Energy Sector
Policy Brief Towards a More Sustainable Energy Economy

Key Issues and Challenges

The energy sector plays an important role in achieving the economic and social development in Egypt,through supplyingthe energy resources mix needed for different sectors and contributing about 15% of the country's FDI. In 2009/2010, Oil contributed 40% of the total primary energy consumption while Natural Gas "NG"counted 56% and only about 4% were from Renewable Energy "RE" including hydro resources.The industrial and transport sectors are the largest end-use consumers of primary energy resources, counting for 34% and 24% respectively in 2009/2010. While for electricity consumption the domestic sector was the highest consumer counting for 39% followed by the industries sector 32%, as shown by fig (1).

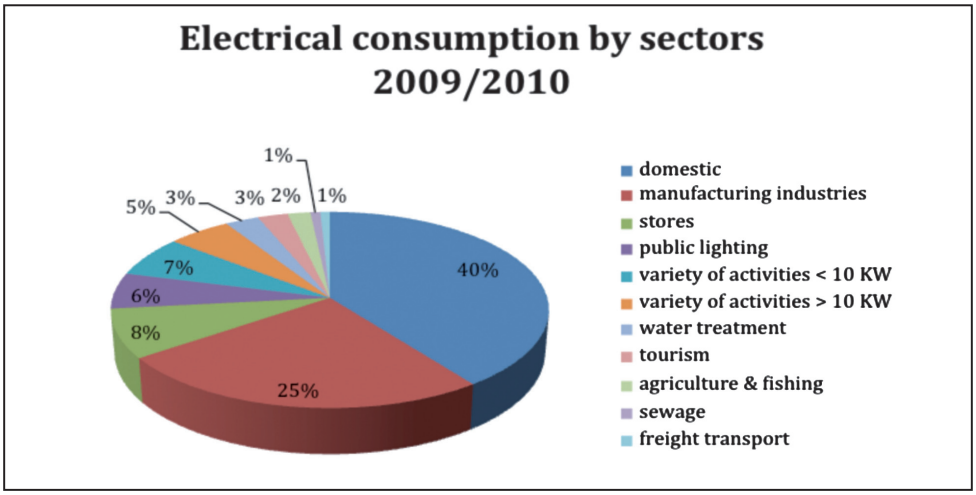


Figure (1) Distribution of electricity consumption by sector

While Egypt enjoyed the availability of large Oil, Gas and R Eresources, the rapidly increasing un- efficient demand, the limited utilization of RE resources and the NG exports have led to an increasing supply / demand deficit since 2007. Consequently, a need has emerged for importing Oil products and LPG to satisfy the local demand. Currently, the country is experiencing frequent oil products and electricity supply shortage that is affecting the national productivity and creating political and social problems.

With the current prevailing consumption patterns, the supply/demand deficit is expected to increase. Three studies conducted between 2008 and 2010 have estimated that the supply/demand energy deficit will reach (30- 50) million ton of oil equivalent between years (2022- 2030) representing 24% - 35% of the consumption demand during the same period (1). Therefore, the Egyptian energy sector will be facing crucial challenges for securing the energy supplies requested for achieving the development programs. As a result, there is a need for the design and implementation of an aggressive energy policy reform, including, but not limited to:

- Enhancing exploration activities for fossil energy resources and reconsidering the NG regulatory framework and export policies.
- Upgrading Energy Efficiency (EE) both in the supply and demand side sectors, which is one of the cost-effective immediate options to help lower future demands and reduce forecasted supply shortages and environmental impacts of the sector.

● Increasing the contribution of RE resources in the energy mix, this can improve energy security, and mitigate GHG emissions.

● Development of an appropriate energy institutional framework and legislative structure that can effectively plan, manage and promote the implementation of EE&RE programs.

The development and implementation of the above energy policy reform by shifting towards a more energy efficient economy and by making greater use of RE is challenged by the lack of clarity on the institutional responsibility for EE, the absence of clear EE goals and the weak support given to RE applications as well as the existing subsidy. Thus very limited interest in investing in EE &RE exists.

In recognition of the above, the Government has acknowledged that EE can be the most cost-effective tool to managing demand and deferring future energy supply investments. In May 2009, this acknowledgement led to the establishment of an *Energy Efficiency Unit* (EEU) at the Cabinet of Ministers "COM" to provide technical advice and support to the Supreme Energy Council "SEC" and coordinates national EE efforts across all sectors to strengthen the linkage between policy development and market implementation, as shown by Fig (2). The EEU's ultimate goal is to help the market moves towards higher demand efficiency and more wide spread use of RE.

