



ESCos - Energy Service Companies: A market tool to foster energy efficiency In the Southern Mediterranean

May 2014



Energy efficiency HVAC system (Heating, Ventilation and Air Conditioning)

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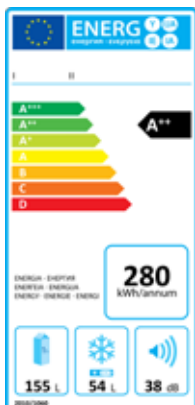
To be turned to bankable project



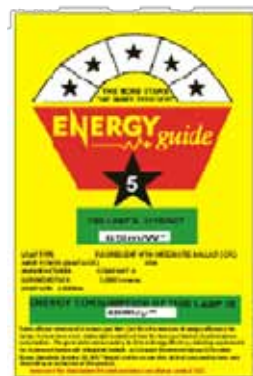
EE Retrofit application in a Spa

Examples of energy labels

EU



Ghana



Thailand



Australia



Source World Energy Council Energy efficiency a recipe for success- 2010



Energy efficiency retrofit of Moldava's largest producer and exporter of fruit juice and canned vegetables. EBRD financed.

Introduction

Energy demand is growing – as is the need for greater efficiency

In most MENA countries oil products and coal remain the dominant energy sources. Rapid population and economic growth are driving higher energy demand, which has grown by over 4% per year since 2000. Action is needed to meet this energy challenge, and the important associated climate, environmental, economic and social challenges. Improving energy efficiency is one of the key tools to achieve this, as approximately 84% of industry productivity gains are attributable to improved thermodynamic efficiency. The National Energy Efficiency Action Plans (NEEAPs) developed by most MENA countries are the policy pillars that set out how this can be achieved.

ESCOs are an effective way to improve energy efficiency and are a key part of most NEEAPs

Energy Service Companies (ESCOs) are highlighted in many of the NEEAPs as key actors, and a major catalyst for improved energy efficiency. The NEEAPs also detail the policy commitment to improve the market situation for ESCOs. Many organisations and firms have high potential to save energy through efficiency measures but are unable to do so because of a lack of knowledge and capacity. ESCOs address this problem by bringing their expertise and know-how and by taking on some of the risks (and rewards). By doing so they help to make energy efficiency investments happen, to the benefit of both sides and the wider economy.



Certification stamp

There is still a lot to do to create the conditions for ESCo markets to flourish

ESCOs remain significantly underdeveloped in the MENA region compared to Europe, North America or elsewhere. The lack of capacity, lack of a suitable regulatory framework, limited commercial financing, subsidised energy prices, and low awareness of ESCOs and their benefits are all important reasons for this. Each of these issues will need to be addressed, to open up this untapped energy saving potential. However, before a market for energy efficiency services can be developed, there must be a strong desire for, and commitment to, building such a market.

What is this brochure?

The brochure intends to support policy makers, firms, organisations, agencies, ESCOs and other professionals by:

- clearly explaining the rationale and benefits of energy efficiency services;
- demonstrating how ESCOs can be relevant and further developed in the MENA region;
- setting out a roadmap for establishing the framework for energy efficiency services markets;
- providing detailed guidance on the specific measures, in areas such as accreditation, that should be taken;
- providing a range of practical examples from the MENA region and beyond to inspire action.

Why is MED-ENEC taking this initiative?

This brochure is a follow up to the Beirut conference held in 2012, and MED-ENEC's publication of the document "Recommendation for regional Arab qualification accreditation and/or certification for providers of energy audits and related energy services". It is intended to contribute to the MED-ENEC mission to "develop the markets for energy efficiency" by helping to make energy services markets a reality in the MENA region.

*Dr. Kurt Wiesegart
MED-ENEC Team Leader*

ESCOs and energy efficiency services

What is an ESCo?

Various definitions of the business model of an ESCo exists. In the context of this publication an ESCo is an enterprise that may offer the entire range of services out of one hand such as appraisal of the energy efficiency potential of a client; identification of technically viable and cost effective energy efficiency measures; design, financing, and implementation management of client approved EE measures. Whether an ESCo is willing to go all the way offering the full service package as very few do, or signs only a performance contract to avoid being a partner in the financial closure of the EE measures, depends on the contractual terms and conditions signed between parties and the client’s willingness to accept such a most comprehensive service package. However an ESCo getting paid by a client for writing a report only identifying technically viable energy efficiency measures and judging their financial attractiveness may not be called an ESCo and is usually referred to as an “energy auditor” in the literature. * The ESCos payment for their services is based either wholly, or partially, on the achievement of energy efficiency improvements (savings) and on meeting of other agreed performance criteria.

The ESCo business model is based on the ESCO’s professional understanding and skills, providing a clear insight into the predictable technical and financial implications of an energy efficiency investment. ESCOs can therefore guarantee specific results and benefits to the user, while also benefitting themselves from a share of the savings made.

The ESCo business model is based on delivering and / or guaranteeing of energy efficiency improvement



MCIT Building, Cairo: Study of EE lighting up-grade conducted

Why use ESCOs - client benefits

Client organisations often make an investment decision on an upfront cost basis, not on a full life cost basis. This happens for a variety of reasons, but among the most important reasons is the limited perception and trust of the true value delivered by an energy efficiency investment.

An energy efficiency project undertaken through an ESCo will generate cash flow as it reduces energy consumption compared to a baseline (demand side) and consequently lowers costs (supply side), while reducing the environmental impact. These key benefits are always measured by at least two important key performance indicators versus the baseline:

In most cases, Energy efficiency improvement expressed as MWh/production or service output

Cash flow improvement

ESCOs save clients energy and improve efficiency while taking on some, or all, of the investment cost and risk

In addition to these benefits the client organisation will also, through working with the ESCo, improve its knowledge of energy consumption and efficiency, while maintaining focus on its core business. Firms and organisations can also improve their reputation and credibility by demonstrating the good practices and environmental improvements they have made to their customers, suppliers and the government.

Box 1: Example ESCo benefits

A multinational industrial company producing plastic films hired an ESCo, who implemented a shared saving EPC, (Energy Performance Contract), installing and operating a new heating system, and a tri- generation power plant to serve the electrical and thermal needs of the company. As a result, and without the company having to fund any investments, the organisation was able to reduce its energy use by 550 Toe (14%), and costs by 10%. This is estimated to have reduced emissions of CO2 by 1,100 tonnes/year.

*This definition of the work of an ESCo is based on A.Kaupp

Energy efficiency services and ESCos

Energy Efficiency Services (EES) are the agreed tasks designed to implement energy efficiency measures in an organisation, leading to improvements in energy efficiency and meeting other agreed performance criteria. EES are defined in the European standard EN 15900: Energy Efficiency Services, which states the key attributes of the service, these key attributes represent the obligations that should be included in the contractual agreement between the customer and the energy service provider, leading to the Energy Performance Contracting.

Energy efficiency is an investment, not an expense

An ESCo typically provides energy efficiency services respecting a standard process, following a path similar to figure 1. ESCos are involved and accountable from the beginning of the process, which includes the following steps:

Energy audit

For an organisation striving to reduce energy consumption and improve its energy efficiency the energy audit is the first and fundamental step irrespective of organisation type (Public Administration, Private Company), size (SME, large organisation) or sector (commercial, industrial, residential).

An energy audit will define, for an organisation, its:

- energy consumption baseline;

- energy consumption drivers and adjustment factors to normalize baseline;
- important factors in energy use;
- priorities for energy efficiency measures.

The implementation of the actions identified in the energy audit will generate benefits to the client organisation, such as cost savings and related environmental benefits.

The energy audit is performed by an energy auditor either directly working for the ESCO or a third party retained by the ESCO. The audit is performed in collaboration with staff belonging to the organisation being audited.

Description of energy efficiency measures

Energy efficiency measures are a set of actions that the client organisation and ESCo will agree upon in a 'service agreement' contract. Following the audit a proposal for measures will be recommended to the client. These measures can be classified in the following categories:

- i.) replacement, refurbishment, modification or addition of equipment;
- ii.) more efficient operations;
- iii.) improved maintenance;
- iv.) training of people;

These types of measures are always integrated in the set up and implementation of an **energy management system** (see box 2) which enables the organisation to develop a policy and action plan to improve its performance by using less energy.

Figure 1 ESCo Energy efficiency services



Energy Performance Contracting

Energy Performance Contracting (EPC) is the outcome of the process of reaching the contractual service agreement between the customer and the ESCo. An energy performance contract should include, as a minimum, the following:

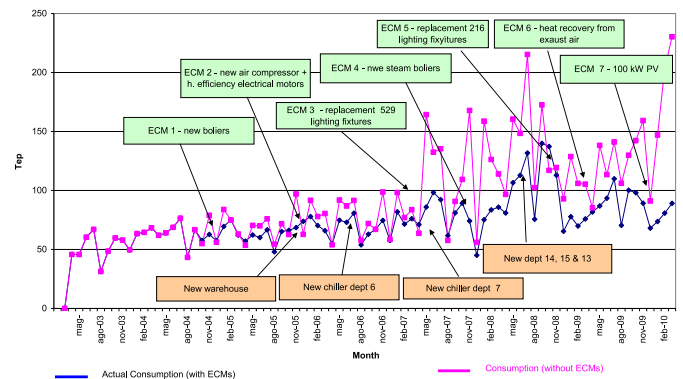
- to whom the service is addressed;
- where the service is delivered;
- define baseline and baseline adjustment factors;
- list of energy efficiency measures to be implemented;
- guaranteed saving versus baseline by implementing the measures of the contract;
- Operations and Maintenance (O&M) procedures and responsibilities (best practices);
- duration of the contract and major milestones;
- people training (all levels);
- reporting procedures;
- list of obligations of the contracting parties and penalties for their breach;
- financing of the project and assets ownership;
- measurement and verification procedure of the quality of the service and guaranteed saving (key performance indicators [KPI]);
- reference date to verify the achieved savings;
- change of law – unforeseen changes clauses;
- default clauses.

The purpose of these, and any other clauses, is to provide the necessary guarantees to both the client and ESCo organisation. It will also establish clearly the responsibilities and liabilities in terms of financing arrangements and risks and also the ownership of any assets secured through the energy efficiency investments.

Measurement and verification are fundamental to assessing the performance of the contracted energy efficiency services

Measurement and verification

Measurement and verification procedures are fundamental to the energy service agreement and are needed to check whether the guaranteed energy efficiency improvement and any other contractual obligations are met (KPIs). The procedure agreed at contracting will include the monitoring and verification reporting format, reporting intervals and the specific links with the energy management system.



Reporting energy efficiency improvement

Follow-up procedures

Follow-up procedures usually include a client's management review of KPIs, the consistency check with the organisation energy policy and the adoption of corrective actions, if any. The ESCo procedures and database of energy consumption are transferred to the client at the end of the contractual agreement. This final transfer is crucial for the client organisation to learn from their experience and continually improve, and also to avoid wasting time and resources if a new contract is made.

