# Financing Energy Efficiency in the Building Sector in MENA Region

February 2015

MED-ENEC
Energy Efficiency in the Construction Sector in the Mediterranean

*Energy Efficiency Lighting at Renaissance Hotel, New Cairo, Egypt*

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# Introduction

Demand for energy in MENA countries will further increase. If business continues as usual by 2030 an amount of 300 GW in new generation capacity is required representing 6% of the world total. The reason behind the high demand is economic growth, the increasing number in population and improving living conditions, which require regular access to energy for more electrical appliances. Without any changes in the demand structure investments in energy infrastructure of USD 458 bn[1] will be required. The money to finance it would need to come from government budgets and donor funds as long as it cannot be leveraged with private sector money.

Given this huge amount of upcoming investment costs, governments worldwide see a high potential in investing in the reduction of energy demand to save future costs. Increasing energy efficiency (below as: EE) especially on the consumption side is therefore the major measure to satisfy the needs of tomorrow. Saving energy means saving on investment costs for new power plants and thus a reallocation of government budgets. One of the highest consumption of energy is given in the building sector, amounting to about 17% of overall energy consumption and 40-45% of total electricity consumption in the MENA region, with cooling systems being the main culprit. It is estimated, based on 2010 figures that because of the growing population and increasing urbanization dwellings will increase from the current 44 million by additional 22.5 million up to 2030, see figure 2. This would be an annual increase of 2.2%. Correspondingly energy demand will increase from 135 Mtoe in 2011 to 208 Mtoe in 2030, if no energy savings measures are undertaken[2]. How can the rapid increase of electricity consumption be brought down?

Other brochures of MED-ENEC have dealt with topics such as buildings codes, development of energy service companies, and the employment effect of EE . This brochure addresses the issue of finance, since the lack of and the access to finance has been cited as one of the main bottlenecks in bringing EE in the building sector forward.

Most MENA countries have set up National Energy Efficiency Action Plans (NEEPAs), which in summary would reduce energy demand by 10 to 15% in the years to come. Implementing all measures which are mentioned in the NEEPAs would require investments in the amount of € 91 bn by 2020[3]. Where should this money come from? It is estimated that worldwide USD 343 to 385 bn are annually generated by the private and the public sector for the purpose of climate finance, with only a very small percentage – approximately 15% – reaching energy efficient investments[4].

There is an apparent gap between the benefits of investing in EE and the actual investments made. The reasons are manifold: Governments don't see that investments into energy saving are much cheaper and so to speak the low hanging fruit, that are easy to pick. Instead, the concept is very often the following: (that) investments are made into new power plants to overcome the shortage. Energy savings are invisible as opposed to other measures, such as renewable energy, and (they) are difficult to measure. The savings of a Grade A labeled refrigerator, for example, cannot be clearly pinpointed on the monthly electricity bill. The difficulty for governments, banks and investors to embrace EE in the building sector is also the fragmented market meaning the large scale of small-sized investments, the diverse investment purposes and the different objectives of borrowers.

This brochure addresses the topic of how to overcome the lack of funds. It will highlight options to remove the bottlenecks to financing EE in the building sector. The role and objectives of the different actors will be clarified and financing mechanism and tools will be explained. Throughout the brochure international best practice examples are showcased as well as experience from the MENA region. All in all the brochure is designed to offer decision makers food for thought and practical concepts and ideas.

EE in the EE in the building sector is one of the great chances to reduce greenhouse gas emissions in the MENA region where it will be financed successfully. There is not a right nor a wrong way. Hence, if one specific way worked in one country, it does not necessarily mean it will work in another. Governments are advised to take a holistic approach and embed their clearly targeted actions in a solid institutional, legal and regulatory framework, supported by a continuous flow of funds.

Dr. Kurt Wiesegart
MED-ENEC Team Leader

1 IEA: World Energy Outlook, 2011.
2 EIB: Financing of Urban Energy Efficiency and Small-scale Renewable Energy Investments in the Southern and Eastern Mediterranean Region, 2013
3 EIB: 2013.
4 OECD/IEA: Plugging Energy Efficiency Gap with Climate Finance, 2012.

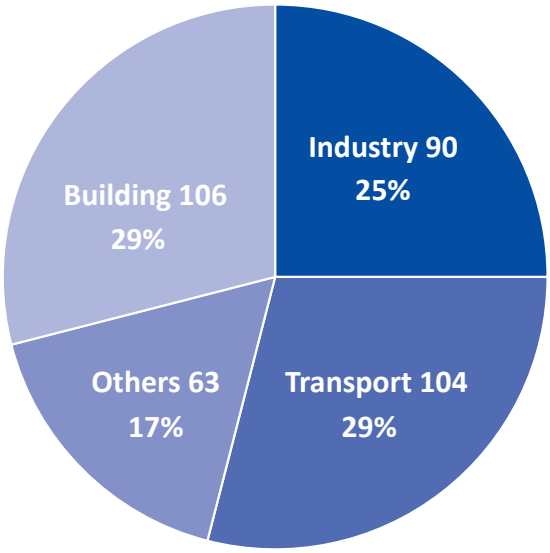
# The Need to Finance Energy Efficiency in Buildings in MENA

## EE to save Energy

Political, economic and social challenges that have developed in recent years, which are expected to accelerate in the near future are the driving force behind the need to finance EE in the building sector in the MENA region. Growing population figures, aging societies and extending middle classes demanding larger and better equipped housing are an important part of the increased demand for energy that can, in the long term, not be met by higher turnout of fossil fuel generated electricity – even in oil-rich countries. All governments and societies have to accept their share of responsibilities to invest in the transformation of the current energy sector. Energy efficient applications and the use of renewable energy are the two main pillars on which the restructuring of the energy sector needs to rest and for which finance needs to be organized. Deployment of these two main instruments has by far not reached their full potential in the MENA countries.

The building sector is one of the main consumers of energy. As can be seen in figure 1 the share of consumed energy in the building sector is high. Figure 2 shows that between 2010 and 2030 around 22.5 mill. new dwellings will be built in MENA – cooresponding to an increase of 50%.

**Figure 1: Share of energy consumption in the building sector**




**Final energy consumption in MENA region in 2007 - MToE**

*Source: ADEME 2010*

## Various reasons to save energy

The necessity to focus on saving energy, also in the building sector is given by a vast array of political, economic and social factors. Worldwide, governments respond to the political responsibility to reduce Green House Gas (GHG) emissions. The MENA region has worldwide the third largest growth in carbon emissions, especially in those countries that export oil, which make up 74% of the total emissions of the region. These countries include Algeria, Iran, Iraq and Saudi Arabia.

Fossil fuel resources are limited. In recent years some of the previously net exporting countries became net importing countries. Also the (still) oil exporting countries will be faced with problems maintaining high growth rates of energy supply. While in the past long-term power development plans have focused on supplying more energy from more fossil-fuel burning power plants it is high time to redirect those investments to the supply of Green Energy and, more important, to increasing EE thus reducing the increase rate of energy consumption. Relocating investments into sustainable energy production and consumption cannot only provide a cleaner and safer future but can actually reduce investments in energy infrastructure.

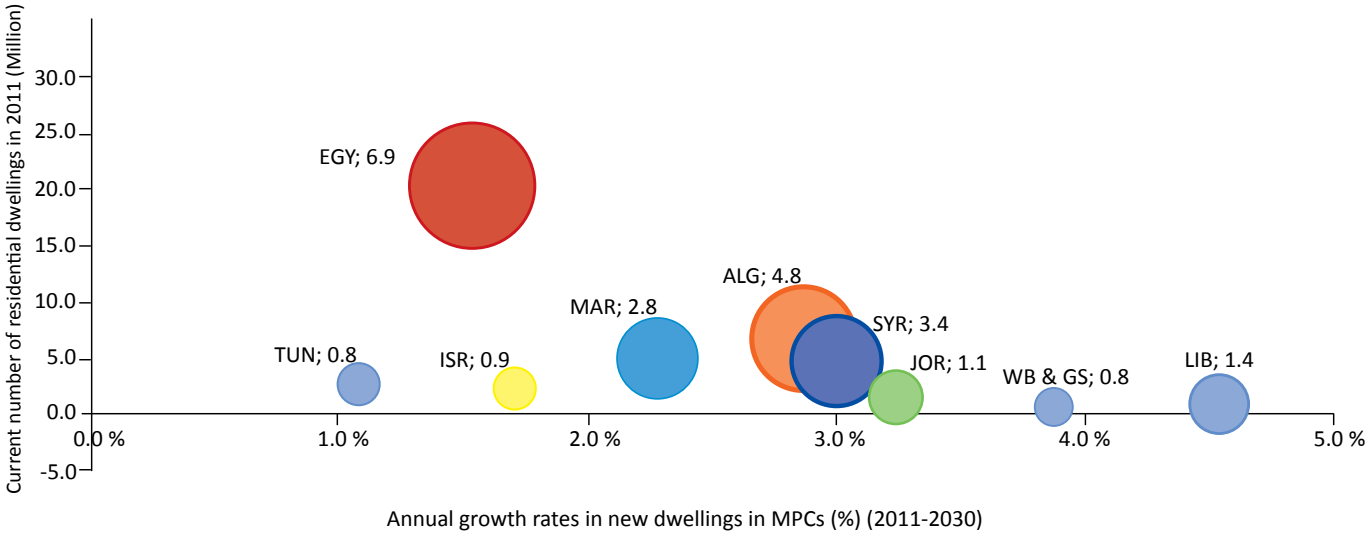
An even larger savings effect for national budgets can be accomplished when governments reduce subsidizing energy tariffs. Energy subsidies distort the market and set wrong incentives for industries, services and households: Those who consume most pay – relatively – less. Abolishing wrongly allocated subsidies will show the true cost of energy to consumers and motivate changes in behavior to save costs[5].

Governments reducing energy subsidies may reallocate some funds saved to avoid socially adverse effects provoked by increased energy tariffs. For the urban poor or people in rural areas who have anyway often little access to energy the increase in tariffs should not mean an additional barrier. Thus part of the funds saved can be used for targeted and limited support. According to the IMF, energy subsides amounted to USD 237 bn (2011) in the MENA region, corresponding to 8.6% of GDP and 22% of total governments revenues. In Algeria or Egypt it amounts to 11 % of GDP. This highlights the magnitude of savings possible.

The amount of subsidies in MENA countries in relation to GDP are presented in table 1.

5 Please also check the MED-ENEC brochure: Energy Subsidies: A Roadmap for Reforms in MENA Region http://www.med-enec.eu/downloads/publications

**Figure 2: Evolution of residential housing numbers in the MPCs from 2011-2030**




*Source: EIB, 2013*

**Table 1: Energy subsidies in selected MENA countries**

| Country | Total subsidies in million US $ | % GDP |
|---|---|---|
| Algeria | 20 264 | 10.7% |
| Egypt | 24 422 | 10.6% |
| Jordan | 1 719 | 6.0% |
| Lebanon | 1 911 | 4.5% |
| Morocco | 661 | 0.7% |
| Tunisia | 1 376 | 3.0% |
| **Total of selected** | **50 354** | **7.9%** |
| **Global average** | **480 000** | **0.7%** |

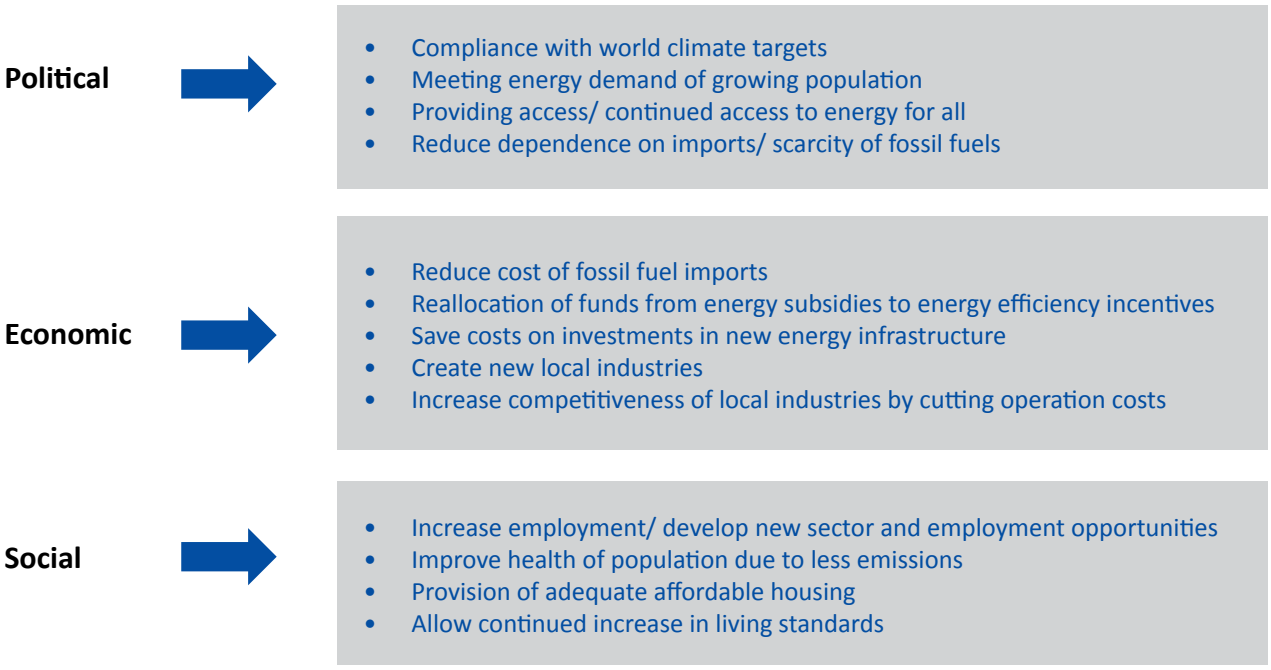
*Source: IMI, 2013*

Restructuring the energy sector and putting more emphasis on EE in the building sector will change the building industry. New jobs are created and since most of the energy-efficient building material and other equipment can be produced locally and economic growth is kept in the country. This stimulating effect is estimated to be three times higher than in renewable energy (without SWHs), where a lot of equipment has to be imported. In addition local entrepreneurs can save in energy costs through energy efficient buildings and thus become more competitive, as their operating costs are decreasing[6].

