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A FRAMEWORK FOR THE EGYPTIAN NATIONAL ENERGY EFFICIENCY STRATEGY

Preliminary Report
To the
ENERGY EFFICIENCY COUNCIL (EEC)
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Section 1 OBJECTIVES

1.1 BACKGROUND

Egypt's economic development outlook for the period 2000-01 to 2016-17 calls for an average annual growth of gross domestic product (GDP) of 7.6%.[1] Energy efficiency offers Egypt a sustainable path to meet these aggressive growth targets in an economically and environmentally sound manner. Market studies estimate that Egypt can generate considerable economic and environmental benefits from energy efficiency investments, including: monetary savings equivalent to approximately 1% of the country's GDP and a 10% drop in annual carbon dioxide emission by 2016-17.[2]

As in many developing countries, barriers to the wide spread use of energy efficiency applications exist in Egypt in different domains (institutional, financial, technical, and market). In the past few years, however, several market and economic-based factors have led to the business community's recognition of the need for energy efficiency.

To capture the significant benefits associated with energy efficiency, an integrated and sustainable national strategy that engages both public and private sector stakeholders is required. A national strategy should also satisfy both short and long-term objectives. While short-term issues should focus on removing barriers that inhibit the development of the energy efficiency field, long-term aspects should focus on ensuring the sustainability of energy-efficient practices in various sectors of the economy. The national strategy should also take into account the local business culture and should allow for a high degree of flexibility that can help accommodate the changing needs of Egypt's emerging economy.

The Energy Efficiency Council (EEC), a consortium of interested public and private organizations, has taken responsibility for coordinating inputs to a sustainable national strategy, which is described below in the remainder of this framework document.

1.2 OBJECTIVES

A primary theme in the development of a National Energy Efficiency Strategy (NEES) for Egypt is the identification of approaches that facilitate sustainable economic development and mitigate the threat of climate change. Increased efficiency in the utilization of energy resources is needed to ensure the reliability of domestic energy supply, enhance the competitiveness of Egyptian industries, and to reduce greenhouse gas emissions. Given the strong link between energy, economic growth, and the environment, the development and implementation of a NEES will aim to achieve several national objectives that can be classified in three main areas:

I – Economic Development

Objective 1. Support and augment national economic growth plans
Objective 2. Enhance the competitiveness of Egyptian industries

[1] National Strategy for Economic and Social Growth in Egypt, 1996/97 to 2016/17. *Ministry of Planning*. March 1997
[2] ECEP Replication Study, March 1998.

Efficient use of end-use energy, especially in energy-intensive sectors, is critical to support economic growth. This will result in the freeing-up of resources that can be re-invested in both local infrastructure and human capital (thereby increasing productivity).

II – Sustainability of National Energy Supply

Objective 1. Strategically shift reliance on energy consumption towards natural gas
Objective 2. Increase deployment of energy-efficiency and renewable energy applications

Efficient production, distribution, and use of domestic energy resources will contribute to the country's energy security by increasing the sustainability of domestic energy supplies.

III- Environmental Protection

Objective 1. Reduce emissions of atmospheric pollutants (nitrogen oxide, particulates, and sulfur oxides)
Objective 2. Reduce emissions of greenhouse gases, mainly carbon dioxide

Expanding the use of cleaner energy systems and technologies will reduce the threat of adverse environmental and health-related impacts.

Table 1-1: Relationship of NEES Objectives to National Priorities

Objectives	Economic Development	Sustainability of Energy Supply	Environmental Protection
Support economic growth	•	○	○
Industrial competitiveness	•	○	○
Shift to natural gas	•	•	•
Clean technology deployment	•	•	•
Reduce atmospheric pollutants	○	○	•
Reduce greenhouse gas emissions	○	○	•

• = Primary effects
○ = Secondary effects

1.3 GOALS

Achieving the objectives of the NEES is expected to result in significant and quantifiable economic and environmental benefits. To support strategy planning and implementation, it will be necessary to establish a set of meaningful and quantifiable goals/targets that can be used by implementing institutions in order to effectively monitor and evaluate the impact of NEES initiatives at both macro and micro levels. The proposed targets should be expressed as indicators reflecting an increase in efficiency in each sector as follows:[3]

- **Macro Level**: Reduce national energy consumption per unit of economic output by a designated percentage in the year 2016/7, compared to a designated base year (for example 1996-97).[4] Associated reductions of air pollutant and greenhouse gas

[3] Where indicated, the targets, indicators, base years, and target years are all *preliminary* estimates based on analyses conducted by the EEC's Quantitative Targets Working Group. See Annex 1 for a brief discussion of how the Work Group is deriving quantitative targets.

[4] This target results from analysis of energy and economic forecasts, including structural changes in economic output, and consideration of numerous studies on the market potential for energy efficiency.

emissions will reduce (PM_{10}, NO_X, SO_X, CO_2) by x, y, z, etc. in the year 2016/7 compared to the UNFCCC base year of 1990.

- Sectoral Level

Secondary Energy Production

- Oil Sector: Increase local consumption of natural gas by ----- tcf by 2005.
- Electric Power Sector: Increase on-site generation applications by 1,000 MW by 2010
- New & Renewable Resources: Increase share of renewable electricity generation to 3% of national total by 2010. Increase nameplate capacity of wind generation to 1300 MW and solar generation to 1050 MW.

Final Energy Consumption Sectors

- Industrial: Reduce energy use per unit of output by 10% to 15% by 2016-17 compared to BAU forecast for the same year
- Government & Public Utilities: Reduce energy consumption per square meter in government facilities by 5% in 2006 and by 20% in 2016/7 compared to 1998/9
- Residential & Commercial: Reduce energy use by ---% by 2016-17, compared to 199?[5]
- Transportation: Increase average fuel efficiency of new automotive vehicles by ---% in 2016-17 compared to 199?
- Petroleum Sector: Reduce energy consumed per ton oil equivalent (TOE) of output by ---% by 2016/17 compared to 1998/9 levels.
- Agricultural: Reduce consumption related to irrigation by --% in 2016-17 compared to 199?

Table 1-2: NEES Goals & Expectations (Preliminary Estimates)

Target Sector	Target Improvement	Target Year*	Baseline*
Macro Economic Level	20% to 30% decrease in energy intensity	2016/7	---
Petroleum Sector	6% reduction in energy inputs per TOE output	2006/7	---
Petroleum Sector	?? % Increase in domestic natural gas use (CM)	2005/6	---
Electric Power Sector	1,000 MW of increased cogeneration application	2005/06	NA
New & Renewable	3% Share of renewable energy in electricity generation	2009/10	NA
Industrial Sector	10% - 15% Decrease in energy use to economic output	2016/7	---
Government	5 % Decrease in energy use per square meter 20% Decrease in energy use per square meter	2006/7 2016/7	--- ---
Res'l & Comm'l	?? % Decrease in energy use	2016/7	---
Transportation	?? % Increase in fuel efficiency per distance traveled	2016/7	---
Agricultural	?? % Increase in irrigation (kWh/yr per feddan)	2016/7	---
GHGs & Air Pollutants	?? % Reduction in PM_{10} CO_2, NO_X, and SO_X	2016/7	---

* Actual Base and Target Years will be determined by sector

[5] All question marks are used to illustrate that specific target years need to be defined.