Clients should monitor the performance of the ESCos to ensure agreed targets and savings are made



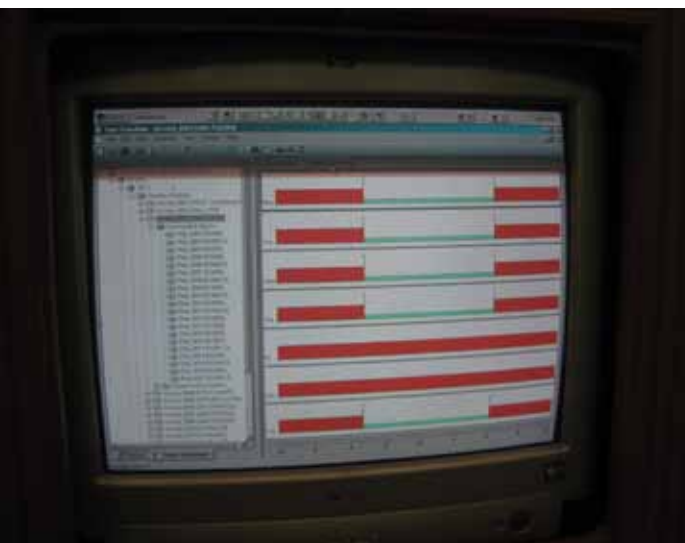
Measurement and monitoring is essential not only for improving awareness and understanding but also for governments, to make regulations more effective

Additional services that can be delivered by ESCo

ESCOs may provide some or all of the following energy efficiency related services:

- **Energy demand side management:** includes all actions that reduce the consumption of energy per unit of product or service delivered (i.e. per tonne produced; or MWh/heated m3 per year) versus baseline. It may include peak demand management;
 - **Energy efficiency in buildings:** covers all actions taken to refurbish an existing building, or to implement in a new building, that improve the overall energy performance by a significant amount;
 - **Process / production energy optimisation:** services focus on minimising energy consumption within an existing process;
- **Facilities management services:** are delivered within a building to coordinate the use of space, infrastructure and people to reduce energy use;
- **Operations and maintenance (O&M):** services include procedures and best practices which are put in place to maintain the energy performance and reliability of equipment;
- **Energy management system:** services help organisations to establish the systems and processes necessary to improve energy efficiency – see box 2;

Energy procurement services: help organisations select the optimum tariff structure fitting their consumption patterns and negotiate energy supply to minimize energy cost.



Building management system

Box 2: Energy management systems

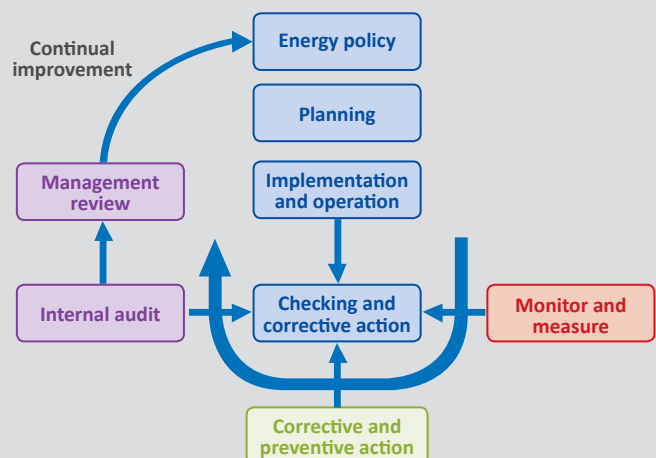
An organisation that adopts an Energy Management System (EMS) commits to integrating energy efficiency into its operations to ensure long term competitiveness. An EMS involves developing an energy policy, establishing objectives and processes to achieve the policy commitments and taking action, as needed, to improve energy performance. This should lead to reductions in energy costs and greenhouse gas emissions. An EMS has several requirements:

- a well-defined energy policy with a person accountable for its implementation;
- an energy audit to survey the development in energy consumption and use;
- preventive and corrective actions to reduce or eliminate inefficient use of energy;
- informing and educating people to be conscious about energy;
- evaluation of energy efficiency performance;
- consideration of energy efficiency and lifetime consumption when purchasing new equipment.

ESCOs performing this service are typically requested to implement these actions at a client's site and to enable for the complete transfer of the EMS (energy audits, O&M procedures and best practices, measurement and verification procedures, consumption database, etc ;) at the end of an EPC.

ISO 50001 is the reference international standard for an EMS and is based on the Plan-Do-Check-Act methodology, starting from the energy policy

Figure 2 ISO 50001 summary diagram



Source: Ecofys, adapted from ISO50001 standard documentation

How do ESCos work?

ESCOs provide benefits to the economy and clients by improving energy efficiency and reduce energy cost, but they also typically operate as profitable businesses, although non-profit ESCos also exist. Profitability is based on a business model that helps clients to share and overcome legal, financial and technical ++risk.

Self-assessment and the energy efficiency investment decision

Investment projects must have their own business plan and generate a self-sustaining cash flow to repay the initial investment. This is true regardless of who is investing the capital (capex) for the energy conservation measures and who is operating and maintaining them (opex).

Self-assessment can assist organisations in deciding how to utilise ESCos

Energy efficiency investments are exactly the same as normal investments, therefore the investment must generate sufficient return from the savings for both the customer and the ESCo. The key question for the client in the first instance is: do they have the competencies to deal with the technical and financial risks of the project? Then, if not, what is the best approach to deal with this? A self-assessment guideline for a client organisation is presented in figure 3.

Figure 3 Self-assessment guideline



Source: MED-ENEC (2012)

The self-assessment works by the client assessing their own understanding by checking the relevant boxes of the five criteria based on the knowledge of its own organisation, for the specific energy efficiency measure (project). Then the client repeats the same analysis for the ESCo it is planning to hire. The quadrant with the most checked boxes highlights which of the two is in the best position to deal with project risks, with

the following recommendations:

MAKE means the client has more knowledge and resources than the ESCo to deal with project risks and it can implement the energy efficiency project on its own;

BUY means the ESCo has more knowledge and resources to deal with project risks than the client, therefore it is more cost effective for the client to hire (buy) the ESCo services;

MAKE-BUY means the client and ESCo have the same knowledge and resources to deal with project risks. In this “equivalent” capabilities situation a deeper analysis is recommended to take into account resources availability (financial, people), project timeframe, etc;

ESCOs that meet clients’ financial needs

While client organisations are typically confident with traditional equipment purchase and investment, they are usually less aware of the benefits of energy services and EPC.

Hiring an ESCo involves a client-supplier relationship that is very different to a direct purchase of equipment where, aside from maintenance, the subsequent contact between the client and equipment supplier is limited. ESCos are different, requiring a long-term partnership, lasting several years. As a result addressing client needs is even more crucial than normal for ESCos.

ESCOs must develop a long term relationship with clients – building trust that they can meet their needs

Since “money matters” ESCos must first provide to clients the evidence that the energy efficiency measures will maintain their effectiveness and efficiency over time and that the cash flow generated by the project is sufficient to repay the initial investment and all other necessary costs. Also, since the financial need of a client is key to make a decision, ESCO needs to facilitate a financial solution that fits the client’s needs (ex: off balance sheet financing, operating lease, capital lease etc...)

ESCOs will also need to demonstrate that there are appropriate contingencies and allowances to manage any problems over the full technical lifetime of the equipment.

The financial and efficiency improvements that ESCos promise are the fundamental market needs that ESCos meet, and will be measured by relevant key performance indicators (KPI) and cash flow projections (Energy Performance Contracting [EPC]).



Energy efficiency measures in a building in Western Syberia financed by the EBRD

ESCOs and risk

Risk assessment and allocation is at the heart of a successful ESCo and EPC arrangement. The client organisation and ESCo must agree which risks they are willing and able to take. This should match to each organisation’s knowledge, understanding, skills and capacity (staff, financial, management).

Table 1 provides a summary risk assessment for an EPC, with a clear allocation of the specific financial and operational (performance) risks between the client and the ESCo. Risks that neither party are able to take on can then be transferred to a third party e.g. as in the table, O&M risks managed by equipment risk insurance or a third party maintenance contract.

Table 1 Risk assessment and allocation

Risk	Client	ESCO
1.FINANCIAL		
Energy prices (switch contract, spark spread, exchange rate...)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Investment costs of energy efficiency measures	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Construction claims (delay, over budget, ...)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Financing method and financing terms	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Client Payments	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Change in energy consumption	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2.OPERATIONAL		
Energy efficiency improvement	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Operations & Maintenance	<input type="checkbox"/>	<input type="checkbox"/>
Equipment energy performance	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Plant reliability	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Measurement & verification procedures	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Change of law – unforeseeable events	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Compliance with regulatory requirements	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Source: MED-ENEC (2012)

Risk identification, mitigation and allocation is at the heart of a successful ESCo and EPC arrangement

ESCO business models

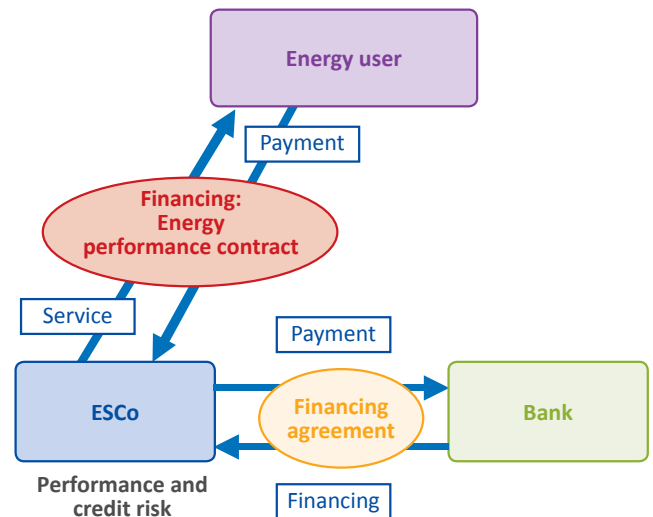
ESCO business models are contractual arrangement options designed in a way to address clients’ management, financial and operational needs. Shared Savings, Guaranteed Savings and Chauffage contracts are the three main business models for ESCOs, Fast out Contracts is a ESCo business models

Shared savings contracts: the ESCo is technically and financially responsible for the energy efficiency measure implementation. The ESCo designs, provides financing based on its own balance sheet, purchase the equipment, installs and executes the O&M of the energy efficiency measures. The ESCO’s cost of the project is “closed book” for the client.

The title of installed equipment is kept with the ESCO for the term of the contract and is usually sold for a symbolic price (1 Euro) to the client at the end of the contract term. The client retains a negotiated percentage of the monitory savings and the ESCo retains usually the majority of the savings, to repay the investment and provide a margin.

In other words, Shared savings contracts simply is a business arrangement where the ESCo invest in the client’s facility, in return the ESCo shares a small percentage of the savings with the client in return for offering the client’s facility for such an investment. The ESCo carries the performance and credit risk (see figure 4).

Figure 4 Mode of operation of shared savings ESCo arrangement



Source: Ecofys, adapted from ECS (2003)

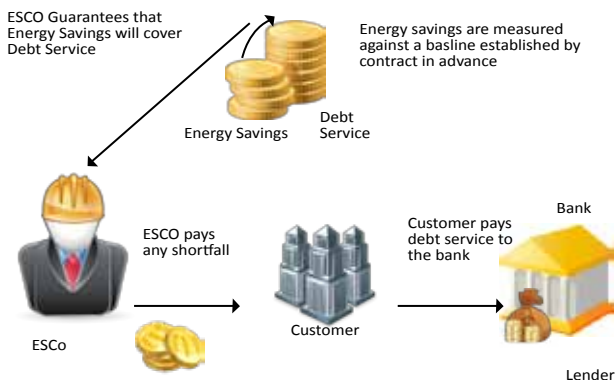
Fast out contracts: the Fast Out model is a sub-set of shared savings contracts that is used for public sector clients. Similar to the Shared Savings arrangements, the ESCo is technically and financially responsible for the energy efficiency measure implementation. The ESCo designs, provides financing based on its own balance sheet, purchase the equipment, installs and executes the O&M of the energy efficiency measures.

