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for

The Technical Secretariat (TS) of the Cabinet of Ministers (CoM)

Development of a System of Energy Intensity Indicators for the Egyptian Economy

Final Report

Submitted by:

Environics
Environmental Systems...
...On the path to sustainability

In association with

ERCC
ENERGY & ENVIRONMENTAL CONSULTANTS

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Acknowledgments

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List of Acronyms

BAT	Best Available Technology
Btu	British Thermal Units
CAPMAS	Central Agency for Public Mobilization and Statistics
CEI	Composite Energy Index
CFL	Compact Fluorescent Lamps
CHP	Combined Heat and Power
CoM	Cabinet of Ministers
CP	Cleaner Production
CTA	Cairo Transport Authority
DANIDA	Danish International Development Agency
ECES	Egyptian Center for Economics Studies
EE	Energy Efficiency
EEAA	Egyptian Environmental Affairs Agency
EEC	Egyptian Energy Efficiency Council
EEHC	Egyptian Electricity Holding Company
EEIGGR	Energy Efficiency Improvements and Greenhouse Gas Reductions
EERE	Office of Energy Efficiency and Renewable Energy
EEU	Energy Efficiency Unit
EGAS	Egyptian Natural Gas Holding Company
EGPC	Egyptian General Petroleum Corporation
EH	Hypothetical Energy
EI	Energy Intensity
ENR	Egyptian National Railways
EOS	Egyptian Organization for Standardization and Quality Control
EPI	Energy Performance Index
ERA	Electric Utility and Customer Protection Regulatory Agency
ES	Energy Savings
EU	European Union
FDI	Foreign direct investment (FDI)
FEI	Federation of Egyptian Industries
GBC	Green Buildings Certification
GCR	Greater Cairo Region
GDP	Gross Domestic Product
GEF	Global Environment Facility
GFEI	Global Fuel Economy Initiative
GHG	Green House Gases
GSHI	Green Star Hotel Initiative
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (German Technical Cooperation)
HCMLT	Holding Company for Maritime and Land Transport
HDV	Heavy Duty Vehicle
HS	Harmonized Commodity Description and Coding System
IAEA	International Atomic Energy Agency
IDA	Index Decomposition Analysis
IDA	Industrial Development Agency
IEA	International Energy Agency
IEE	Industrial Energy Efficiency
IMC	Industrial Modernization Centre

ISA	Independent Statutory Authority
ISIC	International Standard Industrial Classification
JICA	Japan International Cooperation Agency
kWh	Kilo Watt Hour
LDV	Light Duty Vehicle
LMDI	Log- Mean Divisia Index
LPG	Liquefied Petroleum Gas
LTMC	Long Term Marginal Cost
MENA	Middle East and North Africa
MEPS	Minimum Efficiency Performance Standards
MOE	Ministry of Education
MOED	Ministry of Economic Development
MOF	Ministry of Finance
MOH	Ministry of Health
MOP	Ministry of Petroleum
NAT	National Authority for Tunnels
NBRC	Housing and Building Research Center
NG	Natural Gas
NGO	Non-Governmental Organization
ODEX	Odyssee Energy Efficiency Index
OECD	Organization for Economic Co-operation and Development
OEP	Organization for Energy Planning
PPP	Public Private Partnership
SCE	Supreme Council of Energy
TDA	Tourism Development Authority
toe	Ton Oil Equivalent
TOR	Terms of Reference
TPA	Transport Planning Authority
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNIDO	United Nations Industrial Development
US- DOE	United States - Department of Energy
WCO	World Customs Organization
WEC	World Energy Council

Executive Summary

Environics and ERCC were assigned by UNEP/CoM to carry out the project for Development of an Energy Consumption Indicators System for Egypt. The ultimate objective of this project is "*Increasing demand side energy efficiency in Egypt, without negatively impacting economic development targets*".

The scope of the project, "*The development of a system to measure and evaluate energy use in Egypt and guide data collection and policy making*", contributes to achieving the ultimate objective. Work carried throughout this project for developing this system contributes the following:

- Suggesting an energy accounting framework and system of indicators for the Egyptian economy, based on the best present international practices and research.
- Illustrating the capability of the proposed accounting framework and indicators for tracking energy use changes with time and relating it to changes in the size of the economy, economic structure, or efficiency of energy use, which is not possible with the present metrics.
- Demonstrating the use of the proposed framework and indicators on pre-selected sectors within the Egyptian economy.
- Analyzing the usability of existing data within the proposed accounting framework.
- Proposing an institutional setup through which the accounting framework could be implemented.
- Recommending short term activities to initiate the implementation.

The application of the developed system should make it possible to track changes in energy intensity, identify barriers to the reduction of energy intensity, and help outline programs to reduce Egypt's energy intensity to decouple GDP and energy consumption growth. The system will thus provide the basis for sustained rational planning and decision making.

Focus Sectors

The focus in this project is on pre-specified economic sectors, identified to be the highest final energy consumers in Egypt. These are namely the industrial, transportation, residential, commercial and tourism sectors.

Sub-sectors focused upon within each of the main sectors were identified based on a number of guiding principles including level of energy consumption, and size of activity and its level of growth.

Sector	Selected Sub-Sector
Residential Sector	The whole sector is covered
Commercial Sector	Schools, Hospitals, Retail Malls, Office Buildings and Supermarkets.
Industrial Sector	Iron and steel, Cement, Fertilizers, Aluminum, Wheat Milling and Sugar Production.
Transportation	For passenger transport: intracity public buses, river transport and metro and intercity busses, railway and domestic air transport. For freight transportation: intercity river, railway and trucks.
Tourism	Hotels

Accounting Framework

This study proposes an accounting framework for energy intensity in the Egyptian economy. The applied accounting framework in this study is the Log-Mean Divisia Index (LMDI) method of Index Decomposition Analysis, which is used by other developed countries.

The accounting framework suggests a series of indicators that allow changes in energy use in the economy to be attributed to different causes (referred to as effects) within the economy. It thus improves the understanding of the energy consumption patterns and trends within the economy, necessary to support related decision making.

The relative contributions to energy use from changes in energy intensity, economic activity, and economic structure, are calculated (called the intensity effect, activity effect, and structural effect). Together, these provide a way to understand the energy consumption within a specific sub-sector, a sector or the whole economy. From these effects, the following can also be calculated:

- The Energy Savings (ES), which is the amount of energy saved due to improvements in energy intensity;
- The Energy Performance Index (EPI), a unitless weighted ratio of the energy change; and
- The Hypothetical Energy (EH), energy use if there had been no change in intensity along the duration studied.

The ES and EPI ultimately reflect the result of various changes in societal/technological trends, as well as policies and measures which affect energy consumption at the economy level under study. This level could be a factory (depending on type), group of factories within an industry, industrial sub-sector, total industrial sector, and at the scale of the economy. ES and EPI, in addition to the three effects, are generally referred to as energy indicators.

Data that feed into the accounting framework has been a main constraint to produce numerical values. Data challenges faced include:

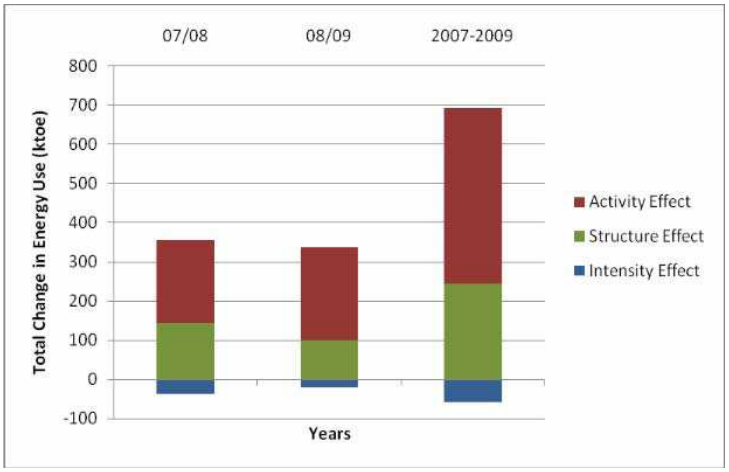
- *Availability:* Data required for calculation of some intensity measures is not generated.
- *Accessibility:* Available data does not consistently cover the time series required for analysis. In other cases, it could be totally inaccessible.
- *Aggregation:* Aggregation hides details needed for adequate analysis.

- *Compatibility:* This is mainly related to data being compiled for the specific purposes of the entity generating, or compiling it. The lack of a Common Economic Structure for data collection within different entities prevents the use of this data for a common purpose.
- *Accuracy:* In some cases, the figures acquired are not realistic and it was clear that the data compiled was not verified.

Contribution of the Proposed Framework to Policy Making

Using the limited data available, the present work provides a case study demonstrating the value that the proposed energy accounting framework can have when applied economy-wide and supported by appropriate data. The full implementation of this accounting framework will require a sustainable cross-sectoral system. This will entail costs in terms of trained personnel, information protocols, costs to collect, compile, process, and analyze data and in some limited cases to generate data not currently generated. However, it represents a necessary basis for targeted policy making.

The results obtained for the residential sector, graphically represented below, are a case in point. They analyze the changes in electricity consumption into the three effects mentioned above, activity, structure, and intensity, explaining the cause for the overall electricity consumption change from 2007-2009. They show a change due to an increase in activity (increase number of consumers, shown in red), a shift in consumers to the higher tiers (shown in green) and a slight reduction in intensity of consumption (consumption/household) in the higher tiers. This reduced intensity is in turn likely due to structure within each tier; however data is not available to allow an analysis within the tiers.



The proposed energy accounting framework provides a tool that:

- Allows energy use changes to be tracked over time.
- Analyzes energy use changes (both on an economy, sectoral and end use scale).
- Forecasts energy demands based on an understanding of dominant trends,
- Highlights areas for efficiency improvement.
- Guides decision makers to policies aimed at the energy sector through better understanding of energy consumption trends nationwide, e.g. energy pricing, moderating peak demand, and encouraging sectors low-energy expansions.

- Evaluates the effect of policies – both energy policies and general policies – on energy demand.
- Predicts the expected effect of policies on energy consumption, whether the policies are directly related to energy or not (e.g., a housing tax, which will provide an incentive for smaller housing, and therefore lower energy use).

Proposed Institutional Setup

The study proposes three necessary conditions in order to develop an institutional setup for the energy accounting framework system:

- ***Assign A National level government Body***
  Given the existing institutional setup for EE, the Supreme Council for Energy and the Energy Efficiency Unit SCE/EE host the accounting framework system as they are the closest to the decision making hub represented by the Cabinet.

- ***Adopt a Bottom-Up Approach***
  In most of the cases, the data is available, disaggregated and obviously compatible when it is considered at the facility level. Accordingly, it is proposed that data is recorded at the facility level through an energy register and is availed to the entity compiling this data in a periodical energy report.

- ***Sectoral Mainstreaming***
  It is proposed that the energy accounting framework be mainstreamed at the sectoral level. The entity to host the system is proposed to be the same recommended by a parallel study carried out by SCE/EE for establishing EE units at the sectoral level.

Sector	Ministry	Proposed Entity
Industry	Ministry of Trade and Industry	IDA
Tourism (Hotels)	Ministry of Tourism	TDA
Transportation	Ministry of Transport	National Institute of Transport
Residential	Ministry of Housing	Housing and Building National Research Center
Commercial	Ministry of Trade and Industry	Internal Trade Development Authority
Schools	Ministry of Education	To be determined by the Ministry
Hospitals	Ministry of Health	To be determined by the Ministry

The main tasks undertaken within the energy accounting framework system are:

- ***EI Indicator Identification***
  EI indicators proposed within the scope of this assignment are based on international adopted EI indicators as well as data availability and format. It is proposed to apply the accounting framework for the indicators at two stages.

The first is for EI where data is generated and compiled, while the second is for data that is neither currently generated and/or compiled.

Sector/Sub sector[1]	Proposed EI indicator for First Stage	Additional EI Indicator for Second Stage
Industry	▪ Annual Energy Consumption (toe)/Unit of Production (ton) ▪ Annual Energy Consumption (toe)/Value Added (LE)	
Residential	▪ Annual Electricity Consumption (kWh)/ Household	▪ Annual Energy consumption (toe) /Household ▪ Annual Energy consumption (toe)/floor area (m^2)
Hotels	▪ Annual and Monthly Energy Consumption (toe)/Guest Night ▪ Annual and Monthly Energy Consumption (toe) /Hotel Room ▪ Energy Consumption (toe)/Value Added (LE)	▪ Annual Energy consumption (toe)/floor area (m^2)
Schools	▪ Annual Electricity consumption (kWh)/Student	▪ Annual Energy consumption (toe)/floor area (m^2) ▪ Annual Energy consumption (toe)//Student
Hospitals	▪ Annual Energy Consumption (toe)/Patient Bed	▪ Annual Energy consumption (toe)/floor area (m^2)
Office Buildings, Supermarkets, Malls	▪ Annual Electricity consumption (kWh)/m^2	▪ Annual Energy consumption (toe)/floor area (m^2)
Transportation	▪ Annual Energy Consumption (toe) /passenger-km ▪ Annual Energy Consumption (toe) /ton-km	

For residential sector, schools, office buildings, supermarkets and malls, it is proposed to calculate energy intensity at the first stage using electricity

[1] Collecting data at the lowest disaggregated level will allow a more accurate calculation and analysis of the indicators. For example in schools, data collected at the school level will allow identifying schools working morning and/or evening shifts.

consumption only, since electricity consumption data is available, while at the second stage the intensity is calculated using the total energy consumption data (electricity and fuel).

It is also proposed that these energy intensities be refined and extended with system development to include additional sectors/sub-sectors or additional measures, e.g. to test the impact of specific policies, as the need arises.

- ***Data Generation and Compilation***
  It is proposed that the data be generated at the lowest disaggregated level possible to prevent errors resulting from matching data from different entities. Compilation of data has to be carried out at the sectoral level.

- ***Data Verification***
  For ensuring the quality and reliability of the indicators, the compiled data for the calculations has to be verified for quality control and assurance by an unbiased entity. CAPMAS is the organization mandated by law to collect data on the national level. Accordingly, it is proposed that the SCE/EE unit mobilizes CAPMAS to play this role in cooperation with the suppliers of energy, namely electricity, natural gas and petroleum products.

- ***Indicators processing and analysis***
  Processing and analysis, according to the proposed accounting framework, requires dedicated and focused personnel with adequate background and whose expertise will be accumulated through practical experience. At its early stages, the implementation of this accounting framework will also benefit from extensive feedback for refinement and adjustment. Accordingly, at the initiation of the system, it is proposed that a centralized system be hosted by SCE. In parallel, actions could be taken to decentralize the indicator system to the sectoral level, incrementally. The transfer from a centralized to a sectoral system could be carried out in phases based on the level of development, capability and specific needs of the specific sector and the Ministry/Agency managing it.

- ***Reporting***
  Reporting will be undertaken by the EE unit to both the Ministry/Agency supervising specific sub-sectors, as well as the SCE. For all sectors to which processing and analysis will be decentralized, the sectoral entity will take over this role.

  An integral part of the reports will be a comparative analysis of the time trends and relationship to drivers of the specific sector/sub-sector energy consumption, as well as a comparison to relevant international indicators or benchmarks. Areas requiring more attention and analysis and/or action should also be identified.

- ***Setting Action Plans***
  Based on the indicators and analysis, action plans with set targets are developed, including policies at the national and sectoral levels. These should be proposed by the EE unit in cooperation with sectoral units to be presented

to the relevant ministries for discussion and adoption. These plans will be discussed and approved by the SCE to ensure consistency, and eventual synergy and that they are in line with the policies developed on the national levels.

Actions to Improve Energy Efficiency

In addition to the energy accounting framework system and the knowledge resulting from it, there are additional necessary pillars on which an Energy Efficiency (EE) system should be based, none of which is well developed in Egypt. These are:

- **Institutional Setup of Energy Management in Egypt**
  As discussed above, the recently established EE unit reporting to the Supreme Council of Energy (SCE) is planned to play the role of the lead EE entity. It is well located within the structure of the Egyptian government, but to date, it is not staffed nor equipped to play this role.

- **Laws and Regulations covering EE**
  An energy efficiency law is required to regulate critical functions such as mandatory audits, mandatory designation of energy managers, reporting, mandatory labeling, and standards. The regulation of energy recording and reporting will represent a critical contribution to the proposed energy accounting system, and will thus need to be put into effect on the short term.

- **EE Strategy**
  Developing a National Energy Efficiency strategy is essential for setting the roadmap for EE in Egypt guiding actions at the national and sectoral levels.

- **EE Policies and Measures**
  The proposed policies are mainly implemented on the sectoral level. However ***Progressive Pricing*** is the major policy proposed to be implemented on the national level, although with specific sectoral applications.

  On the sectoral level, the EE policies are divided into activity-oriented, efficiency-oriented and structure-oriented. Given the current demographic growth and the need for stronger economic development, policies oriented to reduce activity levels need to be avoided for the industrial and tourism sectors. On the other hand, increase in the residential and commercial sectors is inevitable, and given the shortage in hospitals and schools, the increase in their activities is needed. Transportation is the only sector where growth may be controlled based on rational land-use and supply chains.

  Structure-oriented policies, influencing sectors composition for a more effective energy use, are needed in all sectors. For example, it is desirable to shift towards low energy consumption industries/products in the industrial sector, to shift transportation modes to public transportation, railroads and river transport. However, these structure-oriented policies are to be implemented on the longer term based on clearly developed plans.

Efficiency-oriented policies are more likely to achieve results on the short term compared to structural or activity oriented policies. The proposed efficiency oriented policies on the sectoral level include:

- EE standards
- Compulsory Energy labeling
- Mandatory energy audits
- Financial incentives and soft loans for EE
- Public investment in EE projects

Action Plan and Preparatory Activities

A fully developed system covering all sectors of the Egyptian Economy should allow for the calculation of economy-wide indicators as well as those at the highest level of disaggregation practically useful for policy guidance. It is obvious that a multi-year action plan is necessary for such system to be established, developed and settled. The development of this action plan will benefit from the extension of the exercise undertaken during this study, in two respects.

First, the accounting framework proposed through this study would need to be repopulated with data specifically collected and compiled for its purposes. Fortunately, most of the basic data required for the proposed framework is actually ***generated***, but its usability in this respect is lost in the aggregation process. As proposed during the EEU meeting held on June 19th, 2011, priority sector(s)/sub-sector(s) could be selected for the first version of the energy indicators based on data generation and compilation status of the sector/sub-sector and the willingness of the sectoral entity to host and implement the energy accounting system. Second, the development of this action plan will benefit from the extension of this exercise to a larger number of sub-sectors of the selected sectors.

Influencing the process of data aggregation at the sector level will require a closer cooperation with sectoral entities responsible for data collection and compilation based on a clear understanding of the benefits that the proposed accounting framework could provide.

Accordingly, these preparatory activities could yield a number of important results in a relatively short period:

- The development of an action plan based on real implementation experience, although of a limited scope;
- This action plan could represent the necessary basis for a donor financed project reflecting local, rather than donor priorities;
- Increase sectoral awareness of the benefits and workings of the proposed energy accounting framework, and accordingly buy-in and ownership;
- Issue an early version of energy indicators, benefiting from the experience accumulated through the current study but using more compatible data for the year 2012.

The following is the proposed time schedule for the preparatory activities:

	2011	2012				2013	
	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Establishing data collection system within the data generating entities							
Collecting indicators data							
Verifying Data							
Calculating the Indicators by EEU/SCE							
Issuance of first Set of Indicators							
Revisiting the indicators and feeding back to data collection system							
Developing an Action Plan							
Action Plan							

1. Introduction

Energy Intensity in Egypt (total primary energy consumption per 2005 USD of GDP at Purchasing Power Parity), as published by the U.S. Energy Information Administration (EIA), has increased from 186 toe/$ in 1980 to 206 toe/$ in 1984. This was followed by a generally decreasing trend to reach 180 toe/$ in 2000. During the period from 2000-2005, there was a significant increase in the energy intensity to reach 204 toe/$ in 2005. This increase was followed by a rapid decrease in year 2006 and 2007 to reach 177 toe/$ in 2007. The fluctuation in energy intensity during this period 1980-2007 is graphically presented in Figure (1).

Based on data published by the World Energy Council (WEC), Egypt Primary Energy Intensity versus GDP per capita is compared with other MENA countries and OECD countries. It is noticed that most MENA countries with similar GDP to Egypt have higher energy intensity. It is also noticed that in most of the OECD countries energy intensities range from 100 toe/$ to 200 toe/$. Egypt falls at the higher end of this range; however all of these countries have a higher GDP than Egypt. Figure (2) presents a graphical presentation of energy intensity versus GDP for Egypt, and the MENA and OECD countries.

This indicates that Egypt has the potential to increase its GDP per capita, while maintaining, or even decreasing, its primary energy intensity per unit of GDP.

Increasing GDP per capita with a growing population requires an increase in the level of activities in the economy. Decreasing the energy intensity of Egypt, while increasing the level of economic activities, requires that Energy Efficiency (EE) policies be mainstreamed when planning and implementing activities contributing to the national economy. Energy consumption indicators for each of the energy intensive sectors of the Egyptian economy will guide the development of these EE policies.

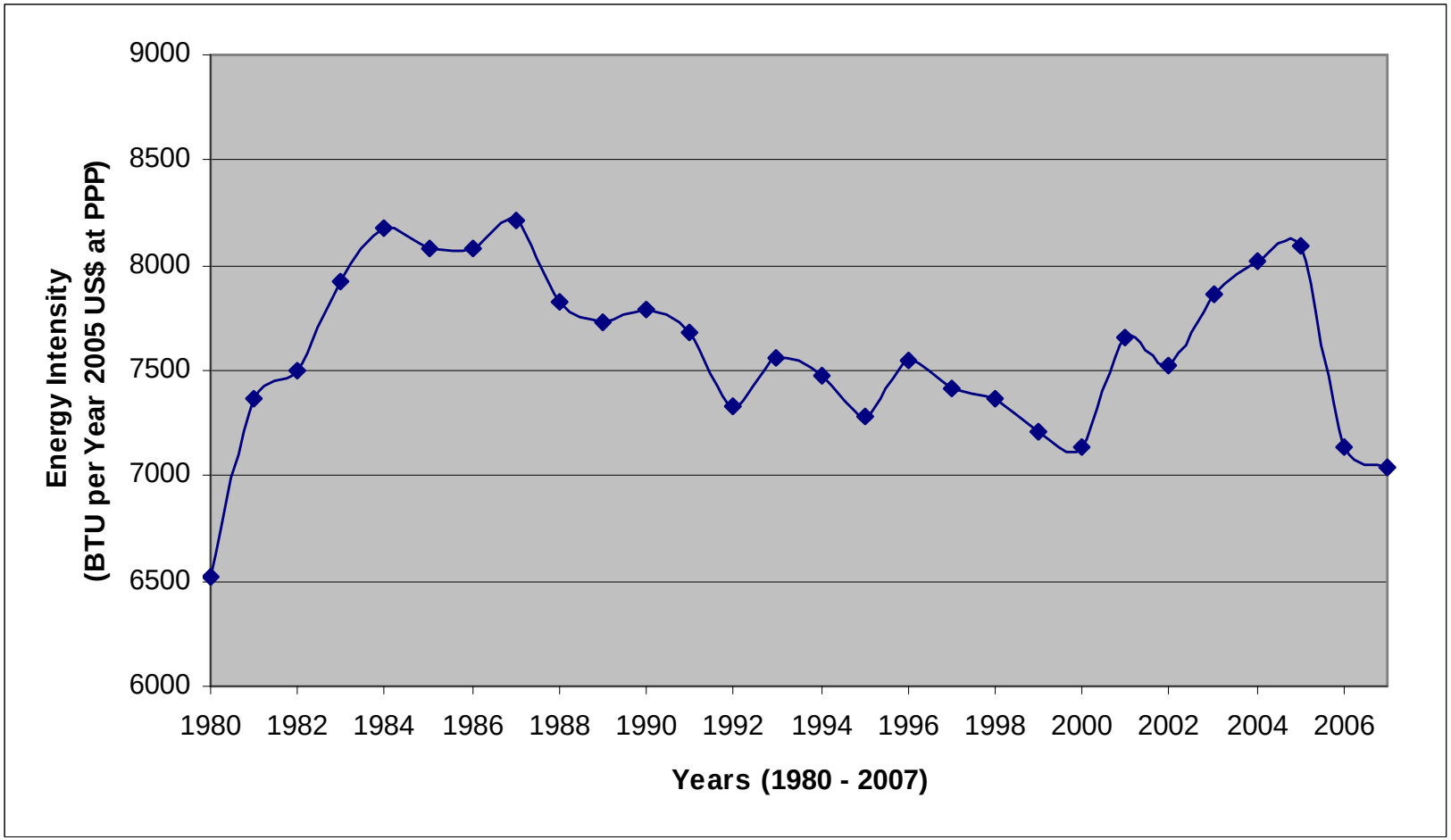


Figure (1): Egypt Energy Intensity - Total Primary Energy Consumption per Dollar of GDP (Btu per Year 2005 U.S. Dollars at PPP)

Source: U.S. Energy Information Administration (EIA)

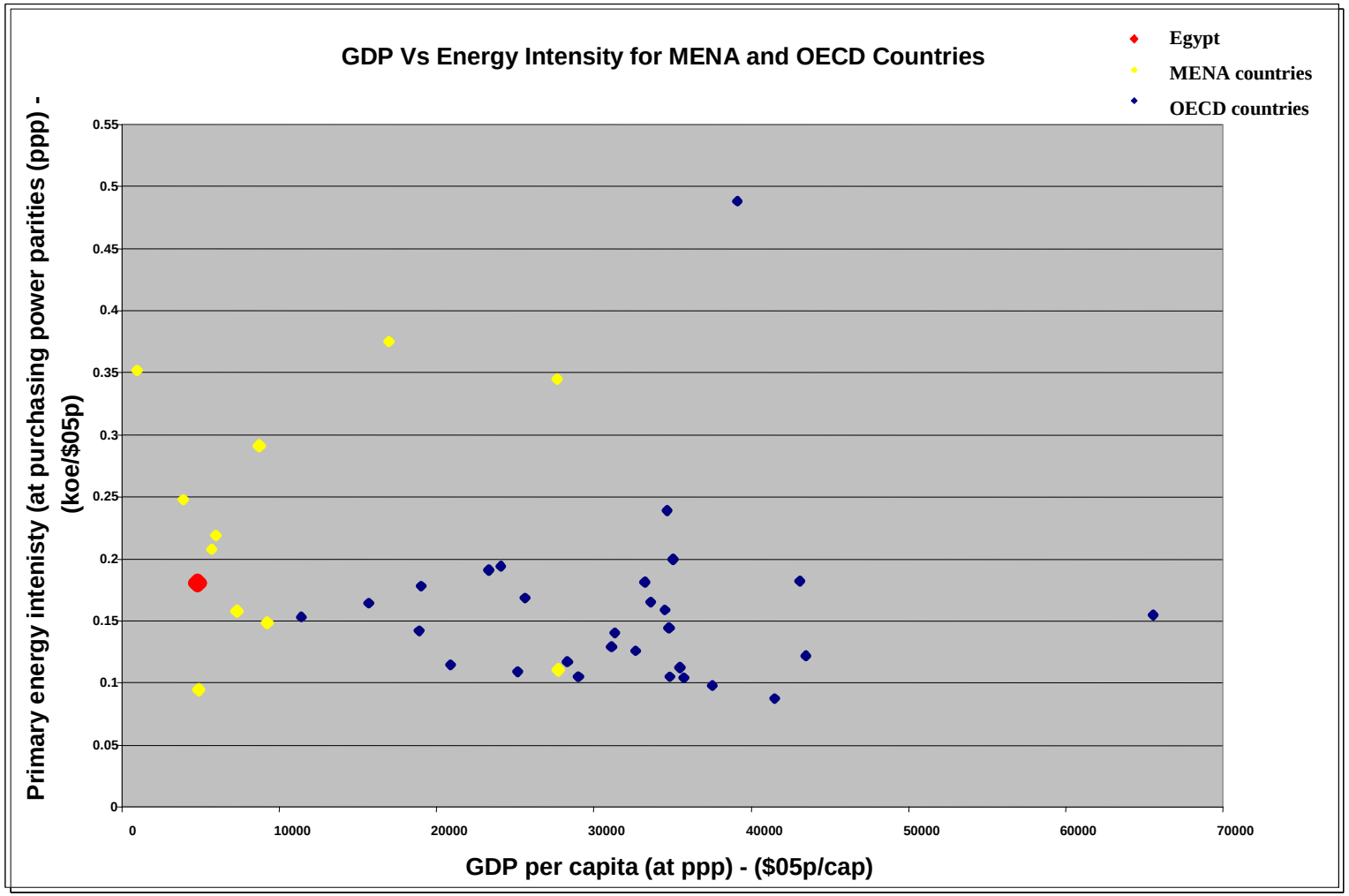


Figure (2): GDP versus Energy Intensity for MENA and OCED Countries

Source: World Energy Council, *www.enerdata.fr*

MENA countries presented in the figures do not include Bahrain, Iraq, Oman, Palestine, Qatar, United Arab Emirates and Libya.

Environics and ERCC were assigned by UNEP/CoM to carry out the project for Development of an Energy Consumption Indicators System for Egypt. The ultimate objective of this project is "*Increasing demand side energy efficiency in Egypt, without negatively impacting economic development targets"*.

The scope of the project, namely "*The development of a system to measure and evaluate energy use in Egypt and guide data collection and policy making"*, contributes to achieving the ultimate objective. The application of this system should make it possible to track changes in energy intensity, identify barriers to the reduction of energy intensity, and help outline programs to reduce Egypt's energy intensity to decouple GDP and energy consumption growth. The system will thus provide the basis for sustained rational planning and decision making.

As per the Terms of Reference (TORs), the focus in this project is on pre-specified economic sectors, identified to be the highest final energy consumers in Egypt. These are namely the industrial, transportation, residential, commercial and tourism sectors.

The final energy consumption in Egypt has increased from about 23.6 MTOE in 1994/1995 to approximately 45 MTOE in 2007/2008. This corresponds to an average annual increase of about 5.5%. However, the final energy consumption mix, presented in Figure (5), is almost the same over the period 1994/1995 –2007/2008, with industrial[1], transport, residential and commercial (including Tourism) being the main energy consumers.

[1] Energy consumption in the industrial sector presented in this section includes also non-energy uses.

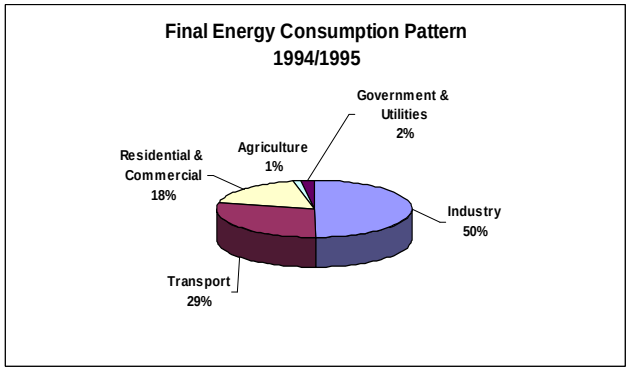


Figure (3): Energy Consumption (1994/1995)
Source: OEP

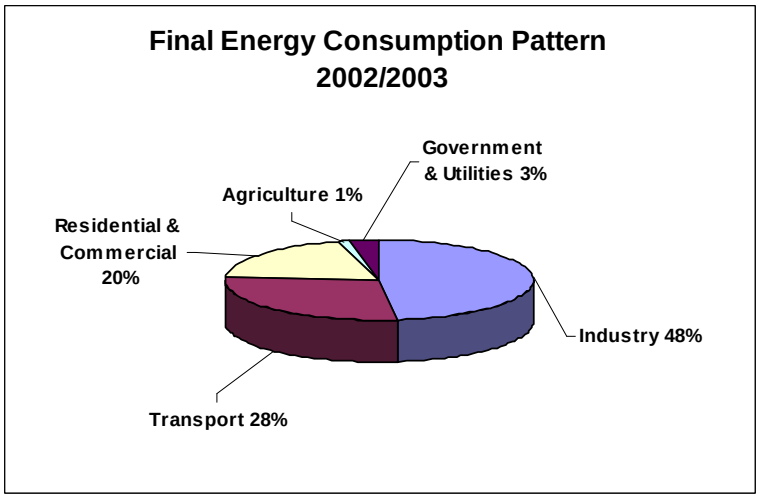


Figure (4): Energy Consumption (2002/2003)
Source: OEP

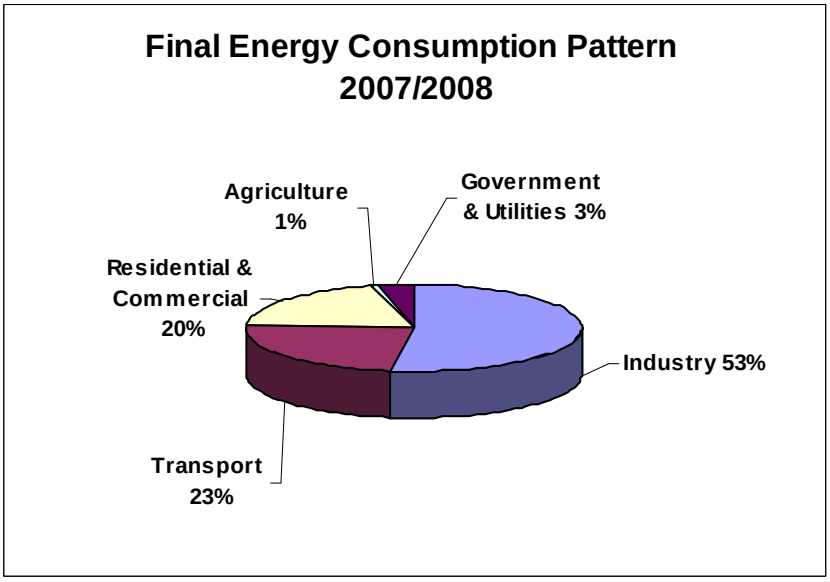


Figure (5): Energy Consumption (2007/2008)
Source: Compiled from EEHC, EGPC and EGAS

2. Selected Sub-Sectors

The Term of Reference (TOR) of the assignment identifies the main energy consuming sectors to be addressed as Industrial, Commercial, Residential, Tourism and Transport. As per the TOR, the Consultant is to break-down each sector into sub-sectors (or levels) to focus upon, as relevant.

Identifying the sub-sectors to be focused upon within each of the main sectors is based on the following criteria:

- Large consumers of energy, and/or
- Activities of growing size, and preferably
- Managed by a specific entity, which will facilitate monitoring the energy consumption pattern and impact of the applied policies.

The selected sub-sectors have been discussed with experts within each sector through individual meetings and finally in the Energy Efficiency Unit of the supreme Energy Council meeting held on July 8th, 2010. During this meeting the proposed sub-sectors and recommendations for including and excluding sub-sectors were discussed. These recommendations are reflected in this section.

2.1 Specifying Sub-sectors

This section presents the justification behind the selection of sub-sectors within each of the five sectors.

- **Residential**
  The residential sector covers all types of residential units. This sector could be divided geographically (governorates and marakez), by income level (occupancy rate and/or appliance ownership), and by nature of the area (rural and urban). However, for each of these divisions, the two factors of high energy consumption and increase in activity apply, and no subdivision can thus be focused upon alone since both factors are related (e.g. change in energy consumption of rural areas could be resulting from urbanization, and change of energy consumption in low income levels could be related to change in income distribution). Thus it is not recommended to focus on any sub-sector within the residential sector. Divisions within the sector based on power consumption are used for analysis of the sector indicators.

- **Commercial**
  The commercial sector is one of the most difficult sectors to define and one with perhaps the widest variation in definition across other countries. In general, the commercial sector includes all spaces used for services, but not for any type of industrial processing. These include administrative office spaces, retail and wholesale spaces, entertainment, service providers, institutional buildings, etc. These may also include hotels and warehouses. The main energy consuming services in the commercial sector are lighting, space conditioning,

water heating, and the operation of equipment (such as computers, ovens in restaurants, etc.).

In Egypt, there is no unified definition of the commercial sector. The Code for Energy Efficiency in Commercial Buildings[2] sets technically detailed EE specifications for a wide range of commercial buildings. The commercial buildings definition in different national surveys, including those carried by OEP, varies. For example, in some surveys, banks and clinics were considered as part of the commercial sector, while in other studies they are not.

The Egyptian Electricity Holding Company (EEHC) definition of commercial buildings covers a wide range of activities, including hotels, utility companies, and workshops.

In all cases, it is clear that the commercial sector can not be dealt with as a single entity due to the variation in the type of activity based on the building type.

The sub-sectors to be focused upon in the commercial sector are selected from those fulfilling the main criteria identified earlier. They are significant consumers of energy, and/or they are growing in number, and they represent a specific category which can be regulated and influenced by policy. These sub-sectors are:

- Schools
- Hospitals
- Retail Malls
- Office buildings (this does not include office spaces in residential buildings)
- Supermarkets

- **Industry**

  According to the Prime Minister Decree 1795/2008 amended by Decrees 446/2009, 1953/2010 and 2130/2010 regulating the selling prices of electricity and NG to the industries, energy intensive industries are identified as:

  - Iron
  - Cement
  - Aluminum
  - Fertilizers
  - Copper
  - Petrochemicals

  Annex (I), includes the Prime Minister Decrees.

  In addition, the Egyptian German Joint Committee of Renewable Energy, Energy Efficiency and Environmental Protection (JCEE), has

[2] Egyptian Code for Energy Efficiency in Buildings - Part Two: Commercial Buildings (ECP 306-2005), National Housing & Building Research Center, Ministry of Housing, Utilities and Urban Development.

identified industries in Egypt with significant potential to reduce fossil fuel and electricity consumption as:

- Chemical and Fertilizer (21%)[3],
- Iron & steel (34%),
- Aluminum industry (10%),
- Paper and pulp industry,
- Cement (11%),
- Building materials industry,
- Glass,
- Ceramics,
- Food industry, closely related to the agricultural sector, and
- The textile industry (31%) is less intensive but is considered because of its importance to Egypt.

Based on initial discussions with industry experts[4] and comparison of energy consumption as well as size and homogeneity of each industry, it was agreed that the focus will be on the identified energy intensive sectors by Prime Minister's Decree 446/2009.

However, during the energy efficiency unit meeting the attendees proposed to exclude the Aluminum, Copper and Petrochemicals industries. This was justified by the fact that there is only one primary Aluminum production plant and one primary Copper production plant in Egypt.

The petrochemicals sector constitutes different industries, each having a different energy consumption pattern and limited number of plants. Due to the diversity of this sector, it was agreed with the EEU to exclude it.

It was also proposed to include less energy intensive industries with high value added, such as the food industry.

Based on the suggestion of the EEU, it was concluded that the focus be on the following high energy intensive sectors:

- Iron
- Cement
- Fertilizers
- Aluminum

Although, there is only one aluminum plant, electricity consumed by this plant presents a substantial amount of the electricity consumed by the industrial sector, and accordingly any energy efficiency measure implemented in the plant will result in considerable electricity savings.

[3] In brackets is the %age of energy intensity above world average according to the cited Energy Committee and the Industrial Modernization Center.

[4] Meetings were held with Dr. Mohamed El Sobki, of the IMC, and Eng. Mohamed El Sherif, of the Ministry of Industry, and Eng. Hisham El Harouny of IDA.

The food industry sector is diverse and can not be represented by a common indicator. Thus, focus will be on two of the food industry sub-sectors. These are:

- Wheat Milling
- Sugar Production

Both products represent strategic goods. Wheat mills are large in number and energy is mainly consumed as electricity used in operating the motors. Thus, the EE measures to be adopted will target specific equipment. As for sugar production, the existing plants are limited, but the industry is growing. Energy intensity in the sugar industry is relatively high compared to other food industries, and the energy uses are diverse.

- **Transportation**

The transport sector is concerned with the transport of freight and people. Transport is a clearly identified sector, relatively more uniform across countries and economies, though the relative importance of its various modes may vary across countries. International transport is almost always excluded since its contribution to both national energy consumption and GDP are difficult to ascertain.

In Egypt, the prominent modes of freight transport are road, and rail. The prominent modes of passenger transport are road, rail, and air. Transport encompasses intracity and intercity transport.

For passenger transport both intracity and intercity transportation are addressed in this work, while for freight transport, only intercity transportation is addressed. Unlike other transportation modes, private cars, taxies, and trucks (others than those operated by the Holding Company for Maritime and Land Transport) are not managed by a single entity that compiles data and facilitates its accessibility. Available data on intercity passenger-km and ton-km for these modes are based on surveys, assumptions and projections carried out by TPA. The last extensive survey was carried out in 1993 for intracity transportation. Currently, a national survey is taking place and expected to be finalized in 2011[5]. Since data for these modes are not generated periodically, indicators will not be calculated for these modes of transportation within the scope of this study.

Intracity city passenger transport includes:

- Public Buses
- River Transport
- Metro

Intercity city passenger transport includes:

- Buses

[5] This information has been confirmed through a meeting with the Transport Planning Authority (TPA).

- Railway
- Domestic Air transport

Intercity freight transport includes:
- River
- Railway
- Trucks, operated by the Holding Company for Maritime and Land Transport.

River transport is not a significant mode of transport in Egypt for either passenger or freight transport (river transport's share is 6% of Egypt total freight transport)[6]. However, river transport is one of the sub-sectors to be focused upon, as it is an energy efficient mode of transport expected to be developing rapidly.

- **Tourism**
  Given the size and importance of tourism to the Egyptian economy, and the existence of a separate entity (Ministry of Tourism) which oversees the sector, tourism has been selected as one of the sectors to focus upon in this project.

  The tourism sector includes hotels, tourist transportation, touristic restaurants, and tourist shopping, entertainment, and cultural activities.

  For the purposes of this study, and using the criteria previously discussed, the focus is on energy consumption in hotels, as it is the sub-sector that best represents the tourism sector.

2.2 Specific Focus

In selecting EI indicators for residential and a number of commercial sub-sectors, the focus is on electric energy consumption. This focus is justified by the following facts:

- Gas consumption is used mostly for cooking and water heating. It does not greatly change seasonally, and does not scale with dwelling size as electricity consumption does.
- Consumption of NG is nearly constant over a period of time, while that of electricity increases[7]. The greatest growth in power demand is on electricity to lighting, running new appliances, as well as for ventilation, air conditioning and heating.
- Natural Gas is used mainly as a substitute for LPG.

6 Reference: JICA, The Development Study on Inland Waterway Transport in the Arab Republic of Egypt (2002), cited in APL and Frost & Sullivan, Egypt. Opportunities and Challenges in Freight Transport and Logistics.

[7] According to EGAS, through personal communication, the average monthly consumption for a household (based on the monthly bills) is 25-30 m^3 and is constant over time.

In addition, EEHC and EGAS adopt different coding systems, and accordingly NG and electricity data can not be matched for each residential and commercial building.

This concept applies for the residential sector, as well as identified sub-sectors of the commercial sector (office buildings, malls, supermarkets and schools). Although, there are recent initiatives for using NG in cooling in commercial building, this application is not yet widespread in Egypt.

As for hospitals and hotels, NG/gas oil are a major source of energy. Accordingly, they will be taken into consideration in the energy calculations.

Although some hotels generate their own power, as they are located in areas not yet connected to the national grid (e.g. Southern Red Sea Governorate), the focus of this study will be on hotels that receive power through the electric grid due to data availability.

In the EEU meeting held on June 19th, 2011, discussions took place regarding inclusion of LPG in the residential sector EI indicators, as LPG presents a substantial amount of energy consumption in the residential sector[8]. Not including LPG was justified by the lack of any entity that generates data on LPG consumption per household. Unlike NG and electricity, no meters are installed for measuring LPG consumption in households.

[8] A study carried out by OEP in 1996, indicated, based on a sample survey on households in Port Said governorates, that LPG presents 42% of the energy consumed by households.
However, with the increase of households connected to the electricity grid and the increase in electric applications in the houses, it is expected that this percentage has decreased significantly.

3. Proposed Energy Intensity Indicators

Energy Intensity indicators proposed for the national economy are guided by two factors:

- **International Energy Intensities**
  The main objectives of the EI indicators are to measure intensity of an activity over a period of time, to track the overall performance in time, and to compare it with international benchmarks. Using internationally adopted energy intensities as guidance will assist in proposing activity measures. These measures could be used in assessing the EI of different activities in the Egyptian economy relative to international figures.

- **Data Availability and Format**
  For most sub-sectors, different activity measures are used to measure the energy intensity for a single activity. In proposing the national activity measures, data generated locally and its format are used as guidance to select from adopted international EI indicators.

3.1 International EI Indicators

National energy efficiency measurement and monitoring became an important component of energy strategy in many countries, in the aftermath of the 1973 world oil crisis. With substantial increases in world oil prices, many countries recognized the need to understand how effectively energy was being consumed in their economies and to increase energy efficiency. To serve these purposes, appropriate energy efficiency indicators were developed and applied so that any efficiency changes that took place could be quantitatively expressed. These indicators were also used in cross-country comparisons to explain differences in energy performance between countries and for international benchmarking.

3.1.1 Economic Structure for Energy Analysis

Internationally, several countries have undertaken the exercise of developing national energy indicators, and have therefore mapped their economic structure for this purpose.

Although there are similarities between hierarchies, there are also considerable differences. Annex II shows the hierarchies for Canada, New Zealand, the United States, Australia, and the hierarchy used by the IEA, respectively.

Generally speaking, most countries have at least four sectors in common, though the constituents and structures of the sectors may vary. Those four sectors are: residential, commercial, industrial, and transport.

Additional sectors included in some hierarchies are: power generation, agriculture & fishery, utilities, mining and extractive industries (that are not specified elsewhere in industrial sector). Some countries include a service

sector which covers public utilities and government services. Some include these under the commercial sector.

It is clear that there is no rigid or unique sectoral economic structure for energy consumption, which allows flexibility in developing the national structure based on the existing economic structure of the country. For example, where mining substantially contributes to the economy, it may not be realistic to include it in the industrial sector as the value addition is not based on processing but rather extraction.

3.1.2 Energy Accounting Systems

Energy accounting systems refer to the entire system for measuring, recording, calculating, and analyzing a country's energy consumption. This is in contrast to an accounting framework[9] which describes the analytical methods used for calculation of indicators. Therefore, two different accounting systems may use the same accounting framework, but differ in that they define and measure different variable, sectors, sub-sectors, measures of activity, etc.

There exists a wide variation among the energy accounting systems and frameworks used by different countries. Variations exist among systems on the level of sector desegregation. As an example, the Canadian indicator system has more than 100 sub-sectors. Not unexpectedly, the number of sectors is fewer for IEA and EU-ODEX since these are multi-country initiatives and data availability is a limitation.

The sub-sectors in transport and industry are similar across countries but depend on the prevalence of industries and transport modes within each country (e.g. availability of inland water transport, or of a metals refining industry).

3.1.3 Measures of Energy Use and Activity

International adopted indicators were used as guidance in developing the national indicators. Annex (III) includes a summary of the proposed energy consumption indicators proposed in the "Energy Indicators for Sustainable Development Guidelines and Methodologies" issued by the International Atomic Energy Agency (IAEA) in 2005.[10]

For each EI indicator, the energy consumption and activity measures vary according to the activity being measured. The activity measure could be physical or monetary.

[9] The Accounting Framework adopted in the calculation of the indicators is presented in Section 4 of this Report.

[10] This publication is the product of an international initiative to define a set of Energy Indicators for Sustainable Development (EISD) and corresponding methodologies and guidelines. The successful completion of this work was led by the International Atomic Energy Agency (IAEA) in cooperation with the United Nations Department of Economic and Social Affairs (UNDESA), the International Energy Agency (IEA), Eurostat and the European Environment Agency (EEA).

The energy consumption measure is uniform as it measures all types of energy consumed to carry out an activity in a specified period. Energy consumption units adopted by each country vary (e.g. ton oil equivalent (TOE), British Thermal Units (BTU), Joules).

On the other hand, the measures of activity in some sectors are internationally uniform, while in others there are variations between countries. The most uniform sectors are the transport and industrial sectors. Transport activity is measured by the mass of goods or number of passengers transported times multiplied by the distance for which they are transported (ton-kilometers or passenger-kilometres), whereas industrial activity is measured by physical unit of production, volume, mass, etc. These measures of activity are used almost universally across national energy accounting systems.

For sectors such as residential and commercial, it is common to use floor area as a measure of activity. However, individual household is also a used measure of activity since ultimately a household is the unit of housing for a family, which is the basic unit of society. The tracking of both household energy consumption and residential unit size allows the changes in energy consumption to be attributed to. For example, changes in efficiency of energy use, changes in occupancy, or changes in residential unit area and space conditioning. The ability to use different measures of activity is limited by the availability of data.

For hotels, schools and hospitals, in some countries, such as the US, Canada, New Zealand and the UK, data are available with reference to activity measures (guest nights in hotels, students in schools, hospital beds in hospitals). However, the data is not always complete and is sometimes part of independent work undertaken by industry groups rather than as part of a national plan. In many cases, comparison must be tightly controlled, particularly with respect to weather conditions, where large part of the energy consumption is utilized for space conditioning.

The activity measure captures both the service provided by the activity (e.g. household, student, hospital bed), as well as the level of service. For example, energy consumption per student is expected to be higher in private schools than in government schools, reflecting the level of service provided.

Monetary activity measures are uniform and represent the value added for each activity. The value added could be in US$ at Purchasing Power Parity (PPP) or in local currency.

3.2 Data Availability and Format

From the adopted international activity measures discussed above, the data generated and compiled in Egypt will be used to guide the selection of the national activity measures.

In identifying data availability and format, meetings were held with different entities. These are:

- Central Agency for Public Mobilization and Statistics (CAPMAS)
- Information and Decision Support Center (IDSC)
- Egyptian Electricity Holding Company (EEHC)
- Tourism Development Agency (TDA)
- Industrial Development Agency (IDA)
- Industrial Modernization Center (IMC)
- River Transport Authority
- Cairo Transport Authority (CTA)
- Ministry of Economic Development (MoED)
- Transport Planning Authority (TPA)
- Holding Company for Maritime and Land Transportation (HCMLT)
- UNDP/GEF Energy Efficiency Improvement and Greenhouse Gas Reduction Project)
- National Institute of Housing and Construction Research (NIHCR)

And consultations were carried out with EGAS and EGPC.

Based on the meetings with these entities, available data generated was identified and, accordingly official requests were sent to these entities to acquire the data. Annex (IV) includes the official requests and the data lists requested from each entity.

Energy Consumption Data

Consumed energy is in the form of electricity, petroleum products and natural gas. Data on Electricity consumption is generated by the Ministry of Electricity & Energy (MOEE), through the Egyptian Electricity Holding Company (EEHC)[11], while data on Petroleum Products and Natural Gas are generated by the Ministry of Petroleum (MOP) through the Egyptian General Petroleum Corporation (EGPC) and the Egyptian Natural Gas Holding Company (EGAS), respectively.

Electricity consumption data is generated on monthly basis per user, and is based on the electricity meter installed at each user. Natural Gas data is generated on monthly basis for each sector. Annex V includes the electricity and NG categories.

Petroleum products consumption data is generated on annual basis. The scheme adopted by the MOP in tracking fuel consumption is carried out through the distribution companies and their agents. Each agent reports the consumed fuel by type and recipient. The reported data is compiled, coded and computerized at EGPC.

In addition to energy suppliers (MOP & MOEE), energy consumption for specific sub sectors is generally generated by consuming entities. For example, the Egyptian National Railways (ENR) generates data for rail transport on a monthly basis. Other entities, such as the Central Agency for Public Mobilization and Statistics (CAPMAS), publish data compiled from the generating entities.

[11] EEHC has confirmed that they can provide the electricity consumption data for the last couple of years.

The selected energy unit to be used in the indicators is ton oil equivalent (toe), as it was found to be the most commonly used and accordingly, will allow the comparison of national intensity indicators with international ones.

Physical Data

For each sector and sub-sector, associated activity could be measured. Unlike the energy consumption data, the data measuring the activity is generated by different entities based on the nature of the activity. In the transportation sector, the physical data is passenger-km for passengers or ton-km for goods. In other sectors the data could vary, for example: in the residential sector, the generated physical data could be floor area or households, and in the industrial sector it could be production (in tons) or value of the product (i.e. sales).

Monetary Data

The Ministry of Economic Development (MOED), publishes regularly Egypt's Gross Domestic Product (GDP). It is the single entity mandated to calculate and publish such information.

The source of information is other national entities:

1- Information collected directly from other ministries.
2- Information/date periodically generated by CAPMAS. Since the general census is performed only once every ten years, some of this information is based on extrapolations of sample surveys and estimates. Some are also partial, e.g., manufacturing data only considers establishments having more than 15 employees[12].
3- Budgetary information from the Ministry of Finance. Information extracted from the budget includes consumption, investment, government wages, taxes subsides, etc.
4- Central bank reports, especially those concerning international trade.

The Ministry of Economic Development produces two types of outputs regularly. The first are monitoring reports (yearly, quarterly, every five years). As these are produced shortly after the monitoring period ends, they include some estimates, and could hold some differences with the other output which is the yearly national accounts.

Yearly national accounts are produced in dedicated reports and include the Gross Domestic Product (GDP) at the aggregate level using income and expense information. Value added is defined as the difference, including both returns to labor (wages) and to capital (profits).

In general, information available at the MOED is not disaggregated enough for calculation of monetary based indicators at the sub-sector level, as it stops at the ISIC4 2-digit level. As for CAPMAS, it also follows the ISIC 4. For sectors like the industrial sector and tourism, CAPMAS publishes value added data at 4-digits level. In the industrial sector, published monetary data includes:

[12] Given the choice of sub-sectors in this study, this limitation is irrelevant.

- Wages, benefits and insurances
- Production Requirement cost and depreciation
- Production value at selling price
- Total Production Cost
- Net value added
- Value of Fixed Assets

While, available tourism data includes:
- Wages, benefits and insurances
- Revenues
- Value of commodity and service requisites, transfers expenses
- Value of fixed assets

Accordingly, CAPMAS monetary data could be used in the calculations of the indicator. The GDP value used in the indictor will be in Egyptian currency, and could be converted to US$ for comparison with international indicators.

3.3 Proposed Sectoral Energy Intensity Indicators

Based on the two guiding factors discussed above, namely, international energy intensity indicators and data availability and format, the EI indicators for selected sub-sectors of the Egyptian economy are proposed.

The main energy consumption drivers, the identified and requested data by the consultancy team (see Annex IV), as well as the received data are presented in this section.

3.3.1 Residential Sector

The main energy drivers for energy services in the residential sector are the number of households, which is a function in population, as well as the floor area per housing unit and the appliance ownership, both being indicators of living standards. The increase in connectivity of the population/households to electricity is not considered a future driver in Egypt, as most of the population/households are already connected. According to CAPMAS 2006 census, 99.1 % of the households and 98.4% of the population are connected to electric energy.

The population growth leads to the increase in the number of households, and total floor area. According to CAPMAS population census of 1996 and 2006, the total population has increased by 18.33% in the 10 year period and the number of housing units has increased by 36% during the same period. The unbalanced increase in the population and household results from a number of factors, including:

- The decrease in the number of persons per household. The average number of persons per household has decreased from 4.7 in 1996 to 4.2 in 2006. This decrease could be a result of changes in socioeconomic behavior, where extended family members are moving into separate housing units, as well as availability of housing units, leading to a relaxation of the housing-unit constraint.

- Population shift from rural to urban areas with lower household population density. The average number of persons per household, as per 2006 census, in rural areas is 4.4, while in urban areas is 3.9.

It is also estimated that the population growth rate during the period from 2007-2022 will be 37%, while the growth in the number of households will be 40%. Moreover, the movement of households into housing units with larger floor area will lead to an increase in energy consumption per household.

The factors that best reflect the energy consumption in the residential sector are the floor area and the household. The data on the floor area corresponding to the units consuming energy is not compiled. Accordingly, the household will be used as the indicator activity measure. This will compound the impacts of both the housing unit floor area and the appliances ownership on the energy consumption. Detailed surveys could be carried out in the future for specifying their impacts.
The initially proposed indicator is electricity consumption per household averaged by markaz/district (as the latter reflects a reasonably homogeneous living standard). The indicator could be subdivided by income level; where occupancy rate per room in each Markaz/District used as a proxy. However, based on further discussions with the EEU, it was agreed that it will be more beneficial is to analyze the indicators per electricity tariff level (tier), as this will assist in analyzing policies related to progressive pricing which is already adopted and is continuously adjusted. Also the per-tier EI will allow analysis based on income level, as income level is related to the electricity tier. Accordingly, the proposed EI is electricity consumption for each electricity tier per household.

Annual Electricity Consumption (kWh) per tier / Number of Households

As per MOED[13], monetary data for the residential sector are calculated as the estimated rental value of housing units. This is considered to be relevant whether the unit is actually rented or owned by the tenant. The discrepancy between different rental systems (old controlled rent versus new market rent) infuses an institutional inconsistency into rental value estimates of otherwise similar units.

It is the opinion of the study team and the EEU that indicators taking this value into account will not add to the value of the study output.

Sources of Data
The sources of Data for the indicator are:

[13] Interview with Mr. Mahmoud Arafa, supervising the department of National Accounts in the Ministry.

- Egyptian Electricity Holding Company (EEHC)

Identified Data

Electricity consumption as well as the corresponding number of households is available at the Egyptian Electricity Holding Company (EEHC) per Markaz/district, as well as per electricity tier.

3.3.2 Tourism Sector

The main drivers of energy consumption in this sector are; the increase in external and internal tourism which led to an increase in the number of hotels as well as the occupancy rate per hotel; and, the competition among hotels (other than price competition) which led, to an increase in amenities.

The number of hotels in Egypt has increased by 32% from 2000 to 2008, and the number of hotel rooms has increased by 86% during the same period[14]. This indicates that the size of the average hotel has substantially increased.

The size of the hotel is reflected by the number of hotel rooms, while the occupancy rate is reflected by the guest nights. The size of the hotel is not expected to change throughout the year, however the occupancy rate will. Therefore, it is proposed to calculate the indicator on monthly basis per hotel.

The proposed EI for hotels is *annual and monthly energy consumption per guest night, as well as per hotel room.*

Annual and Monthly Energy Consumption per Hotel (toe) / Guest Night

Annual and Monthly Energy Consumption per Hotel (toe) / Hotel Room

Annual Energy Consumption per star category (toe) / Value added (LE)

Intensities for energy consumption per guest night and hotel room will be calculated for each hotel with electricity consumption above 500 KW, aggregated for all the identified hotels and segregated by hotel size.

The energy consumption per value added is proposed to be calculated per star category for all hotels.

Source of Data

The sources of data for the indicators are:

[14] Source: CAPMAS

- UNDP/GEF Energy Efficiency Improvement and Greenhouse Gas Reduction Project.
- Tourism Development Authority (TDA)
- Egyptian Natural Gas Holding Company (EGAS)
- CAPMAS

Identified Data

Annual data for electricity consumers above 500 KW is available from the database at UNDP/GEF Energy Efficiency Improvement and Greenhouse Gas Reduction Project.

Data on fuel consumption is not available at the TDA, however, it has been agreed[15] that the list of hotels above 500 kW be sent to the TDA and the TDA will compile the data on fuel consumption from the hotels through the tourism chambers. It was also agreed that the TDA identifies the types of energy used in each hotel (electricity, NG, gas oil). The hotels using gas oil could be excluded from the list and data on NG consumption in each of the hotels using NG be obtained from EGAS. Alternatively, the list of hotels could be shared with EGAS to identify those connected and provide their consumption[16]. TDA could only address this sub-group to identify those using gas oil.

In addition, it was planned that data regarding guest nights and hotel rooms per hotel will also be obtained from the tourism chambers, through the TDA.

For monetary data, information from CAPMAS is available for both private and state owned enterprises for the years 2004 to 2008 together with number of hotel rooms and guest nights categorized by tourist class (star number). The following is the monetary data available at CAPMAS, categorized by star rating (tourist class):

- Wages, benefits and insurances
- Revenues
- Value of commodity and service requisites, transfers expenses
- Value of fixed assets

The value added would be calculated from the above data.

