles and services involved and the barriers addressed by actual examples of putting in place this instrument.

Figure 5: Main Components of an Energy-savings Insurance Instrument
(chart originally created by the Climate Finance Lab[15])



1.7.2 Key Relevant Points to Implementation in the MENA Region

This instrument is well adapted to be piloted in the MENA region. The main hindrance to putting in place an ESI mechanism is the poor regional EPC market development as well as the lack of technical experience among the main players in the EPC field. Since the EE market is not very developed in the region, setting up such a programme will require carrying out many awareness-raising and capacity-building activities to foster the involvement of various actors (SMEs, ESPs, banks, insurance companies, etc.).

Prerequisites to the successful implementation the ESI mechanism in the MENA regional context include:

> Open-minded insurance companies that agree to take on risks and develop a new insurance product;

> Clear understanding of the difficulty with assessing risk and properly defining insurance premiums;

> Well-developed ESCO market;

> Strong regulation and a solid and steady legal framework to ensure that EPCs are honoured by stakeholders;

> Very accurate and well-defined measurement and verification standards for precise energy savings calculations.

One of the main barriers to the development and large-scale implementation of such insurance products is the fact that EE projects are developed and implemented in a limited number and are insured in an even lesser number. This prevents insurers from:

> Generating enough data and statistical analytics to accurately estimate risk levels;

> Standardising transactions to insure against other risks;

> Developing streamlined (thus inexpensive) processes for claims, verification of damages, etc.

This means that, in the initial implementation period of such products, pricing can be prohibitively expensive, or the insurer might face unknown risk that cannot be quantified.

15 Global Innovation Lab for Climate Finance. Energy Savings Insurance. Retrieved from https://www.climatefinancelab.org/project/insurance-for-energy-savings/.

1.7.3 Morocco Case Study

Overall, the ESI instrument fits well within Morocco's national strategies, including the 2009 National Energy Strategy and key framework laws with regulations regarding the liberalisation of the electricity market, RE and EE. There is a strong push for EE and RE development in Morocco and the instrument is well placed to support that push. As an instrument that depends on and supports a strong ESCO market in a given country, many factors that make ESI suitable overlap with those supporting the development of a strong ESCO market. As such, key government-supported actors, like the Moroccan Agency for Solar Energy (MASEN) or the Energy Investment Company (SIE), have a potential role to play in offering services or supporting links among market players to support the development of the ESI instrument.

There are already key laws in place that support the development of a strong ESCO market with the characteristics required to secure financing; they have succeeded in reducing the perceived risks of the EE and ESCO market. These include an EE law that mandates energy audits for large energy customers, financial incentives for EE activities and an EE fund.

A state-owned Super ESCO is being created, demonstrating strong potential for growth in the sector. Also, Morocco has a history of putting in place strong systems to encourage specific energy developments (e.g. RE procurement by MASEN).

Article 7 of Law No. 47-09 governing EE clearly defines ESCOs and their operating conditions. A draft regulation on ESCO modalities of operation and responsibilities is being prepared and finalised; it is expected to be adopted by the end of 2019. When this decree is put into effect, it will enable the implementation of energy performance contracts (EPCs) with performance guarantees across all the sectors targeted, thereby helping create service offerings in Morocco's EE market that meet quality standards and requirements.

Overall, the economic aspects hindering the ESCO market can be potentially improved by this instrument, which will reduce the risk and support increased lending to ESCOs. The pipeline of projects, other supporting elements and the instrument could be simultaneously developed to create conditions for success.

1.8 EEI #8 – Voluntary Agreement

1.8.1 Description of the Instrument

A voluntary agreement (VA) is a turnkey and negotiated covenant between public authorities and a firm or group of firms. Such voluntary agreements not only include targets and timetables for taking actions aimed at improving EE or reducing GHG emissions, but also outline rewards and penalties. VAs vary in form, legal status, structure and provisions, parties involved and enforceability. The IEA defines the VA as "essentially a contract between the government and industry, or negotiated targets with commitments and time schedules on the part of all participating parties" (IEA, 1997).[16] The Intergovernmental Panel on Climate Change (IPCC) refers to voluntary actions as "actions taken by firms, Non-Governmental Organisations (NGOs), and other actors that go beyond regulatory requirements" and further states that "voluntary agreements represent an evolution from traditional mandatory approaches based on conventional or economic regulations and intend to provide further flexibility to polluters. They are based on the idea that, under certain conditions, polluters can decide collectively to commit themselves to abatement instead of, or beyond the requirements of regulation."[17] The overview provided by the IPCC indicates how voluntary agreements vary substantially in approach, the sectors they address, parties involved, level to which they are fully voluntary or rather aimed at circumventing non-negotiated regulation and how they are integrated with other policy instruments.