Given the general transparency requirements for government clients, the ESCo's cost of the project is "open book" for the client and the ESCo's margin is disclosed. To reduce the cost of In Chauffage contracting, the ESCo must carry out all aspects of project development and implementation, plus the ESCo must be sufficiently well capitalized to own the equipment (usually with a large portion being financed by a bank loan).

The ESCo supplies energy according to a specified price for an agreed period. Often the assets are then turned over to the customer free of charge, the total savings is retained by the ESCo and applied to pay down the project cost, which is the reason for the name "Fast Out". Fast Out contracts are variable term contracts.

Guaranteed savings contracts: the customer finances the investment for energy efficiency measures and pays the ESCo for the energy efficiency services, including O&M costs. The monetary value of the energy savings versus the baseline should allow the customer to repay its debt obligation within the term of the contract. The term of the contract is usually fixed. The client retains ownership of the equipment (unless the equipment is leased by the client - in that case the leasing company retains ownership).

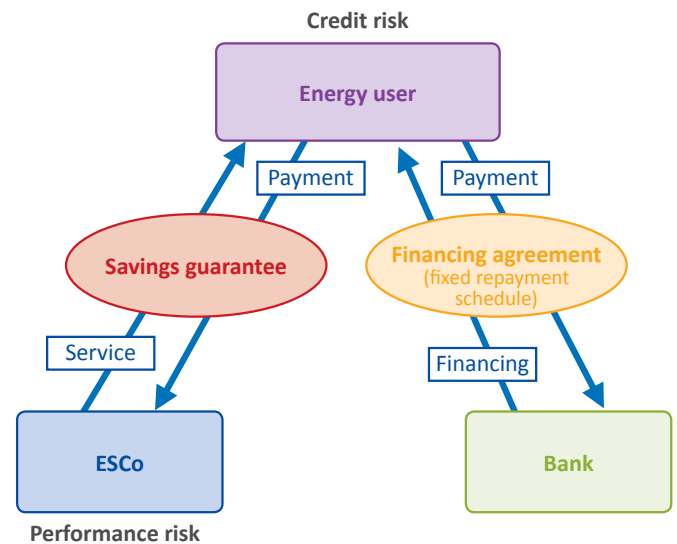
Figure 5 Performance Guarantee – Guaranteed Savings Contract



In this model the ESCo carries the performance risk by guaranteeing the energy savings to the client, the client takes on the credit risk from the repayments of the loan to the bank (see figures 5 and 6).

ESCOs always take the performance risk – the allocation of credit (financial) risk is the key factor in distinguishing different ESCo business models

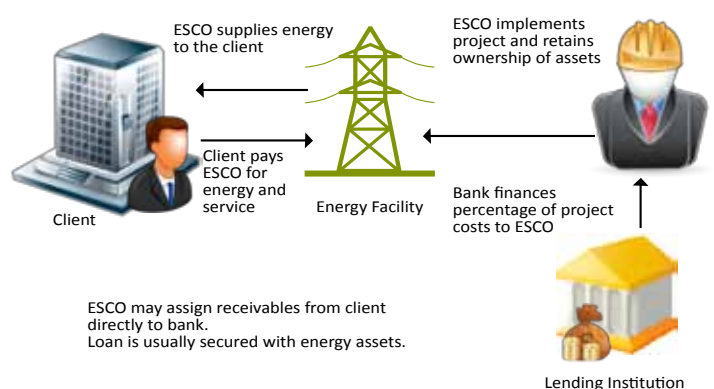
Figure 6 Mode of operation of guaranteed savings ESCo arrangement



Source: Ecofys, adapted from iet.jrc.ec.europa.eu

Chauffage contracts: "Chauffage" is a French term meaning heat or heat supply (often for buildings). In the ESCo context, it is used to describe a contracting arrangement in which the ESCo owns the assets and provides or sells energy as well as other services to the customer. Chauffage contracting can be more akin to a medium-term energy supply contract similar to one that might be negotiated between an independent power producer (IPP) and a utility in addition to providing other services. Typical Chauffage is illustrated in figure 7

Figure 7 Typical Chauffage Structure



In most Chauffage contracts, the ESCo charges the client a negotiated fee (normally per unit area of the building space) and in return provide predefined living

conditions (ex: 22° C 50% relative humidity etc...). The ESCo carries out all aspects of project development and implementation including design, construction, O&M and is also responsible for paying the utilities. The idea here that the more efficiently the ESCo can deliver this service the more profitable they are. In most cases Chauffage contracts would involve major investments by the ESCo in the client's facility like building a co-generation or a chiller plant. The ESCo need to be sufficiently well capitalized to own the equipment (usually with a large portion being financed by a bank loan). The ownership of the equipment is retained by the ESCo often the assets are then turned over to the customer free of charge at the end of the contract.

Many other arrangements, between shared savings, guaranteed savings and chauffage are possible, but essentially the choice of contract boils down to one key

element which is risk allocation of the various activities. In the overwhelming majority of cases the ESCo will be accountable and responsible for the performance risk, i.e. the risk of the success of the Energy Conservation Measures (ECM) they propose and implement. The key distinguishing factor between different contract types is the extent to which the ESCo, along with the client, also take a financial risk, through their direct involvement in the credit arrangement for financing, or ownership, of the energy efficiency assets.

Implementing measures

With a risk sharing and EPC agreement in place then the ESCo can implement the specific measures agreed upon, for the types of services see page 9. Figure 8 presents an example template of an action plan agreed upon by the energy end user and ESCo before EPC implementation which is aligned with NEEAP and lists the agreed measures.

Figure 8 Template for agreed energy efficiency measures action plan

NEEAP Initiative: _____ Customer: _____ Location: _____

No	Discription	Potential for saving			Investment	Payback time	Time schedule	Person in charge	Detailed calculations in attachemens	Comments
		kWh/year	Avoided TCO ₂ /year ar	Local currency/year	Local currency	Years				
1	Replace incandescent lamps with compact fluorescent lamps	3 000		5 000	20 000	4	Sep 2013		A.1	EPC
2	Replace existing water pumps with high efficiency electric motors	2 500		3 500	10 000	2.9	Nov 2013		A.2	
3										
4										



Marriot Hotel, Cairo: Several EE lighting studies conducted in preparation for implementation

Status of ESCOs in the MENA region

NEEAPs and the ESCo markets in the MENA region

ESCO markets hardly exist in the MENA region, with Tunisia the main exception (see box 3). Governments recognise this fact and the recent creation of their NEEAPs has highlighted creation of ESCo markets as an important measure to improve their energy efficiency.

There are commitments to ESCOs in the region but markets are under-developed in almost all countries – Tunisia is the exception and has the most advanced market

An assessment of energy efficiency policy in the MENA region which analyses the strategic direction and nature of targets for energy efficiency is presented in figure 9. This identifies a trend from indicative targets, developed from a bottom-up or top-down strategy, moving towards the type of binding targets within a top-down strategy as experienced in Tunisia and, more recently, also Algeria.

Table 2 presents a snapshot of the current situation for ESCOs for selected countries in the MENA region. This is a MED-ENEC elaboration made from published NEEAPs and results from the Energy Efficiency workshop held in Beirut in May 2012. It shows a mix of progress across the countries, with four of the six having developed

indicative targets for energy efficiency measures, but only two of the four, Jordan and Tunisia, also highlight an important role for ESCOs in energy audit, demonstration projects and EPC. Palestine even highlights no role for ESCOs in its NEEAP as it is taking a different strategic approach to energy efficiency markets, by focusing on promoting energy audits and energy management. None of the countries is assessed to have a functional ESCo certification scheme.

Importantly the table highlights that three of the countries, Jordan, Lebanon and Tunisia, have put programmes in place for ESCo development.

Figure 9 Energy efficiency policy strategy and targets in MENA countries

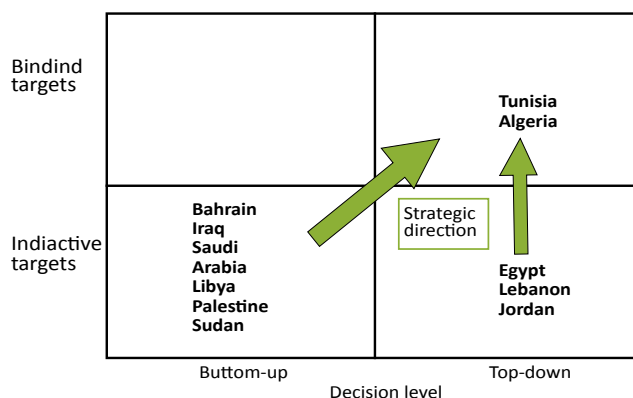


Table 2 Summary of NEEAPs and ESCo market development in selected countries

Country	NEEAP	Energy Efficiency Measures	ESCO ROLE			ESCos certification schemes	Programmes for ESCO development
			ENERGY AUDIT	Demonstration Projects	EPC		
Egypt	2012	Indicative targets	Cooperation with energy distributors			-	-
Jordan	2013	Indicative targets	✓	✓	✓	-	-
Lebanon	2011	Indicative targets	✓	-	-	-	✓
Morocco	Law 47.09		✓	-	-	-	-
Palestine	2011	Indicative targets	-	-	-	-	-
Tunisia	PEEI Project		✓	✓	✓	-	✓



A close-up on regional markets

Taking a closer look at the market developments in selected MENA countries the following summaries can be made:

Tunisia: is the stand out success story in the MENA region – see box 3.

Egypt: alongside Tunisia, Egypt pioneered some of the earliest market initiatives for ESCOs in the MENA region in the early 2000s. But the market for ESCOs in Egypt remains under-developed, with energy end-users hesitant to undertake EPC and local banks and financial institutions reluctant to accept energy efficiency measures or products as collateral. Highly subsidised energy prices and lack of experience in measurement and verification have limited the development of energy efficiency markets with EPC. This has led to the development of a market based mainly on energy efficiency applications with traditional product guarantee provisions and the technical risks assigned to the final user. Local financial institutions have not been motivated to develop new services for the supply of energy efficiency equipment. The NEEAP of Egypt does not give any hints to the possible role of ESCOs.

Jordan: the Jordanian NEEAP, which was developed with the support of MED-ENEC, highlights a variety of sectors in which energy savings can be made, with specific energy savings attributed to measures delivered by ESCOs and EPC, or by direct implementation of energy efficiency measures by end users. The measures include, for example, improvement of the energy efficiency of the Water Authority of Jordan (IEE) for a total saving of 60 GWh/year corresponding to about 40,000 TCO₂/year.

Lebanon: the Lebanese NEEAP, also developed with MED-ENEC's support, outlines 14 independent but inter-related national initiatives to improve energy efficiency and reach its targets. These measures include the action plan of the Lebanese Centre for Energy Conservation (LCEC) which launched an energy audit support programme and a campaign to promote energy efficiency in the tertiary and industrial sectors.