The social dimension is another issue to consider: According to UN projections the population in the MENA region will increase by 65% reaching 430 million by 2020 from currently 300 million. Of these 170 million live in cities, a number which is expected to grow to 280 million. In Algeria already 67% of the population live in the city, 78% in Jordan and 91% in Israel, requiring more and better buildings. These housing facilities need to be energy efficient. This requires financing.

6 Please see also the MED-ENEC brochure: EE and Employment – A win-win opportunity: http://www.med-enec.eu/downloads/publications

**Figure 3: The need to act: Reasons to finance EE in the building sector**




## Answers from the MENA region

Many countries agreed to set binding targets for the reduction in GHG. To transfer a political vision into reality, governments need to take actions to save - with quantifiable targets by adopting dedicated EE policies, setting the legal framework, establishing implementing agencies and linking it to finance. It is necessary to translate policies into monetary demand, identifying budgets and appropriate financial instruments. The latter may require a review of the readiness of the banking sector. This process has already started in the MENA region.

The League of Arab States has detailed its Arab Guideline for Improving Electricity Efficiency and Rationalizing Its Consumption at the End User. It demands member states to prepare a three-year National Energy Efficiency Action Plan (NEEAP) specifying annual reviews and detailing interim targets for execution. At the same time dedicated bodies have to be set up to coordinate the various activities and control the output. The Executive Office of the Arab Ministerial Council of Electricity approved the guideline in 2010.

**Box 1: Arab energy efficiency guideline**

**Economic Sector**
**Energy Department**
**Secretarial of the Arab Ministerial Council for Electricity**

**Article X: Financial resources and funding mechanisms**

The state shall provide the necessary financial resources to support and implement energy efficiency improvement programs and measures by promoting the development of private market for energy efficiency services. The state shall administer such financial resources in the manner it deems appropriate. Member states can also establish energy efficiency fund/funds to promote the implementation of electricity efficiency improvement programs and other measures. Such funds are to complement rather than complete with similar commercial facilities.

*Source: http://www.med-enec.eu/sites/default/files/user_files/downloads/Booklet-EN%20with%20cover.pdf*

Table 2 provides an overview of the legal basis and the EE targets set by countries in the MENA region. Lebanon, Palestine and Jordan have developed NEEAPs with the support of MED-ENEC.

**Table2: Legal basis for EE and EE targets in the Mena region**

| Country | Based on | | Savings | By year |
|---|---|---|---|---|
| | LAW | POLICY | | |
| Algeria | EE Law (1999) | National Program of Energy Management (PNME)/2010-2014 | 16% | 2020 |
| Egypt | law drafted | National Energy Efficiency Strategy (NEES)/2000 | 15% | 2030 |
| Jordan | RE and EE Law (2010) | National Energy Strategy (NES)/2007-2020 | 20% | 2020 |
| Lebanon | law drafted | National Energy Efficiency Action Plan (NEEAP) | 5-10% | 2020 |
| Morocco | RE and EE Law (2010) | National Plan for Priority Action (PNAP)/2008-2012 | 12% | 2020 |
| Palestine territories | law drafted | National Energy Efficiency Action Plan (NEEAP) | 10% various sectors | 2020 |
| Tunisia | RE and EE Law and later modifications 2004/2009 | National Energy Efficiency Action Plan (NEEAP) /2013-2020 | 20% | 2020 |

*Source: EIB: Financing of Urban Energy Efficiency and Small-scale Renewable Energy Investments in the Southern and Eastern Mediterranean Region 2013 and IV. and MED-ENEC: Energy Efficiency in the Construction Sector in the Mediterranean, 2013*

A study by EIB[7] has analyzed the targets under the individual EE plans and the actions envisaged thereunder and came to the conclusion that in order to achieve the 2020 targets an amount of € 91 bn in investments in subsidies must be made available. This large amount of money needs to be sourced.

While all MENA countries have EE policies in place or drafted not all of them are linked to dedicated implementing agencies and/or funding. Worldwide it is one of the most common shortfalls that the money for EE measures is either not budgeted, not budgeted in full, rely on income from flexible sources and is not fixed or rely too much on private funds. Earmarked funding is needed, regardless whether it comes from a dedicated fund or a clearly defined position in the national budget.

**Box 2: KfW thermal building rehabilitation program needs additional funding**

KfW Thermal building rehabilitation program) relied on funds from the EU Emission Trading System (ETS). At the time the funding was decided the price of one ton of CO2 stood at around € 15 so that approximately € 3 bn. were expected annually. Half of that amount was supposed to go into the building program. Due to the drop in prices of the certificates, the expected amounts could not be achieved. In order to maintain the program the German government had to take recourse to ordinary budgetary resources.

*Source: Fraunhofer ISI: Financing the energy efficiency transformation in the building sector in the EU, 2012*

Table 3 shows the different institutional settings of those MENA countries, which have dedicated units in regard to implementing agents and financial vehicles. As the example of Jordan shows, an implementing agency is not always established. The important thing is that there is an independent dedicated unit that has reliable funding, monitors and controls the results of its activities and gives feed-back to policy makers.

*Insulation sheets*

7 EIB, 2013

*Green Investments*

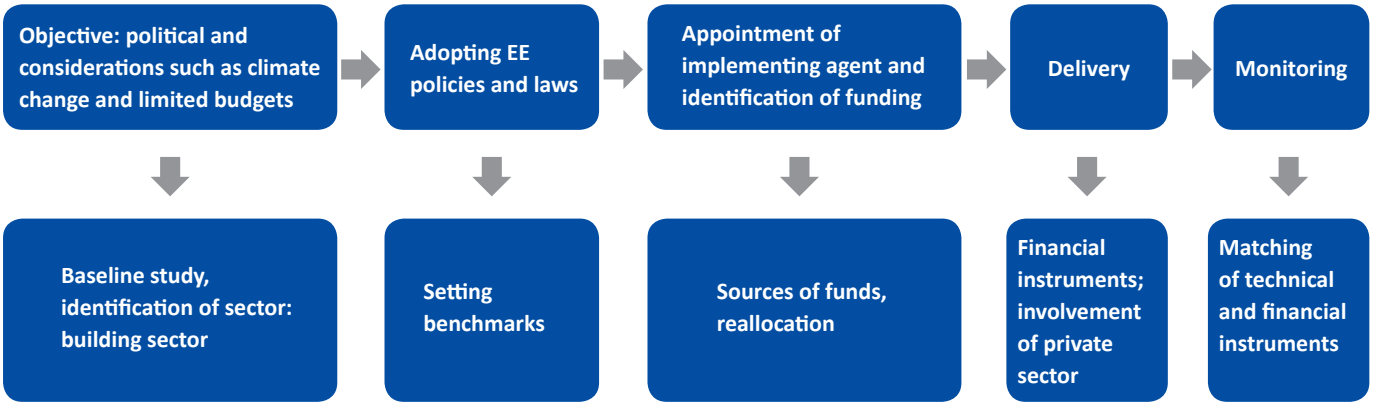
**Table 3: EE implementing agents and EE funds in the MENA region**

| Country | Algeria | Jordan | Lebanon | Morocco | Tunisia |
|---|---|---|---|---|---|
| Implementing agency | National Agency for the Promotion and Management of EE | | LCEC | Agency for Development of RE and EE | National Agency for Energy Conservation |
| Financial Vehicle | National Fund for Energy | Jordan RE and EE Fund | National EE and RE Account (under preparation) | Guarantee Fund for RE and EE (under preparation) | Energy Transition Fund |

*Source: EIB: 2013, MED-ENEC*

Finance EE in the building sector requires a reliable and continuous flow of funds. It is needed to enable changes in the mind-set of societies as well as induce changes in technologies and services. Saving energy is saving future investment costs.

**Figure 4: The logical flow of thoughts to finance EE in the building sector**



*Buildings in Ramallah, Palestine combining EE measures & RE technologies*

# Bottlenecks to EE Financing in the Building Sector

## Selection of various bottlenecks

If EE is such a brilliant idea, how come it is not more widespread? One major reason why EE has not picked up is visibility. Not only are investments in new power plants more visible, but the output is also a clearly recognizable increase in megawatt. In EE the investment goes into the saving of energy meaning that existing houses receive an efficient building envelope or new houses are built according to for example new building codes. For an outsider those potential savings are not visible. Saved energy cannot be shown. Without a proper verification system in place the savings are even hard to document. Also, financial impacts of savings first of all occur at the side of the individual end user.

Compared to renewable energy, where the market can be divided into four distinct fuel sources (solar, wind, bio and geothermal), EE in the building sector relates to a diverse and fragmented market of smaller initiatives such as efficient lightning, thermal insulation, brick manufacturing, double glassing, electrical appliances, etc. Therefore no large lobby groups can build up, which penetrate the market with relevant information, as this being the case meanwhile already in countries, where RE plays an important role, since providing a substantial number of jobs. In Germany for example: The RE sector is employing around 300.000 people

Taking economies of scale into consideration the transaction costs of one large power plant for example in terms of project preparation costs, financial and legal costs are lower than for a number of smaller activities usual for EE. Banks spend a similar amount of time on preparation, processing and monitoring for smaller projects as they do for larger. The internal expenses compare therefore negatively for smaller activities and banks in general prefer from a cost perspective larger loans. Especially for commercial banks this is an important reason not to finance EE projects. Thus, worldwide investments in EE are lagging behind.

In addition to weaknesses in the energy policy and the lack of clear implementation instructions EE is often not seen by governments as a holistic approach resulting in individual actions by different ministries and public authorities. The outcomes are scattered and unaligned regulations, provisions and instructions, hindering the swift follow-through. Very often EE is focused on energy and industry related ministries and the finance side is kept out. But the financial sector needs guidance and support as well to be able to provide loans and other financial instruments to support the implementation of energy efficient measures.

When commercial banks undertake a normal due diligence they need information they are familiar with and they can rely on. In order to overcome the bank's lack of the specific knowledge it is very important to formulate benchmarks, energy audit reports, measurement and verification processes in a manner that allows banks to translate it into monetary terms. Only if the savings potential is understood can banks relate to it and factor the information in their processes. This may ultimately result in lower interest rates and thus impact the financial feasibility of the energy efficient investment.

Access to finance is another major obstacle. Despite the fact that there are many internationally and locally operating environment funds often this money does not reach the end-user. At the same time many investments are not undertaken due to the lack of funds. This is a paradox situation and

*District cooling system in the Pearl-Qatar*

can only be explained by a mismatch of communication, instruments and public awareness in an unfavorable institutional environment.

The investors such as the house owner are discouraged by the higher upfront costs for energy efficient buildings. And-investors and tenants last of which in most cases the later energy consumer have different objectives: the earlier may not want to invest, because the savings will occur on the side of the tenant. This problem can be solved only if mandatory EE building codes are in place, which are enforceable by respective authorities.[8]

A close-up on the main bottlenecks:

**Figure 5: Selection of major bottlenecks for EE financing in the building sector**

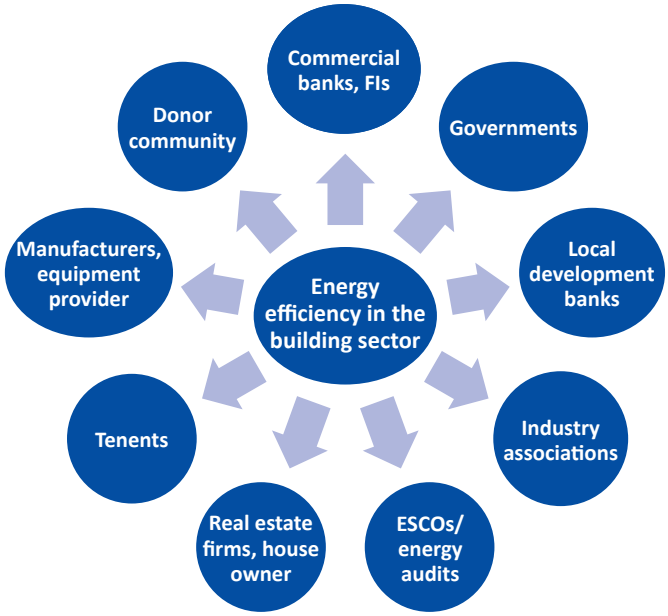
| | |
|---|---|
| **legal and regulatory** | EE policies do not formulate clear objectives; the enforcement of the policies is weak; the policies do not provide for clear priorities; no implementing programs are developed; no government budget to kickstart EE identified; no reporting mechanism deployed.<br>Capacity in the relevant authorities is weak.<br>One observation in the MENA region is that the decison making processes are very centralised, making a swift and locally adapted implementation difficult. |
| | No holistic approach: Omission of cooperation between ministries and authorities; energy efficency requires different ministries to cooperate.<br>Banking sector left out of consideration of energy efficiency although it is a major facilitator of EE investments. |
| | No benchmarks such as standard labeling programs, EE building codes, certification systems to establish transparency.<br>No standard energy auditing procedure, no standard energy auditor trainings, no certified graduation processes.<br>No reporting standards on EE, no sufficient metering to document savings. |
| | Government support programs are developed but information not disseminated, leading to little or no demand.<br>Lack of awanes raising actions.<br>Deployment of best practices missing; no pilot projects or development of champions. |
| **economic and financial** | Energy tariffs subsidised,distort the market and make investments look less attractive/ not financially feasable.<br>No Green Finance guideline to incentivise commercial banks to lend to energy efficient investments.<br>In the MENA region not all recommended technologies under the NEEAP seem to be economical and financially feasable. |
| | Lack of public funds, public sector funds are not properly targeted at the end-user.<br>Public sector funds fail to leverage commercial lending.<br>Loans are provided with no or little accompanying measures such as technical assistance. |
| | Commercial banks are reluctant to lend to EE because they do not understand the EE savings potential, assume EE investments to be high risks and thus increase interest rates, making EE investments even less attractive.<br>Lack in staff capacity; lack of internal procedures, lack of cash-flow based lending procedures.<br>High transaction costs because investments are small. |
| | EE investments are considered to have high upfront costs, making pay-back periods long and increase risk for investor.<br>Banks require high collaterals limiting future investments. |
| **other** | Technical understanding of EE among population limited; little skills to install, maintain, monitor EE equipment and materials.<br>No or not sufficient local equipment provider or production of EE material; no understanding of traditional EE material.<br>Savings of individual equipment not easy to quantify. |
| | Lack in consumer awareness: benefits of saving not perceived as big, because each of the measures/applicances consume only little energy.<br>Information on EE equipment/material and its benefits not readily available making the information process cumbersome and time- consuming. |
| | Split incentives in decision making process: developers and home owners do not want to invest, because they are not the ones to save on energy. Tenant has no say in the construction/ renovation process but has to pay the energy bill. |

8 MED-ENEC has published several brochures on this issue – “EE Codes”, ”EE Building Codes – A roadmap for implementation”, “EE Urban Planning – Guidelines for MENA”, Energy Efficient Guidelines for MENA”… http://www.med-enec.eu/downloads/publications

# Roles and Objectives of Stakeholders

Financing EE in the building sector needs an interdisciplinary and a holistic approach. Interdisciplinary, because the expertise of a large number of stakeholders from different backgrounds is needed. Holistic, because segmented approaches by individual actors inevitably drift apart and lose momentum and direction of the common goal. This chapter shows how the different parties link to financing EE in the building sector and highlights their individual interests and roles.