Section 2 STRATEGY ROADMAP

2.1 STRATEGY CONCEPT

The National Energy Efficiency Strategy (NEES) will focus on developing an enabling framework for energy efficiency practices to expand by removing existing barriers that inhibit market growth. This framework will rely on a combination of regulatory and policy reforms as well as market transformation initiatives to increase demand on efficiency and build capacity to meet market demand. Reforming relevant policies will create demand, and building the necessary capacity in the delivery channels will strengthen market development. Regulations and successful policy reforms can be utilized to "push" the energy consumers towards energy efficiency practices. Policy reform and regulations can also be used with other market-based initiatives to "pull" the market and condition its growth towards efficiency.

As illustrated below, the "push and pull" strategy elements and initiatives will rely on a range of cross cutting activities such as capacity building, awareness and promotion, and information integration. Since flexibility is an essential element in the design of any strategy, maintaining the right balance between policy reforms and market transformation initiatives will require an implementation approach that allows for greater flexibility and customization.

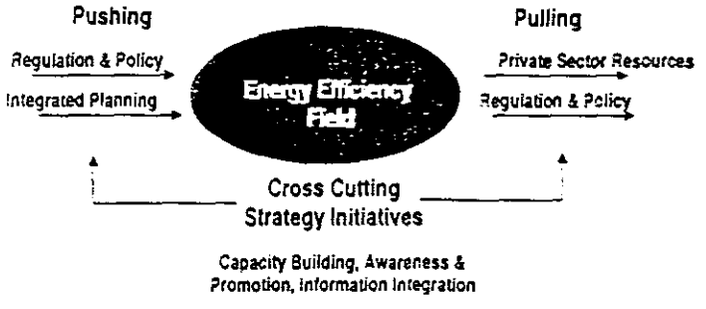

Figure 2-1: NEES Conceptual Diagram

2.2 STRATEGY APPROACH

To achieve the desired objectives of the strategy, an enabling environment for the expansion of the energy efficiency practice needs to exist. Creating such an environment will require concurrent activities in several key areas. However, and prior to discussing these areas, it is essential to identify a point of responsibility for overseeing the development, coordination, and implementation aspects of the NEES in general. The most suitable body to take that function is the Energy Efficiency Council (EEC).

For the purpose of discussing key areas and approaches to achieve the goals and objectives of the strategy, two main areas are defined. 1) Areas relying on policy and market initiatives to condition the market by stimulating demand for and increasing the supply of energy-efficiency goods and services. 2) Cross cutting activities that function as a general foundation for the energy efficiency field to grow and develop. Each of these areas includes a group of proposed initiatives or tactics for which further detailed planning and careful

evaluation are required for market implementation. Approaches or key areas focusing on removing existing barriers, and provide market conditioning are:

- *2.2.1 Utilizing regulatory and policy instruments to move towards EE*
- *2.2.2 Attracting private sector investments and resources in EE*
- *2.2.3 Integrating energy efficiency into energy, economic, and environmental planning*

The current climate and economic conditions is suitable for only some of these initiatives, allowing for easier market acceptance. The remaining initiatives, however, will require more fundamental changes in policies and regulations before their adoption is possible. Therefore, proposed initiatives are classified as either long-term or short-term based on their relevance to the national priorities, prevailing policy, and institutional conditions.

Key areas that are considered as a necessary foundation for the energy efficiency field to grow and develop are:

- *2.2.4 Increasing awareness of energy efficiency benefits*
- *2.2.5 Building capacity in key stakeholder organizations*
- *2.2.6 Developing an integrated energy efficiency information system*

Each key area in both groups comprises of various tools, approaches, and means to achieve its objectives. [Figure 2-2 provides a conceptual illustration of how the strategy approaches lead toward strategy objectives, followed by a brief explanation of the overall theme and focus of each key approaches.]

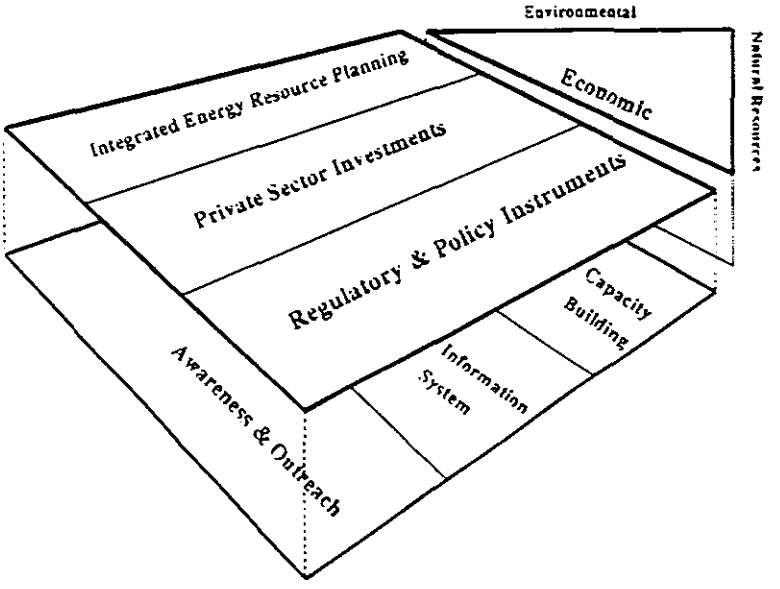

Figure 2-2: NEES Approaches

2.2.1 Utilizing Regulatory and Policy Instruments

A range of policy instruments will be used to send economic and regulatory signals to key energy efficiency stakeholders. A primary objective of the regulatory and policy initiatives is

to expand the applications of energy efficiency practices by encouraging cost-effective delivery of efficient products and related services. In the short- to medium-term, targeted policy interventions will be used to stimulate the supply of and demand for energy efficiency technologies and services. Full-scale adoption and commercialization of many energy efficiency technologies may be achieved in the longer run.

Key to the success of the Strategy however, is ensuring that proposed regulatory and policy reforms are offered in an integrated fashion, thus avoiding conflicting signals, and leveraging potential synergies. Examples of these instruments include:

- Pricing signals that encourage optimal use of available resources for both fuels and electricity while taking into consideration socioeconomic objectives
- Investment incentives and tax credits that stimulate the development of energy efficiency projects and increase the local manufacture of efficient technologies
- Codes and standards that detail minimum acceptable energy efficiency and performance for energy-intensive end uses through mandatory and voluntary guidelines
- Favorable import duties for designated energy-efficient equipment with penalties imposed on imported in-efficient and environmentally unfriendly products

2.2.2 Attracting Private Sector Investments and Resources

A key component of the NEES is encouraging private sector involvement in the delivery of energy efficiency goods and services. Developing a market-driven environment that mobilizes technical and financial resources of the private sector will expedite implementation of the Strategy recommendations. Creative delivery mechanisms, competition, and other means to increase market awareness will expand the energy efficiency practice. This can be engineered through proper policy and regulatory signals.

Using private resources can also be accomplished through public-private partnerships (PPPs). The formation of PPPs will leverage private sector expertise in financing and developing energy efficiency initiatives. PPPs will help create commercially viable methods of providing infrastructure and services to key areas of the economy, including the energy, industrial, transportation, and commercial sectors. To stimulate the use of such arrangements, the government will enhance its procurement guidelines, as well as other institutional practices, to create a healthy environment for PPPs.

The strategy approach will also stimulate participation of local and international financial institutions in the development of the energy efficiency market. The creation of investment vehicles will be evaluated as means to fund energy efficiency projects.