Sustained support and planning are essential to overcoming the barriers to ESCo market development

In summary, while selected NEEAPs in the MENA region provide some solid ground for ESCo growth, the market remains largely untapped. As shown in Tunisia and globally (see boxes 3 and 4) sustained action and support

is important to grow the market for ESCOs. A road map for action and co-ordination with market actors are both crucial steps towards overcoming the barriers to ESCo market development.

Box 3: Tunisia - a growing energy service market

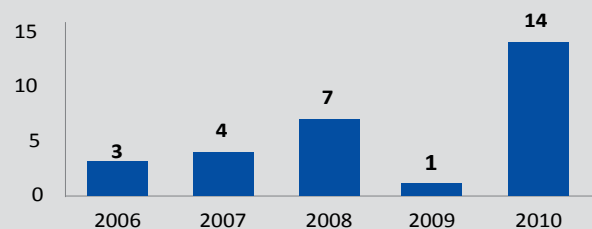
Mandatory energy audits, supported by profitable financial arrangements have established a market for energy service companies (ESCOs) in Tunisia.

In 2004 Tunisia passed its first energy efficiency law setting the framework for ESCOs to undertake energy audits and achieve savings for industry. The scheme was supported by a US\$ 8.5m loan from the World Bank's Global Environment Facility (GEF), which leveraged about \$3 of private and governmental investments for every \$1 of funding. At the time, nearly four hundred participants from various stakeholders (banks, ESCOs, industry, commercial and public sector) were trained and thus took over new roles and jobs. This helped the programme to grow as the technical and financial capacity within Tunisia grew and staff gained experience.

Key factors of success

- The 2004 law made ESCOs and EE investment in industry profitable.
- Tunisia has a long established Agency for Energy Efficiency and Renewable Energy (ANME) for the coordination of projects, funding, monitoring and evaluation.
- The pilot scheme 'Programme d'efficacité énergétique dans le secteur industriel' (PEEI) provided funding and technical support for developing ESCOs. The scheme stimulated ESCO contracts and helped build relationships between ESCOs and industry.
- Investment in the technical and financial tools and capacity to make the market viable.

EPC development in Tunisia



Source: World Esco Outlook- P.Langlois – S.J. Hansen – 2012

Box 4: ESCo markets around the world

The increasing awareness and the importance of energy efficiency has led to enormous interest in ESCOs and energy efficiency services worldwide. The current state of the market can be summarised as:

North America: is the oldest and most advanced energy efficiency market. In the US the increased volatility of energy prices and mandatory energy saving targets defined by federal and state laws are still fuelling market growth. The Municipal, University, School and Hospital (MUSH) market has been fertile ground for ESCOs for over 30 years and will continue to support growth as many government facilities are aging and improvements are needed.

A recent legislative act (Dodd-Frank act) and a new financial accounting requirement (FASB 13) on operational “lease” definitions may have an impact on ESCOs ability to provide EPC in certain market segments.

South and Central America: Brazil has the most developed market, followed by Mexico as a distant second and Uruguay. Initiatives supported by influential organisations such as World Bank, are endorsing and supporting the ESCo business model and helping the development of the national framework necessary to build a sustainable industry platform.



Europe: ESCO markets are at diverse stages of development across Europe with Germany leading the way followed by the UK. Other countries (like Italy, France and Spain) have some level of ESCO activity, in most other countries there are only a few ESCOs established and these are not always offering comprehensive EPC. There has been slower market growth in all countries in recent years due to the financial crisis and economic downturn. In general the ESCO offering was

Changes towards a more favourable legislative framework in the EU Energy Efficiency Directive (2012/27/EU), are increasing activity in the refurbishment of public buildings. High energy costs and energy intensity and the presence of energy efficiency financing supported by institutional investors (World Bank, EBRD, etc;) is supporting ESCo market development in Central and Eastern Europe.

Asia: economic growth and industrialisation in China and India, and the sheer size of their potential markets are driving market development. This is the fastest growing regional ESCOs market, although in some countries the lack of government support, such as appropriate legislative frameworks and access to public facilities, is blocking market development.

Oceania: In Australia the demand for energy efficiency has been low in the past and the market is largely untapped, but recent above-inflation increases in energy costs and the adoption of an emissions trading system, has sparked greater interest and consideration of ESCOs and EPC. Government policies such as a legal framework for EPC and the mandatory disclosure of building energy ratings, alongside the “greener” visibility and sustainability of businesses, is expected to significantly widen the opportunities for ESCo development.

Sub-Saharan Africa: ESCOs are largely underdeveloped in this region with the exception of some activities in the southern region (South Africa).



Benefits and barriers to ESCo market development

Energy efficiency is the greenest energy policy that any government can have: in simple terms, electricity that is not generated and the fossil fuel that is not consumed are the most cost effective and sustainable actions that can be taken.

Energy efficiency is the greenest policy any government can pursue – but there are important barriers to investment

The main benefit of ESCos is that they address key barriers of Energy efficiency investments, according to the IEA World Energy Outlook (2012) the main three barriers are:

- **the benefits of energy efficiency are not visible** as efficiency improvement is often not measured.
- **the financial benefits usually occur over the long term**, while upfront costs are often considered a risk. Financing support mechanisms and tax incentives can reduce this barrier.
- **there is insufficient capacity** which means that people with the right skills and understanding are often not available to lead the successful deployment of efficient technologies.

As it relates to public sector ability to procure ESCo: Inadequate legal framework in terms of lack of procurement mechanisms. Because ESCo procurement is different than procurement for projects with well-defined scope and specifications, regulations and procurement mechanisms need to be drafted to allow transparent public procurement of ESCo services.

ESCos are a fundamental channel to market and the energy efficiency services they offer address each of these barriers by:

- **making the benefits of efficiency more visible and tangible** – by basing services on explicit and detailed monitoring and verification of energy use and efficiency improvement.
- **alternative business models** which enable sharing of the financial risk of energy efficiency investments between partners and over time, reducing the barrier of upfront costs.
- **providing energy efficiency expertise** that can be applied across all types of organisations and can lead the development and deployment of energy efficient technologies in partnership with the client organisation.

This makes it simpler and easier to implement energy efficiency measures.

Box 5: Competitiveness benefits for the Lebanese Energy Efficiency Group

Lebanon-based EEG (Energy Efficiency Group) offers energy audits and has recently audited the Four Seasons George V Hotel in Paris. This was EEG’s first audit in France, and was a result of EEG’s successful audits for the Four Seasons Hotels in Beirut and Marrakech. If all of EEG’s recommendations are implemented, the energy savings could top €420,000 annually. Speaking about the energy audit, Ronald Diab, Managing Director of EEG, said, “EEG is establishing itself on the global hospitality map as an expert in the energy audit field.” Following the audit, EEG is continuing to work with The Four Seasons George V management to ensure the appropriate implementation of the chosen energy efficiency measures. EEG is currently working on energy audits for further Four Seasons’ properties globally, and the results will be reported in the coming months.

EEG is a Lebanon based company which is expanding rapidly. Their success story shows that in the field of EE there is still a lot of room for competition worldwide. Developing this market locally can help to create expertise which can also be exported.

Source: Newspaper article Lebanon: Monday, February 11 - 2013 <http://www.ameinfo.com/lebanons-energy-efficiency-provides-energy-efficiency-329261>

Other key benefits of ESCos – economy and employment

Developing ESCos can provide significant benefits to a country by making it more energy efficient. Energy efficiency has a range of economic benefits stemming from the energy savings, these benefits can include:

- Lower energy consumption per unit of output: the implementation of energy management systems has been proven to improve energy efficiency by between 4-8% across industries, which can be used to:
 - reduce overall energy consumption; and/or
 - increase production while energy costs remain the same or decrease.
- Lower energy imports: if energy consumption is reduced, can result in improved trade balances as less energy sources and fuels need to be imported (or: more energy sources will be available for export and to generate income for the government).
- Lower energy costs for firms improves their competitiveness: so that they can provide products at

lower cost in domestic markets and are more able to compete internationally.

- Lower energy costs for end-users: freeing up money for organisations and people to spend on other things.
- Employment: within the ESCos themselves and also indirectly, through the money saved by efficiency being spent elsewhere and generating jobs in these sectors.

This final benefit, employment, is a major plus point within the MENA region and is the subject of another publication produced by MED-ENEC titled 'Energy efficiency and employment: A win-win opportunity in the Southern Mediterranean'.

In summary, this finds that investment in energy efficiency of the type that ESCos would help stimulate, can provide hundreds of thousands of jobs across the MENA region by 2030. Jobs in ESCos would typically be at the high end of the job market, relatively few in number but highly skilled jobs.

Growing ESCo markets will help save energy, improve economic efficiency and create jobs

Estimates of the employment potential from energy efficiency vary, but are in the range of 15-35 direct jobs per million EUR invested (GIZ, 2012; Rod Janssen, 2012) and with this typically leveraging in an estimated 5-10 times more money from private investors, meaning this number of jobs could be significantly multiplied to anything from 75-350 jobs per million EUR. This is before the indirect employment benefits of these new jobs (the wages spent by new workers) and the money saved through improved efficiency being spent in the local economy, being taken into account, which could increase the benefits even further.

Energy efficiency also brings more 'bang for your buck' as EE investments are found to generate many more jobs than similar investments in alternatives such as new fossil fuel plants, or renewable energy. Finally the jobs generated by energy efficiency are typically local, requiring skilled and unskilled local people on the ground and increased demand of local highly qualified energy professionals.



Heat losses out building windows

ESCos address the fundamental barriers to energy efficiency investments but face specific obstacles to their development

Barriers of ESCo market development

While the basic case for ESCos is strong there are also five important reasons why ESCo markets are not more widespread in the MENA region.

1. Lack of overall energy strategy, policies and legal framework to promote ESCos

While the recent development and publication of NEEAPs by countries in the region provides a good starting point for ESCos to develop there is still much further work for government to do. A focused energy strategy and specific policies are needed to support the development of ESCos and their markets. There also needs to be a clear and functional legal framework in which the ESCo business model can flourish. Such policies and the relevant legal framework are missing in many countries. This leads to too much uncertainty and risk for those who would consider setting up an ESCo or using an EPC arrangement.

While some appropriate institutions for energy efficiency do exist in the region, in most countries there is no unique energy agency, or equivalent and supporting bodies that coordinate and harmonise the energy efficiency activities for all stakeholders. These types of agency are required to help prepare all other relevant institutions and support ESCo market development. They should also be accountable for energy strategy implementation and the coordination of all market actors and have measurable goals and plans.

3. Lack of appropriate market conditions – energy prices

Energy efficiency in general and ESCos in particular need a viable market to operate in. This requires the scope for ESCos to make efficiency gains for clients that pay back the investments and further generate revenues through efficiency gains for both the ESCo. While the potential for efficiency gains is high in the MENA region, the costs-benefits of efficiency gains are often low. This is due to high levels of energy subsidies across the region. The subsidies reduce the price of energy and therefore the cost savings that are possible per unit of energy saved. Without a positive investment return within a specific period it is not possible to develop a viable market. Energy price reform is therefore essential to develop ESCo markets. Another publication of MED-ENEC tackles this issue – a respective road map on energy price reforms in MENA region.