**Figure 6: Stakeholders in the process of financing EE in the building sector**

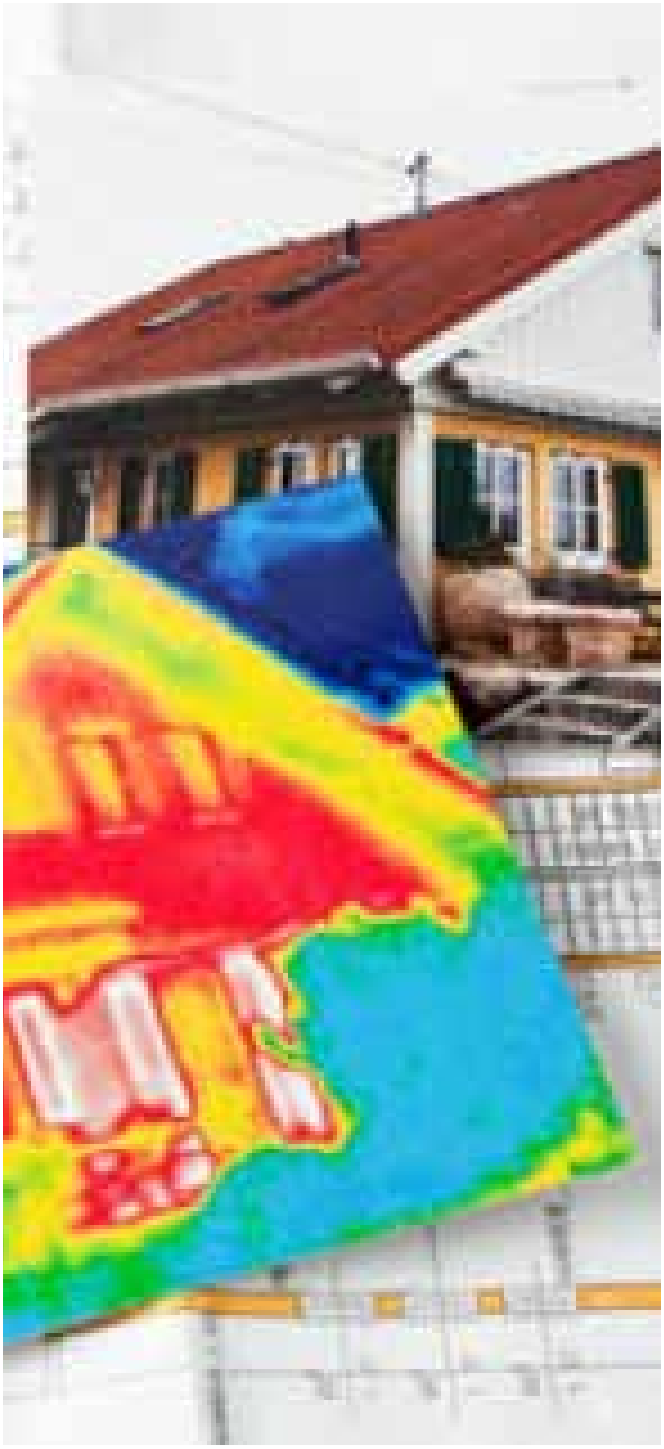



## Governments

Governments hold a central position in financing EE . Their objective should be to facilitate the saving of energy as part of their overall energy plan. Given that budgets are tight, they have to balance competing investment priorities.

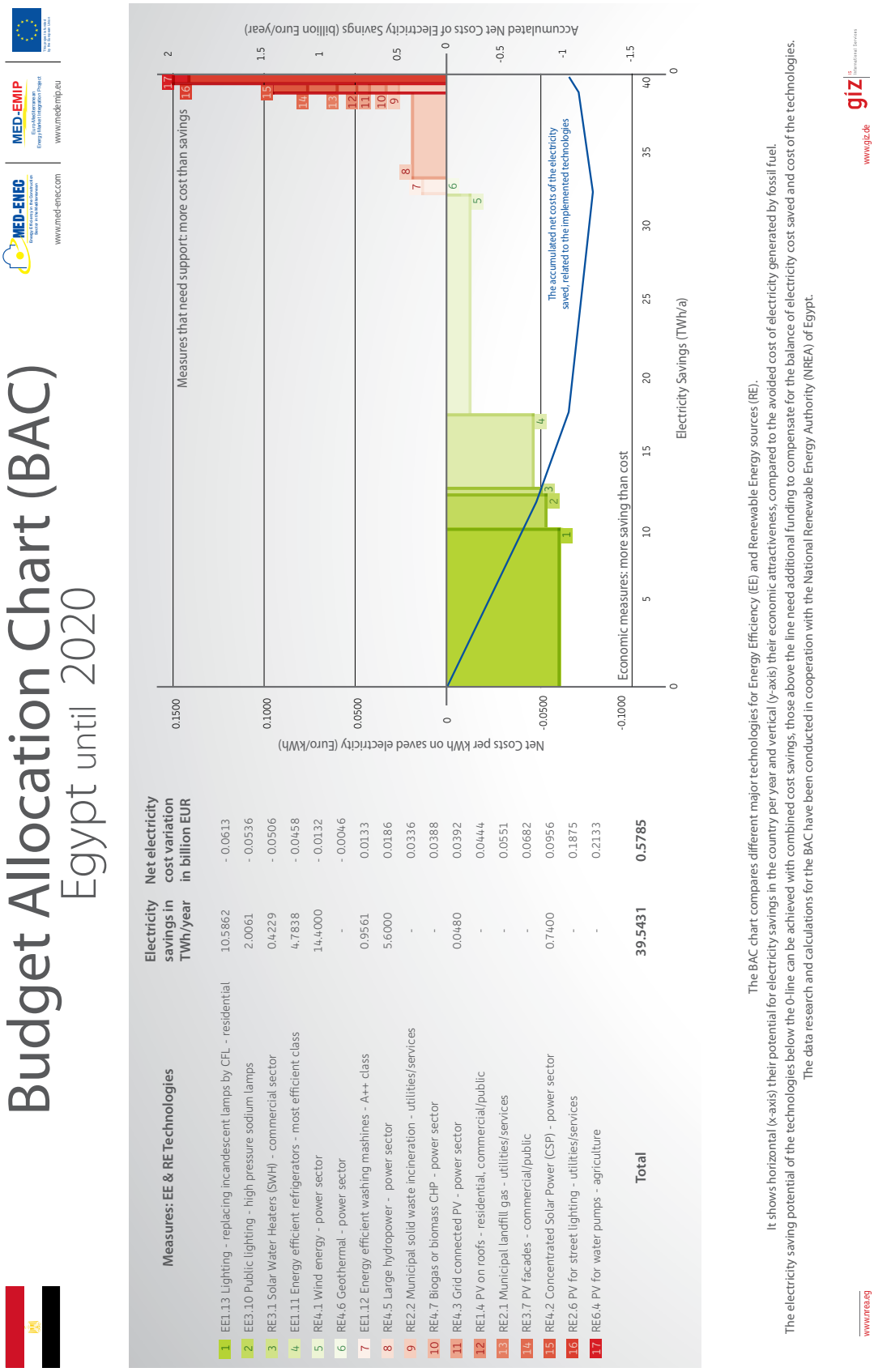
- The main role of the governments is to come up with relevant policies and to set the legal and regulatory frame for implementation.
- Different government units such as the Ministry for Energy and the Ministry for Industries as well as the Central Bank have to align their activities to provide finance and support instruments, so that all necessary actors are being enabled. (interdisciplinary)
- Finance has to be provided. Insufficient funds mean that policies cannot be implemented.

In deciding where to allocate the funds governments are sometimes torn between too many choices. The Budget Allocation Chart (BAC, Fig.7)[9] helps to visualize what options a country has: Invest in generation capacity and increase energy supply or decrease demand for energy by supporting EE. The chart shows if and what measures are cost effective. From here the government can decide individually what funds need to be budgeted and what for.



*Energy audits are the first step to save energy. This house needs urgent rehabilitation*

**Figure 7: Budget Allocation Chart of Egypt**[10]




10 : http://www.med-enec.eu/sites/default/files/user_files/downloads/BAC%20Egypt%20April%202011.pdf

## Donor agencies

World Bank, the Global Environment Facility, the European Investment Bank (EIB) and the European Bank for Reconstruction and Development (EBRD), to name but a few, are donor agencies that provide loans and technical assistance to the governments in the MENA region in support of EE including the building sector. These organizations provide financial support either through the national governments, which then is called **sovereign lending**, because the repayment of the loan is guaranteed by the respective country. **Non-sovereign lending** means that financial support is given directly to the private sector, which in turn carries the sole responsibility for loan repayments. **Technical assistance** includes a wide area of advisory services such as capacity building measures, policy advice and trainings for the purpose of setting up EE in the building sector.

**Financial support** is the provision of funds either on grant or on interest bearing loan basis. These loans can be provided as credit lines to financial institutions such as banks which in turn on-lend the funds to their clients (see also figure 8 below). The role of donor agencies differs, but includes in cooperation with the government policies to

- deploy technical assistance where it is needed,
- provide financial support to the governments (budget support) or directly to individual projects,
- advise on policy issues.

## National Development Banks

KfW in Germany, China Development Bank in China, Banco Nacional de Obras y Servicios Públicos in Mexico are all government banks that act as intermediaries between the governments and end users. For this purpose they receive government and/or donor funds at preferential rates and lend to other banks and end-users according to clearly defined guidelines. Depending on their legal structure they may leverage government funds with own capital resources. National development banks can be the operator of dedicated EE funds. Their role depends on the policy but usually encompasses

- implementing government policies and programs,
- providing loans, technical assistance for project preparation and implementation as well as equity,
- reviewing and monitoring of the economic success of government policies,
- reporting and feed-back to policy makers,
- operating of EE funds.

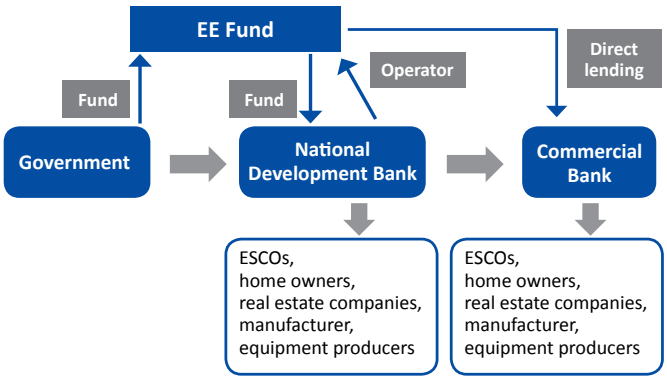
## Commercial banks

Commercial banks and specialized financial institutions such as mortgage banks and leasing companies have a responsibility towards their shareholders to make profits, avoid non-performing loans and facilitate investments of the industry and private households. They can be engaged to act as a distributor of public funds for EE in a typical on-lending structure. Because of their network of branches in the country they maintain close contact to end-users. Their interest is to increase the customer base and respond to market demand. Their role is

- mainstreaming EE activities,
- leverage public funds,
- "commercializing" investments in EE,
- …. but they usually need support to improve skills and understanding of the specifics of EE and will have to develop proper internal procedures.

In an on-lending structure the government passes the cheaper cost of funds through to the national development bank (or directly) to commercial banks. Banks will charge borrowers a commission and – based on the lower interest rates – their risk premium. Thus the overall costs for the borrower are cheaper than the usual market rate.

**Figure 8: On-lending structure**




## Industry Associations

As intermediary between the government and the industry sector they act as a lobby group to support the economic development of the respective (industry) sector. They act also as platforms to disseminate relevant policies and government guidelines. Industry Associations play often a crucial role in maintaining quality standards which is an important criterion for the risk assessment of banks. In EE in the building sector a large number of industry associations representing the diverse field of different industry sectors, such as glass making, electronics, building material, solar panels etc. are involved. There is however no combined industry called "energy efficiency".

Industry Associations referring to the building sector– manufacturing, architects, engineers - should:

- facilitate restructuring of the sector to respond to new demands for EE; lobby for government support for the restructuring,
- request government for finance to support R&D for EE technologies,
- set up pilot cases to introduce new technologies, materials etc. and a pipeline of projects,
- set and monitor quality standards,
- facilitate trainings, initiate new skills, offer information, communicate changes and challenges in the sector,
- may need themselves support to approach their members with new EE ideas.