2.2.3 Integrating Energy Efficiency into National Energy Planning

One of the key approaches to increasing efficiency of the economy is integrating energy efficiency considerations into national economic, energy, and environmental planning. This includes the application of least-cost planning techniques such as integrated energy resource planning, which relies on the use of supply- and demand-side measures to meet Egypt's growing energy needs. In addition to traditional planning aspects, it will include considerations for end-use efficiency programs (or demand-side management programs).

industrial competitiveness and international trade, deployment of distributed generation resources, development of domestic renewable energy resources, alternative fuels, and advanced "clean" technology R&D, among others. Integrated planning will thus ensure that domestic energy resources are utilized in a manner that promotes sustainable economic development and environmental protection.

2.2.4 Increasing Awareness of Energy Efficiency Benefits

Energy efficiency awareness and promotional campaigns will be undertaken in parallel with other strategy initiatives in order to stimulate local demand for energy efficient goods and services. Awareness campaigns and outreach activities will be designed to support the core policy and market initiatives in the NEES by accomplishing the following:

- Enhancing the awareness of target players of the economic benefits of energy efficiency, as a foundation for increasing the **supply** of energy efficiency services.
- Increasing public awareness of the environmental, health-related and economic benefits of energy efficiency, thus increasing **demand** for energy efficiency services.

Target players to which energy efficiency awareness and outreach activities will be directed include investors, energy service providers and equipment manufacturers. This will ensure their buy-in and help increase the supply of energy efficient goods and services.

On a parallel track, energy efficiency awareness and outreach activities will target service recipients including end-users and the general public. This will enhance their support of energy efficient practices and values due to economic, health-related and environmental gains. This will lead to increased demand for energy efficient goods and services.

Increasing awareness of energy efficiency should be viewed as an ongoing task to be accomplished through effective channels such as media campaigns, educational programs, advertising and informational seminars. The media, as well as educational institutions, will have a key role to play in this respect. Awareness campaigns will also be directed at and channeled through private business associations and non-governmental organizations, given the opportunities for leveraging their existing information exchange mechanisms.

2.2.5 Building Capacity in Key Stakeholder Organizations

Capacity building initiatives will be designed to support the core policy and market initiatives and recommendations in the NEES by building the required capacity for targeted players to **supply** the policy inputs and energy efficiency services needed.

Capacity building initiatives will help increase the supply of energy efficiency services by providing energy managers and service providers with the skills and expertise required for implementing projects nationwide. Capacity building activities will also fill gaps in the local manpower profile through a variety of training courses, certification programs, institutional development activities, technology transfer, and the formation of centers for energy efficiency technology development. Energy efficiency stakeholder organizations will be strengthened through capacity building activities that are specifically tailored to the needs of their personnel. In addition, capacity building initiatives will equip policy makers and reformers with the requisite expertise to develop effective policy frameworks that are designed to facilitate the implementation of market initiatives and related NEES activities.

2.2.6 Developing an Integrated Energy Efficiency Information System

Accurate quantitative and qualitative information is required to enable informed decision-making in developing and implementing the NEES. Furthermore, it is required in the market place to enable energy users and service providers to make sound business decisions regarding energy use and investments. Therefore, the role of information systems in supplying reliable data to stakeholders is paramount to realizing the Strategy goals and objectives. A coordinated information integration approach will identify appropriate systems, processes, and linkages to meet the information requirements of EEC decision-makers, organizations, and interested parties in government, industry, commerce, and society in general.

2.3 REALIZATION OF STRATEGY OBJECTIVES

As outlined in Section 1, the successful realization of the national strategy is expected to bring substantial benefits to the national economy, security of energy resources, and the environment. The NEES accelerates the achievement of these benefits occurs through more widespread and rapid adoption of energy-efficiency (see Figure 2-3).

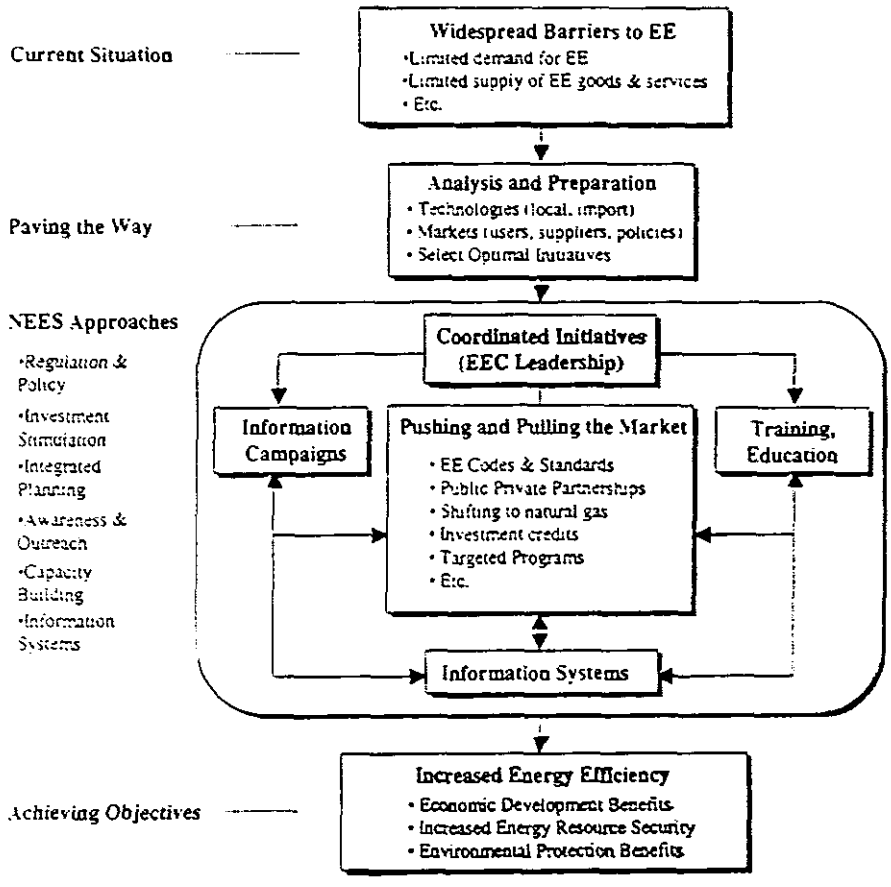

Figure 2-3: Realizing NEES Objectives through Strategy Approaches

From the current situation, which is characterized by numerous barriers to energy efficiency, the EEC is paving the way towards a comprehensive strategy. The EEC's preparatory work is building upon previous and existing activities by analyzing remaining market, institutional, and technology barriers. The outcome will be a comprehensive set of initiatives (each of which comprises action plans that coordinate the activities or multiple stakeholders), consistent with the strategy concept and approaches described above in Section 2.1 and Section 2.1, respectively.

Through the EEC's leadership, initiatives will be implemented in a comprehensive and coordinated manner, ensuring that market barriers to energy efficiency are appropriately prioritized and addressed systematically. Market stakeholders, through their active participation, will provide invaluable guidance to the EEC's strategy approaches and play critical roles in implementing NEES activities. The outcome of their combined efforts will be the more rapid realization of increased energy efficiency and its benefits to the country.

Section 3 STRATEGY RECOMMENDATIONS

It is critical to the success of the strategy to immediately designate the Energy Efficiency Council (EEC) as the key holder and responsible body for its implementation. Such designation, if formally done by the GOE, will facilitate the charter of the EEC and help establish expectations for NEES implementation.