Energy efficiency retrofit of a heating system in a school building in Bratislava (EBRD)

4. Lack of appropriate finance

While EE financing have some unique attributes (ex: the savings stream can be used as collateral) similar rules of finance apply, i.e. they should:

- not create risks for the financing organisation beyond its core competencies;
- be simple and easy to access; and
- be reasonably priced.

The difference is that energy efficiency is not a “visible” product but a sophisticated service with a certain degree of complexity to be understood. Complex analysis and modelling are undertaken by ESCos to understand and ‘secure’ the cash flow of an investment.

This type of service also needs to be supported by a level of understanding and sophistication among financing partners, regardless of whether the business model is for “shared savings” or “guaranteed savings”. The long term project-based financing to the ESCo, or the client organisation, has to be supported by appropriate financial tools i.e. that enable repayment from cash flow and require no additional collateral. These financial tools and the capacity among financing organisations is often missing, meaning projects cannot secure finance.

Alongside subsidised energy prices, a lack of necessary policies, laws, institutions, financing and capacity are key major barriers to ESCo development

5. Lack of practical support and experience

Cutting across all these issues and holding the development of ESCos back is a lack of practical support and experience. There is a shortage of people with awareness of the strategies, policies, legislative mechanisms, business models, qualification-certification schemes, institutions and financial tools needed to quickly move forward. There is also often a lack of practical support on training and information from governments and other organisations.

Further work is needed to disseminate best practices, design and implement ESCo certification and more generally to share knowledge, experience and train people.



MCIT Building – Smart Village, EE Building envelop

Road map for promoting ESCo development in the MENA region

Addressing the barriers to the ESCo industry development will require concerted and coordinated action across government

A road map for ESCos in the MENA region

The remainder of this booklet details the specific steps that should be taken to overcome the barriers to ESCo development. It proposes a road map and action plan for enabling ESCo markets to succeed. The process starts with national energy policies and energy efficiency targets defined by Governments and ends with the achievement of efficiency improvements and energy savings. The road map details the steps to creating an appropriate legal framework, appropriate market conditions, improving access to finance, appropriate institutional setup and also the additional practical support required.

Figure 10 presents the road map for ESCos, which will involve concerted and coordinated efforts from all major stakeholders to deliver successful market growth.

Key lessons for the road map and overcoming the obstacles

Lessons learned from other countries around the world (Hansen and Langlois, 2012; IFC, 2011) pick out a few key factors in successful reforms for energy efficiency services market development:

- **Government support:** including a stable and functional institutional framework, such as that

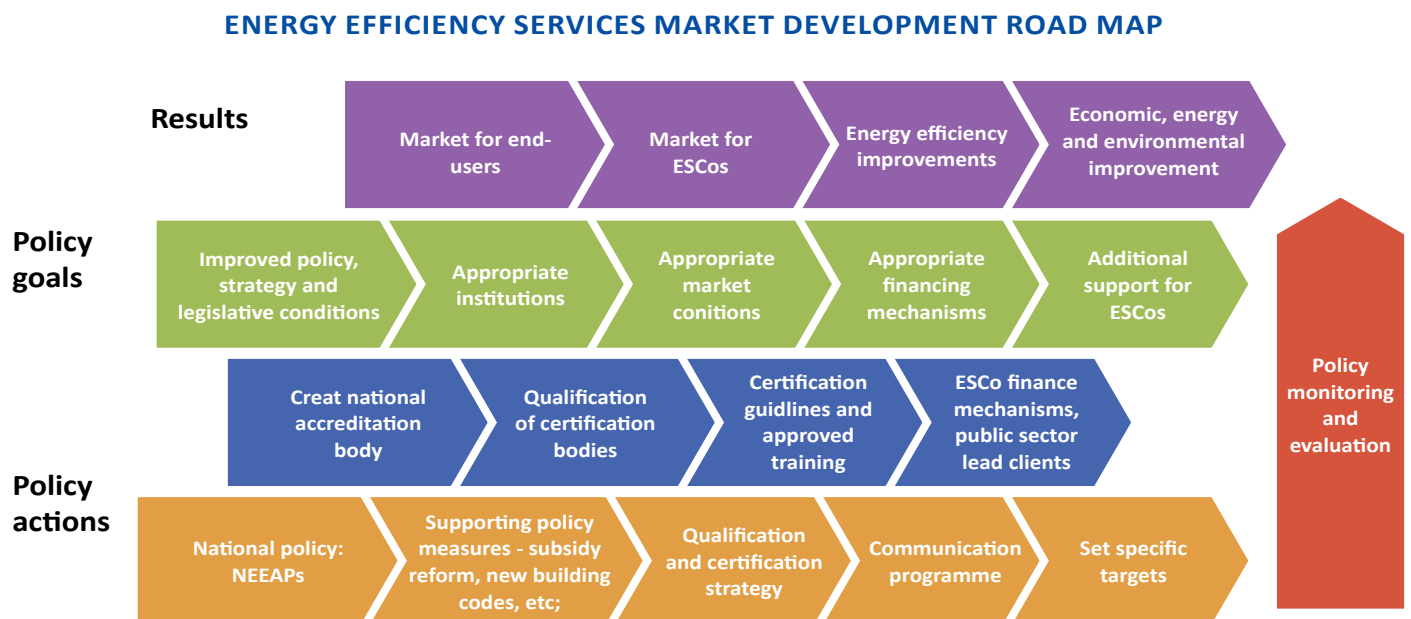
defined in NEEAPs, with a dedicated and responsible agency, mandatory energy efficiency targets and promotion of EPC;

- **Strategic market focus:** allowing ESCos to start up in specific market segments that are simpler and easier (i.e. public sector buildings and organisations) helps to mitigate the financing access barriers and client’s financial risk;
- **Financing access:** ensuring the availability of guaranteed loans, or revolving funds to guarantee client’s payments, from government or sovereign organisations (World Bank, National Development Bank) and local financial institutions. These need to be setup so that ‘all-in’ financing costs (including guarantee fees) do not exceed market interest rates.

There are also lessons to be learnt from only partially successful market development. Difficult experiences from Egypt, India and China (Hansen and Langlois, 2012; IFC, 2011) demonstrated that uncoordinated planning can dilute market efforts and increase the time needed for long term market development. China and India have both now managed to overcome these obstacles and have developed thriving ESCo markets.

Government intervention is essential to enable ESCo markets to grow – support, market focus and access to finance are crucial factors

Figure 10 A road map to successful ESCo markets



Creating an appropriate strategy, policy and legal framework

Appropriate regulations are needed to support ESCo market development, they must create certainty for market players.

National energy strategy and policy

In the past, countries have implemented subsidised energy audits with the aim to stimulate market development. These programmes are no longer sufficient and a comprehensive energy strategy and concerted actions are required to build knowledge, capacity, codes, standards and the capabilities to develop and implement EPC in any given country. The NEEAPs form the strategic basis for these policy measures and should include:

1. the definition of binding national energy efficiency targets;
2. the allocation of these targets to responsible parties;
3. the definition of a market based incentive scheme(s); and
4. the dissemination of best practices, codes and standards.

Building codes in particular are a major instrument to achieve energy savings potential in buildings, the recently published MED-ENEC booklet on ‘Energy efficiency codes: industry, construction and utilities in the Southern Mediterranean’ provides much more information and guidance on this issue. Other specific policies are further described in the following sections.

A coherent national energy strategy must be supported by appropriate policy measures and a legal and regulatory framework

Necessary basic legal and regulatory set-up for ESCos

As an ESCo cannot run the risk of providing a guarantee on an EPC contract that is not technically and financially feasible this can give some confidence to client organisations, as they will know that an ESCo will not engage in unrealistic projects. Despite this, clients often also need added security. Likewise ESCos need to have certainty about clients’ timely payments.

Standards, accreditation and certification for ESCos can provide this but need to be rooted in an appropriate legal framework. This needs to communicate and disseminate the ESCo business model, the provision of EPC contracting and the training and development of people.

Legislative provisions such as codes of practice and procurement rules in the public sector, can help trigger development across all market segments. The public authorities, by leading by example, can demonstrate the effectiveness of guaranteed energy efficiency improvements to other clients and how payment risks are eliminated for ESCos.

Standards and best practices are risk management tools to ensure that EPC is built on solid grounds and methods. These need to be supported by third party certification from an independent accredited organisation. This will ensure that ESCo organisations at all levels, understand, share and apply the same procedures to manage projects and have the inherent capability to carry out an EPC.

Certification and accreditation are essential to ensure transparency and engender trust in the operation and performance of ESCos. Without certification the potential client organisation would need to check by itself the competencies and capabilities of the energy service suppliers to select the appropriate ESCo for its own needs. The same would also apply to the financial institutions deciding on the lending. This is an inefficient and costly way of using ESCos.



Certification document for an Energy Manager

Steps in establishing national standards and a certification process

The qualification and certification of Energy Efficiency Services (EES), EPC and ESCos is crucial to a competitive and transparent market. The adoption and enforcement of common standards and requirements is a government responsibility, typically carried out through a national standardisation body. Certification processes on the other hand, must be carried out by an independent accredited organisation, but which also remains compliant with the requirements of the national accreditation body.

The ultimate goal for such legal framework is to support the ESCO industry, protect consumers and promote energy efficiency investments. It is important to bear in mind that government unnecessary control can add more red tape and is usually a barrier on its own and therefore defeating the purpose. In many cases a self-regulated approach supported by the government in terms of legislation has proved to be a good option striking that balance between protecting consumers and promoting energy efficiency investments.

The accrediting institutions are examined in more detail in the next section. Steps in the national standard process include:

1. National accreditation body to be created (if necessary) and to adopt energy efficiency services and energy services providers (ESCO) standards – which should be consistent with NEEAPs;
2. National accreditation body to accredit a Certification Body which will comply with and certify the adopted standards;
3. Certification body to design and implement a process that will assess the compliance of EES and ESCos against minimum requirements of the adopted standards. In Europe the available standards are EN15900 for EES, UNI CEI 11352 for ESCos; and at international level, ISO 50001 is the standard for energy management systems;
4. Supporting activities, such as a concerted programme of information dissemination about certified ESCos, professionals training, EPC, best practices and demonstration projects. Target audiences are energy end-users, engineering companies, technology providers and local financial institutions. The NEEAP should provide a structure for these activities.