All of the above will be done however only in case the government has set the framework for implementing EE in the building sector – which is first of all the enforcement of EE Building Codes.

## Manufacturers and equipment producers

In many countries manufacturing and production is performed by small and medium sized companies (SMEs). Worldwide they are the innovative force in an economy as they are usually the risk takers, the engineers who develop their products further and who are flexible to adapt to market demand quickly. At the same time they have the largest finance demand and are – also worldwide – the most challenging clients for banks. Because of their small asset size, their often inconsistent book-keeping practice and financial knowledge SMEs have difficulties to obtain loans. SMEs are the ones to turn to the black or grey markets for finance and thus miss the opportunity to gain from government supported loans.

Given the fact that a stimulating environment for implementing EE in the building sector is in place, producers can:

- respond to market demand and offer relevant EE products, material and equipment,
- undertake investments to be able to produce new products,
- take on R&D and develop products to market maturity,
- provide high quality products at reasonable prices to substitute imports,
- but they need financial support to respond to EE demand.

## Real estate firms and developers

They design, plan and construct new houses and refurbish existing ones. Real estate firms and developers are the closest to making EE in the building sector a success story. Very clearly, many of the government support instruments are geared towards their direct support. However, since their objective is profit maximization, this group will only invest as much as is needed because EE measures are expensive and not all of the extra costs can be rolled over to their tenants. They need to strike a balance between legislation and what is financially viable. In European countries EE Building Codes are mandatory. This development is still in an early phase in MENA countries.

Real estate developers:

- design and construct energy efficient buildings,
- work according to building codes, standards and other regulations,
- utilize government support programs,
- demand state of the art equipment and technology at reasonable prices.

## Energy Service Companies (ESCOs)

As service providers, their role is similar to the one of the manufacturers and equipment providers. They are usually SMEs as well, but with even less assets on their balance sheet. From a banking point of view the financing risk is even higher because ESCOs don't own anything yet make purchases on behalf of their clients against future expected savings in energy expenses. To base the loan repayment on the savings is a grey area for banks due to the difficult assessment of the future cash-flow of an ESCO.

ESCos[11]

- assess energy savings potential and make proposals to save,
- take the risk of energy savings,
- act as go-between for end-users, banks and equipment providers,
- finance EE measures for their clients,
- need finance initially to start and maintain their business.

## Tenants and home owners

Their room for tenants of new or existing buildings to maneuver is smallest. As the ones to select household appliances they may be eligible for financial support when changing/buying new energy efficient equipment such as refrigerators, air conditioners, washing machines etc. Many government programs also promote the use of solar water heaters.
Tenants and home owners

- do not review their energy bill and take decisions to move to energy efficient houses (voting by feet),
- are not aware of saving potentials, and lack information when new appliances need to be bought,
- do not understand financial savings that can be made, even if each piece of equipment may be only a small contributor,
- need financial incentives to become a responsible **"EE citizen"**.

11 More details please refer to the MED-ENEC brochure: Energy Service Companies: A market tool to foster energy efficiency; http://www.med-enec.eu/downloads/publications

# International Experience of EE Finance in the Building Sector

## Objectives

International experience in financing EE in the building sector is heterogeneous. Due to the large diversity in energy policies, institutional settings, traditions and capacity in each country, the objectives, measures and target groups vary. What is common is that governments feel the responsibility to act and are initially prepared to provide funds. But because of competing budgetary objectives and funding constraints they shift the responsibility for financing closer to where energy is generated and distributed and where the savings will occur, which means closer to energy companies/utilities and the end-user. The key decision to be taken is what mechanism governments use to achieve their objectives to:

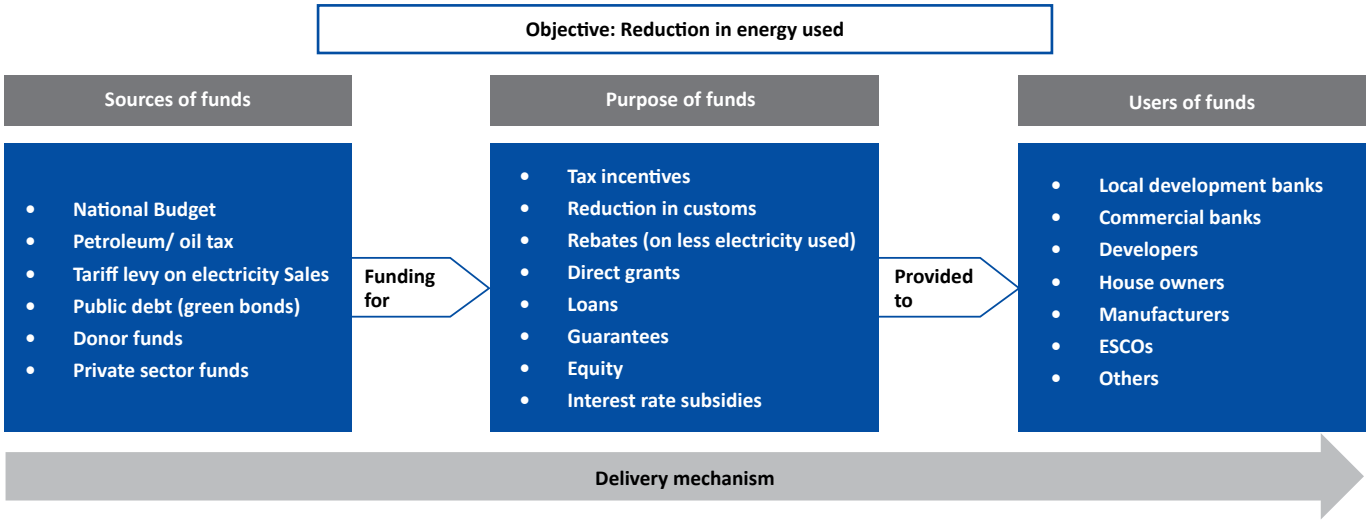
- maximize the output in ktoe saved per $1 investment and
- provide financial support to end-users, wherever and whenever it is needed.

Worldwide there are a large number of different techniques, which have developed over time and which can be used in combination or individually. The typical **demand side management (DSM)** structure has advanced into an **energy obligation scheme (EEO)**, which puts clearly defined energy saving targets on energy companies. **ESCOs** are a mechanism which shifts more responsibility to the private sector by establishing companies, which facilitate energy saving and financing the EE investment. Lately **NAMAs (National Appropriate Mitigation Action)** have come up which are targeted sector approaches, combining all financial resources and activities. Last but not least **revolving funds** are a very common mechanism, which can take many different shapes and has been used successfully in many countries (see box 3 Thailand revolving fund). All of these different delivery mechanisms are merely a conveyer belt to deliver funds to users and beneficiaries.

There is principally no right or wrong way to finance EE and policies that worked in one country may not function in another. The chart below gives a summary of international experience detailing where the money may come from, what it can finance and who may be the beneficiaries. There are many more options, and often a mixture is used.

*Applying insulation in the roof of an apartment*

**Figure 9: Sources, purposes and users of funds**




**Box 3: Thai energy efficiency revolving fund**

The Thai Energy Efficiency Revolving Fund (EERF) started operation in 2003 under the Energy Conservation Policy. The objective was to increase investments in machinery and equipment in support of RE and EE and enable banks to understand EE investments and properly address the inherent risks.
Sources of funds: Funds were provided from the government budget which channeled the revenues from a petroleum tax to the EERF. The pilot phase was planned to be from 2003 to 2005 with USD 60 million provided, but the initial phase was replicated a number of times up to 2013 providing a total of USD 238 million.

Purpose of funds: low-interest rate loans, guarantees.

Users of funds: The fund selected partner banks to which low-interest rate loans where provided. They in turn lent money to their clients for EE and RE projects. First only 6 banks were selected; in the meantime since 2012/13 the number has doubled. Now the partner banks provide their own funds to finance EE investments. Source: http://www.unece.org/fileadmin/DAM/energy/se/pp/eneff/Astana_EEForum_Sep2010/d1s4_3_Prasert_e.pdf

## Finance delivery mechanism

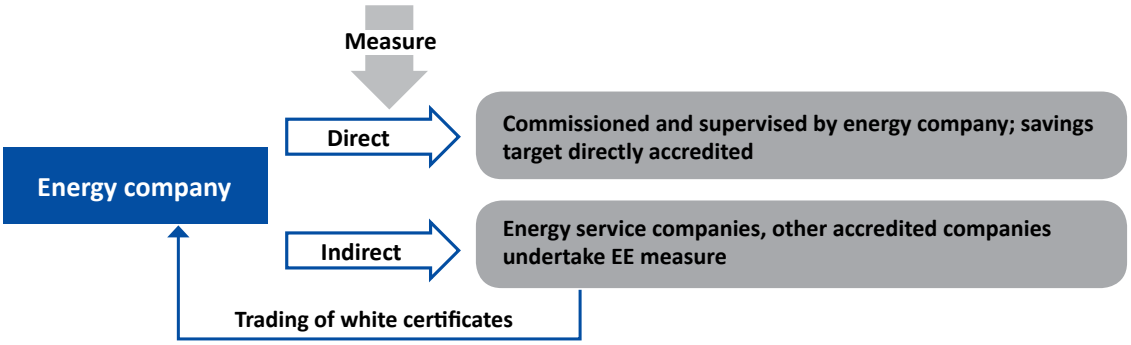
**Demand-side management (DSM)** is a mechanism that is useful when load management is a problem and tariffs are not recovering costs. More efficient management of electric energy loads it could result in increasing EE on the consumption side and, accordingly, in energy conservation. That is why it is also referred to as "smart grid". Depending on what problem has been identified – e.g. during peak load hours - it may encourage a shift to efficient compact fluorescent lighting, more energy efficient household appliances, using electricity outside peak hours and others.

In terms of financing EE in buildings, DSM is a reallocation mechanism that releases government funds by using the existing MW efficiently, thereby freeing money that otherwise would have to be invested in new energy supply infrastructure. It also enables the utility to support their clients reducing energy consumption by promoting energy efficient appliances. DSM is linked to utility finance, because if the utilities succeed in reducing energy by smarter management they lose in income. Depending on the level of liberalization in the energy sector government support may be required for utilities to make up for this loss. In a liberalized market tariffs tend to be high and changes may cause social tension, if no remedies for the poor are provided.

**Energy efficiency obligations (EEO)** is an extension of DSM whereby energy companies and utilities are obliged to act. They can be energy retail companies and distributors. Utilities are obliged to fund measures that lead to energy consumption or carbon emission reductions. A penalty will be levied on the company if energy savings targets are not met. For example utilities finance EE measures for their customers to save energy. They then make sure that energy savings are measurable and verified and provide subsidies for each kilowatt hour saved.

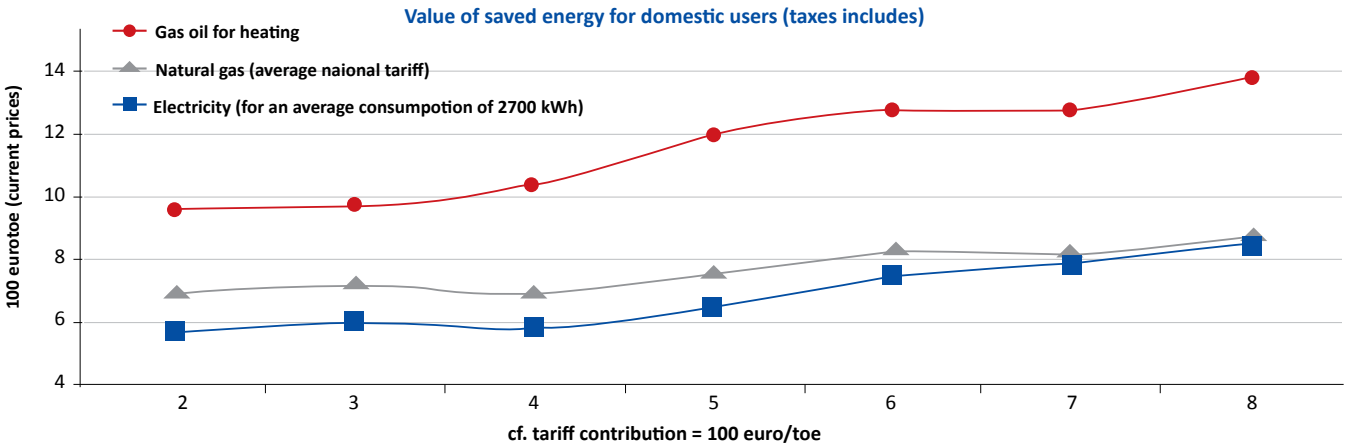
The results of such actions are quantified in energy saving accreditations back to the energy company as so called White Certificates. They state how much energy has been saved and can also be produced by third parties such as energy service companies and other firms like manufacturers of insulation materials. In some countries these certificates can be traded, helping the energy company to meet the targets. White Certificates can be issued for electricity savings, gas savings and other fuel source savings depending on government objectives. Some forms of EEOs are also called on-bill finance because the utility takes the (high) upfront costs and the customer is repaying the investment with the energy bill.

**Figure 10: Delivery mechanism of EEO**




To sustain EEOs, energy companies are financed by government subsidies and funds from the eligible customers. The subsidies can range from 0-100% contingent for example on the necessity to cushion off social adverse effects. The customer has to pay a part of the EE investment to assure their continued interest in the measure and their active contribution to save energy. The results of EEOs have been promising, as can be seen in the figure below stating the saved cost in energy.