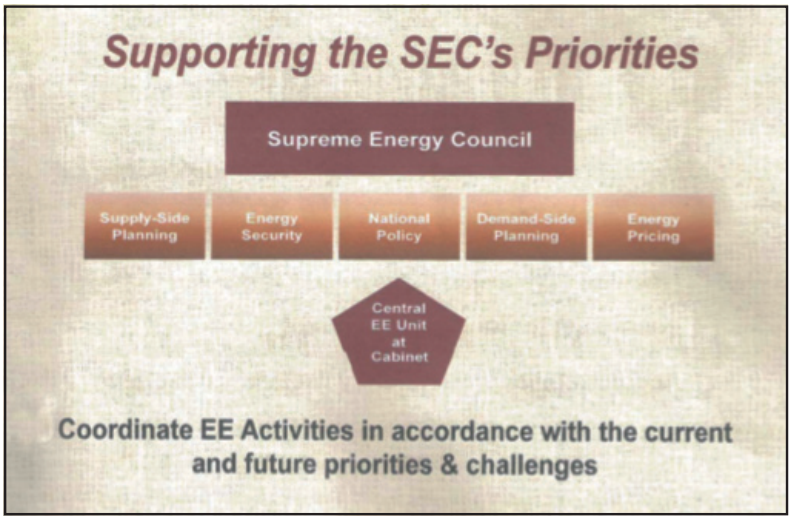


Figure (2) The Role of the central EEU

The Institutional and Legislative Framework

The need for developing an effective institutional, regulatory and legislative framework is now at a crucial level. Getting to this framework requires a series of staged and progressive actions to be implemented gradually. The priority actions should be directed to strengthening the institutional structure and build its capacity sustainably.

In August 2010, the SEC requested the EEU to investigate the possibility of building a new decentralized structure to promote and support EE implementation. In response the EEU supported by the World Bank conducted a study to assist in developing an approach for main streaming EE into the energy and economic development strategies and targets. The approach is based on creating sector-specific EE units in each of the major energy production and consumption sectors to carry on the responsibility of planning, implementation and monitoring EE activities in these sectors. The proposed institutional framework is expected to provide more effective and customized EE solutions to the market due to the knowledge of each sector with its own energy needs. The specific benefits expected to be realized are:

● Better identification of customized EE approaches consistent with the sector's planned targets and existing priorities.

- Improved reliability of data collection and relevance to EE.
- Development of a set of realistic and relevant EE indicators.
- Improved communication with energy consumers at a disaggregated level to support ongoing modifications of policies and programs based on market needs.
- Enhanced ability to raise public awareness, disseminate information, and communicateat a disaggregated level within each sector.

Although the sector-specific EE units are expected to be fully managed and funded by their respective sector, meanwhile they will be working in full coordination with the EEU. This will ensure coordination between different units and maintain consistency with Egypt's overall energy policy. The EEU will also provide capacity building and assistance support in organizational planning, marketing strategies, development of sector-specific indicators, training, policy analysis and recommendations for program design and monitoring. On the other hand the sectoral EE units will keep EEU/IDSC informed in all relevant activity and information, see Fig (3). To perform this function, the capacity of the EEU, which is currently supported by the MDG Fund, should be further strengthened and more sustainable.