The energy consumption data in CAPMAS is available as monetary data (in LE), and accordingly will not reflect the actual consumption in terms of energy units.

The following method is proposed for calculating the energy consumption per value added:

- The ratio of energy consumption per room and per guest night for each star rating will be calculated from data obtained from UNDP/GEF project and TDA.
- The ratio of value added per room and per guest night for each star rating will be calculated from CAPMAS data.

[15] Based on a meeting with Mr. Gamal Zaghloul of the Tourism Development Authority
[16] Contact with EGAS confirmed the possibility of providing this information.

- Using both ratios for the same start rating, the energy consumption per value added will be calculated.

The limitation of the proposed method of calculation is that energy consumption per room and per guest night is to be calculated for hotels with electric energy above 500 KW. This group of hotels will not address all star categories, as the one and two star hotels are unexpected to be within this group. Moreover, this group is expected to include all five star hotels and only a certain percentage of four and three star hotels. Thus the accuracy of the energy consumption per room and per guest night ratio is expected to be high for five star hotels and to decrease with the star categories.

Obtained Data

Annual data for electricity consumers above 500 KW is available at the UNDP/GEF Energy Efficiency Improvement and Greenhouse Gas Reduction Project database.

EGAS provided Natural gas consumption data for hotels with electric power above 500 KW.

TDA provided Guest Nights data for hotels in the different governorates. However, only few of this data matched with the list of Hotels with electric power above 500 KW.

The identified published data of CAPMAS is available, but was not used in the calculation of the indicators per value added (LE). This was due to the limited number of Hotels where energy consumption and Guest Nights were available.

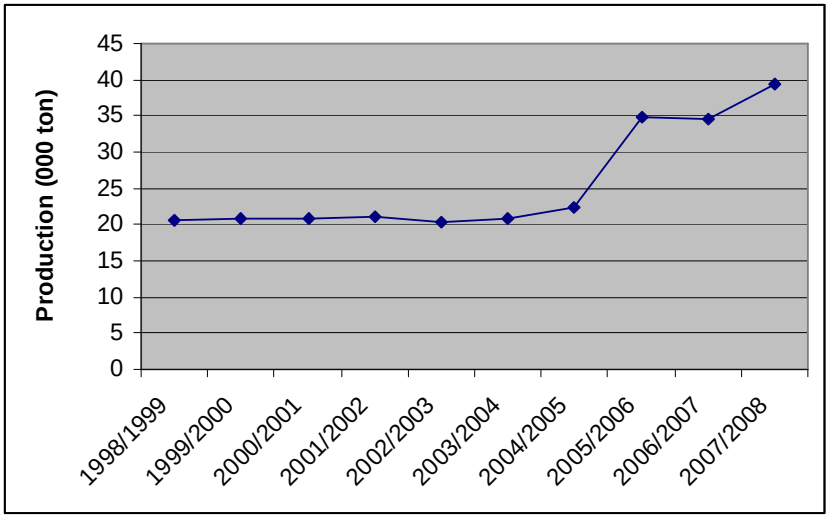
3.3.3 Industrial Sector

The industrial sector is one of the main sectors in the Egyptian economy. The contribution of the industrial sector to the GDP was 16.2% in 2008/2009[17]. The energy consumption drivers of the industrial sector are; the industrial investments continuous growth; the change in the industry mix towards higher energy intensity industries; and, the replacement of the capital stock.

The industrial sector has been continuously growing during the last decades, and the industry mix is changing. The sector growth is driven by the economic development policy since industry is considered a main provider of employment opportunities. It is also driven by the need to diversify to non-oil exports, which is fulfilled by increasing industrial exports.

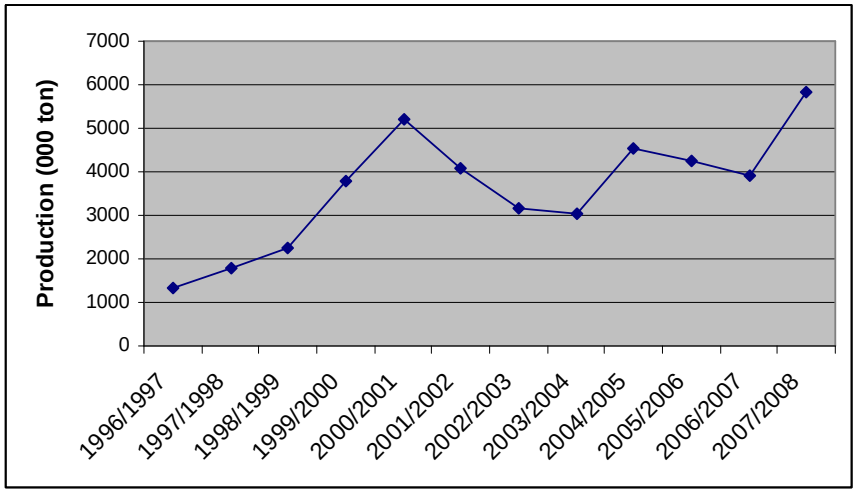
Recently, energy intensive industries such as cement, iron and steel, and fertilizers have been increasing, compared to other less energy intensive industries such as textiles. This increase is resulting from establishing new plants or increasing the production capacity of exiting ones.

[17] Source: Follow-up report on Economic and Social Development Plan for year 2008/2009, Ministry of Economic Development.



Source: CAPMAS

Figure (6): Development of Cement Production in Egypt



Source: CAPMAS

Figure (7): Development of Steel Bars Production in Egypt

In addition, the replacement of old industrial equipment in existing establishments and phasing out of old plants are expected to increase the energy efficiency as new technologies are more energy efficient.

Other important drivers are the economic incentives offered by the government for industrial cities, and exports subsidies also given mostly to industrial exporters.

The proposed indicator for each industrial establishment within the identified sectors is annual energy consumption per unit of production.

Annual Energy Consumption in Industrial Establishment (toe)/ Unit of Production (ton)

Annual Energy Consumption in Industrial Sub-sector (toe)/ Value added (LE)

Source of Data

The sources of data for the indicator are:
- Industrial Development Agency (IDA)
- Ministry of Economic Development
- CAPMAS

The Industrial Development Agency (IDA) compiles data on actual production (ton), as well as energy consumption per energy type (e.g. NG, gas oil, electricity). This data is available for each industrial establishment, and is obtained by IDA directly from the establishments.

The IDA adopts the Harmonized Commodity Description and Coding System (HS)[18], for categorization. It is similar to the system adopted by the customs authority, but differs than the ISIC categorization system adopted by the Ministry of Economic development and CAPMAS.

CAPMAS compiles annual data on production for the different industrial sectors disaggregated to the ISIC 4-6 digits level. This includes production value, electricity consumption, fuel consumption, and value added (all in monetary units- LE). Recently, energy consumption data started to be compiled, from each plant, in energy units per type of energy[19]. Moreover, CAPMAS published data on energy consumption of selected industrial sectors covering specific years.

In addition, the information on both industrial production (in physical units) and energy consumption per industrial establishment is available in IDA starting from 2008 onwards.

For the energy consumption per value added, the indicator will not reflect the benefit to the economy, as the value added for each sub-sector does not take

[18] The Harmonized Commodity Description and Coding System (HS) forms the basis of the Customs Tariff. The HS was developed and is maintained by the World Customs Organization (WCO), an independent intergovernmental organization with over 160 member countries, based in Brussels, Belgium.

[19] It was not confirmed whether the results of these surveys are computerized or are kept in paper format.

energy subsidies into consideration. This is clarified by a study carried out by the Egyptian Center for Economic Studies (ECES)[20], which indicates that the reduction of fuel subsidies will lead to an increase in production cost of cement, iron and steel and fertilizers industries, by 11%, 5% and 4% respectively.

Received Data

Data obtained from the IDA included energy intensities for different industries. However, it did not include the raw data that would allow applying the accounting framework.

In addition, no data has been obtained from CAPMAS on the Industrial Sector.

3.3.4 Commercial Sector

The indicators for each of the five selected sub-sectors will vary, based on the energy consumption drivers for each sub-sector.

Schools

The population growth, as well as the need to increase the number of students enrolled in the education system (percentage of students in the age of school who are not enrolled in schools is 9% according to the 2006 census) and to reduce class density are the main drivers for energy consumption in schools.

The number of schools, classes and students has increased during the period from 2004/2005 to 2008/2009, by 12%, 3% and 4%, respectively. This indicates that the size of the average school has decreased.

It was initially proposed to represent the energy consumption intensity in schools as both the energy consumption per number of classes as well as per number of students. However, based on discussions with experts, it was concluded that having an indicator per pupil is sufficient. The class density would be used for analysis of the indicator.

Annual Electricity Consumption (kWh) in Schools per Governorate/ Student

Source of Data

The sources of data for the indicator are:

- Egyptian Electricity Holding Company (EEHC)
- Ministry of Education

[20] ECES, The Impact of Reducing Energy Subsidies on Energy Intensive Industry in Egypt, Working Paper No. 124, May 2007.

Identified Data

Electricity data is available at EEHC covering public and private schools separately[21].

Data on number of classes and students in public and private schools, distributed by governorate, is available at the Ministry of Education[22]. This data is only available at the governorate level, and accordingly, does not allow identifying number of shifts in each school and the timing (i.e. morning/evening shifts).

For monetary purposes, national accounts provide educational activity data that differs according to whether this activity is for or not-for profit. The value added is composed as returns to labor and to capital. Accordingly, it is calculated for the former based on actual exhaustive data or a sample survey to be extrapolated to the population. In both cases, the data is provided by CAPMAS. Extrapolation is based on the number of schools, and classes, in the population. For non-profit schools, value added is limited to labor wages.

In both cases, it is the opinion of the study team that figures included in the national accounts do not reflect the value of education to society. Thus, basing indicators on financial values will not have relevant implications on potential policies or interventions. Accordingly, energy indicators based on monetary value of the activity will not be developed.

Received Data

Electricity consumption for public and private schools per govevernorate was obtained from the EEHC.

Number of pupils and classes is published by the Ministry of Education.

Hospitals

The main drivers in hospitals are; the increase in population; the need to improve health services; and, utilization of high energy consuming medical equipments in Hospitals. Annex VI presents the number of hospital beds per 1000 person and life expectancy at birth in different MENA and OECD countries in 2003. There is a positive correlation between both factors, as one increases it pushes the other towards increasing.

The number of patient (hospital) beds will be used as the activity data for the indicator.

Annual Energy Consumption in Hospital (toe)/Patient Bed

[21] Some of the electricity distribution companies have the private and public schools codes separated, focus is on those.

[22]Data on number of classes and students in public and private schools distributed by governorate is published on the Ministry of Education website: http://services.moe.gov.eg/egov_statbook.html

The focus is on hospitals with electric capacity above 500 KW, and the indicator was proposed to be calculated for each hospital separately, and aggregated according to the affiliation of the hospital (public/private).

The sources of data for the indicator are:
- UNDP/GEF Energy Efficiency Improvement and Greenhouse Gas Reduction Project.
- Ministry of Health

Identified data

Electricity consumption data for hospitals will be obtained from the database of the UNDP/GEF Energy Efficiency Improvement and Greenhouse Gas Reduction Project, for consumers above 500 KW.

The number of patient beds in each hospital with electric capacity above 500 KW is available at the Ministry of Health. The Ministry was also requested to identify the types of energy used in each hospital (electricity, NG, gas oil)[23]. It was planned to exclude hospitals using gas oil from the list, while data on NG consumption in each of the hospitals using NG be obtained from the EGAS. In addition, the list of hospitals was shared with EGAS to identify those connected to the NG network and provide their consumption.

National accounts handle the value added for hospitals the same way as those for schools. The extrapolation of a sample survey is based on the number of beds[24]. Similarly, potential policy implications of each indicator can not be based on such financial values. Accordingly, these indicators will not be developed.

Received Data

Electricity consumption data for hospitals above 500 KW was obtained from the database of the UNDP/GEF Energy Efficiency Improvement and Greenhouse Gas Reduction Project. NG consumption for Hospitals in that list was obtained from EGAS.

Patient beds in most of these hospitals were obtained from published data by the Ministry of Health.

Office Buildings

The trend of dedicated office buildings is nationally increasing. The Egyptian economy structure is changing towards services, where requirements for office buildings are increasing. Intensive use of modern office equipment and

[23] No interviews were held with representatives from the Ministry of Health, but the availability of patient beds within each Hospital was confirmed to be available at the Ministry. Availability of data regarding types of energy used per hospital was not confirmed before requesting it.

[24] For other health units, such as clinics not including beds, the sample is extrapolated based on the health units in the population. In all cases, the representativeness of the sample is crucial.

information and communication technologies is also increasing the energy consumption of this sector

The floor area of the buildings is proposed to be used as an activity data for the indicator.

Electricity consumption (Kwh) per office building/floor Area (m^2)

The focus will be on office buildings with electric capacity above 500 KW. The indicator will be calculated for each building separately, and aggregated according to the affiliation of the building (public/private).

The sources of data for the indicator are:
- UNDP/GEF Energy Efficiency Improvement and Greenhouse Gas Reduction Project.
- Municipalities

Identified Data
Electricity consumption data for office buildings (for consumers above 500 KW) is available on the UNDP/GEF Energy Efficiency Improvement and Greenhouse Gas Reduction Project database. It was planned to acquire the floor area data for each office building from the municipalities.

The value added for office buildings is based on the returns, mainly rental value from which expenses are deducted. This is based on CAPMAS administered surveys. When these surveys are based on samples, the rentals are extrapolated for the whole population based on footage. It is noted that values added for office buildings is not related to the type of service provided in the rented space.

Received Data
Electricity consumption data for office buildings above 500 KW was obtained from the UNDP/GEF Energy Efficiency Improvement and Greenhouse Gas Reduction Project database.

Based on the Clients decision, the municipalities were not requested for area data, since it was considered rather complicated to request data from different municipalities within different governorates. Accordingly, area data was obtained through satellite images, published studies and testament of personnel.

Supermarkets
Chain supermarkets are increasing in Egypt. The energy consumption in these supermarkets increases with increase in size.

Annual Electricity consumption (kWh) per supermarket / Floor Area (m^2)

The focus is on supermarkets in Greater Cairo Region (GCR).

The sources of data for the indicator are:
- Egyptian Electricity Holding Company (EEHC)
- Municipalities

Identified Data
Electricity consumption for selected supermarkets in GCR is available at EEHC, while the floor area data is available at the municipalities.

Received Data
Electricity consumption data for supper markets was obtained from EEHC. Similar to office buildings, the area was not requested from the municipalities. It was obtained through satellite images, published studies and testament of personnel.

Retail Malls

The number of retail malls in Egypt is increasing. A list of malls in Greater Cairo has been compiled.

Annual Electricity consumption (kWh) per mall /floor Area (m^2)

Similar to office buildings, including that the value added is not related to the type of commerce/service provided in the rented space.

The sources of data for the indicator are:
- Egyptian Electricity Holding Company (EEHC)
- Municipalities

Identified Data
Electricity consumption data for each mall is available at EEHC, while floor area data is available at the municipalities.

Received Data
Electricity consumption data for malls was obtained from EEHC. Similar to the office buildings and super markets, the area was not requested from the municipalities. It was obtained through satellite images, published studies and testament of personnel.

3.3.5 Transportation Sector

Drivers of energy consumption in the transportation sector include:
- Population growth.
- Centralization of national organizations and authorities, and services in greater Cairo region.

- Increase in car ownership, due to increased living standards, availability of different long term payment mechanisms, and the inefficient public transport system.
- Fuel subsidies policies adopted by the government, leading to increase in usage of private cars for passenger transport and trucks for freight transport.
- Traffic congestion, leading to higher fuel consumption.
- Expansion of suburbs, unaccompanied by a parallel expansion of public transportation.
- Increase integration in world trade, implying increase in export and import activities requiring the transport of goods (raw material and products) to and from ports.
- Distribution of economic activities on the vertical level, implying transportation of goods (e.g. concentration of industrial activities in the greater Cairo region and satellite towns, tourist activities in the red sea: importing all its requirements from other regions).
- Lack of fuel efficiency standards, which allows for assembling and importing of low efficiency vehicles.

Indicators are developed for passenger and freight transportation for different modes of transportation.

For passenger transport, indicators are developed for intracity and intercity modes of transportation. In the intercity, the following modes of transportation are addressed:

- Railways
- Domestic air flights
- Buses

In the intracity, the following modes of transportation are addressed:

- Metro
- Public buses (in Greater Cairo and Alexandria)
- River transport (in Greater Cairo)

Annual Energy Consumption (toe) per mode of transportation/ Passenger-km

For freight transport, indicators are proposed to be calculated for the intercity transportation, for the following modes:

- River transport
- Railways transport
- Trucks

Annual Energy Consumption (toe) per mode of transportation/ton - km

Source of Data

Sources of data for the indicators are:
- Egyptian General Petroleum Corporation (EGPC)
- River Transport Authority
- Egyptian Railways Authority (ENR)
- Cairo Transport Authority (CTA) and Alexandria Transport Authority (ATA)
- Ministry of Civil Aviation
- National Authority for Tunnels (NAT)
- Holding company for Maritime and Land Transport

Energy consumption data is available at the entities managing transportation activities (e.g. NAT, ERA), except for the freight river transport. Energy consumption data on freight river transport is available at EGPC, where it is not collected by the River Transport Authority[25].

Data on passenger-km and ton-km is available at entities managing the transportation activities. For public buses and river passenger data, Cairo Transport Authority (CTA) compiles data on distances traveled by public busses and river boats, as well as the number of passengers in Greater Cairo Region. A similar system is adopted for Alexandria Passenger Transport Authority. However, these two separate datasets (number of passengers and distance traveled) do not present the passenger-km.

Received Data

The following data was received for passenger transport:
- Railway fuel consumption and passenger-km was received from the Egyptian National Railways
- Underground electricity consumption and passenger-km was received from the Egyptian Company for Metro (ECM)
- Intercity road transport fuel consumption and passenger-km was received from the Maritime and Land Transport Co.
- Public buses fuel consumption and total kilometers traveled was received from Cairo Transport Authority

The following data was received for freight transport:
- Railway fuel consumption and tonne-km – Egyptian National Railways
- Intercity road transport fuel consumption & tonne-km – Sample data from land and Maritime Transport Holding Company

[25] Private companies have started operation only recently. It is doubtful that they have already collected relevant information.

4. Indicators and Methodology

Energy consumption per unit of Gross Domestic Product (GDP) or per unit of industrial production (e.g. tonne cement, square meter of fabric) represent two types of indicators at different ends of the scale of economic activity. One is at the national level and the other could be at the level of a single institution. The successful system of indicators connects these to reflect changes at the institutional level in the economy wide consumption. It also explains economy-wide changes through changes at the institutional and sectoral levels.

In order to perform this analysis, the economy is divided into sectors which are further divided into sub-sectors and sub-sub-sectors, etc. to the finest level for which data are available within the economy. Over time, the acquisition of data allows the sub-sectors to become finer and therefore provides a more complete picture of energy consumption within the economy.

In this work, the energy accounting framework components are as follows:

Energy change: the total change in energy consumption at the economy, sector, sub-sector level or lower.

Energy intensity: the amount of energy consumed per unit of activity. It is expressed as energy/unit of activity. Energy intensity could only be calculated when a measure for the activity could be unified. For example, energy/unit of GDP at the national level, energy per passenger kilometer for transport of passengers and energy per tonne-km for transport of goods. However, it is not possible to calculate overall energy intensity for transport (unless the activity measure is unified) since there is no clear way to mix transport of passengers and goods.

Activity: a measurable purpose for which energy is consumed. It differs from sector to sector and within sub-sectors and sub-sub-sectors. Examples of activity measures are tonnes of cement production, square meter of fabric production, number of housing units, room-nights of occupancy in a hotel, or monetary value. The units depend on the nature of the activity. There may be multiple measures of activity for a single activity. For example, the size of the housing market may be measured by the number of housing units or by the total floor area of these units. The size of retail commercial activity may be measured by the monetary value of retail sales or by the floor area of retailers.

Structure: structure reflects the relative sizes of activities and their share in the economy.

The **intensity effect**, **activity effect**, and **structural effect** reflect the changes in energy consumption due to changes in energy intensity of activities, the level of activity, or the relative size of the activities (their structure), respectively. The three effects are expressed in units of energy. Their sum is the total change in energy consumption at the level they are applied (sector, sub-sector, etc.).

From the above, the **Energy Savings (ES)**, and the **Energy Performance Index (EPI)** are calculated.

Energy savings (ES) reflect a change in energy consumption due to a change in the intensity of consumption, rather than a change in the activity level or structure. The ES is expressed in units of energy. A negative ES implies greater energy consumption because of an increase in energy intensity. The **Hypothetical Energy (EH)** is the energy that would have been consumed if there had been no change in intensity.

The **Energy Performance Index (EPI)** measures a ratio change in energy consumption. It is a weighted ratio of energy consumptions and is unitless. It behaves as an indicatory of the efficiency of energy use, provided that the activity measures are suitably chosen. A lower EPI implies a reduction in energy use due to a reduction in energy intensity (which can be understood as improvement in energy efficiency, if the activity measure is suitably defined).

Together, the energy change, energy intensity, intensity effect, activity effect, structural effect, ES and EPI form an accounting system for tracking economy-wide variation in energy consumption. The ES and EPI are often referred to alone as energy indicators. Annex (VII) includes definitions of the terminologies used in the accounting framework.

Energy intensity can be calculated for a data set in a specific point in time. However, the full accounting system can only be applied to changes in energy consumption over time. It cannot be calculated for a single set of energy use data. The effects and indicators must be calculated for energy use data and compared with use at some other point in time. They then explain the changes in use between the different times.

A Methodology for Calculating Indicators, Accounting Framework

There are different accounting frameworks with different underlying mathematical models for tracking economy wide energy consumption. For the same data, the different frameworks will lead to different results and therefore different conclusions about energy consumption. The differences arise from the formulas used to compose the different effects and indicators. The methods are discussed by several authors and are beyond the scope of this work. A brief discussion is provided in Annex VIII

The Log-Mean Divisia Index (LMDI) method of the Index Decomposition Analysis (IDA) is used for this study. It is now the most commonly used methodology and adopted by virtually all of the countries engaged in creating an energy indicator system, though there are slight variations between the systems used in different places. The system used in this work follows that developed by Ang, Mu, and Zhou[27] and Ang.[28] An explanation of the

27 Ang, B.W., Mu, A.R., Zhou, P., Accounting frameworks for tracking energy efficiency trends, Energy Economics (2010),

calculation methods is presented in the following section, based on the adopted systems. The details of the methods are in the cited references.

Calculation of the Energy Intensity Indicators

The inputs to the accounting system are the energy consumption for a given activity and the size of the activity, covering each economic activity. From these, the energy intensity of the activities, the share of each activity in the economic structure, and the overall change in energy consumption are calculated. Using the calculated values, the activity, structural, and intensity effects are determined through taking the logarithmic average in energy consumptions and weighting it by the natural log of the change in structure, activity, or intensity, respectively. The calculation process is shown schematically in Figure 8.

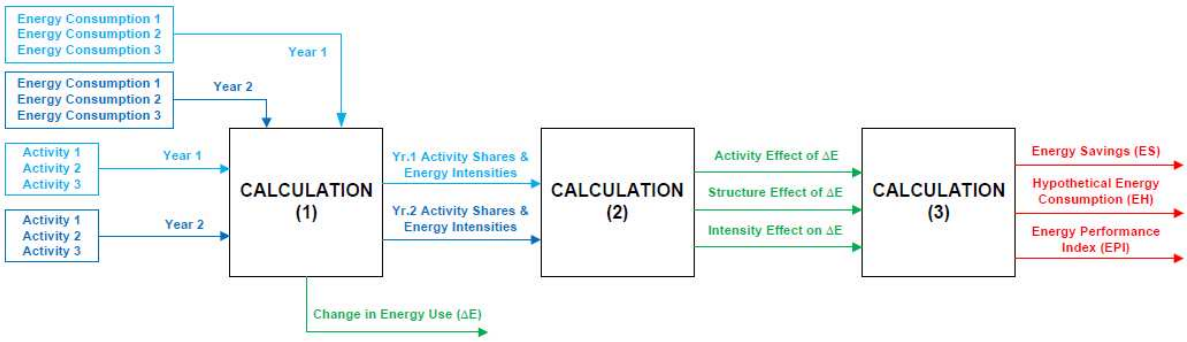


Figure (8): Schematic for the information flow in calculation of energy indicators.

The calculations in this work are based on the Log Mean Divisia Index framework using index decomposition as described by Zhou and Ang.

$$I = \frac{E}{Q},$$

Where I is the energy intensity, E is energy consumption, and Q is the activity.

- **Calculation (1)**
  The subscripts *i* and *j* are used to denote sectors and sub-sectors of the economy such that E_i is the energy consumption in sector *i* and E_{ij} is the energy consumption in the sub-sector *j* of sector *i*. The activity share, S_{ij} of each sub-sector, is defined as $S_{ij} = \frac{Q_{ij}}{Qi}$, and the energy intensity in each sub-sector *j* is similarly defined as $I_{ij} = \frac{E_{ij}}{Qij}$. The change in energy use in a sector *i* in a period from the year 0 to a year

28 Ang, B. W., Monitoring changes in economy-wide energy efficiency: From energy–GDP ratio to composite efficiency index, Energy Policy 34 (2006) 574–582

T, is simply $\Delta E_i^{0,T} = E_i^T - E_i^0$. Applying this equation and the definitions above gives the output of the first calculation step shown in Figure 8.

The energy consumption in sector *i* can then be written as

$$E_i = \sum_{j=1}^{n_i} E_{ij} = \sum_{j=1}^{n_i} Q_i S_{ij} I_{ij}$$

In other words, the energy consumption in sector *i* is the sum of the energy consumption in its sub-sectors *j*, which is in turn the product of the activity, the activity share, and the intensity, in each sub-sector.

- **Calculation (2)**

A main goal of the energy accounting framework is to decompose the change in energy consumption over time to three main effects, an intensity effect, E_{i-int}, a structural effect E_{i-str}, and an activity effect, E_{i-act}. The intensity effect represents change in overall energy consumption due to a change in intensity. The structural effect represents a change in overall energy consumption to a change in the structure of the sector (i.e. relative size of activities). The activity effect represents a change in overall energy consumption due to a change in the level of activity.

The total change in consumption, ΔE_i, is then

$$\Delta E_i = \Delta E_{i-int} + \Delta E_{i-str} + \Delta E_{i-act}$$

where ΔE_{i-int}, ΔE_{i-str}, and ΔE_{i-act} are the intensity, structural, and activity effects, respectively.

If these changes in energy consumption are taken for a period of time starting with year 0 and ending with year *T*, then they are expressed as $\Delta E_i^{0,T}$. Each of the three effects can then be calculated as follows

$$\Delta E_{i-int}^{0,T} = \sum_{j=1}^{n_i} L\left(E_{ij}^T, E_{ij}^0\right) \ln\left(\frac{I_{ij}^T}{I_{ij}^0}\right)$$

$$\Delta E_{i-str}^{0,T} = \sum_{j=1}^{n_i} L\left(E_{ij}^T, E_{ij}^0\right) \ln\left(\frac{S_{ij}^T}{S_{ij}^0}\right)$$

$$\Delta E_{i-act}^{0,T} = \sum_{j=1}^{n_i} L\left(E_{ij}^T, E_{ij}^0\right) \ln\left(\frac{Q_i^T}{Q_i^0}\right)$$

Where *L* is a logarithmic average given by

$$L(a,b) = \begin{cases} \dfrac{a-b}{\ln\left(\frac{a}{b}\right)} a \neq b \\ \mathbf{0}\ if\ a = b \end{cases}$$

By performing the above calculations, the energy changes due to each effect are found. These are the results of calculation step 2, shown in Figure 8.

- **Calculation (3)**

  Two indicators can then be calculated to help quantify the overall energy performance. These are the Energy Savings (ES) and the Energy Performance Index, (EPI). The ES is simply the negative of the intensity effect. It is the energy saved (or consumed) as a result of a change in intensity. If the appropriate activity measures are chosen, the intensity reflects directly the efficiency of energy use.

  $$ES_i^{0,T} = -\Delta E_{i-int}^{0,T}$$

  The EPI is a unitless ratio change indicating the relative change in energy consumption due to changes in intensity. It is calculated as

  $$EPI_i^{0,T} = \exp\left[\Delta E_{i-int}^{0,T} \frac{\ln\left(\frac{E_i^T}{E_i^0}\right)}{E_i^T - E_i^0}\right] = \left[\frac{E_i^T}{E_i^0}\right]^{\frac{\Delta E_{i-int}^{0,T}}{E_i^T - E_i^0}}$$

  The EPI is directly related to the EPS. Ang Mu and Zhou point out that "As an example, an EPI of 0.9 derived from an intensity effect of -10 Mtoe can be interpreted as a 10% improvement in energy efficiency that is equivalent to 10 Mtoe of energy savings'".

5. Data Used for Calculation and Choice of Activity Measures

The development of an energy accounting framework is always limited by the availability of data. The countries that have gone through this practice have spent many years developing institutions and protocols for recording data and for providing it in the forms required for calculation. As per the TOR, this report is based upon data already available, and accessible that could be collected for the five sectors considered: residential, commercial, transport, tourism, and industrial. In each sector, the available data does not represent the total activity or energy consumption, which is not available. Instead, the data represents a sample that is a fraction of the activity and associated energy consumption in each sector.

In order to produce a meaningful set of indicators and effects, several components are needed:

1- The activity level within each sector and sub-sector,
2- The energy consumption that corresponds to this activity level,
3- An understanding of the structure of the sector or sub-sector such that it is possible to divide the activities in each sector or sub-sector in a way that relates to their demand for energy.

As an example, the sub-sectors of the industrial sector may be represented by the different industries (metals, cement, food, etc.). They may be further divided into different types within the same industry, e.g. white cement, Portland cement, etc. They can be further divided by type of facility, e.g. wet production or dry production, and so on. The divisions are limited only by the availability of data and the level of division which serves the goals of those using the framework.

For this work, the only data obtainable for the industrial sector was in the form of energy intensities for various industries. These are noted in comparison with international figures in chapter seven. However, this data does not allow the energy indicators, the ES and EPI, to be calculated, nor does it allow the calculation of activity levels, or structural, activity, or intensity effects for the sector. As a result, the industrial sector cannot be included in the economy-wide calculations in this study.

The data used in the calculation of the indicators is summarized in this chapter. The data collected represents a small fraction of the overall economy wide energy consumption, which is reflected in the results. The sector which has the most complete data set is the residential sector for which only electric energy consumption data was used. In principle, the electric power consumption data is complete.

Finally, the data received included several inconsistencies or inaccuracies. They were corrected to the extent possible and used in the development of the system, with the main goal of building the required framework.

5.1 Residential Sector

The energy consumption data available for the residential sector reflects the largest share of energy use (for which data is available) in any sector. This is because a significant portion of the energy consumption: the electric energy consumption is generated by the Egyptian Electricity Holding Company and its subsidiaries. As a result, it was possible to obtain the official electricity consumptions in the housing sector, in each tariff level. The data was provided by the EEHC.

The use of natural gas in households is not included for two reasons. The first reason is that it is not possible to match the consumption of natural gas per household with the electricity consumption of households. In other words, there is no way to find the natural gas consumption for households that consume between 50 and 200kWh/month. The second reason is that the consumption of electrical energy was considered more important to focus on, because; it is expected that it is growing more rapidly; it can be more easily influenced by policy; and, is responsible for the problems of peak demand. Natural gas is typically only used for cooking or heating water compared with the many, and growing, uses of electricity. Liquefied propane gas (LPG) is used in households mainly as a substitute for natural gas and is not considered in this work for reasons similar to those for excluding natural gas.

Activity Measures and Sector Structure

The measure of activity available in the sector is the number of households. The sub-sectors in the housing sector are structured in this report by the electricity tariff level.

If, for example, the surface area for housing could be used as an activity measure, this would provide additional benefits through reflecting energy efficiency of houses resulting from increased thermal insulation, or reduced lighting consumption, etc. The structure of the sector can then be based on household area. For example, households of less than 100 m^2, or between 100-200 m^2, and so on. The size of the household provides a direct indicator of socio-economic status as well as a tool for predicting energy consumption for newly licensed buildings (by the building floor area). However, this would also require matching the floor area data with electricity consumption data.

Although the data set obtained from the EEHC represents the most complete data for a sector, it remains questionable. For example, the total kilowatt hours consumed in the tier consuming from 0-50 kWh/month indicates an average consumption of 97.4 kWh/month. This is the only sub-sector with such an inconsistency.

5.2 Commercial Sector

Five types of establishments are considered in the commercial sector: Schools, hospitals, administrative office buildings, malls, and supermarkets. Each of these form a sub-sector. Hospitals and schools are further divided into public and private and by location. For each type of building, only the electricity

consumption is considered as it is the dominant form of energy consumption. Electricity consumption was provided by the EEHC or the GEF/Energy Efficiency Project (for consumers above 500 kW). The main question arising with respect to this data is the electricity metering methodology. For example, malls are often not stand-alone structures. They may be part of a hotel or other complex built by the same developer, under the same name. Therefore, it may be that the entire mall is not supplied by the single meter connected in its name. Or it may be that the meter connected in the name of mall also feeds another activity in the same area which gives misleading results for energy consumption.

Activity Measures and Sector Structure

The measures of activity for hospitals and schools are patient-bed and number of pupils (obtained from the Ministry of Health and Ministry of Education, respectively). Electricity consumption data for hospitals and schools was obtained from EEHC. Natural gas data was not included in schools or hospitals because it was insufficient to apply on the sub-sector scale, or because of lack of correspondence between data sets.

For the remaining sub-sectors, administrative buildings, malls, and supermarkets, the activity measure used was floor surface area. For supermarkets, it was obtained either from studies of retail activity or by direct questioning at the stores. For example, the average floor area given for a certain supermarket chain is 2,500 m^2/store.[29] The electricity consumption for three of five branches of this chain was provided by the EEHC. Given that 60% of the sample is represented, the total area for the chain's supermarkets was considered 7,500 m^2 and their electricity consumption was considered the total electricity consumption provided for three branches by the EEHC. Obviously, this method does not permit accurate data. However, it was the only means available to find a floor area and therefore the only means possible to include supermarkets which are a sector of growing consumption.

For a different retail chain, the floor areas were obtained through interviews with personnel of individual supermarkets. In many cases, the personnel were aware of the total area of tiles used for the store flooring. It was difficult to determine if this area reflected only the retail area, or if it also included the storage area in the back of the supermarket.

For administrative buildings and malls, the surface areas were obtained by measuring the total projected area of the building from satellite images, then multiplying by the number of stories. Again, the analysis only produces an estimate for energy consumption. However, it is the most accurate method available for this study and it allows the inclusion of malls and administrative buildings in a way that they could not be included otherwise.

To determine change in the structure of a sector, it is necessary to know the relative change in the size of each of its sub-sectors, for example, strong

[29] "Invest in Egypt" report by the General Authority for Investment, 2010.

growth in the supermarket area. This change in structure is not reflected in this work as the activity measures were taken at a single point in time and for a fixed sample size. All change in energy use is therefore attributed to a change in intensity (intensity effect).

5.3 Transport Sector

The transport sector is divided into two main sub-sectors: passenger transport and freight transport. Passenger transport is further divided into city and inter-city and then by transport mode. Freight transport is divided into rail and road. Data for private sector transport was not available. All data for rail roads was provided by the Egyptian National Railways (ENR). Data for road freight transport was provided by the Holding Company for Land and Maritime Transport (for its own activity). Data for metro transport was provided by the National Authority for Tunnels (NAT).

Data for other city public transport was provided by the Cairo Transport Authority (CTA). The data provided included fuel consumption and total kilometers traveled. It did not include passenger-km data since this data is not recorded by the CTA. The passenger-km data needed to complete the sector calculation was estimated by assuming bus occupancy of 40 passengers for minibuses and 50 passengers for large busses. Total kilometers travelled were only available for 2009. The ratios of passenger per kilometer were available for other years. The passenger-km data for 2007 and 2008 was calculated by assuming a constant number of total kilometers (i.e. the bus routes are assumed to have not changed significantly in the past three years) and using the passenger/km as a proportionality factor. Obviously, this number does not represent the true value but is the best available approximation.

The data provided from each of the transport data sources (Metro company, ENR, etc.) includes the energy consumption and passenger or cargo travel (passenger-km and tonne-km) for its mode of transport. It was realized that in the transportation sector, if both energy and physical data were not provided by the same entity, it would not be otherwise possible to match data from one entity with that from another. As an example, the River Transport Authority provided detailed data on the volume of goods transported by river. However, it was not possible to obtain information on the fuel consumption from the Egyptian General Petroleum Company. As a result, river transport could not be included in this study.

Generally speaking, the data for the transport sector are questionable as there are large unexplained variations in intensity, or various extrapolations or corrections required to make the data and units suitable. The data for this sector and the results should be considered to demonstrate the method of calculation rather than present accurate results.

Activity Measures and Sector Structure

The measures of activity in the transport sector are passenger-km and tonne-km for passenger and freight transport, respectively. These measures are used internationally without exception, with no other readily apparent alternatives.

The structure of the sector is shown by the different methods of transport. A shift from one mode of transport to another, or a change in the relative sizes of the different modes, represents a structural change. For example, a shift of cargo transport from road to rail represents a structural shift which will influence energy consumption of the sector even for the same activity size in the sector (i.e. for the same number of tonne-kms transported).

5.4 Tourism Sector

The energy consumption in the tourism sector was restricted to consumption in hotels. The data for the number of rooms available in each hotel was provided by the Tourism Development Authority (TDA). The energy consumption data was provided by the GEF/Energy Efficiency Project covering only hotels of over 500 kW of power consumption. The occupancy data was provided from CAPMAS for the years 2007-2008 and by the TDA for 2009. Natural gas consumption was provided by EGAS.

Activity Measures and Sector Structure

The main tourism sector calculations were developed using the total number of hotel rooms as the measure of activity. This is because it was the only reasonable activity measure for which data is available. The occupancy rate was only available at the governorate level. Energy consumption is only available for a limited number of hotels, and only those with a power demand over 500 kW. It was possible to obtain estimates of hotel floor area for a very limited number of hotels by using satellite images and multiplying the plan area by the number of stories. These provide estimates of hotel consumption per unit floor area, but with the reservations about the lack of clarity over what floor area is part of the hotel and what floor area is part of other establishments (e.g. adjacent mall).

Structure for the sector is provided by sorting the sector in terms of the star hospitality rating of the hotels (5 star, 4 star). This sorting is expected to correlate well with the levels of energy consumption. A shift in structure would indicate one level of hotel service (5 star, 4 star) growing or shrinking with respect to the others. This can be a result of construction of new hotels, demolition of older ones (i.e. a change in hotel floor space available in a certain star), or a change in the demand for each type of hotel (shown in the number of room-nights spent in each type). This reflection depends on the choice of activity measure.

5.5 Industrial Sector

The data provided for industry reflects the energy intensity of certain industries. They do not allow the calculation of the energy effects or intensities. Therefore, the industrial sector is not included in this framework. The intensities are presented in comparison with intensities reported from other countries.

The activity measures in industry typically relate to physical units of production: tonnes, liters, square meters, etc. The structure of the sector is

provided by the relative size of production in different industries and the activity in the sector is measured by the production of the various goods.

The list below summarizes the data used in this report and includes the information explained above. The forms of energy use and activity measure for each sector or sub-sector are shown in brackets as energy use/activity measure, i.e. the form of intensity.

1. Residential (Electricity consumption/household)

- Obtained Data: Electricity consumption and number of households by tariff level (tier) as well as by District/Markaz - EEHC.
- Activity Unit: Households
- Structure: Tiers (based on consumption rates)
- Intensity Unit: Electricity consumption per household

2. Commercial

2.1. Educational (Electricity consumption/pupil)

- Obtained Data:
  - Electricity consumption of schools (public and private) by district – EEHC.
  - Number of pupils per governorate by governorate – Ministry of Education.
- Activity Unit: Number of pupils.
- Structure: Type of school (public and private) – Governorates – Districts.
- Intensity Unit: Electricity consumption per pupil.

2.2. Health care (Energy consumption/patient-bed)

- Obtained Data:
  - Electricity consumption of hospitals (public and private) over 500 kW by hospital name – GEF/UNDP.
  - Number of patient-beds per hospital – Ministry of Health.
  - Natural gas consumption for 9 hospitals (the only ones above 500 kW) – EGAS.

- Activity Unit: Number of patient-beds
- Structure: Type of hospital (public and private) – Governorates – Hospital Name
- Intensity Unit: Electricity consumption per patient-bed

2.3. Administrative Buildings, Malls & Supermarkets (Electricity consumption/sqm)

- Obtained Data:
  - Electricity consumption of some administrative buildings, malls and supermarkets by establishment name – EEHC and GEF/UNDP.
  - Floor area (in sqm) by establishment name – Satellite images, published studies, and testament of personnel.
- Activity Unit: Floor area. Note that the activity effect for this sub-sector is "zero" because the areas of the establishments have not changed over the period of the study.
- Structure: Establishments. Note that the structural effect for this sub-sector is "zero" as the relative activities have not changed over the course of this study.
- Intensity Unit: Electricity consumption per square meter.

3. Transport:

3.1. Passenger Transport (energy/passenger-km)

- Obtained Data:
  - Railway fuel consumption & passenger-km – Egyptian National Railways.
  - Underground electricity consumption & passenger-km – Cairo Metro Authority.
  - Intercity road transport fuel consumption & passenger-km – Maritime and Land Transport Co.
  - Public buses fuel consumption & total kilometers traveled – Cairo Transport Authority.
- Activity Unit: Passenger-km.
- Structure: Type, (city and intercity) – Mode of transport.
- Intensity Unit: Energy consumption per passenger-km.

3.2. Freight Transport (energy/tonnes-km)

- Obtained Data:

- Railway fuel consumption & tonne-km – Egyptian National Railways.
- Intercity road transport fuel consumption & tonne-km – Sample data from land and Maritime Transport Holding Company.

- Activity Unit: Tonne-km.
- Structure: Mode of transport.
- Intensity Unit: Energy consumption per tonne-km.

4. Tourism (Energy consumption/room)

- Obtained Data:
  - Electricity consumption of hotels over 500 kW by hotel name – GEF/UNDP.
  - Natural gas consumption of hotels over 500 kW by hotel name – EGAS.
  - Number of rooms per hotel and their star grade by hotel name – TDA.
  - Occupancy and number of rooms per governorate – TDA & CAPMAS.
  - Floor area per hotel – Calculated from satellite images for few establishments to produce sample intensity per sqm..
- Activity Unit: Number of rooms.
- Structure: Star grade – Governorate – Hotel name.
- Intensity Unit: Energy consumption per room.

Alternatively,

- Activity Unit: Occupancy (Guest-night).
- Structure: Governorates.
- Intensity Unit: Electricity consumption per guest-night.

5. Industrial

- Obtained Data:
  - Energy intensities for various industries – Industrial Development Authority.

Data to calculate a set of energy effects and indicators was not available.

Data Quality and Consistency

The basic data required for developing a system of energy indicators are mostly available. However, in most cases they are not collected in a manner that allows computation. This is because activity measures often do not correspond with the energy consumption. Amongst the main obstacles was the collection of data by different entities. Further difficulties arise from data that could be gathered but is not. For example, the CTA has data on the number of passengers and the total kilometers traveled by their busses. They do not have data on the number of passenger-kilometers travelled on their busses. In order to be able to include the CTA, assumptions were made about average bus occupancy to be able to calculate passenger-kilometres travelled. In some instances the data appeared to have unit errors which were corrected as possible (i.e. consumption of diesel reported in thousands of cubic meter or tons, instead of litres). In other instances the data was simply incredible and had to be excluded. Since the purpose of this work is to produce an energy accounting system rather than a set of values, these assumptions were made to make it possible to provide an example of how the energy accounting system might work.

These problems are expected to be remedied by the presence of a well informed unit responsible for collecting data and a system to check its integrity. This difficult job is implementable because most data are presently collected in some form. Procedural modifications are required to enable the use of the data in an energy accounting framework and other purposes.

6. Indicator Calculation Results

The main results of the indicator calculations are presented in the Table (1), with the complete results presented in Annex IX

The changes in energy consumption are shown as either a structural effect (i.e. energy consumption changing as a result of a change in the composition of the sector), an activity effect (i.e. energy consumption changing as a result of a change in the size of the sector, i.e., the level of activity within the sector), or as an intensity effect (i.e., energy consumption changing as a result of a change in the energy required per unit of activity). The latter is often closely linked with the efficiency of energy use, particularly if the activity measure is appropriately defined.

Table (1): Results of calculation of energy indicators for the economy

Sector/Sub-sector	Energy Use (ktoe)		Change in Energy Use (ktoe)				Energy Savings & Hypothetical Energy (ktoe)[30]		Perfor-mance Index[31]
	(2007)	(2009)	Total Change	Activity Effect	Structure Effect	Intensity Effect	ES	EH	EPI
Economy-wide (2007-2009)	**3,615**	**4,264**	**648.79**	**430.16**	**243.82**	**-27.18**	**27.18**	**4,291**	**0.993**
1. Residential Sector (No. of Households)	**3,131.32**	**3,767.07**	**635.74**	**449.53**	**243.72**	**-57.50**	**57.500**	**3,824.57**	**0.983**
2. Commercial Sector	**53.07**	**59.93**	**6.86**	**0.73**	**0.22**	**5.90**	**-5.905**	**54.03**	**1.111**
Education (No. of Pupils)	22.61	25.42	2.82	0.73	0.22	1.86	-1.863	23.56	1.081
Hospitals (No. of Patient-Beds)	15.42	17.27	1.85	0.00	0.00	1.85	-1.852	15.42	1.120
Admin Buildings (Floor area)	1.23	1.32	0.09	0.00	0.00	0.09	-0.087	1.23	1.071
Shopping Malls (Floor area)	10.71	12.18	1.47	0.00	0.00	1.47	-1.467	10.71	1.137
Super-Markets (Floor area)	3.10	3.74	0.64	0.00	0.00	0.64	-0.636	3.10	1.205
3. Transport Sector	**412.25**	**417.69**	**5.45**	**-20.1**	**1.88**	**23.67**	**-23.67**	**394.02**	**1.06**
Passenger Transport (P-Km)	341.62	356.89	15.28	-14.48	2.13	27.63	-27.63	329.26	1.08
Freight Transport (T-Km)	70.63	60.79	-9.83	-5.62	-0.25	-3.96	3.96	64.76	0.94
4. Tourism Sector (No. of Rooms)	**19.24**	**19.98**	**0.75**	**0.00**	**0.00**	**0.75**	**-0.745**	**19.24**	**1.039**

Note that although the formulation is labeled economy-wide and applies to the entire economy, the data presented represents only a very small fraction of the economy, with only 4,000 ktoe of approximately 75,000 ktoe [32] accounted for. The data for the residential sector is the most complete and is therefore much larger than any of the other sectors which contain only samples. The left-most column shows in brackets the activity measure used in each sector. Main sectors are shown in bold. Sub-sectors are in normal font.

[30] Calculated from the LMDI method
[31] A unitless index calculated from the LMDI method
[32] US Energy Information Administration for 2008

6.1 Residential Sector

The residential sector has the largest reported energy consumption, due to the high availability and accessibility of the data in this sector. The results show that the total energy consumption in the sector increased by 635.74 ktoe through the period 2007 to 2009 (from 3,131 ktoe in 2007 to 3,767 ktoe in 2009). Of these 635.74 ktoe, 449.53 ktoe are due to an increase in activity – the overall number of households increased; 243.72 ktoe are due to a change in structure, i.e. a shift towards higher tiers of consumption; and a 57.50 ktoe reduction is due a change in intensity in the sub-sectors, i.e. a reduction in the average consumption per household in each sub-sector except the lowest consumption tier.

The mean household energy use in the five sub-sectors (covering from 50 kWh/month to above 1000 kWh/month) has decreased within each sub-sector. However the overall simple arithmetic average household consumption has increased because of the increased numbers of household in the higher consumption tiers. The total change in energy consumption as a result of this shift within sub-sectors is captured in the structural effect. The intensity effect captures the reduction in energy use because of the lower mean energy use per house-hold within the 5 higher consumption sub-sectors, and the increase in mean energy use per household in the lowest consumption sector.

The Hypothetical energy demand (the energy demand if there had been no change in intensity) is 3,824.57 ktoe, and the energy saved due to a reduction in intensity is 57.50 ktoe (the negative of the intensity effect). The energy performance index, EPI, at 0.983 shows a slight improvement in the relative use of energy. This example illustrates part of the benefit of analyzing energy use through a system as proposed in this work. It also illustrates the importance of proper selection of an activity measure and proper interpretation of results.

The use of another activity measure, such as floor area, may show for example, that newer, larger homes are consuming more overall, but are more efficient per square meter because of their newer appliances. While such an activity measure may show that older homes which have remained the same size have increased in energy consumption because of increased electronic devices.

The decomposition of the energy change in the residential sector is shown graphically in Figure 9. The graph shows that the energy consumption between the years 2007 and 2009 has increased due to an increase in the size of activity and other changes in the structure of the sector, while it has decreased due to a reduction in intensity within the sector. This conclusion is obtained from studying the energy change along 2007/2008 and 2008/2009 using a chaining analysis approach. The comparison of these numbers graphically with the overall change in the economy is unreasonable simply because the size of energy consumption in the sample in the residential sector is much greater than elsewhere.

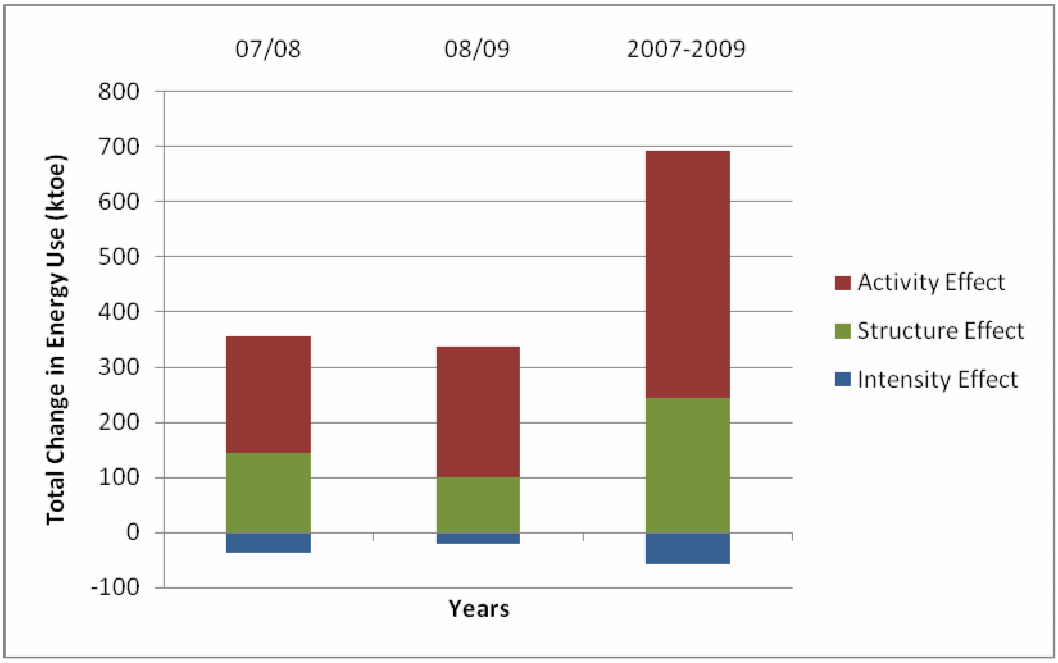


Figure (9): The change in energy use in the residential sector

The change presented in figure (9) is decomposed into an activity effect, structure effect, and intensity effect for years 2007-2008, 2008-2009, and overall for the period 2007-2009.

6.2 Commercial Sector

The commercial sector has the largest number of different sub-sectors within this study. The results are shown in Table 1 for each of the sub-sectors and for the commercial sector in aggregate. The activity, structure, and intensity effects for hospitals, administrative buildings, malls and supermarkets are shown as zero. This is a direct result of fixation of the number of establishments whose physical size has not changed in the years 2007-2009. With more data available, ideally for an economy wide system, the changes in activity and structure would truly reflect the changing sizes of the sub-sectors and their effect on energy demand.

The pattern of energy use is very interesting to note in this sector. Although there are no changes in activity or structure for the data set taken, there is a considerable change in intensity for the sub-sectors, most notably, supermarkets, shopping malls and hospitals. Coupled with the growth in activity in these sub-sectors, which is not captured in this study, this implies a very strong growth in overall energy demand. It therefore suggests the need for a mechanistic study for these entities with on-site energy audits and recommendations for energy use reduction.

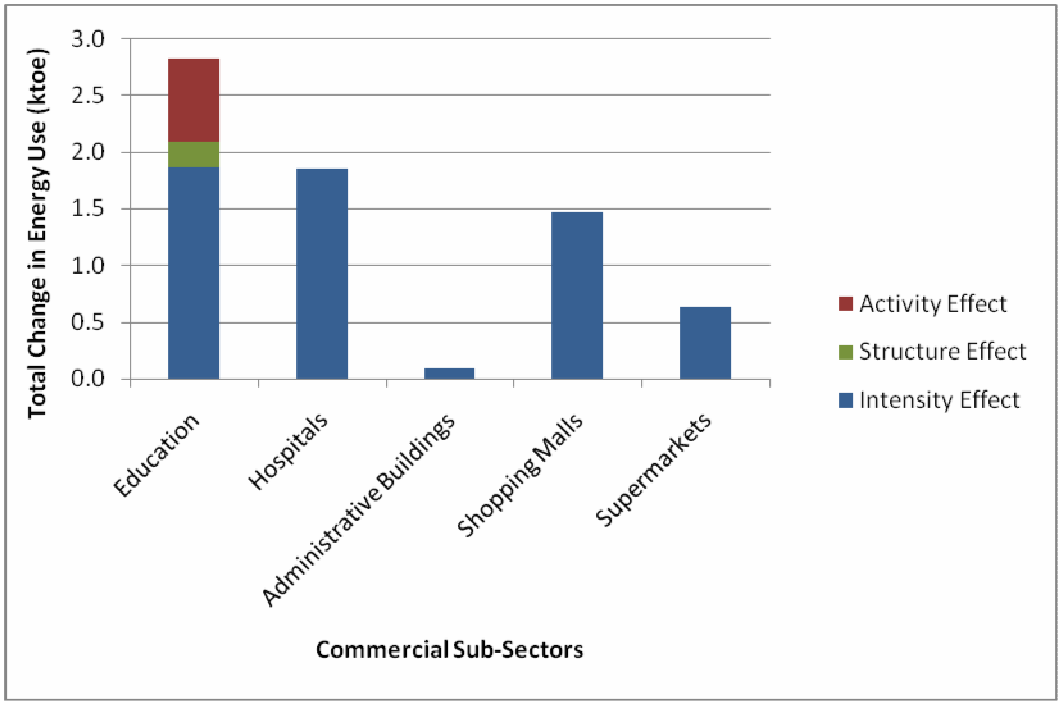


Figure (10): A decomposition of the energy demand in the different sub-sectors of the Commercial sector

Note that for sectors where there is no change in intensity of structure (as a result of the way data are collected), the entire change in energy consumption is attributed to changes in intensity.

6.3 Transport Sector

The size of energy consumption in the passenger transport sub-sector is considerably larger than the freight transport sub-sector in this study. As mentioned before, this is a result of the data availability and does not reflect the true sizes of the sub-sectors within the economy. Data was simply available for a larger base of energy consumption in the passenger sub-sector because of the large public transport organizations. The reduction in total energy consumption in the passenger sector was reported in the collected data. However, the activity was developed by assuming constant total kilometers of travel since only data for 2009 was available. The number of passenger-km for other years was then calculated based on the ratios given for passenger/km relative to 2009.

The freight transport sector, even with its limited information, presents an interesting case. There is an overall reduction of 9.83 ktoe of energy consumption in the sub-sector. Of these, -0.25 ktoe are due to a shift in modes of transport – i.e. a structural change. It is therefore possible to see how such a system of indicators can be used as a tool for predicting the overall effect on energy demand within the sector (e.g. the construction of a new highway, or new railway, or policy to shift transport from road to rail or river barge).

Regretfully, complete data was not available for river transport to allow its inclusion in the study. Figure (11) graphically presents the energy change in the overall transport sector, again showing the changes in energy use in the sector decomposed to sub-sectors and effects within the sub-sectors. The transport data is the least reliable with sometimes large and unreasonable variations from year to year. As with all results in this study, these should be taken as an example of the types of results obtainable form an energy accounting system and not as actual numerical results.

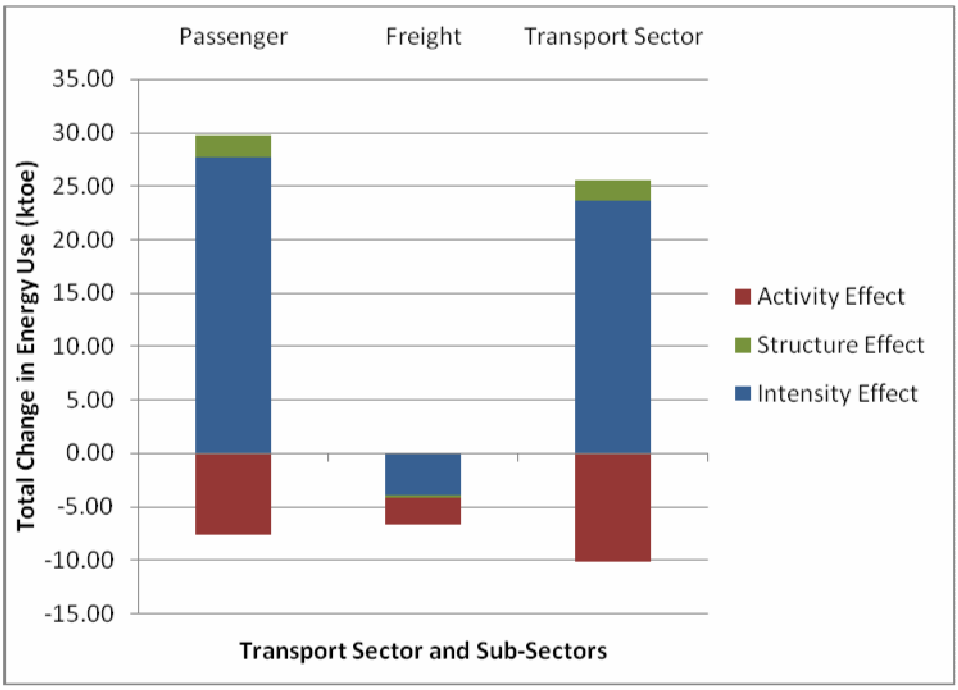


Figure (11): Change in Energy Use in the Transport Sector

6.4 Tourism Sector

Similar to the sub-sectors of the commercial sector, the activity effect and structure effect within the tourism sector are zero because there was no change in the activity measure (number of rooms) for the given data sample over the period of the study. In reality, these effects would reflect the change in tourist volume (if room-night is used as an activity measure) or the change in hotel stock (if floor area is used as an activity measure).

The change presented in Figure (12) is attributed entirely to changes in intensity because the sample in the study does not include variations in activity or structure over the study period

Figure (12): Changes in energy use within the tourism sector.

Economy Wide Results

The most immediately noticeable feature is that the data provided in the residential sector dominates all others in terms of energy consumption, and therefore also in change of consumption. This is because the data for the residential sector is the most complete as it is obtained from a single source, the EEHC. For other sectors, the data collected represents only a small sample of the sector (that was available and could be used) intended to demonstrate the method of calculation. Because the consumption in the residential sector is far greater than that in other sectors it is difficult to represent the overall changes in the economy graphically and meaningfully as they might be if the data were more complete. In addition, the total energy consumption considered in this study is a mere few percent of the total energy consumption of the economy.

However, the structure developed can then be filled with data to produce a meaningful representation of the economy.

7. Comparison with International Benchmarks

Table (2) provides a basic comparison with energy consumption in various countries. While the direct comparison of numbers is of limited value, the more important point is the benefit that can be provided by having realistic and country-specific benchmarks for consumption in different categories in the Egyptian economy.