The development and implementation of the NEES will require effective use of the strategy approaches that are outlined in Section 2. Six (6) key areas have been identified as means to reach the overall objectives of the Strategy. Of these, three areas are categorized as policy and market initiatives proposed to remove specific barriers or seize certain market opportunities to spread energy efficiency in various sectors of the economy, while the remaining three are considered necessary foundation for the energy efficiency field to grow and develop. These foundational, or crosscutting, activities included capacity building, awareness & outreach, and information integration and will be needed for most initiatives across all phases.

To define a clear path of the NEES implementation, a framework of time-bound recommendations that integrates policy and market-based initiatives with local regulations and national priorities will ultimately be needed. Well-defined stakeholder roles and responsibilities will enable effective coordination and implementation of a wide range of strategy initiatives. Brief discussions of an implementation timeline and of stakeholder roles follow in Section 4 and Section 5, respectively.

3.1 IMMEDIATE STEPS

During the initial phase of the strategy, the EEC and its member organizations will need to take some immediate steps to position the NEES for implementation. During the first year after approving the strategy, the following front-end activities are critical in order to lay the foundation for the successful implementation of the NEES.

3.1.1 Formalize Functions of the EEC

To ensure successful and timely implementation of the NEES, it is essential that the main functions of the EEC be formally recognized, thereby given it the necessary momentum to play a leadership role in guiding and monitoring the development of an enabling environment for energy efficiency. Key functions for the EEC should include:

- Identifying and advocating necessary energy efficiency policy and regulatory reforms
- Ensuring comprehensive energy efficiency programming and planning
- Mobilizing and securing resources (including coordination of donor funding activities) for implementation of NEES initiatives
- Setting implementation targets and quantifiable goals
- Monitoring the ongoing implementation of the NEES

3.1.2 Prioritize Strategy Recommendations and Initiatives

An essential front-end activity for the EEC and its member organizations will be to prioritize policy reforms and strategy recommendations. This identification and analysis of policy recommendation will involve the following activities:

- Initiating detailed policy and economic analysis that will provide the basis for formulating a policy reform agenda
- Identifying linkage of strategy initiatives to national economic, environmental, and social priorities

3.1.3 Develop Coordinated Stakeholder Action Plans

EEC member organization will develop individual action plans in support of implementing the NEES. Action plans will be time-bound and will address the following elements:

- Actions that a given organization will take to help implement the NEES within its domain (technical analysis, policy development, and outreach & promotion activities)
- Resource and capacity building requirements
- Organizational responsibilities (assigning responsibility within the organization to carry out strategy-related activities)

The EEC will take a coordinating role by ensuring that the action plans of individual organizations are consistent with the national economic and environmental objectives.

3.2 KEY POLICY & MARKET TACTICS

As mentioned above, key policy and market tactics utilize three broad approaches for stimulating energy efficiency in various sectors of the economy. These approaches use a variety of tactics and tools to remove targeted market barriers or seize specific market opportunities. The approaches include:

- Utilizing regulatory and policy instruments to move towards efficiency
- Attracting private sector investments and resources in energy efficiency markets
- Integrating energy efficiency into energy resource planning

The following policy and market recommendations comprise core strategy elements, comprising integral parts of the three strategy approaches.

3.2.1 Developing a National Plan for Energy Efficiency Standards

Abstract: The development of a national plan for codes and standards is needed to help accelerate the deployment of high efficiency technologies as well as to encourage the construction of energy-efficient buildings. The establishment of codes and standards will ensure that design specifications for new equipment and buildings meet or exceed high efficiency standards while preventing Egypt's existing stock of equipment and buildings from slipping below such standards. It is important that the development of a national plan be based on a systematic approach that fosters the increased participation and inter-agency cooperation of key stakeholders. The development of a national plan will be jointly led by the Egyptian Organization for Standardization (EOS), the Organization for Energy Planning (OEP) and the Housing and Building Research Center (HRBC). However, the establishment

of a national plan will also involve a myriad of concerned entities, including but not limited to local equipment manufacturers and suppliers and their respective trade and business associations, as well as other stakeholders in the equipment/technology deployment "supply chain." The national plan will not only ensure that suitable standards are codified but will incorporate proper provisions for monitoring and enforcement.

Background: Currently, there are a number of programs in which energy efficiency codes and/or standards for equipment/appliances are being developed (this includes developing codes for energy efficiency in buildings). Key stakeholders involved in these programs include: the EOS, HRBC and the OEP. Most of the ongoing activities are supported through the UNDP/GEF program which is being implemented by Egyptian Electricity Holding Company (the UNDP-GEF program is expected to result in the development of energy efficiency standards for only three appliances).

The current activities described above cover only part of what is needed for a national plan for EE codes and standards. This situation was highlighted at a November 2000 roundtable discussion on codes and standards for equipment, appliances, and new buildings. The roundtable event was jointly sponsored by OEP, USAID (EEPP - support to the development of a National Energy Efficiency Strategy), and the UNDP (CLASP project). Other key stakeholders participated in this event, including: equipment manufacturers/retailers, government authorities, NGOs, business associations, energy sector policy makers, and the media. All stakeholders agreed on the need to utilize a comprehensive approach in developing a national plan for energy efficiency codes and standards.

Description: The National Plan For EE Codes and Standards (NPEECS). As illustrated below in Figure 3-1, the proposed approach to developing EE codes and standards will be implemented in four main stages.

The *initial stage* of the NPEECS will focus on the inclusion of EE codes and standards as a key item in the National Energy Efficiency Strategy.

The *second stage* will involve three key elements.

- First, an institutional capacity assessment will be carried out in order to determine the manpower and infrastructure needs that are required to support a comprehensive NPEECS. Once these needs are identified, work activities will focus on bridging any "gaps" by developing and implementing any needed capacity building programs.
- Second, relevant studies and analysis will be conducted in order to prioritize the equipment/technologies for which the technical committee should establish EECS.
- Third, a technical committee for EECS will be established. The technical committee will work with key stakeholders to develop a standardized approach to developing the EECS (this will be carried out in parallel to the second element)

The third stage will focus on the development of EE codes and standards. Other activities will include developing test procedures, evaluating labeling and enforcement/compliance-related issues, and awareness & promotion programs.

The fourth stage will include the development of supporting laws and regulations as well as introducing monitoring programs. Follow-up and continual improvement systems will also be developed