In many cases, the introduction of VAs has been a matter of choosing a certain policy style and culture of policy cooperation. Public authorities have not necessarily performed a direct ex-ante quantitative comparison of VAs and legislation, for example, before selecting VAs. Public authorities in some countries that have traditionally applied this policy have stated that one major argument for introducing VAs has been the public authorities' trust that they could cajole industrial enterprises to undertake commitments, which would have otherwise been impossible to legislate.[18]

National authorities fulfill several roles in supporting and creating appropriate carrots and sticks to encourage companies and technology providers to enter into VAs. They may provide financial support (carrots) for undertaking certain EE investments, as well as tax rebates, exemptions, public recognition, technical assistance and training.

Moreover, most VAs use sticks too, including some form of penalty mechanism or other threat of sanctions to discourage non-compliance with VA commitments. In cases where a financial stimulus is provided, the most common threat is withdrawing eligibility for the stimulus (e.g. subsidy or tax rebate), often combined with a requirement to retroactively pay back the financial aid already provided after the last compliance or reporting period.

16 IEA. 1997. "Voluntary Actions for Energy-Related CO2 Abatement". Paris: OECD/IEA.

17 IPCC. 2014. "Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate", 2014.

18 Rezessy, S. Bertoldi, P. "Voluntary agreements in the field of energy efficiency and emission reduction: Review and analysis of experiences in the European Union". Energy Policy, 39(2011)7121–7129. doi:10.1016/j.enpol.2011.08.030.

The role of national authorities must be to coordinate these aspects and ensure they create the desired environment and supportive policy to motivate companies to join and commit to VAs. Programme participants (VA signatories) commit to defined targets and specified obligations, in particular GHG reductions, EE improvements, even choosing one of the two options or other specific targets such as adopting the best available technology. Most current VAs are a combination of sectoral and individual agreements, i.e. both individual companies and sectoral associations are allowed to enter into such agreements.

1.8.2 Key Relevant Points to Implementation in the MENA Region

An analysis of previous experiences revealed that VAs have been successful particularly in countries with traditions of close cooperation between government and the industrial sector. In this way, the instrument is well suited to be applied in MENA countries. It requires few preconditions and can be negotiated on an ad hoc basis between government entities and a range of actors, including firms and associations. VAs are frequently and successfully combined with a range of other instruments and can stimulate verifiable and significant energy savings when properly designed and implemented.

Key considerations that have been shown to contribute to a successful VA include:

- Products can be defined in a way that is sufficiently clear to the governments and industrial stakeholders involved and energy performance can be defined in a meaningful way;
- An established test procedure that all parties can agree to or turnkey agreement can be defined easily;
- Signatories agree to share performance data about products covered by the VA to ensure that, even if policy makers are initially at an information disadvantage, they can catch up over time;
- A robust compliance regime with an independent auditor or inspector who not only has the mandate to verify data and test products from individual signatories but also reports to a body representing all parties involved;
- Available energy performance improvement options are introduced at affordable costs and suppliers can pass on those costs to customers;
- Major product manufacturers and suppliers are known and trusted by firms and willing to negotiate.

1.8.3 Saudi Arabia Case Study

VAs are often adopted by energy-intensive sectors to contribute to the national effort while reducing business energy costs. This fits in well with the energy consumption structure of Saudi Arabia whose industrial sector accounts for 44 percent of final energy consumption; in the industrial sector's total energy consumption, 70 percent is consumed by a few main energy-intensive subsectors, such as steel, petrochemicals, cement and aluminum. Taking into account the relatively small number of companies in these subsectors, it would be straightforward for them to enter into a collective VA and establishing EE targets.

Some of these companies belong to international groups (cement, for example), are familiar with such approaches, and can play a leadership role in launching an agreement process. Hence, VAs are in line with the current context in Saudi Arabia.

The scope of actions by major large industrial enterprises in Saudi Arabia through VAs could be significant. Continued progress in pricing reforms is expected to create increasing opportunities for this instrument to be applied to improve EE throughout the economy. The very high carbon intensity of the Saudi economy also means that simple measures could have large impacts at low costs. Prices are the key variable because as prices are raised to international levels according to the government's current plans, demand management tools can produce positive effects.