The comparison of benchmarks across countries is difficult and of limited value for three main reasons: the first is the different conditions prevalent in different countries the second is the wide variation in reported figures worldwide, and the third is the low confidence in the values of data used in this study. It is also often difficult to determine the exact comparability of the numbers. For example, the Egyptian figures are obtained by dividing total legitimate household consumption by total number of households ("families") reported by the EEHC. The numbers for other countries may be arrived at differently, therefore limiting comparability.

Generally speaking, the household in Egypt consumes 62% of that in the UK and 22% of the average home in the U.S. These figures include electricity consumption only and do not therefore reflect heating unless electricity is used for heating.

The consumption of energy per pupil in Egypt is far less than that in the UK, which is not surprising considering that UK schools are likely climate conditioned and have a number of electrical appliances.

Energy consumption in Egyptian hospitals, per patient bed, compares reasonably with the figures reported in India. The figures reported for the rest of the commercial sector, shopping malls, supermarkets, and administrative office buildings are all within the values reportedly. Of course, these are based on a fairly limited sample.

In the transport sector in particular, benchmarks vary widely and are often specific to geography and transport methods, occupancy, speed, etc. As such, it is not possible to directly compare, for example, train service in France running at 200+ km/hr, with much slower trains in Egypt. Further, the comparison of electric powered rail and diesel powered rail can be misleading as fossil fuel energy used to generate the electricity is often not counted, and therefore the inefficiencies in this process are excluded.

Worldwide, energy consumption per ton-km or passenger-km can vary several folds within the same mode of transport. Occupancy, utilization of return trips (empty or full, particularly in freight transport) are important factors affecting energy consumption, as are traffic patterns, elevation changes, etc. Given the large variation in energy consumption for transport worldwide, and given the specificity required to produce meaningful data from the transport sector and the uncertainties in transport data available for this study, a comparison with international benchmarks is neither practicable nor meaningful.

The energy consumption per hotel room for Egyptian hotels in 2009, 51,200 kWh is rather high, based on comparison with other countries, in particular India which is expected to be similar. Comparison with other countries based on square meter of floor area also shows consumption in Egyptian hotels being rather high. Consumption per square meter for Egyptian hotels was calculated using floor areas obtained from satellite images. The energy use value contains both electricity and natural gas consumption. Only hotels above 500 kW are included in this study. Taking this into account, the figure is not unreasonable. If the average hotel room in a large major hotel is 36 m^2 (including bathrooms, closets, etc…) and we assume that only a fraction (perhaps 50%) of a hotel's total building area is in rooms, then the higher number is perhaps reasonable. The dominant effect is likely to be the selection of hotels that are only above 500 kW in power consumption and comparing with the averages elsewhere. There is expected to be a large variation in consumption from smaller hotels to larger ones. This is confirmed by the variation in reported energy use per square meter in hotels in different countries.

The value for hotel consumption per square meter is 730 kWh/m^2. Considering that this value represents four major 5 star hotels and one 4 star hotel, it is reasonably close to figures reported elsewhere.

Table (2): Comparison of International Benchmarks for Energy Intensity[33]

Unit	Egyptian Economy[34]	Australia	Canada	Denmark	India	Ireland [j]	Turkey	UK	US
1. Residential (Electricity Consumption only)									
kWh/household/yr	2,417		30,917 [c]		990 [g]			3,880 [l]	11,040 [q]
kWh/m^2/yr	N/A		231 [c]	50 [e]				40 [m]	
2. Commercial									
2.1. Schools									
kWh/pupil/year	Public18 Private 52							Good [n] 922–1,329 Typical [n] 1,285-1,805	
kWh/m^2/year	N/A		281 [d]	70 [e]		Good 56 Typical 66		Good [n] 146 Typical [n] 204	215 - 252 [r] 536 [s]
2.2. Hospitals									
kWh/PatientBed/yr	Public 7,527 Private 13,590				12,832 - 15,181 [h]				
kWh/m^2/year	N/A		786 [d]		88 – 378 [i]			Good [o] 445 Typical [o] 550	786 [r]
2.3. Office Space									
kWh/m^2/year	84	Low [a] <100 High [a] >400	338-394 [d]		115 - 258 [i]			128 [m]	252 - 311 [r]
2.4. Shopping Malls									
kWh/m^2/year	770				252 [i]		Low [k] <670 High [k] >920		347 [r] 855 [s]
2.5. Supermarkets									
kWh/m^2/year	1,315	1,000 [b]	483 [d]					Sales [p] 1,115 Offices [p] 225 Non-food [p] 306	676 [r] 2,148 [s]

[33] All referenced online documents accessed February 2, 2011 unless otherwise noted. Where energy consumption in facilities that use electricity only is available, it has been used; otherwise, total energy consumption is used.

[34] Figures for Egypt are calculated from 2009 data. Hotel energy consumption per square meter is calculated based on satellite data used to calculate floor area for Ramses Hilton, Nile Hilton, Four Seasons, Semiramis, and Shepeard hotels.

Unit	Egyptian Economy[34]	Australia	Canada	Denmark	India	Ireland [j]	Turkey	UK	US
3. Hotels									
kWh/room/year	51,200				24,110 [i]				
kWh/m^2/year	730			42.6 [f]	279 [i]			90 [m]	236 - 347 [r] 612 [s]

a *Exergy Australia Energy Efficiency Guide* -- http://www.xgl.com.au/pauls/office.html

b Build Green Consulting -- http://www.buildgreen.co.nz/performance.html

c Natural Resources Canada – Office of Energy Efficiency, Residential Sector – Energy Use Analysis
http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/tablesanalysis2/res_00_1_e_1_4.cfm?attr=0

d *Commercial and Industrial Consumption of Energy Survey, Summary Report June 2007* - Natural Resources Canada
http://oee.nrcan.gc.ca/publications/statistics/cices06/pdf/cices06.pdf

e *Danish Low Energy Building Projects, NETS Seminar, Sep. 2008, Helsinki, Finland,*Alsen, S. -- http://www.greennetfinland.fi/fi/images/7/74/Alsen.pdf

f *Sustainable Cities Cases: Copenhagen, No. 1 Green Hotel in the World*
http://sustainablecities.dk/en/city-projects/cases/copenhagen-no1-green-hotel-in-the-world

g Coping with Residential Energy Demand in India – *Lawrence Berkeley National Lab, LBNL- 63199, 2007*
http://eetd.lbl.gov/ea/ies/iespubs/63199.pdf

h *Benchmarking and Maturity Model for Green Practices, ECO-III Project* Kumar, S.
http://www.google.com/url?sa=t&source=web&cd=4&sqi=2&ved=0CCYQFjAD&url=http%3A%2F%2Fwww.nasscom.in%2Fupload%2FGreen_it%2FBenchmarking_Maturity_model_Green_Practices_UNAID.ppt&rct=j&q=energy%20consumption%20shopping%20malls%20kwh%20per%20floor%20area&ei=z0ARTcyQCoezhAfXzeSmAg&usg=AFQjCNGlKlorJSOEKAU3ySyoek4TsqQgqA&cad=rja

i *Benchmarking of Energy Consumption and Labeling of Commercial Buildings, BEE-ECO III Project preliminary results*, 14 July, 2010, New Delhi, India
http://eco3.org/wp-content/plugins/downloads-manager/upload/Benchmarking-Brochure%20%28Public%29%20.pdf

j *Energy Benchmarks for Public Sector Buildings in Northern Ireland*, Jones, P. G., Turner, R. N., Browne, D. W. J., Illingworth, I. J.
http://www.cibse.org/pdfs/energy_benchmarks.pdf

k *Evaluating performance indices of a shopping centre and implementing HVAC control principles to minimize energy usage*, Canbay, C.S., Hepbasli, A.,

and Gokcen, G. -- http://jyjs.gzhu.edu.cn/jzsb/upload_file/201052176488609.pdf

l Renewables in Scotland – Household Energy Consumption -- http://www.esru.strath.ac.uk/EandE/Web_sites/01-02/RE_info/hec.htm

m Tesco-Everton Public Inquiry – Environmental Impact Assessment– Appendix 19 – Energy Use http://inquiry.knowsley.gov.uk/Core%20Documents/CD%201.3.1%20%28iii%29%20Appendix%2019%20Energy%20technical%20annexe%201b%20revised.pdf

n Energy Consumption Guide, Best Practice Programme – Saving Energy in Schools -- http://www.energybenchmarking.co.uk/schools/ECG73.pdf

o *Benchmarking and Best Practice – Energy Management for Healthcare in the UK*, Aspinall, P. http://www.google.com/url?sa=t&source=web&cd=7&sqi=2&ved=0CDsQFjAG&url=http%3A%2F%2Fciteseerx.ist.psu.edu%2Fviewdoc%2Fdownload%3Fdoi%3D10.1.1.130.4944%26rep%3Drep1%26type%3Dpdf&rct=j&q=energy%20consumption%20hospital%20kwh%20per%20square%20meter&ei=mSoRTcO8HMSAhAfI1o24Dg&usg=AFQjCNE6oNzRRekOxXunJBKV9Y0L1Cwv2Q&cad=rja

p *Proposed Supermarket in West Durrington West Durrington Sustainable Environment Statement*, Bajaj, N. -- http://www.worthing.gov.uk/worthings-services/planningandbuildingcontrol/proposedlargedevelopments/archiveddevelopments/tescoapplicationwb090146armamendedplans/pdffile,62695,en.pdf

q USA EIA 2009 Statistics -- http://www.whitehouse.gov/recovery/innovations/clean-renewable-energy

r *US Department of Energy Commercial Building Benchmark Models*, August 2008 -- http://www.nrel.gov/docs/fy08osti/43291.pdf

s *2003 Commercial Building Energy Consumption Survey, US Energy Information Administration* http://www.energystar.gov/ia/business/tools_resources/new_bldg_design/2003_CBECSPerformanceTargetsTable.pdf

Table (3): Comparison of EI for Selected Industries in Egypt and Globally.[35]

Industry	Kg Oil Eq/ton in Egypt	Global Average Kg Oil Eq /ton
Cement	122	110
Fertilizers	971	800
Iron & Steel	744	570
Glass	500	400
Textile	2270	1725

Although data for the industrial sector was not available for inclusion in this work, Table (3) shows energy intensities reported for Egyptian industries and global averages which may be useful in future work.

Energy Consumption and production data provided by the IDA are included in Annex (X), and energy intensities have been calculated by the study team. There is a significant variation between the calculated intensities based on IDA data and those included in Table (3) above.

[35] National Democratic Party Energy and Development Paper, 2007

8. Proposed Energy Accounting System

As clarified in the previous sections, this assignment has faced data challenges and limitations on a number of levels. These could be summarized in the following aspects.

- ***Availability***
  Data required for calculation of some indicators is not generated. This is especially true for a number of transportation modes such as privately owned vehicles, and public transportation modes with fees not related to distance (intracity buses).

- ***Accessibility***
  Available data does not consistently cover the time series required for analysis. In other cases, it could be totally inaccessible. For example, although, at the level of the tourist facility, occupancy and energy consumption are generated at least on a monthly basis, they are not compiled at the facility or the sector level.

- ***Aggregation***
  Aggregation hides details needed for adequate analysis. For example, although industrial data is generated at the facility level, its aggregation does not allow for analysis of evolution of sector structure and activity level.

- ***Compatibility***
  This is mainly related to data being compiled for the specific purposes of the entity generating, or compiling it. The lack of a Common Economic Structure for data collection within different entities prevents the use of this data for a common purpose. Examples, inter-alia, are the independent Coding System for Energy Providers (Electricity/Natural Gas/Fuel), and the HS coding system used by IDA and the ISIC system used by CAPMAS.

- ***Accuracy***
  In some cases, the figures acquired are not realistic and it was clear that the data compiled was not verified.

The institutional set up for an energy accounting system should address as much as possible these limitations.

8.1 Energy Accounting Systems, International Experience

In considering a future institutional setup for the energy accounting system in Egypt, systems adopted by other countries were reviewed. It has been found that these are usually hosted by a governmental body which calculates indicators based on data generated by different bodies including national statistics offices, energy generation institutes, ministry of economic, and ministry of energy, government departments each within its field of activities, etc. The data generated by these entities is sometimes complemented by

surveys carried out with the purpose of providing missing data for the indicators calculation and analysis.

In the USA, there are two energy indicator systems that complement each other. The first is developed by the Energy Information Administration, while the second is by the US Department of Energy (DOE) – Office of Energy Efficiency and Renewable Energy (EERE). The EERE indicators differ from the DOE in that they provide more detailed sector disaggregation, and identify additional explanatory factors at each level of aggregation. Statistical data for the indicators are obtained from different entities including: U.S. Department of Commerce, Bureau of Economic Analysis; Federal Reserve System, Statistical release G17; Federal Highway Administration; and Federal Aviation Administration[36].

In Sweden, Swedish Energy Agency is the entity hosting the indicator system, and Statistical data are mainly obtained from the Swedish Official Statistics (SOS). In the UK, the Department of Energy and Climate Change (DECC), which is a governmental Department, is the entity hosting the indicator system. Data for the indicators is obtained based on surveys carried out by DECC, as well as the Office for National Statistics, Office of the Gas and Electricity Markets (Ofgem) and other Government Departments.

The Institutional setups for EE in different developed and developing countries were analyzed in details in a study carried out by the World Bank37. The study covered twenty-nine EE agencies spanning twenty-seven countries and varying in age from 2 to 30 years. The analysis revealed seven distinct institutional models, ranging from government agency to privately owned entities:

1. Government agency with broad energy related responsibilities
2. Government agency focused on clean energy technologies (e.g., EE, renewable energy, sustainable energy, global climate change)
3. Government agency focused on EE only
4. Independent statutory authority (ISA) with a government-appointed board
5. An independent corporation (IC) owned by the government
6. A public - private partnership (PPP), generally in the form of a corporation with ownership by government and nongovernmental entities
7. A nongovernmental organization (NGO)

Examples of the Seven Institutional Models and Advantages and Limitations, are presented in Table (4)

[36] Source: - EERE energy efficiency indicator website http://www1.eere.energy.gov
- US EIA Independent Statistic and Analysis

[37] World Bank: ESMAP, "An Analytical Compendium of institutional frameworks for energy efficiency implementation" October 2008.

Table (4): Examples of the Seven Institutional Models and Advantages and Limitations

Type	Brief Description	Examples	Advantages	Limitations
Government Agency	Agency with broad energy responsibilities	U.S. Department of Energy Danish Energy Authority	- There is greater credibility with stakeholders. - Government agencies have access to public funding. - There is integration of EE within broad sector objectives.	- EE must compete with other energy programs for resources and management attention. - Large bureaucracy may impede decision making. - It is difficult to retain staff.
Government Agency	Agency focusing primarily on clean energy	Australian Greenhouse Office Mexico: CONAE	- Agency focus is consistent with EE. - It is easier to attract dedicated staff. - Dedicated "clean energy" agency provides greater voice in sector policy and obtaining resources.	- Narrower focus provides less clout. - Potential for competition between technologies (EE, RE) within the clean energy Umbrella.
Government Agency	Agency focusing entirely on EE	Thailand: DEDE Brazil: PROCEL	- There is opportunity to create a pro-EE agency culture. - It is easier to attract dedicated staff and dynamic management. - There is possible leveraging of other resources (e.g., GEF, donors).	- Narrower focus provides less clout. - Success is highly dependent on effective top management. - Agency may not be isolated from broader energy policy agenda. - Agency must compete for resources.
Independent Statutory Authority (ISA)	An independent authority created by statute to promote EE or clean energy	U.K. Energy Saving Trust Sustainable Energy Ireland	- Independence facilitates operational discretion. - There is flexibility in accessing outside advice and support. - ISAs have flexibility in hiring management and staff. - ISAs have flexibility in fund raising and decision making	- Agency may not be viewed as mainstream. - There is potential competition between ISA and public agencies. - ISAs have less direct access to public funding. - Changing scope may require legislation.
Independent corporation	An independent corporation owned entirely by the government	South Africa: NEEA Korea Energy	- Independence facilitates operational discretion. - Independent corporations can access private-sector talent and technical	- Independent corporations have less direct access to public funding. - Board selection and composition will determine effectiveness.

Type	Brief Description	Examples	Advantages	Limitations
		Management Corporation	capacity. - They have the ability to form JVs and subsidiaries. - There is flexibility to obtain external inputs and funds, including shares flotation.	- Agency may not be viewed as mainstream. - Potential competition exists between IC and public agencies.
Public–private partnership (PPP)	A corporation owned partly by the government and partly by the private sector	Polish National Conservation Agency Germany: DENA	- Partnerships have flexibility in obtaining private-sector inputs (and possibly funding). - Independence allows greater freedom and flexibility in decisions.	- There are potential conflicts between public and private perspectives. - Partnerships have less direct access to public funding.
Non-governmental organization (NGO)	Non-profit or nongovernmental organization	Austrian Energy Agency Croatia Energy Institute	- NGOs have greater credibility with some stakeholders. - They may attract dedicated staff and management. - EE focus helps build core competencies. - There is flexibility to obtain external inputs and funding.	- NGOs have less direct access to public funding. - Some public- and private-sector stakeholders may find the NGO not credible. - NGO governance structure may impose other strictures.

Source: World Bank: ESMA, "An Analytical Compendium of institutional frameworks for energy efficiency implementation" October 2008.

8.2 Proposed Institutional Setup, Necessary Conditions

A National level Government Body

The institutional structure, and culture, of the Egyptian state necessitates that the EE lead institution be governmental. The existing EE institution setup, presented in section 9, includes the Supreme Council for Energy which falls under the first category of the World Bank study "Government Agency with Broad Energy Related Responsibilities", and the Energy Efficiency Unit which follow the third category "Government agency focused on EE only". These are also closest to the decision making hub represented by the Cabinet.

Bottom-Up Approach

The consultant team has intended during this assignment to generate, as per the TORs, energy indicators for selected sub-sectors of the Egyptian economy based on existing data. The team was faced with a number of limitations which constrained application. As stated above, although data is generated at the facility level, it is often not properly stored nor transferred to the higher, sectoral or sub-sectoral, level. The incompatibility of data compiled for different purposes constrains its usability for the common purpose of production of reliable energy indicators.

In most of the cases, the data is ***available***, ***disaggregated*** and obviously ***compatible*** when it is considered at the facility level. This data could be compiled through periodical surveys. However, as clarified in the figure below, the effort related to data collection increases with the level of disaggregation. Accordingly, in order to avoid this increase in costs, an approach that makes data generated at the facility level ***accessible*** to the higher level is necessary for a sustained energy accounting system.

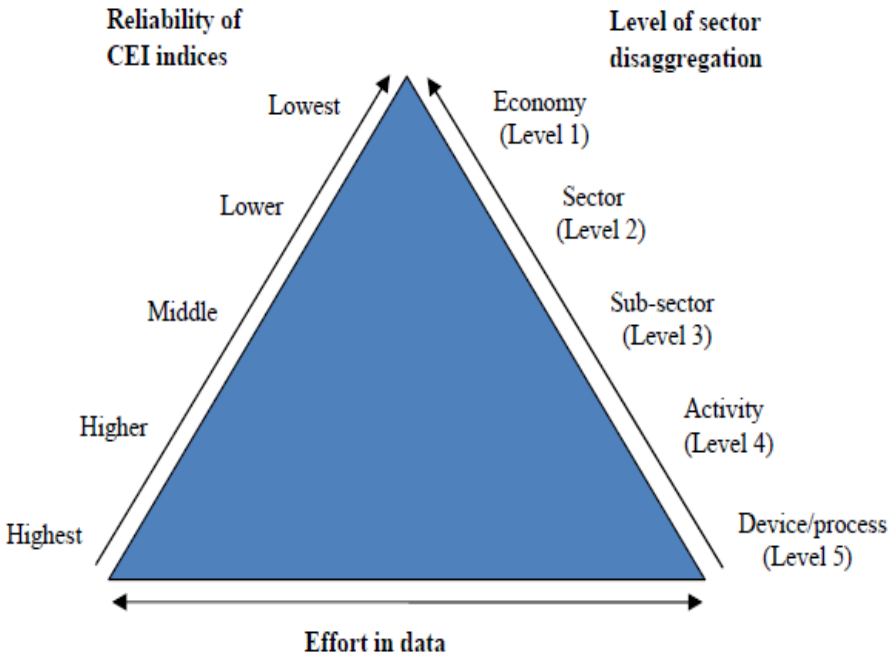


Figure (13): Data Disaggregation and Reliability of CEI

In order to reduce the time and costs related to such surveys, the relevant data already available at the facility level, on both its consumption and its activity measure, should be compiled by the same facility in an ***energy register***. This is a necessary condition for a sustainable energy accounting framework and has already been proposed in a draft electricity law and earlier in a proposed EE law, but was never put in place. The existence of this register at the facility level also represents an important input to awareness of energy performance, a necessary condition for voluntary action, at this level.

Costs could be rationalized even further if the data recorded at the facility level is availed to the entity compiling this data in a ***periodical energy report***. For most of the consuming sectors, this will avoid the need for surveys to produce indicators and limit them to field truthing and/or information needed for interpretation. Electronic reporting will obviously further reduce the cost of manipulation of the compiled data.

As it is unlikely that facilities will voluntarily undertake either steps, a regulation imposing energy recording and reporting on facilities is necessary. In order not to overwhelm the data compilation entity in the early stages of implementation, a preliminary focus on facilities above a certain consumption threshold, or on specific sectors/sub-sectors, is recommended, to be extended incrementally.

Sectoral Mainstreaming

Sectoral mainstreaming is a necessary condition for improvement of energy performance of the Egyptian economy without negatively impacting economic development targets. Energy reduction targets cannot be imposed without due consultation with the target community, likely to be more effectively undertaken at the sector level, and interventions to achieve these reduction targets are even more related to the specifics of each sector.

Similarly, on the energy accounting system level, the close involvement of the sectoral entities will hold a number of benefits. First, relevant data is currently not generated in a usable form by one statistical body, but rather by different ministries/agencies, each within its field of specialization. The distributed collection and compilation of data becomes even more relevant with data being reported by facilities. The specific format of this report will obviously be related to the nature of the sector, and the quantity of data expected to be received is unlikely to be handled by a single entity. Finally, and most importantly, the sectoral involvement in data collection and compilation represents an important step towards mainstreaming of the energy agenda, including EE, at the sector level.

A project was carried out by the EE unit of the SCE for developing EE units in the Ministries managing the main energy consuming activities. These ministries are:

- Ministry of Industry and Trade
- Ministry of Housing

- Ministry of Tourism
- Ministry of Transportation
- Ministry of Local Development

In addition, the entities to host the sectoral EE unit within each ministry have also been proposed with the scope of this study and are presented in Table (5)

It is proposed that the energy accounting system be hosted, at the sectoral level, within these EE units. The schools and hospitals, which fall within the scope of the current assignment, were not addressed in the other project. Therefore, the entity to host the indicator system within the Ministry of Education and Ministry of health needs to be identified based on the institutional setup within each ministry.

Table (5): Proposed Entities for Hosting the Energy Accounting System

Sector	Ministry	Proposed Entity
Industry	Ministry of Trade and Industry	IDA
Tourism (Hotels)	Ministry of Tourism	TDA
Transportation	Ministry of Transport	National Institute of Transport
Residential	Ministry of Housing	Housing and Building National Research Center
Commercial	Ministry of Trade and Industry	Internal Trade Development Authority
Schools	Ministry of Education	To be determined by the Ministry
Hospitals	Ministry of Health	To be determined by the Ministry

8.3 Energy Accounting System, by Task

The main tasks undertaken within the energy indicator system are:

- ***Identification of Energy Intensity indicators***
  Intensity indicators are identified based on the purpose of their use. There are EI indicators adopted to measure the energy intensity for an activity. In the residential sector, for example the EI is total electricity (or energy) consumption/housing units or m^2. Others are developed to test the impact of an implemented EE policy, for example, the introduction of energy saving lamps could be tested by an EI indicator for measuring electricity consumption in lighting/housing unit or m^2. The focus of this assignment was on the former category and it is proposed that the indicators proposed are taken as a starting point.

  It is proposed that these indicators be refined and extended with system development to include additional sectors/sub-sectors or additional indicators, e.g. to test the impact of specific policies, as the need arises.

Table (6): Proposed Indicators

Sector/Sub-sector	Proposed Indicator
Industry	▪ Energy Consumption (toe)/Unit of Production (ton) ▪ Energy Consumption (toe)/Value Added (LE)
Residential	▪ Average Electricity Consumption (kWh)/Household
Hotels	▪ Energy Consumption (toe)/Guest Night ▪ Energy Consumption (toe) /Hotel Room ▪ Energy Consumption (toe)/Value Added (LE)
Schools	▪ Electricity consumption (kWh)/Student
Hospitals	▪ Energy Consumption (toe)/Patient Bed
Office Buildings, Supermarkets, Malls	▪ Electricity consumption (kWh)/m^2
Transportation	▪ Energy Consumption (toe) /passenger-km ▪ Energy Consumption (toe) /ton-km

- ***Data Generation and Compilation***

  As clarified in Table (7) below, the data needed for the proposed EI indicators was not always available or accessible in the format required for energy accounting. In the course of this assignment, it has been noticed that activity data and energy data for a specific indicator could be available in one entity (e.g. EEHC provides electricity data as well as number of households), while for others, activity data and energy data are available at two or more entities (e.g. Ministry of Health provides patients beds data, while other entities provides energy consumption data). Moreover, data could be available in one entity but not in the format required for calculating the indicators, as per some of the transportation data, or data could be available but not compiled as per the floor area data available at the municipalities.

  The *generation of data for a specific EI indicator by a single entity* prevents errors resulting from matching data from different entities. This will apply to e.g. the railway authority and the metro company. In cases where the *Data for a specific EI indicator is generated by different entities*, it is proposed that data be recorded at the lowest disaggregated level possible to accurately match. The application will differ according to the sub-sector as clarified in table (7). For some of those, data is to be compiled by school, hospital, supermarket, office building, hotel and factory, while for others especially for transportation sub-sectors, the level will be at the companies, e.g. river transport, city transport, air transport, and truck transportation companies. Most of the data discrepancies and limitations faced during this assignment could be avoided through data recording and reporting at the facility level.

- ***Data Verification***

  The verification has to be carried out by an unbiased entity, to ensure the quality and reliability of data to which the quality of indicator is sensitive.

  For ensuring the quality and reliability of the indicators, the compiled data for the indicators has to be verified for quality control and assurance by an unbiased entity. CAPMAS is the organization mandated by law to collect data on the national level. Accordingly, it is proposed that the SCE/EE unit mobilizes CAPMAS to play this role in cooperation with the suppliers of energy, namely electricity, natural gas and petroleum products.

Table (7): Data and Sources

Sector	Sector/ EI Indicator	Required Data	Source	Proposed Source[38]
Residential	- *Electricity consumption/ number of household*	Electricity consumption	EEHC	EEHC
		number of households		
Industry	- *Energy Consumption/ Unit of production* - *Energy Consumption/ Value added*	Energy Consumption	IDA	Individual Industrial facilities
		Unit of production		
		Value Added	CAPMAS	CAPMAS
Tourism (Hotels)	- *Energy Consumption per Hotel/ Guest Night* - *Energy Consumption per Hotel /Room* - *Energy Consumption in Hotel/Value added*	Energy Consumption	EEHC EGAS	Individual Hotels
		Guest Nights	TDA (not compiled)	
		Room		
		Value added	CAPMAS	CAPMAS
Commercial (office building/super markets/malls)	- *Electricity consumption in office buildings/floor area* - *Electricity consumption in supermarkets/floor area* - *Electricity consumption in malls/floor area*	Electricity Consumption	EEHC	Individual Facilities
		Floor area	Municipalities (not compiled)	
Schools/ Hospitals	- *Energy consumption in hospitals/ Patient Bed* - *Electricity consumption in schools/Class* - *Electricity consumption in schools/Student*	Energy Consumption	EEHC EGAS	Individual Schools and Hospitals
		Patient Bed	MOH [39]	
		Student	MOE	
Transportation	- *Transportation* - *Energy Consumption in railways//passenger-km* - *Energy Consumption in railways /ton-km* - *Energy consumption in*	Energy Consumption in railways	ERA	ERA
		passenger-km in railways		
		ton-km in railways		
		Energy consumption in metro	EMC	EMC
		passenger-km in metro		
		Energy consumption for freight river	EGPC	River Transport Companies

[38] For specific sub-sectors at system initiation

[39] Data was mainly obtained from the MOH and completed from other entities including CAPMAS and the hospitals.

Sector	Sector/ EI Indicator	Required Data	Source	Proposed Source[38]
	metro/passenger-km - *Energy consumption in river transport/ton-km* - *Energy consumption in public river transport/ passenger-km* - *Energy consumption in Domestic Air transportation/ passenger-km* - *Energy consumption in intracity public buses/ passenger-km* - *Energy consumption in intercity buses/ passenger-km* - *Energy consumption in freight transportation by truck/ton-km*	transport		
		ton-km in river	River Transport Authority	
		Energy consumption for passenger river transport	CTA	CTA
		passenger-km in river		
		Energy consumption in Domestic Air transportation	Ministry of Civil Aviation	Air Transport companies
		passenger-km in Domestic Air transportation		
		Energy consumption in intracity public buses	CTA & ATA	City Transport Companies
		passenger-km in intracity public buses		
		Energy consumption in intercity buses	HCMLT	Passenger and Freight transportation companies.
		passenger-km in intercity buses		
		Energy consumption in freight transportation by truck		
		ton-km in freight transportation by truck		

- ***Indicators processing and analysis***

  Processing and analysis of the indicator, according to the proposed accounting framework, require dedicated and focused personnel with adequate background and whose expertise will be accumulated through practical experience.

  There are obvious benefits for indicator processing and analysis at the sectoral level, as the sector is better comprehended by those closer to the specifics of its activities. Moreover, as both data collection and compilation from one side and decision making and action from the other should be undertaken by the specific sector, undertaking the linking intermediately step of data processing and analysis is consistent with a mainstreaming approach.

  However, the current adoption of a decentralized (Sectoral) processing and analysis of indicators might not be feasible. First, not all sectors are currently ready to host such a system. For example, in the industrial sector, the IDA has an established system for collecting data and calculating specific energy consumption, and this system could be further developed to host the indicator system. On the other hand, the TDA does not compile the required energy or activity data for the indicator.

  The implementation of this accounting framework will also benefit, at its early stages, from extensive feedback for refinement and adjustment, which is better managed centrally. Accordingly, at the initiation of the system, it is proposed that processing and analysis be centralized (Supra-Sectoral) and hosted by SCE. In parallel, actions could be taken to decentralize the indicator system to the sectoral level, incrementally.

  This could be done on two levels from one side, and as described in Chapter 4, there are three consecutive levels of calculation. Incremental decentralization could therefore be through the transfer of calculation levels one by one. This is to be done from another side, the transfer to decentralized processing and analysis could be phased based on the level of development, capability and needs of the specific sector and the Ministry/Agency managing it. One or more sectors where an EE unit is planned to be established will be priority sectors where the indicator system is decentralized.

  In summary, processing and analysis are proposed to be initiated centrally with a clear vision to decentralize these tasks to the sectoral level. Accordingly, in the short term, it is proposed that SCE takes the responsibility of processing and analysis through its EE unit. To ensure a smooth transfer from a centralized to a decentralized system, it is proposed that the EE unit of SCE seconds professionals from entities planned to undertake these tasks in the different ministries. These professionals will represent, in due time, the core of sectoral system.

- ***Reporting***
  Reporting will be undertaken by the EE unit to both the Ministry/Agency supervising specific sub-sectors, as well as the SCE. For all sectors to which processing and analysis will be decentralized, the sectoral entity will take over this role.

  An integral part of the reports will be a comparative analysis of the time trends and relationship to drivers of the specific sector/sub-sector energy consumption, as well as a comparison to relevant international indicators or benchmarks. Areas requiring more attention and analysis and/or action should also be identified.

- ***Setting Action Plans***
  Based on the indicators and analysis, action plans with set targets are developed, including policies at the national and sectoral levels. These should be proposed by the EE unit in cooperation with sectoral units to be presented to the relevant ministries for discussion and adoption. These plans will be discussed and approved by the SCE to ensure consistency, and eventual synergy and that they are in line with the policies developed on the national levels.

9. Actions to Improve Energy Efficiency

Planning for action to improve EE has to be based on energy indicators calculated from high quality data. In this respect, the energy accounting system proposed in the previous section represents a necessary, but not a sufficient, input to EE planning.

However, the mere existence of knowledge does not drive the decision making and action required for improving energy performance of the Egyptian economy. There are additional necessary pillars on which an Energy Efficiency (EE) system should be based, none of which is well developed in Egypt. This section briefly presents the status of each of these pillars in Egypt. These include the institutional setup, related strategy and regulatory framework as well as EE policies.

- **Institutional Setup of Energy Management in Egypt**

Managing EE on the national level requires the existence of a national organization to lead and promote EE activities, and formulate an effective national EE strategy with national and sectoral energy intensity reduction targets.

The Organization of Energy Planning (OEP) could have played this role. OEP was established in 1983 as an independent legal entity reporting to the Ministry of Petroleum to take the responsibility of providing technical support to the Supreme Council for Energy (SCE). It was established in 1979 to undertake comprehensive and integrated energy planning and policy analysis within the economic framework.

During its life time, OEP generated useful knowledge in terms of national energy balances, surveys and studies. It also built human capacity and expertise of a corps of energy specialists. However, since the SCE did not convene, the decision making body which OEP should have been supporting represented a crucial missing link for an energy management system to be developed, let alone sustained.

Moreover, the focus on energy planning at the national level without mainstreaming at the sectoral level hampered real EE progress to take place. The demand for the service supplied by OEP never materialized and it was finally dissolved in 2006.

EE activities currently distributed among different organizations (Key EE players) in the Egyptian market are:

- **Supreme Council of Energy (SCE)**
  The SCE has been revived in 2007 and it takes over the strategic functions of energy policy, including EE. Members include ministries representing most of the consuming sectors, energy producers and other stakeholders such as Environment and Finance.

- **Energy Efficiency Unit in the Supreme Council of Energy**
  The Energy efficiency unit is established in 2009. The unit reports to the SCE, and its main focus is to coordinate all efforts related to energy efficiency.

- **New and Renewable Energy Authority (NREA)**
  The NREA was established in 1986. NREA's mission is to promote renewable energies and to assist in the development of a national plan for renewables. NREA is also active in the field of promoting EE and it operates the testing laboratories for standards of appliances. However, NREA is not responsible for developing policies or undertaking projects for energy efficiency.

- **Egyptian Energy Efficiency Council (EEC)**
  The EEC established in 2000, is a voluntary consortium of public and private sector organizations associated with the generation, distribution, and use of energy resources in Egypt. The main vision of the Council is to create an enabling framework that allows a wide adoption of energy efficiency in Egypt.

- **Electric Utility and Customer Protection Regulatory Agency (Egypt ERA)**
  Egypt ERA was established in 2000. The Agency's mandate is to regulate, supervise, and control all matters related to the electric power activities, whether in generation, transmission, distribution, or consumption, in a way that ensures availability and continuity of supply so as to satisfy consideration environmental protection, the interests of the electric power consumers as well as the interest of the producers, transmitters and distributors.

  ERA mandates covers all activities related to electric power, including consumption, while protecting the environment. Accordingly, within its scope of activities, ERA promotes EE among the consumers. In addition, a proposed electricity law, now in a draft status, adds new mandates to ERA including setting plans and programs for EE

- **Energy Unit in the Egyptian Environmental Affairs Agency (EEAA)**
  The role of the Energy Unit is to review the most appropriate institutional framework for energy efficiency on both energy production and consumption sectors, to implement demo projects and to disseminate more widely information, knowledge and best practices that support accelerated market development of energy efficiency and renewable energy.

As mentioned in section 8, of the current players, the recently established EE unit reporting to the Supreme Council of Energy (SCE) is planned to play the role of the lead EE entity. It is well located within the structure of the Egyptian government, but to date, it is not staffed nor equipped to play this role.

- **Laws and Regulations covering EE**

.

A limited number of EE standards and labels are regulated by Ministerial Decrees. Other applicable laws, such as environmental and traffic laws, have an indirect impact on EE.

A Draft electricity law, which addresses important aspects of EE, was cleared by the legislative department of the State Council and should now be reviewed by the Parliament. The issues addressed by this Draft Law include labeling and standards. It also requires from each facility with a contracting capacity above 500 KW to have an energy manager as well as an energy register. Moreover, the law obliges the competent ministry to design polices aimed at expanding the application of efficiency equipment.

A more exhaustive coverage of EE aspects was proposed in a draft energy efficiency law prepared in 2003 within the scope of the UNDP/GEF funded project for Energy Efficiency Improvements and Greenhouse Gas Reductions (EEIGGR). Proposed regulations in the law are:

- Establishment of an Energy Fund to enable finance for energy conservation projects. This fund is to be financed by the avoided subsidy of the electricity and fuel saved due to the implementation of the energy conservation projects.
- Making energy auditing in industrial and commercial enterprises mandatory every three years.
- Developing an energy efficiency benchmarking system based on the local practice for different industrial and commercial sectors. Facilities which are above the average benchmark will be requested to develop a compliance action plan and implement it, within five year. The benchmark will be updated every five years, and the above average companies will be requested to comply, such that a sustainable mechanism for energy efficiency improvement is developed.
- Requesting all energy providers (i.e. electricity and fuel) to allocate 1% of their revenue for the promotion of the energy conservation concept as well as public awareness.
- Establishing a National Energy Efficiency Agency which will implement as well as enforce the law.

The fact that EE is currently not directly regulated by any national laws and regulations represents a major constraint to progress on this front. The legal and regulatory framework provides overall direction for national energy efficiency strategies and policies. The EE Regulations coupled with a proper enforcement mechanism are considered one of the most effective tools for energy reduction. An energy efficiency law is required to regulate critical functions such as mandatory audits, mandatory designation of energy managers, reporting, mandatory labeling, and standards. The regulation of energy recording and reporting will represent a critical contribution to the proposed energy accounting system.

- **Energy Efficiency Strategy**

  Developing a National Energy Efficiency strategy is essential for setting the roadmap for EE in Egypt, guiding actions at the national and sectoral levels. Previous activities were undertaken in this respect, including the framework for the Egyptian National Energy Efficiency Strategy developed in 2001. Other documents addressing the issue include:

  - Framework for Sustainable Development Strategy, issued in 2008.
  - Cleaner Production Strategy for industry, issued by EEAA in 2006.
  - National Energy Strategy until 2020/2022, issued in 2005/2006 by the National Council for Production and Economic Affairs of the Specialized National Councils.
  - Egypt Energy Strategy to 2030, developed for EGAS in 2009.

  However, the fact is that a national EE strategy was never developed to be adopted. Such strategy should have guided, and thus potentially accelerated, the implementation of energy efficiency practice across all sectors, through setting specific, measurable and achievable energy efficiency objectives

- **EE Policies and Measures**

  The lack of a comprehensive energy efficiency strategy prevents the development of mutually supportive EE policies and measures. However, there are, currently, a number of direct and indirect EE policies and measures adopted on both the national and sectoral level.

  One of the main policies having a direct impact on EE is energy pricing. There is no question that EE has been hindered by subsidized energy prices. However, the government of Egypt has started in 2004 to gradually increase energy prices, and it is expected that with the incremental increase in the prices, EE projects will become more economically attractive.

  On the other hand, a policy that could have had an EE impact is the currently adopted progressive electricity pricing system in the residential sector. It could encourage energy consumers into moving from a high tariff tier to a lower one by adopting EE measures. However, as this system has been developed as a cost recovery approach rather than an EE tool, pricing levels do not seem to provide the needed incentives for consumers.

  Table (8) compiles current EE policies in Egypt, while Annex (XI) presents a short description of these policies. A summary of common energy efficiency policies adopted internationally is presented in Table (9) and their short description is included in Annex (XII). Comparing local EE policies to those commonly adopted internationally, it is clear that a number of EE policies proven effective in other countries are worth being considered in Egypt.

Table (8): Summary of Energy Efficiency Policies in Egypt

	Transportation Sector	Industrial Sector	Commercial and Residential Buildings
Regulatory Instruments	- New Traffic Law, issued in 2008 - Vehicle emissions testing and certification program	- Draft electricity law - Standards for equipment.	- Draft electricity law - EE building codes for residential and commercial buildings - Energy efficiency standards and labels for equipment
Financial Instruments	- Duties and taxes based on engine size - Preferential loans (general taxi loan)	- Loan and subsidies (EFI and IMC) - Price reform for Energy intensive sectors	- Subsidized Compact Fluorescent Lamps (CFLs) program.
Public Investment	- Modal shift through upgrade of metro - Modal shift as per the sustainable transport project of Egypt including: - Improving high quality buses - Constructing new networks with improved facilities for walking and cycling		
Policy Processes	- Master Planning (Greater Cairo Urban Transport Master Plan) - National Sustainable Development framework Strategy	- National Sustainable Development framework Strategy - National strategy for cleaner Production	- National Sustainable Development framework Strategy
Voluntary Agreements			- Green Star Hotel Initiatives - Green Pyramid Rating System
Education and outreach		- Capacity Building - Recognition programs	

Table (9): Summary of International Energy Efficiency Policies

	Transportation Sector	**Industrial Sector**	**Commercial and Residential Buildings**
Regulatory Instruments	- Fuel economy standards - EE Labeling for new cars - Mandatory Audits	- Minimum energy performance standards - Energy management standards - Mandatory Audits	- Energy Efficiency Building Codes - Minimum Energy Performance Standards for appliances - Mandatory Audits - Appliances labeling
Financial Instruments	- Vehicle taxation - Fuel taxation - Road Pricing - Car scraping Schemes	- Energy or energy related CO_2 taxes - Grants and subsidies - Energy efficiency loans and innovative funding mechanisms - Tax relief for purchase of energy efficient technologies	- Grants for EE projects in Schools - Subsidies for EE measures in commercial and residential buildings - Green loan programs for households - Energy taxes
Public Investment	- Modal shift of existing or establishment of new public modes of transportation	- National EE Industrial Programs	- Energy Efficiency in Government Operations
Policy Processes	- National energy efficiency strategies - Strategies and action plans for EE in transportation	- National energy efficiency strategies - Strategies and action plans for EE in Industry	- National energy efficiency strategies and action plans
Voluntary Agreements	- Voluntary agreements with vehicle manufacturers	- Energy Reduction Agreements with industries	- Energy Star for buildings - Voluntary building industry initiatives
Education and Outreach	- Dissemination of EE information through websites	- Capacity building - Recognition programs	- Dissemination of EE information through websites
Tradable permits	- Energy savings obligations	- Energy Savings Obligations	- Energy Savings Obligations

10. Policies and Measures for Further Consideration

As effective policies need to be tailored to the context in which they are implemented, they cannot be transferred as such across different regulatory and cultural environments. Accordingly, national and sectoral institutions need to consider commonly adopted policies on the international level with due consideration to relevant constraints and opportunities. This should be within an EE strategy developed and adopted by these institutions, which should also develop and advocate the adoption of a regulatory framework conducive for EE management.

As clarified in the previous section, the strategy and the regulation can effectively build on previous efforts in both respects. However, as opposed to previous practice, they need to be considered together to avoid a dominant partial approach that has dominated and has proven ineffective during the last decades.

The design of the institutions to undertake EE planning and decision making for action is outside the scope of this assignment. A study currently being carried out by the EE of the SCE, referred to in section 8, addresses this issue. However, as much as they should be supported by the knowledge generated through an operational energy accounting framework, they could also benefit from the communication and management infrastructure secured through its implementation. The arrangement proposed for the energy accounting system should also pave the way for sectoral mainstreaming to take place.

This section is focused on the EE policies to be considered by such institutions. As the time needed for the development of the energy accounting framework should not delay all EE actions, this section also proposes a number the short term interventions. Action is needed in the short term, not only to achieve progress on rationalizing energy consumption, but also to send the right signals to society and start building a very much needed EE culture. Moreover, the full scale implementation of EE strategy will require capacity building for the different players in energy efficiency management (including regulators, energy consumers, and equipment producers), and well public awareness and continuous dissemination of EE information related to products and programs. The implementation of short term interventions will insure that existing capacities will be utilized and additional capacities will be incrementally developed.

As will be seen, short term interventions are those which validity is not highly sensitive to the accurate calculation of local energy indicators.

The proposed policies are mainly implemented on the sectoral level. However ***Progressive Pricing*** is the major policy proposed to be implemented on the national level, although with specific sectoral applications.

Given that across the board increase of energy prices could have an impact on economically vulnerable sectors of society; it is a politically sensitive issue.

Accordingly, it is proposed that a progressive energy pricing be adopted, where reference for pricing varies among sectors.

Progressive Energy Pricing should lead to structural shifts within each sector as indicated in table (10) below. It is also an incentive for improving energy management practices and investing in energy efficient equipment for industrial facilities, residential and commercial units.

It should be noted that the existing progressive pricing infrastructure, e.g. in the residential sector would allow for a swift implementation, which requires pricing levels to shift from being a cross subsidy mechanism to becoming an effective disincentive mechanism. On the other hand, some of the approaches proposed for specific sectors will need to be based on robust local energy intensity indicators. In such cases, these will not be viable for short term interventions, unless preceded by targeted studies for specific subsectors (e.g. energy intensive industries). When dealing with productive sectors, the proposed approaches will need to be thoroughly discussed with the targeted community to insure implementability.

Additional policies to be considered include:

- EE standards
- Compulsory Energy labeling
- Mandatory energy audits
- Financial incentives and soft loans for EE
- Public investment in EE projects

Table (10): Expected Impact of Proposed Progressive Energy Pricing

	Proposed Reference for Progressive Energy Pricing	Excepted Reaction
Industrial	***Specific Energy Consumption per Ton of Product*** It is proposed to be applied to all energy sources except self generated renewable energy, and to vary depending on energy intensity of industry.	It will encourage structural shift towards low energy intensity industries.
Hotel	***Specific Energy Consumption of Electricity per Guest night*** The reference is proposed to be guest night, as this is the source of value added, and that the same reference be applied to all star categories.	It will encourage the shift to lower impact tourism (green hotels) as well as the shift to middle class hotels instead of luxurious hotels.
Transportation	Progressive Energy Pricing cannot be applied.	
Residential	***Consumption of electricity per Household*** It is proposed to use household, as per the existing pricing system, and not the area (m^2) as the reference. Time sensitive pricing could also be applied for large consumers.	This will control the conspicuous increase in area per household.
Commercial (Office Buildings/Supermarkets/ Malls)	***Consumption of Electricity per m^2*** The area of reference in malls should be the commercial space, i.e. excluding the public space, to encourage natural ventilation and lighting of public spaces. Time sensitive pricing could also be applied for large consumers.	Applying this reference is expected to control growth in public AC spaces, and excessive lighting in commercial stores.
Hospital and Schools	It is not recommended to apply a Progressive Energy Pricing	

- **Sectoral Level Policies**

  On the sectoral level, the EE policies are divided into three categories based on their effect on energy consumption. These categories are:
  - Activity Oriented
  - Intensity Oriented
  - Structural Oriented

  The ***activity oriented*** policies are those impacting the activity level within the sector. This should be reflected in the country's development plan and included in the sustainable development strategy and the EE strategy. It should be noted that the activity referred to is the activity of the sector as a whole and not the differential subsectoral development (e.g. the increase in the industrial sector activity could be based on the decrease of the activity of energy intensive sectors and an increase in that of less energy intensive ones), which is considered a structural issue.

  As clarified in table (11), it is clear that the increase in the residential and commercial sectors is inevitable, while the increase in the activity of the Industrial and Tourism (hotels) sector is desirable, that is in terms of output rather than investment, e.g. tourist guest nights rather than number of hotel rooms. With the exception of the transportation sector, controlling the growth of the activity will not be feasible. Accordingly, the focus has to be on the efficiency and structure oriented policies.

Table (11): Expected/ Needed Activity Development

Sector	Measure of Activity	Expected/Needed Activity Change
Industry	Production in tons	The increase in this sector's activity is desired for economic development.
Tourism (Hotels)	Hotel Rooms	The Egyptian tourism industry is one of the most important sectors in the economy, in terms of high employment and hard currency revenues. The increase in this sector size is needed for economic development.
Transportation	Passenger-Km Passenger -ton	Transport is a service sector with high energy consumption. Activity is expected to increase with population growth. However, this growth has to be controlled to reduce energy consumption. This could be achieved by long term plans of land use optimization.
Residential	Household	Population growth will inevitably lead to an increase in number of households.
Office Buildings/ Supermarkets/Malls	Area (m^2)	With the population growth and new development, the activity of the commercial sector is expected to increase.
Hospitals and Schools	Patients beds in hospitals and students in schools	This activity should increase as there is shortage in both hospitals and schools on the national level.

The ***intensity oriented*** policies result in the use of more energy efficient equipment, reduction of energy losses from the building envelope, and in adopting more energy efficient processes in operation, table (12) presents the proposed intensity effect policies accordingly.

The ***structure oriented*** policies reflect the sub-sector activity composition change within a sector. Table (13) presents the proposed structure oriented policies.

Table (12): Intensity Oriented Policies, proposed for Further Consideration

		Industry	Tourism (Hotels)	Transportation	Residential	Commercial	Hospitals and Schools
Equipment	Regulatory	**Minimum Energy Performance Standards (MEPS)** MEPS are applied for particular industrial equipment such as motors and boilers, or equipment specific to certain industries such as electric furnaces and rotary kilns. Appling MEPS will ensure the use of efficient energy equipment by industries.	**MEPS and Labels** MEPS as well as compulsory labeling of appliances will ensure the use of efficient equipment.	**Fuel Efficiency Standards** Setting fuel efficiency standards will result in more energy efficient fleet. **Labels** Regulating car labeling displaying information on fuel consumption will raise customer awareness and promote EE.	**MEPS and Labels** Same as hotels	**MEPS and Labels** Same as hotels	**MEPS and Labels** Same as hotels
	Financial	**Differential Taxes on Equipment** Applying accelerated depreciation, tax reduction, tax exemptions on energy efficient equipment, will encourage the purchase of energy efficient equipment and technologies. **Soft Financing** Providing soft financing for replacement of equipment with more EE ones. **Progressive Energy Pricing** Will encourage investment in energy efficient equipment	. **Soft Financing** Providing soft financing for replacement of appliances with more efficient ones, is an incentive for using more EE equipment**.** **Progressive Energy Pricing** Will encourage investment in energy efficient equipment.	**Subsides of Hybrid Vehicles** Subsidies of hybrid vehicles are expected to result in an increase in the share of hybrids, which is an energy efficient vehicle. **Vehicles Replacement** Similar to the taxis scraping scheme, providing preferential loans for private vehicles replacement will reduce energy inefficient fleet.	**Financial Incentives for equipment replacement** For specific high energy consumption equipment provide financial incentives for their replacement. **Progressive Energy Pricing** Will encourage investment in energy efficient equipment	**Progressive Energy Pricing** Will encourage investment in energy efficient equipment	**Financial Incentives for equipment replacement** Provide financial incentives for the replacement of specific high energy consumption equipment.
Building Envelope	Regulatory	NA	**Energy Audits** Compulsory internal periodical audits will assess the implementation of design standards, minimizing energy losses. It is proposed to be initially applied on large energy consumers.	NA	**Energy Audits** Same as hotels	**Energy Audits** Same as hotels	**Energy Audits** Same as hotels
Process	Regulatory	**Energy Audits** Compulsory internal periodical audits of industrial establishments will ensure compliance with EE regulations and will identify areas of improvement, leading to adopting better EE practices within the plant. **Energy Management Standards** EMS provides guidance for industrial facilities to integrate EE into their management practices, including fine-tuning production processes and improving EE of industrial systems.	**Energy Audits** Compulsory internal periodical audits of hotels will lead to adopting EE practices. **Energy Management Standards** EMS provides guidance for hotels to integrate EE into their management practices, and daily operations. **Maximum Light Intensity Standards** The Egyptian EE codes for commercial buildings set minimum energy intensity for different areas within Hotels. Setting maximum light intensity limits will minimize the excessive lighting in some places, and accordingly electricity consumption.	NA **Land Use Planning** Regulations for land use planning and zoning will reduce congestion and increase energy efficiency.	NA	**Energy Audits** Same as hotels **Energy Management Standards** Same as hotels **Maximum Light Intensity Standards** Similar to hotels, only minimum energy intensity for different areas within commercial buildings are available. **Regulating Time of Operation** Limiting the time of operation of commercial activities will decrease electricity consumption.	**Energy Audits** Same as hotels **Energy Management Standards** Same as hotels
	Financial	**Progressive Energy Pricing** Incentive to industry to improve energy management at their facilities.	**Progressive Energy Pricing** Incentive to improve energy management practices	**Fuel Pricing** Increasing fuel pricing will rationalize the use of private vehicles. However, decent public transportation options will need to be available first.	NA	**Progressive Energy Pricing** Incentive to improve energy management practices.	NA
	Public Investment	NA	NA	**Investing in public transport** This will provide the necessary infrastructure for modal shift into public transport	NA	**Investment in Government office Building** Government could invest in improving energy efficiency in office buildings to rationalize energy use.	NA

Table (13): Structure Oriented Proposed Policies

	Industry	Tourism (Hotels)	Transportation	Residential	Office Buildings/ Supermarkets/Malls
Structure Objective	Moving towards low energy intensive industries	Adopt low energy impact tourism	Modal shift to public transportation, railroads and river transport	Shifting towards more compact housing	Establish a more mixed development
Financial Policies	**Progressive Energy Pricing** Increasing pricing of energy for energy intensive sectors will lead to the control of energy intensive sector growth. As a result, investment in low energy consuming sectors will be favored. **Energy Export Taxes** Increasing export taxes on products of high energy content will also control the increase of energy intensive sectors.	**Progressive Energy Pricing** Will promote shifting into low energy impact tourism.	**Road pricing** A Road pricing including trucking is considered as a driver to shifting to public transport and freight transport by railroads and river. **Fuel Pricing** Increasing fuel pricing will encourage the use of public transport.	**Electricity Pricing** Increasing electricity prices will have an indirect impact on shifting towards more compact housing. On the other hand electricity pricing per unit area in the residential sector has to be avoided, as it will support the increase in housing areas and accordingly will increase energy consumption for the same number of households.	**Electricity Pricing** Increasing electricity prices on commercial activities such as shopping malls will have an indirect impact on limiting the growth of such activities.
Public Investment			**Investment in Public Transportation and Railroads and River Transport** Availability of public transportation will encourage modal shift. In addition, availability of railroads and river transport will encourage the shift from freight transport by road to railways and river.		

Short term Interventions

Compared to structural or activity impacts, intensity impacts are more likely to be achieved on the short term. Accordingly, the focus will be on the short term, with two notable exceptions

First, transportation will need more direct interventions related to structural (i.e. modal) shift, from private to public transport and from trucking goods to transportation through the more efficient means of railroads and river transport. Although impacts might take some time to materialize, the relevant structure oriented policies will need to be initiated in the immediate term. Moreover, in terms of activity, export of industrial energy intensive products will need to be controlled in the immediate term to avoid over investment in such industries.

The proposed short term interventions are presented in Table (14). Selected interventions are detailed in Annex (XIII)

Table (14): Proposed Short Term Interventions

	Industry	**Residential**	**Hotels**	**Transportation**	**Commercial**
Progressive Pricing	Differential Pricing based on specific Energy consumption in high energy intensity sub-sectors	Increase electricity prices for the higher consumption categories (above 350 KwH) to stimulate EE	Increase electricity prices for the higher consumption categories (5 stars) to stimulate EE	×[40]	Increase electricity prices for the higher consumption categories (e.g commercial malls) to stimulate EE
Peak Load Electricity Management [41]	Time Sensitive Pricing of Electricity Consumption for large consumers	Time Sensitive Pricing of Electricity Consumption for large consumers	Time Sensitive Pricing of Electricity Consumption for large consumers	×	- Controlling shopping activities during electricity peak demand - Applying time sensitive pricing for large consumers
EE labels and Standards	Completing EE standards and enforcement of labels for energy performance of major energy consuming equipment	Completing and updating EE standards and enforcement of labels for energy performance of major electricity consuming household equipment	Setting EE standards for appliances and enforcement of labels	Setting Fuel Efficiency Standards for vehicles and enforcement of Labeling	Setting EE standards for appliances and enforcement of labeling
Equipment Replacement	Replacement of Inefficient Industrial Equipment (e.g. motors & boilers)	Replacement of Selected household equipment (preliminarily focus on electric water heaters)	Replacement of Selected appliances (e.g. lighting and air conditioning)	Replacement of inefficient Vehicles	Replacement of Selected appliances (e.g. lighting and air conditioning)
Public Recognition Programs	Excellence award based on EE performance	×	Excellence award based on EE performance	×	×
More Effective Use of Energy Resources	Combined Heat and Power (CHP), and Waste Heat Recovery	×	×	×	×
Setting Trade Conditions	Controlling export of energy intensive products	×	×	×	×
Standards for in-door Environment	×	×	Setting maximum light intensity limits and minimum temperature limits in public spaces.	×	Setting maximum light intensity limits in shops.

[40] Applying progressive pricing policy in the transportation sector will not be feasible, as consumption of each individual user can not be tracked. However, this approach could be simulated through increasing licensing fees for vehicles with higher fuel use per unit of distance.

[41] This policy focuses on reduction of energy consumption during peak period. This reduction will be achieved through shifting demand for some activities and conducting other activities more energy efficiently. Thus this policy has an EE impact.

11. Next Steps

Operationalizing the energy accounting system, proposed in this study, and developing an EE national system requires the existence of a number of conditions, including:

- Institutional Setup
- Laws and Regulations Covering EE
- EE Strategy
- EE Policies and Measures

Satisfying all of the above conditions is the ultimate objective. However, on the short term there are a number of actions that are proposed to be carried out.

- ***Reporting***

  Data availability and compatability is a crucial prerequisite for the accounting framework system. Reporting at the lowest level, i.e. facility level, will allow generation of disaggregated and compatible data. The facility will keep an energy register at its premises and could also report periodically to the entity compiling the data through periodical energy reports.

  A regulation imposing energy recording and reporting on facilities is necessary. It is proposed that focus be on facilities above a certain consumption threshold, or on specific sectors/sub-sectors, to be extended incrementally.

- ***Focus on Pilot Sectors***

  As proposed during the EEU meeting held on June 19th, 2011, priority sector(s)/Sub-sector(s) could be selected to be focused upon as a pilot. Selecting the pilot sector(s)/Sub-sector(s) will be based on data generation and compilation status of the sector/sub-sector and the willingness of the sectoral entity to host and implement the energy accounting system.

  Based on data availability, it is proposed to focus on the industrial and residential sectors respectively. As for the willingness of these entities, namely the IDA and the Housing and Building National Research Center or other entities, it needs to be discussed among the EEU members.

  As discussed in the report, it is proposed that the energy accounting system be hosted by SCE at an initial stage, and be decentralized afterwards. Accordingly, it is proposed that SCE seconds professionals from sectors that will be focused upon in the pilot stage. During the secondment period, the professionals will be trained and prepared to host the system in their entities.

Since plans are underway to establish energy efficiency units in different entities, it is recommended that priority in establishing these units be to entities proposed to host the energy accounting systems.

In addition, it is proposed to apply the accounting framework for the indicators at two stages. The first is for indicators where data is generated and compiled, while the second is for data that is neither currently generated and/or compiled. For residential sector, schools, office buildings, supermarkets and malls, it is proposed that at the first stage the energy intensity is calculated using electricity consumption only, as electricity consumption data is available, while at the second stage the intensity is calculated using the total energy consumption data (electricity and fuel).