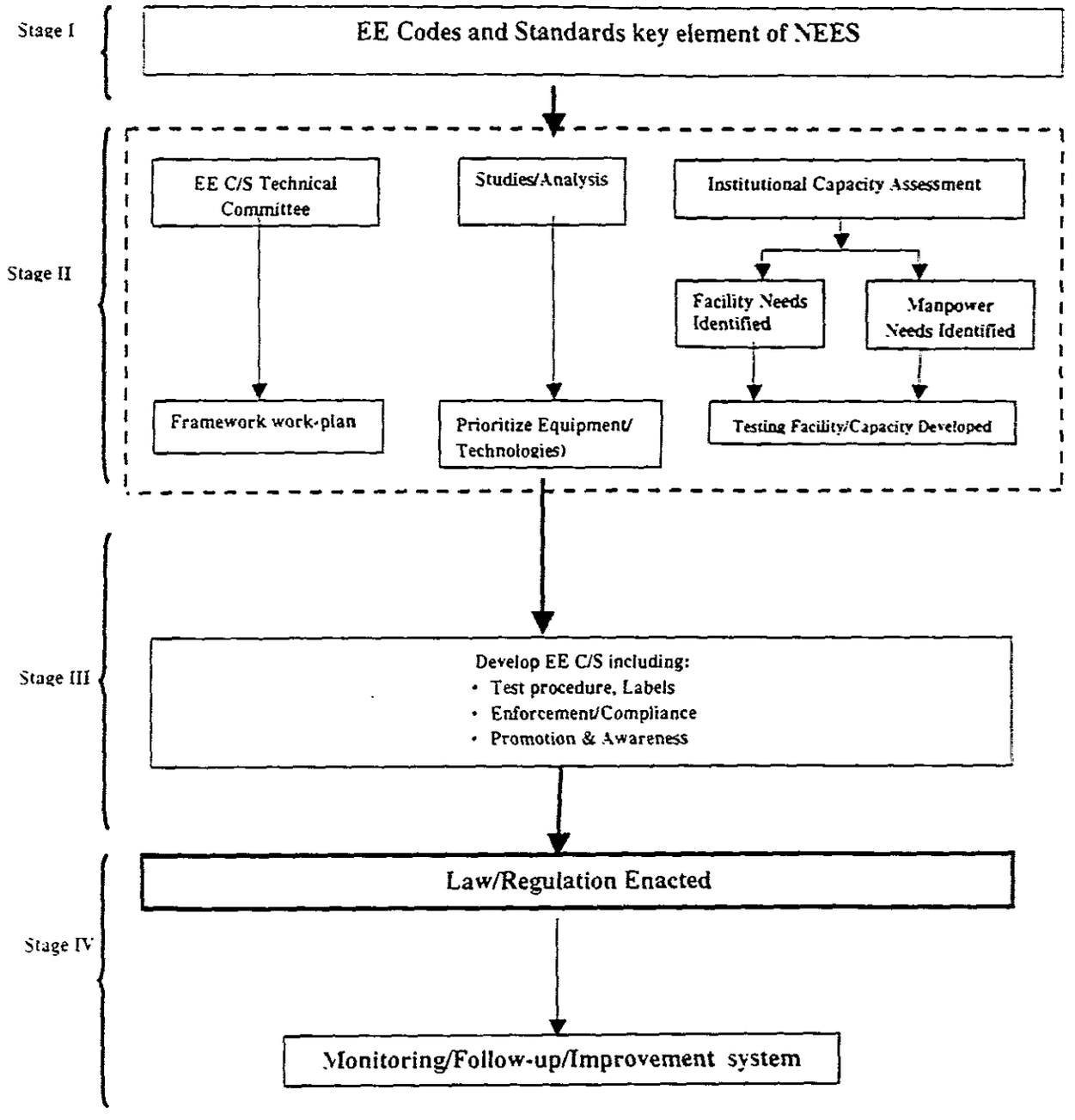

Figure 3-1 : The National Plan for EE Code and Standards

Roles/Responsibilities In the NPEECS

EEC:

- Endorse use of EECS
- Prioritize equipment and technologies
- Follow up & evaluation
- Promotion and planning

EOS/MOTS/EISA/ISA:

- Form EE CS technical committee
- Set systematic approach to EECS development
- Carry out analyses related to EECS
- Develop EECS for prioritized equipment
- Monitor production in manufacturing facilities and local market
- Monitor imported equipment/appliances

OEP:

- Conduct Institutional capacity assessment
  - HRD needs
  - Testing facilities and related infrastructure needs
- Carry out policy analyses related to EECS
- Promotion and improvement

Key Stakeholders:

- Develop capacity and infrastructure for EECS
- Carry out analyses etc in support of EECS promulgation including monitoring, enforcement, outreach and

Expected Results: A systemic and coordinated approach to developing and promulgating EECS will ensure that codes and standards become a positive policy instrument that improves the local market dynamics by stimulating demand for energy efficiency goods and services.

Appropriate analyses undertaken in stage two of the proposed national plan will facilitate the development of timetables for the promulgation of EECS for individual technologies. This will ensure a net positive economic benefit for the country.

Elements of the national plan include the following:

- Minimum efficiency standards for energy-consuming equipment
- Energy efficiency codes for new construction projects
- Appliance labeling
- Certification
- Industry-specific energy intensity standards

Resource Requirements: Many of the elements required to successfully develop a national plan for EECS are already in place. However, additional resources will be required for testing laboratories and investments in capacity building and awareness-related programs.

3.2.2 Identifying and Promoting Strategic Public/Private Partnerships

Abstract: The formation of public-private partnerships (PPPs) can be used to improve the delivery of existing public services and/or to create new services that utilize the financial and technical resources of the private sector.[6] Successful PPPs draw on the expertise and existing assets of the public sector by forming complementary partnerships with the private sector. PPPs offer Egypt an efficient method of providing energy services that support the implementation of numerous NEES initiatives, including:

- Development of new financing vehicles
- Promoting local manufacture of energy-efficient equipment
- Encouraging the cost-effective procure procurement of energy efficiency resources
- Accelerating the shift from liquid fuel oil to natural gas

Description: The use of PPPs would represent a change in the way many Egyptian government and public sector organizations have typically financed and delivered energy

[6] PPPs can be created through a variety of partnership arrangements, including concessions, joint-ventures, and outsourcing.

services. To create an enabling environment for PPPs, a series of targeted policy analysis, capacity building, awareness and promotion, and policy development programs should be implemented as part of a preparatory and implementation phase of the NEES, as illustrated in Figure 3-2.

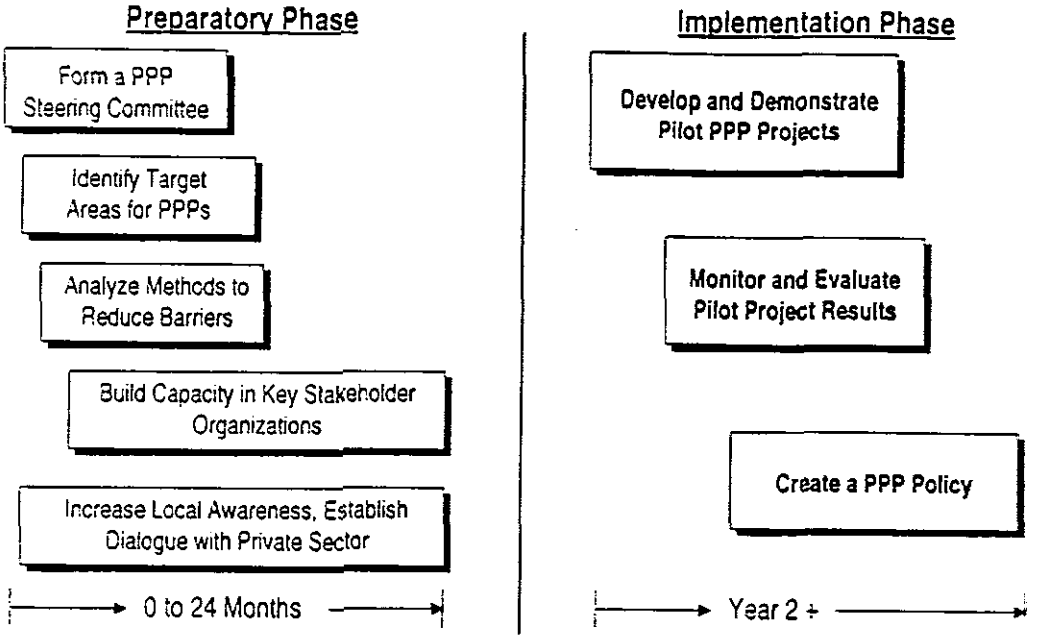

Table 3-2: Creating an Enabling Environment for PPP

A prerequisite to the widespread use of PPP is to carry out a series of front-end preparatory activities that are conducted in parallel over the short-term period, including:

- Forming a PPP Steering Committee: A PPP steering committee is required to coordinate the development of a framework in which partnerships with the private sector will be established. The steering committee should contain decision-makers from key government/public and private sector organizations. The steering committee should address the following issues: defining objectives for PPP development, determining the primary role for the government/public sector in PPPs, expanding opportunities for private sector involvement in the delivery of public services, identifying new financing maximizing the contribution of existing public sector resources to PPPs, and ensuring that public interests are safeguarded. The steering committee can also coordinate capacity building and awareness programs for local stakeholders.
- Identifying Target Areas for PPP Development: Each government/public sector stakeholder agency should conduct a thorough evaluation of the potential areas where the injection of private sector resources could facilitate the delivery of services.[7] Part of this evaluation will involve the creation of a dialogue with the private sector regarding areas for their potential participation (market sounding with private sector).
- Building Capacity: To successfully develop PPPs, government/public stakeholders will need to acquire deal-making skills required to work with private sector partners.

[7] The PPP Working Group identified and evaluated a series of potential PPP options.

A series of capacity building activities should be conducted for appropriate government/public sector agencies. Capacity building initiatives should mirror key PPP project development steps, including project identification, evaluation, development, financing, implementation, and performance monitoring. Capacity building programs should also be carried out for private sector stakeholders in order to facilitate the structuring and negotiation of agreements with the public sector. To maximize the effectiveness of capacity building activities, it is recommended that programs be conducted for a select group of personnel that will have a direct involvement in PPPs.

- Increasing PPP Awareness: The utilization of PPP is relatively new to Egypt and the level of local awareness of PPP fundamentals is low. To increase local awareness, a comprehensive information campaign is required to inform all relevant decision-makers and professional and technical staff of the main elements and benefits of PPP. A distinction should be made between target audiences with a strong emphasis on increasing PPP awareness among key decision-makers and senior management in the government/public sector. Broad-based awareness programs can be implemented for professional and technical staff using less costly methods (e.g. CD-ROM, web sites, etc).

During the implementation phase, momentum gained from activities carried out in the preparatory phase will help create the enabling environment and technical expertise that is necessary to develop a variety of PPPs. Long-term strategy actions will therefore focus on testing PPP options and the codification of PPP guidelines as part of an implementation phase, including activities such as the following:

- Developing Pilot Projects: The development and implementation of PPP pilot projects in selected markets/regions can be used to build capacity in local stakeholder organizations and to identify areas where further reforms and/or assistance is required.
- Enacting a PPP Policy: The adoption of a PPP policy will establish a set of transparent guidelines for both public and private sector organizations. Policy guidelines will help clarify the procedures associated with the formation of PPPs, including: bidding procedures, legal parameters of PPP development, risk allocation between public and private sector partners, and the authority of government/public sector agencies to enter into a PPP arrangement. The enactment of a PPP policy will also send a strong signal to local stakeholders regarding the GOE's intent to provide services through PPP. Policy guidelines will also encourage the private sector to identify opportunities to establish profitable business areas that create new methods and ideas for delivering public services - leading to better value services for the general public.

Expected Results: The potential economic and environmental benefits from energy efficiency-based PPPs on national (macro) level is significant given that PPPs are a broad-based tool that can be used to develop numerous NEES initiatives.[3] The exact level of benefits that is achieved by forming PPPs depends in part on how strongly the PPP concept is embraced and promoted by local stakeholders. On a micro level, however, benefits from individual partnerships can be measured in the following terms:

[3] Market research studies indicated that the potential national economic benefits from the development of energy efficiency projects exceeds $1 billion.

- Economic: net present value (NPV) of a PPP, private sector investment, and increased industrial competitiveness
- Environmental: reduced emissions of greenhouse gases and atmospheric pollutants
- Social: job creation and technology transfer

Resource Requirements: Much of the resources needed to develop and introduce PPPs exist within the public and private sectors. Mobilizing those resources, however, will require significant commitment to capacity building, outreach, and awareness activities.

3.2.3 Integrating Energy Efficiency into Environmental Policy

When the Government of Egypt placed improving environmental quality on its priority list, as evident by instituting Law 4 of 1994, the market responded accordingly. The Government priority was mirrored in the business community, and the financial industry paid attention to these emerging needs. Energy efficiency will take the same level of attention if it is promoted as means to economic and environmental solutions. Additionally, the link between energy efficiency and mitigation of adverse climate change lends a strong justification to include energy efficiency as means to comply with the requirements of Law 4.

3.2.4 Developing Balanced Custom Tariffs for Imported Energy-Consuming Equipment

Imposing duty taxes on imported goods is used to protect local products from foreign competition. However, most technically proven equipment are manufactured outside of Egypt and therefore, duties present an economic barrier for wide spread implementation. A detailed listing of energy efficiency measures should be compiled with projections of their market penetration for the near future. An analysis should be performed to determine the optimum custom duties rate structure that increases the economic feasibility of projects while maintaining revenue neutrality to the Country's treasury.

3.2.5 Facilitating On-site Energy Production

Egypt can capture significant economic and environmental benefits from the increased development of projects that involve the efficient on-site generation of electricity and heat at industrial and commercial facilities. To facilitate the development of cogeneration projects, a comprehensive policy is needed that addresses the following elements:

- On-site generation tariff structure (that includes sell-back provisions and equitable charges for back-up power)
- Technical requirements (grid code) for operating on-site generation units in parallel to the national electric grid
- Proving transparent guidelines for siting and licensing requirements

The development of a policy for on-site generation will leverage the work of the Ministry of Electricity and Energy, which is evaluating a range of cogeneration policy options.

3.2.6 Developing New Financing Vehicles for Energy Efficiency

The creation of new financing vehicles will help project developers and end-users overcome a significant barrier to energy efficiency investments: a lack of long-term financing options that meet the needs of performance based contracts. Financial institutions are becoming increasingly aware of the economic and environmental benefits from investments in energy

efficiency. However, local financial institutions are still in an evaluation mode in which they are assessing the viability of energy efficiency as a business option. To fully engage the financial sector, the following steps should be taken to mitigate perceived lending risks and create a market environment that is more conducive to creating new financing vehicles:

- Enacting legal and regulatory reforms that strengthen the ability of local stakeholders to enforce contracts
- Deepening local capital markets in order to provide increased access to capital
- Providing government guarantees on selected energy efficiency projects
- Increasing the awareness among local financial community regarding energy efficiency project development methods
- Prioritizing policy and market reforms that help create a pipeline of bankable projects (e.g. development of PPPs, efficient energy pricing, etc.)