This flexible and turnkey instrument can potentially fit well into the existing framework conditions and would require few major changes. As demonstrated by many examples around the world, industrial enterprises identify funding from their operating budgets to implement cost-effective EE actions and, in so doing, become leaders in their industry. Considering the foreseeable changes expected in energy systems in the KSA, some forward-looking sectors may consider setting a good example. Government support could be required to address the lack of time and resources needed to develop and implement a VA.

1.9 EEI #9 – EE TAX-based Instrument

1.9.1 Description of the Instrument

EE tax incentives encourage practices that decrease energy consumption, support an increase in the market share of advanced energy-efficient products and encourage homeowners and business owners to undertake EE improvements. Some well-known examples include tax incentives for vehicles; in 1992, the US federal government first introduced a tax credit for qualified electric vehicles of up to $4,000 or a 10 percent tax deductible on vehicle prices.[19]

In the residential sector, incentives can take the form of a tax credit or rebate:

> A tax credit is subtracted from the amount of tax. Credit is claimed when the taxpayer files taxes for the previous year. So, if they made a purchase last year, they would claim their tax credit the year when they file their taxes.

> Rebates work differently than tax credits by providing cash back to customers more quickly after they make a purchase. Many state governments, local governments, and utilities offer rebates for energy-efficient equipment purchases. Some manufacturers also sponsor special offers that can make efficient products more affordable.

Tax credits have been introduced in many countries to encourage households to invest in energy efficient retrofits. While several have shown significant results, it has been noted that "they increase the complexity of the tax system and may be less effective than a direct grant programme, the benefits from which do not depend on the time of year when tax returns are filed."[20]

In the commercial sector, corporate tax incentives include corporate tax credits, deductions and exemptions. These incentives are available in some states to corporations that purchase and install eligible renewable energy or energy-efficient equipment or construct green buildings. In a few cases, the incentive is based on the amount of energy produced by an eligible facility. Some states allow the tax credit only if a corporation has invested a minimum amount in an eligible project. Typically, there is a maximum limit on the dollar amount of the credit or deduction.

1.9.2 Key Relevant Points to Implementation in the MENA Region

Some key lessons learned should be well understood before establishing EE tax instruments in the MENA region. These include:

> The mechanism can increase the complexity of the tax system, which implies additional transaction costs;

> Implementing the mechanism requires robust and well-organised tax administration to deal with this complexity and properly control fraudulent practices on the market;

> The system is not effective in countries with high rates of tax evasion and where the informal sector is strong;

> Such programmes may have an inflationary effect. In fact, there is a risk of artificially increasing equipment prices to saturate tax credit ceilings, which has been observed for the solar water heater market in certain countries such as France;

> The mechanism can increase pressure on public finances in case of an unplanned rapid uptake of the tax incentive by the market;

> This kind of programme is exposed to public budget related uncertainties and may be stopped if the government changes its priorities.

1.9.3 Morocco Case Study

Overall, the EE tax instrument fits in with Morocco's national strategies and initiatives. Morocco has made EE a priority since the 2009 National Energy Strategy and has set an ambitious EE target for 2030, thus demonstrating a clear long-term commitment. EE tax incentives can contribute to Morocco's effort by encouraging EE practices, supporting an increase in the market share of advanced energy efficient products and encouraging homeowners and business owners to undertake EE improvements.

Several policies have been implemented or are being implemented to improve EE and encourage energy conservation. These include:

> Minimum efficiency standards for energy-using equipment;

> Energy performance standard in new building;

> Energy efficiency in industry;

> Rebates on energy bills:

19 Duff, D. "Tax Policy and Global Warming" in Canadian Tax Journal (2003), Volume 51, Issue 6, p. 2,063.

20 Page 2,101 in Duff (2003).

> A popular programme that has been successfully implemented is the 20-20 initiative.[21] The initiative offers a 20% rebate on any energy bill that conserves 20% of energy when compared with the same month in the previous year. This initiative has been popular with Moroccans.

> Dedicated loans:
- The programme to develop Morocco's solar water heater (Shemsi) market aims to encourage the purchase of solar water heaters by providing grants and has set a target of 1.7 million m2 of solar water heaters installed in households by 2020.[22]

> Morocco has also introduced tax measures mainly in the transport sector, including:
- A reduction in import duties for hybrid vehicles;
- The annual taxation of vehicles (vignette) according to the owners' incomes, although the initial objective is not related to energy efficiency.