Table (15): Proposed EI Indicators in Two Stages

Sector/Sub sector	Proposed EI indicator for First Stage	Additional EI Indicator for Second Stage
Industry	▪ Annual Energy Consumption (toe)/Unit of Production (ton) ▪ Annual Energy Consumption (toe)/Value Added (LE)	
Residential	▪ Annual Electricity Consumption (kWh)/ Household	▪ Annual Energy consumption (toe) /Household ▪ Annual Energy consumption (toe)/floor area (m^2)
Hotels	▪ Annual and Monthly Energy Consumption (toe)/Guest Night ▪ Annual and Monthly Energy Consumption (toe) /Hotel Room ▪ Energy Consumption (toe)/Value Added (LE)	▪ Annual Energy consumption (toe)/floor area (m^2)
Schools	▪ Annual Electricity consumption (kWh)/Student	▪ Annual Energy consumption (toe)/floor area (m^2) ▪ Annual Energy consumption (toe)/Student
Hospitals	▪ Annual Energy Consumption (toe)/Patient Bed	▪ Annual Energy consumption (toe)/floor area (m^2)
Office Buildings, Supermarkets, Malls	▪ Annual Electricity consumption (kWh)/m^2	▪ Annual Energy consumption (toe)/floor area (m^2)
Transportation	▪ Annual Energy Consumption (toe) /passenger-km ▪ Annual Energy Consumption (toe) /ton-km	

- ***Implement Short Term Interventions***

  Short term interventions have been proposed in this study addressing:

  - ***Progressive Pricing***
  - Peak Load Electricity Management
  - EE Labeling and Standards
  - Equipment Replacement
  - Public Recognition Programs
  - More Effective Use of Energy Resources
  - Setting Trade Conditions
  - Standards for Indoor Environment

  Annex (XIII) includes details for each of the above interventions on the sectoral level.

  It is proposed to select from these interventions, a number of interventions that could be implemented directly. The proposed selection criteria include:

  - ***Effectiveness***

    Interventions that are expected to have high impact on energy savings and EE (e.g. controlling export of energy intensive products, and differential pricing based on SCE)

  - ***Easiness***

    Interventions that require no or low investment cost (e.g. Setting EE labels), and need minimum regulatory and institutional changes to be implemented (e.g. adopting EE recognition programs for industries and Hotels).

  - ***Signaling***

    Interventions that send a signal to the community regarding the scarcity of the energy resources, and shift their mindsets towards adopting energy efficient practices (e.g. increasing electricity prices for higher consumption categories commercial and residential sectors).

- ***Developing an Action Plan***

  A fully developed system covering all sectors of the Egyptian Economy should allow for the calculation of economy-wide indicators as well as those at the highest level of disaggregation practically useful for policy guidance. It is obvious that a multi-year action plan is necessary for such system to be established, developed and settled. Developing the action plan will be based on the experience gained during development of the first set of indicators.

  The first set of indicators will be based on the sectors covered by selected pilot units, and will cover year 2012 data, where data will be compiled periodically (proposed to be monthly) throughout the year and analyzed. The issuance of the first set of indicators will result in:

  - The development of an action plan based on real implementation experience, although of a limited scope;

- This action plan could represent the necessary basis for a donor financed project reflecting local, rather than donor priorities;
- Increase sectoral awareness of the benefits and workings of the proposed energy accounting framework, and accordingly buy-in and ownership;
- Issue an early version of energy indicators, benefiting from the experience accumulated through the current study but using more compatible data.

Table (16): Proposed Time Schedule for Preparatory Activities

	2011	2012				2013	
	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Establishing data collection system within the data generating entities							
Collecting and analyzing indicators data							
Verifying Data							
Calculating the EI Indicators by EEU/SCE							
Issuance of first Set of Indicators							
Revisiting the indicators and feeding back to data collection system							
Developing an Action Plan							
Action Plan							

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Annex (I)

Energy Intensive Industries PM Decrees

قرار رئيس مجلس الوزراء
رقم ١٧٩٥ لسنة ٢٠٠٨

رئيس مجلس الوزراء

بعد الاطلاع على الدستور ؛

وعلى القانون رقم ٢١ لسنة ١٩٥٨ بشأن تنظيم الصناعة وتشجيعها ؛

وعلى قانون ضمانات وحوافز الاستثمار رقم ٨ لسنة ١٩٩٧ ولائحته التنفيذية ؛

وعلى القانون رقم ١١٤ لسنة ٢٠٠٨ بفتح اعتمادين إضافيين بالموازنة العامة للدولة للسنة المالية ٢٠٠٧/٢٠٠٨ ؛

وعلى قرار رئيس الجمهورية رقم ٤٢٠ لسنة ٢٠٠٥ بشأن تنظيم وزارة التجارة والصناعة ؛

وعلى قرار رئيس مجلس الوزراء رقم ١٣٢٥ لسنة ٢٠٠٦ بشأن سعر بيع الغاز الطبيعى ؛

وعلى قرار المجلس الأعلى للطاقة بتاريخ ٢٠٠٧/٨/٢١ بشأن الموافقة على تعديل أسعار بيع الغاز الطبيعى والطاقة الكهربائية للشركات الصناعية كثيفة الاستهلاك للطاقة مع مراقبة تحركات أسعار الطاقة لضمان كفاءة وفاعلية التسعير ؛

وعلى قرار رئيس مجلس الوزراء رقم ١٩١٤ لسنة ٢٠٠٧ ؛

وبناء على ما عرضه وزراء البترول ، والكهرباء والطاقة ، والاستثمار ، والتجارة والصناعة ، والمالية ؛

قـــرر :

(المادة الأولى)

بالنسبة للقطاعات الصناعية كثيفة الاستهلاك للطاقة (زجاج - سيراميك - كيماويات - حديد - أسمنت - أسمدة - ألومنيوم - نحاس) .

ترفع أسعار الطاقة المستخدمة فيها على النحو التالى :

ترفع أسعار الغاز الطبيعى إلى ٣ دولارات لكل مليون وحدة حرارية بريطانية .

ترفع أسعار الكهرباء كالتالى :

٢٠,٢ قرش لكل كيلووات ساعة لمشتركى الجهد الفائق .

٢٤,٥ قرش لكل كيلووات ساعة لمشتركى الجهد العالى .

٣٣,٤ قرش لكل كيلووات ساعة لمشتركى الجهد المتوسط ، مع تعديل القسط الشهرى الثابت ليصبح ١٠,٤ جنيه / ك.و .

(المادة الثانية)

بالنسبة لقطاع صناعة البتروكيماويات :

الغاز المستخدم كوقود فى صناعة البتروكيماويات ، تطبق عليه نفس الأسعار الواردة بالمادة الأولى من هذا القرار .

الغاز المستخدم كمادة أولية فى صناعة البتروكيماويات ، يتم تسعيره طبقًا لمعادلة سعرية ترتبط بسعر المنتج النهائى ،

يطبق على هذه الصناعة نفس أسعار الكهرباء الواردة فى المادة الأولى من هذا القرار .

(المادة الثالثة)

بالنسبة لباقى القطاعات الصناعية (غذائية - غزل ونسيج - أدوية - هندسية) .

ترفع أسعار الطاقة دون التقيد بالحد الأدنى للاستهلاك على النحو التالى :

ترفع أسعار الغاز الطبيعى تدريجيًا على مدار ثلاث مراحل وذلك من ١,٢٥ دولار للمليون وحدة حرارية بريطانية إلى ٢,٦٥ دولار وذلك بمتوسط زيادة لكل مرحلة قدرها ٠,٤٦٦ لكل مليون وحدة حرارية بريطانية .

ترفع أسعار الكهرباء تدريجيًا على مدار ثلاث مراحل كالتالى :

من ٩ , ١١ قرش إلى ٨ , ١٧ قرش لكل كيلووات ساعة لمشتركى الجهد الفائق .

من ٤ , ١٤ قرش إلى ٦ , ٢١ قرش لكل كيلووات ساعة لمشتركى الجهد العالى ،

من ٧ , ١٩ قرش إلى ٥ , ٢٩ قرش لكل كيلووات ساعة لمشتركى الجهد المتوسط .

وذلك بمتوسط زيادة لكل مرحلة يبلغ ٢ قرش لكل كيلووات ساعة للجهد الفائق ، ٢ , ٤ قرش لكل كيلووات ساعة للجهد العالى ، ٣ , ٣ قرش لكل كيلووات ساعة للجهد المتوسط مع تعديل القسط الشهرى الثابت عن الحمل الأقصى المسجل الفعلى من ٩ جنيهات / ك.و إلى ٤ , ١٠ جنيه / ك.و . خلال نفس الفترة .

(المادة الرابعة)

على كل من وزير البترول ووزير الكهرباء والطاقة تنفيذ هذا القرار .

(المادة الخامسة)

ينشر هذا القرار فى الجريدة الرسمية ، ويعمل به اعتباراً من تاريخ نشره .

صدر برئاسة مجلس الوزراء فى ٢٦ جمادى الآخرة سنة ١٤٢٩ هـ

(الموافق ٣٠ يونيـــــة سنة ٢٠٠٨م)

رئيس مجلس الوزراء

دكتور/ أحمد نظيف

رقم الإيداع بدار الكتب ٦٥ / ٢٠٠٨

الهيئة العامة لشئون المطابع الأميرية

٢٥٠١٥ س ٢٠٠٨ - ٢١٠٧

قرار رئيس مجلس الوزراء

رقم ٤٤٦ لسنة ٢٠٠٩

بتعديل بعض أحكام قرار رئيس مجلس الوزراء رقم ١٧٩٥ لسنة ٢٠٠٨

رئيس مجلس الوزراء

بعد الاطلاع على الدستور ؛

وعلى القانون رقم ٢١ لسنة ١٩٥٨ بشأن تنظيم الصناعة وتشجيعها ؛

وعلى قانون ضمانات وحوافز الاستثمار الصادر بالقانون رقم ٨ لسنة ١٩٩٧ ؛

وعلى القانون رقم ١١٤ لسنة ٢٠٠٨ بفتح اعتمادين إضافيين بالموازنة العامة للدولة للسنة المالية ٢٠٠٧/٢٠٠٨ ؛

وعلى قرار رئيس الجمهورية رقم ٤٢٠ لسنة ٢٠٠٥ بشأن تنظيم وزارة التجارة والصناعة ؛

وعلى قرار رئيس مجلس الوزراء رقم ١٣٢٥ لسنة ٢٠٠٦ بشأن سعر بيع الغاز الطبيعى ؛

وعلى قرار مجلس الوزراء بجلسته رقم (١٨) المنعقدة بتاريخ ٢٠٠٦/١٠/١١ بشأن الزيادة فى أسعار المواد البترولية وأسعار الكهرباء اعتباراً من أكتوبر ٢٠٠٦ ؛

وعلى قرار المجلس الأعلى للطاقة بتاريخ ٢٠٠٨/١٢/١٦ بشأن المراجعة الدورية لجداول أسعار الطاقة ؛

وعلى قرار رئيس مجلس الوزراء رقم ١٩١٤ لسنة ٢٠٠٧ ؛

وعلى قرار رئيس مجلس الوزراء رقم ١٧٩٥ لسنة ٢٠٠٨ ؛

وعلى قرار المجلس الأعلى للطاقة بتاريخ ٢٠٠٧/٨/٢١ بشأن الموافقة على تعديل أسعار بيع الغاز الطبيعى والطاقة الكهربائية للشركات الصناعية كثيفة الاستهلاك للطاقة مع مراقبة تحركات أسعار الطاقة لضمان كفاءة وفاعلية التسعير ؛

وبناءً على ما عرضه وزراء البترول والكهرباء والطاقة والتجارة والصناعة ؛

قـــــرر :

(المادة الأولى)

تعـــدل المـــادة الأولى من قـــرار رئيس مجلس الوزراء رقـــم ١٧٩٥ لسنة ٢٠٠٨ بشأن أسعار الطاقة وذلك بحذف قطاعات صناعات الزجاج ، والسيراميك ، والكيماويات منها ، ويطبق عليها أسعار المادة الثالثة من القرار رقم ١٧٩٥ لسنة ٢٠٠٨

(المادة الثانية)

يستبدل بالنص (بالنسبة لباقى القطاعات الصناعية «غذائيـــة - غـزل ونسيج - أدوية - هندسية») الوارد بالمادة الثالثة من قرار رئيس مجلس الوزراء رقم ١٧٩٥ لسنة ٢٠٠٨ بشأن أسعار الطاقة ، النص التالى :

(بالنسبة لكافـة القطـاعـات الصناعيـة غير المذكورة فى المادتين الأولى والثانية من قرار رئيس مجلس الوزراء رقم ١٧٩٥ لسنة ٢٠٠٨) .

ويستـمر العمـــل بأحكام المـــادة الثالثـــة من القـــرار رقم ١٧٩٥ لسنة ٢٠٠٨ وذلك لأسعار كل من الغاز الطبيعى والكهرباء طبقًا لما هو وارد بها .

(المادة الثالثة)

على وزير البترول ووزير الكهرباء والطاقة تنفيذ هذا القرار .

(المادة الرابعة)

ينشـــر هذا القـــرار فى الجـــريدة الرسميـة ، ويعمـــل بـــه اعتباراً من ٢٠٠٩/٢/١ حتى نهاية عام ٢٠٠٩

صدر برئاسة مجلس الوزراء فى ١٦ صفر سنة ١٤٣٠ هـ

(الموافق ١١ فبراير سنة ٢٠٠٩ م) .

رئيس مجلس الوزراء

دكتور / أحمد نظيف

قرار رئيس مجلس الوزراء

رقم ١٩٥٣ لسنة ٢٠١٠

رئيس مجلس الوزراء

بعد الاطلاع على الدستور ؛

وعلى القانون رقم ٢١ لسنة ١٩٥٨ بشأن تنظيم الصناعة وتشجيعها ؛

وعلى قانون ضمانات وحوافز الاستثمار الصادر بالقانون رقم ٨ لسنة ١٩٩٧ ؛

وعلى قرار رئيس الجمهورية رقم ٤٢٠ لسنة ٢٠٠٥ بشأن تنظيم وزارة التجارة والصناعة ؛

وعلى قرار مجلس الوزراء بجلسته رقم (١٨) المنعقدة بتاريخ ٢٠٠٦/١٠/١١ بشأن الزيادة فى أسعار المواد البترولية وأسعار الكهرباء اعتباراً من أكتوبر ٢٠٠٦ ؛

وعلى قرار المجلس الأعلى للطاقة بتاريخ ٢٠٠٧/٨/٢١ بشأن الموافقة على تعديل أسعار بيع الغاز الطبيعى والطاقة الكهربائية للشركات الصناعية كثيفة الاستهلاك للطاقة مع مراقبة تحركات أسعار الطاقة لضمان كفاءة وفاعلية التسعير ؛

وعلى قرار المجلس الأعلى للطاقة بتاريخ ٢٠٠٨/١٢/١٦ بشأن المراجعة الدورية لجداول أسعار الطاقة ؛

وعلى قرار رئيس مجلس الوزراء رقم ١٣٢٥ لسنة ٢٠٠٦ بشأن سعر بيع الغاز الطبيعى ؛

وعلى قرار رئيس مجلس الوزراء رقم ١٧٩٥ لسنة ٢٠٠٨ ؛

وعلى قرار رئيس مجلس الوزراء رقم ٤٤٦ لسنة ٢٠٠٩ ؛

وبناءً على ما عرضه وزيرا البترول والتجارة والصناعة ؛

قـــــرر :

(المادة الأولى)

بالنسبة للقطاعات الصناعية كثيفة الاستهلاك للطاقة :

(الحديد - الأسمنت - الأسمدة - الألومنيوم - النحاس)

يستمر العمل بأسعار الغاز الطبيعى المستخدم فيها دون تغيير ، طبقًا للأسعار المنصوص عليها بالمادة الأولى من قرار رئيس مجلس الوزراء رقم ١٧٩٥ لسنة ٢٠٠٨ والمحددة بـ ٣ دولارات لكل مليون وحدة حرارية بريطانية .

(المادة الثانية)

بالنسبة لقطاع صناعة البتروكيماويات :

الغاز المستخدم كوقود فى صناعة البتروكيماويات ، ينطبق عليه الأسعار الواردة بالمادة الأولى من هذا القرار .

الغاز المستخدم كمادة أولية فى صناعة البتروكيماويات ، يتم تسعيره طبقًا لمعادلة سعرية ترتبط بسعر المنتج النهائى .

(المادة الثالثة)

بالنسبة لقطاعات صناعات :

(الزجاج المسطح - السيراميك والبورسلين)

تحدد أسعار الغاز الطبيعى المستخدم فيها بـ ٢,٣ دولار للمليون وحدة حرارية بريطانية .

(المادة الرابعة)

بالنسبة لكافة القطاعات الصناعية الأخرى غير المذكورة فى المواد الأولى والثانية والثالثة من هذا القرار :

تحدد أسعار الغاز الطبيعى بـ ٢ دولار للمليون وحدة حرارية بريطانية .

(المادة الخامسة)

يستمر العمل بأسعار الطاقة الواردة بقرار رئيس مجلس الوزراء رقم ٤٤٦ لسنة ٢٠٠٩ بالنسبة لصناعات (الزجاج - السيراميك - الكيماويات) حتى ٢٠١٠/٦/٣٠

(المادة السادسة)

تتم مراجعة هذه الأسعار بصفة دورية فى ضوء تغيرات الأسعار العالمية وكذلك فى ضوء التغير فى متوسط سعر تصدير الغاز المصرى .

(المادة السابعة)

على وزير البترول تنفيذ هذا القرار .

(المادة الثامنة)

ينشر هذا القرار فى الجريدة الرسمية ، ويعمل به ابتداء من ٢٠١٠/٧/١

صدر برئاسة مجلس الوزراء فى ٢٩ رجب سنة ١٤٣١ هـ

(الموافق ١١ يولية سنة ٢٠١٠ م) .

رئيس مجلس الوزراء

دكتور / أحمد نظيف

رقم الإيداع بدار الكتب ٢٠١٠/٦٥ الهيئة العامة لشئون المطابع الأميرية ٢٥٠٣١ س ٢٠١٠ - ١٩٠٧

قرار رئيس مجلس الوزراء
رقم ٢١٣٠ لسنة ٢٠١٠

رئيس مجلس الوزراء

بعد الاطلاع على الدستور ؛

وعلى القانون رقم ٢١ لسنة ١٩٥٨ بشأن تنظيم الصناعة وتشجيعها ؛

وعلى قانون ضمانات وحوافز الاستثمار الصادر بالقانون رقم ٨ لسنة ١٩٩٧ ؛

وعلى قرار رئيس الجمهورية رقم ٤٢٠ لسنة ٢٠٠٥ بشأن تنظيم وزارة التجارة والصناعة ؛

وعلى قرار مجلس الوزراء بجلسته رقم ١٨ المنعقدة بتاريخ ٢٠٠٦/١٠/١١ بشأن الزيادة فى أسعار المواد البترولية وأسعار الكهرباء اعتباراً من أكتوبر ٢٠٠٦ ؛

وعلى قرار المجلس الأعلى للطاقة بتاريخ ٢٠٠٧/٨/٢١ بشأن الموافقة على تعديل أسعار بيع الغاز الطبيعى والطاقة الكهربائية للشركات الصناعية كثيفة الاستهلاك للطاقة مع مراقبة تحركات أسعار الطاقة لضمان كفاءة وفاعلية التسعير ؛

وعلى قرار المجلس الأعلى للطاقة بتاريخ ٢٠٠٨/١٢/١٦ بشأن المراجعة الدورية لجداول أسعار الطاقة ؛

وعلى قرار رئيس مجلس الوزراء رقم ١٣٢٥ لسنة ٢٠٠٦ بشأن سعر بيع الغاز الطبيعى ؛

وعلى قرار رئيس مجلس الوزراء رقم ١٧٩٥ لسنة ٢٠٠٨ ؛

وعلى قرار رئيس مجلس الوزراء رقم ٤٤٦ لسنة ٢٠٠٩ ؛

وبناء على ما عرضه وزيرا الكهرباء والطاقة والتجارة والصناعة ؛

قـــــرر :

(المـادة الأولى)

بالنسبة للقطاعات الصناعية كثيفة الاستهلاك للطاقة :

(الحديد - الأسمنت - الأسمدة - الألومنيوم - النحاس - البتروكيماويات)

تحديد أسعار الكهرباء كالتالى :

٢١,٧ قرش لكل كيلو وات ساعة لمشتركى الجهد الفائق .

٢٦,٣ قرش لكل كيلو وات ساعة لمشتركى الجهد العالى .

٣٥,٨ قرش لكل كيلو وات ساعة لمشتركى الجهد المتوسط .

مع تعديل القسط الشهرى الثابت عن الحمل الأقصى المسجل الفعلى ليصبح ١٢,١ جنيهًا /ك.و .

يتم زيادة أسعار الطاقة الكهربائية المستهلكة فى هذه القطاعات بنسبة (٥٠٪) خلال فترة الذروة (٤ ساعات تحدد بدايتها وزارة الكهرباء والطاقة) .

(المـادة الثانية)

بالنسبة لقطاعات صناعات :

(الزجاج المسطح - السيراميك والبورسلين)

تحديد أسعار الكهرباء كالتالى :

١٥,٩ قرشًا لكل كيلو وات ساعة لمشتركى الجهد الفائق .

١٩,٢ قرشًا لكل كيلو وات ساعة لمشتركى الجهد العالى .

٢٦,٣ قرشًا لكل كيلو وات ساعة لمشتركى الجهد المتوسط .

مع تعديل القسط الشهرى الثابت عن الحمل الأقصى المسجل الفعلى ليصبح ١١,١ جنيهًا /ك.و .

(المـادة الثالثة)

بالنسبة لكافة القطاعات الصناعية الأخرى غير المذكورة فى المادتين الأولى والثانية من هذا القرار :

تحدد أسعار الكهرباء كالتالى :

١٥,٤ قرشًا لكل كيلو وات ساعة لمشتركى الجهد الفائق .

١٨,٦ قرشًا لكل كيلو وات ساعة لمشتركى الجهد العالى .

٢٥,٥ قرشًا لكل كيلو وات ساعة لمشتركى الجهد المتوسط .

مع تعديل القسط الشهرى الثابت عن الحمل الأقصى المسجل الفعلى ليصبح ١١,١ جنيهًا /ك.و .

(المـادة الرابعة)

يستمر العمل بأسعار الطاقة الواردة بقرار رئيس مجلس الوزراء رقم ٤٤٦ لسنة ٢٠٠٩ بالنسبة لصناعات (الزجاج - السيراميك - الكيماويات) حتى ٢٠١٠/٦/٣٠

(المـادة الخامسة)

على وزير الكهرباء والطاقة تنفيذ هذا القرار .

(المـادة السادسة)

يُنشر هذا القرار فى الجريدة الرسمية ، ويعمل به ابتداءً من ٢٠١٠/٧/١

صدر برئاسة مجلس الوزراء فى ١٧ شعبان سنة ١٤٣١ هـ
(الموافق ٢٩ يولية سنة ٢٠١٠م)

رئيس مجلس الوزراء

دكتور/ أحمد نظيف

رقم الإيداع بدار الكتب ٢٠١٠/٦٥ الهيئة العامة لشئون المطابع الأميرية ٢٥٠٥٨ س ٢٠١٠ - ١٩٠٧

Annex (II)

International Structures for Energy Analysis

Sectors	Sub-Sectors				
	Australia	**Canada**	**New Zealand**	**IEA (International Energy Agency)**	**USA**
Resedential	N/A	Space Heating	Private homes	Space Heating	Northeast
		Space Cooling	Rented homes	Water Heating	Midwest
		Water Heating	Apartments	Lighting	South
		Lighting	Flats	Cooking	West
		Appliances	Mobile homes	Appliances	Housing types (for all regions)
Commercial	N/A	Retail Trade	Trade (wholesale and retail)		
		Wholesale Trade	Commerce		
		Office	Government services		
		Educational Services			
		Health Care & Social Assistance			
		Arts, Entertainment & Recreation			
		Accommodations & Food Services			
		Information & cultural Industries			
		Transportation & Warehousing			
		Other Services			
Industrial	Food, beverages and tobacco	Mining	Wood pulp & paper	Iron & Steel	Manufacturing (21 NAICS sectors)
	Textile, clothing, footwear and leather	Forestry	Basic metals products	Cement	Food, Beverage and Tobacco, Textile Mills, Textile Product Mills, Apparel Manufacturing, Leather and Allied, Wood Products, Paper, Printing, Petroleum and Coal, Chemicals, Plastics and Rubber, Nonmetallic Mineral, Primary Metal, Fabricated Metal, Machinery, Computer and Electronics, Electrical Equipment, Appliance, and Components, Transportation Equipments, Furniture and Related Products, Miscellaneous Manufacturing
	Wood, paper and printing	Iron & Steel	Other agriculture & fishing	Pulp & Paper	
	Chemicals and associated products	Chemicals	Dairy products	Chemicals & Petrochemicals	
	Non-metallic mineral products	Cement	Non-metallic minerals	Aluminium	
	Iron and steel (excludes coke ovens and blast furnaces)	Petroleum Refining	Chemicals		
	Basic non-ferrous metals	Smelting & Refining	Other food processing		
	Other metal products	Pulp & Paper	Forestry & logging		
	Machinery and equipment	Other Manufacturing	Meat processing		
	Other manufacturing	Construction	Non-specified manufacturing		Non-manufacturing
			Mining & exploration		Agriculture
			Construction		Mining
			Publishing & printing		Construction
			Dairy farming		
			Textiles		

Sectors	Sub-Sectors				
	Australia	**Canada**	**New Zealand**	**IEA (International Energy Agency)**	**USA**
Transport	N/A	Passenger Transportation	Passenger Transportation	Passenger Transportation	Passenger Transportation
		Inter-City Buses	Cars & Vans	Cars	Highway Transportation
		Urban Transit	Buses	Buses	Air Transportation
		School Buses	Rail	Ships	Rail Transportation
		Motorcycles	Domestic Air	Rail	Freight Transportation
		Light Trucks	Freight Transportation	Air	Trucking
		Large Cars	Road	Freight Transportation	Pipelines
		Small Cars	Rail	Trucks	Air
		Rail	Coastal Shipping	Ships	Water
		Air	Off-road Vehicles	Rail	
		Freight Transportation			
		Heavy Trucks			
		Mdium Trucks			
		Light Trucks			
		Marine			
		Rail			
		Air			
		Off-road Vehicles			
Services	Water supply, sewerage and drainage	N/A	N/A	Education	N/A
	Wholesale and retail trade			Food & Lodging	
	Communication services			Health	
	Finance, insurance, property and business			Offices	
	Government administration and defense			Retail	
	Education, health and community services			Others	
	Accommodation, cultural and personal services				
Agriculture			N/A	N/A	N/A
Mining		N/A	N/A	N/A	N/A
Construction		N/A	N/A	N/A	N/A
Electricity / Energy Generation	N/A	N/A			Electricity-only plants
					Combined Heat and Power (CHP) Plant

Annex (III)

International Energy Consumption Indicators

Proposed Energy Consumption Indicators Proposed in the "Energy Indicators for Sustainable Development Guidelines and Methodologies" issued by the International Atomic Energy Agency (IAEA) in 2005

Sector	Industrial	Service/commercial	Household	Transport
Indicator Brief Definition	Energy use per unit of value added in the industrial sector for selected energy-intensive industries	Final energy use per unit of service and commercial value added or per floor area	Amount of total residential energy used per person or household or unit of floor area. Amount of energy use by residential end use per person or household or unit of floor area, or per electric appliance	Energy use per unit of freight-kilometer (km) hauled and per unit of passenger-km traveled by mode
Units	Energy: tonnes of oil equivalent (toe) per US dollar Electricity: kilowatt-hours (kWh) per US dollar	Tonnes of oil equivalent (toe) for final energy and kilowatt-hours (kWh) for electricity per US dollar (value added), in constant US dollars (purchasing power parity [PPP]) or per square meter of floor area	Tonnes of oil equivalent (toe) of final energy and kilowatt-hours (kWh) of electricity per capita or per household or square meter of floor area; toe and kWh of electricity for space heating per unit of floor area; kWh of lighting per unit of floor area; toe and kWh for cooking per household; toe and kWh for water heating per capita; unit electricity consumption for electric appliances	Freight: tonnes of oil equivalent (toe) per tonne-km Travel: toe per passenger-km
Alternative Definition	Energy use per unit of physical output in the industrial sector, manufacturing branches and selected energy-intensive industries	None	None	Overall average fuel consumption for all modes per passenger-km or tonne-km

Annex (IV)
Data Requests
(Letters to various institutions and template tables)

القطاع/الشريحة	المؤشر المقترح	البيانات المطلوبة	الوحدة المطلوبة	البيانات المتاحة
الشركة المصرية القابضة للكهرباء (EEHC)				
السكني	استهلاك الكهرباء/وحدة سكنية	إجمالى الإستهلاك الشهرى والسنوى من الكهرباء بالوحدات السكنية لكل حى/مدينة/مركز	كيلووات ساعة/مركز	استهلاك الكهرباء من 9 شركات توزيع تغذي 25 محافظة (18 مركز في القاهرة الكبرى و 7 في الاسكندرية و أكثر من 115 في المحافظات الأخرى) في الأعوام 2007-2009
		عدد الوحدات السكنية المشتركة المقابل لبيان إستهلاك الكهرباء	وحدة سكنية/مركز	البيان المقابل لاستهلاكات الكهرباء المقدمة
التجاري (التعليمي)	استهلاك الكهرباء/فصل	إجمالى الاستهلاك السنوى من الكهرباء لقطاع المدارس (الخاصة والحكومية) لكل حى/مدينة/مركز	كيلووات ساعة/مركز	استهلاك الكهرباء في المدارس الحكومية و الخاصة (وعددهم) من 9 شركات توزيع تغذي 80 محافظة في الأعوام 2007-2009
التجاري (الاداري)	استهلاك الكهرباء/متر مربع	إجمالى الاستهلاك السنوى من الكهرباء لقائمة مباني ادارية مرفقة	كيلووات ساعة/سنة	استهلاك الكهرباء في 4 مباني ادارية في الأعوام 2007-2009
التجاري (المحلات)	استهلاك الكهرباء/متر مربع	إجمالى الاستهلاك السنوى من الكهرباء لقائمة المحلات التجارية المرفقة	كيلووات ساعة/سنة	استهلاك الكهرباء في 25 سوبر ماركت في الأعوام 2007-2009
التجاري (المراكز التجارية)	استهلاك الكهرباء/متر مربع	إجمالى الاستهلاك السنوى من الكهرباء لقائمة المراكز التجارية المرفقة	كيلووات ساعة/سنة	استهلاك الكهرباء في 8 مراكز تجارية في الأعوام 2007-2009
السياحي	استهلاك الكهرباء/ليلة فندقية	إجمالى الاستهلاك السنوى من الكهرباء لقائمة الفنادق المرفقة	كيلووات ساعة/سنة	استهلاك الكهرباء من 9 شركات توزيع في 101 فندق (بينهم 24 في القاهرة) في الأعوام 2007-2009
مشروع تحسين كفاءة الطاقة - د. ابراهيم ياسين				
السياحي	استهلاك الكهرباء/فندق	إجمالى الإستهلاك السنوى من الكهرباء للفنادق السياحية ذات استهلاك اعلى من 500 كيلووات	كيلووات ساعة/سنة	استهلاك الكهرباء في 103 فندق في الأعوام 2007-2009
التجاري (الصحي)	استهلاك الطاقة/مستشفى	إجمالى الإستهلاك السنوى من الكهرباء للمستشفيات ذات استهلاك اعلى من 500 كيلووات	كيلووات ساعة/سنة	استهلاك الكهرباء في 123 مستشفى في الأعوام 2007-2009
التجاري (المباني الادارية)	استهلاك الكهرباء/مبنى اداري	إجمالى الإستهلاك السنوى من الكهرباء للمباني الادارية ذات استهلاك اعلى من 500 كيلووات	كيلووات ساعة/سنة	استهلاك الكهرباء في 28 مبنى في الأعوام 2007-2009
الجهاز المركزي للتعبئة العامة و الاحصاء (CAPMAS)				
الصناعي	استهلاك الكهرباء/القيمة المضافة	إجمالى الإستهلاك السنوى من الكهرباء للصناعات الآتية: الحديد و الصلب - الأسمنت - الأسمدة - الألومنيوم - السكر - طحن القمح	ميجاوات ساعة/قطاع	استهلاك الكهرباء السنوي في الأعوام 2007-2009
		معدل الإستهلاك السنوى من الوقود بأنواعه	لتر/سنة	الاستهلاك الكلي (بدون أنواع) في الأعوام 2007-2009
الشركة المصرية القابضة للغازات الطبيعية (EGAS)				
السياحي	استهلاك الكهرباء/فندق	إجمالى الإستهلاك السنوى من الغاز الطبيعي لكل فندق	متر مكعب غاز/سنة	استهلاك الغاز الطبيعي في الأعوام 2007-2009
التجاري (الصحي)	استهلاك الطاقة/سرير	إجمالى الإستهلاك السنوى من الغاز الطبيعي لكل مستشفى	متر مكعب غاز/سنة	استهلاك الغاز الطبيعي في الأعوام 2007-2009
الهيئة العامة للتنمية الصناعية (IDA)				
الصناعي	استهلاك الكهرباء/القيمة المضافة	إجمالى الإستهلاك السنوى لكل نوع من أنواع الطاقة للمنشآت الصناعية المرفقة	ميجاوات ساعة/سنة	-
		معدل الانتاج في المنشآت الصناعية المقابلة لبيان إستهلاك الطاقة	طن/سنة	-
هيئة التنمية السياحية (TDA)				
السياحي	استهلاك الكهرباء/غرفة فندقية	عدد الغرف في كل فندق	عدد الغرف/فندق	عدد الغرف في بعض الفنادق في عدد من المحافظات
		معدل الإشغال لكل فندق	عدد الليالي الفندقية/فندق	معدل الاشغال في بعض المحافظات
		إجمالى الإستهلاك السنوى من الغاز الطبيعي لكل فندق	متر مكعب غاز/فندق	-
		إجمالي استهلاك السولار (لغير الطوارئ) في كل فندق	لتر/سنة	-
الموقع الإلكتروني لوزارة الصحة (Ministry of Health)				
التجاري (الصحي)	استهلاك الطاقة/سرير	عدد الاسرة في كل مستشفى	عدد الاسرة/مستشفى	تم تجميع بعض البيانات بمعرفة الاستشاري
الموقع الإلكتروني لوزارة التعليم (Ministry of Education)				
التجاري (التعليمي)	استهلاك الكهرباء/طالب	عدد الطلاب في كل محافظة	عدد الطلاب/محافظة	تم تجميع بعض البيانات بمعرفة الاستشاري
المحافظات/المحليات (Municipalities)				
التجاري (المباني الادارية)	استهلاك الكهرباء/متر مربع	مساحة قائمة المباني المرفقة	متر مربع/مبنى اداري	تم تجميع بعض البيانات بمعرفة الاستشاري
التجاري (المحلات)	استهلاك الكهرباء/متر مربع	مساحة قائمة المحلات التجارية المرفقة	متر مربع/محل	تم تجميع بعض البيانات بمعرفة الاستشاري
التجاري (المراكز التجارية)	استهلاك الكهرباء/متر مربع	مساحة قائمة المراكز التجارية الرفقة	متر مربع/مركز تجاري	تم تجميع بعض البيانات بمعرفة الاستشاري
الهيئة القومية لسكك حديد مصر (ENR)				

النقل (السكة الحديد)	استهلاك الطاقة/راكب-كم	معدل استهلاك الوقود في نقل الركاب	لتر/سنة	استهلاك الوقود في الأعوام 2005-2009
		المسافة المقطوعة للركاب	راكب-كم/سنة	البيان المقابل لاستهلاكات الوقود المقدمة
	استهلاك الطاقة/طن-كم	معدل استهلاك الوقود في نقل البضائع	لتر/سنة	استهلاك الوقود في الأعوام 2005-2009
		المسافة المقطوعة للبضائع	طن-كم/سنة	البيان المقابل لاستهلاكات الوقود المقدمة
هيئة تشغيل مترو الأنفاق - الهيئة القومية للأنفاق (NAT)				
النقل (مترو الانفاق)	استهلاك الطاقة/راكب-كم	معدل استهلاك الطاقة في نقل الركاب	ميجاوات ساعة/سنة	استهلاك الكهرباء في الأعوام 2005-2009
		المسافة المقطوعة للركاب	راكب-كم/سنة	البيان المقابل لاستهلاكات الكهرباء المقدمة
الهيئة العامة للنقل النهري (River Transport Authority)				
النقل (النهري) للبضائع	استهلاك الطاقة/طن-كم	المسافة المقطوعة للبضائع	طن-كم/سنة	المسافة المقطوعة في الأعوام 2005-2009
	استهلاك الطاقة/طن-كم	كمية البضائع المنقلة	طن/سنة	الكمية المنقولة المقابلة للبيان المقدم
الهيئة المصرية العامة للبترول (EGPC)				
النقل (النهري) للبضائع	استهلاك الطاقة/طن-كم	معدل استهلاك الطاقة في نقل البضائع	لتر/سنة	-
الشركة القابضة للنقل البحري و البري (HCMLT)				
النقل البري للركاب بين المدن	استهلاك الطاقة/راكب-كم	معدل استهلاك الوقود (سولار) في نقل الركاب	لتر/سنة	استهلاك السولار في الأعوام 2005-2009
		معدل استهلاك الوقود (ديزل) في نقل الركاب	لتر/سنة	استهلاك الديزل في الأعوام 2005-2009
		معدل استهلاك الوقود (غاز) في نقل الركاب	لتر/سنة	استهلاك الغاز الطبيعي في الأعوام 2005-2009
		المسافة المقطوعة للركاب	راكب-كم/سنة	البيان المقابل لاستهلاكات الوقود المقدمة
النقل البري للبضائع بين المدن	استهلاك الطاقة/طن-كم	معدل استهلاك الوقود (سولار) في نقل البضائع	لتر/سنة	استهلاك السولار في الأعوام 2005-2009
		المسافة المقطوعة للبضائع	طن-كم/سنة	البيان المقابل لاستهلاكات الوقود المقدمة
هيئة نقل القاهرة (CTA)				
النقل (اتوبيسات النقل العام)	استهلاك الطاقة/راكب-كم	معدل استهلاك الوقود في نقل الركاب	لتر/سنة	استهلاك الوقود في الأعوام 2005-2009
		المسافة المقطوعة للركاب	راكب-كم/سنة	المسافة المقطوعة (كم) و عدد الركاب المقابل للبيان المقدم
النقل (النهري) للركاب	استهلاك الطاقة/راكب-كم	معدل استهلاك الوقود في نقل الركاب	لتر/سنة	استهلاك الوقود في الأعوام 2005-2009
		المسافة المقطوعة للركاب	راكب-كم/سنة	المسافة المقطوعة (كم) و عدد الركاب المقابل للبيان المقدم

الشركة القابضة لكهرباء مصر

السيد /

تحية طيبة وبعد،

بالإشارة الى مشروع ترشيد الطاقة وما تم مناقشته مع سيادتكم في اجتماع سابق.

برجاء التكرم بتوفير البيانات الخاصة باستهلاك الكهرباء و المتعلقة بكلاً من القطاعات التالية:

القطاع السكني – المراكز التجارية – السوبرماركت – المباني الادارية – المدارس - الفنادق

بالاضافة الى بيانات عن عدد الوحدات السكنية المتصلة بشبكة الكهرباء بنفس المركز/ المدينة / الحى، و كذلك عدد المدارس الحكومية والخاصة فى كل محافظة.

مرفق بهذا الخطاب بيان مفصل بالمعلومات المطلوبة.

كما يرجى ترشيح مندوب لسيادتكم لمتابعة هذا الأمر مع استشاري مجلس الوزراء لهذا المشروع.

نشكر لسيادتكم حسن تعاونكم،

وتفضلوا بقبول فائق الاحترام،

بيان مفصل للشركة القابضة لكهرباء مصر

بيانات القطاع المنزلى/السكني

برجاء توفير البيانات التالية للمراكز والمدن والأحياء الواردة بالجدول المرفق (مرفق 1):

- إستهلاك الكهرباء (كيلووات ساعة) الشهرى للأعوام 2007، 2008، 2009
- عدد الوحدات السكنية المتصلة بشبكة الكهرباء بنفس المركز/ المدينة / الحى

برجاء إستيفاء الجدول للأعوام 2007، 2008، 2009

بيانات المراكز التجارية Malls

برجاء توفير البيانات التالية للأنشطة التجارية المرفقة (مرفق 2):

- إستهلاك الكهرباء السنوى للأعوام 2007، 2008، 2009

بيانات السوبرماركت Supermarkets

برجاء توفير البيانات التالية للأنشطة التجارية المرفقة (مرفق 3):

- إستهلاك الكهرباء السنوى للأعوام 2007، 2008، 2009

بيانات المبانى الإدارية

برجاء توفير البيانات التالية للأنشطة التجارية المرفقة (مرفق 4):

- إستهلاك الكهرباء السنوى للأعوام 2007، 2008، 2009

بيانات المدارس

برجاء توفير البيانات التالية وذلك طبقاً للجدول المرفق (مرفق 5):

- إستهلاك الكهرباء فى مدارس القطاع الخاص والقطاع العام فى كل محافظة
- عدد المدارس الحكومية والخاصة فى كل محافظة

برجاء إستيفاء الجدول للأعوام 2007، 2008، 2009

بيانات الفنادق

برجاء توفير البيانات التالية وذلك طبقاً للجدول المرفق (مرفق 6):

- إستهلاك الكهرباء (كيلووات ساعة) الشهرى للفنادق المحددة فى مرفق 6

برجاء إستيفاء الجدول للأعوام 2007، 2008، 2009

مرفق (1)

شركة كهرباء شمال القاهرة

إستهلاك الكهرباء الشهرى فى القطاع المنزلى لعام 2007 (برجاء تكرار الجدول لعام 2008 ،2009)

المحافظة	حى/مدينة/ مركز		يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	الإجمالى السنوى
القاهرة	مصر الجديدة	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	شبرا	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	روض الفرج	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	الوايلى	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	النزهة	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	المطرية	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
القليوبية	مركز ومدينة القناطر الخيرية	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	شرق شبرا الخيمة	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	غرب شبرا الخيمة	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													

شركة كهرباء جنوب القاهرة

إستهلاك الكهرباء الشهرى فى القطاع المنزلى لعام 2007 (برجاء تكرار الجدول لعام 2008 ،2009)

المحافظة	حى/مدينة/ مركز		يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	الإجمالى السنوى
القاهرة	منشية ناصر	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
الجيزة	الدقى	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	بولاق الدكرور	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
حلوان	حلوان	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
6 أكتوبر	العياط	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	البدراشين	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	أوسيم	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	كرداسة	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	الوحات البحرية	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													

شركة القناة لتوزيع الكهرباء

إستهلاك الكهرباء الشهرى فى القطاع المنزلى لعام 2007 (برجاء تكرار الجدول لعام 2008 ،2009)

المحافظة	حى/مدينة/ مركز		يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	الإجمالى السنوى
الشرقية	كفر صقر	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	مشتول السوق	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
شمال سيناء	الحسنه	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	الشيخ زويد	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
جنوب سيناء	طابا	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	شرم الشيخ	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
البحر الأحمر	رأس غارب	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
حلوان	الشروق	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
بورسعيد	الزهور	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													

شركة شمال الدلتا لتوزيع الكهرباء

إستهلاك الكهرباء الشهرى فى القطاع المنزلى لعام 2007 (برجاء تكرار الجدول لعام 2008 ،2009)

المحافظة	حى/مدينة/ مركز		يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	الإجمالى السنوى
الدقهلية	تمى الأمديد	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	طلخا	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	منية النصر	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	المطرية	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	جمصة	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	الجمالية	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
كفر الشيخ	الرياض	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	فوه	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	مطوبس	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													

شركة الإسكندرية لتوزيع الكهرباء

إستهلاك الكهرباء الشهرى فى القطاع المنزلى لعام 2007 (برجاء تكرار الجدول لعام 2008 ،2009)

المحافظة	حى/مدينة/ مركز		يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	الإجمالى السنوى
الإسكندرية	برج العرب	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	الحمام	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	محرم بك	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	الجمرك	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	الدخيلة	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	العامرية	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	الساحل الشمالى	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													

شركة مصر الوسطى لتوزيع الكهرباء

إستهلاك الكهرباء الشهرى فى القطاع المنزلى لعام 2007 (برجاء تكرار الجدول لعام 2008 ،2009)

المحافظة	حى/مدينة/ مركز		يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	الإجمالى السنوى
سوهاج	سوهاج مركز	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	المراغة	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
قنا	أبو تشت	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	نجع حمادى	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	نقادة	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	دشنا	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	فرشوط	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	الوقف	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	أرمنت	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													

شركة مصر الوسطى لتوزيع الكهرباء

إستهلاك الكهرباء الشهرى فى القطاع المنزلى لعام 2007 (برجاء تكرار الجدول لعام 2008 ،2009)

المحافظة	حى/مدينة/ مركز		يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	الإجمالى السنوى
بنى سويف	سمسطا	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	ناصر	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
المنيا	المنيا الجديدة	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
أسيوط	صدقا	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	أبو تيج	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	الغنايم	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
الوادى الجديد	الداخلة	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	الخارجة	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													
	باريس	إستهلاك الكهرباء (كيلو وات ساعة)													
		عدد الوحدات السكنية المشتركة													

مرفق (2)

شركة شمال القاهرة لتوزيع الكهرباء

أسم المول	إستهلاكات الكهرباء السنوية (ميجاوات ساعة)		
	2007	2008	2009
اركيديا مول كورنيش النيل – اركيديا مول, بولاق			
مركز سيتى ستارز City Stars centre شارع عمرو بن الخطاب – مدينة نصر			
مول أبراج نايل سيتى بولاق ابو العلا كورنيش النيل			
جنينة مول شارع البطراوى المتفرع من شارع عباس العقاد في مدينة نصر			

شركة جنوب القاهرة لتوزيع الكهرباء

أسم المول	إستهلاكات الكهرباء السنوية (ميجاوات ساعة)		
	2007	2008	2009
بيمان Beymen Cairo mall جاردن سيتى– القاهرة			
داندى ميجا مول كم 28 - طريق القاهرة الاسكندرية الصحراوى الجيزة			
ه ايبر وان امتداد محور 26 يوليو – مدخل مدينة الشيخ زايد			
ديزينوبلويس Designopolis طريق مصر – إسكندرية الصحراوى"6 كم من البوابات			
معادى سيتى سنتر الطريق الدائرى – المعادى			
فرست مول 35 شارع الجيزة – الجيزة			

مرفق (3)

شركة جنوب القاهرة

اسم وعنوان السوبرماركت	إستهلاك الكهرباء (كيلووات ساعة)		
	2007	2008	2009
ألفا ماركت 7 أ كورنيش النيل – المعادي – بجوار فندق سوفيتيل			
ألفا ماركت 3 شارع الملك الأفضل – الزمالك			
ألفا ماركت 7 شارع السد العالى الدقى			
مترو ماركت المعادي : طريق مصر حلوان الزراعي			
مترو ماركت المعادي 9 : 16 طريق 81			
مترو ماركت اللاسلكي : 9 شارع اللاسلكي –المعادي			
مترو ماركت أكتوبر : المركز التجارى لاسيتي			
مترو ماركت المقطم : ميدان النافورة			
مترو ماركت سوريا : 32 شارع سوريا– المهندسين			
مترو ماركت الدقي : 5 شارع المساحه			
مترو ماركت الزمالك : 2 شارع إسماعيل محمد			
مترو ماركت جامعة الدول : 26 شارع جامعة الدول العربيه– المهندسين			
مترو ماركت ايران : 10 شارع ايران–الدقي			
مترو ماركت لبنان : 21 شارع اليمن– المهندسين			
مترو ماركت الهرم : 3 شارع العريش			
مترو ماركت المنيل : 19 شارع المنيل			
مترو ماركت الثورة : ١٨ شارع الثورة امام مدرسة جمال عبد الناصر			
سعودى ماركت الزمالك : 20 شارع المرعشلى			

اسم وعنوان السوبرماركت	إستهلاك الكهرباء (كيلووات ساعة)		
	2007	2008	2009
سعودى ماركت المعادى : شارع 252 المعادى			
سعودى ماركت المهندسين: 20 شارع الحجاز المهندسين			
سعودى ماركت الهرم: 3 شارع العشرين من لطفى السيد محطة المساحة			

شركة شمال القاهرة

اسم وعنوان السوبرماركت	إستهلاك الكهرباء (كيلووات ساعة)		
	2007	2008	2009
ألفا ماركت 7 شارع الطحاوى – ميدان الذهبى– الخليفة المأمون			
مترو ماركت القطامية : مرتفعات القطامية			
مترو ماركت الرحاب : المول التجارى (2)			
مترو ماركت القاهرة الجديدة : سفن ستارز مول			
مترو ماركت مدينة نصر : 6 شارع البطراوي			
مترو ماركت عمار بن ياسر : 76 شارع عمار بن ياسر –مصر الجديده			
مترو ماركت مصر الجديده : 18 شارع الخليفه المأمون			
مترو ماركت روكسي : 18 شارع الاهرام– مصر الجديده			
مترو ماركت تريومف : 30 شارع النزهه– مصر الجديده			
مترو ماركت الاهلي : 98 شارع حسن مأمون– مدينة نصر			
مترو ماركت مكرم عبيد : 35 شارع مكرم عبيد–مدينة نصر			
مترو ماركت مساكن شيراتون : مربع الوزارء ٢–مربع رقم ١١٧٤– بجوار الأكاديمية العربية للنقل البحرى			
سعودى ماركت شيراتون: قطعة رقم 13 و 14 مربع 1136 شارع خالد أبن الوليد			

مرفق (4)

شركة شمال القاهرة

اسم وعنوان المبنى الاداري	إستهلاك الكهرباء (كيلووات ساعة)		
	2007	2008	2009
مركز التجارة العالمى 1191كورنيش النيل بولاق, القاهرة			
برج البنك الأهلى 1187 كورنيش النيل بولاق القاهرة			

شركة جنوب القاهرة

اسم وعنوان المبنى الاداري	إستهلاك الكهرباء (كيلووات ساعة)		
	2007	2008	2009
برج المغربى 94 شارع التحرير الجيزة			
برج النيل الادارى 21–23 شارع شارل ديجول الجيزه			
برج الفؤاد 37 شارع جامعة الدول العربية المهندسين الجيزة			

مرفق (5)

المحافظة	المدارس الخاصة		المدارس الحكومية	
	إستهلاك الكهرباء (كيلوات ساعة)	عدد المدارس	إستهلاك الكهرباء (كيلوات ساعة)	عدد المدارس

بيانات الفنادق لعام - 200

شركة شمال وجنوب القاهرة لتوزيع الكهرباء

اسم الفندق	إستهلاك الكهرباء (كيلو وات ساعة)												
	يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى
فندق وكازينو شيراتون القاهرة													
فندق كايرو تاور اونيل													
فندق النيل هيلتون													
فندق سميراميس													
فندق هيلتون رمسيس													
فندق السلام													
فندق هيات برنس													
فندق الميرديان													
فندق شبرد – شركة الفنادق المصرية													
فندق سياج													
فندق الكونكورد –العالم العربى													
فندق واحة راديسون													
فندق الهرم الأخضر													
فندق شهرزاد – شركة فنادق مصر الكبرى													
فندق مينا جاردن													
فندق كتراكت													
فندق فيرمونت – شركة نايل سيتى للسياحة والفنادق													

اسم الفندق	إستهلاك الكهرباء (كيلو وات ساعة)												
	يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى
فندق البارون													
فندق فور سيزون													
فندق بيراميدز بلازا مصر													
فندق هيلتون الجولف – شركة دريم لاند													
فندق الشمس													
فندق الجولى فيل													
فندق النوفتيل													
فندق رمادا / شركة فنادق حدائق الاهرام													
فندق أطلس – شركة سقارة للاستثمارات													

شركة الإسكندرية لتوزيع الكهرباء

اسم الفندق	**إستهلاك الكهرباء (كيلو وات ساعة)**												
	يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى
فندق فلسطين													
فنـــــدق العصـــــافرة													
فندق المحروسة													
فندق بلازا													
فندق رمادا– الدلتا للسياحة													
فندق شيراتون المنتزه													

شركة القناة لتوزيع الكهرباء

الفندق	إستهلاك الكهرباء (كيلو وات ساعة)												
	يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى
لينه ""حدائق السلطان""" – شرم الشيخ													
فندق النورهيلتون – الغردقة													
دولفينو ""عايده""" – شرم الشيخ													
فندق روما– الغردقة													
فندق سفير الغردقه– الغردقة													
البارون – شرم الشيخ													
فندق بلوسكاي– الغردقة													
هلتون طابا – طابا													
كورال هلتون نويبع– نويبع													
الفنار بيتش – شرم الشيخ													
الفيروز– بورسعيد													
مارينا شارم – شرم الشيخ													
فرجينيا – شرم الشيخ													
ديوان العمر – شرم الشيخ													
ايماج هيلتون – شركس باي – شرم الشيخ													
البارون بلمز (توسعات) –													

شرم الشيخ (رأس نصرانى)													
هوليداى ان – شرم الشيخ													
مكسيم بلازا – شرم الشيخ													
فندق ونادى غوص راس نصرانى – رأس نصرانى													
فندق ريدز كارلتون – شرم الشيخ													
موفمبيك طابا – شركة طابا للتنمية السياحية –													
جرين بلازا – شركة الجيزة – شرم الشيخ													
شارم هوليداى – شرم الشيخ													
شارم كليف – خليج نعمة													
ريف اوازيس – شرم الشيخ													
ام الجريفات الثابتة – مرسى علم													
السلام كونكورد – شرم الشيخ													
فندق فلامنكو –القصير													
جنه سفاجا													
وردة الصحراء – الغردقة													
جراند مكادى – كليوباترا – الغردقة													

غزالة جاردينز – خليج نعمة													
فندق بوريفاج – الغردقة													
فندق بانوراما الجونة													
فالكون هيلز – شرم الشيخ													
سول شارم													
ابروتيل جراند شارم – شرم الشيخ													
نيو كوين شرم – شرم الشيخ													
سويس ان العالمية – العريش													
رويال روجانا – شرم الشيخ													
اكوا لاند													
فندق العين ريزورت													
فندق على بابا – الغردقة													
فندق اليكو ايجيبت													
فندق الابروى													
الجولف – الغردقة													
الشيخ كوست – شرم الشيخ													
هلتون دهب – دهب													
هلنان دهب													
كنج سنفرو – شرم الشيخ													
بيراميزا شرم الشيخ													

صنافير خليج نعمة													
فندق هيلتون بلازا – الغردقة													
ريف اوازيس – شرم الشيخ													
فندق مينا مارك – الغردقة													

شركة البحيرة لتوزيع الكهرباء

	إستهلاك الكهرباء (كيلو وات ساعة)												
الفندق	يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى
فندق سيدى عبد الرحمن													
فندق شاطئ عايدة – الساحل الشمالى													

شركة مصر العليا لتوزيع الكهرباء

	إستهلاك الكهرباء (كيلو وات ساعة)												
الفندق	يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى
فندق الجولي فيل – الأقصر													
فندق إيتاب – الأقصر – المنيا													
فندق ونتر بالاس – الأقصر													
فندق إيزس– الاقصر													
فندق النيل بمدينة ناصر – سوهاج													

فندق سونستا الاقصر													
فندق الميرديان الاقصر													
فندق السوفوتيل البياضية													
قرية سيتى فيرست – أبو سمبل													
فندق ايجوتيل – الأقصر													
فندق الشيراتون – الأقصر													
فندق النوفوتيل – الأقصر													
فندق أوبروي –أسوان													
فندق كتراكت – أسوان													
-فندق إيزيس–اسوان الجزيره													

مشروع تحسين كفاءة الطاقة

السيد /

تحية طيبة وبعد،

بالإشارة الى مشروع ترشيد الطاقة وما تم مناقشته مع سيادتكم في اجتماع سابق.

برجاء التكرم بتوفير البيانات الخاصة باستهلاك الكهرباء في كلاً من قوائم الفنادق و المستشفيات و المباني الادارية المرفقة.

مرفق بهذا الخطاب بيان مفصل بالمعلومات المطلوبة.

كما يرجى ترشيح مندوب لسيادتكم لمتابعة هذا الأمر مع استشاري مجلس الوزراء لهذا المشروع.

نشكر لسيادتكم حسن تعاونكم،

وتفضلوا بقبول فائق الاحترام،

بيان مفصل لمشروع تحسين كفاءة الطاقة

برجاء توفير البيانات التالية:

- إستهلاك الكهرباء للفنادق الواردة بمرفق (1) لعامى 2007، 2008
- إستهلاك الكهرباء للمستشفيات الواردة بمرفق (2) لعامى 2007، 2008
- إستهلاك الكهرباء للمبانى الإدارية الواردة بمرفق (3) لعامى 2007، 2008

الجهاز المركزي للتعبئة العامة والإحصاء

السيد /

تحية طيبة وبعد،

بالإشارة الى مشروع ترشيد الطاقة وما تم مناقشته مع سيادتكم في اجتماع سابق.

برجاء التكرم بتوفير البيانات الخاصة بالأنشطة الصناعية المرفقة و المتعلقة بصافي الانتاج و القيمة المضافة، وكذلك استهلاك الكهرباء و انواع الوقود المختلفة.

مرفق بهذا الخطاب بيان مفصل بالمعلومات المطلوبة.

كما يرجى ترشيح مندوب لسيادتكم لمتابعة هذا الأمر مع استشاري مجلس الوزراء لهذا المشروع.

نشكر لسيادتكم حسن تعاونكم،

وتفضلوا بقبول فائق الاحترام،

بيان مفصل للجهاز المركزى للتعبئة العامة والإحصاء

برجاء توفير البيانات التالية لكل من الأنشطة الصناعية الواردة بالجدول المرفق:

- الإنتاج (بالألف جنية)
- القيمة المضافة الصافية لكل منشأة
- إستهلاك الكهرباء (بالكيلوات ساعة و الألف جنيه)
- إستهلاك الأنواع المختلفة من الوقود (بالطن والألف جنيه)

برجاء إستيفاء الجدول للسنوات التالية 2007، 2008 ، 2009.

القسم	الباب	الفصل	النشاط		الإنتاج (بالألف جنيه)	القيمة المضافة الصافية (بالألف جنيه)	كهرباء		الوقود							
									غاز طبيعى		مازوت		سولار		أخرى (برجاء التحديد)	
							كيلو وات ساعة	(بالألف جنيه)	طن	(بالألف جنيه)	طن	(بالألف جنيه)	طن	بالألف جنيه)	طن	بالألف جنيه)
10	106	1061	1061-06	طحن الحبوب												
10	107	1072	1072 -01	صناعة السكر الخام من قصب السكر												
			1072 -02	صناعة السكر من البنجر												
			1072 -03	تكرير السكر الخام												
			1072 -04	صناعة أنواع أخرى من السكر (سكر قيقب- سكر محول – سكر نخيل)												
			1072 -05	إنتاج المولاس												
20	201	2012	2012-01	صناعة الأسمدة النتروجينيه (الأزوتيه) تشمل اليوريا سلفات ونترات النشادر												
			2012-02	صناعة الأسمدة الفوسفاتية												
			2012-03	صناعة الأسمدة البوتاسيه												
23	239	2394	2394-01	صناعة الأسمنت المائى بما فى ذلك اسمنت بورتلاند												
			2394-02	صناعة الأسمنت الألمونيومى												
			2394-03	صناعة الأسمنت الحديدي												

القسم	الباب	الفصل	النشاط		الإنتاج (بالألف جنيه)	القيمة المضافة الصافية (بالألف جنيه)	كهرباء		الوقود							
									غاز طبيعى		مازوت		سولار		أخرى (برجاء التحديد)	
							كيلو وات ساعة	(بالألف جنيه)	طن	(بالألف جنيه)	طن	(بالألف جنيه)	طن	بالألف جنيه)	طن	بالألف جنيه)
			2394-04	صناعة الأسمنت السوبر فوسفاتي												
			2394-05	صناعة الأسمنت في شكل كتل مطحونة أو غير مطحونة												
24	241	2410	2410-01	تشغيل الأفران ذات الحرارة العالية والعمليات المتصلة بها												
			2410-11	عمليات أفران اختزال بالغاز لإنتاج الحديد الأسفنجي												
			2410-12	إنتاج الصلب الغفل والصلب المستمر بطريقة الأفران الكهربائية												
	242	2420	2420-03	عمليات صهر وتنقية ودرفله وسحب المعادن غير الحديدية (عدا الذهب والمعادن الثمينة)												
			2420-06	إنتاج الألمونيوم من البوكسيت												
			2420-07	الإنتاج شبه تام الصنع للالومنيوم.												