**Figure 11: Avoided energy costs for participating customers in Italy from 2002-2008**




*Source: ECEEE, 2012*

**Energy Service Companies (ESCOs)**[12] act as facilitators between the EE targets of governments, banks and the potential energy savers. They address the problem of the highly fragmented market in EE and of the lack of technical expertise, capacity and funding of various actors who would have the potential to save energy. There is no uniform definition of ESCOs. They may offer the entire range of services out of one hand such as:

- assessment of EE potential of a client,
- identification of technically viable and cost effective measures,
- design, finance and implementation management.

The way they deliver their services is grouped according to

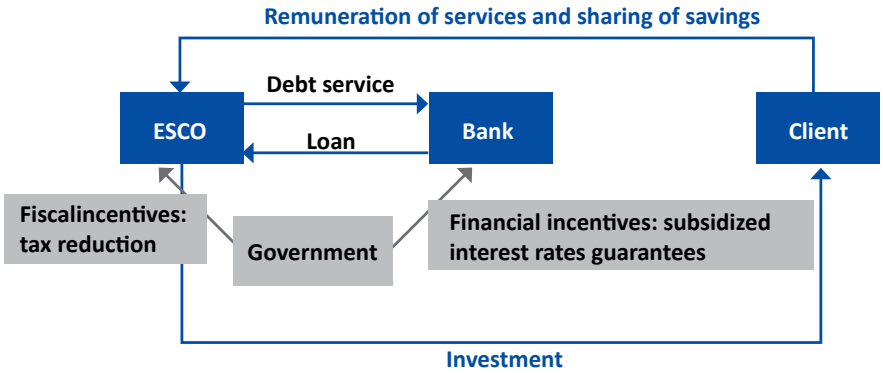
12 More information about ESCos see also MED-ENEC: ESCOs, 2014; http://www.med-enec.eu/downloads/publications

the underlying contracts they entertain with their clients. The most popular are

- energy supply contracts (ESC) and
- energy performance contracts (EPC),
- energy operation contracts (EOCs) and
- third party finance (TPF)

The business model of an ESCO is based on the ability to secure and monetize the energy saved and use this cash-flow as a source of repayment for the loan.
But also ESCOs need finance to perform their services[13]. This is worldwide a problem, because banks are not used to financing loans based on energy savings. It would require a shift from a collateral based thinking to a cash-flow based one. Therefore governments kick-off finance for ESCOs either by direct support like loans or through financial incentives. In parallel many governments look at capacity building measures also for banks to enable their staff to perform loans also for EE . Another frequently applied option of financing the service provider and the recommended EE measures is that the bank provides the loan to the recipient of the service – e.g. the manufacturer, a public entity or else.

**Figure 12: Financial support mechanism for ESCOS**




**Box 4: Tunisia's experience with ESCOs**

Supported by a USD 8.5 million loan from the Global Environment Facility, the World Bank encouraged the promulgation of a legal framework and the establishment of ESCOs under the 2004 Energy Efficiency Law. The law defines the scope of ESCOs to make feasibility studies, manage, monitor and finance projects and guarantee performance.

The service companies must be certified by the National Agency for Energy Conservation (ANME). Tunisia has set clear rules of mandatory energy audits for high end consumers. This has ensured that there was demand for continued ESCO services after the program was finished. During the program a large number of people from different sectors (banks, energy auditing firms, the industry) were trained.

Two types of energy performance contracts (EPCs) are popular in Tunisia:
**Shared savings contract,** where the client and the ESCO share the investment in the underlying contract
**Contract savings guarantee,** where the client finances all measures and ESCO guarantees the savings. This is similar to third party finance.

**National Appropriate Mitigation Action (NAMA)** falls under the international climate negotiations of the United Nations Framework Convention on Climate Change (UNFCCC). Since commitments under the Kyoto protocol have expired and no new binding agreements have been reached, developing countries deployed voluntary schemes – NAMAs – to reduce greenhouse gas emissions after 2012.

NAMAs are basically another form of fund which is financed by different groups such as donors, governments and climate related funds with the objective to give holistic support to a sector or part of a sector. This is in opposite to CDM (clean development mechanism) finance which has concentrated on individual projects. Thus NAMAs can be used to finance EE in the building sector. One of the first pilot NAMAs, which has received a lot of attention is the EcoCasa example from Mexico (see box 6). It serves as model for other NAMAs in the way the objectives and the delivery has been structured.

13 The following figures are adapted from Berliner Energie Agentur, Frankfurt 2012. Other possible structures between the stakeholders are presented in the MED-ENEC brochure on ESCos: http://www.med-enec.eu/downloads/publications

**Box 5: What can NAMAs be?**

- A program giving rebates to customers who buy energy efficient home appliances
- A program that financially supports feed-in tariffs for renewable energy, bridging the gap between the local (fossil) fuel sources and the cost of the renewable energy
- A program to design transport master plans for each mode of transport to improve traffic flow and reduce air pollution

NAMAs are submitted by the eligible country to the UNFCCC for approval. Lebanon for example after releasing NAMA decision 196/1, is currently in the process of packaging their mitigation action[14]. The Ministry of Environment has been appointed to be the national coordinator. The selected NAMAs will be judged by their GHG reduction potential, economic, social and environmental co-benefits, institutional readiness and MRV (measurement, reporting and verification) ability. The focus should be on activities related to EE, renewable energy, waste and wastewater management.

*4 MW Tri-generation system, Enfidha-Hammamet Airport, Tunisia. Investment of 5 Million EUR, including a 20% grant from the Energy Transition Fund*

14 MED-ENEC has supported the development of a NAMA concept for the building sector of Lebanon. MED-ENEC website: http://www.med-enec.eu/news/med-enec-supported-development-lebanese-nama-nationally-appropriate-mitigation-actions

**Box 6: NAMA-pilot EcoCasa in Mexico**

**Objective:** Extend the penetration of basic energy efficiency standards to the entire new housing market in Mexico and to upgrade efficiency standards to more ambitious levels.

**Participants:** The German KfW Development Bank and the Inter-American Development Bank (IDB) supported by the Clean Technology Fund (CTF) and the German Government are as Co-Financiers providing concessional loans while the Sociedad Hipotecaria Federal (SHF) and the National Housing Commission (CONAVI) are responsible for the program execution.

**Design:** The program contributes to the efforts of the Mexican Government to reduce GHG emissions related to the residential sector by providing financial incentives for energy efficient and low-carbon houses to low and middle income population. Use of technology include façade cladding or building insulation which reduce the energy to cool the house.

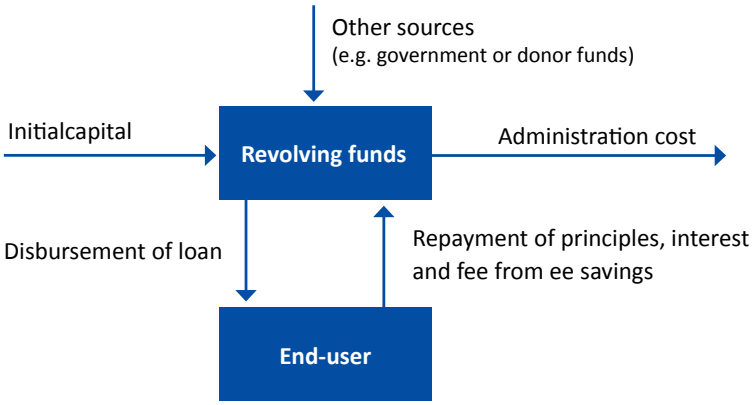
**Eligible:** Large public housing financiers, private housing developers, financial intermediaries and small and medium sized developers.

**Outcome:** Focus on low income housing to improve living conditions at lower costs and reduce demand for energy. The program also supports the employment sector. It is estimated that the program can reduce 200 ktCO2e annually in 2020.

*Source:https://www.kfw-entwicklungsbank.de/International-financing/KfW-Entwicklungsbank/Environment-and-climate/F%C3%B6rderinstrumente/NAMA-National-Appropriate-Mitigation-Action/*

**Revolving Funds** are a flexible instrument because they can be used by governments to finance end-users as well as the various mechanism such as EEOs and ESCOs. The basic idea is that a fund is created that replenishes itself through the investments it makes. It has the advantage that - after an initial equity contribution - it is independent of the fiscal years and overall budget constraints. In EE the idea of a revolving fund is that it will be replenished by repayments from Energy savings.

**Figure 13: Revolving fund structure for EE**




Examples of revolving funds are

- The **China** Clean Development Mechanism Fund (CCDMF) is a national climate fund that supports low carbon growth and climate resilience in China. It is a revolving fund that receives regular capital injections from levies collected by the government on clean development mechanism projects in China.
- The Green Revolving Fund (GRF) is a $12 million revolving loan fund of Harvard University in the US that provides capital for high-performance campus design, operations, maintenance, and occupant behavior projects. Basic project eligibility guidelines state that projects must reduce the University's environmental impacts and have

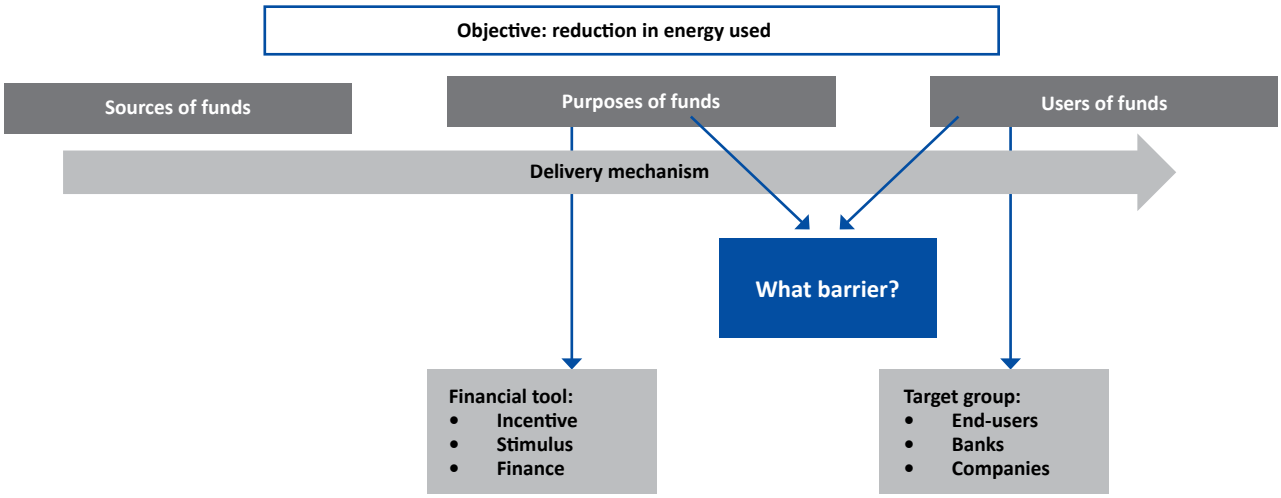
a payback period of five to ten years or less. Since its inception, the GRF has supported nearly 200 projects that have yielded over $4 million in energy savings annually.

- In **Estonia** the EU Structural Funds are combined with the funds from the government to form a revolving fund (KredEx) for housing refurbishment and offer a long-time low interest loan for apartment buildings to achieve EE. The aim of the renovation loan is to support the renovation of apartment buildings and to raise their EE at least by 20%, by improving the accessibility of loan capital.
- The **Thai** Energy Efficiency Fund (see Box 3)

## Barriers – and examples for solutions

International experience shows that delivery mechanisms are only as good as the nature of the barrier to EE finance is clear, the target group and the financial tools have been identified. The question is what does the policy want to achieve (example: a reduction of x ktoe in cooling), in which target group (example: multi-storage housing) and what sort of financial tool is needed to achieve the objective? This is showcased by the figure 14. Governments need to carefully analyze the issue to understand the nature of the problem and select the appropriate financial tool.

**Figure 14: Identification of barriers to energy finance**

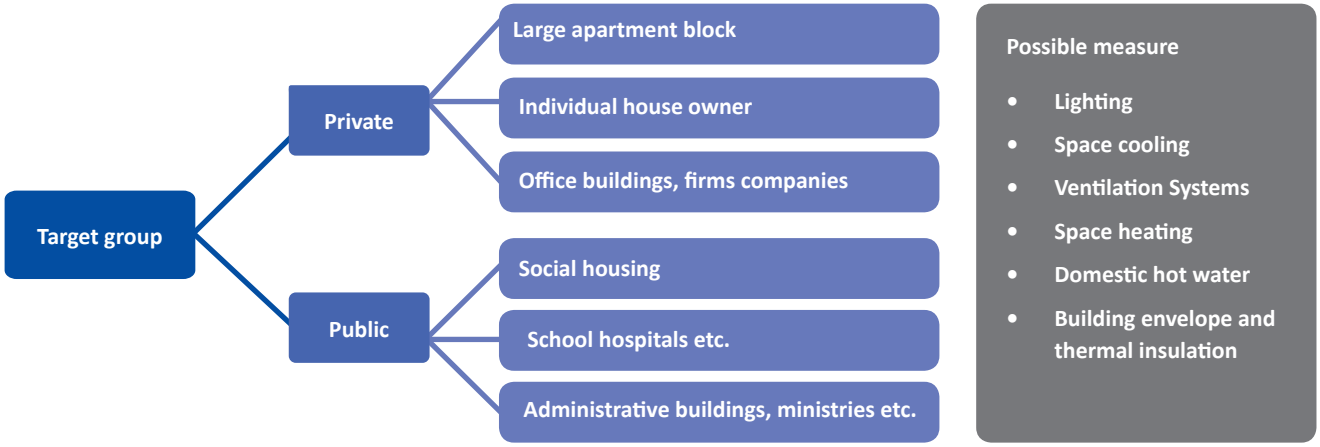



Financial tools target the nature of the barrier (why is nothing happening) and can be:

- a stimulus such as an increase in energy tariffs, an obligation to save, a new benchmark,
- an incentive such as a tax reduction or a grant,
- direct finance such as a subsidy for 10% of the investment costs

To highlight the extend of different possibilities of finance to overcome barriers an example from the EU is taken. The next chart (Fig. 15) shows first of all the different target groups and the possible measures where energy can be saved. The EU example picks only two measures (space and water heating) and shows what incentives can be provided to make the target groups save energy.