Morocco demonstrates huge EE potential in various sectors and, as EE tax incentives have been successfully established in the residential, commercial and transportation sectors in many countries around the world, they could be applied to all those sectors in Morocco.

A large part of EE potential in Morocco can be mobilised using the tax incentive instrument. For that, it will be necessary to set up a legal framework for the tax incentive and calculate the appropriate rate to provide a reasonable stimulus to target sectors in order to increase the market share of EE products and goods. Introducing EE tax incentives or implementing a rebate programme for the purchase of energy-efficient appliances (lights, refrigerators, and room air-conditioners) and vehicles could help boost the market for energy-efficient equipment and appliances.

Once the legal framework is implemented, it will be advisable to create an online platform in Morocco to raise awareness about the available rebates and incentives.[23] This platform is expected to inform Moroccan homeowners and business owners on the national rebates, local rebates and incentives that would allow them to save money and protect the environment.

In the case of Morocco, it can be recommended to adopt tax credit system rather than a rebate system, as the latter can be more complex to set up by the fiscal administration.

1.10 EEI #10 – Super ESCO

1.10.1 Description of the Instrument

A Super energy service company (ESCO), better known as the Super ESCO, is an entity set up by government that functions as an ESCO mainly or exclusively dedicated to helping the public sector undertake EE projects. A super ESCO always invests under government guidelines for public-sector projects because public funds are their main source of funding.

The Super ESCO uses an energy performance contract (EPC) approach for its large EE projects to obtain energy savings guarantees from private ESCOs. Technically, energy service providers are in charge of supervising and implementing EE measures in the public sector through EPCs that include an energy-savings guarantee.

The Super ESCO can also support capacity building and project development in existing private-sector ESCOs and may also help set up new ESCOs. Launching a Super ESCO requires the capacity to develop adapted concepts and produce complete documentation such as an ESCO accreditation scheme, procurement and contract templates, M&V plans, and so on.

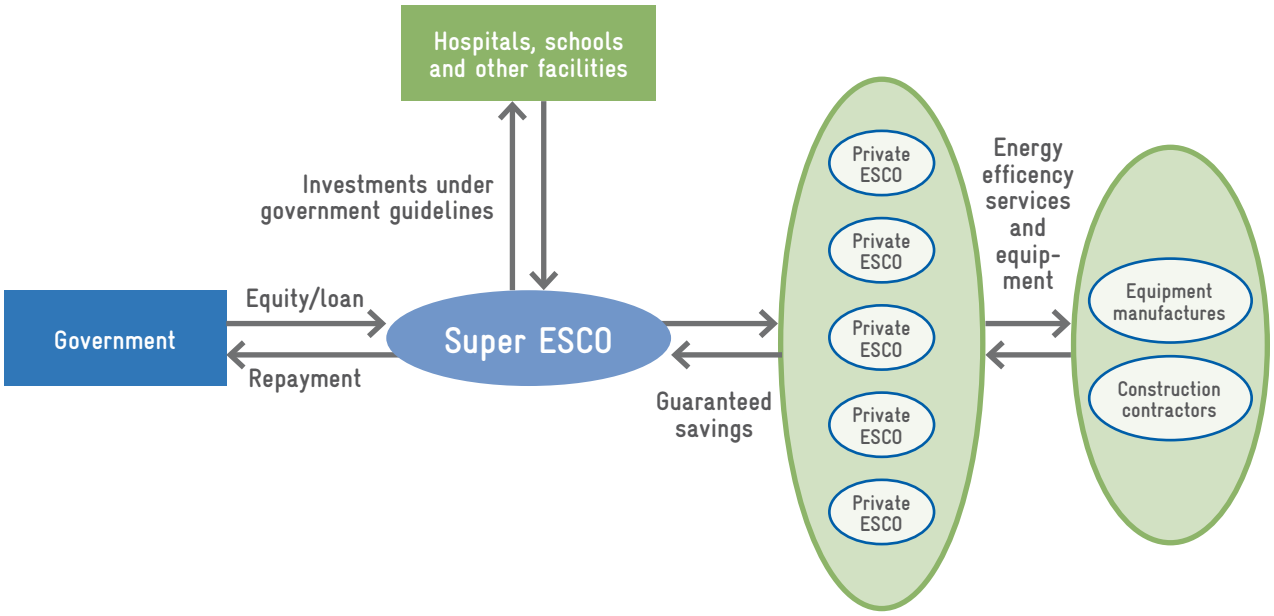
The main beneficiary of this instrument is the public sector through EE measures that improve the energy performance of facilities or buildings and reduce energy costs. All MRV activities and follow-up should be carried out by each ESCO that is directly in contact with equipment manufacturers and construction contractors for EE services and equipment.