الشركة المصرية القابضة للغازات الطبيعية

السيد /

تحية طيبة وبعد،

بالإشارة الى مشروع ترشيد الطاقة.

برجاء برجاء التكرم بتوفير البيانات الخاصة باستهلاك الغاز الطبيعي لكلاً من قائمتي الفنادق و المستشفيات المرفقة.

مرفق بهذا الخطاب بيان مفصل بالمعلومات المطلوبة.

كما يرجى ترشيح مندوب لسيادتكم لمتابعة هذا الأمر مع استشاري مجلس الوزراء لهذا المشروع.

نشكر لسيادتكم حسن تعاونكم،

وتفضلوا بقبول فائق الاحترام،

بيان مفصل للشركة المصرية القابضة للغازات الطبيعية

برجاء توفير البيانات التالية لكل من الفنادق الواردة بالجدول المرفق – مرفق (1):

- إستهلاك الغاز الطبيعى الشهرى بالفنادق الواردة بالجدول المرفق
  وذلك للأعوام 2007، 2008 ، 2009.

برجاء توفير البيانات التالية لكل من المستشفيات الواردة بالجدول المرفق– مرفق (2):

- إستهلاك الغاز الطبيعى السنوى الواردة بالجدول المرفق
  وذلك للأعوام 2007، 2008 ، 2009.

مرفق (1)

بيانات الفنادق لعام - 200

شركة شمال وجنوب القاهرة لتوزيع الكهرباء

اسم الفندق	إستهلاك الغاز الطبيعى (م3)												
	يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى
فندق وكازينو شيراتون القاهرة													
فندق كايرو تاور اونيل													
فندق النيل هيلتون													
فندق سميراميس													
فندق هيلتون رمسيس													
فندق السلام													
فندق هيات برنس													
فندق الميرديان													
فندق شبرد – شركة الفنادق المصرية													
فندق سياج													
فندق الكونكورد –العالم العربى													
فندق واحة راديسون													
فندق الهرم الأخضر													
فندق شهرزاد – شركة فنادق مصر الكبرى													
فندق مينا جاردن													

اسم الفندق	إستهلاك الغاز الطبيعى (م3)												
	يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى
فندق كتراكت													
فندق فيرمونت – شركة نايل سيتى للسياحة والفنادق													
فندق البارون													
فندق فور سيزون													
فندق بيراميدز بلازا مصر													
فندق هيلتون الجولف – شركة دريم لاند													
فندق الشمس													
فندق الجولى فيل													
فندق النوفتيل													
فندق رمادا / شركة فنادق حدائق الاهرام													
فندق أطلس – شركة سقارة للاستثمارات													

الإسكندرية

اسم الفندق	إستهلاك الغاز الطبيعى (م3)												
	يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى
فندق فلسطين													
فنـــــدق العصـــــافرة													
فندق المحروسة													
فندق بلازا													

فندق رمادا– الدلتا للسياحة													
فندق شيراتون المنتزه													

فنادق القناة (الإسماعيلية/بورسعيد/السويس/ شمال سيناء/ جنوب سيناء/ البحر الأحمر)

الفندق	إستهلاك الغاز الطبيعى (م3)												
	يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى
لينه ""حدائق السلطان""" – شرم الشيخ													
فندق النورهيلتون – الغردقة													
دولفينو ""عايده""" – شرم الشيخ													
فندق روما– الغردقة													
فندق سفير الغردقه– الغردقة													
البارون – شرم الشيخ													
فندق بلوسكاي– الغردقة													
هلتون طابا – طابا													
كورال هلتون نويبع– نويبع													
الفنار بيتش – شرم الشيخ													
الفيروز– بورسعيد													
مارينا شارم – شرم الشيخ													

فرجينيا – شرم الشيخ													
ديوان العمر – شرم الشيخ													
ايماج هيلتون – شركس باي – شرم الشيخ													
البارون بلمز (توسعات) – شرم الشيخ (رأس نصرانى)													
هوليداى ان – شرم الشيخ													
مكسيم بلازا – شرم الشيخ													
فندق ونادى غوص راس نصرانى – رأس نصرانى													
فندق ريدز كارلتون – شرم الشيخ													
موفمبيك طابا – شركة طابا للتنمية السياحية –													
جرين بلازا – شركة الجيزة – شرم الشيخ													
شارم هوليداى – شرم الشيخ													
شارم كليف – خليج نعمة													
ريف اوازيس – شرم الشيخ													
ام الجريفات الثابتة – مرسى علم													
السلام كونكورد – شرم													

الشيخ													
فندق فلامنكو –القصير													
جنه سفاجا													
وردة الصحراء – الغردقة													
جراند مكادى – كليوباترا – الغردقة													
غزالة جاردينز – خليج نعمة													
فندق بوريفاج – الغردقة													
فندق بانوراما الجونة													
فالكون هيلز – شرم الشيخ													
سول شارم													
ابروتيل جراند شارم – شرم الشيخ													
نيو كوين شرم – شرم الشيخ													
سويس ان العالمية – العريش													
رويال روجانا – شرم الشيخ													
اكوا لاند													
فندق العين ريزورت													
فندق على بابا – الغردقة													
فندق اليكو ايجيبت													
فندق الابروى													

الجولف – الغردقة													
الشيخ كوست – شرم الشيخ													
هلتون دهب – دهب													
هلنان دهب													
كنج سنفرو – شرم الشيخ													
بيراميزا شرم الشيخ													
صنافير خليج نعمة													
فندق هيلتون بلازا – الغردقة													
ريف اوازيس – شرم الشيخ													
فندق مينا مارك – الغردقة													

فنادق البحيرة (البحيرة/ مرسى مطروح والساحل الشمالى)

	إستهلاك الغاز الطبيعى (م3)												
الفندق	يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى
فندق سيدى عبد الرحمن													
فندق شاطئ عايدة – الساحل الشمالى													

فنادق مصر العليا (سوهاج /قنا /الأقصر / أسوان)

	إستهلاك الغاز الطبيعى (م3)												
الفندق	يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى
فندق الجولي فيل –													

الأقصر													
فندق إيتاب – الأقصر – المنيا													
فندق وننتر بالاس – الأقصر													
فندق إيزس– الاقصر													
فندق النيل بمدينة ناصر – سوهاج													
فندق سونستا الاقصر													
فندق الميرديان الاقصر													
فندق السوفوتيل البياضية													
قرية سيتى فيرست – أبو سمبل													
فندق ايجوتيل – الأقصر													
فندق الشيراتون – الأقصر													
فندق النوفوتيل – الأقصر													
فندق أوبروي –أسوان													
فندق كتراكت – أسوان													
-فندق إيزيس–اسوان الجزيره													

مرفق (2)

اسم المستشفى	إستهلاك الغاز الطبيعى (م3)		
	2007	2008	2009
مستشفى حلوان العام			
مستشفى الطلبة جامعة حلوان			
مستشفى معهد ناصر			
المعهد القومى للقلب			
مستشفى مجلس الدفاع الوطنى			
المعهد القومى للكلى و المسالك البولية			
المستشفى الايطالى			
مستشفى جراحة اليوم الواحد			
مبنى القصر العينى الجديد			
مستشفى جامعة عين شمس			
وحدة الابحاث الطبية للبحرية الامريكية			
مستشفيات جامعة القاهرة			
مستشفى الزهراء			
مستشفى مصر للطيران			
مستشفى النيل بدراوى			
مستشفى أبو الريش – أطفال			
مستشفيات جامعة القاهرة			
مستشفى هليوبوليس			
مستشفى الصدر			
مستشفى المجندين الجديد			
مستشفى الدعاة للعاملين بوزارة الأوقاف			
مستشفى جامعة عين شمس			
مستشفى دار الفؤاد			
مستشفى المطرية التعليمى			
مستشفى الطلبة			
مستشفى جراحة اليوم الواحد			
مستشفى المنيل الجامعى – كلية الطب			
مجمع الخدمات الطبية			
معهد الأورام القديم والجديد			
مستشفى منشية البكرى			
جامعة القاهرة – مبنى الجراحة والحوادث			
العيادة الخارجية لمستشفى القبة			
المقاولون العرب–مستشفى			
مستشفى باب الشعرية			
مستشفى النيل			
مستشفى ناصر العام			
مستشفى الصحة النفسية			

اسم المستشفى	إستهلاك الغاز الطبيعى (م3)		
	2007	2008	2009
مستشفى الرمد			
مستشفى الشيخ زايد التخصصى			
مركز الطب الطبيعى /تاهيل وعلاج الروماتيز			
مستشفى التامين الصحى			
مستشفى الصحة النفسية			
مستشفى مصرالدولى			
مستشفى كوبرى القبة			
مستشفى جراحة اليوم الواحد			
مستشفى جامعة القاهرة			
مستشفى المنيل الجامعى			
مستشفى المقطم			
مستشفى العائلات			
مستشفى النصر			
مستشفى الرمد			
مستشفيات جامعة عين شمس / مبنى الاستقبال			
مستشفيات جامعة القاهرة			
جامعة عين شمس / مستشفى عين شمس التخصصى			
المنتج الصحى للطب النفسى			
مستشفى المنيرة العام			
مستشفى القاهرة للامراض الجلدية والتناسلية			
مستشفى الشروق			
مستشفى الحوامدية العام			
جامعة القاهرة مستشفى الطلبة			
مستشفى جراحات اليوم الواحد			
المركز الطبى التخصصى			
المؤسسة العلاجية بالقاهرة مستشفى الاهرام			
وزارة الصحة والسكان/ مستشفى الصحة النفسي			
هيئة كهرباء مصر مستشفى العاملين بقطاع			
مستشفيات جامعة القاهرة مشروع التنمية			
مستشفى دار الشفاء			
مستشفى جراحات اليوم الواحد			
مستشفى الساحل التعليمى			
مستشفى اوسيم المركزى			
مستشفى العياط المركزى			

اسم المستشفى	إستهلاك الغاز الطبيعى (م3)		
	2007	2008	2009
مستشفيات جامعة عين شمس			
مستشفى دار الشفاء			
مستشفى الساحل التعليمى			
مستشفى أحمد ماهر			
مستشفى احمد جلال			
مستشفى السلام			
مستشفى كليوباترا			
مستشفيات الإسكندرية			
المستشفى العسكرى			
المركز الطبى سموحة			
مستشفى أبو قير التخصصىللتأمين الصحى			
كلية الطب / المستشفى الجامعى			
مستشفـــــى شـــــرق المدينـــة			
مستشفى جمال عبد الناصر			
مستشفـــى الطلبـــة الجامعى			
مستشفيات منطقة القناة (الإسماعيلية/بورسعيد/السويس/ شمال سيناء/ جنوب سيناء/ البحر الأحمر)			
مستشفى شرم الشيخ			
المستشفى العسكرى			
مستشفى اولاد صقر المركزى – الشرقية			
مستشفى اليوم الواحد			
المستشفى العسكرى			
مستشفى الاحرار – الشرقية			
مستشفى الجامعه			
المستشفى العام			
مستشفيات الدلتا (الدقهلية/ دمياط/ كفر الشيخ/ الغربية/ المنوفية/القليوبية)			
مستشفى شبين الكوم التعليمى			
مستشفى الحالات الحرجه بشبين الكوم			
مستشفى بنها التعليمى			
مستشفى صدر ميت خلف			
مستشفى سرس الليان			
مستشفى جراحة المخ والاعصاب			
مستشفى العبور بكفر الشيخ			
مستشفى الهلال بشبين الكوم			
مركز الأورام شمال دمياط			
مركز الكلى و المسالك البولية			
مركز طب وجراحة العيون بكفر الشيخ			
مركز أبحاث أمراض الكبد والقلب بكفر الشيخ			

اسم المستشفى	إستهلاك الغاز الطبيعى (م3)		
	2007	2008	2009
مستشفى طوخ المركزى			
مستشفى المبره			
مستشفى مبارك العسكرى			
مستشفى فوه للتأمين الصحى			
مركز الكلى بجيهان			
مشتشفى قويسنا المركزى			
مستشفى الرمد بزفتى			
مستشفى الطفل ببنها			
مستشفى الباجور العام			
مستشفيات البحيرة (البحيرة/ شمال النوبارية/ الساحل الشمالى)			
مستشفى الرحمانيه المركزى			
المستشفى العام بدمنهور			
مستشفى السلوم العسكرى			
مستشفى كفر الدوار الجديدة			
مستشفى رشيد			
مستشفيات مصر الوسطى (الفيوم/المنيا/ بنى سويف/ أسيوط/ الوادى الجديد)			
مستشفى التأمين الصحى			
مستشفى سوزان مبارك – المنيا			
المجمع الطبى بالمنيا (التأمين الصحى)			
التأمين الصحى ببنى مزار			
مستشفى الشرطة			
المجمع الطبى للتأمين الصحى			
مستشفى معلمين بنى سويف			
مستشفى مغاغة العام			
مستشفيات مصر العليا (سوهاج /قنا /الأقصر / أسوان)			
معهد الاورام بسوهاج			
مستشفي كوم امبو المركزي			
مستشفى سوهاج العام			

الهيئة العامة للتنمية الصناعية

السيد /

تحية طيبة وبعد،

بالإشارة الى مشروع ترشيد الطاقة وما تم مناقشته مع سيادتكم في اجتماع سابق.

برجاء التكرم بتوفير البيانات الخاصة بكل منشأة صناعية تابعة للقطاعات الصناعية الآتية:

الحديد / الألومنيوم /الأسمنت /الأسمدة / المطاحن/ السكر

و المتعلقة بالاستهلاك السنوي لجميع انواع الطاقة و كذلك معدل الانتاج السنوي بكل منشأة..

مرفق بهذا الخطاب بيان مفصل بالمعلومات المطلوبة.

كما يرجى ترشيح مندوب لسيادتكم لمتابعة هذا الأمر مع استشاري مجلس الوزراء لهذا المشروع.

نشكر لسيادتكم حسن تعاونكم،

وتفضلوا بقبول فائق الاحترام،

بيان مفصل للهيئة العامة للتنمية الصناعية

بالنسبة للقطاعات الصناعية التالية: **الحديد / الألومنيوم /الأسمنت /الأسمدة / المطاحن/ السكر**

برجاء التفضل بتوفير البيانات التالية لكل منشأة صناعية بالقطاعات الصناعية الست الواردة أعلاه

- الإستهلاك السنوى لكل نوع من أنواع الطاقة (كهرباء- سولار- مازوت – غاز طبيعى – اخرى).
  الإنتاج السنوى بالطن فى كل منشأة صناعية.

هيئة التنمية السياحية

السيد /

تحية طيبة وبعد،

بالإشارة الى مشروع ترشيد الطاقة وما تم مناقشته مع سيادتكم في اجتماع سابق.

برجاء التكرم بتوفير البيانات الخاصة بقائمة الفنادق المرفقة و المتعلقة بالدرجة السياحية، عدد الغرف، عدد الليالي الفندقية و كذلك معدل استهلاك الغاز الطبيعي و السولار في الفنادق التي تعتمد على كلاً منهما.

مرفق بهذا الخطاب بيان مفصل بالمعلومات المطلوبة.

كما يرجى ترشيح مندوب لسيادتكم لمتابعة هذا الأمر مع استشاري مجلس الوزراء لهذا المشروع.

نشكر لسيادتكم حسن تعاونكم،

وتفضلوا بقبول فائق الاحترام،

بيان مفصل لهيئة التنمية السياحية

برجاء توفير البيانات التالية لكل من الفنادق الواردة بالجدول المرفق:

- الدرجة السياحية (بالنجوم)
- عدد الغرف
- عدد الليالى الفندقية شهرياً
- كمية الغاز الطبيعي المستهلك في كل فندق.
- تحديد الفنادق التى تستخدم سولار كأحد مصادر الطاقة، لأغراض غير أغراض الطوارىء عند إنقطاع الغاز الطبيعى.
- فى حالة إستخدام ***السولار لغير أغراض الطوارى*** برجاء تحديد الكمية المستخدمة سنوياً.

برجاء إستيفاء الجدول للسنوات التالية 2007، 2008 ، 2009.

بيانات الفنادق لعام - 200

فنادق القاهرة

اسم الفندق	الدرجة السياحية	عدد الغرف	الليالى الفندقية												الإستهلاك السنوى من السولار	الإستهلاك السنوى من االغاز الطبيعي
			يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى	
فندق وكازينو شيراتون القاهرة																
فندق كايرو تاور اونيل																
فندق النيل هيلتون																
فندق سميراميس																
فندق هيلتون رمسيس																
فندق السلام																
فندق هيات برنس																
فندق الميرديان																
فندق شبرد – شركة الفنادق المصرية																
فندق سياج																
فندق الكونكورد -العالم العربى																
فندق واحة راديسون																
فندق الهرم الأخضر																
فندق شهرزاد – شركة فنادق مصر الكبرى																
فندق مينا جاردن																

اسم الفندق	الدرجة السياحية	عدد الغرف	الليالى الفندقية													الإستهلاك السنوى من السولار	الإستهلاك السنوى من االغاز الطبيعي
			يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى		
فندق كتراكت																	
فندق فيرمونت – شركة نايل سيتى للسياحة والفنادق																	
فندق البارون																	
فندق فور سيزون																	
فندق بيراميدز بلازا مصر																	
فندق هيلتون الجولف – شركة دريم لاند																	
فندق الشمس																	
فندق الجولى فيل																	
فندق النوفتيل																	
فندق رمادا / شركة فنادق حدائق الاهرام																	
فندق أطلس – شركة سقارة للاستثمارات																	
فنادق الإسكندرية																	
فندق فلسطين																	
فنـــــدق العصـــــافرة																	
فندق المحروسة																	
فندق بلازا																	
فندق رمادا– الدلتا																	

اسم الفندق	الدرجة السياحية	عدد الغرف	الليالى الفندقية													الإستهلاك السنوى من السولار	الإستهلاك السنوى من االغاز الطبيعي
			يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى		
للسياحة																	
فندق شيراتون المنتزه																	
فنادق منطقة القناة (الإسماعيلية/بورسعيد/السويس/ شمال سيناء/ جنوب سيناء/ البحر الأحمر)																	
لينه ""حدائق السلطان""" – شرم الشيخ																	
فندق النورهيلتون – الغردقة																	
دولفينو ""عايده""" – شرم الشيخ																	
فندق روما– الغردقة																	
فندق سفير الغردقه– الغردقة																	
البارون – شرم الشيخ																	
فندق بلوسكاي– الغردقة																	
هلتون طابا – طابا																	
كورال هلتون نويبع– نويبع																	
الفنار بيتش – شرم الشيخ																	
الفيروز– بورسعيد																	
مارينا شارم – شرم الشيخ																	
فرجينيا – شرم الشيخ																	

اسم الفندق	الدرجة السياحية	عدد الغرف	الليالى الفندقية													الإستهلاك السنوى من السولار	الإستهلاك السنوى من االغاز الطبيعي
			يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى		
ديوان العمر – شرم الشيخ																	
ايماج هيلتون – شركس باي – شرم الشيخ																	
البارون بلمز (توسعات) – شرم الشيخ (رأس نصرانى)																	
هوليداى ان – شرم الشيخ																	
مكسيم بلازا – شرم الشيخ																	
فندق ونادى غوص راس نصرانى – رأس نصرانى																	
فندق ريدز كارلتون – شرم الشيخ																	
موفمبيك طابا – شركة طابا للتنمية السياحية –																	
جرين بلازا – شركة الجيزة – شرم الشيخ																	
شارم هوليداى – شرم الشيخ																	
شارم كليف – خليج نعمة																	
ريف اوازيس – شرم الشيخ																	

اسم الفندق	الدرجة السياحية	عدد الغرف	الليالى الفندقية													الإستهلاك السنوى من السولار	الإستهلاك السنوى من االغاز الطبيعي
			يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى		
ام الجريفات الثابتة – مرسى علم																	
السلام كونكورد – شرم الشيخ																	
فندق فلامنكو –القصير																	
جنه سفاجا																	
وردة الصحراء – الغردقة																	
جراند مكادى – كليوباترا – الغردقة																	
غزالة جاردينز – خليج نعمة																	
فندق بوريفاج – الغردقة																	
فندق بانوراما الجونة																	
فالكون هيلز – شرم الشيخ																	
سول شارم																	
ابروتيل جراند شارم – شرم الشيخ																	
نيو كوين شرم – شرم الشيخ																	
سويس ان العالمية – العريش																	

اسم الفندق	الدرجة السياحية	عدد الغرف	الليالى الفندقية												الإستهلاك السنوى من السولار	الإستهلاك السنوى من االغاز الطبيعي
			يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى		
رويال روجانا – شرم الشيخ																	
اكوا لاند																	
فندق العين ريزورت																	
فندق على بابا – الغردقة																	
فندق اليكو ايجيبت																	
فندق الابروى																	
الجولف – الغردقة																	
الشيخ كوست – شرم الشيخ																	
هلتون دهب – دهب																	
هلنان دهب																	
كنج سنفرو – شرم الشيخ																	
بيراميزا شرم الشيخ																	
صنافير خليج نعمة																	
فندق هيلتون بلازا – الغردقة																	
ريف اوازيس – شرم الشيخ																	
فندق مينا مارك – الغردقة																	

اسم الفندق	الدرجة السياحية	عدد الغرف	الليالى الفندقية												الإستهلاك السنوى من السولار	الإستهلاك السنوى من االغاز الطبيعي
			يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى		
فنادق منطقة البحيرة (البحيرة/ مرسى مطروح والساحل الشمالى)																	
فندق سيدى عبد الرحمن																	
فندق شاطئ عايدة – الساحل الشمالى																	
فنادق بمصر العليا (سوهاج /قنا /الأقصر / أسوان)																	
فندق الجولي فيل – الأقصر																	
فندق إيتاب – الأقصر – المنيا																	
فندق ونتر بالاس – الأقصر																	
فندق إيزس– الاقصر																	
فندق النيل بمدينة زاصر – سوهاج																	
فندق سونستا الاقصر																	
فندق الميرديان الاقصر																	
فندق السوفوتيل البياضية																	
قرية سيتى فيرست – أبو سمبل																	
فندق ايجوتيل – الأقصر																	
فندق الشيراتون – الأقصر																	

اسم الفندق	الدرجة السياحية	عدد الغرف	الليالى الفندقية												الإستهلاك السنوى من السولار	الإستهلاك السنوى من االغاز الطبيعي
			يناير	فبراير	مارس	أبريل	مايو	يونيو	يوليو	أغسطس	سبتمبر	أكتوبر	نوفمبر	ديسمبر	إجمالى		
فندق النوفوتيل – الأقصر																	
فندق أوبروي –أسوان																	
فندق كتراكت – أسوان																	
-فندق إيزيس–اسوان الجزيره																	

الهيئة القومية لسكك حديد مصر

السيد /

تحية طيبة وبعد،

بالإشارة الى مشروع ترشيد الطاقة.

برجاء التكرم بتوفير البيانات الخاصة بالنقل عبر السكة الحديد و المتعلقة باستهلاك الوقود و معدل النقل سنوياً لكلاً من نقل الركاب و نقل البضائع.

مرفق بهذا الخطاب بيان مفصل بالمعلومات المطلوبة.

كما يرجى ترشيح مندوب لسيادتكم لمتابعة هذا الأمر مع استشاري مجلس الوزراء لهذا المشروع.

نشكر لسيادتكم حسن تعاونكم،

وتفضلوا بقبول فائق الاحترام،

بيان مفصل للهيئة القومية لسكك حديد مصر

برجاء التفضل بتوفير البيانات التالية للنقل عبر السكة الحديد:

- كمية الوقود بالطن المستخدمة كمصدر للطاقة لنقل كلاً من الركاب والبضائع سنوياً (طن/سنوياً)
- (راكب. كم) passenger -km سنوياً
- (طن– كم) ton-km سنوياً

وذلك للأعوام 2005، 2006 ، 2007 ، 2008 ،2009

بيانات نقل الركاب

	2005	2006	2007	2008	2009
كمية الوقود (الديزل) المستخدم كمصدر للطاقة سنوياً (طن)					
(راكب. كم) سنوياً passenger -km					

بيانات نقل البضائع

	2005	2006	2007	2008	2009
كمية الوقود (الديزل) المستخدم كمصدر للطاقة سنوياً (طن)					
(طن– كم) سنوياً ton-km					

هيئة تشغيل مترو الأنفاق (التابعة للهيئة القومية للانفاق)

السيد /

تحية طيبة وبعد،

بالإشارة الى مشروع ترشيد الطاقة وما تم مناقشته مع سيادتكم في اجتماع سابق.

برجاء التكرم بتوفير البيانات الخاصة بنقل الركاب عبر مترو الأنفاق و المتعلقة باستهلاك الكهرباء و معدل النقل سنوياً.

مرفق بهذا الخطاب بيان مفصل بالمعلومات المطلوبة.

كما يرجى ترشيح مندوب لسيادتكم لمتابعة هذا الأمر مع استشاري مجلس الوزراء لهذا المشروع.

نشكر لسيادتكم حسن تعاونكم،

وتفضلوا بقبول فائق الاحترام،

بيان مفصل لهيئة تشغيل مترو الأنفاق (التابعة للهيئة القومية للانفاق)

برجاء التفضل بتوفير البيانات التالية للنقل عبر مترو الأنفاق:

- الكهرباء المستخدمة كمصدر للطاقة لنقل الركاب سنوياً
- (راكب. كم) passenger -km سنوياً

وذلك للأعوام 2005، 2006 ، 2007 ، 2008 ،2009

بيانات نقل الركاب

	2005	2006	2007	2008	2009
كمية الكهرباء المستخدمة كمصدر للطاقة سنوياً (كيلو وات ساعة)					
(راكب. كم) سنوياً passenger -km					

الهيئة العامة للنقل النهري

السيد /

تحية طيبة وبعد،

بالإشارة الى مشروع ترشيد الطاقة وما تم مناقشته مع سيادتكم في اجتماع سابق.

برجاء التكرم بتوفير البيانات الخاصة بالنقل النهري للبضائع و المتعلقة بمعدل النقل سنوياً.

مرفق بهذا الخطاب بيان مفصل بالمعلومات المطلوبة.

كما يرجى ترشيح مندوب لسيادتكم لمتابعة هذا الأمر مع استشاري مجلس الوزراء لهذا المشروع.

نشكر لسيادتكم حسن تعاونكم،

وتفضلوا بقبول فائق الاحترام،

بيان مفصل للهيئة العامة للنقل النهري

برجاء التفضل بتوفير البيانات التالية للنقل النهرى للبضائع :

- (طن– كم) ton-km سنوياً

وذلك للأعوام 2005، 2006 ، 2007 ، 2008 ،2009

بيانات نقل البضائع

	2005	2006	2007	2008	2009
(طن– كم) سنوياً ton-km					

الهيئة المصرية العامة للبترول

السيد /

تحية طيبة وبعد،

بالإشارة الى مشروع ترشيد الطاقة وما تم مناقشته مع سيادتكم في اجتماع سابق.

برجاء التكرم بتوفير البيانات الخاصة بالنقل النهري و المتعلقة باستهلاك الوقود في نقل البضائع.

مرفق بهذا الخطاب بيان مفصل بالمعلومات المطلوبة.

كما يرجى ترشيح مندوب لسيادتكم لمتابعة هذا الأمر مع استشاري مجلس الوزراء لهذا المشروع.

نشكر لسيادتكم حسن تعاونكم،

وتفضلوا بقبول فائق الاحترام،

بيان مفصل للهيئة المصرية العامة للبترول

برجاء التفضل بتوفير البيانات التالية للنقل النهرى للبضائع :

- كمية الوقود بالطن المستخدمة كمصدر للطاقة للنقل النهرى للبضائع سنوياً وذلك للأعوام 2005، 2006 ، 2007 ، 2008 ،2009

بيانات النقل النهرى للبضائع

	2005	2006	2007	2008	2009
كمية الوقود (السولار) المستخدمة كمصدر للطاقة سنوياً (طن) فى النقل النهرى للبضائع					

الشركة القابضة للنقل البحري والبري

السيد /

تحية طيبة وبعد،

بالإشارة الى مشروع ترشيد الطاقة وما تم مناقشته مع سيادتكم في اجتماع سابق.

برجاء التكرم بتوفير البيانات الخاصة بالشركات التابعة للشركة القابضة للنقل البحري و البري (شرق الدلتا، غرب ووسط الدلتا والصعيد) و المتعلقة بالنقل البري للركاب بين المدن.

مرفق بهذا الخطاب بيان مفصل بالمعلومات المطلوبة.

كما يرجى ترشيح مندوب لسيادتكم لمتابعة هذا الأمر مع استشاري مجلس الوزراء لهذا المشروع.

نشكر لسيادتكم حسن تعاونكم،

وتفضلوا بقبول فائق الاحترام،

بيان مفصل للشركة القابضة للنقل البحري والبري

برجاء التفضل بتوفير البيانات التالية للنقل البرى للركاب بين المدن بالنسبة لشركات التابعة للشركة القابضة (شرق الدلتا، غرب ووسط الدلتا والصعيد):

- نوع وكمية الوقود بالطن المستخدمة كمصدر للطاقة لنقل الركاب سنوياً
- (راكب. كم) passenger -km سنوياً

وذلك للأعوام 2005، 2006 ، 2007 ، 2008 ،2009

بيانات النقل البرى للركاب

2009	2008	2007	2006	2005	
كمية الوقود المستخدمة كمصدر للطاقة سنوياً (طن)					
					- سولار
					- بنزين
					- غاز
					(راكب. كم) سنوياً **passenger -km**

<u>برجاء التفضل بتوفير البيانات التالية للنقل البرى للبضائع بين المدن عبر الأسطول التابع للشركة القابضة:</u>

- نوع وكمية الوقود بالطن المستخدمة كمصدر للطاقة لنقل البضائع سنوياً
- (طن- كم) ton-km سنوياً

وذلك للأعوام 2005، 2006 ، 2007 ، 2008 ،2009

بيانات النقل البرى للبضائع

2009	2008	2007	2006	2005	
كمية الوقود المستخدمة كمصدر للطاقة سنوياً (طن)					
					- سولار
					- بنزين
					- غاز
					(طن- كم) سنوياً **ton-km**

هيئة النقل العام بالقاهرة

السيد /

تحية طيبة وبعد،

بالإشارة الى مشروع ترشيد الطاقة وما تم مناقشته مع سيادتكم في اجتماع سابق.

برجاء التكرم بتوفير البيانات الخاصة بنقل الركاب عبر أتوبيسات النقل العام و قطاع النقل النهري داخل القاهرة الكبرى و المتعلقة باستهلاك الوقود في نقل الركاب و معدل النقل سنوياً.

مرفق بهذا الخطاب بيان مفصل بالمعلومات المطلوبة.

كما يرجى ترشيح مندوب لسيادتكم لمتابعة هذا الأمر مع استشاري مجلس الوزراء لهذا المشروع.

نشكر لسيادتكم حسن تعاونكم،

وتفضلوا بقبول فائق الاحترام،

بيان مفصل لهيئة النقل العام بالقاهرة

بيانات النقل البرى للركاب

برجاء التفضل بتوفير البيانات التالية لنقل الركاب داخل القاهرة الكبرى عبر أتوبيسات النقل العام:

- كمية الوقود المستخدم كمصدر للطاقة لنقل الركاب سنوياً
- (راكب.كم) passenger-km سنوياً

وذلك للأعوام 2005، 2006 ، 2007 ، 2008 ،2009

	2005	2006	2007	2008	2009
كمية الوقود (الديزل) المستخدم كمصدر للطاقة سنوياً (طن)					
(راكب. كم) سنوياً passenger -km					

فى حالة عدم توافر البيانات (راكب– كم)، برجاء توفير التالى:

- عدد الخطوط والمسافة التى يقطعها الخط
- عدد الركاب على كل خط سنوياً

رقم الخط	من	الى	المسافة المقطوعة (كم)	عدد الركاب/سنة

بيانات النقل النهرى للركاب

برجاء التفضل بتوفير البيانات التالية للنقل النهرى للركاب داخل القاهرة الكبرى:

- كمية الوقود المستخدم كمصدر للطاقة لنقل الركاب سنوياً
- (راكب.كم) passenger-km سنوياً

وذلك للأعوام 2005، 2006 ، 2007 ، 2008 ،2009

	2005	2006	2007	2008	2009
كمية الوقود (الديزل) المستخدم كمصدر للطاقة سنوياً (طن)					
(راكب. كم) سنوياً passenger -km					

فى حالة عدم توافر البيانات (راكب– كم)، برجاء توفير التالى:

- عدد الخطوط والمسافة التى يقطعها الخط
- عدد الركاب على كل خط سنوياً

رقم الخط	من	الى	المسافة المقطوعة (كم)	عدد الركاب/سنة

Annex (V)

Electricity and NG Categories

Electricity Tariff

Residential :	**Price (Pt/KWh)**
1) First 50 kWh monthly	5.0
2) 51 - 200 kWh	11.0
3) 201 - 350 kWh	16.0
4) 351 - 650 kWh	24.0
5) 651 - 1000 kWh	39.0
6) More Than 1000 kWh	48.0

Commercial:	**Price (Pt/KWh)**
1) First 100 kWh monthly	24.0
2) 101 - 250	36.0
3) 251 - 600	46.0
4) 601 - 1000	58.0
5) More Than 1000 kWh	60.0

Prices are based on Power Factor 0.9

Source: Egyptian Electricity Holding Company , Annual Report 2009/2010

Natural Gas Consuming Sectors

Type	Sector	Remarks
Energy Intensive	Electricity	
	Fertilizers	
	Iron & Steel	
	Cement	
Labor Intensive	Small and Refractory industries – Industrial Zones	Ceramic, bricks, etc.
Others	Petrochemicals and Methanol	SIDPEC and e-methanx
	Residential and Semi Residential	Shops, Admin. building, …
	Vehicles Refueling	
	Gas Derivatives	UGDC, Al-Amerya, Western Desert Gas Complex
	Petroleum	Refineries, gas injection and Gas lift in some gas fields.

Annex (VI)

Hospital Beds and Life Expectancy

Health Services Data in MENA and OECD Countries (2003)

Country	No. of Hospital Beds per 1000 person *	Life Expectancy at Birth (total population)**
Japan	14.3	80.93
Czech Republic	8.8	75.18
Austria	8.3	80.13
France	7.7	79.28
Hungary	7.8	72.17
Finland	7.2	77.92
Slovakia	7.2	74.43
Korean South	7.1	78.64
Israel	6.1	79.02
Luxemburg	6	77.66
Ireland	4.3	77.35
UK	4.2	78.16
Denmark	4	77.1
Spain	3.8	79.23
United States	3.3	-
Turkey	2.6	71.8
Egypt	**2.2**	**70.41**
Jordan	1.7	77.88
Syria	1.5	69.39
Mexico	1	72.3

*Sources: * World Bank -World Development Indicators Database*
*** Central Intelligent Agency (CIA) - WORLD FACTBOOK*

Annex (VII)
Terminology & Definitions
(Including Mathematical Symbols)

Terminology & Definitions

This Annex presents definitions of terminology and expressions commonly used in the report.

Energy Accounting System: refers to the entire system for measuring, recording, calculating and analyzing a country's energy consumption.

Accounting framework: refers to the analytical method used for calculation of the indicators.

Activity: refers to the activity within an economy that drives energy consumption at the studied levels (sector, sub-sector, etc.). It is measured in a unit which captures driver for energy consumption, and varies from one sector or sub-sector to another. Activity in transport, for example, is measured in passenger-kilometers and tonne-kilometers for passengers and cargo, respectively.

Activity Effect: is the change in energy consumption due to a change in the size of an activity which correlates with energy use.

Changes in Energy Efficiency: they are often approximated by changes in energy intensity (energy per unit of monetary or physical activity). This is carried out with or without adjustment for changes in factors unrelated to efficiency (such as end-use structure, fuel mix and weather). In other words, changes in energy efficiency are taken as the inverse of changes in energy intensity, and the concepts of efficiency and intensity are used interchangeably. In this manner, definition of energy efficiency reflects factors other than ''true'' energy efficiency given by thermodynamic indicators.

Component-Based Intensity Effect: represents the effect of changing energy intensity for sub-sectors or detailed components of the economy. In general, an index developed from the aggregate energy intensity will not be equal to the component-based intensity index. Only in the case where changes in the individual component intensities are the same, with constant shares of activity for each component, will the indexes be equivalent.

Chaining Analysis: in a chaining analysis, the calculation of EPI and ES is done based on a yearly time-series data where the results from each year are chained together to form the overall results for the period. This is compared to non-chaining analysis which is based on the change from the start and end of the period under study. From the viewpoint of tracking energy efficiency trends, chaining analysis is preferred because it provides a more realistic measure of the real changes in energy efficiency over time, it makes full use of the data available, and is more flexible in terms of application.

Energy Indicators: also known as "*energy performance indicators*", are calculated indicators which provide a measure of the changes in energy use and the causes for it. They may be defined at different levels of aggregation in terms of energy demand, e.g. economy-wide, sector, sub-sector, end use, technology, process and device.

Energy Savings (ES): refers to the energy savings resulting from energy efficiency improvement (measured as a reduction in intensity of use). It is linked to the intensity effect, i.e. when ES is negative; this means that energy efficiency deteriorates resulting in a higher level of energy consumption than otherwise.

Energy Performance Index (EPI): is a weighted index of changes in sub-sector energy intensities. It is linked to the ratio change in energy consumption, i.e. a decrease in EPI implies an improvement in energy efficiency. Generally speaking, energy efficiency index estimated at a higher level of sector disaggregation is considered to be more refined.

Index Decomposition Analysis (IDA) – LMDI Approach: is used to decompose (factorize) a change in energy consumption of a sector, over time, into several pre-defined effects (activity, structure and intensity) that contribute to the change. It therefore gives estimates of the impacts of several drivers of change in energy consumption.

Intensity effect: refers to the change in energy consumption as a result of a change in energy intensity in energy consuming activities.

Monetary-Based Indicators: are given as ratios between energy consumption in an energy unit and economic activity in a monetary unit. They are often used when energy efficiency is measured at a high level of aggregation, where it is not possible to characterize the activity with a single physical indicator across the whole spectrum of activities. Well-known monetary-based indicators include the energy–GDP ratio and industrial energy use per unit of industrial monetary output. This indictor was often employed by researchers in the 1970s and early 1980s mainly due to its simplicity and the paucity of energy consumption data.

Physical-Based Indicators: are normally calculated at a disaggregated level, such as by sub-sector or end-use, by relating energy consumption to an activity indicator measured in the physical terms (e.g. tonnes of steel, passenger-kilometres, floor area in square metres, etc.) or to an energy consumption unit (e.g. vehicle, dwelling, etc).

Structural Effect: refers to the change in energy consumption due to a changing economic structure. This index is employed at higher levels of the indicators hierarchy and reflects the impact on energy use from changes in the relative importance of sub-sectors at lower levels of the hierarchy. It primarily shows the impact of shifts in the composition of sectors or sub-sectors with different absolute energy intensities.

Mathematical Symbols

E is the energy use

I is the intensity of energy use, given as the ratio of energy use to activity

Q is the activity level, measured in appropriate units for each sector or sub-sector.

S is the ratio of activity in a given sector or sub-sector to the overall activity in the sector or economy and is a measure of the structure within the sector or economy.

i the subscript i refers to the various sectors such that E_i is the energy consumption in sector i.

j the subscript j refers to the various sub-sectors such that E_{ij} refers to the energy consumption in sub-sector j of sector i.

Annex (VIII)
Energy Accounting Frameworks

Energy Accounting Frameworks

The commonly used ratio of energy consumption to GDP is not a sufficient measure of how effectively an economy uses its energy. It does not provide insight on the changes in energy use over time, nor the effect that policies have on this energy use. Several accounting frameworks have been developed to track economy-wide energy use and provide indicators that give insight into the sources and variations of this energy use as a tool for planners and policy makers. Given that these frameworks were developed independently by several countries over the course of approximately the past three decades, it is not surprising that there are variations between them. There is some effort presently to unify these systems. As some systems become more developed and refined than others, they offer natural advantages which cause countries to migrate to their use.

The purpose of a framework is to establish a means of aggregating energy use from the lowest levels considered in the economy, a means of tracking changes in energy use over time, and a means for decomposing these changes into causes based on the relative structural, activity, and efficiency changes. Two main methods exist, the Laspeyres method and the Log Mean Divisia Index. They are described briefly and compared in the following sections.

The Laspeyres Index:

The Laspeyres index measures the change in energy intensity as a percentage change. For example, a sub-sector has doubled its energy consumption from 100 units to 200 units in a period of years. The percentage change will depend on the year taken as reference. From the start year to the end year, the consumption will have increased by 100%. From the end year to the start year the consumption will have decreased by 50%. The Laspeyres Index method is therefore said to be asymmetric. In addition, Laspeyres tends to have a residual term, which means that the changes in energy use of components of the economy do not always add to the overall change in energy use. This residual term is usually small, but can be of significant importance in years of considerable change, such as through economic crises.

The Log Mean Divisia Index (LMDI)

Using the example given before, if a log change of the ratio of energy consumptions is taken, the natural log (ln) of 200/100 is 0.693. If the reference year is reversed, and ln(100/200) is -0.693. The change is only in the sign indicating whether there has been an increase or decrease in energy use. This is the basis of the LMDI method. Amongst its advantages, the LMDI method does not have a residual term allowing the changes in overall energy use to be decomposed over the changes in sectoral energy use. This is because the residual term is distributed over effects in energy efficiency, activity level, and structural change in the economy using appropriate weights for each.

The LMDI has the additional advantage that, as a property of logarithms, it expresses multiplicative changes in the indicators as a sum of logarithms.

The broad criteria for evaluating an indicator system are its theoretical foundation and its adaptability in tracking economy wide energy usage. These can be expressed in the following four points[i] (suggested by Ang, 2004):

1) Sound theoretical foundation.
2) Adaptability to adequately serve its intended purpose to capture the true economy-wide energy efficiency trends.
3) Ease of use, where it's easily adopted under different application situations and constraints.
4) Ease of interpretation of the results, which is quite subjective and to some extent linked to the methodological framework, as well as the analysis technique, i.e. the results given by non-chaining analysis are easier to be understood but they are not as refined as those given by chaining analysis. In general, the more refined estimates, the less easy they are to be understood by non-experts.

Capturing Changes in Energy Intensity

The change in energy intensity over time can be found by differentiating the energy intensity with respect to time. However, the result is a differential equation which can be tedious to apply in practice, and complex to integrate to find the cumulative change. If instead the integral problem is treated, the change over time of the energy intensity, D_{tot}, can be obtained by taking a ratio of energy intensities

$$D_{tot} = \frac{I_0}{I_T}$$

where, $I_0$is the initial intensity and I_T the final intensity for the period of time from year 0 to year T,over which change is to be evaluated. The indicators can be structured as indexes, such that a change in overall energy intensity D_{tot} can be described as the product of a structural change, D_{str} and an intensity change, D_{int},

$$D_{tot} = \frac{I_0}{I_T} = D_{str} D_{int}$$

This is called a multiplicative decomposition. It is one of the more common forms of decomposition of the total energy use. It allows the energy use, E, to be written as:

$$E = I \times S \times A$$

where I is a measure of the energy intensity, S a measure of the structure of the economy, and A is a measure of the activity in the economy.

In a similar manner, the decomposition can be additive, such that changes in energy intensity can be expressed as

$$\Delta I_{tot} = I_T - I_0$$

The change can then be decomposed additively such that

$$\Delta I_{tot} = I_T - I_0 = \Delta I_{str} + \Delta I_{int}$$

In both cases, whether a multiplicative or additive decomposition, the purpose is to be able to assign changes in energy intensity to changes in the efficiency of use, the level of activity, or changes in the structure of the economy. This leads to a better understanding of the effects of policies. Within a given framework, there will be additive and multiplicative indices, each used to explain different variations in energy use.

In this sense, the LMDI method is advantageous as it makes use of the multiplicative and additive properties of logarithms to allow the simple derivation of multiplicative of additive changes in energy use.

The Choice of a Framework

For the purposes of this study, we propose the use of the Log Mean Divisia Index (LMDI) approach. Although the results of either an LMDI approach or a Laspeyres approach will be similar under most circumstances, the LMDI approach does offer several advantages. First, the lack of a residual term means the decomposition is exact, and therefore under circumstances of large change, will offer more insight than the Laspeyres method.

Second, the ability to use the multiplicative and additive properties of logarithms makes the use of an LMDI more convenient in decomposing energy use to effects related to activity level, structure of the economy, and energy intensity of the sectors and sub-sectors.

Finally, the LMDI is now becoming the more widely accepted method. Internationally, the LMDI is being advanced as a unifying method for the calculation of energy indicators. The US, Canada, Australia, New Zealand, and others have all adopted the LMDI method. The notable exception is the 2005 IEA study which used the Laspeyres method, though they did not focus their analysis on which method to use. Future studies from the IEA may use either method. Adoption of the LMDI method in Egypt would therefore facilitate comparison with other countries and have the advantage of easily integrating future developments in the accounting method.

Although many differences can be found among the existing accounting systems for tracking economy-wide energy efficiency trends, however, there are two basic approaches:

IDA Approach (Index Decomposition Analysis or Decomposition Cum-Aggregation Approach)	Unit Consumption Approach (Direct Aggregation Approach)
This technique is used to decompose (or factorize) a change in energy consumption in a sector, over time, into several pre-defined effects that contribute to the change. One of them is the intensity effect which is estimated based on changes in the energy intensities of the subsectors.	"Unit Energy Consumption", is a term that has a meaning similar to sub-sector (or end-use) energy intensity in the IDA approach, except that it is more closely linked to the use of physical indicators for activity. Examples are energy consumption per unit floor area, per appliance and per tonne of manufactured products, but it can also mean energy consumption per value-added or any other economic measures of activity.
The EPI or ES for a sector is derived from the corresponding intensity effect estimate. The economy-wide estimate is given as the weighted sum (in the case of EPI) or sum (in the case of ES) for all sectors.	Changes in unit consumption of sub-sectors (or end-uses) are weighted and aggregated or deal with in some other form with a similar concept to give the EPI.
Similar estimates are generally made for effects other than intensity, included in the IDA identity. The common ones are the activity effect and the structure effect. It therefore gives estimates of the impacts of several drivers of changes in energy consumption.	The unit consumption approach is actually similar to the energy intensity effect, computed in the IDA approach. However, it does not explicitly give estimates of the effects of other drivers of energy use.
The activity indicators for sub-sectors in a sector are expected to be the same in definition and have the same unit of measurement. This allows the effects of changes in the overall activity level and activity mix to be defined and captured.	
IDA studies allow the use of either an additive or multiplicative accounting framework. Depending on the choice, either EPI or ES will be derived first.	Multiplicative formulation is the norm in the unit consumption approach and the EPI is always the indicator that is computed first.
Since the IDA approach allows for formulation in either the additive or multiplicative form, it is more general than the unit consumption approach.	Compared to the standard IDA approach, the unit consumption approach is more flexible in terms of how sub-sector energy intensities are defined.

We can broadly group the analytical frameworks of the accounting systems into three different categories, namely the LMDI-based, the Laspeyres-based, and ODEX. The choice within the IDA approach usually lies between the LMDI method and the Laspeyres method. The choice depends partly on the accounting approach, and its implications on how EPI and ES are computed. The LMDI decomposition method has been found to be a good technique and has been recommended for adoption in many countries around the world.

Log Mean Divisia Index (LMDI-I)	Laspeyres Index
EPI and ES are explicitly defined but uniquely related. Their computation can be simplified by virtue of the relationship that exists between the additive and multiplicative versions of the LMDI method	The Laspeyres index, are easy to use and the results given are easy to interpret. However, they do not satisfy several index number tests which are pertinent to the development of a robust EPI.
The change is only in the sign indicating whether there has been an increase (looking forward) or decrease (looking backward) of energy use.	The Laspeyres index measures the change in an energy intensity indicator as a percentage change.

The accounting systems and studies used in various countries focus on final energy use, except for USA-EERE which, in addition to final energy use, also provides estimates with conversion and distribution losses in electricity production allocated to electricity end uses. Variations exist among systems and studies on the level of sector disaggregation, with the Canadian example having more than 100 sub-sectors. The number of sectors is fewer for IEA and EU-ODEX since these are multi-country initiatives and data availability is a limitation. The sub-sectors in transport and industry are fairly standard across countries. The main variations in these sectors are how fine the sub-sectors are. Differences between countries tend to be greater for the residential/household sector and commercial/institutional sector since energy use in these sectors is dependent on geographical location and climate, and different activity indicators may be used to represent drivers of energy use.

[i] Suggested by Ang, 2004.

Annex (IX)

Calculation Results

Table 1: Economy-wide Energy Intensity Indicators for the Egyptian Economy (2007-2009)

Sector/Sub-sector	Measure of Activity (Unit)	Energy use (Ei) (ktoe)		Change in Energy use (ktoe)				LMDI		
		Ei (k-1)	Ei (k)	Change in energy use ($\Delta Ei_{k-1,k}$)	Activity effect ($\Delta Ei_{act\ k-1,k}$)	Structure effect ($\Delta Ei_{str\ k-1,k}$)	Intensity effect ($\Delta Ei_{int\ k-1,k}$)	ESi_t	EHi_t	$EPIi_t$
Economy-wide (2007-2009)		**3,615.87983**	**4,264.67228**	**648.79245**	**430.15982**	**245.81616**	**-27.18354**	**27.18354**	**4,291.86**	**0.99311**
1. Residential Sector	**No. of Households**	**3,131.32416**	**3,767.06793**	**635.74377**	**449.52731**	**243.71648**	**-57.50002**	**57.50002**	**3,824.56795**	**0.98319**
2. Commercial Sector		**53.07207**	**59.93013**	**6.85806**	**0.73361**	**0.21973**	**5.90472**	**-5.90472**	**54.02542**	**1.11068**
Education Sub-Sector	**No. of Pupils**	22.60565	25.42233	2.81668	0.73361	0.21973	1.86333	-1.86333	23.55900	1.08099
Hospitals Sub-Sector	**No. of Patient-Beds**	15.42126	17.27309	1.85183	0.0E+00	0.0E+00	1.85183	-1.85183	15.42126	1.12008
Admin Buildings Sub-Sector	**GFA (sq.m)**	1.23232	1.31939	0.08707	0.0E+00	0.0E+00	0.08707	-0.08707	1.23232	1.07066
Shopping Malls Sub-Sector	**GFA (sq.m)**	10.71162	12.17853	1.46690	0.0E+00	0.0E+00	1.46690	-1.46690	10.71162	1.13695
Super-Markets Sub-Sector	**GFA (sq.m)**	3.10122	3.73680	0.63558	0.0E+00	0.0E+00	0.63558	-0.63558	3.10122	1.20495
3. Transport Sector		**412.24711**	**417.69239**	**5.44529**	**-20.10110**	**1.87996**	**23.66643**	**-23.66643**	**394.02596**	**1.06050**
Passenger Transport Sub-Sector	**Passenger-Km**	341.61634	356.89433	15.27800	-14.48129	2.12852	27.63077	-27.63077	329.26357	1.08245
Freight Transport Sub-Sector	**Ton-Km**	70.63077	60.79806	-9.83271	-5.61981	-0.24856	-3.96433	3.96433	64.76239	0.94939
4. Tourism Sector	**No. of Rooms**	**19.23649**	**19.98183**	**0.74534**	**0.0E+00**	**0.0E+00**	**0.74534**	**-0.74534**	**19.23649**	**1.03875**
5. Industrial Sector	**Ton Product**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Table 2: Residential Sector Energy Intensity Indicators (2007-2009)

Sector/Sub-sector	Activity & Activity level (Qi)			Energy use (Ei) (ktoe)		Activity Share (S)		Energy Intensity (I)		Change in Energy use (ktoe)				LMDI		
	Measure of Activity (Unit)	Qi (k-1)	Qi (k)	Ei (k-1)	Ei (k)	Sij (k-1)	Sij (k)	Iij (k-1)	Iij (k)	Change in energy use ($\Delta Ei_{k-1,k}$)	Activity effect ($\Delta Ei_{act\ k-1,k}$)	Structure effect ($\Delta Ei_{str\ k-1,k}$)	Intensity effect ($\Delta Ei_{int\ k-1,k}$)	ESi_t	EHi_t	$EPIi_t$
Residential (2007-2009)				**3,131.32416**	**3,767.06793**					**635.74377**	**449.52731**	**243.71648**	**-57.50002**	**57.50002**	**3,824.56795**	**0.98319**
Residential (2007)														**0**	**0**	**1**
		Qi 2007 (0)	**Qi 2008 (t=1)**	**Ei 2007 (0)**	**Ei 2008 (t=1)**											
Residential (2008)	No. of Households	**15,912,000**	**16,968,000**	**3,131.32416**	**3,448.72743**			2.0E-04	2.0E-04	**317.40327**	**211.12466**	**143.78553**	**-37.50693**	**37.50693**	**3,486.23436**	**0.98866**
L1 **Tarriff Tier 1: 1-50 kWh**	No. of Households	2,984,000	3,083,000	269.63027	310.93723	0.18753	0.18169	9.0E-05	1.0E-04		18.62086	-9.16245	31.84856			
L1 **Tarriff Tier 2: 51-200 kWh**	No. of Households	8,564,000	8,879,000	1,202.29579	1,229.80224	0.53821	0.52328	1.4E-04	1.4E-04		78.13472	-34.21100	-16.41727			
L1 **Tarriff Tier 3: 201-350 kWh**	No. of Households	3,076,000	3,491,000	865.00430	973.80911	0.19331	0.20574	2.8E-04	2.8E-04		59.00809	57.21442	-7.41769			
L1 **Tarriff Tier 4: 351-650 kWh**	No. of Households	1,049,000	1,186,000	508.05675	557.62683	0.06593	0.06990	4.8E-04	4.7E-04		34.21340	31.14518	-15.78851			
L1 **Tarriff Tier 5: 651-1000 kWh**	No. of Households	163,000	206,000	142.90628	169.21754	0.01024	0.01214	8.8E-04	8.2E-04		10.00407	26.44737	-10.14017			
L1 **Tarriff Tier 6: Over 1000 kWh**	No. of Households	76,000	123,000	143.43078	207.33448	0.00478	0.00725	1.9E-03	1.7E-03		11.14353	72.35201	-19.59184			
		Qi 2008 (1)	**Qi 2009 (2)**	**Ei 2008 (1)**	**Ei 2009 (2)**											
Residential (2009)	No. of Households	**16,968,000**	**18,128,000**	**3,448.72743**	**3,767.06793**				2.1E-04	**318.34050**	**238.40265**	**99.93094**	**-19.99309**	**19.99309**	**3,787.06102**	**0.99447**
L1 **Tarriff Tier 1: 1-50 kWh**	No. of Households	3,083,000	3,218,000	310.93723	323.28461	0.18169	0.17752	1.0E-04	1.0E-04		20.96742	-7.37874	-1.24130			
L1 **Tarriff Tier 2: 51-200 kWh**	No. of Households	8,879,000	9,169,000	1,229.80224	1,312.79450	0.52328	0.50579	1.4E-04	1.4E-04		84.03917	-43.19506	42.14815			
L1 **Tarriff Tier 3: 201-350 kWh**	No. of Households	3,491,000	3,998,000	973.80911	1,094.38521	0.20574	0.22054	2.8E-04	2.7E-04		68.30573	71.76503	-19.49467			
L1 **Tarriff Tier 4: 351-650 kWh**	No. of Households	1,186,000	1,337,000	557.62683	600.84265	0.06990	0.07375	4.7E-04	4.5E-04		38.28614	31.09829	-26.16861			
L1 **Tarriff Tier 5: 651-1000 kWh**	No. of Households	206,000	268,000	169.21754	207.72141	0.01214	0.01478	8.2E-04	7.8E-04		12.41973	36.99567	-10.91153			
L1 **Tarriff Tier 6: Over 1000 kWh**	No. of Households	123,000	138,000	207.33448	228.03955	0.00725	0.00761	1.7E-03	1.7E-03		14.38445	10.64575	-4.32513			

Table 3: Commercial Sector Energy Intensity Indicators (2007-2009)

Sector/Sub-sector	Activity & Activity level (Qi)			Energy use (Ei) (ktoe)		Activity Share (S)		Energy Intensity (I)		Change in Energy use (ktoe)				LMDI		
	Measure of Activity (Unit)	Qi (k-1)	Qi (k)	Ei (k-1)	Ei (k)	Sij (k-1)	Sij (k)	Iij (k-1)	Iij (k)	Change in energy use (ΔEi k-1,k)	Activity effect (ΔEi act k-1,k)	Structure effect (ΔEi str k-1,k)	Intensity effect (ΔEi int k-1,k)	ESi t	EHi t	EPIi t
Commercial (2007-2009)				**53.07207**	**59.93013**					**6.85806**	**0.73361**	**0.21973**	**5.90472**	**-5.90472**	**54.02542**	**1.11068**
Commercial (2007)														**0**	**0**	**1**
		Qi 2007 (t=0)	**Qi 2008 (t=1)**	**Ei 2007 (t=0)**	**Ei 2008 (t=1)**											
Commercial (2008)		**14,457,004**	**14,662,065**	**53.07207**	**58.11828**					**5.04621**	**0.33685**	**0.04401**	**4.66535**	**-4.66535**	**53.45293**	**1.08760**
L1 **Education (Schools)**	No. of Pupils	**14,032,870**	**14,237,931**	**22.60565**	**23.96542**					**1.35977**	**0.33685**	**0.04401**	**0.97891**	**-0.97891**	**22.98650**	**1.04295**
L2 Public Schools	No. of Pupils	**13,106,021**	**13,284,360**	**19.57641**	**20.62439**	0.93395	0.93303	1.5E-06	1.6E-06		0.29070	-0.03069	0.78796	-0.78796	19.83642	1.03999
L3 Cairo & Helwan Gov	No. of Pupils	1,117,353	1,129,037	3.08272	3.08281	0.07962	0.07930	2.8E-06	2.7E-06		0.04472	-0.01265	-0.03197			
L4 Cairo Districts in North Cairo				1.65682	1.73831											
L4 Cairo Districts in South Cairo				0.78427	0.73046											
L4 Helwan Districts in North Cairo				0.04296	0.05635											
L4 Helwan Districts in South Cairo				0.59867	0.55770											
L3 Al-Qaliubeya Gov	No. of Pupils	790,015	823,592	1.09200	1.11127	0.05630	0.05784	1.4E-06	1.3E-06		0.01598	0.02987	-0.02659			
L4 Districts in North Cairo				0.50989	0.48935											
L4 Districts in South Delta				0.58211	0.62192											
L3 Giza & 6th of October Gov	No. of Pupils	1,036,839	1,062,844	1.45835	1.50813	0.07389	0.07465	1.4E-06	1.4E-06		0.02152	0.01522	0.01304			
L4 Giz Gov				0.77554	0.87526											
L4 6th of October Gov				0.68282	0.63287											
L3 Ismaileia Gov	No. of Pupils	190,003	193,574	0.37196	0.33535	0.01354	0.01360	2.0E-06	1.7E-06		0.00513	0.00145	-0.04318			
L3 Port Said Gov	No. of Pupils	98,860	98,921	0.33349	0.35310	0.00704	0.00695	3.4E-06	3.6E-06		0.00498	-0.00477	0.01940			
L3 Suez Gov	No. of Pupils	101,836	102,934	0.21901	0.18648	0.00726	0.00723	2.2E-06	1.8E-06		0.00293	-0.00077	-0.03470			
L3 Al-Sharqeya Gov	No. of Pupils	1,034,227	1,052,208	1.50186	1.31777	0.07370	0.07390	1.5E-06	1.3E-06		0.02042	0.00384	-0.20836			
L3 North Sinai Gov	No. of Pupils	74,848	76,980	0.12434	0.12729	0.00533	0.00541	1.7E-06	1.7E-06		0.00183	0.00171	-0.00058			
L3 South Sinai Gov	No. of Pupils	12,619	13,673	0.05251	0.05997	0.00090	0.00096	4.2E-06	4.4E-06		0.00081	0.00369	0.00295			
L3 Red Sea Gov	No. of Pupils	43,771	45,092	0.09589	0.09174	0.00312	0.00317	2.2E-06	2.0E-06		0.00136	0.00143	-0.00694			
L3 Dammietta Gov	No. of Pupils	222,582	224,164	0.37150	0.38341	0.01586	0.01574	1.7E-06	1.7E-06		0.00548	-0.00280	0.00924			
L4 North Dammietta				0.04157	0.04628											
L4 South Dammietta				0.09525	0.09742											
L4 Ras El-Barr				0.01551	0.01587											
L4 New Damietta				0.05072	0.05187											
L4 Ezbet El-Borg				0.00648	0.00662											
L4 Al-Zarqa				0.03044	0.03114											
L4 Farscore				0.05364	0.05486											
L4 Al-Shoaraa				0.01304	0.01304											
L4 Kafr Saad				0.04816	0.04926											
L4 Kafr Al-Batikh				0.01668	0.01706											
L3 Daqahleya Gov	No. of Pupils	958,605	963,957	1.50432	1.66204	0.06831	0.06770	1.6E-06	1.7E-06		0.02295	-0.01414	0.14890			
L4 Belqass				0.24944	0.29763											
L4 Belqass Villages				0.05215	0.05035											
L4 Al-Satamouni				0.02433	0.03346											
L4 Sherbin				0.03286	0.05559											
L4 Sherbin Villages				0.04381	0.05196											
L4 Dakarnes				0.04716	0.04680											
L4 Bani Oubid				0.01945	0.02772											
L4 Menyet El-Nasr				0.05739	0.05878											
L4 Mit Salsil				0.02623	0.03756											
L4 Al-Gammalleya				0.02332	0.02171											
L4 Al-Manzala				0.02879	0.04690											
L4 Al-Manzala Villages				0.02314	0.03587											
L4 Al-Matareya				0.03019	0.03239											
L4 Gammassa				0.00035	0.00031											
L4 East El-Mansoura				0.07208	0.07446											
L4 West El-Mansoura 1				0.07674	0.07676											
L4 West El-Mansoura 2				0.07388	0.08259											
L4 Al-Mansoura Villages 1				0.02800	0.02848											
L4 Al-Mansoura Villages 2				0.12378	0.12485											
L4 Talkha				0.06605	0.06759											
L4 Nabrawa				0.03428	0.03516											
L4 Al-Sinbellawin				0.05376	0.05417											
L4 Al-Sinbellawin Villages				0.05157	0.05234											
L4 Tama Al-Amdid				0.04767	0.04841											