**Figure 15: Target group, end-user and possible measures**



Basically none of the selected EU countries used the same delivery mechanism to support space and water heating because they all faced different barriers. Examples:

The **Bulgarian** Energy Efficiency Fund (BEEF), which was funded by multiple sources including the World Bank/Global Environment Facility, the Bulgarian national budget and the private sector, provide a credit line and a grant of up to 20% of total investment costs. Eligible borrowers are house-owners, real estate firms and public housing companies.
In **Italy** investors receive a tax credit of up to 55% allotted over a number of years.
In **Poland** not only real estate firms and house owners can avail of the subsidized loans but also local heat sources and local heat distributors.
**Latvia** is addressing the problem that big apartment blocks have various owners. They can be represented by one legal person, for example the property management company, to apply for a loan for all. Investment costs of up to 50% are supported, and people with lower incomes can get a higher support rate.
The Green Deal in the **UK** is targeting the quick turn-over in the real estate market. It does not link the loan to the owner but to the property. The debt the energy efficient investment has caused is linked to the energy bill. If a flat changes its owner the new owner repays the remaining debt through its electricity bill while at the same time receiving the benefits from the EE investment in form of less energy consumed..

The success of each of the measures needs monitoring. The monitoring methods are very different:

- Energy audits are approved by the designated authorities, and energy auditors supervise and document the construction phase.
- A report of energy saved is produced for a certain number of years after the implementation of the EE measure to verify that specific targets are met.
- The payment of the loan is only available after the measure has been implemented and showed the desired results.
- The loan amount is tied to the amount of energy saved. The higher the achieved increase of EE , the geater the loan will be.

## Finance to banks

International experience for EE finance in the building sector shows that commercial banks are reluctant to finance EE investments. The amounts to be financed are often small, producing high transaction costs, the concept of financing savings of operation costs requires them to rely on cash-flow based lending, and the technical risks are not transparent.
Therefore governments and donors need to incentivize banks to finance EE measures. One very common way is to provide cheap funding to banks under the condition that they lend to EE investments. The cheaper funds enable the bank to recover some of their cost, gain experience and develop a market. Usually these loans are accompanied by technical assistance to improve the technical understanding of energy savings and update internal procedures.

Another common support mechanism is to grant a guarantee for loans that have been made to finance EE in buildings. In this way the risk of the bank that the loan is not repaid is partially covered.

**Box 7: Tunisia's on-lending program under PROSOL**

In Tunisia the PROSOL 1+2 program, which ran up to 2012, promoted investments of renewable energy in the residential sector through the purchase of solar water heaters (SWH). The buyers received a 20% subsidy on the costs of SWHs and the banks received cheaper funds to subsidize the interest rates by up to 50% (from 12% to 6%) and extend the tenure of the loan from 3 years to 5 years. In addition the banks received a guarantee from the electricity utility which covered the final loan amount through the electricity bill.

*Applying thermal insulation on new buildings - Syria*

# Current Situation in MENA

## How much funds are needed to achieve what

EE in the building sector in the MENA region is mainly financed by governments and the international donor community. Very little money is provided by local commercial banks. It is the objective of all countries to leverage more private funds and shift more and more of the financial burden to the consumer. At this stage government and donor finance is needed to incentivize investments and assume investment costs.

The EIB[15] has undertaken a study how much money would be needed to implement the national targets under the NEEAPs in the building sector in MENA region[16], given that not all measures under the plans are equally financially and economically viable. They review a scenario (#1) by which only those measures are implemented that are immediately financially viable for the investor (e.g. changing to CFL), a scenario (#2) by which also those measures are implemented that require governments to cover the difference between the financial and economic costs, and a scenario (#3) where all measures planned are implemented and which would need further subsidies (e.g. changing the building envelope in existing buildings).

If all measures currently considered under the national plans are implemented the energy savings targets for 2020 could almost be achieved, resulting in savings of 12 mtoe (cumulated) for the region. If only the measures under scenario #2 are implemented 85% of the targets could be achieved. This, of course, would result in much lower costs for governments as can be seen in figure 16. The difference between the full deployment scenario #3 and the scenario #2 is substantial: € 91 billion are needed of which € 29 billion would be subsidies, which government would need to incentives investments and to make them economically feasible for investors. This must be compared to the investment costs under scenario #2 which are € 30 billion. Most of the savings and the investment costs would be in Algeria and Egypt, the countries with the largest building stock.

**Figure 16: Development of energy savings under the different scenarios in the MENA region**

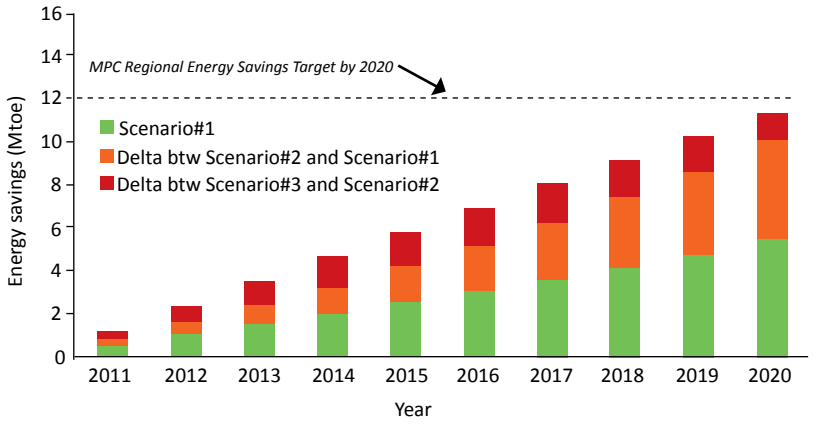
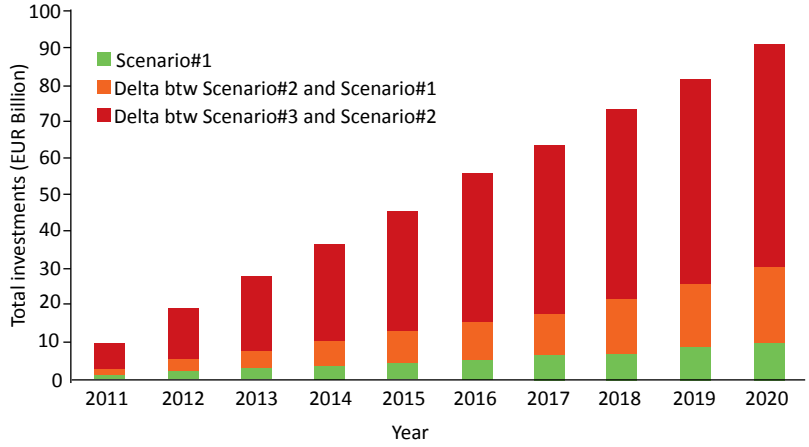



**Figure 17: Development of investment costs under the different scenarios in MENA region over 2011-2020**




15 EIB, 2013

16 Countries include Algeria, Egypt, Israel, Jordan, Lebanon, Syria, Morocco, Tunisia and West Bank/Gaza.

## Budget Finance

Governments in the MENA region have selected different vehicles to finance the investments in the building sector mirroring their budget constraints, competing investment needs and the situation of the energy sector. The table below specifies some of them.

**Table 4: Examples for EE financing in MENA and their sources**

| Country | Energy Efficiency Fund | Sources of funds | Activity (selection) |
|---|---|---|---|
| Algeria | National Fund for Energy Management (FNME) annual capital € 57 m | Tax on natural gas; initial government contribution of € 1.15 mill. and continuous budgetary support | n/a |
| Egypt | None pointed at EE directly; but support via Industrial Modernization Center | Government budget | Credit guarantee program; equipment grant scheme |
| Jordan | Jordanian Renewable Energy and EE Fund (JREEEF) | Annual budget allocation; initial donor support | Interest rate subsidies; guarantee facility |
| Lebanon | National Energy and Renewable Energy Action (NEEREA) | Government: USD 200 mill. Disbursed and potential 400 mio for 2015<br>€ 12 mill. EU support<br>EIB support planned | (see box 8) |
| Morocco | Energy Development Fund (EDF) total capital USD 1 bn. | USD 200 mill. from government budget/ Hassan II fund; USD 800 mill. from UAE and Saudi Arabia | Credit guarantee fund; interest rate subsidies |
| Palestine | Revolving Fund for ESCOs | Donor funded; revolving income through projects | Start-up capital investments |
| Syria | none | | |
| Tunisia | Energy Transition Fund (FTE) | Government and donor funding | Grants for energy audits, EE & RE investment and substitution for natural gas |

- In **Algeria** the fund invested in a period from 2007 to 2011 in 10,000 solar water heaters in dwellings, spending about € 6 mill. and saving 1.5 ktoe/year.
- In **Egypt**, where there is no designated EE agency, the government supported the electricity distribution companies to deploy 6 mill. CFLs to residential customers in Cairo, spending € 22.6 mill. planned saving 20.0 ktoe/year.
- In **Morocco** PROMASOL, the Moroccan Program for Promoting Solar Energy, financed the installation of 100,000 sqm of solar water heater panels by 2012 spending € 30 mill. planned saving 3.1 ktoe/year. The funds were provided through interest rate subsidies and the guarantee fund as well as money from the private sector.


**Box 8: Lebanon's progressive finance alternative**

Lebanon provides an interesting example for the fact that finance for EE is channeled through banks. The Central Bank of Lebanon (CBL) was crucial in developing the National Fund together with the local authority for energy (LCEC). From the start the objective was to use banks to stimulate investments through low cost funds. Subsequently NEEREA has the following components:

- Subsidized interest rates, whereby CBL exempts banks from reserve requirements.
- Cash subsidies, which will be paid after the project is completed and the savings are confirmed by LCEC. The subsidies are funded by the EU and represent 5% or 15% of the loan amount, depending if the sector already receives another form of subsidy.
- A loan guarantee for SMEs up to 40 employees ("Kafalat Energy")
- A TA program to improve staff's technical and managerial skills in advising clients at the level of the guarantee organization Kafalat, participating commercial banks and CBL.

*Source: EIB, 2013*

## Multilateral finance

As can be seen from the table 4 above some of the government funds are directly supported by donors. Funding from donor agencies plays a large role in financing the building sector in the MENA region. Usually it entails a whole set of different measures including:

- Policy support to strengthen the legal and regulatory frame work
- Technical assistance is targeted at various stakeholders within the process and may entail capacity building at the institution, the transfer of technical knowledge and the dissemination of information.
- Loans either to the fund directly or to other stakeholders.
- Equity to provide a funding vehicle with sufficient capital to start working.

Very often energy efficient measures are included in remediation for renewable energy, and it is unclear how the funds are separated. Also, because EE is such a fragmented market, where the individual transactions are not very big in terms of money needed, many of the interventions are not clearly visible because they run under a different heading such as a urban sector improvement program or small and medium sized enterprise support, or strengthening local utilities demand management system. The table 5 below gives an example under what heading EE is financed by the Asian Development Bank (ADB), the European Bank for Reconstruction and Development (EBRD) and the European Investment Bank (EIB).

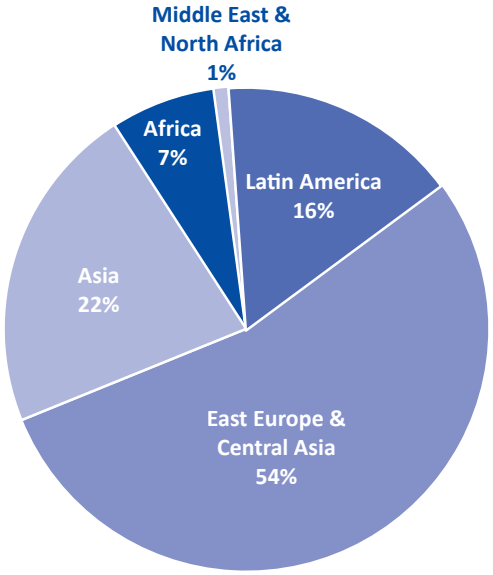
**Table 5: EE hard to detect in multilateral bank portfolios**

| ADD | EBRD | EIB |
|---|---|---|
| Energy | Industry | Industry |
| Finance | Sustainable Energy Financing Facilities | Buildings |
| Multisector | Cleaner Energy Production | District heating |
| Waste and municipal infrastructure services | Municipal infrastructure | Cogeneration (combined heat and power) |

*Source: OECD IEA, 2012*

Looking at the regional distribution of multilateral finance for EE it soon becomes obvious why there are so few examples for the MENA region: Only 1% of overall finance goes to the MENA region. It should however not be forgotten that most of the MENA countries count as "middle income countries" reducing their eligibility to receive concessional funding. Also a number of activities have been slowed down due to the current political situation in some countries. Below some of the better known examples for support are listed.

**Figure 18: Multilateral financing for the MENA region**




*Source: OECD IEA, 2012*

## Examples for donor funding in the region

**World Bank** together with the Global Environment Facility **(GEF)** supported the establishment of the **Jordan** Renewable Energy and Energy Efficiency Fund (JREEEF). The support started in June 2009 and ended in June 2014. A total of USD 45 mill was invested by the World Bank and GEF. The funding was also used to reduce energy subsidies, help raise energy tariffs to a higher level and buffer the social adverse effects. The loan was accompanied by various capacity building measures, for example to carry out energy audits for public buildings and the development of a projected pipeline to be financed by the JREEEF.

The **UNDP** together with the **GEF** have supported Morocco to set up EE codes in residential buildings. The money went to the National Agency for Renewable Energy and Energy Efficiency and Ministry of Housing and Urban Development. The project started in 2009 and closed in 2013. The technical assistance program focused on setting up the EE building code institution, draft the building code, and develop pilot cases. The loan targeted investments in the 400,000 residential buildings and made up USD 13 mill. of the total of USD 18 mill. project.