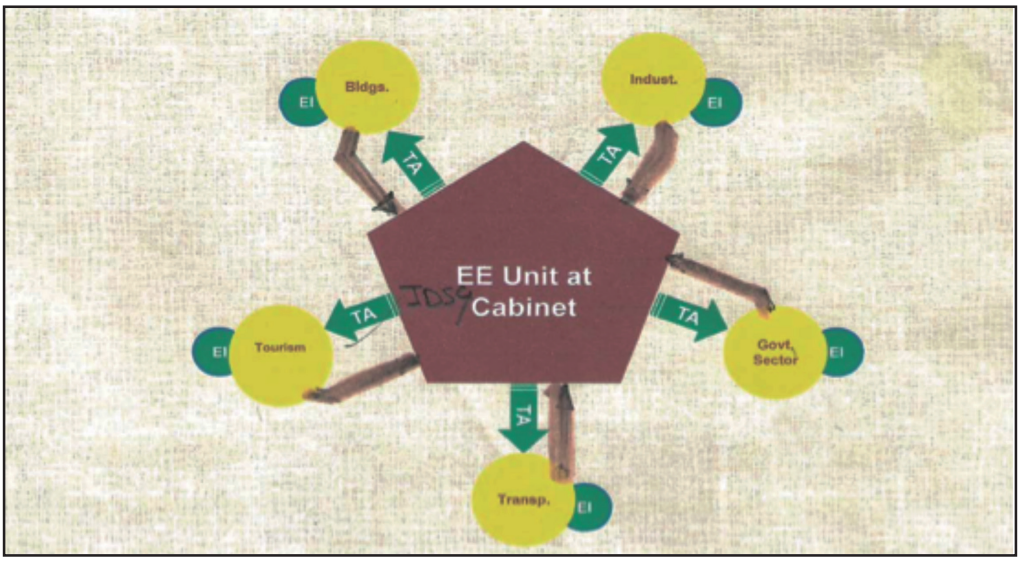


Figure (3) links between central EEU/IDSC and EE Units in key sectors

Six EEUs have been recommended in an earlier analysis (2) to be established at the Ministries of Industry & Foreign Trade, Housing & Urban Communities, Tourism and Transportation & Local Development. Currently four EEUs are already established in the Ministry of Housing, the Ministry of Tourism, Ministry of Industry and Trade, and Ministry of Transport, however, they are not yet sufficiently activated.Two additional EE units are to be established within the structures of the Ministry or Electricity & Energy (MOEE) and the Ministry of Petroleum (MOP) to address utility sponsored demand side and supply side efficiency improvements within their respective domains. The MOEE has already taken advanced steps for the establishment and activation of the unit.

The proposed institutional structure is one of the cornerstones of the framework, but having a full fledge independent Energy Efficiency Agency along with the proper legislation for enforcement will complete the picture and allow the practice to sustainably grow. While EE legislations can confer status and permanency and provide the legal basis for obtaining funding, it is recommended that the enactment of a comprehensive EE law should be deferred until some experience is gained from the sector EE units' operations.

Energy Efficiency Indicators

Accountability and responsibility for improving the relationship between the amount and the mix of energy use to the expected outputs of each sector should lie with the consuming end. Therefore, setting up an energy accounting mechanism that links energy use to the productivity indices of each sector is a key requirement for the success of the recommended approach. Sector-specific incentives and disincentives as well as regulations are strongly encouraged to ensure linkage between efficiency and productivity. The broader objective is to integrate efficiency into the key sectors of the economy and link its impacts to economic development. Understanding how progress in each sector impacts the national economy in a quantitative as well as qualitative by policy decision makers is critical to gain their continued support.

Specific EE indicators and the streamlining of each of the sector's energy information system and supporting databases should be simultaneously developed to create the basis for future benchmarks, regulations and standards. Energy reduction targets should also be established for the implementation of sector-specific EE programs, EE measurement and verification system and EE incentives and policies. Energy pricing reform is another key element to achieve sustained measurable improvement in EE, and should be accelerated to the extent permitted by the social and political context. An analytical study sponsored through the MDG-F/CCRMP has identified and evaluated the necessary structure for an effective indicators system that takes into account the relationship between energy consumption and economic structure and activity for the sector and its main sub-sectors. These indicators can be calculated from existing data sources and additional indicators can be developed in the future as new and more relevant data become available.

Funding and Legislation

Funding resources are essential to support EE activities. The successful implementation of the recommended sector-specific EE units will require funding and technical assistance (TA). Although donor funding is likely to be available for TA activities, a dedicated EE fund with budget support would ensure adequate and stable financing for well-planned longer term EE programs. As pricing reforms and subsidy restructuring take place, there will also be a need to provide financing schemes to energy end-users to fund EE projects. International experiences indicate that there are many barriers to financing EE programs and a number of financing mechanisms have been developed to overcome these barriers. The two most relevant mechanisms that can be used in Egypt are: 1. establishment of an "'Energy Efficiency Fund" – a special purpose fund established and monitored by the government with support from interested international development partners 2. a dedicated line of credit by donor agencies to local banks and financial institutions. Carbon finance may also be used for supplemental financing of energy efficiency programs.