		L4	Aga				0.09263	0.09374												
		L4	Mit Ghamr				0.03147	0.03172												
		L4	Mit Ghamr Villages				0.04025	0.04080												
		L4	Kom El-Nour				0.05355	0.05393												
	L3	Kafr El-Sheikh Gov		No. of Pupils	511,814	507,972	0.90885	0.84519	0.03647	0.03568	1.8E-06	1.7E-06		0.01272	-0.01932	-0.05705				
		L4	Kafr El-Sheikh				0.19083	0.14407												
		L4	Kafr El-Sheikh Villages				0.10314	0.11573												
		L4	Dissouq				0.12989	0.09494												
		L4	Dissouq Villages				0.08130	0.06871												
		L4	Sidi Salem				0.04793	0.05308												
		L4	Sidi Salem Villages				0.04739	0.03743												
		L4	Qleen				0.03265	0.04000												
		L4	Mitobss				0.03436	0.04086												
		L4	Fowah				0.04969	0.04020												
		L4	Billa				0.04430	0.05635												
		L4	Al-Hamoul				0.03913	0.04310												
		L4	Al-Hamoul Villages				0.03140	0.03182												
		L4	Baltim				0.03247	0.02669												
		L4	Al-Riyad				0.04435	0.05221												
	L3	Al-Beheira Gov		No. of Pupils	961,644	964,847	1.13427	1.36178	0.06853	0.06777	1.2E-06	1.4E-06		0.01806	-0.01392	0.22337				
	L3	Al-Minoufeya Gov		No. of Pupils	643,727	655,458	0.90158	0.83847	0.04587	0.04604	1.4E-06	1.3E-06		0.01262	0.00309	-0.07881				
		L4	Districts in South Delta				0.81080	0.75183												
		L4	Districts in Al-Beheira				0.09077	0.08665												
	L3	Matrouh Gov		No. of Pupils	71,567	72,698	0.19346	0.10911	0.00510	0.00511	2.7E-06	1.5E-06		0.00214	0.00017	-0.08666				
	L3	Al-Gharbeya Gov		No. of Pupils	730,498	729,429	0.72913	0.71646	0.05206	0.05123	1.0E-06	9.8E-07		0.01049	-0.01154	-0.01161				
	L3	Al-Fayoum Gov		No. of Pupils	537,559	536,490	0.32506	0.32772	0.03831	0.03768	6.0E-07	6.1E-07		0.00473	-0.00538	0.00331				
	L3	Bani Souif Gov		No. of Pupils	498,958	505,813	1.49774	1.44269	0.03556	0.03553	3.0E-06	2.9E-06		0.02133	-0.00127	-0.07510				
	L3	Al-Minia Gov		No. of Pupils	922,347	941,716	0.50232	0.70435	0.06573	0.06614	5.4E-07	7.5E-07		0.00867	0.00375	0.18961				
	L3	Assiut Gov		No. of Pupils	734,661	752,675	0.77327	0.78432	0.05235	0.05286	1.1E-06	1.0E-06		0.01130	0.00757	-0.00781				
	L3	New Valley Gov		No. of Pupils	40,992	40,107	0.11923	0.10220	0.00292	0.00282	2.9E-06	2.5E-06		0.00160	-0.00401	-0.01462				
	L3	Aswan Gov		No. of Pupils	251,335	252,114	0.48944	0.56961	0.01791	0.01771	1.9E-06	2.3E-06		0.00767	-0.00603	0.07854				
	L3	Luxor Gov		No. of Pupils	94,054	93,970	0.28825	0.28127	0.00670	0.00660	3.1E-06	3.0E-06		0.00413	-0.00439	-0.00672				
	L3	Qina Gov		No. of Pupils	653,831	654,469	0.75952	0.84570	0.04659	0.04597	1.2E-06	1.3E-06		0.01163	-0.01085	0.08541				
	L3	Souhag Gov		No. of Pupils	771,476	789,626	0.74635	1.47615	0.05498	0.05546	9.7E-07	1.9E-06		0.01552	0.00936	0.70491				
	L2	Private Schools		No. of Pupils	**926,849**	**953,571**	**3.02924**	**3.34103**	0.06605	0.06697	3.3E-06	3.5E-06		0.04614	0.07470	0.19095	-0.19095	3.15008	1.06183	
	L3	Cairo & Helwan Gov		No. of Pupils	386,213	398,483	2.11485	2.36274	0.02752	0.02799	5.5E-06	5.9E-06		0.03245	0.03750	0.17795				
		L4	Cairo Districts in North Cairo				0.36393	0.46147												
		L4	Cairo Districts in South Cairo				0.14981	0.17347												
		L4	Helwan Districts in North Cairo				0.91135	0.95896												
		L4	Helwan Districts in South Cairo				0.68975	0.76885												
	L3	Al-Qaliubeya Gov		No. of Pupils	48,623	51,487	0.10658	0.13593	0.00346	0.00362	2.2E-06	2.6E-06		0.00175	0.00516	0.02244				
		L4	Districts in North Cairo				0.09205	0.12115												
		L4	Districts in South Delta				0.01453	0.01478												
	L3	Giza & 6th of October Gov		No. of Pupils	226,263	238,645	0.39105	0.41786	0.01612	0.01676	1.7E-06	1.8E-06		0.00587	0.01568	0.00527				
		L4	Giz Gov				0.26890	0.22609												
		L4	6th of October Gov				0.12215	0.19177												
	L3	Ismaileia Gov		No. of Pupils	8,603	8,863	0.03821	0.04054	0.00061	0.00062	4.4E-06	4.6E-06		0.00057	0.00060	0.00116				
	L3	Port Said Gov		No. of Pupils	8,258	8,591	0.01358	0.01290	0.00059	0.00060	1.6E-06	1.5E-06		0.00019	0.00033	-0.00120				
	L3	Suez Gov		No. of Pupils	9,987	10,405	0.00981	0.00749	0.00071	0.00073	9.8E-07	7.2E-07		0.00012	0.00023	-0.00266				
	L3	Al-Sharqeya Gov		No. of Pupils	43,177	33,282	0.00603	0.00608	0.00308	0.00234	1.4E-07	1.8E-07		0.00009	-0.00166	0.00162				
	L3	North Sinai Gov		No. of Pupils	1,503	1,890	0.00106	0.00288	0.00011	0.00013	7.1E-07	1.5E-06		0.00003	0.00039	0.00140				
	L3	South Sinai Gov		No. of Pupils	275	340	0.01534	0.01372	0.00002	0.00002	5.6E-05	4.0E-05		0.00021	0.00287	-0.00471				
	L3	Red Sea Gov		No. of Pupils	2,269	2,836	0.02260	0.02681	0.00016	0.00020	1.0E-05	9.5E-06		0.00036	0.00514	-0.00129				
	L3	Dammietta Gov		No. of Pupils	8,115	8,492	0.00580	0.00646	0.00058	0.00060	7.1E-07	7.6E-07		0.00009	0.00019	0.00038				
		L4	South Dammietta				0.00369	0.00381												
		L4	Ras El-Barr				0.00154	0.00187												
		L4	Farscore				0.00032	0.00053												
		L4	Al-Shoaraa				0.00026	0.00025												
	L3	Daqahleya Gov		No. of Pupils	25,281	26,326	0.04512	0.04714	0.00180	0.00185	1.8E-06	1.8E-06		0.00067	0.00120	0.00015				
		L4	Dakarnes				0.00109	0.00080												
		L4	Al-Manzala				0.00000	0.00012												
		L4	East El-Mansoura				0.01729	0.01907												
		L4	West El-Mansoura 1				0.00012	0.00086												
		L4	West El-Mansoura 2				0.00157	0.00152												
		L4	Talkha				0.02506	0.02476												
	L3	Al-Beheira Gov		No. of Pupils	19,143	18,130	0.01516	0.02487	0.00136	0.00127	7.9E-07	1.4E-06		0.00028	-0.00135	0.01078				
	L3	Al-Minoufeya Gov		No. of Pupils	16,706	17,340	0.02074	0.02157	0.00119	0.00122	1.2E-06	1.2E-06		0.00031	0.00048	0.00004				
		L4	Districts in South Delta				0.01476	0.01523												
		L4	Districts in Al-Beheira				0.00598	0.00634												
	L3	Al-Gharbeya Gov		No. of Pupils	24,822	25,433	0.01538	0.01584	0.00177	0.00179	6.2E-07	6.2E-07		0.00023	0.00015	0.00008				
	L3	Al-Fayoum Gov		No. of Pupils	13,558	14,882	0.02007	0.02054	0.00097	0.00105	1.5E-06	1.4E-06		0.00029	0.00160	-0.00142				
	L3	Bani Souif Gov		No. of Pupils	12,162	12,430	0.01376	0.01410	0.00087	0.00087	1.1E-06	1.1E-06		0.00020	0.00010	0.00004				
	L3	Al-Minia Gov		No. of Pupils	29,909	31,977	0.06519	0.07557	0.00213	0.00225	2.2E-06	2.4E-06		0.00102	0.00368	0.00568				

L3	Assiut Gov	No. of Pupils	18,034	18,612	0.06413	0.04552	0.00129	0.00131	3.6E-06	2.4E-06		0.00079	0.00093	-0.02032			
L3	Aswan Gov	No. of Pupils	1,103	1,273	0.00334	0.00397	0.00008	0.00009	3.0E-06	3.1E-06		0.00005	0.00047	0.00011			
L3	Luxor Gov	No. of Pupils	2,947	3,013	0.00633	0.00502	0.00021	0.00021	2.1E-06	1.7E-06		0.00008	0.00004	-0.00143			
L3	Qina Gov	No. of Pupils	4,547	4,616	0.01125	0.00958	0.00032	0.00032	2.5E-06	2.1E-06		0.00015	0.00001	-0.00183			
L3	Souhag Gov	No. of Pupils	15,351	16,225	0.02387	0.02389	0.00109	0.00114	1.6E-06	1.5E-06		0.00035	0.00098	-0.00130			
L1	**Health Care (Hospitals)**	Patient-Bed	**24,453**	**24,453**	**15.42126**	**17.47472**					**2.05346**	**0.0E+00**	**0.0E+00**	**2.05346**	**-2.05346**	**15.42126**	**1.13316**
L2	Public Hospitals	Patient-Bed	**21,678**	**21,678**	**12.62213**	**14.34373**	0.88652	0.88652	5.8E-04	6.6E-04		0.0E+00	0.0E+00	1.72159			
L3	Cairo Gov	Patient-Bed	14,371	14,371	9.02306	9.41951											
L4	Hospital 001	Patient-Bed	253	253	0.02231	0.02481	0.01035	0.01035	8.8E-05	9.8E-05		0.0E+00	0.0E+00	0.00250			
L4	Hospital 002	Patient-Bed	219	219	0.08284	0.08559	0.00896	0.00896	3.8E-04	3.9E-04		0.0E+00	0.0E+00	0.00275			
L4	Hospital 003	Patient-Bed	841	841	0.85526	1.14808	0.03439	0.03439	1.0E-03	1.4E-03		0.0E+00	0.0E+00	0.29282			
L4	Hospital 004	Patient-Bed	278	278	0.22606	0.23959	0.01137	0.01137	8.1E-04	8.6E-04		0.0E+00	0.0E+00	0.01353			
L4	Hospital 005	Patient-Bed	616	616	0.05011	0.05653	0.02519	0.02519	8.1E-05	9.2E-05		0.0E+00	0.0E+00	0.00642			
L4	Hospital 006	Patient-Bed	229	229	0.09198	0.09813	0.00936	0.00936	4.0E-04	4.3E-04		0.0E+00	0.0E+00	0.00615			
L4	Hospital 007	Patient-Bed	60	60	0.03471	0.03310	0.00245	0.00245	5.8E-04	5.5E-04		0.0E+00	0.0E+00	-0.00162			
L4	Hospital 008	Patient-Bed	250	250	0.05290	0.05694	0.01022	0.01022	2.1E-04	2.3E-04		0.0E+00	0.0E+00	0.00403			
L4	Hospital 009	Patient-Bed	143	143	0.04529	0.00925	0.00585	0.00585	3.2E-04	6.5E-05		0.0E+00	0.0E+00	-0.03604			
L4	Hospital 010	Patient-Bed	240	240	0.12551	0.15498	0.00981	0.00981	5.2E-04	6.5E-04		0.0E+00	0.0E+00	0.02948			
L4	Hospital 011	Patient-Bed	750	750	0.11440	0.12532	0.03067	0.03067	1.5E-04	1.7E-04		0.0E+00	0.0E+00	0.01092			
L4	Hospital 012	Patient-Bed	256	256	0.03616	0.04016	0.01047	0.01047	1.4E-04	1.6E-04		0.0E+00	0.0E+00	0.00401			
L4	Hospital 013	Patient-Bed	110	110	0.05474	0.10445	0.00450	0.00450	5.0E-04	9.5E-04		0.0E+00	0.0E+00	0.04971			
L4	Hospital 014	Patient-Bed	1,000	1,000	0.26965	0.29785	0.04089	0.04089	2.7E-04	3.0E-04		0.0E+00	0.0E+00	0.02820			
L4	Hospital 015	Patient-Bed	150	150	0.26710	0.29180	0.00613	0.00613	1.8E-03	1.9E-03		0.0E+00	0.0E+00	0.02469			
L4	Hospital 016	Patient-Bed	110	110	0.00829	0.01396	0.00450	0.00450	7.5E-05	1.3E-04		0.0E+00	0.0E+00	0.00567			
L4	Hospital 017	Patient-Bed	1,794	1,794	0.44739	0.48622	0.07337	0.07337	2.5E-04	2.7E-04		0.0E+00	0.0E+00	0.03883			
L4	Hospital 018	Patient-Bed	1,208	1,208	2.13409	2.21936	0.04940	0.04940	1.8E-03	1.8E-03		0.0E+00	0.0E+00	0.08526			
L4	Hospital 019	Patient-Bed	253	253	0.26377	0.33592	0.01035	0.01035	1.0E-03	1.3E-03		0.0E+00	0.0E+00	0.07216			
L4	Hospital 020	Patient-Bed	550	550	0.56982	0.55140	0.02249	0.02249	1.0E-03	1.0E-03		0.0E+00	0.0E+00	-0.01842			
L4	Hospital 021	Patient-Bed	732	732	0.17680	0.20641	0.02993	0.02993	2.4E-04	2.8E-04		0.0E+00	0.0E+00	0.02961			
L4	Hospital 022	Patient-Bed	726	726	0.37192	0.25199	0.02969	0.02969	5.1E-04	3.5E-04		0.0E+00	0.0E+00	-0.11993			
L4	Hospital 023	Patient-Bed	418	418	0.10956	0.10916	0.01709	0.01709	2.6E-04	2.6E-04		0.0E+00	0.0E+00	-0.00040			
L4	Hospital 024	Patient-Bed	496	496	0.32529	0.29814	0.02028	0.02028	6.6E-04	6.0E-04		0.0E+00	0.0E+00	-0.02715			
L4	Hospital 025	Patient-Bed	308	308	0.40890	0.32802	0.01260	0.01260	1.3E-03	1.1E-03		0.0E+00	0.0E+00	-0.08087			
L4	Hospital 026	Patient-Bed	202	202	0.13260	0.14552	0.00826	0.00826	6.6E-04	7.2E-04		0.0E+00	0.0E+00	0.01292			
L4	Hospital 027	Patient-Bed	427	427	0.16980	0.12400	0.01746	0.01746	4.0E-04	2.9E-04		0.0E+00	0.0E+00	-0.04580			
L4	Hospital 028	Patient-Bed	430	430	0.25788	0.26711	0.01758	0.01758	6.0E-04	6.2E-04		0.0E+00	0.0E+00	0.00923			
L4	Hospital 029	Patient-Bed	324	324	0.16840	0.15898	0.01325	0.01325	5.2E-04	4.9E-04		0.0E+00	0.0E+00	-0.00942			
L4	Hospital 030	Patient-Bed	218	218	0.16544	0.16316	0.00892	0.00892	7.6E-04	7.5E-04		0.0E+00	0.0E+00	-0.00228			
L4	Hospital 031	Patient-Bed	300	300	0.14445	0.16173	0.01227	0.01227	4.8E-04	5.4E-04		0.0E+00	0.0E+00	0.01728			
L4	Hospital 032	Patient-Bed	180	180	0.35757	0.36211	0.00736	0.00736	2.0E-03	2.0E-03		0.0E+00	0.0E+00	0.00455			
L4	Hospital 033	Patient-Bed	300	300	0.48210	0.46975	0.01227	0.01227	1.6E-03	1.6E-03		0.0E+00	0.0E+00	-0.01235			
L3	Alexandria Gov	Patient-Bed	3,900	3,900	1.17933	0.99617											
L4	Hospital 034	Patient-Bed	284	284	0.16636	0.16657	0.01161	0.01161	5.9E-04	5.9E-04		0.0E+00	0.0E+00	0.00021			
L4	Hospital 035	Patient-Bed	2,160	2,160	0.23850	0.04870	0.08833	0.08833	1.1E-04	2.3E-05		0.0E+00	0.0E+00	-0.18980			
L4	Hospital 036	Patient-Bed	856	856	0.18248	0.18355	0.03501	0.03501	2.1E-04	2.1E-04		0.0E+00	0.0E+00	0.00107			
L4	Hospital 037	Patient-Bed	600	600	0.59199	0.59735	0.02454	0.02454	9.9E-04	1.0E-03		0.0E+00	0.0E+00	0.00537			
L3	Nile Delta Region	Patient-Bed	2,410	2,410	2.36487	3.85910											
L4	Hospital 038	Patient-Bed	512	512	0.17623	0.19899	0.02094	0.02094	3.4E-04	3.9E-04		0.0E+00	0.0E+00	0.02276			
L4	Hospital 039	Patient-Bed	150	150	0.14716	1.14721	0.00613	0.00613	9.8E-04	7.6E-03		0.0E+00	0.0E+00	1.00004			
L4	Hospital 040	Patient-Bed	410	410	0.11588	0.13648	0.01677	0.01677	2.8E-04	3.3E-04		0.0E+00	0.0E+00	0.02060			
L4	Hospital 041	Patient-Bed	150	150	0.01813	0.01744	0.00613	0.00613	1.2E-04	1.2E-04		0.0E+00	0.0E+00	-0.00069			
L4	Hospital 042	Patient-Bed	108	108	0.03432	0.03109	0.00442	0.00442	3.2E-04	2.9E-04		0.0E+00	0.0E+00	-0.00322			
L4	Hospital 043	Patient-Bed	320	320	0.09150	0.09547	0.01309	0.01309	2.9E-04	3.0E-04		0.0E+00	0.0E+00	0.00397			
L4	Hospital 044	Patient-Bed	60	60	0.26283	0.36653	0.00245	0.00245	4.4E-03	6.1E-03		0.0E+00	0.0E+00	0.10370			
L4	Hospital 045	Patient-Bed	238	238	1.28946	1.63488	0.00973	0.00973	5.4E-03	6.9E-03		0.0E+00	0.0E+00	0.34542			
L4	Hospital 046	Patient-Bed	34	34	0.02196	0.02277	0.00139	0.00139	6.5E-04	6.7E-04		0.0E+00	0.0E+00	0.00082			
L4	Hospital 047	Patient-Bed	150	150	0.02544	0.02380	0.00613	0.00613	1.7E-04	1.6E-04		0.0E+00	0.0E+00	-0.00165			
L4	Hospital 048	Patient-Bed	55	55	0.06207	0.05994	0.00225	0.00225	1.1E-03	1.1E-03		0.0E+00	0.0E+00	-0.00213			
L4	Hospital 049	Patient-Bed	54	54	0.06964	0.07342	0.00221	0.00221	1.3E-03	1.4E-03		0.0E+00	0.0E+00	0.00379			
L4	Hospital 050	Patient-Bed	22	22	0.02176	0.02014	0.00090	0.00090	9.9E-04	9.2E-04		0.0E+00	0.0E+00	-0.00162			
L4	Hospital 051	Patient-Bed	147	147	0.02850	0.03094	0.00601	0.00601	1.9E-04	2.1E-04		0.0E+00	0.0E+00	0.00244			
L3	Al-Beheira Region	Patient-Bed	997	997	0.05487	0.06895											
L4	Hospital 052	Patient-Bed	754	754	0.04189	0.03686	0.03083	0.03083	5.6E-05	4.9E-05		0.0E+00	0.0E+00	-0.00503			
L4	Hospital 053	Patient-Bed	243	243	0.01298	0.03209	0.00994	0.00994	5.3E-05	1.3E-04		0.0E+00	0.0E+00	0.01911			
L2	Private Hospitals	Patient-Bed	**2,775**	**2,775**	**2.79913**	**3.13100**	0.11348	0.11348	1.0E-03	1.1E-03		0.0E+00	0.0E+00	0.33187			
L3	Cairo Gov	Patient-Bed	2,332	2,332	2.39689	2.58620											
L4	Hospital 054	Patient-Bed	100	100	0.59496	0.61277	0.00409	0.00409	5.9E-03	6.1E-03		0.0E+00	0.0E+00	0.01782			
L4	Hospital 055	Patient-Bed	203	203	0.39207	0.40174	0.00830	0.00830	1.9E-03	2.0E-03		0.0E+00	0.0E+00	0.00967			
L4	Hospital 056	Patient-Bed	134	134	0.22746	0.26496	0.00548	0.00548	1.7E-03	2.0E-03		0.0E+00	0.0E+00	0.03750			
L4	Hospital 057	Patient-Bed	50	50	0.15081	0.16905	0.00204	0.00204	3.0E-03	3.4E-03		0.0E+00	0.0E+00	0.01824			
L4	Hospital 058	Patient-Bed	145	145	0.27201	0.30054	0.00593	0.00593	1.9E-03	2.1E-03		0.0E+00	0.0E+00	0.02852			

L4	Hospital 059	Patient-Bed	200	200	0.39795	0.44586	0.00818	0.00818	2.0E-03	2.2E-03		0.0E+00	0.0E+00	0.04791			
L4	Hospital 060	Patient-Bed	1,500	1,500	0.36164	0.39129	0.06134	0.06134	2.4E-04	2.6E-04		0.0E+00	0.0E+00	0.02964			
L3	Canal Region	Patient-Bed	215	215	0.35010	0.48869											
L4	Hospital 061	Patient-Bed	215	215	0.35010	0.48869	0.00879	0.00879	1.6E-03	2.3E-03		0.0E+00	0.0E+00	0.13859			
L3	Nile Delta Region	Patient-Bed	228	228	0.05214	0.05610											
L4	Hospital 062	Patient-Bed	228	228	0.05214	0.05610	0.00932	0.00932	2.3E-04	2.5E-04		0.0E+00	0.0E+00	0.00396			
L1	**Administrative Buildings in Cairo**	GFA (sq.m)	**182,636**	**182,636**	**1.23232**	**1.29234**					**0.06002**	**0.0E+00**	**0.0E+00**	**0.06002**	**-0.06002**	**1.23232**	**1.04870**
L2	Office Space 001	GFA (sq.m)	40,120	40,120	0.20625	0.22198	0.21967	0.21967	5.1E-06	5.5E-06		0.0E+00	0.0E+00	0.01573			
L2	Office Space 002	GFA (sq.m)	31,360	31,360	0.78600	0.84090	0.17171	0.17171	2.5E-05	2.7E-05		0.0E+00	0.0E+00	0.05490			
L2	Office Space 003	GFA (sq.m)	33,156	33,156	0.06459	0.04907	0.18154	0.18154	1.9E-06	1.5E-06		0.0E+00	0.0E+00	-0.01552			
L2	Office Space 004	GFA (sq.m)	78,000	78,000	0.17548	0.18039	0.42708	0.42708	2.2E-06	2.3E-06		0.0E+00	0.0E+00	0.00491			
L1	**Shopping Malls in Cairo**	GFA (sq.m)	**184,000**	**184,000**	**10.71162**	**11.73063**					**1.01901**	**0.0E+00**	**0.0E+00**	**1.01901**	**-1.01901**	**10.71162**	**1.09513**
L2	Mall 001	GFA (sq.m)	150,000	150,000	8.27139	9.14359	0.81522	0.81522	5.5E-05	6.1E-05		0.0E+00	0.0E+00	0.87220			
L2	Mall 002	GFA (sq.m)	12,000	12,000	0.61637	0.61476	0.06522	0.06522	5.1E-05	5.1E-05		0.0E+00	0.0E+00	-0.00162			
L2	Mall 003	GFA (sq.m)	11,000	11,000	0.61600	0.62371	0.05978	0.05978	5.6E-05	5.7E-05		0.0E+00	0.0E+00	0.00771			
L2	Mall 004	GFA (sq.m)	11,000	11,000	1.20786	1.34857	0.05978	0.05978	1.1E-04	1.2E-04		0.0E+00	0.0E+00	0.14072			
L1	**Supermarkets in Cairo**	GFA (sq.m)	**33,045**	**33,045**	**3.10122**	**3.65517**					**0.55395**	**0.0E+00**	**0.0E+00**	**0.55395**	**-0.55395**	**3.10122**	**1.17862**
L2	Retail 001	GFA (sq.m)	6,545	6,545	0.33546	0.41079											
L3	Branch 001-A	GFA (sq.m)	1,130	1,130	0.02217	0.06597	0.03420	0.03420	2.0E-05	5.8E-05		0.0E+00	0.0E+00	0.04380			
L3	Branch 001-B	GFA (sq.m)	900	900	0.05941	0.06630	0.02724	0.02724	6.6E-05	7.4E-05		0.0E+00	0.0E+00	0.00690			
L3	Branch 001-C	GFA (sq.m)	1,150	1,150	0.04974	0.05314	0.03480	0.03480	4.3E-05	4.6E-05		0.0E+00	0.0E+00	0.00340			
L3	Branch 001-D	GFA (sq.m)	1,100	1,100	0.06184	0.07614	0.03329	0.03329	5.6E-05	6.9E-05		0.0E+00	0.0E+00	0.01431			
L3	Branch 001-E	GFA (sq.m)	985	985	0.08410	0.09021	0.02981	0.02981	8.5E-05	9.2E-05		0.0E+00	0.0E+00	0.00611			
L3	Branch 001-F	GFA (sq.m)	1,280	1,280	0.05821	0.05903	0.03874	0.03874	4.5E-05	4.6E-05		0.0E+00	0.0E+00	0.00082			
L2	Retail 002	GFA (sq.m)	7,500	7,500	0.33463	0.39190	0.22696	0.22696	4.5E-05	5.2E-05		0.0E+00	0.0E+00	0.05727			
L3	Branch 002-A				0.17238	0.18573											
L3	Branch 002-B				0.15479	0.15700											
L3	Branch 002-C				0.00746	0.04917											
L2	Retail 003	GFA (sq.m)	9,000	9,000	0.69521	0.78212	0.27236	0.27236	7.7E-05	8.7E-05		0.0E+00	0.0E+00	0.08690			
L2	Retail 004	GFA (sq.m)	10,000	10,000	1.73592	2.07037	0.30262	0.30262	1.7E-04	2.1E-04		0.0E+00	0.0E+00	0.33445			
			Qi 2008 (1)	**Qi 2009 (2)**	**Ei 2008 (1)**	**Ei 2009 (2)**											
Commercial (2009)			**14,662,065**	**14,893,640**	**58.11828**	**59.93013**					**1.81185**	**0.39677**	**0.17572**	**1.23936**	**-1.23936**	**58.69077**	**1.02122**
L1	**Education (Schools)**	No. of Pupils	**14,237,931**	**14,469,506**	**23.96542**	**25.42233**					**1.45691**	**0.39677**	**0.17572**	**0.88442**	**-0.88442**	**24.53791**	**1.03648**
L2	Public Schools	No. of Pupils	**13,284,360**	**13,493,790**	**20.62439**	**21.07609**	0.93303	0.93257	1.6E-06	1.6E-06		0.33519	0.15119	-0.03467	0.03467	21.11076	0.99834
L3	Cairo & Helwan Gov	No. of Pupils	1,129,037	1,266,763	3.08281	4.00637	0.07930	0.08755	2.7E-06	3.2E-06		0.05686	0.34880	0.51789			
L4	Cairo Districts in North Cairo				1.73831	1.67045											
L4	Cairo Districts in South Cairo				0.73046	0.78060											
L4	Helwan Districts in North Cairo				0.05635	0.05477											
L4	Helwan Districts in South Cairo				0.55770	1.50055											
L3	Al-Qaliubeya Gov	No. of Pupils	823,592	844,580	1.11127	1.00403	0.05784	0.05837	1.3E-06	1.2E-06		0.01705	0.00954	-0.13383			
L4	Districts in North Cairo				0.48935	0.45821											
L4	Districts in South Delta				0.62192	0.54582											
L3	Giza & 6th of October Gov	No. of Pupils	1,062,844	975,388	1.50813	1.75822	0.07465	0.06741	1.4E-06	1.8E-06		0.02630	-0.16626	0.39005			
L4	Giz Gov			467,455	0.87526	1.07836											
L4	6th of October Gov			507,933	0.63287	0.67986											
L3	Ismailleia Gov	No. of Pupils	193,574	198,061	0.33535	0.29257	0.01360	0.01369	1.7E-06	1.5E-06		0.00506	0.00213	-0.04997			
L3	Port Said Gov	No. of Pupils	98,921	99,798	0.35310	0.34556	0.00695	0.00690	3.6E-06	3.5E-06		0.00564	-0.00255	-0.01063			
L3	Suez Gov	No. of Pupils	102,934	108,156	0.18648	0.14947	0.00723	0.00747	1.8E-06	1.4E-06		0.00270	0.00558	-0.04529			
L3	Al-Sharqeya Gov	No. of Pupils	1,052,208	1,062,611	1.31777	1.37822	0.07390	0.07344	1.3E-06	1.3E-06		0.02174	-0.00848	0.04720			
L3	North Sinai Gov	No. of Pupils	76,980	78,301	0.12729	0.14032	0.00541	0.00541	1.7E-06	1.8E-06		0.00216	0.00012	0.01076			
L3	South Sinai Gov	No. of Pupils	13,673	14,671	0.05997	0.05596	0.00096	0.00101	4.4E-06	3.8E-06		0.00093	0.00315	-0.00809			
L3	Red Sea Gov	No. of Pupils	45,092	46,823	0.09174	0.10116	0.00317	0.00324	2.0E-06	2.2E-06		0.00155	0.00208	0.00579			
L3	Dammietta Gov	No. of Pupils	224,164	230,439	0.38341	0.42634	0.01574	0.01593	1.7E-06	1.9E-06		0.00653	0.00464	0.03177			
L4	North Dammietta				0.04628	0.05143											
L4	South Dammietta				0.09742	0.10824											
L4	Ras El-Barr				0.01587	0.01763											
L4	New Damietta				0.05187	0.05763											
L4	Ezbet El-Borg				0.00662	0.00736											
L4	Al-Zarqa				0.03114	0.03460											
L4	Farscore				0.05486	0.06096											
L4	Al-Shoaraa				0.01304	0.01481											

		L4	Kafr Saad				0.04926	0.05473												
		L4	Kafr Al-Batikh				0.01706	0.01895												
	L3		Daqahleya Gov	No. of Pupils	963,957	980,886	1.66204	1.67459	0.06770	0.06779	1.7E-06	1.7E-06		0.02692	0.00213	-0.01649				
		L4	Belqass				0.29763	0.18451												
		L4	Belqass Villages				0.05035	0.06126												
		L4	Al-Satamouni				0.03346	0.04687												
		L4	Sherbin				0.05559	0.03669												
		L4	Sherbin Villages				0.05196	0.04135												
		L4	Dakarnes				0.04680	0.04609												
		L4	Bani Oubid				0.02772	0.03828												
		L4	Menyet El-Nasr				0.05878	0.06351												
		L4	Mit Salsil				0.03756	0.06613												
		L4	Al-Gammalleya				0.02171	0.02661												
		L4	Al-Manzala				0.04690	0.03072												
		L4	Al-Manzala Villages				0.03587	0.02879												
		L4	Al-Matareya				0.03239	0.05479												
		L4	Gammassa				0.00031	0.00143												
		L4	East El-Mansoura				0.07446	0.07880												
		L4	West El-Mansoura 1				0.07676	0.08446												
		L4	West El-Mansoura 2				0.08259	0.08511												
		L4	Al-Mansoura Villages 1				0.02848	0.02965												
		L4	Al-Mansoura Villages 2				0.12485	0.13822												
		L4	Talkha				0.06759	0.07930												
		L4	Nabrawa				0.03516	0.03655												
		L4	Al-Sinbellawin				0.05417	0.06350												
		L4	Al-Sinbellawin Villages				0.05234	0.07163												
		L4	Tama Al-Amdid				0.04841	0.05679												
		L4	Aga				0.09374	0.09418												
		L4	Mit Ghamr				0.03172	0.03261												
		L4	Mit Ghamr Villages				0.04080	0.04309												
		L4	Kom El-Nour				0.05393	0.05369												
	L3		Kafr El-Sheikh Gov	No. of Pupils	507,972	504,788	0.84519	0.89097	0.03568	0.03489	1.7E-06	1.8E-06		0.01400	-0.01946	0.05124				
		L4	Kafr El-Sheikh				0.14407	0.17002												
		L4	Kafr El-Sheikh Villages				0.11573	0.09363												
		L4	Dissouq				0.09494	0.10994												
		L4	Dissouq Villages				0.06871	0.07614												
		L4	Sidi Salem				0.05308	0.05549												
		L4	Sidi Salem Villages				0.03743	0.04964												
		L4	Qleen				0.04000	0.04304												
		L4	Mitobss				0.04086	0.03344												
		L4	Fowah				0.04020	0.05375												
		L4	Billa				0.05635	0.05289												
		L4	Al-Hamoul				0.04310	0.03139												
		L4	Al-Hamoul Villages				0.03182	0.02955												
		L4	Baltim				0.02669	0.02626												
		L4	Al-Riyad				0.05221	0.06579												
	L3		Al-Beheira Gov	No. of Pupils	964,847	971,158	1.36178	1.43430	0.06777	0.06712	1.4E-06	1.5E-06		0.02255	-0.01344	0.06341				
	L3		Al-Minoufeya Gov	No. of Pupils	655,458	670,348	0.83847	0.83606	0.04604	0.04633	1.3E-06	1.2E-06		0.01351	0.00530	-0.02122				
		L4	Districts in South Delta				0.75183	0.75218												
		L4	Districts in Al-Beheira				0.08665	0.08388												
	L3		Matrouh Gov	No. of Pupils	72,698	76,237	0.10911	0.07847	0.00511	0.00527	1.5E-06	1.0E-06		0.00150	0.00292	-0.03506				
	L3		Al-Gharbeya Gov	No. of Pupils	729,429	733,578	0.71646	0.66664	0.05123	0.05070	9.8E-07	9.1E-07		0.01115	-0.00723	-0.05374				
	L3		Al-Fayoum Gov	No. of Pupils	536,490	545,169	0.32772	0.33571	0.03768	0.03768	6.1E-07	6.2E-07		0.00535	-0.00003	0.00266				
	L3		Bani Souif Gov	No. of Pupils	505,813	516,427	1.44269	1.46218	0.03553	0.03569	2.9E-06	2.8E-06		0.02343	0.00673	-0.01068				
	L3		Al-Minia Gov	No. of Pupils	941,716	958,751	0.70435	0.67672	0.06614	0.06626	7.5E-07	7.1E-07		0.01114	0.00124	-0.04001				
	L3		Assiut Gov	No. of Pupils	752,675	767,686	0.78432	0.82250	0.05286	0.05306	1.0E-06	1.1E-06		0.01296	0.00290	0.02232				
	L3		New Valley Gov	No. of Pupils	40,107	40,571	0.10220	0.13963	0.00282	0.00280	2.5E-06	3.4E-06		0.00194	-0.00056	0.03606				
	L3		Aswan Gov	No. of Pupils	252,114	254,394	0.56961	0.60755	0.01771	0.01758	2.3E-06	2.4E-06		0.00949	-0.00420	0.03264				
	L3		Luxor Gov	No. of Pupils	93,970	92,663	0.28127	0.29251	0.00660	0.00640	3.0E-06	3.2E-06		0.00463	-0.00865	0.01525				
	L3		Qina Gov	No. of Pupils	654,469	657,878	0.84570	0.77796	0.04597	0.04547	1.3E-06	1.2E-06		0.01309	-0.00888	-0.07196				
	L3		Souhag Gov	No. of Pupils	789,626	797,665	1.47615	0.72208	0.05546	0.05513	1.9E-06	9.1E-07		0.01701	-0.00633	-0.76475				
L2			Private Schools	No. of Pupils	**953,571**	**975,716**	**3.34103**	**4.34624**	0.06697	0.06743	3.5E-06	4.5E-06		0.06158	0.02454	0.91909	-0.91909	3.42714	1.27188	
	L3		Cairo & Helwan Gov	No. of Pupils	398,483	405,888	2.36274	3.04264	0.02799	0.02805	5.9E-06	7.5E-06		0.04337	0.00613	0.63040				
		L4	Cairo Districts in North Cairo				0.46147	0.89384												
		L4	Cairo Districts in South Cairo				0.17347	0.20086												
		L4	Helwan Districts in North Cairo				0.95896	1.14705												
		L4	Helwan Districts in South Cairo				0.76885	0.80089												
	L3		Al-Qaliubeya Gov	No. of Pupils	51,487	55,639	0.13593	0.18695	0.00362	0.00385	2.6E-06	3.4E-06		0.00258	0.00983	0.03861				
		L4	Districts in North Cairo				0.12115	0.17151												
		L4	Districts in South Delta				0.01478	0.01544												
	L3		Giza & 6th of October Gov	No. of Pupils	238,645	245,674	0.41786	0.67481	0.01676	0.01698	1.8E-06	2.7E-06		0.00865	0.00691	0.24139				
		L4	Giz Gov			178,866	0.22609	0.26868												
		L4	6th of October Gov			66,808	0.19177	0.40613												

L3	Ismaileia Gov	No. of Pupils	8,863	8,847	0.04054	0.04200	0.00062	0.00061	4.6E-06	4.7E-06		0.00067	-0.00074	0.00153			
L3	Port Said Gov	No. of Pupils	8,591	8,843	0.01290	0.01320	0.00060	0.00061	1.5E-06	1.5E-06		0.00021	0.00017	-0.00008			
L3	Suez Gov	No. of Pupils	10,405	10,521	0.00749	0.00436	0.00073	0.00073	7.2E-07	4.1E-07		0.00009	-0.00003	-0.00320			
L3	Al-Sharqeya Gov	No. of Pupils	33,282	33,278	0.00608	0.00461	0.00234	0.00230	1.8E-07	1.4E-07		0.00009	-0.00009	-0.00146			
L3	North Sinai Gov	No. of Pupils	1,890	2,097	0.00288	0.00180	0.00013	0.00014	1.5E-06	8.6E-07		0.00004	0.00020	-0.00132			
L3	South Sinai Gov	No. of Pupils	340	332	0.01372	0.01558	0.00002	0.00002	4.0E-05	4.7E-05		0.00024	-0.00058	0.00221			
L3	Red Sea Gov	No. of Pupils	2,836	3,259	0.02681	0.03086	0.00020	0.00023	9.5E-06	9.5E-06		0.00046	0.00354	0.00004			
L3	Dammietta Gov	No. of Pupils	8,492	8,506	0.00646	0.00539	0.00060	0.00059	7.6E-07	6.3E-07		0.00010	-0.00009	-0.00109			
L4	South Dammietta				0.00381	0.00223											
L4	Ras El-Barr				0.00187	0.00250											
L4	Farscore				0.00053	0.00036											
L4	Al-Shoaraa				0.00025	0.00029											
L3	Daqahleya Gov	No. of Pupils	26,326	26,650	0.04714	0.04164	0.00185	0.00184	1.8E-06	1.6E-06		0.00072	-0.00017	-0.00604			
L4	Dakarnes				0.00080	0.00083											
L4	Al-Manzala				0.00012	0.00022											
L4	East El-Mansoura				0.01907	0.02059											
L4	West El-Mansoura 1				0.00086	0.00042											
L4	West El-Mansoura 2				0.00152	0.00112											
L4	Talkha				0.02476	0.01845											
L3	Al-Beheira Gov	No. of Pupils	18,130	17,798	0.02487	0.01665	0.00127	0.00123	1.4E-06	9.4E-07		0.00033	-0.00071	-0.00784			
L3	Al-Minoufeya Gov	No. of Pupils	17,340	18,103	0.02157	0.02354	0.00122	0.00125	1.2E-06	1.3E-06		0.00036	0.00061	0.00101			
L4	Districts in South Delta				0.01523	0.01717											
L4	Districts in Al-Beheira				0.00634	0.00637											
L3	Al-Gharbeya Gov	No. of Pupils	25,433	25,829	0.01584	0.01643	0.00179	0.00179	6.2E-07	6.4E-07		0.00026	-0.00001	0.00034			
L3	Al-Fayoum Gov	No. of Pupils	14,882	12,430	0.02054	0.02554	0.00105	0.00086	1.4E-06	2.1E-06		0.00037	-0.00450	0.00913			
L3	Bani Souif Gov	No. of Pupils	12,430	13,983	0.01410	0.01585	0.00087	0.00097	1.1E-06	1.1E-06		0.00024	0.00152	-0.00001			
L3	Al-Minia Gov	No. of Pupils	31,977	33,068	0.07557	0.08236	0.00225	0.00229	2.4E-06	2.5E-06		0.00127	0.00137	0.00415			
L3	Assiut Gov	No. of Pupils	18,612	18,965	0.04552	0.05789	0.00131	0.00131	2.4E-06	3.1E-06		0.00083	0.00014	0.01140			
L3	Aswan Gov	No. of Pupils	1,273	1,499	0.00397	0.00426	0.00009	0.00010	3.1E-06	2.8E-06		0.00007	0.00061	-0.00039			
L3	Luxor Gov	No. of Pupils	3,013	3,155	0.00502	0.00292	0.00021	0.00022	1.7E-06	9.3E-07		0.00006	0.00012	-0.00228			
L3	Qina Gov	No. of Pupils	4,616	4,774	0.00958	0.01214	0.00032	0.00033	2.1E-06	2.5E-06		0.00017	0.00019	0.00219			
L3	Souhag Gov	No. of Pupils	16,225	16,578	0.02389	0.02482	0.00114	0.00115	1.5E-06	1.5E-06		0.00039	0.00013	0.00040			
L1	**Health Care (Hospitals)**	Patient-Bed	**24,453**	**24,453**	**17.47472**	**17.27309**					**-0.20163**	**0.0E+00**	**0.0E+00**	**-0.20163**	**0.20163**	**17.47472**	**0.98846**
L2	Public Hospitals	Patient-Bed	**21,678**	**21,678**	**14.34373**	**14.03020**	0.88652	0.88652	6.6E-04	6.5E-04		0.0E+00	0.0E+00	-0.31353			
L3	Cairo Gov	Patient-Bed	14,371	14,371	9.41951	9.91435											
L4	Hospital 001	Patient-Bed	253	253	0.02481	0.02387	0.01035	0.01035	9.8E-05	9.4E-05		0.0E+00	0.0E+00	-0.00094			
L4	Hospital 002	Patient-Bed	219	219	0.08559	0.00483	0.00896	0.00896	3.9E-04	2.2E-05		0.0E+00	0.0E+00	-0.08076			
L4	Hospital 003	Patient-Bed	841	841	1.14808	0.05421	0.03439	0.03439	1.4E-03	6.4E-05		0.0E+00	0.0E+00	-1.09388			
L4	Hospital 004	Patient-Bed	278	278	0.23959	0.23290	0.01137	0.01137	8.6E-04	8.4E-04		0.0E+00	0.0E+00	-0.00668			
L4	Hospital 005	Patient-Bed	616	616	0.05653	0.04336	0.02519	0.02519	9.2E-05	7.0E-05		0.0E+00	0.0E+00	-0.01318			
L4	Hospital 006	Patient-Bed	229	229	0.09813	0.10132	0.00936	0.00936	4.3E-04	4.4E-04		0.0E+00	0.0E+00	0.00320			
L4	Hospital 007	Patient-Bed	60	60	0.03310	0.03629	0.00245	0.00245	5.5E-04	6.0E-04		0.0E+00	0.0E+00	0.00319			
L4	Hospital 008	Patient-Bed	250	250	0.05694	0.05951	0.01022	0.01022	2.3E-04	2.4E-04		0.0E+00	0.0E+00	0.00257			
L4	Hospital 009	Patient-Bed	143	143	0.00925	0.42390	0.00585	0.00585	6.5E-05	3.0E-03		0.0E+00	0.0E+00	0.41465			
L4	Hospital 010	Patient-Bed	240	240	0.15498	0.01980	0.00981	0.00981	6.5E-04	8.3E-05		0.0E+00	0.0E+00	-0.13518			
L4	Hospital 011	Patient-Bed	750	750	0.12532	0.12655	0.03067	0.03067	1.7E-04	1.7E-04		0.0E+00	0.0E+00	0.00123			
L4	Hospital 012	Patient-Bed	256	256	0.04016	0.05848	0.01047	0.01047	1.6E-04	2.3E-04		0.0E+00	0.0E+00	0.01832			
L4	Hospital 013	Patient-Bed	110	110	0.10445	0.03528	0.00450	0.00450	9.5E-04	3.2E-04		0.0E+00	0.0E+00	-0.06917			
L4	Hospital 014	Patient-Bed	1,000	1,000	0.29785	0.29531	0.04089	0.04089	3.0E-04	3.0E-04		0.0E+00	0.0E+00	-0.00255			
L4	Hospital 015	Patient-Bed	150	150	0.29180	0.28155	0.00613	0.00613	1.9E-03	1.9E-03		0.0E+00	0.0E+00	-0.01025			
L4	Hospital 016	Patient-Bed	110	110	0.01396	0.01614	0.00450	0.00450	1.3E-04	1.5E-04		0.0E+00	0.0E+00	0.00218			
L4	Hospital 017	Patient-Bed	1,794	1,794	0.48622	0.51066	0.07337	0.07337	2.7E-04	2.8E-04		0.0E+00	0.0E+00	0.02444			
L4	Hospital 018	Patient-Bed	1,208	1,208	2.21936	2.22163	0.04940	0.04940	1.8E-03	1.8E-03		0.0E+00	0.0E+00	0.00228			
L4	Hospital 019	Patient-Bed	253	253	0.33592	0.24323	0.01035	0.01035	1.3E-03	9.6E-04		0.0E+00	0.0E+00	-0.09269			
L4	Hospital 020	Patient-Bed	550	550	0.55140	0.59981	0.02249	0.02249	1.0E-03	1.1E-03		0.0E+00	0.0E+00	0.04841			
L4	Hospital 021	Patient-Bed	732	732	0.20641	0.06192	0.02993	0.02993	2.8E-04	8.5E-05		0.0E+00	0.0E+00	-0.14449			
L4	Hospital 022	Patient-Bed	726	726	0.25199	0.30118	0.02969	0.02969	3.5E-04	4.1E-04		0.0E+00	0.0E+00	0.04919			
L4	Hospital 023	Patient-Bed	418	418	0.10916	0.09498	0.01709	0.01709	2.6E-04	2.3E-04		0.0E+00	0.0E+00	-0.01418			
L4	Hospital 024	Patient-Bed	496	496	0.29814	0.09428	0.02028	0.02028	6.0E-04	1.9E-04		0.0E+00	0.0E+00	-0.20386			
L4	Hospital 025	Patient-Bed	308	308	0.32802	0.33355	0.01260	0.01260	1.1E-03	1.1E-03		0.0E+00	0.0E+00	0.00553			
L4	Hospital 026	Patient-Bed	202	202	0.14552	1.43515	0.00826	0.00826	7.2E-04	7.1E-03		0.0E+00	0.0E+00	1.28963			
L4	Hospital 027	Patient-Bed	427	427	0.12400	0.03612	0.01746	0.01746	2.9E-04	8.5E-05		0.0E+00	0.0E+00	-0.08787			
L4	Hospital 028	Patient-Bed	430	430	0.26711	0.24809	0.01758	0.01758	6.2E-04	5.8E-04		0.0E+00	0.0E+00	-0.01902			
L4	Hospital 029	Patient-Bed	324	324	0.15898	0.01008	0.01325	0.01325	4.9E-04	3.1E-05		0.0E+00	0.0E+00	-0.14890			
L4	Hospital 030	Patient-Bed	218	218	0.16316	0.86814	0.00892	0.00892	7.5E-04	4.0E-03		0.0E+00	0.0E+00	0.70498			
L4	Hospital 031	Patient-Bed	300	300	0.16173	0.15837	0.01227	0.01227	5.4E-04	5.3E-04		0.0E+00	0.0E+00	-0.00336			
L4	Hospital 032	Patient-Bed	180	180	0.36211	0.36459	0.00736	0.00736	2.0E-03	2.0E-03		0.0E+00	0.0E+00	0.00248			
L4	Hospital 033	Patient-Bed	300	300	0.46975	0.51928	0.01227	0.01227	1.6E-03	1.7E-03		0.0E+00	0.0E+00	0.04953			
L3	Alexandria Gov	Patient-Bed	3,900	3,900	0.99617	0.94905											
L4	Hospital 034	Patient-Bed	284	284	0.16657	0.16189	0.01161	0.01161	5.9E-04	5.7E-04		0.0E+00	0.0E+00	-0.00468			
L4	Hospital 035	Patient-Bed	2,160	2,160	0.04870	0.02299	0.08833	0.08833	2.3E-05	1.1E-05		0.0E+00	0.0E+00	-0.02571			

		L4 Hospital 036	Patient-Bed	856	856	0.18355	0.18593	0.03501	0.03501	2.1E-04	2.2E-04		0.0E+00	0.0E+00	0.00239			
		L4 Hospital 037	Patient-Bed	600	600	0.59735	0.57823	0.02454	0.02454	1.0E-03	9.6E-04		0.0E+00	0.0E+00	-0.01912			
	L3	Nile Delta Region	Patient-Bed	2,410	2,410	3.85910	3.03163											
		L4 Hospital 038	Patient-Bed	512	512	0.19899	0.23098	0.02094	0.02094	3.9E-04	4.5E-04		0.0E+00	0.0E+00	0.03199			
		L4 Hospital 039	Patient-Bed	150	150	1.14721	0.11117	0.00613	0.00613	7.6E-03	7.4E-04		0.0E+00	0.0E+00	-1.03603			
		L4 Hospital 040	Patient-Bed	410	410	0.13648	0.14124	0.01677	0.01677	3.3E-04	3.4E-04		0.0E+00	0.0E+00	0.00476			
		L4 Hospital 041	Patient-Bed	150	150	0.01744	0.01862	0.00613	0.00613	1.2E-04	1.2E-04		0.0E+00	0.0E+00	0.00118			
		L4 Hospital 042	Patient-Bed	108	108	0.03109	0.03242	0.00442	0.00442	2.9E-04	3.0E-04		0.0E+00	0.0E+00	0.00133			
		L4 Hospital 043	Patient-Bed	320	320	0.09547	0.09962	0.01309	0.01309	3.0E-04	3.1E-04		0.0E+00	0.0E+00	0.00415			
		L4 Hospital 044	Patient-Bed	60	60	0.36653	0.37052	0.00245	0.00245	6.1E-03	6.2E-03		0.0E+00	0.0E+00	0.00399			
		L4 Hospital 045	Patient-Bed	238	238	1.63488	1.77379	0.00973	0.00973	6.9E-03	7.5E-03		0.0E+00	0.0E+00	0.13891			
		L4 Hospital 046	Patient-Bed	34	34	0.02277	0.02897	0.00139	0.00139	6.7E-04	8.5E-04		0.0E+00	0.0E+00	0.00620			
		L4 Hospital 047	Patient-Bed	150	150	0.02380	0.02932	0.00613	0.00613	1.6E-04	2.0E-04		0.0E+00	0.0E+00	0.00553			
		L4 Hospital 048	Patient-Bed	55	55	0.05994	0.05973	0.00225	0.00225	1.1E-03	1.1E-03		0.0E+00	0.0E+00	-0.00021			
		L4 Hospital 049	Patient-Bed	54	54	0.07342	0.07696	0.00221	0.00221	1.4E-03	1.4E-03		0.0E+00	0.0E+00	0.00354			
		L4 Hospital 050	Patient-Bed	22	22	0.02014	0.02240	0.00090	0.00090	9.2E-04	1.0E-03		0.0E+00	0.0E+00	0.00226			
		L4 Hospital 051	Patient-Bed	147	147	0.03094	0.03588	0.00601	0.00601	2.1E-04	2.4E-04		0.0E+00	0.0E+00	0.00494			
	L3	Al-Beheira Region	Patient-Bed	997	997	0.06895	0.13518											
		L4 Hospital 052	Patient-Bed	754	754	0.03686	0.03882	0.03083	0.03083	4.9E-05	5.1E-05		0.0E+00	0.0E+00	0.00196			
		L4 Hospital 053	Patient-Bed	243	243	0.03209	0.09636	0.00994	0.00994	1.3E-04	4.0E-04		0.0E+00	0.0E+00	0.06427			
	L2	Private Hospitals	Patient-Bed	**2,775**	**2,775**	**3.13100**	**3.24289**	0.11348	0.11348	1.1E-03	1.2E-03		0.0E+00	0.0E+00	0.11189			
	L3	Cairo Gov	Patient-Bed	2,332	2,332	2.58620	2.67580											
		L4 Hospital 054	Patient-Bed	100	100	0.61277	0.68516	0.00409	0.00409	6.1E-03	6.9E-03		0.0E+00	0.0E+00	0.07239			
		L4 Hospital 055	Patient-Bed	203	203	0.40174	0.42029	0.00830	0.00830	2.0E-03	2.1E-03		0.0E+00	0.0E+00	0.01855			
		L4 Hospital 056	Patient-Bed	134	134	0.26496	0.26791	0.00548	0.00548	2.0E-03	2.0E-03		0.0E+00	0.0E+00	0.00295			
		L4 Hospital 057	Patient-Bed	50	50	0.16905	0.17543	0.00204	0.00204	3.4E-03	3.5E-03		0.0E+00	0.0E+00	0.00638			
		L4 Hospital 058	Patient-Bed	145	145	0.30054	0.30700	0.00593	0.00593	2.1E-03	2.1E-03		0.0E+00	0.0E+00	0.00646			
		L4 Hospital 059	Patient-Bed	200	200	0.44586	0.43967	0.00818	0.00818	2.2E-03	2.2E-03		0.0E+00	0.0E+00	-0.00619			
		L4 Hospital 060	Patient-Bed	1,500	1,500	0.39129	0.38034	0.06134	0.06134	2.6E-04	2.5E-04		0.0E+00	0.0E+00	-0.01095			
	L3	Canal Region	Patient-Bed	215	215	0.48869	0.49734											
		L4 Hospital 061	Patient-Bed	215	215	0.48869	0.49734	0.00879	0.00879	2.3E-03	2.3E-03		0.0E+00	0.0E+00	0.00866			
	L3	Nile Delta Region	Patient-Bed	228	228	0.05610	0.06975											
		L4 Hospital 062	Patient-Bed	228	228	0.05610	0.06975	0.00932	0.00932	2.5E-04	3.1E-04		0.0E+00	0.0E+00	0.01365			
L1	**Administrative Buildings in Cairo**		GFA (sq.m)	**182,636**	**182,636**	**1.29234**	**1.31939**					**0.02705**	**0.0E+00**	**0.0E+00**	**0.02705**	**-0.02705**	**1.29234**	**1.02093**
	L2	Office Space 001	GFA (sq.m)	40,120	40,120	0.22198	0.18830	0.21967	0.21967	5.5E-06	4.7E-06		0.0E+00	0.0E+00	-0.03368			
	L2	Office Space 002	GFA (sq.m)	31,360	31,360	0.84090	0.90180	0.17171	0.17171	2.7E-05	2.9E-05		0.0E+00	0.0E+00	0.06090			
	L2	Office Space 003	GFA (sq.m)	33,156	33,156	0.04907	0.05556	0.18154	0.18154	1.5E-06	1.7E-06		0.0E+00	0.0E+00	0.00649			
	L2	Office Space 004	GFA (sq.m)	78,000	78,000	0.18039	0.17373	0.42708	0.42708	2.3E-06	2.2E-06		0.0E+00	0.0E+00	-0.00666			
L1	**Shopping Malls in Cairo**		GFA (sq.m)	**184,000**	**184,000**	**11.73063**	**12.17853**					**0.44790**	**0.0E+00**	**0.0E+00**	**0.44790**	**-0.44790**	**11.73063**	**1.03818**
	L2	Mall 001	GFA (sq.m)	150,000	150,000	9.14359	9.74919	0.81522	0.81522	6.1E-05	6.5E-05		0.0E+00	0.0E+00	0.60560			
	L2	Mall 002	GFA (sq.m)	12,000	12,000	0.61476	0.61127	0.06522	0.06522	5.1E-05	5.1E-05		0.0E+00	0.0E+00	-0.00348			
	L2	Mall 003	GFA (sq.m)	11,000	11,000	0.62371	0.61984	0.05978	0.05978	5.7E-05	5.6E-05		0.0E+00	0.0E+00	-0.00387			
	L2	Mall 004	GFA (sq.m)	11,000	11,000	1.34857	1.19823	0.05978	0.05978	1.2E-04	1.1E-04		0.0E+00	0.0E+00	-0.15035			
L1	**Supermarkets in Cairo**		GFA (sq.m)	**33,045**	**33,045**	**3.65517**	**3.73680**					**0.08163**	**0.0E+00**	**0.0E+00**	**0.08163**	**-0.08163**	**3.65517**	**1.02233**
	L2	Retail 001	GFA (sq.m)	6,545	6,545	0.41079	0.40095											
		L3 Branch 001-A	GFA (sq.m)	1,130	1,130	0.06597	0.06578	0.03420	0.03420	5.8E-05	5.8E-05		0.0E+00	0.0E+00	-0.00019			
		L3 Branch 001-B	GFA (sq.m)	900	900	0.06630	0.06978	0.02724	0.02724	7.4E-05	7.8E-05		0.0E+00	0.0E+00	0.00347			
		L3 Branch 001-C	GFA (sq.m)	1,150	1,150	0.05314	0.04343	0.03480	0.03480	4.6E-05	3.8E-05		0.0E+00	0.0E+00	-0.00971			
		L3 Branch 001-D	GFA (sq.m)	1,100	1,100	0.07614	0.06943	0.03329	0.03329	6.9E-05	6.3E-05		0.0E+00	0.0E+00	-0.00671			
		L3 Branch 001-E	GFA (sq.m)	985	985	0.09021	0.09389	0.02981	0.02981	9.2E-05	9.5E-05		0.0E+00	0.0E+00	0.00368			
		L3 Branch 001-F	GFA (sq.m)	1,280	1,280	0.05903	0.05864	0.03874	0.03874	4.6E-05	4.6E-05		0.0E+00	0.0E+00	-0.00039			
	L2	Retail 002	GFA (sq.m)	7,500	7,500	0.39190	0.42650	0.22696	0.22696	5.2E-05	5.7E-05		0.0E+00	0.0E+00	0.03461			
		L3 Branch 002-A				0.18573	0.17612											
		L3 Branch 002-B				0.15700	0.19287											
		L3 Branch 002-C				0.04917	0.05752											
	L2	Retail 003	GFA (sq.m)	9,000	9,000	0.78212	0.80713	0.27236	0.27236	8.7E-05	9.0E-05		0.0E+00	0.0E+00	0.02501			
	L2	Retail 004	GFA (sq.m)	10,000	10,000	2.07037	2.10222	0.30262	0.30262	2.1E-04	2.1E-04		0.0E+00	0.0E+00	0.03185			