The German **KfW** Development Bank is in preparation for a loan to finance EE measures at public buildings in Egypt, especially university buildings. The loan will be accompanied by technical assistance up to € 2 Mio. to prepare the partner organization and build capacity. KfW is also preparing for other EE projects in Morocco, Tunisia and Jordan.

Activities of donor finance in the making (end of 2014):

The European Investment Bank **(EIB)** is planning to extend a facility by the name ELENA, which had successfully operated in other countries to improve technical, managerial, financial, and structural competence in the sector in all over **MENA**. ELENA is expected to address EE in new and existing buildings, RE integration in buildings, EE and RE in local infrastructure and have a component on transport.

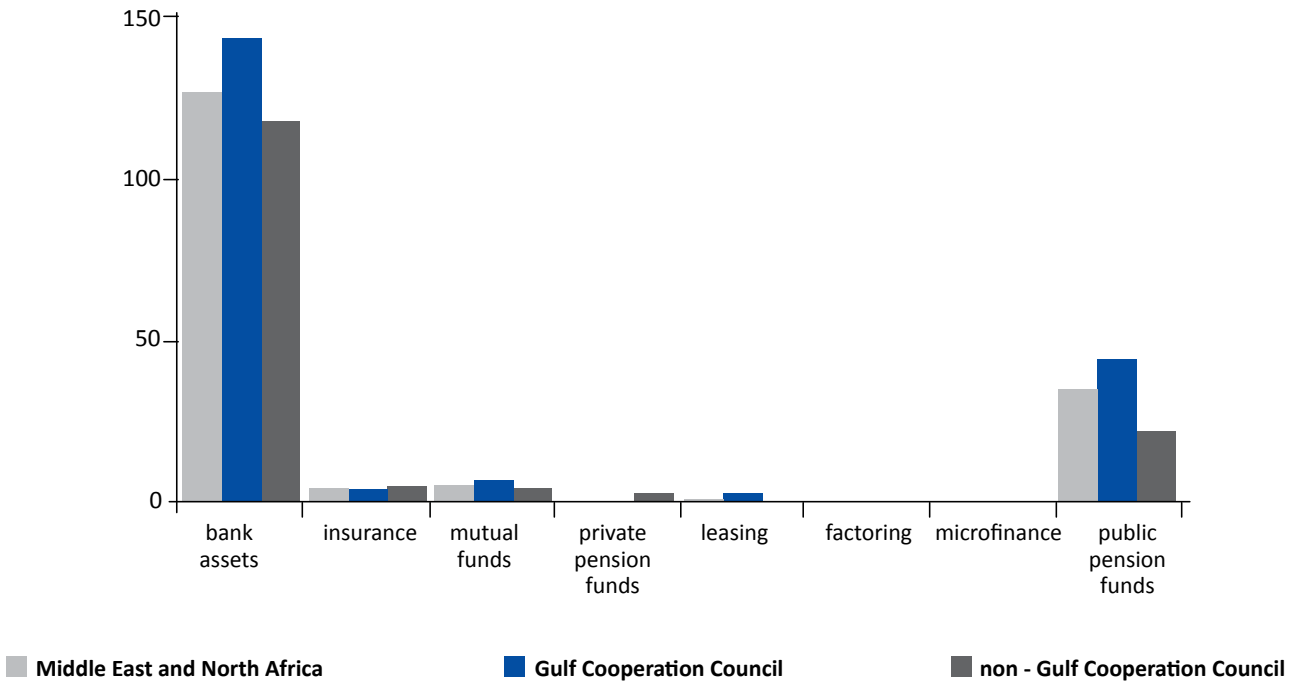
The European Bank for Reconstruction and Development **(EBRD)** plans to invest up to USD 1.1 bn in the **MENA** region. The loans have not yet been fine-tuned, but will be under the sustainable energy finance (SEF Facility). As has been announced, a loan of USD 30 mill. to the National Bank of **Egypt** (NBE) for on-lending to private sub-borrowers for EE and renewable energy projects (the Project) is considered. EBRD intends to provide technical assistance to support NBE and the sub-borrowers in the design and successful implementation of the credit line. The implementation and saved energy will be verified by an external source.

## Situation of commercial banks

Despite the fact that the banking sector in the MENA region is relatively big, well capitalized and not severely affected by the financial crisis of 2008, access to commercial finance is a problem. The reason is a combination of different factors. According to the World Bank roadmap report they are:

- Weak financial infrastructure: processes such as remittances, existence of credit bureaus and settlement systems for swift transmission of funds are missing or inefficient.
- Weak competition in the banking sector: in general the banking sector is developing better in countries where the sector is not dominated by state banks. In Jordan, Egypt, Morocco, Tunisia and Lebanon banks act more freely than in Algeria and Syria, where there are fewer but bigger banks.
- Lending to only a view clients: loans are directed by the governments (policy lending), or banks only provide loans to big, sometimes state-owned companies.
- Lack of non-bank financial institutions: there are basically no alternatives to banks such as for example leasing companies or micro-finance institutes. Leasing and factoring are less than 1% of total GDP, and microfinance is a diminishing 0,2% (see figure 19, Assets of Financial Institutions as a percentage of GDP).

**Figure 19: Assets of financial institutions as a percentage of GDP**



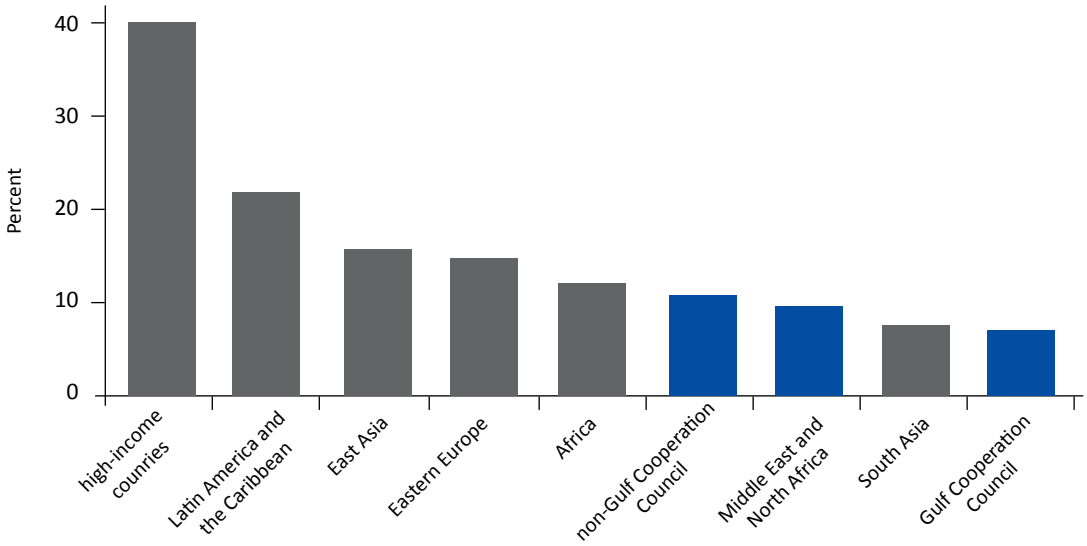

*Source: World Band staff compilation based on data from Axco, Euromoney, Factors Chain International (FCI), International Monetary Fund (IMF), Investment Company Institute (ICI), Micro Finance Information Exchange (MIX), World Bank, and national sources.*

*Note: Data are from 2009 or latest year available.*

*Source: Worldbank, 2011*

Many countries use housing finance as a platform to provide financial incentives if houses are built according to EE standards. Housing or mortgage finance is a special field in the banking industry because the processes are fairly standardized with longer than usual maturities taking the immobile asset as collateral. The process has just started in the MENA region accounting for 9% of total loan portfolio, which is a low rate when compared to other countries.

**Figure 20: Housing financing in the MENA region**




*Source: World Bank staff calculations based on data from national sources and the World Bank Housing Finance Unit database*

*Note: Data are regional averages computed on 2010 figures or latest available year*

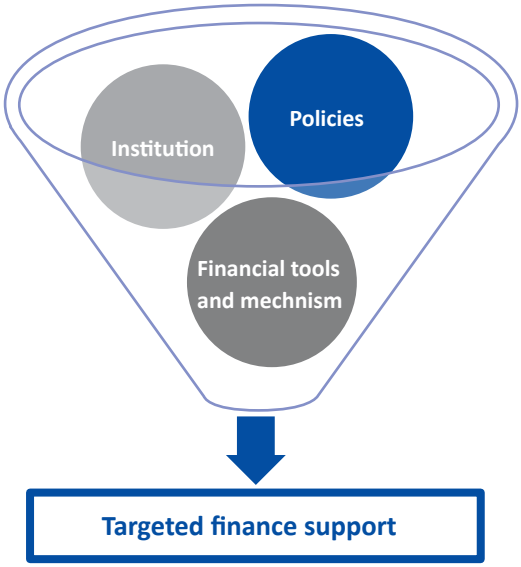
All of the above has an adverse effect on financing EE in the building sector. In addition to the weaknesses in the banking sector, the central banks as the supervising entity do not use their leverage to develop a green finance policy, obligating banks to, for example, invest a certain percentage of their portfolio in "green" or energy efficient projects or making checks on basic energy benchmarks a mandatory process.

*Green building*

# Targeted Support to Overcome Bottlenecks

To overcome bottlenecks in financing EE in the building sector governments in the MENA region need to engage at three levels: the political, the institutional level and the level of individual financing instruments and mechanisms. Governments need to take a supporting role that guides and monitors the process. The financial input should be designed in a manner that it slowly fades out once society has taken over their responsibility to save energy.

**Figure 21: Targeted financial support**




## Policy level

**Holistic approach:** EE is not only a subject for the energy ministries. It has overlaps with other ministries such as industry ministries, Building & Housing, Environment, central banks, the treasury, technology and education ministries. Currently there is often little coordination between the different political units in any of the countries of the MENA region despite the fact that finance, industries as well as skilled workers are needed to achieve the energy savings objectives in the building sector.

- Set up of a high-level conference to raise awareness of EE not only for the building sector among the different political players. The objective should be a common resolution to assess policies according to their impact on energy and introduce energy saving measures. Make EE a cross-cutting initiative. A Steering Committee with the relevant stakeholders empowered with strong authority could foster the development in the interest of the country.
- The Steering Committee, as a temporary unit, can take care for initiating a necessary legal and regulatory framework and for setting up an "Energy Agency".

**Alignment of policies:** The lack of an integrated approach often results in policies issued by other ministries contradicting the savings objectives. The role, for example, of industry ministries is to create economic growth and employment, so usually little focus is put on saving energy.

- Set up of working groups to identify contradicting polices and introduce changes – including proposals for designing respective legal frameworks for the different economic sectors. This could be for example under the guidance of the above suggested Steering Committee.

Creating the **legal and regulatory framework:** EE laws and regulations in most MENA countries still need improvement. Once finalized, an appropriate institutions must be set up on central and local level to guide and ensure the enforcement of the laws.

- To recover the huge energy saving potential in the building sector mandatory EE Building Codes need to be in place and enforced – guided by dedicated institutions on municipal level and below. This counts also for other EE supporting policies and measures – as the development of ESCOs addressing EE in the existing buildings, labeling and minimum energy performance standards (MEPs) for equipment [17].

17 A respective possible institutional set-up for ESCos (for accreditation, certification) is proposed in the MED-ENEC brochure on ESCos: Website: http://www.med-enec.eu/downloads/publications: Energy Service Companies: A market tool to foster energy efficiency. Also: "EE Building Code – a Roadmap for implementation in the MENA Region".

*Egyptian Ministry of Electricity & Energy and Ministry of Tourism Representatives at the opening of the 3rd Energy Audit Training, organized in collaboration with EU-MED-ENEC and UNDP (Feb. 2015)*

**Restructuring of energy policy:** Subsidizing energy tariffs is the single issue that can be clearly identified as having the most negative impact on financing EE also in the building sector. A rethinking process to reduce subsidies avoiding socially adverse implications is a must for any future action. Funds currently used for paying the subsidies can be replaced by measures to save energy.

- Many initiatives are already on the way. The new perspective of linking reduction in subsidies with measures to raise the efficiency of energy consumption should be the objective. Reallocation of funds is the buzz-word.

**Green Finance policy:** Mainstreaming of EE finance in the private commercial sector is the way to reduce the burden on government budgets. A Green Finance policy obligates banks as part of the national economy to contribute their part. A Green Finance policy forces banks to assess their activities according to clearly set "green" guidelines and lend a certain percentage of their portfolio to the green cause. Thus access to finance for EE in the building sector will become easier.

- Initiate fact finding of objectives of green finance, formulate policies and identify supporting instruments for commercial banks.

**Opening of the financial sector:** The current focus on banks as the sole source for financing in the MENA region deprives investors of other internationally recognized financing tools such as leasing. Non-bank financial institutions improve the access to finance.

- Identify supervising authorities and start the legal and regulatory process to establish non-bank financial institutions.

**Unlocking technical potential:** The beauty of financing EE also in the building sector is that it creates a lot of positive side effects. A well placed technology campaign by

industry ministries targeted at EE equipment, material and technologies enforces locally produced and easily available hardware and at the same time keeps the value chain within the country – thus creating employment opportunities all over the country[18].