21 Worcester Polytechnic Institute (WPI). (October 2015). "Energy Sustainability in Morocco".

22 Moroccan-German Energy Partnership PAREMA. (September 2017). "Renewable energy and energy efficiency in Morocco: Context and market access". Retrieved from https://www.energypartnership.ma/fileadmin/user_upload/morocco/media_elements/PAREMA_-_Brochure_RENEWABLE_ENERGY_AND_ENERGY_EFFICIENCY_IN_MOROCCO.pdf. Consulted on July 17, 2019.

23 Worcester Polytechnic Institute (WPI), "Energy Sustainability in Morocco", October 16, 2015.

Figure 6: Conceptual Model of the Super ESCO



1.10.2 Prerequisites for and Relevant Points to Implementation in the MENA Region

International experiences demonstrate that the Super ESCO is very effective in upscaling EE services and promoting the private ESCO market in countries where such a market is small or non-existent. In these countries, the Super ESCO can provide one of the most rapid paths to implementing national EE programmes and can overcome most of the market-related barriers identified in most developing countries.

The Super ESCO is well adapted to being piloted in the MENA region and can greatly help tap EE potential in the region and create an enabling environment for a sustainable ESCO market. Moreover, if the instrument receives strong political support and is well designed to meet the specific conditions of countries, it can help achieve a real transformation of the market and will allow the public sector to play a leading role in promoting EE technologies and practices. As a result, EE services and the ESCO market will take off, thus helping countries progress in their sustainable development efforts.

There is experience with this instrument in the region. In 2013, the United Arab Emirates (UAE) established a Super ESCO, the Etihad ESCO. The initiative was launched by the Dubai Electricity and Water Authority (DEWA) under the leadership of the Dubai Supreme Council of Energy. It helps foster an EPC market in Dubai so that owners can improve EE in their buildings.

Some key elements could be put in place before establishing the Super ESCO more broadly in the MENA region:

> National regulations governing ESCOs and EPCs must be in place. The government has to support all steps in the creation of the Super ESCO and EPCs and regulations should cover this engagement and remove legal barriers if they exist. For instance, a possible conflict of interest could arise between the government Super ESCO and emerging commercial ESCOs that need public-sector projects to spur their growth and development;

> After the establishment of a Super ESCO, the government needs to provide the Super ESCO with sufficient funds and human resources to carry out public projects under the EPC approach and leverage commercial financing;

> All implementation procedures between the Super ESCO and its different public and private partners and necessary documentation should be developed, documented and shared. A support and capacity-building programme targeting involved actors must also be put in place to ensure main stakeholders are involved. Targeted actors include:
  - Employees from the government's Super ESCO have to be trained on ESCO and EPC concepts and materials, as well as on reinvesting the energy savings into EE or green projects;
  - Public-sector beneficiaries need capacity-building to properly utilise the new equipment;
  - Private-sector ESCOs need technical capacities to deliver the best EE equipment and projects to the Super ESCO;
  - Main actors of the private ESCO sector may require training and support to strengthen their awareness of rules, procedures and risks associated with their market;
  - Contractors and manufacturers have to understand the ESCO market and its processes.

1.10.3 Egypt Case Study

Due to the untapped EE potential in public buildings (up to 50% in some cities), Egypt presents ideal conditions to establish a Super ESCO. The Super ESCO is a unique opportunity to carry out and implement EE projects in the public sector by identifying and developing EPC projects. Moreover, there is a strong push from the Egyptian government to improve EE by creating institutional capacities (e.g. EE units within ministries). It also fits well with Egypt's long-term strategies outlined in the NEEAP 1 and 2, the Vision 2030 and the Sustainable Energy Strategy 2035.

To advance implementation, Egypt would need to develop legislation to support ESCOs and develop EPCs in general. A recent paper prepared by the Energy Section of the Sustainable Development Policies Division (SDPD) of Economic and Social Commission for Western Asia (ESCWA)[24] provides an informative and helpful analysis of the measures that are being undertaken by Egypt and should be continued to facilitate developing the local ESCO market. These measures include:

> Creating an EE agency or a similar institutional framework;

> Developing legislation for supporting ESCOs and EPC-based EE implementation;

> Raising awareness among end users and consumers and promoting the benefits of working with ESCOs;

> Implementing energy polices and EE targets, such as through the NEEAP;

> Capacity-building of ESCOs;

> Reforming energy tariffs and rationalisation of subsidies;

> Creating a dedicated EE fund, EE revolving funds or EE credit lines offered by domestic financial institutions.