Further information on these issues and more can be found in the MED-ENEC study ‘Recommendation for regional Arab qualification accreditation and/or certification for providers of energy audits and related energy services’ which can be found on the MED-ENEC project website www.med-enec.com

The national accreditation body must appoint an independent accredited certification body and its actions supported through a range of information and training activities



Cover of “The Arab Guideline for Improving Electricity Efficiency and Rationalizing its Consumption at the End User”, published by the League of Arab States, supported by MED-ENEC



Modern EE lighting Hibiz Temple, Egypt (Philips)

Box 6: Standards, certification and codes in the EU; Energy Efficiency Directives of the EU and LAS

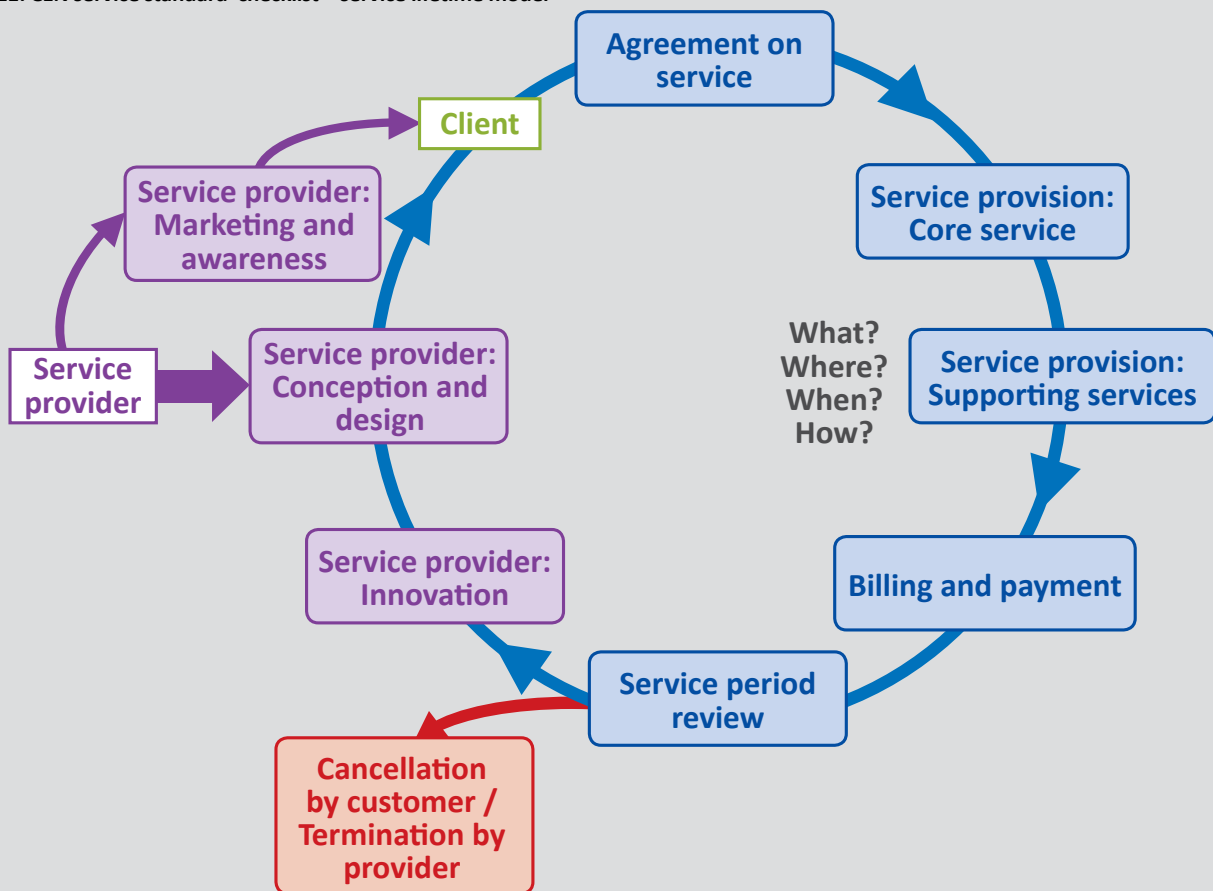
In the EU, recent requests for standards development, codes of practice, professional codes and similar standards and certification have been proven to influence energy end-users decision making processes and to enhance trust between service suppliers and final users.

The recently agreed EU Energy Efficiency Directive [EED] (2012/27/EU) obliges Member States to renovate public buildings, to introduce energy efficiency obligations and to establish financing facilities for energy efficiency measures. The binding measures contained within the Directive have provided a legal framework for EES markets, with each Member State deciding on its own specific implementation in law and the supporting policies to help bring in the considerable investments that are needed.

The need to remove barriers and increase market credibility for ESCOs is also recognised within the new EED. Article 16 of the Directive defines the need to create accreditation, qualification and certification schemes, with suitable training programmes to make available competencies and manage energy efficiency measures implementation. The energy efficiency Guideline of the League of Arab States focuses on the necessity of establishing ESCOs in its member countries.

The European Standardization Body CEN has developed guidelines for the development of service standards. It contains a check list, with guidance to develop a service from conception and design, through to delivery, taking into account the needs and requirements of stakeholders, including clients. The stages for a service lifetime model are illustrated in Figure 11. This type of model should take account of important external influences such as society, technology, competition and legislation.

Figure 11: CEN service standard checklist – service lifetime model



Appropriate institutional set-up for ESCo markets

It is crucial to have supporting institutions to develop capacity and experience for ESCos markets, otherwise organisations will be reluctant to invest in energy efficiency projects. The lack of these institutions is an important obstacle to growth. More important they should lead by example (ex: adopt procurement mechanisms to allow procurement of ESCO for government buildings). There are options when it comes to considering the “right” institutional setup and the role of government. The institutional setup can be exclusive where the government assumes the role of regulating, providing accreditation and enforcing standards to protect the public interest.

On the other hand the institutional setup can be inclusive where the accreditation can be self-regulated by the industry itself through membership based organizations. Such organization can either provide guidelines, accreditation and licences to be voluntarily used by the industry and consumers (ex: Association of Energy Engineers provides CEM for energy auditors - EVO provides CMVP licences for M&V etc..) or can be empowered by legislation to mandate enforceable standards for licencing, certification and accreditation. From experience we tend to favour the inclusive route because it can set up progressive standards to provide protection to the clients without or with minimum government red tape.

Government must lead on institutional setup

Successful standards, certification and accreditation for ESCos need appropriate institutions. The government needs to lead and coordinate the road map across all relevant institutions. Simple, strong and stable institutional set up is the minimum requisite to build a sustainable EES market. The “top down approach” has to tie in with the “bottom up” needs of market actors such as client organisations, ESCos and financing institutions.

Government must lead on the institutional setup to implement the roadmap – a national accreditation body is needed

The proposed road map envisages the following roles under the leadership of a central governmental agency or authority which has the institutional role to manage and control the energy efficiency market (also see figure 12):

Government best through a dedicated *national energy efficiency agency* to provide energy policy guidelines

(NEEAPs) which include:

- mandatory or indicative energy saving targets with specific reference to the leading role to be played by the public administration;
- energy efficiency schemes to support energy efficiency projects and facilitate project financing;
- legislative provisions endorsing adopted standards, best practices and EPC as implementation and risk management tools;
- monitoring and verification processes to measure progress versus targets.

National Accreditation Body is appointed by the government in the public interest so that business users and consumers can have confidence and trust in the capabilities of energy service suppliers. It is responsible for:

- recommending and setting standards;
- assessing the conformity of the independent certification body, in performing audits for the required scope of certification (eg. ESCo certification).

Independent certification body which complements the national accreditation body by:

- assessing the conformity of ESCos to the national standards and requirements;
- issuing certificates of conformity.

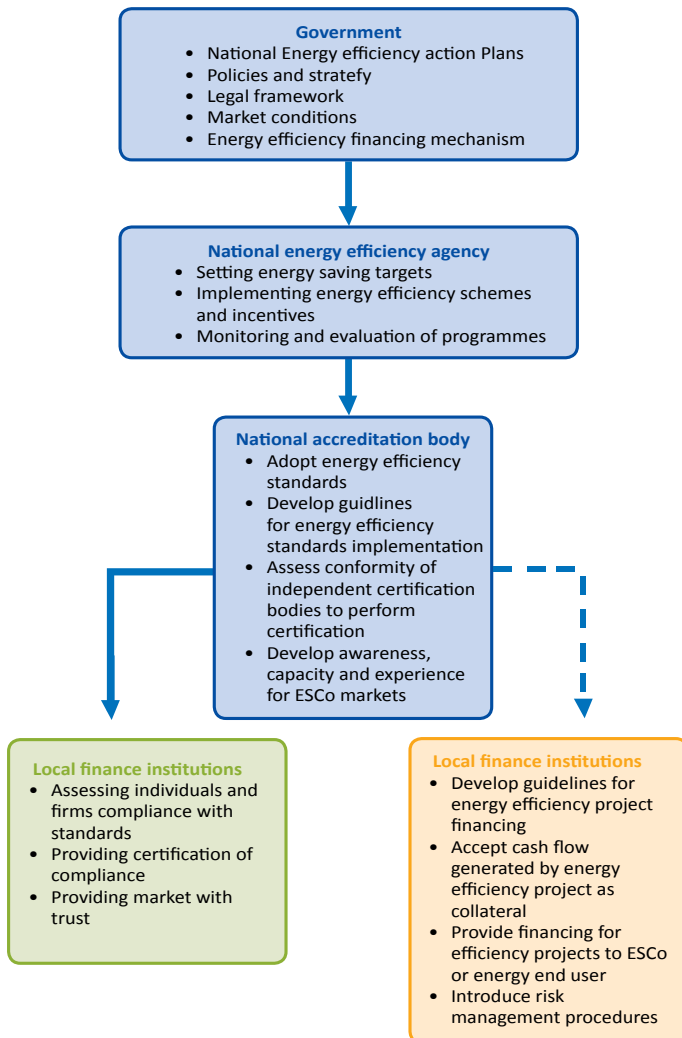
Local financial institutions who will be responsible for:

- developing financial services designed around energy efficiency services (project cash flow as collateral, duration, grace period, repayment schedule).

The National Accreditation Body

In some countries these bodies still need to be established for energy efficiency products and services, while, in others, the existing bodies need to re-examine their roles and activities. This could include ensuring that they are part of the Multilateral Recognition Agreement (MLA) of the world association of conformity assessment accreditation (IAF) for energy efficiency product and services. Currently Egypt, Iran, United Arab Emirates and Tunisia are IAF signatories while Libya is an “observer” organization. More details can be found in the documents on the MED-ENEC website. The primary role of this body is to set the standards (see box 7) to which ESCos must conform, it has an enforcement role connected to this through assessing the quality of the work carried out by the independent certification agency. It must monitor and assess that the certification body is conforming to its agreed standards and requirements, so that the certification system maintains its integrity.

Figure 12 Example of institutional framework



This body must also implement actions to remove barriers to develop capacity and experience for ESCOs, to build a sustainable energy efficiency market, such as improving:

- awareness of EPC and ESCOs business models;
- ESCOs market credibility;
- financing of energy efficiency measures.

In MENA countries examples of accreditation bodies are: ARAC (Arab Accreditation Body), EGAC (Egyptian Accreditation Council), JSMO (Jordan Standards and Metrology Organization), LNCSM (Libyan National Centre for Standardization and Metrology), SEMAC (Moroccan Accreditation Service), TUNAC (Tunisian Accreditation Council).

Independent certification body

The independent certification body is tasked with assessing individuals and organisations against the standards and requirements set out in law and by the national accreditation body. It will have the power to award certificates to compliant organisations.

ESCOs certification can help ensure compliance with clients’ needs as well as with relevant legislative provisions and NEEAPs objectives. For ESCOs, the overall goal of such an institution is to ensure that EPC from certified ESCOs is trustworthy, this is why independence is important.