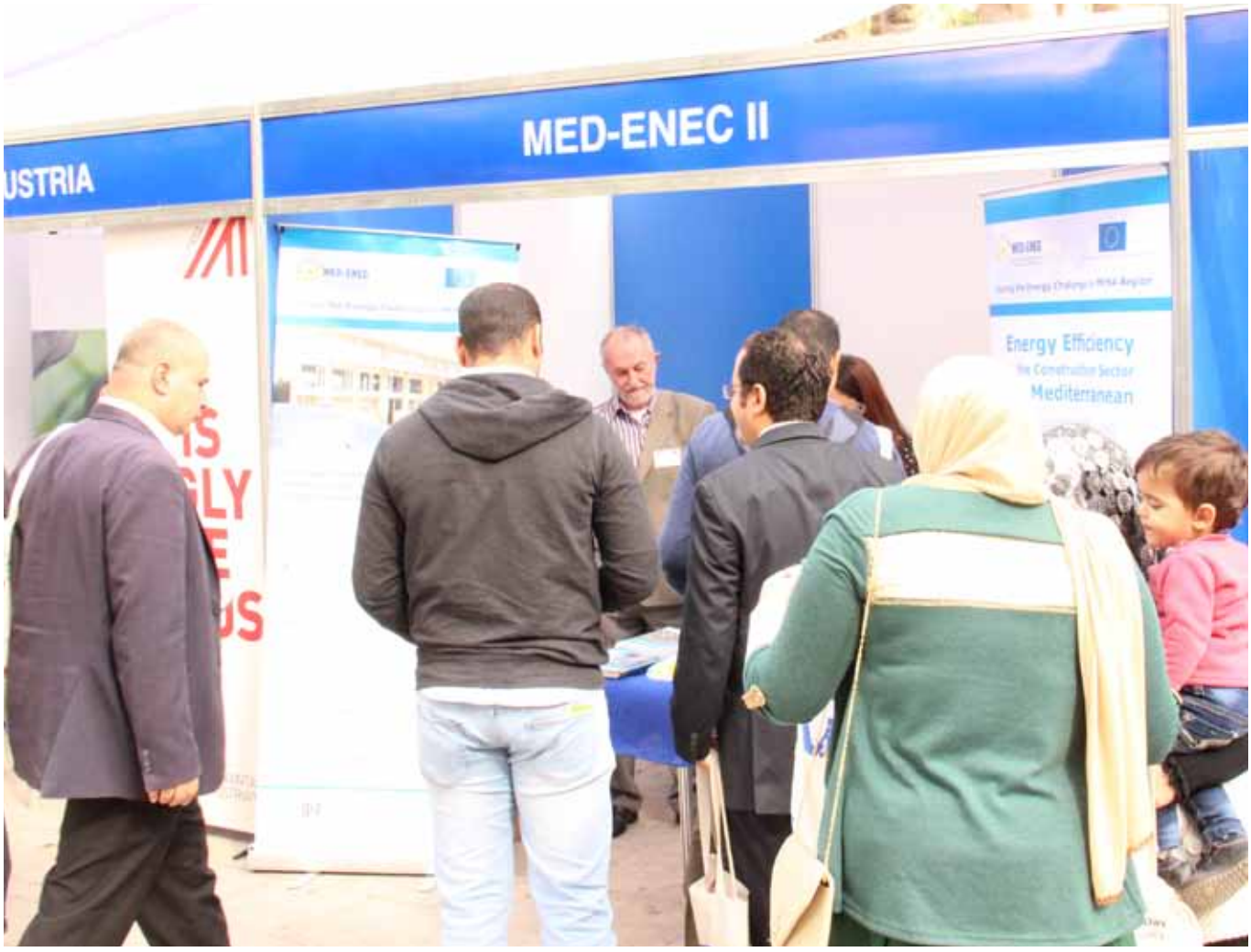
- Identification of current ability in the industry and alignment and reconciliation with demand.
- Accompanying financial support to SMEs in the building sector.

**Organization of different funding sources:** To overcome the lack of funds governments are advised to identify demand for funding and organize supply of funding sources. The objective is to get a continuous funding stream that supports the EE policies over a sufficient long time. Good experience has been made with NAMAs and revolving funds.

- Initiate a dedicated NAMA to finance EE in the building sector.
- Initiate a revolving fund with professional assistance from the banking side.
- Establish a quota for EE in the building sector.

**Create public awareness:** The technical understanding of EE as well as the benefits for the end-users are not sufficiently clear in societies in the MENA region. For end-users to accept policy changes and to act, it is essential that information is easily available, policy actions are transparent and energy savings are clearly identifiable. Financial options need to be transparent.

- Organization of a professional campaign for EE in the building sector linked to certain user groups.
- Follow-up on the campaign to keep the momentum; repetition of campaign[19].




*MED-ENEC booth at the Euro-Egyptian energy day: a public awareness day on EE*

18 A brochure on the positive employment impacts of EE measures is available on MED-ENEC Website: http://www.med-enec.eu/downloads/publications: Energy Efficiency and Employment : a Win-Win Opportunity

19 Early 2015 MED-ENEC is publishing a brochure on awareness campaigns to promote EE: "Marketing is Power – Promoting Energy Efficiency in MENA region"

## Institutional level

Bottlenecks at the institutional level usually block the way in two directions: firstly the message cannot be conveyed to the end user in an appropriate, understandable manner. Secondly, if the institution fails to set up appropriate implementation structures it will also difficult to monitor what effect and progress EE in the building sector has. Without for example correct baseline data new ideas and instruments can not be developed.

**Independent energy agency needed:** As discussed above some countries in the MENA region do not have a dedicated institution to implement the NEEAP. This, however, is recommended to avoid scattered and uncoordinated activities. It may also reduce a conflict of interest that may arise if the ministry as the political decision maker is also the implementing unit.

- Review current institutional set-up and recommend changes.

**Anchorage of NEEAPs:** The NEEAPs are the main instrument to see EE in the building sector through. The question is how deeply the NEEAPs are anchored in the institutions. Can institutions pay enough attention to the tasks or do they have different, maybe conflicting functions?

- Review suitability of institutions to implement NEEAP.

**Institutional set-up for enforcing EE Building Codes (EEBC)[20]:** Enforcing the EEBCs needs an appropriate institutional set-up. The institution needs to be at municipality level and, in case, also below, in charge of approving design and construction of new buildings.

- Establish respective institutions and care for capacity building of the staff to enable the institution fulfilling the tasks.

## Unlocking the financing bottleneck

Lack of funds and of access to funds are the bottlenecks that need to be addressed. In addition to the well-known traditional instruments, MENA countries should target this bottleneck with new sources of funds.

**NAMAs:** By bundling different donor funds and national resources NAMAs overcome the issue of too many but too scattered sources of funds. All can be combined to form a NAMA. It also helps to design a holistic approach because NAMAs usually address an entire sector or a group within the sector. Because NAMAs can only be established if the country officially applies for them at the UNFCCC, countries make sure that their national policy is supported and not the approach of an individual donor agency. NAMAs provide lower funding costs, allowing local banks to pass these benefits through to their clients. As the example ECO CASA in Mexico shows, NAMAs for financing EE in the building sector are possible.

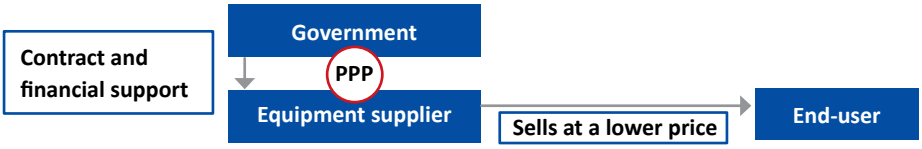
**Public-Private Partnerships:** PPPs have often been drawn on as a future source for funding. Indeed, in mature markets the combination of public and private funds to finance EE in the building sector has a good chance. The private money usually comes from private equity funds, trusts or pensions funds.


*Lebanon's NAMA is the first in the region - components, barriers and supporting measures as identified by the different stakeholders. National workshop organized as part of EU-MED-ENEC technical assistance to its partner countries.*

20 The MED-ENEC brochure "EE Building Code – a Roadmap for implementation in the MENA Region" focuses on the policy making process of EE Building Codes, the legal framework and the institutional set-up. http://www.med-enec.eu/downloads/publications:

If one takes PPPs not only as a means to source finance but broadens the term a bit a new form of PPP appears, which includes the manufacturing industry. In some countries equipment producers are supported by the government to be able to sell energy efficient equipment/appliances at a lower than market price to the end-user. This helps the government to achieve EE , the equipment provider to increase the turn-over of his company (and gain experience in this new product) and the end-user, because the price for the appliance is reasonable. Usually a contract is signed between the government and the private company, detailing the maturity of the financial support and the price binding effect this has, as well as the technical specifications of the equipment.

**Figure 22: PPP to finance EE in the building sector**




**ESCOs:** ESCOs have proven to be good financial delivery mechanisms in mature countries. For them to perform well a stable regulatory environment is needed, as their business model relies mainly on contracts between different parties. These contracts need to be enforceable. Also, the nature of their work may require changes in the legislation to cover their scope of work.

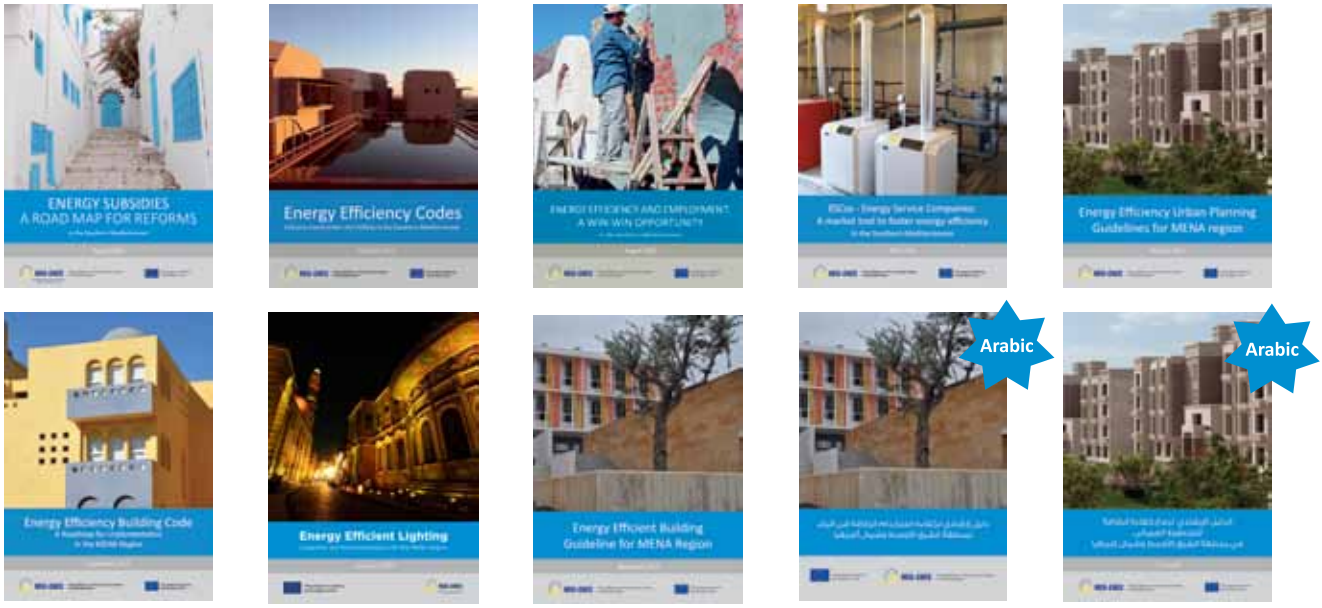
- Review of legal framework for ESCOs.
- Provision of financial support instruments such as subsidized interest loans and guarantees.
- Making audit reports bankable/readable for banks.

**Green Sukuk Bonds:** Sukuk Bonds can be provided by Islamic and non-islamic banks. Sukuk Bonds can also be used to finance "green" activities. Islamic finance does not take interest or Riba. It works in a way that the bank acts as the buyer of the goods and services and leases them back to the client. The client pays a rental fee.

There are different Sukuks, depending on the underlying purpose. Most common for governments, who want to supplement their budget by taking up a bond is the Al-Ijara structure. It works for countries with a sovereign risk of BBB and better. The structure is very similar to what is known under the sale and lease back process as described above.

**Leasing:** MENA countries have very few non-banking institutions. EE equipment and appliances - mainly for the industry - however, are very well suited to get financing also outside the banking sector. The leasing firm can be a dedicated company or the manufacturing company. In case of the leasing company they buy the equipment and lease it to the end-user at a special rate and undertake – if necessary – maintenance. This saves the end-user the high upfront costs, and the leasing rate is designed to match the savings on the user's energy bill. Depending on the nature of the contract, at the end of the leasing period the appliance is either taken back by the leasing company or it stays in the ownership of the end-user

**Figure 23: MED-ENEC Publications on energy efficiency issues (available at www.med-enec.eu/downloads/publications)**



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## Abbreviations

| | |
|---|---|
| *Bn* | *billion* |
| *CDM* | *Clean development mechanism* |
| *DMS* | *Demand-side management* |
| *EBRD* | *European Bank for Reconstruction and Development* |
| *EE* | *Energy efficiency* |
| *EEO* | *Energy efficiency obligations* |
| *EIB* | *European Investment Bank* |
| *ENPI* | *European Neighborhood and Partnership Instrument* |
| *ESCO* | *Energy Service Company* |
| *EU* | *European Union* |
| *GEF* | *Global Environment Facility* |
| *GHG* | *Green House Gas Emission* |
| *GW* | *Gigawatt* |
| *IEA* | *International Energy Agency* |
| *KfW* | *Kreditanstalt für Wiederaufbau, Germany* |
| *Ktoe* | *Kilotons of oil equivalent* |
| *KtCO2* | *Kilotons of carbon emission* |
| *kWh* | *Kilowatt/hour* |
| *MENA* | *Middle East and North Africa* |
| *Mill* | *Million* |
| *Mtoe* | *Megaton of oil equivalent* |
| *MW* | *Mega Watt* |
| *NAMA* | *National Appropriate Mitigation Action* |
| *NEEPAs* | *National Energy Efficiency Action Plans* |
| *RE* | *Renewable Energy* |
| *SWH* | *Solar Water Heater* |
| *SME* | *Small and medium sized companies* |
| *UN* | *United Nations* |
| *UNFCCC* | *United Nations Framework Convention on Climate Change* |
| *UNDP* | *United Nations Development Program* |

## Boxes



## Tables



## Figures

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# Imprint

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