3.2.7 Promoting Local Manufacturing of Energy-Efficient Equipment

The creation of a sustainable market for energy efficiency in Egypt will require the development of a strong base for local manufacturing of related equipment and other products. Establishing a local manufacture of clean and efficient technologies will help lower up-front investment costs, improve project economics, facilitate maintenance and after-sale support, and create high-skilled new jobs. To encourage local and foreign companies to establish manufacturing operations in Egypt however, an enabling business environment must exist. This will require:

- Economic incentives
- Industry incubators
- Licensing and co-manufacturing
- Protection against foreign products
- Technology commercialization strategies

3.2.8 Encouraging the Procurement of Cost-effective Energy Efficiency Resources

As mentioned in Section 2, integrated energy planning relies on the use of either least-cost supply- or demand-side resources. Procuring cost-effective energy efficiency resources will require coordination to ensure competitiveness and verification that such resources can be relied on as part of the overall energy resource map. An implementing agency is needed to play such a coordinating role. The most likely model to implement this initiative is a demand-side management program under the guidance of a power utility or a local distribution company.

The cost of procuring these resources can be arranged in the form of a "customer charge" or a pure government subsidy to help establishing the concept. In the short term, a public oversight agency (designated regulatory agency) might best oversee the implementation of such an initiative, with possible future administration transferring to the private sector.

Egypt has become an attractive market for international independent power producers (IPPs) to compete for contracts to build generation resources. This presents Egypt with an opportunity to procure energy efficiency resources in conjunction with power generation.

3.2.9 Accelerating the Shift from Liquid Fuel to Natural Gas

Egypt's abundant reserves of natural gas is estimated at approximately 43 trillion cubic feet, which provides the country with a unique opportunity to utilize its energy resources in a manner that promotes sustainable economic development.[9] Current Egyptian energy policy calls for the shifting of energy demand away from fuel oil and towards natural gas. However, in order to stimulate domestic markets for natural gas, innovative business approaches and policy reforms that overcome existing barriers are required, including:

- Expanding the BOOT contracts with natural gas Local Distribution Companies (LDCs) to include incentives for providing turn-key natural gas-based energy services
- Removing subsidies on local fuel oil
- Offering incentives for end-users to convert oil-consuming equipment to natural gas
- Providing training required to install, operate, and maintain natural gas-fired equipment
- Developing policies that promote on-site generation of power using natural gas

3.2.10 Increasing EE in the Transportation Sector

Transportation accounts for approximately 31% of Egypt's total final energy consumption. The transportation sector is a major consumer of oil products – accounting for over 40% of Egypt's total annual oil consumption.[10] Given the major impact that transport activities have on local economic, environmental, and social issues, front-end activities of the NEES will include the development of an action plan that will help optimize energy use in the transportation sector. The action plan will include an analysis of a wide range of efficiency options for freight and passenger transportation, including:

- Switching to alternative fuels that help reduce emissions and improve fuel economy (including the conversion of vehicles to compressed natural gas systems)[11]
- Shifting to less energy-intensive modes of transportation by encouraging the increased use of mass transit systems (via policy directives and pricing signals)
- Improving transportation infrastructure and planning by enacting policies that reduce the demand by transport vehicles and improve traffic flow within existing systems
- Increasing the use of efficient transportation technologies by developing incentives that help promote the use of vehicles with high fuel economies

3.2.11 Expanding the Use of Renewable Energy Technologies

Renewable energy technologies offer Egypt clean sources of energy that have a significantly lower environmental impact than conventional energy technologies.[12] Therefore, the NEES will include a series of targeted programs that foster the deployment and use of new and renewable energy technologies in key areas of the economy, including electric power

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[9] OEP, November 2001 (Arabic Version). The identified seismic 3D potential gas reserves are 120 trillion cubic feet.

[10] Organization for Energy Planning, 1999.

[11] The accelerated conversion of cars and buses to natural gas will leverage the success of ongoing GOE and international donor-funded transportation sector initiatives.

[12] The GOE has set a target of having 3% of Egypt's electricity production being generated by new and renewable energy by the year 2010 (NREA, January 2001)

generation and transportation.[13] Renewable energy programs will be conducted in coordination with a variety of NEES initiatives and will include the following elements:

- Establishing investment incentives and tax credits that stimulate local utilization and manufacture of new and renewable energy technologies
- Incorporating renewable energy into supply-side energy planning (e.g. evaluating the use of renewable systems to meet distributed power generation needs)
- Increasing research and development efforts that aim to accelerate the commercialization of renewable energy systems (where possible, leveraging partnerships with the private sector and international donor community)

3.2.12 Preparing Competitiveness Road Maps for Energy-Intensive Industries

To compete successfully in markets that are increasingly competitive and globally open, the Egyptian industrial sectors must implement strategic reforms and invest wisely in technologies that will achieve competitive advantages in the future. The process of industry road mapping serves national interests by examining market and technology trends to identify strategies aimed at maintaining those competitive advantages. The initial focus will be on energy-intensive industries, where management and technological improvements serve to reduce energy use and boost profits: efficiency gains will not only benefit domestic industries, but also benefit the national economy and environment.

3.3 CROSS CUTTING ACTIVITIES

Throughout all phases of the NEES, there will be a series of cross cutting activities that are required to facilitate the successful completion of most if not all strategy initiatives. Specifically, continuous support will be needed in awareness & outreach, capacity building, and information integration domains.

3.3.1 Increasing Awareness of Energy Efficiency Benefits

EE Awareness Planning and Implementation Mechanism: In order for energy efficiency awareness and outreach activities to be effective and to contribute to the achievement of NEES objectives and targets, they need to be based on careful analysis and planning. They also require carefully coordinated implementation, and ongoing evaluation of effectiveness and degree of target achievement. Careful planning and coordination will counter current fragmented efforts in raising energy awareness, with their contingent duplication of efforts, wastage of resources and limited achievement of results.

In the interest of careful planning, effective coordination and evaluation, the EEC will take a lead role in directing energy efficiency awareness and outreach activities. This is in keeping with objective #4 in the EEC Protocol, stated as follows: "Cooperation in outreach and awareness building initiatives on energy efficiency, renewable energy, demand-side management, and global warming through awareness campaigns, workshops, and capacity building seminars."[14]

The EEC will have oversight in determining awareness needs, prioritization of activities that address awareness needs, and coordinating awareness/outreach plans belonging to different

[13] NREA is leading several initiatives that focus on the analysis wind, solar, and biomass energy systems.
[14] EEC Protocol, October 1998

organizations. It will monitor and evaluate programs, maintain cross-organizational data on awareness needs, programs, participants, and results. In executing this coordination function, the EEC will need to delegate to one of its members organizations the responsibility of conducting needs assessments and market research, aligning organizational outreach plans, monitoring program implementation, and maintaining awareness data. The awareness planning and implementation mechanism is illustrated below in Figure 3-3.