Energy efficiency legislations could provide the legal foundation for instituting and enforcing policies and assigning responsibilities and funding, and providing legitimacy to the target EE institutional structure. Efforts to initiate the legislative process of an EE law should be considered as soon as the market and social dynamics in the country allow.

However, in order for Egypt to achieve major and sustained improvements in , it is critical that the Government continue energy price reform, develop and implement EE law and associated regulations that can foster an EE financing market.

Current Major Policies and Measures

Various programs and activities related to EE and RE, either on the technical or policy development side, were undertaken for more than 25 years in Egypt. However, no sustainable impacts or true market transformation in terms of EE were realized and limited market penetration was achieved for RE application. Although many demonstration projects were implemented to prove the technical feasibility of energy efficiency investments in various segments, there has been no large-scale replication of these projects. A key element for this market resistance was attributed to the subsidized energy prices.

The energy audits and surveys carried out over the past few years demonstrate that the EE potential for the various sectors could range from 10-20% of the total end-use consumption, while the studies quoted earlierhave estimated that only about 8.3 % of the total energy consumption by 2022 can be saved by EE measures. There is still a need for more focused studies to evaluate the practical potential for EE and for the adoption of more dedicated policies to be facilitate its implementation.

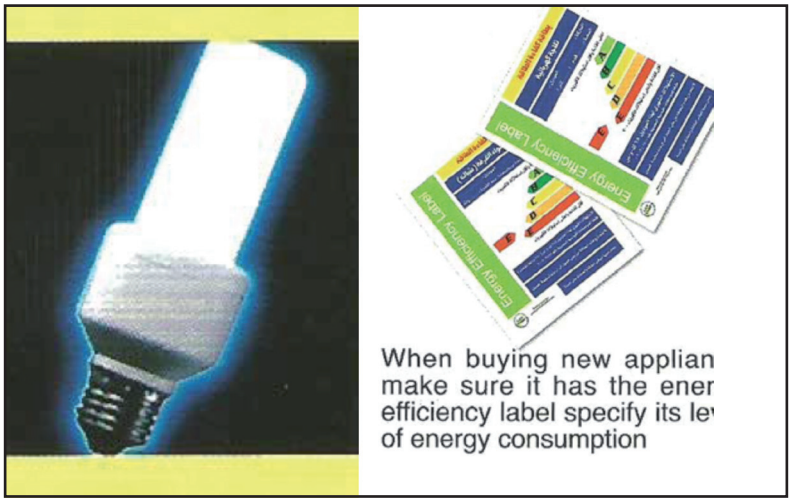
During the last few years, several EE regulations were approved by SEC and/or the cabinet of ministers "COM" and strategic targets were identified for RE development, as well as formulating a unified electricity bill, awaiting the approval of the People's Assembly. The current policies include:

EE Adopted Policies

- An efficient lighting programme (Compact Fluorescent Bulbs) for the residential and commercial sectors, as well as street lighting,is being implemented by MoEE; About 120 million efficient bulbs have already been installed through the programme.

- Efficiency labeling of energy-using appliances is being implemented but is not widely used yet. Four standards were developed for home appliances; however its application is still low due to the lack of consumer awareness and weak enforcement of the standards.

- Standard specifications for (CFLs bulbs) have been elaborated and used for procurement (MoEE).



- Energy Efficiency Programmes in government bodies and public utilities have started.

- The building code for residential sector was approved for implementation on a voluntary basis with no developed mechanism and institutional capacities to monitor its implementation.

- In November 2012, the MOEE launched the national EE plan for the electricity sector including seven sub-programmes targeting to save 5566 G.W.H between (2013 –2015). Table (1) shows the total electricity

saving and estimated cost for the different components of the plan, most of it will be funded through bilateral and international funded project.

RE AdoptedTarget Polices

- SEC approved a RE target of 20% of the produced electricity by 2020 including hydro resources (Feb 2008). A priority was given to wind generated electricity to reach 12% (7200MW). Currently 540MW of wind farms are operating and connected to the national grid,see fig (5).

Figure (5) Wind Farms at Zafarana

- The COM in July 2012 approved the plan for solar generated electricity to target "3500 MWe" by 2027. Articles 47 and 54 of the formulated unified electricity bill addressed some regulations and incentives for encouraging RE applications.

- Three implementation modalities were identified for RE project including:
1. implementation by NREA, 2. BOO project through EEHC and 3.special tariff project through "EETC".