Table 4: Transport Sector Energy Intensity Indicators (2007-2009)

Sector/Sub-sector				Activity & Activity level (Qi)		Energy use (Ei) (ktoe)		Activity Share (S)		Energy Intensity (I)		Change in Energy use (ktoe)				LMDI		
			Measure of Activity (Unit)	Qi (k-1)	Qi (k)	Ei (k-1)	Ei (k)	Sij (k-1)	Sij (k)	Iij (k-1)	Iij (k)	Change in energy use (ΔEi k-1,k)	Activity effect (ΔEi act k-1,k)	Structure effect (ΔEi str k-1,k)	Intensity effect (ΔEi int k-1,k)	ESi t	EHi t	EPIi t
Transport (2007-2009)						**412.24711**	**417.69239**					**5.44529**	**-20.10110**	**1.87996**	**23.66643**	**-23.66643**	**394.02596**	**1.06050**
Transport (2007)																**0**	**0**	**1**
				Qi 2007 (0)	**Qi 2008 (t=1)**	**Ei 2007 (0)**	**Ei 2008 (t=1)**											
Transport (2008)				**87,770.00**	**86,426.20**	**412.24711**	**385.41894**					**-26.82817**	**-14.53021**	**1.19844**	**-13.49640**	**13.49640**	**398.91533**	**0.96671**
L1	Passenger Transport		P-km (10^6)	**84,685.40**	**83,914.70**	**341.61634**	**342.62844**					**1.01211**	**-3.11454**	**0.74805**	**3.37860**	**-3.37860**	**339.24984**	**1.00992**
	L2	City	P-km (10^6)	**18,079.40**	**18,831.70**	**118.31169**	**111.00303**											
		L3	Bus & MiniBus	7,607.00	7,607.00	83.39258	75.18127	0.08983	0.09065	0.01096	0.00988		-0.72422	0.72422	-8.21131			
		L3	River Bus	16.00	16.00	0.37534	0.55469	0.00019	0.00019	0.02346	0.03467		-0.00420	0.00420	0.17935			
		L3	Metro (Tubeline)	10,456.40	11,208.70	34.54377	35.26707	0.12347	0.13357	0.00330	0.00315		-0.31911	2.74411	-1.70170			
	L2	Intercity	P-km (10^6)	**66,606.00**	**65,083.00**	**223.30465**	**231.62541**											
		L3	Highway	P-km (10^6)	23,387.00	21,410.00	85.97326	60.39066	0.27616	0.25514	0.00368	0.00282		-0.66219	-5.73504	-19.18538			
		L3	Rail	P-km (10^6)	43,219.00	43,673.00	137.33139	171.23475	0.51035	0.52045	0.00318	0.00392		-1.40482	3.01055	32.29764			
L1	Freight Transport		T-Km (10^6)	**3,084.60**	**2,511.50**	**70.63077**	**42.79049**					**-27.84028**	**-11.41567**	**0.45039**	**-16.87500**	**16.87500**	**59.66549**	**0.73803**
	L2	Rail	T-Km (10^6)	2,021.00	1,592.00	40.23509	23.22969	0.65519	0.63388	0.01991	0.01459		-6.36313	-1.02345	-9.61881			
	L2	Trucking	T-Km (10^6)	1,063.60	919.50	30.39568	19.56080	0.34481	0.36612	0.02858	0.02127		-5.05254	1.47384	-7.25619			
				Qi 2008 (1)	**Qi 2009 (2)**	**Ei 2008 (1)**	**Ei 2009 (2)**											
Transport (2009)				**86,426.20**	**84,040.40**	**385.41894**	**417.69239**					**32.27345**	**-5.57089**	**0.68152**	**37.16283**	**-37.16283**	**380.52957**	**1.09702**
L1	Passenger Transport		P-km (10^6)	**83,914.70**	**81,228.00**	**342.62844**	**356.89433**					**14.26589**	**-11.36674**	**1.38047**	**24.25216**	**-24.25216**	**332.64217**	**1.07181**
	L2	City	P-km (10^6)	**18,831.70**	**19,270.00**	**111.00303**	**115.63732**											
		L3	Bus & MiniBus	7,607.00	7,607.00	75.18127	76.61053	0.09065	0.09365	0.00988	0.01007		-2.46964	2.46964	1.42926			
		L3	River Bus	16.00	16.00	0.55469	0.53805	0.00019	0.00020	0.03467	0.03363		-0.01778	0.01778	-0.01664			
		L3	Metro (Tubeline)	11,208.70	11,647.00	35.26707	38.48874	0.13357	0.14339	0.00315	0.00330		-1.19927	2.61295	1.80799			
	L2	Intercity	P-km (10^6)	**65,083.00**	**61,958.00**	**231.62541**	**241.25702**											
		L3	Highway	P-km (10^6)	21,410.00	20,015.00	60.39066	78.43760	0.25514	0.24641	0.00282	0.00392		-2.24601	-2.40438	22.69733			
		L3	Rail	P-km (10^6)	43,673.00	41,943.00	171.23475	162.81942	0.52045	0.51636	0.00392	0.00388		-5.43404	-1.31551	-1.66578			
L1	Freight Transport		T-Km (10^6)	**2,511.50**	**2,812.40**	**42.79049**	**60.79806**					**18.00756**	**5.79585**	**-0.69895**	**12.91066**	**-12.91066**	**47.88739**	**1.28637**
	L2	Rail	T-Km (10^6)	1,592.00	1,889.00	23.22969	36.23730	0.63388	0.67167	0.01459	0.01918		3.31022	1.69371	8.00367			
	L2	Trucking	T-Km (10^6)	919.50	923.40	19.56080	24.56076	0.36612	0.32833	0.02127	0.02660		2.48563	-2.39266	4.90699			

Table 5: Tourism Sector Energy Intensity Indicators (2007-2009)

Sector/Sub-sector				Activity & Activity level (Qi)		Energy use (Ei) (ktoe)		Activity Share (S)		Energy Intensity (I)		Change in Energy use (ktoe)				LMDI		
			Measure of Activity (Unit)	Qi (k-1)	Qi (k)	Ei (k-1)	Ei (k)	Sij (k-1)	Sij (k)	Iij (k-1)	Iij (k)	Change in energy use (ΔEi k-1,k)	Activity effect (ΔEi act k-1,k)	Structure effect (ΔEi str k-1,k)	Intensity effect (ΔEi int k-1,k)	ESi t	EHi t	EPIi t
Tourism (2007-2009)						**19.23649**	**19.98183**					**0.74534**	**0.0E+00**	**0.0E+00**	**0.74534**	**-0.74534**	**19.23649**	**1.03875**
Tourism (2007)																**0**	**0**	**1**
				Qi 2007 (t=0)	**Qi 2008 (t=1)**	**Ei 2007 (t=0)**	**Ei 2008 (t=1)**											
Tourism (2008)				**4,538**	**4,538**	**19.23649**	**21.65831**					**2.42182**	**0.0E+00**	**0.0E+00**	**2.42182**	**-2.42182**	**19.23649**	**1.12590**
L1	5 Stars		Number of Rooms	**3,832**	**3,832**	**15.24648**	**17.18717**	0.84442	0.84442	0.00398	0.00449		0.0E+00	0.0E+00	1.94068	-1.94068	15.24648	1.12729
	L2	Cairo Governorate		3,114	3,114	13.50579	14.34822											
		L3	Hotel 001	Number of Rooms	433	433	1.89590	1.96521	0.09542	0.09542	0.00438	0.00454		0.0E+00	0.0E+00	0.06932			
		L3	Hotel 002	Number of Rooms	840	840	3.04633	3.28008	0.18510	0.18510	0.00363	0.00390		0.0E+00	0.0E+00	0.23374			
		L3	Hotel 003	Number of Rooms	920	920	2.90484	3.12372	0.20273	0.20273	0.00316	0.00340		0.0E+00	0.0E+00	0.21888			
		L3	Hotel 004	Number of Rooms	332	332	0.68062	0.70404	0.07316	0.07316	0.00205	0.00212		0.0E+00	0.0E+00	0.02342			
		L3	Hotel 005	Number of Rooms	318	318	0.64508	0.70762	0.07007	0.07007	0.00203	0.00223		0.0E+00	0.0E+00	0.06254			
		L3	Hotel 006	Number of Rooms	271	271	4.33303	4.56756	0.05972	0.05972	0.01599	0.01685		0.0E+00	0.0E+00	0.23453			
	L2	Alex Governorate		158	158	0.84769	0.82237											
		L3	Hotel 007	Number of Rooms	158	158	0.84769	0.82237	0.03482	0.03482	0.00537	0.00520		0.0E+00	0.0E+00	-0.02532			
	L2	South Sinai Governorate		560	560	0.89300	2.01658											
		L3	Hotel 008	Number of Rooms	560	560	0.89300	2.01658	0.12340	0.12340	0.00159	0.00360		0.0E+00	0.0E+00	1.12358			
L1	4 Stars		Number of Rooms	**706**	**706**	**3.99001**	**4.47114**	0.15558	0.15558	0.00565	0.00633		0.0E+00	0.0E+00	0.48113	-0.48113	3.99001	1.12058
	L2	Cairo Governorate		568	568	3.88888	4.36728											
		L3	Hotel 009	Number of Rooms	302	302	1.03485	1.06551	0.06655	0.06655	0.00343	0.00353		0.0E+00	0.0E+00	0.03067			
		L3	Hotel 010	Number of Rooms	166	166	0.28686	0.46326	0.03658	0.03658	0.00173	0.00279		0.0E+00	0.0E+00	0.17640			
		L3	Hotel 011	Number of Rooms	100	100	2.56718	2.83850	0.02204	0.02204	0.02567	0.02839		0.0E+00	0.0E+00	0.27133			
	L2	Alexandria Governorate		138	138	0.10113	0.10387											
		L3	Hotel 012	Number of Rooms	138	138	0.10113	0.10387	0.03041	0.03041	0.00073	0.00075		0.0E+00	0.0E+00	0.00274			
				Qi 2008 (t=1)	**Qi 2009 (t=2)**	**Ei 2008 (t=1)**	**Ei 2009 (t=2)**											
Tourism (2009)				**4,538**	**4,538**	**21.65831**	**19.98183**					**-1.67648**	**0.0E+00**	**0.0E+00**	**-1.67648**	**1.67648**	**21.65831**	**0.92259**
L1	5 Stars		Number of Rooms	**3,832**	**3,832**	**17.18717**	**15.35622**	0.84442	0.84442	0.00449	0.00401		0.0E+00	0.0E+00	-1.83094	1.83094	17.18717	0.89347
	L2	Cairo Governorate		3,114	3,114	14.34822	13.46752											
		L3	Hotel 001	Number of Rooms	433	433	1.96521	1.84844	0.09542	0.09542	0.00454	0.00427		0.0E+00	0.0E+00	-0.11678			
		L3	Hotel 002	Number of Rooms	840	840	3.28008	3.36529	0.18510	0.18510	0.00390	0.00401		0.0E+00	0.0E+00	0.08521			
		L3	Hotel 003	Number of Rooms	920	920	3.12372	2.77477	0.20273	0.20273	0.00340	0.00302		0.0E+00	0.0E+00	-0.34895			
		L3	Hotel 004	Number of Rooms	332	332	0.70404	0.70093	0.07316	0.07316	0.00212	0.00211		0.0E+00	0.0E+00	-0.00311			
		L3	Hotel 005	Number of Rooms	318	318	0.70762	0.66050	0.07007	0.07007	0.00223	0.00208		0.0E+00	0.0E+00	-0.04711			
		L3	Hotel 006	Number of Rooms	271	271	4.56756	4.11759	0.05972	0.05972	0.01685	0.01519		0.0E+00	0.0E+00	-0.44997			
	L2	Alex Governorate		158	158	0.82237	0.85522											
		L3	Hotel 007	Number of Rooms	158	158	0.82237	0.85522	0.03482	0.03482	0.00520	0.00541		0.0E+00	0.0E+00	0.03285			
	L2	South Sinai Governorate		560	560	2.01658	1.03349											
		L3	Hotel 008	Number of Rooms	560	560	2.01658	1.03349	0.12340	0.12340	0.00360	0.00185		0.0E+00	0.0E+00	-0.98309			
L1	4 Stars		Number of Rooms	**706**	**706**	**4.47114**	**4.62560**	0.15558	0.15558	0.00633	0.00655		0.0E+00	0.0E+00	0.15446	-0.15446	4.47114	1.03455
	L2	Cairo Governorate		568	568	4.36728	4.52809											
		L3	Hotel 009	Number of Rooms	302	302	1.06551	1.01577	0.06655	0.06655	0.00353	0.00336		0.0E+00	0.0E+00	-0.04974			
		L3	Hotel 010	Number of Rooms	166	166	0.46326	0.50868	0.03658	0.03658	0.00279	0.00306		0.0E+00	0.0E+00	0.04542			
		L3	Hotel 011	Number of Rooms	100	100	2.83850	3.00364	0.02204	0.02204	0.02839	0.03004		0.0E+00	0.0E+00	0.16514			
	L2	Alexandria Governorate		138	138	0.10387	0.09751											
		L3	Hotel 012	Number of Rooms	138	138	0.10387	0.09751	0.03041	0.03041	0.00075	0.00071		0.0E+00	0.0E+00	-0.00636			

Table 6: Alternative Tourism Sector Energy Intensity Indicators (2007-2009)

Sector/Sub-sector	Activity & Activity level (Qi)			Energy use (Ei) (ktoe)		Activity Share (S)		Energy Intensity (I)		Change in Energy Use (ktoe)				LMDI		
	Measure of Activity (Unit)	Qi (k-1)	Qi (k)	Ei (k-1)	Ei (k)	Sij (k-1)	Sij (k)	Iij (k-1)	Iij (k)	Change in energy use (ΔEi k-1,k)	Activity effect (ΔEi act k-1,k)	Structure effect (ΔEi str k-1,k)	Intensity effect (ΔEi int k-1,k)	ESi t	EHi t	EPIi t
Tourism (2007-2009)				**140.9288**	**144.8874**					**3.95861**	**-2.01792**	**-0.26974**	**6.24627**	**-6.24627**	**63.13615**	**1.09346**
Tourism (2007)														**0**	**0**	**1**
		Qi 2007 (t=0)	**Qi 2008 (t=1)**	**Ei 2007 (t=0)**	**Ei 2008 (t=1)**											
Tourism (2008)		**125,167.47**	**131,469.28**	**65.4238**	**75.5050**					**10.08122**	**3.45452**	**-0.98535**	**7.61204**	**-7.61204**	**67.89299**	**1.11428**
L1 Cairo Governorate	Guest-night	13,706.16	14,233.32	31.2583	35.4093	0.10950	0.10826	2.3E-03	2.5E-03		1.63526	-0.37886	2.89457			
L1 Alexandria Governorate	Guest-night	2,474.42	2,153.34	1.7139	1.8105	0.01977	0.01638	6.9E-04	8.4E-04		0.08654	-0.33139	0.34143			
L1 Red Sea Governorate	Guest-night	54,731.99	58,888.85	9.6283	10.8463	0.43727	0.44793	1.8E-04	1.8E-04		0.50227	0.24625	0.46955			
L2 Hurghada				9.0023	9.9295											
L2 Marsa Alam				0.3728	0.3999											
L2 Safaga				0.2531	0.2656											
L2 Al-Gouna				0.0000	0.2513											
L1 South Sinai Governorate	Guest-night	50,064.86	52,122.32	17.7170	22.0927	0.39998	0.39646	3.5E-04	4.2E-04		0.97379	-0.17538	3.57732			
L2 Sharm Al-Sheikh				15.8928	19.3615											
L2 Taba				0.8145	1.2848											
L2 Dahab				0.5269	0.9530											
L2 Nuwaiba'				0.4828	0.4934											
L1 Aswan Governorate	Guest-night	844.19	1,164.40	1.3455	1.4481	0.00674	0.00886	1.6E-03	1.2E-03		0.06858	0.38041	-0.34642			
L1 Luxor Governorate	Guest-night	3,345.85	2,907.05	3.7608	3.8981	0.02673	0.02211	1.1E-03	1.3E-03		0.18808	-0.72638	0.67558			
		Qi 2008 (t=1)	**Qi 2009 (t=2)**	**Ei 2008 (t=1)**	**Ei 2009 (t=2)**											
Tourism (2009)		**131,469.28**	**121,885.09**	**75.5050**	**69.3824**					**-6.12260**	**-5.47244**	**0.71561**	**-1.36577**	**1.36577**	**70.74819**	**0.98131**
L1 Cairo Governorate	Guest-night	14,233.32	13,143.86	35.4093	36.3418	0.10826	0.10784	2.5E-03	2.8E-03		-2.71543	-0.14122	3.78911			
L1 Alexandria Governorate	Guest-night	2,153.34	2,478.70	1.8105	1.7205	0.01638	0.02034	8.4E-04	6.9E-04		-0.13361	0.38198	-0.33835			
L1 Red Sea Governorate	Guest-night	58,888.85	52,099.31	10.8463	9.9989	0.44793	0.42745	1.8E-04	1.9E-04		-0.78850	-0.48757	0.42859			
L2 Hurghada				9.9295	9.2361											
L2 Marsa Alam				0.3999	0.2332											
L2 Safaga				0.2656	0.2299											
L2 Al-Gouna				0.2513	0.2996											
L1 South Sinai Governorate	Guest-night	52,122.32	50,202.02	22.0927	16.5520	0.39646	0.41188	4.2E-04	3.3E-04		-1.45252	0.73220	-4.82040			
L2 Sharm Al-Sheikh				19.3615	13.7961											
L2 Taba				1.2848	1.2315											
L2 Dahab				0.9530	1.0387											
L2 Nuwaiba'				0.4934	0.4856											
L1 Aswan Governorate	Guest-night	1,164.40	1,202.24	1.4481	1.2161	0.00886	0.00986	1.2E-03	1.0E-03		-0.10058	0.14307	-0.27456			
L1 Luxor Governorate	Guest-night	2,907.05	2,758.96	3.8981	3.5533	0.02211	0.02264	1.3E-03	1.3E-03		-0.28181	0.08715	-0.15016			

Annex (X)

Calculated EI based on IDA Data

معدلات الإستهلاكات لوحدة الإنتاج للصناعات المختلفة طبقاً لدراسات الهيئة

م	اسم الصناعة	وحدة الإنتاج	الإستهلاكات لوحدة الإنتاج				
			كهرباء (ك.و.س)	غاز طبيعي (م3)	مازوت (طن)	سولار (طن)	المياه (م3)
	صناعة الأسمنت						
1	الأسمنت باستخدام الغاز	(الطن)	110.5	90	0	0	0.07
2	الأسمنت باستخدام مازوت	(الطن)	110.5	0	0.12	0	0.07
	صناعة الحديد						
3	حديد تسليح من خام أكسيد الحديد	(الطن)	929	380	0	0	2.0
4	مسطحات الصاب من خاماته الأولية	(الطن)	929	380	0	0	2.0
5	حديد إسفنجى (DRI) من خاماته الأساسية	(الطن)	120	300	0	0	1
6	إنتاج الدرافيل الصاب والزهر	(الطن)	1170	52	0	0	0
7	حديد تسليح من حديد اسفنجي	(الطن)	780	80	0	0	2
8	مربعات صاب (بيليت) من خام أكسيد الحديد	(الطن)	650	50	0	0	1
9	كور طحن وبلاطات من الصاب الكرومى (كميات الإنتاج صغيرة)	(الطن)	902	39	0	0	9.4
10	مسبوكات وقطع غيار من الزهر	(الطن)	353	0	0	0	0.12
11	لوازم المولسير من الزهر المطروق	(الطن)	240	60	0	0	0
12	سحب أسلاك صاب	(الطن)	270	0	0	0	2
13	حديد تسليح من خردة مستوردة	(الطن)	663	18	0	0	1
14	صناعة المربعات من الخردة المستوردة	(الطن)	673	19	0	0	0
15	حديد تسليح من بيليت (الدرفلة)	(الطن)	140	30	0	0	0
16	القطاعات الطولية من البيليت	(الطن)	130	30	0	0	0
17	خوص ومربعات وزوايا	(الطن)	77	35	0	0	0.02

معدلات الإستهلاكات لوحدة الإنتاج للصناعات المختلفة طبقاً لدراسات الهيئة

م	اسم الصناعة	وحدة الإنتاج	الإستهلاكات لوحدة الإنتاج				
			كهرباء (ك.و.س)	غاز طبيعي (م3)	مازوت (طن)	سولار (طن)	المياه (م3)
	تابع: صناعات الحديد						
18	سحب وحلقنة اسلاك حديدية	(الطن)	322	0	0	0	4
19	لوازم مواسير الصاب	(الطن)	700	60	0	0.1	2.28
20	منتجات المسابك من الصاب	(الطن)	430	0	0	0	0
21	أسلاك حديد رباط وشبك ملحومة وأسلاك منسوجة وساك شبك	(الطن)	246	0	0	0.13	0.25

كهرباء (toe)	غاز طبيعي (toe)	Mazot (toe)	Solar (toe)	SEC (toe/unit)
0.009501287	0.081	0	0	0.090501287
0.009501287	0	0.115792491	0	0.125293778
0.079849897	0.342	0	0	0.421849897
0.079849897	0.342	0	0	0.421849897
0.01031814	0.27	0	0	0.28031814
0.100601865	0.0468	0	0	0.147401865
0.06706791	0.072	0	0	0.13906791
0.055889925	0.045	0	0	0.100889925
0.077589163	0.035007874	0	0	0.112597037
0.030347471	0	0	0	0.030347471
0.02063628	0.054	0	0	0.07463628
0.02319193	0	0	0	0.02319193
0.056979062	0.01644	0	0	0.073419062
0.057873301	0.01728	0	0	0.075153301
0.01203783	0.027	0	0	0.03903783
0.011177985	0.027	0	0	0.038177985
0.006592145	0.0315	0	0	0.038092145
0.027706117	0	0	0	0.027706117
0.06018915	0.054	0	0.102703736	0.216892886
0.036973335	0	0	0	0.036973335
0.021137856	0	0	0.128379669	0.149517526

م	اسم الصناعة	وحدة الإنتاج	الإستهلاكات لوحدة الإنتاج				
			كهرباء (ك.و.س)	غاز طبيعي (م3)	مازوت (طن)	سولار (طن)	المياه (م3)
	صناعات الكيماويات						
34	سماد اليوريا بتركيز 46.5٪ أزوت	(الطن)	55	600	0	0	9
35	صناعة الورق الصحى من لب الخشب	(الطن)	2470	250	0	0	0
36	ورق طباعة الصحف وورق الكتابة والطباعة من مصاص القصب	(الطن)	1200	0	1	0	75
37	صناعة الورق من الدشت	(الطن)	480	220	0	0	0
38	كرتون رمادى (مناشر)	(الطن)	800	0	0	0	0
39	صناعة الكرتون المضلع خط لتوماتيك	(الطن)	66	35	0	0	0
40	أطباق بيض ورقية	(الف طبق)	70	28	0	0	0
41	تقطيع مناديل جيب	(الطن)	150	0	0	0	0
42	صناديق كرتون مضلع محلى	(الطن)	120	0	0	0	0
43	صناعة الكرتون المضلع خط نصف لتوماتيك	(الطن)	100	0	0	0	0
44	فص وتقطيع الورق	(الطن)	25	0	0	0	0
45	خلمة PET	(الطن)	118	93	0	0	1
46	الفوسفور الأصفر	(الطن)	15000	0	0	0	20

22	مواسير الزهر	(الطن)	341	0	0	0	0
23	اللوف المعدنى	(الطن)	229	0	0	0	0.58
24	صاج معرج وصاج محفون بمادة البوليريثان	(الطن)	143	0	0	0.01	0
25	تقطيع ألواح الصاج	(الطن)	107	0	0	0	0
26	أعمدة إنارة	(الطن)	123	0	0	0	0
27	المواسير الصاب الملحومة طولياً	(الطن)	164	0	0	0	0.08
28	كبس الخردة	(الطن)	61	0	0	0	0.02
29	تقطيع وتشريح وتخريم ألواح صاج	(الطن)	41	0	0	0	0.00
30	مساحيق الفلزات	(الطن)	8640	0	0	0	60
31	سيبكة الفيروسيليكون	(الطن)	10805	0	0	0.005	3
	صناعة الالومنيوم						
32	الألومنيوم من أكسيد الألومنيوم (الألومينا)	(الطن)	14500	0	0	0	2
33	قطاعات ألومنيوم من قوالب الألومنيوم	(الطن)	655	0	0	0	0

0.029314716	0	0	0	0.029314716		
0.019704781	0	0	0	0.019704781		
0.018152285	0.005868785	0	0	0.0122835		
0.00917168	0	0	0	0.00917168		
0.010576094	0	0	0	0.010576094		
0.014091904	0	0	0	0.014091904		
0.005254608	0	0	0	0.005254608		
0.003482643	0	0	0	0.003482643		
0.74290608	0	0	0	0.74290608		
0.934137124	0.005085087	0	0	0.929052037		
1.24677525	0	0	0	1.24677525		
0.056319848	0	0	0	0.056319848		
0.544729148	0	0	0.54	0.004729148		
0.437381715	0	0	0.225	0.212381715		
1.068118822	0	0.964937422	0	0.1031814		
0.23927256	0	0	0.198	0.04127256		
0.0687876	0	0	0	0.0687876		
0.037174977	0	0	0.0315	0.005674977		
0.031218915	0	0	0.0252	0.006018915		
0.012897675	0	0	0	0.012897675		
0.01031814	0	0	0	0.01031814		
0.00859845	0	0	0	0.00859845		
0.002149613	0	0	0	0.002149613		
0.094174833	0	0	0.084	0.010174833		
1.2897675	0	0	0	1.2897675		

معدلات الإستهلاكات لوحدة الإنتاج للصناعات المختلفة طبقاً لدراسات الهيئة

0.24907566	0	0	0.225	0.02407566			
0.19229535	0	0	0.1665	0.02579535			
0.179168528	0	0	0.171	0.008168528			
0.131279258	0	0.129301615	0	0.001977644			
0.075238605	0	0	0.0675	0.007738605			
0.003926741	0	0	0.0036	0.000326741			
0.082631105	0	0	0	0.082631105			
0.03611349	0	0	0	0.03611349			
0.1153938	0	0	0.081	0.0343938			
0.329376262	0	0	0.3042	0.025176262			
0.37255287	0	0	0.333	0.03955287			
0.544497508	0.154055603	0.192987484	0.1665	0.03095442			
0.001375752	0	0	0	0.001375752			
1.530395691	1.193698491	0	0	0.3366972			
0.281722265	0	0	0.261	0.020722265			
0.571203491	0	0.289481227	0.261	0.020722265			
0.012897675	0	0	0	0.012897675			
0.011177985	0	0	0	0.011177985			
0.005588993	0	0	0	0.005588993			
0.054313554	0.043135569	0	0	0.011177985			
1.0518915	0	0	0.45	0.6018915			
0.875907	0	0	0.36	0.515907			
0.0484615	0	0	0.0198	0.0286615			
0.00478938	0	0	0.00135	0.00343938			
0.000859845	0	0	0	0.000859845			

قطاع الحراريات							
47	الزجاج المسطح	(الطن)	280	250	0	0	1.50
48	أدوات مائدة زجاجية	(الطن)	300	185	0	0	0
49	الطوب الطفلى بالغاز	(ألف طوبة)	95	190	0	0	0
50	الطوب الطفلى بالمازوت	(ألف طوبة)	23	0	0.134	0	0
51	الطوب الحرارى	(الطن)	90	75	0	0	0
52	السيراميك	(م2)	0	4	0	0	0

معدلات الإستهلاكات لوحدة الإنتاج للصناعات المختلفة طبقاً لدراسات الهيئة

م	اسم الصناعة	وحدة الإنتاج	الإستهلاكات لوحدة الإنتاج				
			كهرباء (ك.و.س)	غاز طبيعي (م3)	مازوت (طن)	سولار (طن)	المياه (م3)
	صناعة البتروكيماويات						
53	البولى إثيلين	(الطن)	961	0	0	0	0
54	البولى بروبلين	(الطن)	420	0	0	0	0
55	خامة بولى ستيرين	(الطن)	400	90	0	0	3
56	فينيل كلوريد مونيمر والبولى فينيل كلوريد (pvc)	(الطن)	293	338	0	0	8
57	أسود كربون	(الطن)	460	370	0	0	6
	الصناعات الدوائية						
57	العبوات الدوائية الزجاجية	(طن)	360	185	0.2	0.15	2
58	السرنجات البلاستيك المعقمة	(ألف سرنجة)	16	0	0	0	0
59	مشروع لنتاج الخامات الدوائية	(طن)	3916	0	0	1.16	152
	صناعات غذائية						
60	سكر(بالغاز)	(الطن)	241	290	0	0	7
61	سكر(بالمازوت)	(الطن)	241	290	0.3	0	7
62	البسكويت	(الطن)	150	0	0	0	0
63	الزيوت	(الطن)	130	0	0	0	0
64	طحن القمح	(الطن)	65	0	0	0	1
65	لستخلاص زيوت	(طن)	130	0	0	0.042	1
	الصناعات الهندسية						
66	الأتوبيس الواحد	(وحدة)	7000	500	0	0	14
67	ميكرو وميني باص	(وحدة)	6000	400	0	0	12
68	سيارات الركوب	(سيارة)	333	22	0	0	0
69	الثلاجات المنزلية	(ثلاجة)	40	2	0	0	0
70	غسالات ملابس	(غسالة)	10	0	0	0	0

معدلات الإستهلاكات لوحدة الإنتاج للصناعات المختلفة طبقاً لدراسات الهيئة

			الإستهلاكات لوحدة الإنتاج

م	اسم الصناعة	وحدة الإنتاج	كهرباء (ك.و.س)	غاز طبيعي (م3)	مازوت (طن)	سولار (طن)	المياه (م3)
	تابع: الصناعات الهندسية						
71	أوانى منزلية من الالومنيوم	(طن)	144	0	0	0	0.3
72	أثاث خشبى	(عدد)	1440	0	0	0	2.4
73	تغليف اسلاك كهربائية	(طن)	160	0	0	0	0.4
74	شدادات وسفالات معدنية	(طن)	667	18	0	0	0.5
75	تصنيع قوالب إسطمبات	(عدد)	2000	0	0	0	1.5
76	تصنيع خشب كونتر	(متر مربع)	0.92	0	0	0	0.004
77	مطبوعات تجارية	(طن)	72	0	0	0	0.12
	صناعة النحاس						
78	شبكات نحاس وسبائك نحاس	(الطن)	800	367	0	0	0.13
79	مواسير نحاس	(الطن)	600	200	0	0	4.8
80	نحاس	(الطن)	64	45	0	0	0.36
81	أسلاك نحاس	(الطن)	864	0	0	0	0
	صناعة الغزل والنسيج						
82	تبييض وصباغة وتجهيز اقمشة قطنية ومخلوطة	(الطن)	878	1489	0	0.05	124
83	غزول قطنية ومخلوطة	(الطن)	2796	22	0	0.01	8
84	اقمشة تريكو قطنية ومخلوطة وبوليستر مبيضة ومصبوغه ومجهزة	(الطن)	1314	0	0	0.60	119
85	حياكة ملابس جاهزة من اقمشة منسوجة	(قطعة)	0.56	0.07	0	0	0.002
86	اقمشة تريكو دائرى خام	(طن)	880	0	0	0	4
87	وبريات قطنية 100%	(طن)	4717	604	0	0	152
88	أقمشة مفروشات جاكارد	(متر)	0.636	0	0	0	0.00

معدلات الإستهلاكات لوحدة الإنتاج للصناعات المختلفة طبقاً لدراسات الهيئة

م	اسم الصناعة	وحدة الإنتاج	الإستهلاكات لوحدة الإنتاج				
			كهرباء (ك.و.س)	غاز طبيعي (م3)	مازوت (طن)	سولار (طن)	المياه (م3)
	تابع: صناعات الغزل والنسيج						
89	أقمشة وشرائط دانتيل	(طن)	6353	0	0	0	57
90	تبييض وصباغة وطباعة أقمشة وقطع ملابس قطنية ومخلوطة	(طن)	1130	308	0	0	6
91	حياكة ملابس جاهزة من اقمشة تريكو	(قطعة)	0.31	0	0	0	0.01
	الصناعات التعدينية						
92	كربونات كالسيوم مطحونة	(طن)	60	0	0	0	0
93	ألواح وترابيع رخام تامة الصقل	(متر مربع)	10	0	0	0	0.04

0.012381768	0	0	0	0.012381768
0.12381768	0	0	0	0.12381768
0.01375752	0	0	0	0.01375752
0.073073	0	0	0.01575	0.057323
0.171969	0	0	0	0.171969
7.93703E-05	0	0	0	7.93703E-05
0.006190884	0	0	0	0.006190884
0.3987876	0	0	0.33	0.0687876
0.2315907	0	0	0.18	0.0515907
0.045978441	0	0	0.0405	0.005478441
0.074290608	0	0	0	0.074290608
1.466788141	0.050982246	0	1.340282949	0.075522946
0.272020455	0.011485972	0	0.020130475	0.240404007
0.728282391	0.61533485	0	0	0.112947541
0.000112085	0	0	6.35294E-05	4.8556E-05
0.07566636	0	0	0	0.07566636
0.948983491	0	0	0.543396226	0.405587264
5.46861E-05	0	0	0	5.46861E-05
0.546254471	0	0	0	0.546254471
0.374047269	0	0	0.276923077	0.097124192
2.6753E-05	0	0	0	2.6753E-05
0	0	0		
0.00515907	0	0	0	0.00515907
0.000838349	0	0	0	0.000838349

94	ألواح وترابيع جرانيت تامة الصقل	(متر مربع)	16	0	0	0	0.12
95	فلسبار مطحون	(طن)	80	0	0	0	0
96	بيرليت	(متر مكعب)	6	0	0	0.019	0
97	ملح طعام مغسول ومكرر	(طن)	5	0	0	0.0006	0
98	كربونات كالسيوم (تكنولوجيا صينية)	(طن)	15	0	0	0	0
99	فوسفات مركز	(طن)	6	0	0	0.006	0.13
100	جبس مكلسن	(طن)	44	0	0.003	0	0.07
	الصناعات الكهربائية						
101	محطات توليد كهرباء بالمازوت	(م . و . س)	0	0	0.3	0	0
102	محطات توليد كهرباء بالغاز	(م . و . س)	0	235	0	0	0
103	التليفزيون	(جهاز)	8	0	0	0	0

معدلات الإستهلاكات لوحدة الإنتاج للصناعات المختلفة طبقاً لدراسات الهيئة

م	اسم الصناعة	وحدة الإنتاج	الإستهلاكات لوحدة الإنتاج				
			كهرباء (ك.و.س)	غاز طبيعي (م3)	مازوت (طن)	سولار (طن)	المياه (م3)
	تابع: الصناعات الكهربائية						
104	سخانات كهربائية	(جهاز)	34	0	0	0	0.04
105	لوحات مطبوعة	(وحدة)	1	0	0	0	0
106	كشافات	(وحدة)	0.05	0.74	0	0	0.002
107	بطاريات سائلة	(وحدة)	0.73	0	0	0	0
108	مبردات مياه	(وحدة)	0.5	0	0	0	0.003
109	وحدات توليد كهربائية	(وحدة)	740	0	0	0	0
110	غلايات	(وحدة)	4	0	0	0	0.2
111	تكييف	(جهاز)	2	0.4	0	0	0.51
112	عوازل كهربائية	(وحدة)	5	0	0	0	0.00
113	سخانات شمسية	(وحدة)	34	0	0	0	0.04
114	أجهزة إستقبال	(وحدة)	0.4	0	0	0	0.00
115	مصاعد كهربائية	(وحدة)	50.09	0	0	0	0.02
116	أدوات كهربائية	(وحدة)	0.01	0	0	0	0.00
117	محركات كهربائية	(وحدة)	10	0	0	0	0.001
118	اللمبات الكهربائية	(وحدة)	0.02	0	0	0	0
119	بطاريات جافة	(وحدة)	0.04	0	0	0	0

0.001383229	0	0	0	0.001383229
0.00687876	0	0	0	0.00687876
0.020055412	0.01951371	0	0	0.000541702
0.000994793	0.000564871	0	0	0.000429923
0.001289768	0	0	0	0.001289768
0.00670106	0.006162224	0	0	0.000538836
0.006529062	0.0001752	0.002611007	0	0.003742855
		0		
0.289481227	0	0.289481227	0	0
0.2115	0	0	0.2115	0
0.000687876	0	0	0	0.000687876
0.00294804	0	0	0	0.00294804
0.000101784	0	0	0	0.000101784
0.000672986	0	0	0.000668919	4.06683E-06
6.30553E-05	0	0	0	6.30553E-05
4.29923E-05	0	0	0	4.29923E-05
0.06362853	0	0	0	0.06362853
0.000358269	0	0	0	0.000358269
0.000554325	0	0	0.00036	0.000194325
0.000462916	0	0	0	0.000462916
0.00294804	0	0	0	0.00294804
3.43938E-05	0	0	0	3.43938E-05
0.004307261	0	0	0	0.004307261
9.47861E-07	0	0	0	9.47861E-07
0.000845876	0	0	0	0.000845876
2.09721E-06	0	0	0	2.09721E-06
3.21081E-06	0	0	0	3.21081E-06

120	الضفائر الكهربائية	(وحدة)	1	0	0	0	0
121	مراوح كهربائية	(وحدة)	0.05	0	0	0	0
122	مبادلات حرارية	(وحدة)	6	0	0	0	0.001

معدلات الإستهلاكات لوحدة الإنتاج للصناعات المختلفة طبقاً لدراسات الهيئة

م	اسم الصناعة	وحدة الإنتاج	الإستهلاكات لوحدة الإنتاج				
			كهرباء (ك.و.س)	غاز طبيعي (م3)	مازوت (طن)	سولار (طن)	المياه (م3)
	الصناعات المعدنية						
123	مشغولات ذهبية وفضية	(كجم)	0.02	0	0	0	0.23
124	قوالب رصاص	(طن)	200	0	0	0.40	0.17

9.96586E-05	0	0	0	9.96586E-05
4.72309E-06	0	0	0	4.72309E-06
0.000544569	0	0	0	0.000544569
2.24287E-06	0	0	1.1475E-07	2.12812E-06
0.428011842	0.410814942	0	0	0.0171969

Annex (XI)

National Energy Efficiency Policies

National EE Policies and Measures

One of the main barriers to EE is lack of necessary policies for promoting and regulating EE. The EE policies currently implemented in Egypt are presented in this section, with a focus on the sectors targeted through this study.

The presented policies are divided into:

- Regulatory Instruments
- Financial Instruments
- Public Investment
- Policy Processes
- Voluntary Agreements
- Education and outreach

1. Transportation

1.1 Regulatory Instruments

National Regulations

In September 2008, the new traffic regulation was issued. Its implementation should improve traffic flow and thus make traffic more effective and energy efficient.

In addition, the law stipulates that mass transport vehicles (including taxis) over 20 years old are not allowed to operate starting July 2011. This regulation is expected to reduce inefficient fuel consuming vehicles.

Vehicle Emissions Testing and Tuning

Emissions standards for vehicles are set by the national environmental regulations. They are controlled by testing stations, before registration of new vehicles or license renewal of current ones. These standards promote complete fuel combustion, and accordingly are considered as an indirect tool for fuel efficiency.

In 1999 a pilot vehicle emissions testing, engine-tuning and certification programme was established in Cairo in order to improve fuel efficiency and air quality. The programme has subsequently been progressively introduced to other cities in Egypt, and vehicle emission testing and certification have become mandatory for vehicle licensing.

1.2 Financial Instruments

Duties and Taxes

High displacement cars are being controlled through two routes, the first is the duties and taxes on imported cars, and the second is the annual vehicle license fees. Duties and Taxes on imported cars include import duties that are relative to the engine displacement (e.g. import duties on passenger vehicles until 1600cc is 40%, while for those above 1600cc it is 135%), as well as development fees which also increase with the increase in engine

displacement. As for the license fees, in May 2008 annual vehicle license fees were increased according to the size of the engine of the vehicle being registered, adding another disincentive for larger cars.

The motor displacement has a direct impact on average fuel consumption per km. Accordingly, discouraging the ownership of larger motor size engines will have a positive impact on EE. However, it should be noted that for the same engine displacement, fuel efficiency varies based on vehicle specifications, and vehicle fuel efficiency, which are still not regulated in Egypt.

Preferential Loans

In 2008, a general taxi loan scheme was set-up under the guidance of the Ministry of Finance (MoF), aiming at the replacement of old taxis in Greater Cairo. MoF avails a grant of 5000 pounds for each taxi to be scrapped. Local banks provide commercial loans of a maximum of L.E 70,000 for each taxi (locally assembled brands) over 60 instalments (5 years).

1.3 Public Investment

Modal Shift through the Underground Metro Development

A major step to upgrade Cairo's transport system has been the construction of an underground metro, the first of its kind in Africa and the Middle East. The 63 km underground network links the three governorates comprising Cairo metropolitan region: Cairo, Giza and Qalyoubia. The network currently comprises two lines: line 1, Helwan–El-Marg, and line 2, Shubra–El-Kheima–Mouneeb. Line 1, which was completed in 1999, is 44 km long and currently carries 1.4 million passengers per day. Line 2, 19 km long, was completed in 2005 and is now used by 1million passengers per day.

A new third line from Cairo International Airport, east of Cairo, to Imbaba in the west is currently being constructed. The new line, about 40.5 km in length, has a design capacity of 2 million passengers per day. Construction has started in 2008 and the line is expected to be fully operational by 2019. Plans for line four are currently taking place and construction is planned to start in 2011. Having line 3 and 4 being built in parallel indicates the commitment of the government to address the need to extend the metro network.

Modal Shift through GEF/UNDP Sustainable Transport Project

The “Sustainable Transport Project for Egypt” is a five years project (2009-2013) funded by GEF/UNDP and implemented in cooperation with EEAA. The project objective is to implement pilot projects leading to numerous replications and aiming to:

- Reduce the growth of the energy consumption and the related greenhouse gas emissions of the transport sector in Egypt.
- Mitigate the local environmental and other problems of the increasing traffic such as deteriorated urban air quality and congestion.

The Sustainable Transport Project for Egypt will have an impact on energy efficiency in the transport sector, through promoting a modal shift. The project supports the modal shift from passenger vehicles to busses, by improving the

quality of busses and introducing new high quality buses. Moreover, the project promotes cycling and walking through constructing new networks with improved facilities for walking and cycling. For freight transport, the project promotes a modal shift from road to more energy efficient rail and river based transport options. The project components are

- **Component (1):** Promoting modal shift from private cars to sustainable integrated public transport for Greater Cairo & its satellite cities (Public Private Partnerships).
- **Component (2):** Promoting modal share[1] of non-motorized Transport (NMT) in medium size cities.
- **Component (3):** Introducing new Transport Demand Management (TDM) measures to expand towards more aggressive measures over time to effectively discourage use of private cars when good quality public transport services are available.
- **Component (4):** Improving energy efficiency of freight transport.
- **Component (5):** Enhancing the awareness & capacity, and strengthening the institutional basis to promote sustainable transport.

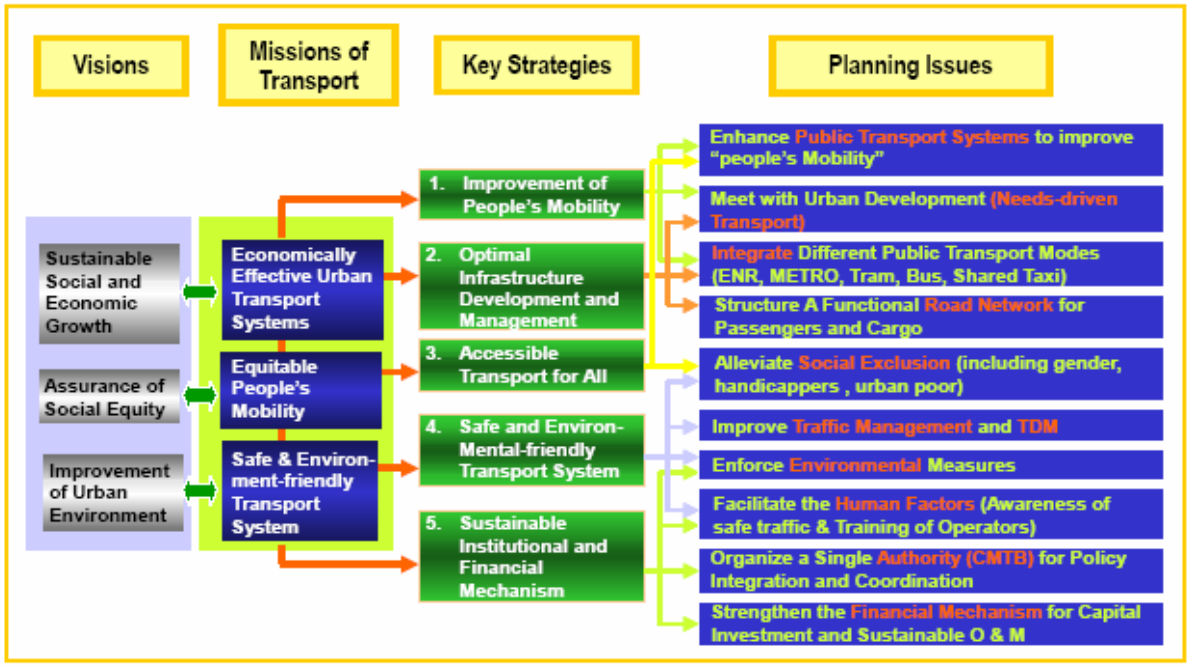
[1] Example: Share of bicycles.

1.4 Policy Processes

Master Planning

The government's vision for transforming the transport sector is reflected in the Greater Cairo Urban Transport Master Plan supported by Japan International Cooperation Agency (JICA) and the Higher Committee for Greater Cairo Transport Planning, Ministry of Transport. The Master Plan studies provided a new framework for consideration of an integrated urban transport system that emphasizes on "people's mobility before that of vehicles." The Master Plan took account of three "missions" for the urban transport:

a) A safe and environment-friendly transport system that would significantly reduce carbon emissions and fuel consumption, focusing on modal shift towards low carbon mass transport systems;
b) An economically effective urban transport system; and
c) An equitable people's mobility.



Planning Structure of CREATS

Source: Transportation Master Plan and Feasibility Study of Urban Transport Projects in Greater Cairo Region in the Arab Republic of Egypt, 2002.

National Sustainable Development Strategy Framework

Confirming its commitment to Sustainable Development, Egypt has issued the National Sustainable Development Strategy framework in 2008. The actual Strategy is currently being developed. The strategy framework sets the challenges that should be addressed in details in the strategy. In the transport sector, energy efficiency and improving the quality of public transportation are among these challenges.

2. Industrial Sector

2.1 Regulatory Instruments

New Electricity Law

Energy Efficiency measures related to industrial establishments in the draft electricity law includes:

- Right to interconnect with the grid and feed in excess energy available from cogeneration and secondary energy units below 50 MW
- Each facility with a contracting capacity above 500 kW shall have an energy manager as well as an energy register.

Standards for Equipment

There are effectively few obligatory norms related to energy efficiency for industrial plants, equipment or devices in Egypt. Some emissions or security regulations as well as technical guidelines have indirect effects on efficiency standards. Energy efficiency standards for motors are set by the Egyptian Organization for Standardization and Quality, and EE standards for boilers are being developed.

2.2 Financial Instruments

Price Reform

Energy prices in Egypt are highly subsidized. However, the government recently adopted a price reform with the objective of gradual reduction of energy subsidies.

The Prime Minister Decrees (1953/2010 and 2130/2010) setting energy prices have divided the industrial sectors into three categories and set a price scheme for each category. The first is energy intensive industries including iron, cement, aluminium, copper, fertilizer, and petrochemicals industries. The second is less energy intensive industries including glass, ceramic and porcelain industries, and the third includes all other industrial sectors.

The adopted price reform is expected to stimulate rational energy use and save large quantities of energy, especially on the long-run.

Loans and Subsidies

The Industrial Modernization Centre (IMC) conducts energy audits to promote energy conservation in the industrial sector. Based on the results of these audits, it proposes improvements and handles low interest loans from the IMC or federation of Egyptian industries (FEI). IMC provide funding for 90% of the energy audit fees and provides up to 15% of the energy efficiency application investment, with a ceiling of 150 thousand LE.

In addition, the Federation of Egyptian Industries (FEI) has a revolving fund (LE 100 million) and provides soft loans (interest 2.5%, 5 year payment plan with a possible 1-year of grace period). Investment periods are generally 5 – 7 years. This source of the fund capital is composed of LE 60 million from

Danish International Development Agency (DANIDA) and LE 40 million from the Egyptian government (MOF) .

An Industrial Energy Efficiency (IEE) project has recently been initiated. It is a five year project (2010-2014) funded by the GEF/UNIDO. The project objective is to facilitate energy efficiency improvements in the industrial sector (with focus on SMEs). This takes place through supporting the development of a national energy management standard and energy efficiency services for Egyptian industry as well as creation of demonstration effect.

Within the project activities, 50 in-depth system assessments are to be completed in industrial facilities and 25 energy optimization system projects, identified through assessments, will be implemented. The project will also work with existing financial institutions and government sponsored incentive programs to develop a tailored package of financial assistance targeted to industrial facilities who adopt an energy management plan.

2.3 Policy Processes

Cleaner Production Strategy

A cleaner production strategy was developed in 2004, with the objective of; encouraging the adoption and implementation of cleaner production in the Egyptian industry; and, presenting the necessary action items that the Egyptian Government should take to facilitate the uptake of cleaner production in the Egyptian industry.

Energy conservation is one of the key elements in the CP strategy. Indicators have been set to measure the achievements of the strategies goals. Average energy consumption per unit product in ton of oil equivalent, has been the indicator adopted for energy consumption.

National Sustainable Development Strategy Framework

Energy efficiency in the industrial sector is one of the main issues considered in the National Sustainable Development Strategy Framework.

2.4 Education and Outreach

Capacity Building

One of the components of the Industrial Energy Efficiency (IEE) project currently being implemented is capacity building for energy efficiency services. This includes energy management and systems optimization- so that both the industrial facilities and their supply chain partners support investments in energy efficient technologies and operations.

Activities planned to be carried out include:

- Energy management training and web-based tools offered, building on international best practices. Thirty EE professionals receive expert level training in energy management, resulting in pool of certified EM experts.

- System optimization training and web-based tools developed. Sixty EE professionals receive expert level systems optimization training, resulting in pool of certified system optimization experts.
- Trained Egyptian experts offer awareness level training to 500 industry representatives.
- Business development consulting, to be offered as needed, to assist trained experts in refining their organization's business model, including equipment vendor training for energy efficiency. One or two EE consultancy entities will be strengthened to become the national coordinator or lead consultancy entity in the EE field.

Recognition Programs

One of the activities of the Industrial Energy Efficiency project is the development of National recognition program for facilities that implement an energy management plan, along with preferred access to technical and financial assistance.

3. Commercial and Residential Buildings

3.1 Regulatory Instruments

EE building codes for residential and commercial buildings

Housing and Building Research Center (HBRC) of the Ministry of Housing has developed energy efficiency building codes for residential and commercial buildings.

The developed codes set minimum energy performance standards for building detailed components and building envelop.

Ministerial decrees, 482/2005 and 190/2009, were issued by the Ministry of Housing Utilities & Urban communities for application of EE code for residential buildings and commercial buildings, respectively.

Energy Efficiency Standards and Labelling

Standards for refrigerators, washing machines, air-conditioners and water heaters were developed by OEP under the UNDP/GEF projects and labels were designed to indicate to which class any appliance belongs. These were approved by the Egyptian Organization for Standardization and Quality Control (EOS). Testing laboratories for these appliances, for efficient lighting equipment (CFLs) and electronic ballasts have been built with the support of the UNDP Energy Thematic Trust Fund. A Ministerial Decree was promulgated, stipulating that it is mandatory to enforce the application of these specifications regarding locally manufactured and imported equipment, as well as to enforce Energy Efficiency Labeling.

It addition, a five year project (2010- 2015) for improving energy efficiency of lighting and other building appliances is being funded by GEF/UNDP. The objective of the project is to improve energy efficiency of end-use equipment,

namely building appliances and lighting systems manufactured, marketed and used in Egypt.

New Electricity law
Article 55 of the draft electricity law obliges the competent Ministry to design policies aimed at expanding the application of higher efficiency equipment to replace low-efficiency appliance and equipment. Article 56 of the draft electricity law also addresses EE labeling of equipment.

3.2 Financial

Subsidized Compact Fluorescent Lamps (CFLs) Program
To activate the diffusion of efficient lighting among customers, EEHC through the electricity distribution companies has implemented a program for selling Compact Fluorescent Lamps (CFL) to their customers. EEHC facilitates payments in eighteen installments, added to the electricity bills with a guarantee period of 18 months. More than 600 thousand lamps were sold through this program. Moreover the Ministry of Electricity and Energy has embarked on an ambitious program for a larger dissemination of the CFLs where 6.2 million lamps were sold through the electricity distribution companies at half of their prices. The annual achieved savings are expected to reach 730 GWh and a load decrease of 400 MW.

3.3 Voluntary Agreements

Green Pyramid Rating System
The Egyptian Green Building Council has developed a system for Green Pyramid Rating System (GPRS). Recognizing the unique ecological, industrial and social challenges of the region, the rating system helps to define what constitutes an “Egyptian Green Building”. To accomplish that goal, the rating system builds upon the Egyptian BEECs and integrates proven methodologies and techniques used in successful programs from the United States, Europe, Asia, South America and the Middle East.

There are three levels for green building certification in accordance with the Egyptian GPRS:

- Silver Pyramid
- Golden Pyramid
- Green Pyramid

Unlike other international rating systems, the highest level of certification is labelled “green” rather than platinum. For example, to raise the awareness, confirm that ultimate goal and promote the fact that the most valuable level is reaching “green”.

Energy Efficiency is one of the key areas in assessing and certifying green buildings. Incentives related to a Green Buildings Certification (GBC) include:

- Access to preferred and prime locations and property per the Government of Egypt
- Financial Assistance including guarantees, credit and insurance
- Utility Concessions
- Equipment support and finance
- Employee support and assistance

Egypt-GBC is a whole-building approach to sustainability by recognizing performance in seven key areas:

- Sustainable Sites Development
- Water Saving
- Energy Efficiency and Environment
- Materials Selection and Construction System
- Indoor Environmental Quality
- Innovation and Design Process
- Recycling of Solid Waste

Green Star Hotel Initiative

Within the scope of the Public Private Partnership (PPP) program of the German Federal Ministry of Economic Cooperation and Development, Egyptian and German tourism key players joined forces, with the technical assistance of the of the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), to implement an environmentally friendly sustainable management system in Egypt's hotel industry, through establishing the Green Star Hotel Initiative (GSHI).

The GSHI has been established with the aim to improve environmental performance of the Egyptian hotel industry. El Gouna has been chosen as the pilot destination in which to launch the Green Star Hotel label. Eleven hotels in El Gouna were certified as green star hotels, with the green stars ranging from three to five stars based on the hotel performance. Phase II of the initiative will take place in at least three other destinations in Egypt.

The criteria of the *Green Star Hotel Label* concentrate on a number of environmental areas including Energy efficiency. All criteria are based upon internationally recognized criteria, including baseline criteria developed by the United Nations Environmental Programme (UNEP) and a range of international organizations.

One of the main objectives of the nationally implemented GSHI is the significant reduction of energy consumption (20-30%).

The main activities carried out within this initiative include:

- *Awareness Campaign*
  Development and conduction of an awareness and promotion campaign for the Green Star Hotel Initiative.
- *Training and Capacity Building*
  Training programmes for the hotels in all pilot destinations and train-the-trainer programmes for the Egyptian Hotel Industry.

- *Certification*
  Technical assistance assuring that the certification process of the pilot hotels is being handled in a transparent way.
- *Assistance to set up of a training and service provider for the Green Star Hotel System*
  Technical assistance and capacity building to establish an Egyptian wide service representative and training provider for the Green Star Hotel Initiative.

Annex (XII)

International Energy Efficiency Policies

International Energy Efficiency Policies

There have been many attempts to compile the EE policies, however none of which was exhaustive. The main international EE policies databases are:

- World Energy Council (WEC) database on energy efficiency policies and measures. Website: http://www.wec-policies.enerdata.eu/\
- International Energy Agency (IEA) Energy Efficiency Policies and Measures Database.
  Website: http://www.iea.org/textbase/pm/?mode=pm

Examples of the most common EE policies are presented in this section. The categorization of the EE policies and measures presented in this section follows the categories adopted by the IEA:

- *Education and outreach:* Policies and measures designed to increase knowledge, awareness and training among relevant stakeholders or users.
- *Financial incentives and subsidies:* Policies and measures that encourage or stimulate certain activities, behaviours or investments using financial and fiscal instruments.
- *Policy processes:* Refers to the processes undertaken to develop and implement policies. This generally covers strategic planning documents and strategies that guide policy development.
- *Public Investment:* Policies and measures guiding investment by public bodies.
- *RD&D:* Policies and measures for the government to invest directly in or facilitate investment in technology research, development, demonstration and deployment activities.
- *Regulatory Instruments:* Covers a wide range of instruments by which a government will oblige actors to undertake specific measures and/or report on specific information.
- *Tradable permits:* Refers to three kinds of systems – greenhouse gas (GHG) emissions trading schemes, white certificate systems stemming from energy efficiency or energy savings obligations, and green certificate systems are based on obligations to produce or purchase renewable energy-sourced power (generally electricity).
- *Voluntary Agreements:* Refers to measures that are undertaken voluntarily by government agencies or industry bodies, based on a formalised agreement.

1. Transportation Sector

1.1 Regulatory Instruments

Fuel Economy Standards

Fuel economy policies and standards result in fuel consumption reduction as well as reduction in carbon dioxide and GHG emissions from the transport sector.

In 2009, the *50 BY 50 Global Fuel Economy Initiative (GFEI)* was launched by the United Nations Environment Programme (UNEP), the International Energy Agency (IEA), the International Transport Forum (ITF) and the FIA Foundation (FIAF). The GFEI aims to catalyze and help harmonize large reductions of greenhouse gas emissions and oil use through improvements in automotive fuel economy in the face of rapidly growing car use worldwide. The GFEI targets an improvement in average fuel economy (reduction in fuel consumption per kilometre) of 50% worldwide by 2050.

National Fuel Economy Initiatives have been adopted by many countries, examples of which are presented in Table (1).