24 SPDP of ESCWA, "The role of Super ESCOs in upscaling energy efficiency in the Arab Region", April 5, 2019. Consulted on https://www.unescwa.org/file/88513/download?token=tatT1El8j.

Conclusions and recommendations

This summary report is the final product of a large in-depth study. To arrive at these results, a team of experts brainstormed and researched options to arrive at an initial long list of 19 innovative instruments and then built an evaluation matrix of innovative instruments/approaches worldwide and within the MENA region. Using the evaluation matrix allowed for selecting 10 instruments from the initial 19. These 10 instruments have been carefully analysed in the comprehensive report.

To help harness the greatest potential of the innovative EE instruments, we offer the following recommendations:

1 Learning about international examples of innovative EE instruments in global and regional peer-to-peer exchange platforms

Global and regional exchange platforms can support the dissemination of innovative, market-based approaches for Energy Efficiency. These platforms should include policy makers, public officials, organizations responsible for energy efficiency but also economists, research groups, chambers of industry or ESCOs. As these platforms bring together several actors, they create a network among policy makers and market actors which could foster the identification of suitable EE models. By sharing best practices and experience, platform members can discuss relevant topics and adjust them more easily to their specific circumstances. This could include the adoption of technologies that already exist elsewhere to their respective markets, the development of pilots for new EE instruments but also the discussion about regulatory frameworks and market conditions.

2 Selecting and testing innovative EE instruments for specific sectors and consumer groups

Some of these innovative EE instruments can be initially used for specific groups and the outcomes can then be compared before they are introduced on a larger scale. By using these "testing labs", the results can be used to show advantages and identify common problems and issues on a small scale at an early stage. At the same time, the results obtained in similar environments can be compared so that proof of effectiveness can be provided. This can lead to increased acceptance, especially in areas with a high level of scepticism towards these instruments.

3 Implementing a robust process for monitoring the effectiveness of all EE instruments available in a country and optimizing the mix of instruments put in place

With one or several EE instruments put in place, a robust monitoring and verifying process will be crucial for ensuring that the targets set initially are consistently and effectively achieved.

A monitoring and verification process will help improve data availability and reliability and can subsequently be used to increase the effectiveness of the mix of instruments. The use of other instruments can be planned more purposefully to increase the cost-effectiveness and benefits. At the same time, this data can be used to advertise for further use cases.

Abbreviations

ACs	Air conditioners
BMU	German Ministry of the Environment, Nature Conservation and Nuclear Safety
CPP	Critical Peak Pricing
DEWA	Dubai Electricity and Water Authority
DSM	Demand-side Management
EE	Energy Efficiency
EEN	Energy Efficiency Network
EEOS	Energy Efficiency Obligation Schemes
EPC	Energy Performance Contract
ESCO	Energy Savings Company
ESCWA	Economic and Social Commission for Western Asia
ESI	Energy Savings Insurance
ESP	Energy Service Provider
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
KSA	Kingdom of Saudi Arabia
M&V	Measurement and verification
MASEN	Moroccan Agency for Sustainable Energy
MBI	Market-based Instrument
MEMR	Ministry of Energy and Mineral Resources
MENA	Middle East and North Africa
MEPS	Minimum Energy Performance Standards
MOCI	Ministry of Commerce and Industry
MRV	Measurement Reporting and Verification
NDC	Nationally Determined Contributions
NEEAP	National Energy Efficiency Action Plan
NGO	Non-Governmental Organisation
RE	Renewable Energy
REEEL	Renewable Energy and Energy Efficiency Law
RTP	Real-time Pricing
SDPD	Sustainable Development Policies Division
SIE	Société d'Investissement Energétique
SME	Small or Medium-sized Enterprise
ToU	Time-of-Use
U4E	United for Efficiency
UAE	United Arab Emirates
UNIDO	United Nations Industrial Development Organization
VA	Voluntary Agreement

Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Head office
Bonn and Eschborn, Germany

Friedrich-Ebert-Allee 32 + 36
53113 Bonn, Germany
T +49 228 4460-0
F +49 228 4460-1766

Dag-Hammarskjöld-Weg 1 - 5
65760 Eschborn, Germany
T +49 6196 79-0
F +49 6196 79-1115

E info@giz.de
I www.giz.de

On behalf of:

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

of the Federal Republic of Germany