It is to be noted that most of EE initiatives and policies that have been adopted in the last decade have mainly focused on saving electricity consumption and promoting RE for electricity production and very few were directed towards saving the consumption of petroleum products particularly in the industrial, housing and transport sectors. Examples ofthe EE issues that have not yet been addressed by consent EE policies are:

- Efficiency legislation for the industrial and commercial sectors has not been adopted.
- Enforcement of efficiency codes in buildings has not advanced.
- Restructuring the transportation system to substitute diesel has not begun.
- The plans for enhancing mass transport are not effectively implemented.

Strategic Policy Recommendation

In view of the current Energy sector's key issues and challenges in particular those related to upgrading EE and promoting RE, the EEU/IDSC is currently adopting a strategic approach including six key issues:

- The policies and plans for promoting EE and RE should be closely linked to the needs of socio-economic development by helping increase the productivity and competitiveness of the various sectors and contribute to poverty alleviation and job creation.

- EE and RE activities should not be considered only for the demand side sub-sector, but for the energy sector at large,i.e. for both the supply and demand sides.
- Demand-side management should be integral to the overall energy sector long-term planning.
- Account abilityfor energy efficiency should lie with the consuming sectors.
- Plans for promoting RE applications, should carefully consider all available resources / technology options both for large scale and distributed energy systems.
- EE and RE programs should effectively contribute to environmental protection and climate change mitigation.

In order to effectively implement the above-mentioned approach, the EEU has already identified the following actions that have to be pursued:

- Building an effective institutional framework, based on strengthening the capacity of sectoral EEU's and enhancing coordination among them and the central EEU
- Developing a national energy efficiency strategy with long-term goals and objectives
- Update the exiting RE targets and strategies to consider the possible application of all RE resources/Technology options in all sectors
- Developing sector-specific EE operating plans for each target sector of the economy
- Implementing market initiatives and policies in targeted sectors
- Monitoring and market development
- Ensuring that an adequate and stable financial support is established for well-planned long term EE & RE programs.

Ongoing Activities and the Way Forward

In line with the strategic key issues and actions described, the EEU is currently devoting efforts to enhance coordination with different stakeholders and partners to ensure that planned activities will address the identified key issues. Several initiatives are being implemented within the scope of the MDG Fund project and the EU funded Energy Sector Policy Support "ESPSP". Also, three other initiatives are being formulated and implemented by EEU/IDSC. These initiatives include:

- Introducing efficient lighting systems to the three IDSC building within the framework of the MDG Fund project and with support from the project on improving energy efficiency in lighting and home appliances MOEE.
- Leading an initiative to introduce efficient lighting systems to Mosques that belong to the Ministry of Awkaf in coordination with the MOEE and Misr Al Khair association. Other locations with large potentials are being considered.
- Contribute to the implementation of the "ESPSP" funded by EU. The 2013 activities will be implemented in cooperation with key national partners and support by the TA consultant of the project.

The core objective of these activities is to strengthen the existing Energy Efficiency Institutional System, for both the EEU and sector-specific units,to support the following:

1. An EE national strategy is developed.
2. The regulation for incentivizing the installation of solar water heaters in new buildings is prepared.
3. Preparation of the incentives scheme for Solar Water Heating (SWH).

4. Energy efficiency management at the consuming sector level is enhanced in 2 sectors with clear action plans.
5. A road map for energy efficiency management is updated.
6. A performance monitoring on energy utilization in consuming sectors is in place.
7. Effective public and street lighting management approaches are proposed.
8. Preparation of standard public procurement documentation for Street Lighting (SL).
9. Design of accreditation system for EE experts.

In view of the above, while coordinating with all partners to achieve the targeted objectives of EE institutional strengthening, strategies and policy development, emphasis will also be given for enhancing possible field implementation of feasible EE options in particular in the industrial, tourism and housing sectors as well as promoting RE in different sectors and setting its strategic targets to include savings on all primary energy resources. As well as priority will be given to the development and adoption of policies those target the following:

- To continue energy pricing review in particular for high consuming sector.
- To adopt sectoral EE strategies and plans including quantitative targets.
- To develop specific EE indicators for each specific industry and identify priority applications.
- To adopt measures to encourage the move towards "Green Development" particularly in the industrial and tourism sectors.

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1. Environics, 2011, Development of a System of Energy Intensity Indicators for the Egyptian Economy.
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Please see IDSC for the detailed reports

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