Table (1): Examples of Fuel Economy Initiatives

Country	Summary
Japan	Regulatory "Top Runner" standards and the mandatory display of energy efficiency values were enabled in 1998. The standards have been introduced for LDVs (1999), LPG vehicles (2003) and HDVs (2006). It is also mandatory to ensure labeling of vehicles. The standards can be considered as effective as there is a strong disincentive for the customers in the form of progressively higher taxes levied based on the gross vehicle weight and engine displacement of automobiles when purchased and registered.
China	China's National Development and Reform Commission introduced in 2004 mandatory fuel efficiency standards for passenger cars. The standards are initially classified into 16 categories based on vehicle weight. Standard values are set for each category. Chinese standards are considered to be the third most stringent globally. The standards do not differentiate based on fuel, but by weight. In 2006, excise tax on vehicles to provide a stimulus for sales of small-engine vehicles. In 2009, China announced that it will target a fleet wide average of 42.2 miles per gallon by the year 2015. In June 2010, the government approved subsidies for 16 car manufacturers to produce fuel efficient cars. Per car, 3,000 yuan is granted if it is proven that they save at least 20% fuel.
South Korea	The Average Fuel Economy program and fuel economy rating identification of motor vehicles were introduced in 2005. The reference average fuel economy standards are 12.4 km/l for vehicles with engine displacement of 1500cc or less, and 9.6 km/l for displacement exceeding 1500cc. Fuel economy standards were set for domestic cars in 2006 and imported cars in 2009 if sales are less

Country	Summary
	than 10,000. If sales of imported cars exceed 10,000 then these must meet US Corporate Average Fuel Economy (CAFÉ) standards.
United States (US)	In May 2009, the US developed a national policy aiming at both increasing fuel economy and reducing greenhouse gas pollution for all new cars and trucks sold in the United States. The new standards, covering model years 2012-2016, and ultimately requiring an average fuel economy standard of 35.5 mpg in 2016, are projected to save 1.8 billion barrels of oil over the life of the program. The fuel economy gain will average more than 5 percent per year and a reduction of approximately 900 million metric tons in greenhouse gas emissions would be achieved accordingly. This would surpass the CAFE law passed by Congress in 2007 that required an average fuel economy of 35 mpg in 2020.

Source: *Global Fuel Economy Initiative (GFEI) and the Clean Air Initiative for Asian cities Working Paper 1/10: Improving Vehicle Fuel Economy in the ASEAN Region, July 2010.*

Labelling

Introducing labels for new cars, which display information on fuel consumption and/or CO_2 emissions, is a relatively simple measure, provided that most car manufacturers on the global market have such information already available and standard test cycles are being applied.

The EU Directive (1999/94/EC) obliges car manufacturers and distributors to display information on fuel consumption and CO_2 emissions of new passenger cars in showrooms and within any marketing activity (CO_2 label). It also makes it mandatory to publish annual guides on fuel economy and CO_2 emissions, with data for all new passenger car models available on the national markets.

The labels include mandatory data on CO_2 emissions (g/km) and fuel consumption (l/100km and/ or km/l). In some countries, an efficiency rating system and additional data like noise, emissions standards, tax and other technical data are included.

In addition, the European Parliament adopted a legislative proposal on the future labelling of tyres in 2009. Tyre buyers will be better informed about their fuel-efficiency, safety and noise performance.

Adopting the system of the European energy label, the tyre label will use a fuel-efficiency categorisation ranging from best-performance (green “A” class) to worst (red “G” class).

In the US, The Environmental Protection Agency (EPA) and the National Highway Traffic Safety Administration (NHTSA) are conducting a joint rulemaking to redesign and add information to the current fuel economy label, which is posted on the window sticker of all new cars and light-duty trucks sold in the U.S. The redesigned label will provide new information to American consumers about the *fuel economy and consumption*, fuel costs, and

environmental impacts associated with purchasing new vehicles (cars and trucks) starting with model year 2012.

1.2 Financial Instruments

Vehicle Taxation

Vehicle taxation can take two forms: as a sales tax, or as an annual vehicle tax /registration fee. The sales tax adds a tax element to the purchasing price and may significantly increase the price of a vehicle, thus discouraging the purchasing of a new vehicle. An annual vehicle tax may have a similar effect. However, by spreading the tax amount over many years the perceived burden for the potential buyer can be reduced. It also does not put a particular burden on new cars but rather treats all cars, both new and used ones, alike. In addition, an annual tax offers more flexibility as tax rates can be changed over time.

Excise Tax on Fuel Inefficient Cars

In 2007, the excise tax, also known at the Vehicle Efficiency Incentive (VEI) was imposed by the Canadian Ministry of Finance. The tax applies to automobiles (including station wagons, vans, and sport utility vehicles) designed primarily for use as passenger vehicles, but not including pickup trucks, vans equipped to accommodate 10 or more passengers, ambulances and hearses, in accordance with the vehicle's fuel-efficiency rating.

It is calculated on the basis of the weighted average fuel consumption and vehicles that surpass 13 or more litres per 100 km are subject to the VEI Excise tax at the following rates:

- At least 13 but less than 14 litres per 100 km: $1,000;
- At least 14, but less than 15 litres per 100 km: $2,000;
- At least 15 but less than 16 litres per 100 km: $3,000;
- 16 or more litres per 100 km: $4,000.

The excise tax applies to all automobiles delivered by a manufacturer after March 19, 2007, including any automobile imported into Canada after that day unless the automobile was put into service before March 20, 2007.

Source: Canadian Revenue Agency website

Fuel Taxation

At the level of the individual driver, fuel taxation increases vehicle operation costs. This encourages drivers to make efficient use of their vehicles, and offers a strong incentive to economically use vehicles (and thus infrastructure). In this regard, efficient use of transport goes hand in hand with the efficient provision of transport infrastructure.

The table below distinguish four types of fuel price regimes that can be found in developed and developing countries.

Fuel price Regimes in 2000

Fuel Price Regime	Examples from developed countries	Examples from Developing countries	Gasoline prices per liter in 2000 [US cents]
High taxation	EU countries, Hong Kong	Côte d'Ivoire, Bolivia, Burundi	> 72
Medium taxation	South Africa, Australia, Canada	Chile, Cameroon, Malawi	48 - 72
Low taxation	USA	Ethiopia, Vietnam, China	33 - 47
Subsidised fuel prices	Saudi Arabia	*Egypt,* Indonesia, Iran	2 - 32

Source: GTZ Fuel Prices and Taxation, 2001

Road Pricing

Road pricing is an exact and efficient way to charge road users for their actual road use. It can be differentiated by vehicle type or time of the day. Road pricing may be applied to the overall road network or to particular roads or bridges.

Toll stickers

Several European countries have toll road payment done in the form of toll stickers affixed to the car's front window, which are valid for a certain amount of time.

Toll collection for trucks:

- Switzerland introduced a toll-system for trucks over 3.5 tonnes in January 2001
- Austria introduced an electronic toll collection system for trucks over 3.5 tonnes in January 2004, based on DSRC micro wave technology.
- Germany followed suit with a toll system for trucks over 12 tons in January 1, 2005. The German Toll Collect system is based on a technology using satellites; truck operators may choose to either install on-board units for automated tracking of movements, or to book their route in advance using the internet or computerized booking terminals.

Source: wekipidia website: *http://en.wikipedia.org/wiki/Toll_roads_in_Europe*

Car Scrapping

Several countries within and outside Europe have implemented car scrapping schemes during the 1990s to increase the rate of renewal of the car fleet and to improve fuel efficiency and environmental conditions.

Subsidies for Hybrid vehicles

A hybrid vehicle is a vehicle that uses an on-board rechargeable energy storage system (RESS) and a fuel based power source for vehicle propulsion. These vehicles use much less fuel than their counterparts and produce less emissions.

Subsidies is the most common type of policy for promoting hybrid vehicles. The subsidy of hybrid vehicles results in an increase in the share of hybrids, and accordingly fuel economy.

1.3 Policy Processes

Energy Efficiency Strategies

National energy efficiency strategies and action plans are crucial for setting the roadmap for EE on the national level as well as the sectoral level. Transportation is one of the main energy consuming sectors in all economies, and is addressed in all national strategies. In some countries and states, such as Hawaii, a separate transportation EE strategy is developed.

1.4 Voluntary Agreements

Voluntary agreement programs can be divided into three categories:

1) Programs that are completely voluntary,
2) Programs that use the threat of future regulations or energy/GHG emissions taxes as a motivation for participation, and
3) Programs that are implemented in conjunction with an existing energy/GHG emissions tax policy or with strict regulations.

Voluntary agreement between governments and vehicle manufactures has been adopted by many countries. In 2003, the Government of Australia reached an agreement with the automotive industry on a voluntary target for new petrol operated passenger cars by 2010, which represented an 18% improvement in the fuel efficiency of new vehicles between 2002 and 2010.

In addition, voluntary agreements are also conducted with service providers in the transport industry. In the USA, a SmartWay Transport initiative has been adopted. The SmartWay Transport is a voluntary partnership between various freight industry sectors and the Environment Protection Agency (EPA) that establishes incentives for applying innovative strategies and technologies to improve fuel efficiency and reduce emissions.

1.5 Education and Outreach

Dissemination of information on vehicle specifications and their fuel efficiency is carried out by different countries. In addition, promotion of eco driving has also been adopted as a measure of EE in the transport sector.

Promoting ECO Driving in Japan
The Japanese government, as part of its call for increased energy efficiency in the transport sector, took measures to promote ECO driving, to positively affect peoples driving habits. Several relevant ministries have joined to form a meeting body, the Eco-Drive Promotion Liaison Committee, in 2003. The Liaison Committee formulated the "Eco Drive 10 Advices" and "Soft Acceleration, e-Start" for a slow start campaign for drivers. In June 2006, the "Action Plan to Promote Eco-driving" was declared and nationally promoted and Eco driving training sessions were also actively delivered in cooperation with the (Energy Conservation Center) ECCJ.

Source: IEA Energy Efficiency Policies and Measures Database

2.1.1 Energy Savings Obligations

Energy savings obligations is a recent and innovative measure in which energy companies (supplier/retailer or distributor) have a legal obligation to promote and stimulate investment, which will save energy in their customers' premises or households. When this obligation can be met, involving buying or selling of energy saving credits, this is usually called White Certificates.

In Europe, Six countries are active in setting significant energy savings obligations on energy companies, these are Belgium (Flanders Region), France, Italy, UK, Denmark and Brazil. Of the six countries, only Italy and France have the transport sector included within the scope the agreement[1].

2. Industrial Sector

2.1 Regulatory Measures

Minimum Energy Performance Standards (MEPS)
Regulations and standards are mandatory policies applied to improve energy efficiency typically to particular industrial equipment such as motors and boilers (being used by a variety of industries) or equipment specific to certain industries such as electric furnaces and rotary kilns.

Approximately two-thirds of the industrial electricity demand is accounted for by motor systems, which are widely used across all industrial sectors. Mandatory minimum efficiency performance standards (MEPS) are implemented worldwide, to gradually prohibit low-efficiency motors. Countries that have implemented

[1] Source: WEC, Energy Efficiency Policies around the World: Review and Evaluation, 2008

minimum energy performance standards (MEPS) at relatively high efficiency levels, such as Canada and the United States, have market shares for high-efficiency motors of over 70%, whereas the market share in countries without them stagnates below 10 or 15%, despite voluntary programs[2].

Energy Management Standards

The purpose of an energy management standard is to provide guidance for industrial facilities to integrate energy efficiency into their management practices, including fine-tuning production processes and improving the energy efficiency of industrial systems.

Typical features of an energy management standard include:

- A strategic plan that requires measurement, management, and documentation for continuous improvement of energy efficiency;
- A cross-divisional management team led by an energy coordinator who reports directly to management and is responsible for overseeing the implementation of the strategic plan;
- Policies and procedures to address all aspects of energy purchase, use, and disposal;
- Projects to demonstrate continuous improvement in energy efficiency;
- Creation of an Energy Manual, a living document that evolves over time as additional energy saving projects and policies are undertaken and documented;
- Identification of key performance indicators, unique to the company, that are tracked to measure progress; and
- Periodic reporting of progress to management, based on these measurements.

Examples of national energy efficiency standards adopted by different countries include:

Ireland: Introduced the Energy Management standard, IS 393 in 2005.

Netherlands: An Energy Management System Specification was developed in 1998 in cooperation with Bureau Veritas, an ISO 14001 certification institute

Sweden: Sweden had a voluntary agreement program since 1994, but only added an energy management standard as a program requirement in 2003.

United States: Georgia Institute of Technology (Georgia Tech) first developed a comprehensive energy management standard for industry in 2000 that has served as a model for several subsequent national standards. The standard was adopted by the American National Standards Institute (ANSI).

[2] Source: *IEA, Industrial Motor Systems Energy Efficiency: Towards a plan of action, Final version 7 July 2006*

Future ISO 50001 Standard for Energy Management

The future ISO 50001 standard for energy management was recently approved as a Draft International Standard (DIS).

ISO 50001 will establish a framework for industrial plants, commercial facilities or entire organizations to manage energy. Targeting broad applicability across national economic sectors, it is estimated that the standard could influence up to 60% of the world's energy use.

The document is based on the common elements found in all of ISO's management system standards, assuring a high level of compatibility with ISO 9001 (quality management) and ISO 14001 (environmental management). ISO 50001 will provide the following benefits:

- A framework for integrating energy efficiency into management practices
- Making better use of existing energy-consuming assets
- Benchmarking, measuring, documenting, and reporting energy intensity improvements and their projected impact on reductions in greenhouse gas (GHG) emissions
- Transparency and communication on the management of energy resources
- Energy management best practices and good energy management behaviours
- Evaluating and prioritizing the implementation of new energy-efficient technologies
- A framework for promoting energy efficiency throughout the supply chain
- Energy management improvements in the context of GHG emission reduction.

Source: ISO Website *http://www.iso.org/iso/pressrelease.htm?refid=Ref1337*

Mandatory Audits

Audit schemes are useful ways to inform consumers about the possible actions to improve energy efficiency. Mandatory audits have been increasing in the industrial sector. In order to have a proper mandatory audit scheme, quality auditors as well as energy management staff within an industrial establishment must exist. This can be assured by the certification of auditors and by the training of energy managers.

Turkey's Experience
The Ministry of Energy and Natural Resources (MENR) issued a Decree in November 1995 providing for measures concerning energy management in industrial plants which consume more than 2000 toe of energy per year. Among the Decree's provisions are:
- Plants consuming over 2000 toe of energy are required to nominate an Energy Control Committee and set up an energy management system; smaller plants should nominate an Energy Manager.
- The managers of these plants must complete energy audits within three years. The results of the audits must be submitted to the National Energy Conservation Centre (NECC).
- These plants should take the measures, adapted in co-operation with NECC, to improve energy efficiency during operations and to take into account this objective when the plants are expanded or modernised.
- The plants should monitor the results of the measures and report annually to NECC on the evolution of energy savings for the plant's three main products. NECC will either organise professional training or give authorisation to organisations for training at these plants.

Source: IEA Energy Efficiency Policies and Measures Database

2.2 Financial Instruments

Investment in energy-efficient industrial equipment and processes is encouraged through tax and fiscal policies. These policies operate either through increasing the costs associated with energy use to stimulate energy efficiency or by reducing the costs associated with energy efficiency investments. Various forms of these instruments have been tried in numerous countries over the past decades. In addition, integrated policies that combine a variety of financial incentives in a national-level energy or GHG emissions mitigation program are also found in a number of countries. Such integrated policies are often national-level energy or GHG programs that combine a number of tax and fiscal policies along with other energy efficiency mechanisms such as voluntary agreements.

Energy Taxes
Energy or energy-related carbon dioxide (CO_2) taxes have been used in a number of countries to provide an incentive to industry to improve the energy management at their facilities. This takes place through both behavioural changes and investments in energy-efficient equipment.

Grants and Subsidies
Beginning in the 1970s, grants or subsidies for investments in energy efficiency were among the first policy measures to be implemented. These remain the most widespread fiscal incentives used today. Those providing the grants or subsidies do not seek a direct financial benefit in the form of return on investment.

Developing countries with higher risk market environments for investments may find that direct public funding in the form of grants or subsidies are a viable option for encouraging investment in energy efficiency[3].

Tax Relief

Tax relief for purchase of energy-efficient technologies can be granted through tax exemptions, tax reductions, and accelerated depreciation. A common approach is to provide a list of technologies for special tax treatment. Depending upon the specific program, this tax treatment could be:

1) Accelerated depreciation where purchasers of qualifying equipment can depreciate the equipment cost more rapidly than standard equipment,
2) Tax reduction where purchasers can deduct a percentage of the investment cost associated with the equipment from annual profits, or
3) Tax exemptions where purchasers are exempt from paying custom taxes on imported energy-efficient equipment.

2.3 Policy Processes

Energy Efficiency Strategies

Similar to the transportation sector, a National Energy Efficiency Strategy addressing the industrial sector and/or an industrial EE strategy are crucial for setting the roadmap for EE within the industrial sector.

2.4 Voluntary Agreements

Agreements to meet specific energy-use or energy efficiency-targets are used in the industrial sector in many countries around the world. Such agreements can be viewed as a tool for developing a long-term strategic plan for increasing industrial energy efficiency. An agreement or target can be formulated in various ways. Two common methods are based on specified energy-efficiency (or energy intensity) improvement targets and on absolute energy use reduction commitments. Either an individual company or an industrial subsector, as represented by a party such as an industry association, can enter into such agreements.

[3] Source: UNIDO, Policies for Promoting Industrial Energy Efficiency in Developing Countries and Transition Economies, 2008.

Netherlands – Long-Term Agreements and Energy Benchmarking Covenants
In the Long-Term Agreements (LTAs) in The Netherlands, voluntary agreements between the Dutch Ministries and industrial sectors consuming more than 1 petajoule (PJ) per year were established. These agreements support achieving an overall national energy-efficiency improvement target of a 20% reduction in energy efficiency between 1989 and 2000. The agreements were negotiated between government and industry associations over a two year period and were signed in 1992. Each industry association signed an agreement with the Dutch Ministry of Economic Affairs committing that industry to achieve specific energy efficiency improvements by 2000. In total, 29 agreements were signed involving about1000 industrial companies and representing about 90% of industrial primary energy consumption in The Netherlands. The average target was a 20% increase in energy efficiency over 1989 levels by 2000. The LTA program ended in 2000 with an average improvement in energy efficiency of 22.3% over the program period.

Source: UNIDO, Policies for Promoting Industrial Energy Efficiency in Developing Countries and Transition Economies, Background Paper for the UNIDO Side Event on Sustainable Industrial Development on 8 May 2007 at the Commission for Sustainable Development (CSD-15).

2.5 Education and Outreach

Information Dissemination and Capacity Building

Raising awareness within the industrial sector on energy efficient equipment and technologies, as well as energy efficient management practices promotes EE within the industrial sector. This is achieved by using a number of tools including developing Energy Efficiency Best Practice guides for different industrial sectors and disseminating it, conducting trainings for industrial establishments and carrying out energy audits

Building Technical Capacity for Optimization

United Nations Industrial Development (UNIDO) has worked with a team of international experts to develop and pilot a training curriculum specifically designed to build the necessary technical capacity in China.

As a result of the UNIDO China Motor System Energy Conservation Program, 22 engineers were trained on system optimization techniques in Jiangsu and Shanghai provinces. The trainees were a mix of plant and consulting engineers. Within two years after completing training, these experts conducted 38 industrial plant assessments and identified nearly 40 million kWh in energy savings.

Source: UNIDO, Policies for Promoting Industrial Energy Efficiency in Developing Countries and Transition Economies, Background Paper for the UNIDO Side Event on Sustainable Industrial Development on 8 May 2007 at the Commission for Sustainable Development (CSD-15).

Recognition Programs

Recognition programs have proven to be effective mechanisms for rewarding industrial facilities who participate in public programs to encourage more energy efficient behaviour.

Recognition programs also lead to building greater awareness of the benefits of industrial energy efficiency among companies that may not yet be active.

Finally, recognition programs create peer pressure within sectors that encourages more energy efficient practices, as companies receiving awards or other types of recognition seek to use them for competitive advantage.

Most countries who have instituted industrial energy efficiency programs also have recognition programs. Thailand offers the Prime Minister's Industrial Award, recognizing top-achieving firms that institute a comprehensive energy management plan and report their results. Australia has an annual ceremony for their Greenhouse Challenge Plus program awardees, which is held at the Parliament House and hosted by the Minister for Industry, Tourism and Resources. Programs in the UK, Ireland, Sweden, Denmark, Korea, and the Netherlands all have recognition programs associated with their target-setting agreement programs, in addition to tax incentives, for companies who document substantial reductions in energy use. Canada, Germany, and Switzerland also have recognition programs based on energy or GHG emissions reduction achievements. The US Environmental Protection Agency offers an ENERGY STAR for Industry award to companies who are in the top of their sector based on reported energy performance.[4]

2.6 Energy Savings Obligations

The energy savings obligations referred to in section 1.2.6, consider the Industrial sector one of the main sectors to be included within the scope the agreement.

[4] Source: Source: UNIDO, Policies for Promoting Industrial Energy Efficiency in Developing Countries and Transition Economies, Background Paper for the UNIDO Side Event on Sustainable Industrial Development on 8 May 2007 at the Commission for Sustainable Development (CSD-15).

3. Commercial Buildings

3.1 Regulatory Instruments

Energy Efficiency Building Codes

Energy efficiency standards in building codes set minimum energy performance standards for all new buildings. Currently, most of the countries have EE addressed in their building codes, or have a separate code for EE.

In India, an Energy Conservation Building Code (ECBC) was issued in 2006 by the Bureau of Energy Efficiency. The code provides minimum requirements for the energy-efficient design and construction of buildings.

The code is mandatory for commercial buildings or building complexes that have a connected load of 500 kW or greater or a contract demand of 600 kVA or greater. The code is also applicable to all buildings with a conditioned floor area of 1,000 m^2 (10,000 ft^2) or greater.

The provisions of this code apply to:
- Building envelopes, except for unconditioned storage spaces or warehouses,
- Mechanical systems and equipment, including heating, ventilating, and air conditioning,
- Service hot water heating,
- Interior and exterior lighting, and
- Electrical power and motors

Source: Bureau of Energy Efficiency, the Energy Conservation Building Code (ECBC), 2006.

The IEA energy efficiency policy recommendations to the G8 2007 summit, stated that the mandatory energy efficiency standards set the minimum energy performance of new buildings. However, there is also a need to encourage maximum energy-efficiency performance in new buildings and to ensure that these buildings are available in the market.

Construction of these high-energy-efficiency performance buildings which use very low, or even no net energy is technically and commercially feasible. Over time, these very low energy-consumption "passive energy houses" (PEH) (that use 65-80% less energy than a standard house) are often, less expensive than those of traditional design. "Zero energy buildings" (ZEB) are currently more expensive than traditional buildings, but their costs are dropping over time. The technology for low energy buildings has been widely available for some time. However, despite the financial benefits of low running costs and technical feasibility, PEH and ZEB command a very small (less than 1%) market presence worldwide[5].

Minimum Energy Performance Standards (MEPS) or Standards

Minimum energy performance standards (MEPS) are used to regulate the energy used by building equipment. MEPS (sometimes referred to as

5 Source: International Energy Agency Energy Efficiency Policy Recommendations To Whom It May Concern: the G8 2007 Summit, Heiligendamm, June 2007.

standards) have the greatest impacts on energy efficiency because they affect all purchasing decisions.

MEPS Worldwide Experiences

Canada has regulated MEPS since 1995 under the Energy Efficiency Act in order to eliminate shipment of inefficient, energy-using products that are either imported into Canada, or manufactured in Canada and transported between provinces for the purpose of sale or lease.

In the U.S., the state of California was a pioneer in the introduction of MEPS. In order to reduce the growth in electricity use, the California Energy Commission (CEC) was given unique and strong authority to regulate the efficiency of appliances sold in the state. It started to adopt appliance efficiency regulations in 1978, and updated the standards regularly over time, and expanded the list of covered appliances.

In 1988, California's standards became national standards for the U.S. through the enactment of the National Appliance Energy Conservation Act (NAECA).

In Brazil, a law was issued in 2001 to stipulte MEPS for three-phase electric motors and compact fluorescent lamps.

Mandatory Audits

Energy audits, walk-through or detailed energy audits, are essential to promote a better understanding of the current status of end-use energy efficiency.

Mandatory requirements for energy audits range from an obligation to carry out audits if a threshold of energy consumption is passed, to mandatory reporting, mandatory implementation of certain types of measures, to mandatory standards.

The possible mandatory elements

- Obligation to carry out audits at regular intervals (generally buildings above certain living space/working area) or when sold or rented out
- Obligation to carry out audits to obtain a building certificate (e.g. Green Buildings- Label of the EU)
- Obligation to inform about the outcome of audits (e.g. building certificates)

In Algeria, tertiary sector establishments are obliged by Decree n° 05-495 to perform mandatory audits. The Algerian mandatory audit program includes the following features:

- Mandatory Audit
- Mandatory Reporting (data, targets, action plan)
- Mandatory Action Plan
- Mandatory Benchmarking
- Mandatory Energy Manager

- Mandatory Certification of Auditors

3.2 Financial Instruments

Energy Taxes
Increasing energy taxes encourages consumers to rationalize their energy use. In some countries the taxes from these funds accumulate in an Energy Fund, used to finance energy efficiency projects as well as energy production.

Grants and Loans
Grants and soft loans are provided to residential and commercial buildings when implementing EE projects. Some programs address specific sub-sectors of commercial buildings such as schools or government office buildings, while others address residential and commercial buildings in general.

Sweden Experience
In Sweden, a special investment support for energy efficiency and renewable energy in public buildings was established in 2005. Funding was made available for up to 30% of costs for the following types of investments:

- Energy mapping
- Conversion of the heating system to shift from fossil fuels or direct electric heating systems to renewable energy sources, heat pump or district heating;
- Attachment to district cooling;
- Installation of an electricity efficient lighting system;
- Installation of electricity efficient ventilation system;
- Installation of equipment for efficient steering, measuring, regulation and running of engines and heating system;
- Energy efficiency measures concerning heat recycling;
- Energy efficiency measures to decrease the leakage of energy from buildings; and,
- Installation of solar cells (solar photovoltaic system).

3.3 Voluntary Instruments

Energy Star for Buildings

The objectives of the Energy Star for buildings schemes are to provide means for measuring and benchmarking the energy performance of buildings as well as to help and encourage buildings to go energy efficient. Buildings are encouraged to go energy efficient by dangling the carrot of the well-recognized energy star label. The energy star labelling scheme provides information to buildings about areas where they need to improve their performance and thus helps them improve their energy efficiency.

It is a voluntary policy instrument in which buildings opt to obtain the energy star label that benchmarks its performance compared to similar buildings.

It uses a 0-100 rating system according to the energy performance of the building. Buildings scoring 75% or higher are eligible to apply for obtaining the energy star label. The label accounts for elements like weather variations, occupancy levels, operation hours and building specific characteristics. The rating of the building is calculated free of charge using an online software called portfolio manager. Once a rating of 75% or above has been scored, the client should have their energy data officially verified by a professional engineer then an application form for the energy star label, free of charge, is sent to the American environmental protection agency (U.S EPA). In case a facility scores less than 75%, the EPA provides guidelines for a strategic energy management approach that leads to better energy management practices.

3.4 Tradable Permits

Energy Savings Obligations

There is considerable variation in the end use sectors which are covered by White Certificates. In practice, most of the activities have been focussed on residential and commercial

Measures employed to save energy in the residential sector within the scope of the Energy savings obligations include[6]:

- Air conditioning units
- Appliances
- Cogeneration
- CFLs
- Condensing Boilers
- Fuel switching
- Glazing
- Heating controls
- Heat pumps
- Insulation
- Low flow showerheads
- Low flow faucets (taps)
- Smart meters
- PV panels
- Solar water heating

[6] WEC, Energy Efficiency Policies around the World: Review and Evaluation, 2008

Annex XIII
Proposed Short Term Interventions

Proposed Short Term Interventions

1. Residential

The average electricity consumption per household has increased by 3% per annum during the last few years. During the same period, households with consumption above 350KwH increased from 7 % of total households in 2004/05 to 10 % in 2008/09. With demographic expansion, residential consumption has increased by an average of 8.5 % per year over the same period. The average consumption per month has increased from 177 KWh to just above 200.

Energy efficiency on the short term will be driven by pricing to which consumers can effectively react through efficiency improvements. Generally, three levels of improvements could be expected:

- Reduce unnecessary consumption through housekeeping (AC temperature, turn off lighting, etc.).
- Improve building envelope, which might require better heat insulation, sealing of openings, natural lighting and ventilation. Some of those will be easier to undertake in the existing housing stock. However, the incentive of pricing will apply to new buildings too.
- Use higher efficiency equipment and appliances.

Interventions on the short term are proposed to focus on revised pricing, as it should stimulate the quest for improvements, revision of the energy performance standards according to technological development, enforcement of energy labels and minimum performance for household equipment for local production and imports.

1) Increase electricity prices for the higher consumption categories (above 350 KWh) to stimulate energy efficiency.

No increase in prices is proposed for categories lower than 200 KWh, while the category between 201 and 350 should ultimately pay the full price (i.e. Long Term Marginal Cost (LTMC) of the service including depreciation). The increase in price for the higher categories should at least cover the subsidies for the lower categories, but should mainly be geared towards stimulation of energy efficiency.

Objectives		Reduce conspicuous consumption.
Targets		Reduce the rate of increase of Mean consumption per month per household (meter) to a maximum of 1% per annum on the short term, to be stabilized on the medium term and eventually reversed.
Beneficiaries		State Budget in terms of: • reduced investments; and • reduced net subsidy.
Main Activities		Issue Decree establishing modified prices for consumption categories.
Duration		Preparation, 6 months.
Direct Inputs	Financial	None.
	Technical	None.
Effect on other Activities	Support	Increase demand for high efficiency equipment, and building envelope upgrading.
	Impede	None.
Accompanying Activities		• Energy performance Labels for household equipment. • Public awareness campaign. • Training and certification of energy auditors. • Enforcement of installing one meter per housing unit.
Participating entities		• Electricity holding company and distribution companies. • Electricity Regulator. • Prime Minister's office.
Main Assumptions		• Elastic Demand for electricity in the higher categories of consumption. • Consumption in the lower categories covers essential functions.
Pre-requisites		Establish demand elasticities at the different consumption levels.
Measure of Effectiveness		Distribution of residential electricity consumption in following years.

2) Enforcement of labels for energy performance of major electricity consuming household equipment

The specifications currently available are those related to washing machines, air conditioners, water heaters and refrigerators. Those were issued in 2003 (updated in 2006), 2008, 2007 and 2003 (updated 2006) respectively by the standardization authority, and the Minister of Industry Decree imposing labeling on local producers and importers was issued in 2003.

These will need to be periodically revisited to insure that they are compatible with best available technology from one side and that Egyptian producers have the capability to produce the best performing equipment. A schedule should also be developed to incrementally raise the floor below which the lowest performing equipment from both imports and local production are rejected.

In addition, and in order to encourage producers and importers to move towards higher performance, a tool to provide an incentive/disincentive could be considered. This could be through a revenue-neutral energy charge on the lowest but acceptable performing equipment through which a subsidy to the best performing would be financed. Since the median performance would be improving, this would trigger a dynamic system by which a continual improvement could be sustained, and only constrained by the pace of technological development. This activity should obviously be undertaken in participation with local producers to agree on an implementable schedule.

Objectives		Continuous improvement of the average performance of household equipment available in the market.
Targets		Energy performance of equipment on the local market is synchronized with Best Available Technology in a specified number of years.
Beneficiaries		• Local producers of high performing equipment, as they could get a larger share of the market. • Consumers, avoiding paying excessive energy bills.
Main Activities		• Revisit Egyptian standards. • Issue revised Standards, if needed, specifying periodical revision periods. • Enforce labelling. • Establish a cross subsidizing revenue neutral system.
Duration		6 months after which labels are enforced. 6 months after which cross subsidy system is initiated.
Inputs	Financial	None, all activities are already undertaken by existing entities including testing facilities in NREA.
	Technical	• Establishing a charging and subsidy system. • Continuous surveys on equipment performance in the local market. • Continuous follow up on developments of Best Available Technologies of equipment energy performance in the world market.
Effect on other Activities	Support	• Highlight consumer responsibility concerning energy bills. • Increase the pace of local assimilation of energy efficiency technological developments. • Dampening effect of higher electricity prices.
	Impede	The intervention holds the risk of increased imports if standards are too challenging for local producers.
Accompanying Activities		• Consumer awareness.
Participating entities		• Standardization Authority. • Ministry of Industry. • Local Household Equipment producers. • Consumer protection authority.
Main Assumptions		• Local producers, mostly producing under license, are able to improve the performance of their equipment. • The local supply market is competitive to allow energy efficiency benefits to flow to consumers.
Pre-requisites		None.
Measure of Effectiveness		Average and distribution of energy performance of household equipment available in the market.

3) Voluntary Replacement of Selected Household Equipment

The previous intervention does not address the existing stock of household equipment, which by any measure will compose a large share of consumption for a long time to come, until this stock is replaced by more energy efficient equipment. Article 55 of the draft Electricity Law stipulates that policies should be set for the replacement of energy inefficient appliances.

The replacement of this stock could be expedited through an incentive scheme to replace the most underperforming equipment. This will include for example the replacement of electric water heaters with natural gas or solar water heaters, which is estimated to reduce primary energy consumption for water heating by 70 % and 100% respectively. It could also include the replacement of older, and less efficient, equipment with a focus on air conditioners, as electric energy consumption in air conditioners is substantial relative to the total electric energy consumption in the residential sector in summer. Air conditioners are also identified as one of the main causes of the summer peak demand.

It is, however, proposed to focus on water heaters as a first phase, as the benefits are more obvious. The incentive could be easily related to the size of saving, i.e. the solar heaters should have a higher incentive as a percentage of their costs. In order to expedite replacement, the incentive might be considered to be higher in the first years of its operation.

The current prices of electric and gas water heaters in the local market are comparable (in the range of LE 500 to 1000), and therefore the initial decision given the energy efficiency of the latter should be straightforward. The replacement however, especially given the additional costs of internal gas connection, is more uncertain. It is proposed that internal connections for replacement be supported by the Ministry of Electricity or Petroleum, being beneficiaries of the scheme. Solar water heaters, however, are about 5-10 times as expensive, but have the advantage of almost no operation costs. Costs of solar heaters are also expected to be reduced with the growth of the market.

Objectives		Improve the energy performance of existing household equipment.
Targets		Replace all electric water heaters in areas connected to the natural gas network in 5 years.
Beneficiaries		• Local producers of gas water heaters. • Boosting the market for solar water heaters. • Consumers, avoiding paying excessive energy bills. • Ministry of electricity, saving additional costs for electricity generation. • Ministry of Petroleum, saving subsidized fuel provided to electricity generation and in case of gas heaters extending sales in areas for which major connections are already available.
Main Activities		• Establish Fund. • Publicize Fund through public media as well as producers and installers of substitute water heaters.
Duration		5 years from fund operation, which could be extended if other equipment is included.
Inputs	Financial	Support fund of LE 50 Million, assuming 100,000 gas heaters @ LE 200 support/piece, and 10,000 solar heaters @ LE 3,000 support/piece.
	Technical	Gas distribution companies for internal connections.
Effect on other Activities	Support	• Transition to renewable energy. • Incentive to producers to move to higher performing equipment. • Dampening effect of higher electricity prices.
	Impede	Demand on electric water heaters, which could have a substantial effect on their local producers.
Accompanying Activities		• Technical specifications of solar water heaters.
Participating entities		• Ministry of electricity. • Ministry of Petroleum. • Local producers. • Standardization Authority.
Main Assumptions		The reduced energy bill does not provide enough incentive to incite replacement of electric water heaters, and other incentives will be needed.
Pre-requisites		Insure that local production meets stimulated demand.
Measure of Effectiveness		Number of heaters replaced through the scheme, and resulting energy savings.

2. Industry

1) Differential Pricing based on specific Energy consumption

This approach integrates the need to increase industrial activities, and thus production, with the lowest possible consumption of energy. It penalizes underperformers through charging a higher price for their misuse of energy as a societal resource. It is based on the fact that energy efficiency of producers of the same product varies based on their process control, technology used and energy management in general. The approach should obviously be related to homogeneous products[1] and therefore will be sector-based. Differential pricing based on local benchmarks (e.g. average specific consumption per ton of product), is expected to trigger a dynamic system in which this local benchmark will constantly move downwards.

Although the proposed system could theoretically be applied to all industrial sectors or sub-sectors, its need for monitoring and follow-up would suggest that there is a practical limit to its application, related to the number of facilities composing the sector. Moreover, the benefits of its application will obviously be higher in energy intensive sectors. It is therefore proposed that the system be applied, in a first phase, on a limited number of energy intensive sectors representing a high share of energy use by industry. Moreover, the number of facilities in each of these sectors should be limited but large enough to have a variation in energy efficiency upon which the system is based. According to these criteria, the sectors proposed are Cement, Iron & Steel and Fertilizers.

In order to clearly focus on the ultimate objective of decreasing consumption of depletable primary energy, it is proposed that accounting for energy consumption does not include self generated renewable energy.

[1] More accurately homogeneous services provided by the use of the product but this might be too complex for short term implementation.

Objectives		Decrease consumption of depletable primary energy in local industrial production of energy intensive products.
Targets		Energy Intensity of energy intensive local industrial production deviation from BAT does nor exceed a certain percentage in a specified number of years.
Beneficiaries		The higher performers in each sector will afford lower prices, or higher profits, for their operations.
Main Activities		• Establish local benchmarks for the selected sectors. • Identify energy efficiency opportunities in these sectors. • Set pricing schedule to stimulate implementation. • Issue Decree establishing modified prices.
Duration		12 months to initiate the system.
Inputs	Financial	• Preparatory Studies. • System operation, including monitoring and follow-up will not entail additional costs over those of an operational indicator system.
	Technical	• Accounting System could be demanding. • The target sectors are not expected to require substantial technical support to implement energy efficiency interventions.
Effect on other Activities	Support	• Attract better performing technologies and green field investments. • Boost the market for renewable energies. • Encourage more effective use of energy, including opportunities for CHP. • Limit over-investment in these sectors through decreasing export advantage based on cheap energy prices.
	Impede	• Could have negative impact on FDI, if attracted by cheap energy prices. • Could have a negative impact of the demanding sectors (construction and agriculture) if costs are passed on to the consumers.
Accompanying Activities		Promote sector specific EE opportunities among industries.
Participating entities		• Ministry of Industry. • Industrial associations. • Energy Suppliers (electricity, gas and fuel).
Main Assumptions		• The legality of charging differential pricing is secured.
Pre-requisites		• The market for the relevant products is competitive enough so that additional costs are not passed on to the consumers.
Measure of Effectiveness		Decreasing local average of specific energy consumption per ton of product in the target industries.

2) Public Recognition Program

An excellence award for non-energy intensive industries is based on their superior performance within a specific sector concerning the energy intensity of their production[2]. The yearly award is based on voluntary submission of the eligible facility of a documentation file for consideration, and an ultimate verification audit, and assessment.

The recently initiated Industrial Energy Efficiency (IEE) project funded by GEF/UNIDO, and implemented by MTI and EEAA in cooperation with MOEE and Ministry of Investment, plans on developing a national recognition program for facilities that implement an energy management plan, along with preferred access to technical and financial assistance.

The excellence award differs from the planned IEE program in that it comprises mainly a comparison of energy intensity on a sectoral level rather than among all facilities as per the IEE program. However, areas of cooperation among the two schemes have to be identified to avoid replication.

[2] To keep it simple in a first phase, but could become of their products at a later stage, as this will involve a number of factors outside the facility fence.

Objectives		Promoting energy efficiency through intra-sectoral awareness and competition.
Targets		Decrease of specific energy consumption within each of the selected sectors by a specific percentage over a specified period.
Beneficiaries		Industries implementing energy efficiency interventions. The wider group of industries gaining awareness on actual implemented interventions (Demonstration effects).
Main Activities		Detailed design for Competition Framework. Secure contributions for the yearly awards could be raised from environmentally conscious organizations.
Duration		6 months of preparation for continuous implementation
Inputs	Financial	• The yearly value of the award is estimated as LE 3 Millions, @ 300,000 for 3 awards targeting 10 selected sectors. The award could be in kind, as support to additional investments in energy efficiency. • Additional funds should be available for design and accompanying activities (assumed to be LE 0.5 million per year).
	Technical	Technical support for the award selection committee.
Effect on other Activities	Support	• Information Collection on industrial performance, through the program, will help in local benchmarking of a number of industries. • Awareness of energy efficiency opportunities.
	Impede	None.
Accompanying Activities		• Public Information Campaign. • Awareness related to energy efficiency opportunities in the target sectors.
Participating entities		• Industrial Associations. • Individual industries. • Funding entities.
Main Assumptions		• Enterprises will value the image created by the award more than the financial value associated with it. • A reasonable group of industries will be interested in competing for the award from each target sector.
Pre-requisites		None.
Measure of Effectiveness		Number of applicants, average and best of class performance.

3) Replacement of Inefficient Industrial Equipment

In order to improve the energy performance of industries, some of the equipment will need to be replaced by equipment of better performance. Most of these interventions will be industry specific and will be driven by other tools such as pricing and benchmarking. However, some equipment, such as motors and boilers, might exist in various industries irrespective of their specific nature, and could therefore be regulated. Energy efficiency standards of motors are already issued by the Standardization Authority (6791/2008), and those of boilers are currently being developed. However, these standards regulate equipment in the market. Given the substantial stock in industry, their impact on the total consumption of energy by industry will be limited.

Ultimately, inefficient equipment will be replaced. However, given the time this process might take, there is a need to expedite it. This is proposed to be through a mix of obligatory and voluntary tools, depending on the efficiency and capacity of the existing equipment, as well as the number of equipment currently in operation in each category. Focus will be on the design, rather than operating efficiency. All required information would be available in the licensing records of this equipment.

Replacement, within a specified time period, is proposed to be obligatory for equipment below the efficiency set by the relevant standard by a large factor and above a certain capacity (both to be specified). This is the equipment which replacement will have the highest impact on energy efficiency, and for which it is expected that economic pricing of energy will provide a sufficient incentive for replacement. Obligatory replacement in this case will only formalize the need for replacement and does not impose any additional costs on industry.

At the other extreme, the energy saving gains will be minimal for a piece of equipment smaller than a specific capacity and deviates form the standard by a small factor. The cut off point for this category should be specified taking into account the number of this equipment currently operative in industry. The replacement of this category of equipment is not addressed by the proposed tools, and is left to the industry's discretion.

In the middle range lies the equipment which replacement is not stimulated by economic energy prices, and accordingly is not justified from the specific facility’s view point, but could given the number of equipment have an important absolute reduction of energy consumption by industry. For this last category, soft financing should be designed to bridge the gap between the financial benefits to the facility and the economic benefit to society.

Objectives		Improve the energy performance of existing industrial equipment.
Targets		Replace all electric motors and boilers above a certain capacity, and below a specified performance standard, in 5 years.
Beneficiaries		• Local producers of high performance equipment. • Industries, avoiding paying excessive energy bills. • Ministry of electricity, saving additional costs for electricity generation. • Ministry of Petroleum, saving part of the subsidized fuel provided to electricity generation and to industries for steam production.
Main Activities		• Establish Categories of equipment, based on a techno-economic study of different pricing levels. • Issue decree for obligatory replacement • Establish Fund (or agree inclusion in existing funds). • Publicize Fund through public media, industrial associations as well as producers and installers of substitute equipment.
Duration		5 years from fund operation, this could be extended if other equipment is included.
Inputs	Financial	Support fund of LE 100 Million, assuming investment needs of LE 500 Million and fund supporting 20% of investments.
	Technical	None.
Effect on other Activities	Support	Acceptability of revised energy prices.
	Impede	None.
Participating entities		• Ministry of electricity. • Ministry of Petroleum. • Local producers. • Industrial associations.
Main Assumptions		The equipment license records will give reasonable indication on its efficiency.
Pre-requisites		Insure that local capacity of production, and services, meets stimulated demand.
Measure of Effectiveness		Periodic assessment of number of replaced equipment through the scheme, and resulting energy savings.

4) Boost Combined Heat and Power Generation

Waste heat is a potential resource. Combined Heat and Power (CHP) is a feasible approach to maximizing output with the same energy inputs. Revised energy prices should stimulate industry interest in this approach. If heat and power will be used within the same facility, there will be no need for further interventions. However, the demand on Heat and Electric Power are not always compatible within a specific facility.

Connecting the generated electricity to the public grid is a typical solution to this discrepancy. Precedents in Egypt exist, but the prices at which electricity is sold to the grid are minimal, and were based on commercial negotiations between the sole buyer and the generator. Benefits to the buyer were seen as limited to savings in fuel costs, and the specific generators valued the advantage of steady operation of their equipment. The framework of this agreement is clearly not conducive for other industrial facilities to follow suit.

The Draft Electricity Law addresses this issue through insuring a fair price for the generator. However, if the law is not issued soon, this potential of energy savings is left untapped. In such case, it is proposed that the Electricity Holding Company, in cooperation with the Electricity Regulatory Agency (ERA), takes the initiative through proposing a feed in tariff based on economic, rather than financial, prices to suppliers, which might take into account the time of supply thus helping in meeting the peak demand. ERA has previously studied a feed in tariff for wind energy suppliers, and accordingly can study a similar feed in tariff for CHP based on similar methodology.

The legal and administrative infrastructure for licensing generators and sales contract developed by the ERA is already available and is adequate, with potential minor adjustments, for the case when the buyer is the national distribution or transmission companies. In order to ease the establishment of the system, it is proposed to limit the suppliers to those below a power capacity of 50 MW as stipulated by the draft electricity Law, in a first phase to be incrementally expanded to higher power capacities.

Objectives		Maximize returns from energy resources.
Targets		Increase distributed generation of electricity to a specified percentage of industry potential within a number of years.
Beneficiaries		• Industries, as it provides a more effective use of their energy resources. • Electricity companies, as they save operation costs and at a certain level of contribution could avoid investment costs. • Ministry of Petroleum, as it saves on subsidized fuel provided for electricity generation.
Main Activities		Establish economic price, and general conditions, to be proposed to suppliers.
Duration		Continuous, after 6 months of preparation.
Inputs	Financial	None, except for preparatory studies.
	Technical	• Management of grid with multiple smaller inputs of electricity generated. • Metering of input, potentially in time. • Accounting system.
Effect on other Activities	Support	Higher consideration for energy value in industries.
	Impede	None.
Accompanying Activities		None.
Participating entities		• Electricity Holding Company. • Electricity Regulatory agency. • Industries with potential for CHP.
Main Assumptions		The economic price suggested by the Electricity network exceeds the cost of generation by a substantial number of industries.
Pre-requisites		Availability of suppliers for CHP equipment and technologies.
Measure of Effectiveness		Electricity provided to the grid through CHP.

5) Trade Conditions

In order to extend the life of local energy resources, export of energy intensive products will need to be controlled. Economic pricing of energy resources will surely have its impacts in decreasing the cost advantage these products currently have. In addition, it is proposed that export fees be raised to reflect the societal value of primary energy embodied in the product, exclusive of self generated renewable energy. This, however, needs to be sensitive to the nature of the industry. For example, the establishment of petro-chemical industries is known to have a much higher value added for natural gas compared to its use as a source of energy. Economies of scale for such industries might rely on the potential export market, in addition to local demand.

Objectives		Limiting the growth of energy intensive industries.
Targets		In 5 years, production of ***selected*** energy intensive products is limited to meeting local demand.
Beneficiaries		• Higher share of investments flowing to non-energy intensive industries. • The general population through reduced unemployment, as these industries are typically labour intensive.
Main Activities		• Economic study to identify export fees for each of the selected product, and adjusting it accordingly. • Market surveys to identify local market demand for each of the selected products.
Duration		Continuous, after 6 month of preparation.
Inputs	Financial	None.
	Technical	None.
Effect on other Activities	Support	Employment needs of the population.
	Impede	• Growth of energy intensive sectors in Egypt. • FDI flowing to energy intensive sectors.
Accompanying Activities		Promotion of labor intensive industries to potential investors.
Participating entities		• Ministry of Trade and Industry. • Ministry of Investment. • Industrial associations.
Main Assumptions		The economic return of exporting energy intensive products is lower than the value of embodied energy and alternative investment opportunities.
Pre-requisites		None.
Measure of Effectiveness		Production rates and exports of products in selected energy intensive industries, in a given year.

3. Commercial

1) Time of Operation

Commercial activities in Egypt, especially in the larger urban areas, operate until well after midnight. The whole schedule has been shifted in the day so that opening time is seldom before noon. Summer heat, extended working hours of shoppers and the lack of other family entertainment opportunities have caused this shift in the shopping time. However, this aberration entails high energy costs, and its correction will help manage the peak demand for electricity in the summer months.

As per EEHC annual data, the electricity peak load period is from 8-10 pm in summer. Closure of commercial activities during this period will reduce demand for electricity. The proposed shift in the working hours of commercial activities (e.g. 9:00 or 10:00am to 8:00 or 9:00pm) will reduce the energy consumption as working hours will decrease (given that currently some shops open for more than 12 hours per day). In addition, energy reduction will result from operating fewer hours in the evening, where relatively more lighting is needed.

This intervention could have an impact on commercial activities as well as the community. Accordingly, studies on its impact on commercial activities and the social acceptance will be conducted prior to implementing it.

Objectives		Reduction of electricity consumption for lighting in commercial shops.
Targets		• Reduction of energy consumption in commercial shops, leading to an increase in energy efficiency. • Reduction of electricity consumption in peak load period to reach the average electricity consumption throughout the day.
Beneficiaries		Employees of sales outlets will have more human working hours.
Main Activities		Issue Decree shifting working hours of commercial activities to (9:00 or 10:00 am to 8:00 or 9:00pm).
Duration		6 months to preparation.
Inputs	Financial	None.
	Technical	None.
Effect on other Activities	Support	• Dampening effect of rising electricity prices.
	Impede	• Could decrease sales as a result of decreasing shopping hours.
Accompanying Activities		• Manage shopping areas (e.g. down town Cairo) so that pedestrian based entertainment (can be as simple as sales points of refreshments) could extend beyond working hours.
Participating entities		Commercial Chambers.
Main Assumptions		The closure of formal commercial activities will not impact their turnover resulting from proliferation of informal activities, or shift to suburban malls.
Pre-requisites		• Investigating the impact of this intervention on the commercial activity. • Studying the social acceptance of this intervention by shop owners and workers and the community. • Impact of the intervention on traffic complexity. Traffic is expected to increase in the period after working hours and before shops closure, and decrease after shops closure. • Enforce the closure of commercial activities of street vendors, in the designated areas. • Consider a consistent arrangement for commercial malls.
Measure of Effectiveness		Electric energy consumption in shops in the following year.

2) Maximum Light Intensity in Shops

The trend of extensive lights in retail shops is sustained through competition between shops to attract customers. It is likely that shop owners feel compelled not to look dimmer than adjacent shops, and are aware of the costs this entails, witness their use of low consumption lighting. However, extensive lighting of these fixtures contradicts the *raison d'être* of the fixtures, as energy saving devices as energy saved is consumed in extensive lighting. The return to normal lighting intensities will not only contribute to the management of peak demand, but will also address visual pollution. This will, however, require setting maximum lighting standards in contrast with existing standards focused on minimum lighting intensities (based on an interest in work environment).

Objectives		Decrease peak demand for electricity.
Targets		Decrease light intensity by a specified percentage in a year.
Beneficiaries		• Shop owners, saving energy. • Shoppers, avoiding extensive lighting.
Main Activities		• Establish maximum standards for light intensity. • Issue Executive Regulation (could be through the environmental law as pollution, or through governors' executive orders).
Duration		6 months to establish maximum light intensity standards and reach implementation agreement.
Inputs	Financial	Equipment and training for light intensity inspection.
	Technical	Measurement equipment of light intensity.
Effect on other Activities	Support	Dampening effect of rising energy prices.
	Impede	None.
Accompanying Activities		Increase awareness of the costs of extensive lighting.
Participating entities		• Commercial Chambers. • Environmental Affairs Agency. • Governorate inspectors.
Main Assumptions		Shop owners would not mind reducing lighting, but only if done collectively.
Pre-requisites		None.
Measure of Effectiveness		Compliance with regulations.

3) Time Sensitive Pricing for Electricity Consumption

Revisiting the pricing schedule of electricity in commercial establishments will help reduce the unmet electricity demand in the peak hours of the summer season which resulted in repeated blackouts during the summer of 2010. However, a more direct tool addressing the time of use would be differentiated pricing according to the time of use.

Time sensitive pricing has been introduced in the industrial sector, as per Prime Minister Decree 2130/2010, where energy intensive industries will be charged 50% above electricity tariffs in peak hours (4 hours to be identified by the Ministry of Electricity and Energy).

In the commercial sector, time sensitive pricing will have an impact on shifting non-peak related activities to other times of the day, as well as conducting activities more efficiently during this period to reduce the consumption.

Time sensitive pricing will require special remotely readable meters, with associated costs of acquisition and installation. Since the efficiency return from this intervention is obviously smaller in the lower consumption categories, its application is proposed to be on high consumption commercial consumers only, starting with consumers above 1000KhW or consumers with installed electric capacity above 500KW. Based on the outputs of this first phase, the decision should be taken concerning its extension to households in the next consumption category.

Objectives		Delay investments in capacity needed to address peak demand.
Targets		Reduce commercial peak demand, and sustain it, to a specified percentage of the average daily demand in the summer months.
Beneficiaries		• State budget in terms of reduced demand for additional generation investments to meet the peak demand. • The general population, and economic entities, in terms of suffering less frequent blackouts and/or of a shorter duration. • Shop owners, saving energy.
Main Activities		• Confirm geographic distribution of upper categories of commercial consumption (expected to be mainly concentrated in Greater Cairo). • Confirm the legality of charging different consumers according to different schemes. • Identification of potential suppliers of meters. • Training for installation and technical service personnel. • Setting up accounting system and training. • Issue Decree establishing modified prices after a specified period. • Installation of meters.
Duration		A total of 2.5 years. Pre-decree, 6 months. Installation of meters, 12 months @ 150 meters/day. Run system for 12 months without additional payments to increase awareness of mitigating intervention.
Inputs	Financial	• Costs of meters and installation (LE 500 -1000/piece); • Costs of system establishment in the relevant distribution companies; and • Training for technical support and service.
	Technical	• Technical services for the modified meters. • System establishment in the distribution companies.
Effect on other Activities	Support	• Increase demand for high efficiency equipment, and building envelope upgrading. • Increase demand on auditing services.
	Impede	None.
Accompanying Activities		• Training and certification of energy auditors.
Participating entities		• Electricity holding company and relevant distribution companies. • Electricity Regulator. • Prime Minister's office.
Main Assumptions		• Elastic Demand for electricity in the higher categories of consumption at peak hours. • The intervention could be formalized at a level of regulation lower than a law.
Pre-requisites		Establish demand elasticities at the different consumption levels and of different uses.
Measure of Effectiveness		Degree of reduction of peak above average demand in the following years.

4. Transportation

Fuel Efficiency Standards

Currently in Egypt taxes and duties are applied on vehicles based on engine displacement, which has an indirect impact on fuel efficiency. However, a more direct control measure of fuel efficiency is applying taxes based on average fuel consumption as per the vehicle design standards. This would apply on annual licensing fees, the local development tax applied on importing cars, as well as the sales tax. These taxes and fees will increase with the increase in the average fuel consumption (lit/km) of the vehicle. These taxes will apply on passenger vehicles in the first phase and then could be extended to include other types of vehicles, trucks, buses, etc.

Objectives		Increasing fuel efficiency of passenger vehicles fleet.
Targets		Reduce the average fuel consumption of the fleet by a specified % per annum on the short term, to be stabilized on the medium term and eventually reduced.
Beneficiaries		• Vehicle owners, saving fuel. • Ministry of petroleum, saving on subsidized fuel. • Fuel Efficient car manufactures/importers.
Main Activities		• An economic study to set the new fees and taxes. • Reviewing the licensing system to incorporate the average fuel consumption. • Issuing a decree with new taxes and fees.
Duration		Continuous, 6 months for preparation.
Inputs	Financial	None.
	Technical	None.
Effect on other Activities	Support	Encourages replacement of old fuel inefficient vehicles.
	Impede	Decrease demand on inefficient locally manufactured vehicles.
Accompanying Activities		None.
Participating entities		• Ministry of Interior. • Ministry of Finance. • Local Manufactures.
Main Assumptions		Local manufactures will be shifting to fuel efficient vehicles.
Pre-requisites		Public awareness on the specifications of different types of vehicles.
Measure of Effectiveness		Average fuel consumption of passenger vehicles fleet.

5. Hotels

1) Maximum Light Intensity and Minimum Temperature

Hotels, especially five stars hotels, have extensive lighting as well as high air conditioning (low temperature) in communal areas within the hotels, such as the lobby, conference rooms, restaurants, etc. Setting maximum light intensity standards as well as minimum temperatures for different places within the hotel will control excessive wasted energy within the hotel.

Objectives		Reducing electricity consumption in hotels.
Targets		Reducing electricity consumption per m2 or room in hotels by a specified percentage in one year.
Beneficiaries		Hotel owner, saving in electricity. Hotel clients, avoid extensive lighting and cooling.
Main Activities		• Establish maximum standards for light intensity and minimum standards for cooling. • Issue regulations stipulating these limits.
Duration		6 months to develop the standards and reach an implementation agreement.
Inputs	Financial	Light intensity and temperature measuring equipment.
	Technical	Training of inspectors.
Effect on other Activities	Support	Dampening effect of rising electricity prices.
	Impede	None.
Accompanying activities		Increase awareness on the costs of extensive lighting and cooling.
Participating entities		• Tourism chambers. • Inspectors.
Main Assumptions		Energy conservation is a priority issue for hotel implementing environmental management guidelines/standards.
Pre-requisites		None.
Measure of Effectiveness		Compliance with regulations.

2) Time Sensitive Pricing for Electricity Consumption

Similar to the intervention proposed for the commercial sector, revisiting the pricing schedule of electricity for hotels will help reduce the unmet electricity demand in peak hours, and reduce electricity consumption in Hotels.

It is proposed to apply this scheme on hotels with a capacity above 500 KW. As per the data obtained from UNDP/GEF Energy Efficiency Improvement & Greenhouse Gas Reduction project, these hotels are expected to be about 500 Hotel.

This intervention can be applied in the residential sector. However, logistically, applying this intervention in Hotels, and in the commercial sector and in industrial sectors will be less complex than in the residential sector. On comparing the impact of electricity reduction per unit (housing unit or Hotel), it will be substantially higher in Hotels.

Objectives		Delay investments in capacity needed to address peak demand.
Targets		Reduce peak demand in the hotel sector, and sustain it, to a specified percentage of the average daily demand in summer months.
Beneficiaries		• State budget in terms of reduced demand for additional generation investments to meet the peak demand. • The general population, and economic entities, in terms of suffering less frequent blackouts and/or of a shorter duration.
Main Activities		• Identify the upper categories of Hotels to which this intervention will be applied. • Confirm geographic distribution of upper categories of Hotels. • Confirm the legality of charging different consumers according to different schemes. • Identification of potential suppliers of meters. • Training for installation and technical service personnel. • Setting up accounting system and training. • Issue Decree establishing modified prices after a specified period. • Installation of meters.
Duration		A total of 1.5 years. Pre-decree, 6 months. Installation of meters and running system for 12 months without additional payments to increase awareness of mitigating intervention.
Inputs	Financial	• Costs of meters and installation is LE 50,000 (1000@piece for 500 meters); • Costs of system establishment in the relevant distribution companies; and • Training for technical support and service.
	Technical	• Technical services for the modified meters. • System establishment in the distribution companies.
Effect on other Activities	Support	• Increase demand for high efficiency equipment, and building. • Increase demand on auditing services.
	Impede	None.
Accompanying activities		• Training and certification of energy auditors.
Participating entities		• Electricity holding company and relevant distribution companies. • Electricity Regulator. • Prime Minister's office. • Ministry of Tourism.
Main Assumptions		• Elastic Demand for electricity in the higher categories of consumption at peak hours. • The intervention could be formalized at a level of regulation lower than a law.
Pre-requisites		Establish demand elasticities at the different consumption levels and of different uses.
Measure of Effectiveness		Degree of reduction of peak above average demand in the following years.