Certification by an accredited third party ensures the client and the local financial institution that the ESCo has the knowledge, the people and the organisation to provide an EE project based on the following capabilities:

- energy audit (investment grade): ESCOs must possess the necessary competencies and knowledgeable people are needed at all stages of project implementation to ensure that energy efficiency measures delivers the guaranteed savings;
- identification and prioritisation of energy efficiency measures;
- operations and maintenance (O&M): as EPC does not achieve maximum energy efficiency if equipment is not properly designed, installed and effectively operated and maintained;
- guarantee of energy efficiency improvement and projected cash flows;
- measurement and verification procedures;
- appropriate training and support measures: continuous training programmes are needed for ESCo staff so that they can successfully run long-term sustainable EPC projects.

Box 7: International standards for ESCOs

The recommended international certification standards to adopt, or to customise based on the specific national needs identified in the NEEAPs, are:

- EN 16247 (and in the future ISO 50002): Energy Audits;
- EN 15900 Energy Efficiency Services;
- UNI CEI 11352 Energy service providers (ESCO);
- ISO 50001 “Energy management systems”;
- Future ISO 5000x standards series on energy efficiency measurements.

Creating appropriate market conditions

ESCO is a relatively sophisticated offering. Its complexity stems from the fact that it requires a market with technical, financial and legal ingredients as well as know how to prosper and grow.

ESCOs must function as normal businesses, therefore the energy efficiency services that they provide must generate a positive cash flow for clients and themselves. One of the biggest obstacles to generate healthy cash flows from energy savings stream is energy subsidies. “Artificially” low energy prices creates weak market conditions for energy services including ESCOs.

Addressing subsidised energy prices

When energy prices are low because of subsidies there will only be a small difference between energy costs before and after the ESCo provides its services. The cost saving is where ESCOs generate benefits to the client organisation and revenue to fund their businesses, small cost differences significantly reduce their potential. Therefore, reducing energy subsidies is important to create bigger cost savings for ESCOs to achieve and profit from, while saving energy for clients. There are many other benefits from reduced energy subsidies, such as improved economic competitiveness, improvements in government finances and energy savings, these are examined further in another publication produced by MED-ENEC ‘Energy subsidies – a road map for reforms’.

Governments must provide policies to support ESCo markets – addressing energy subsidies, introducing market incentives and setting an example through their own use of ESCOs

A leading role for government as first client

An important success factor for ESCo market development is for government to take a leading role in implementing EPC models and EES in buildings controlled by the public administration. In particular, the use of guaranteed saving approaches can take advantage of government’s easier access to finance, minimising the risks for ESCo business start-ups. By taking this role government can support market development and expansion, proving the concept and success to other institutions while also improving its energy efficiency and reducing its costs.

Market-based incentives

In addition to addressing energy prices and providing a first customer for ESCOs the government can also further improve the market conditions by providing specific incentives to encourage ESCo markets to grow. Market-based incentives are among the most favoured means to do this and include energy policy measures such as:

- **Tradable White Certificates:** are documents used to verify that a certain amount of energy efficiency improvement is obtained by obliged parties to achieve imposed targets. Obligated parties can then decide whether to implement energy efficiency measures at end-user level or purchase white certificates. The price of certificates is set either in a spot market or in bi-lateral trading (also see box 8);
- **Energy tax reduction schemes:** where end-users or firms can, by meeting energy efficiency targets, qualify for reductions in energy taxes, CO2 charges, etc.;
- **“Feed in tariff” for energy savings:** a government scheme which provides a guaranteed direct payment per unit of energy efficiency improvement.



Heating system, Bratislava (EBRD)

It is important also to note the impact that incentives in other sectors and policy areas can have as these can sometimes also negatively impact upon the market conditions for ESCOs. For example, incentives for development of new fossil fuel resources can encourage a wasteful attitude to energy use, or tax-breaks for other industries could drain money away from investments in ESCOs.

Box 8: Tradable white certificates in Italy and the EU

Tradable White Certificates (TWC) have been implemented in Italy and have proven to be a cost effective way to mitigate barriers to energy efficiency implementation and to facilitate energy end-use efficiency improvements. In Italy, the energy regulatory authority Autorità per l’Energia Elettrica ed il Gas (AEEG) imposes energy efficiency obligations on electricity and/or gas retailers or distributors and other organisations through the TWC scheme. Gestore Servizi Energetici (GSE) verify and issues TWC against deemed or measured energy saving. Obligated parties can then decide whether to implement energy efficiency measures at end-user level or to purchase TWC from other voluntary operators/implementers which sell these certificates in a market. ESCos can be utilised in this type of system to provide the energy efficiency improvements the scheme demands – see figure 13.

- The relevant variables to take into account are the:
- obliged Party selection;
- definition of energy efficiency targets;
- definition of energy efficiency measures and certification of energy savings;
- market platform to trade white certificates;
- compliance procedures and enforcement;
- costs and financing of the TWC.

Figure 13 Tradable white certificate scheme in Italy

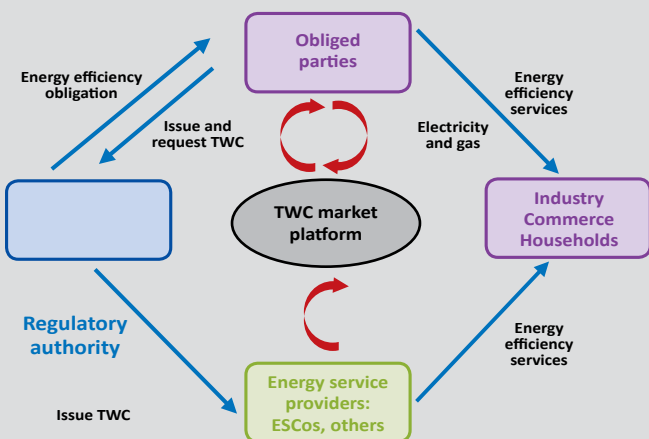


Figure 14 White certificate schemes in other EU countries

Country	Obligated party	Allocation of national targets	Eligible customers	Administrator
Belgium (Flanders)	Electricity distributor	Percentage of energy used in all end use sectors	Residential non-energy intensive industries and services	Government
France	Electricity and gas retailers and importers of road transportation fuels	Market share	All including transport except participants to ETS	Government
Italy	Electricity and distributors with more than 50 000 end users	Market share and turnover	All including transport	AEEG (market regulator)
UK	Electricity and gas retailers with more than 15 000 customers	Number of customers	Residential and priority groups	OFGEM (market regulator)
Denmark	Electricity, gas, fuel oil and heat distributors	Market share and turn over	All except transportation	Danish Energy Authority

Similar schemes have also been successfully implemented in a variety of EU Member States (see figure 14) and are likely to become more common with the implementation of the EU EED and its requirements for year-on-year energy savings. Such schemes could also be successful in MENA countries but with the design tailored to reflect the specific energy market situation of the country.

Appropriate financing mechanisms

Securing finance for energy efficiency investments and services is an important obstacle to ESCOs that needs to be addressed.

ESCOs are poorly understood and therefore perceived as risky by lenders

Project financing is key to the ESCo business model. Any good EPC requires the financing of energy efficiency measures either to the ESCo or to the energy end user. The financing institution should provide funding for a project based on lending which accepts the projected energy savings as collateral and takes a long-term view. The ESCo business model cannot function when a short-term view is taken because the EE projects won't be bankable and the lending from local financial institutions will not be provided.

As energy efficiency projects are usually smaller in economic size than similar projects, e.g. renewable energy projects, they often do not have access to financial incentives guaranteed by government. Therefore, they are often perceived by financial institutions as a small and risky market with low returns. This makes it difficult to convince banks to invest in developing the new type of lending product or service that an ESCo business model needs.

As a result, ESCOs often need to have adequate capital of their own to self-finance their EPC contracts to generate cash flow and develop business. This is a significant barrier to the start-up of independent ESCOs.

Governments should provide direct financial support when others will not

In situations where government involvement as a client and other support mechanisms are not enough to encourage lending to ESCo projects then governments can, and should, take a more active role. Taking advantage of their access to low interest rates, credibility and in-house expertise they can create their own 'energy efficiency funding mechanism' for energy efficiency investments, including EPC and especially for government buildings and assets. This has proven to be an efficient mechanism to pull local financing institutions into the new market.

For example, in Canada the ESCo concept was launched in 1981 with only one or two ESCOs. While some initial competition started in the 1990s it was only when the federal government launched a programme dedicated to the use of the EPC model in federal buildings that competition really started and paved the way for a real

ESCO industry. In this example the guarantees offered by the federal government made financing simple and easy to access for ESCOs.

Public-Private Partnership (PPP) project funding can also be used provide initial guarantee to local financing institutions to support market development.

Governments may need to create financing mechanisms for ESCo projects to help start the market and build knowledge and trust among other lenders

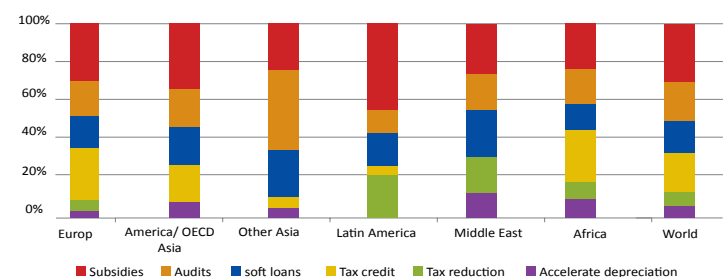
Careful selection of clients by the ESCo reduce risk and uncertainty for financiers

While public administration in many situations can be low risk customers and can have easy access to finance at low rates, in other situations it can have very poor credit rating and are high risk. Careful selection of clients is therefore key, ESCOs need to apply sophisticated credit analysis tools to focus on clients with solid finances and are credit worthy.

Certified, bankable projects will also provide certainty to lenders

To reduce and mitigate the perception of technical risk in EES projects, local financial institutions should promote and request bankable projects from ESCOs certified by an accredited third party organisation. This will help to qualify the market and an ESCOs track record of successfully implemented projects. EPC from certified ESCOs should reduce the time and costs required to analyse and approve the lending to EE projects. By doing this banks can build up their knowledge so that they better allocate resources and develop appropriate lending products and services for ESCOs.

Figure 15 Countries with economic and fiscal incentives by type of incentive



Source World Energy Council Energy efficiency a recipe for success-2010



Box 9: Boosting the energy services market - Good practices in practice in Europe

The **French** action plan was developed together with business, communities, unions and associations. It encompasses policy objectives, information campaigns and financial instruments. Policy objectives for residential sector include the reduction of existing buildings' energy consumption by 38% by 2020 in comparison to 2008 and buildings' refurbishment. Funding is made available which creates a market for energy services. The French government uses furthermore an ERDF in a grant scheme as an additional resource to reach its objectives of retrofitting 800,000 very energy inefficient dwellings.

In **Spain**, there are two different "models" jointly elaborated by the public sector and the professionals for contracting energy efficiency services with public administration: A "Services and Supply Contract" and a "Public-Private Partnership" contract.

In **Finland**, in the framework of the National Energy and Climate strategy, companies and communities apply energy efficiency solutions that can be subsidized by the state.

In **Austria**, energy agencies create demand for energy services, initiate pilot projects and act as independent advisors. Municipalities and federal state organize EPC tenders for their building stock and street lighting.

Cooperation between public institutions and the private sector has also been established in Denmark, where promotion of the ESCOs concept is mainly achieved through projects by research institutes, industry associations, the Danish Energy Agency (DEA) and the Danish Enterprise and Construction Authority.

In **Bulgaria** the Energy Efficiency Law has created a better environment with increased security for the development of ESCo projects, particularly in the municipal sector.

Source: Energy Efficiency Directives of the EU

Box 10: Case studies: innovative use of Structural Funds for EE financing

The JESSICA Holding Fund in Lithuania focus on the modernisation of residential apartment houses. The EIB-managed JESSICA Holding Fund will invest in energy efficiency projects with a total of €227 million, which consists of ERDF funds (€127 million) and national funding (€100 million). The expectations are that commercial banks step in with an additional €20-40 million.

The revolving fund for energy refurbishment in housing in Estonia combines ERDF grant funding with loans from European banks like the CEB or the EIB. It also combines funds from the Credit and Export Guarantee Fund KredEx (national guarantee fund) to provide long-term (up to 20 years) low-interest loans (currently 4.5% compared to the 7% market minimum) through local commercial banks to multiple-unit residential buildings. The objective is to reach minimum 20-30% savings in the building's energy consumption.

Source: Energy Efficiency Directives of the EU

Additional support for ESCos

In addition to the basic necessities outlined above, government can, and should, also support ESCos in other ways. Among the key support tools are:

Communication activities: to raise awareness and understanding of what ESCos are and the possibilities for organisations. The dissemination of complete and coherent information regarding ESCos and EPC to relevant market actors is very important. Seminars, workshops, best practices dissemination, online training and webinars, can all be cost effective ways to support the policies and legislation in place to promote a sustainable market for ESCos. In the EU these types of dissemination activities are now required under the EED.

Communication actions can be channelled through industry associations which typically have an important role in centralizing and harmonizing the common needs of ESCos such as communication with stakeholders linking EPC with NEEAPs and local financial institutions.

Incentives: providing rewards, awards, administrative exemptions and other benefits to organisations that begin to pursue an energy efficiency strategy can help attract firms to take action and to go on to working with ESCos.

Training and workshops: to provide direct tuition, training and education on how ESCos, EES and EPC works. This is crucial to overcome the capacity and knowledge barriers to market development that exist. MED-ENEC has provided several of these training workshops in its partner countries to assist in the short-term, although it is clear a more comprehensive approach is needed in the medium-long term.

Communication and awareness raising activities are crucial to the success of ESCo promotion

Examples of successful support programmes in Europe

Supporting potential client organisations to implement an energy management system such as ISO 50001 is, according to Italian experience a useful incentive in the selection of the service supplier. As one of the requirements for ESCo certification according to UNI CEI 11352 is its capability to implement an energy management system at a client site. This increases the value of the service that is provided because it integrates the energy efficiency projects into clients' strategy and commits both organisations to achieve their agreed targets.

The EU has introduced a mechanism within the recently presented EED to promote the implementation of energy management systems, with a legal requirement for energy management systems in specific circumstances. The Energy Efficiency Guideline of the League of Arab States is pushing its member states in the same direction.

In response to the financial and regulatory challenges to ESCos in the EU, DG Energy in cooperation with the EIB's PPP expertise centre (EPEC), the ManagEnergy Initiative and the Covenant of Mayors is launching an EU-Energy Performance Contracting campaign to support Member States and market actors in the improved function of the energy services market.

In Denmark, to make it easier for small and medium-sized enterprises (SMEs) to get started with energy management systems and successfully implement energy efficiency measures a five stage process has been developed. This was funded by government, and guides SMEs through the process step-by-step, as follows:

1. Initial examination to determine the level of ambition for energy management and how to develop energy policy, targets and objectives;
2. How to organise the energy management work;
3. How to map energy consumption;
4. How to identify, where and how energy efficiency can be improved;
5. How energy management works in day-to-day operations.



Building retrofit in Kyrgyzstan (EBRD)

Monitoring and support for implementing the road map

Implementing each step in this proposed road map will require planning and commitment. It will also require follow-up: the policies and programmes will need to be monitored and evaluated to understand the success of the initiative and what could, and should, be changed to improve results.

The energy efficiency balanced scorecard

To check and monitor the road map implementation progresses it is useful to adopt a measurement system developed by MED-ENEC for this specific task (see figure 15). This measurement system is the energy efficiency balanced scorecard, which is a graphical representation of the critical success factors in the development of ESCo markets:

- financing of ESCo measures and projects in both number and value;
- target achievement TOE/y (NEEAPs);
- qualification and certification of people and firms to carry out energy services work;
- awareness and training activities to improve the knowledge, capacity and skills.

The scorecard highlights the data that must be collected to implement this monitoring system. Requirements to provide the basic data could be written into the

appropriate legislation.

Analysis of the scorecard outcomes will show the progress that has been made and should highlight any areas for further improvement.

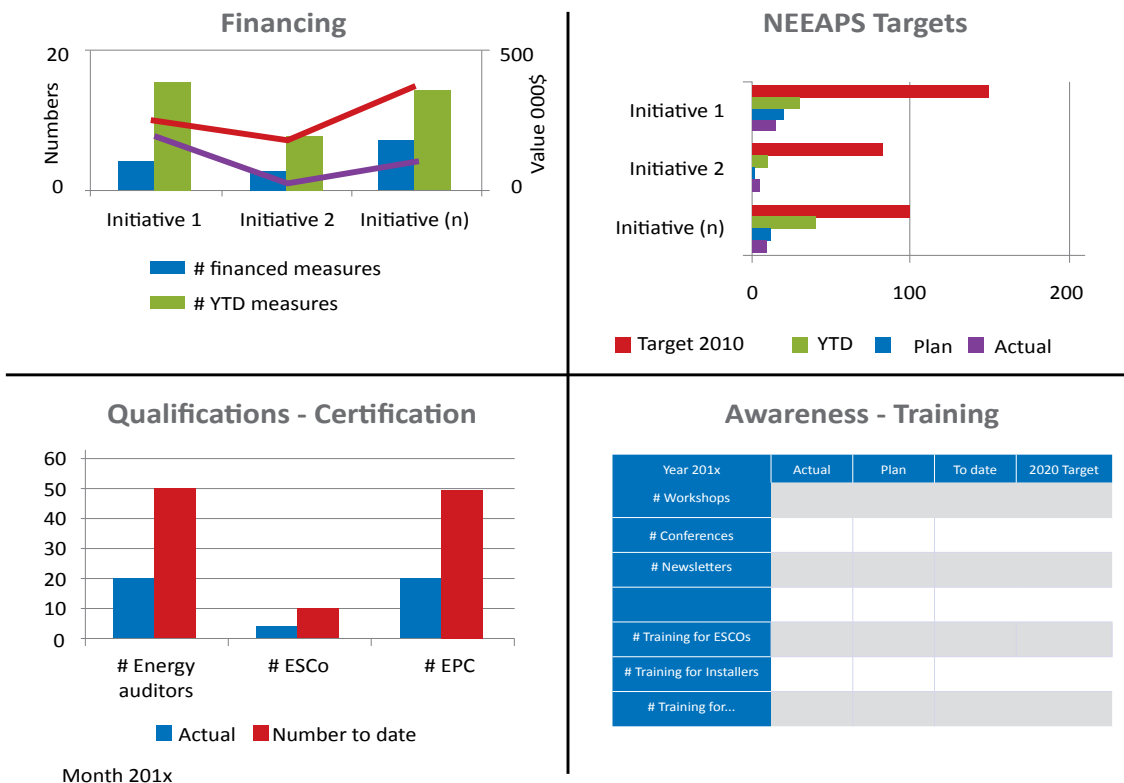
Monitoring and evaluation of the road map using an energy efficiency balanced scorecard will improve implementation

Role of MED-ENEC

MED-ENEC can support the national energy efficiency agency in defining the detailed road map deployment across all aspects: from NEEAP definition, to standard development, communication campaigns to raise awareness, diffusion of best practice and customized trainings for stakeholders and market operators.

MED-ENEC can also provide support for NAMAs (Nationally Appropriate Mitigations Actions) in buildings – which it has already done for Lebanon – implementation of energy efficiency building codes and training courses on a wide range of relevant issues such as energy auditing, ESCo development, and energy efficient buildings development or urban planning.

Figure 16 energy efficiency balanced scorecards



Conclusions

ESCos are an excellent way to tackle the energy challenges in the MENA region

Tackling the rapid growth in energy demand and the economic, social and environmental costs this brings to countries in the MENA region requires many actions, prime among them investment in energy efficiency and renewable energy. ESCOs are among the energy efficiency measures that can be supported and have the advantage of addressing the three key barriers to energy efficiency, of low visibility of savings, up-front costs and insufficient capacity. They do this by making energy savings explicit, monitored and bankable, by developing new business models to share the risk and cost of investments and by stimulating markets for skilled energy services professionals. The services they provide result in wins for the client organisations and ESCOs through financial savings/income, and also for the wider economy in reduced energy use and imports, and improved efficiency, competitiveness and employment.

Government action is needed to support ESCo market development

ESCo markets face key obstacles to their development, which need to be addressed by national governments, by:

1. Improving energy policies, strategy and legal frameworks - to enable ESCOs and clients to operate with confidence and trust, and to be clear on the national goals to be achieved;

2. Creating appropriate institutions – specifically a National accreditation body and an independent certification agency. Ideally this should also be overseen by a dedicated and accountable national energy efficiency agency or authority.
3. Creating appropriate market conditions for ESCOs – addressing the problem of low (subsidised) energy prices, which devalue energy savings, is crucial, and the provision of other market-based incentives for ESCOs should also be examined.
4. Creating appropriate financing mechanisms – the ESCo model should eventually attract private finance on its own, but until this time the government must provide financial resources or access mechanisms to ensure markets can grow.
5. Providing additional support – promotion of ESCOs needs to be supported by communication and awareness raising activities. They also need appropriate training and educational programmes.

This document provides a road map of advice, examples and guidelines on how governments in the MENA region can successfully achieve these changes and create markets for ESCOs. MED-ENEC is poised to offer further support on each of these issues, please contact us for more information.

Figure 17 MED-ENEC publications on energy efficiency issues



MED-ENEC publications on Energy Efficiency issues. Several publications are available also in Arabic and French languages. To download these guidelines please visit <http://www.med-enec.eu/downloads/publications>



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List of Abbreviations

ANME	Agency for energy efficiency and renewable energy {Tunisia}
EBRD	European Bank for Reconstruction and Development
EE	Energy efficiency
EED	Energy Efficiency Directive [EU]
EES	Energy efficiency service(s)
EMS	Energy Management System
EPC	Energy Performance Contracting
ESCO	Energy Service Company
EU	European Union
EUR	Euro (currency)
GEF	Global Environment Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GWh	Giga Watt hour
IEA	International Energy Agency
KPI	Key Performance Indicator(s)
m	million
MED-ENEC Project	– Energy efficiency in the construction sector in the Mediterranean, visit www.med-enec.com
MENA	Middle East and North Africa
MUSH	Municipal, university, school and hospital
MWh	Megawatt hour
NEEAP	National Energy Efficiency Action Plan
O&M	Operations and maintenance
PPP	Public-private partnership
SME	Small or Medium Enterprise
TWC	Tradable white certificates

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Imprint

This is a brochure of the MED-ENEC Project

Project ID: ENPI/2009/224-969

Date of publication: February 2014



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Printed by: Integrity, Cairo, Egypt

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This project is funded by the European Union.

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