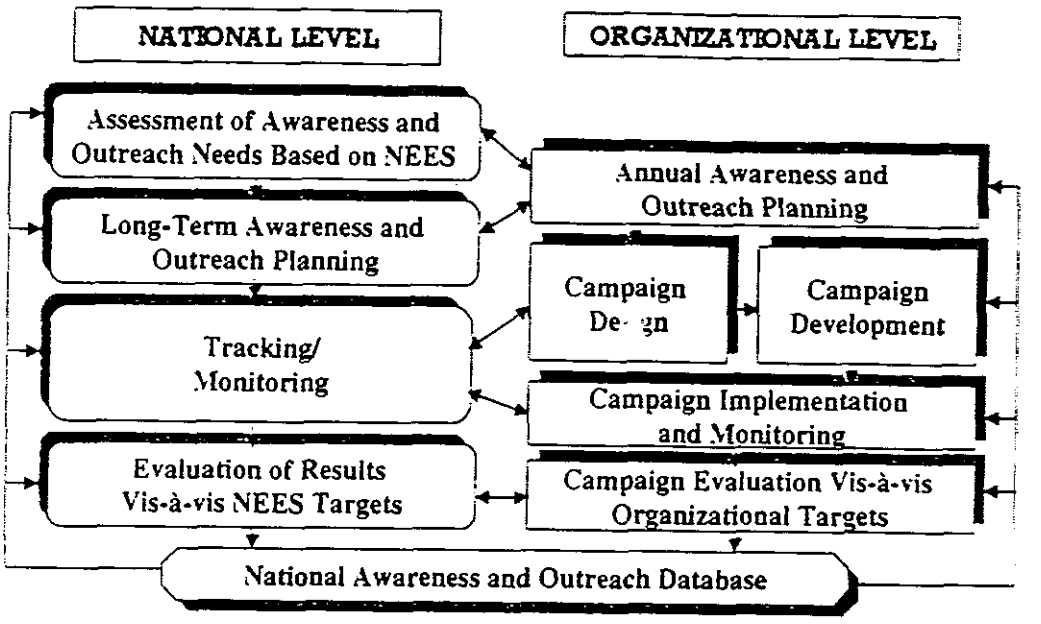

Figure 3-3: Awareness Planning and Implementation Mechanism

The mechanism shown above starts with assessing energy efficiency awareness needs at organizational, sector-based and national levels. Such needs assessment will rely on analyses of baseline versus target awareness behavior within given target populations and targeted market research. Awareness needs assessments will be driven by core policy and market initiatives in the NEES, and accompanying capacity building activities, in order to ensure the effective timing of awareness and outreach programs, as illustrated below in figure 3-4.

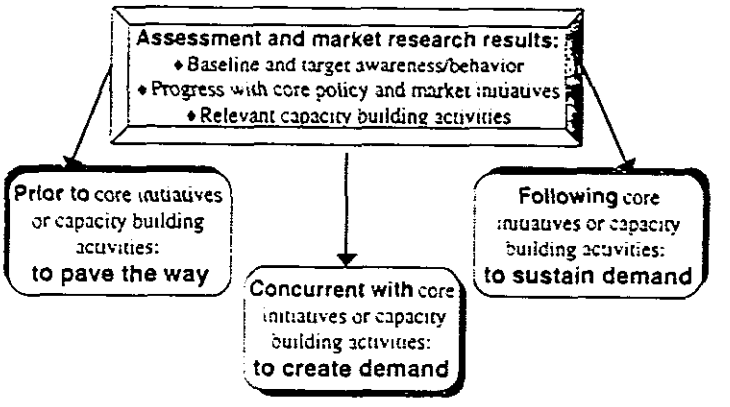

Figure 3-4: Timing of Awareness and Outreach Activities

The results of awareness needs assessments will drive the development of annual awareness and outreach plans at the organizational level, with stakeholder organizations planning to implement targeted awareness programs that meet specific objectives and address specific audiences. In addition, organizational plans will be coordinated to inform long-term national awareness and outreach plans. This will maximize the effective utilization of resources for implementing awareness programs, and enhance the collective achievement of desired results to support NEES objectives.

Awareness and outreach plans will then form the basis for designing and implementing specific campaigns and programs. The plans will clearly provide the objectives, desired results and resource framework within which awareness programs can be implemented. Program design and campaign organization may be outsourced to specialized campaign organizers and service providers, and monitored by the outsourcing organizations, until such a time when a core of awareness specialists is formed to undertake design and implementation activities.

Awareness and outreach activities will also be evaluated by the implementing organizations to measure the degree to which they have achieved organizational targets. In addition, national-level evaluations of awareness activities will be conducted in order to assess the degree of achievement of national awareness targets, to evaluate contribution to NEES objectives, and to further assess energy efficiency awareness needs.

The above awareness planning and implementation mechanism will be supported by a national awareness and outreach database that maintains needs-related, planning, implementation, programmatic, participant-related and evaluation data. All member organizations will be required to provide systematic data to update the database. The database will be accessed by all organizations as well as by the EEC as a key source of information for awareness needs assessment, planning, implementation, and evaluation purposes.

Recommended Awareness and Outreach Activities: In order to support core policy and market initiatives of the NEES, it will be necessary for energy efficiency awareness programs to be staged as follows:

Short- to medium-term awareness campaigns targeting investors, energy efficiency service providers and equipment manufacturers, to enhance their awareness of the economic potential of the energy efficiency field. This will prepare these key players for an increased supply of energy efficient goods and services. Such awareness campaigns could include:

- Awareness and promotional campaigns to encourage private sector participation in delivering energy efficiency products and services
- Promotion to investors' associations highlighting investment and return-on-investment potential in the field of energy efficiency

Short- to medium-term awareness programs targeting policy makers and reformers, to enhance their awareness of the national benefits of creating an enabling environment for the provision of energy efficient goods and services. These programs could include:

- Promotion of the policy alternatives and related regulatory practices to realize the economic and environmental benefits of energy efficiency

- Promotion programs targeting financial institutions to prepare them for creative solutions in financing energy efficiency projects

Short- to medium-term awareness campaigns targeting end-users and the general public, to enhance awareness of the economic, health-related and environmental benefits of energy efficient practices. This will increase the demand for energy efficient goods and services.

- Customer education and marketing campaigns
- Promotion of the individual economic benefits of energy efficiency

Long-term initiatives to sustain energy efficiency awareness, including the following:

- Creating an energy efficiency outreach network and EE marketing centers to disseminate energy efficiency information and best practices and implement ongoing public outreach programs.
- Energy education: incorporating an energy efficiency component in national educational syllabi, focusing on energy efficiency values, best practices and benefits, and targeting different student age groups.
- Establishing a national recognition/award system for institutions utilizing energy efficiency best practices, standards and technologies.

A series of ongoing awareness and outreach programs will thus be designed to communicate the economic and environmental benefits of energy efficiency to target audiences. Awareness and outreach programs will be developed in a manner that incorporates short- and long-term NEES objectives and establishes a clear connection to national economic and environmental priorities. The government will play an essential role in supporting and communicating energy efficiency awareness issues to all stakeholders. Targeting the message to different audiences will require a variety of delivery techniques (e.g. media campaigns, seminars, information centers, etc.).

Recommended Implementation Tactics: The above targeted approach to implementing energy efficiency awareness programs will require carefully timed tactics/steps in order to be successful. The following is a list of required steps, broken down into implementation time frames.

Steps to be initiated immediately (12 months)

- Develop energy efficiency needs assessment, outreach planning and evaluation systems, to be utilized by the EEC, its selected coordinating body, and all stakeholder organizations that plan and implement energy efficiency awareness programs.
- Develop a national awareness and outreach database.

Steps to be considered for the short-term (24 months)

- Conduct targeted market research to focus awareness and outreach campaigns.
- Develop long-term and annual awareness and outreach plans.
- Conduct/coordinate targeted awareness campaigns.
- Monitor and evaluate programs and campaigns.
- Develop a cadre of EE awareness specialists.

Steps to be developed in the long-term (5 Years+)

- Revise school curricula to incorporate EE concepts at all levels.
- Establish an energy efficiency outreach network.
- Develop and implement a national award system for energy efficient institutions.

3.3.2 Building Capacity in Key Stakeholder Organizations

Capacity Building Planning and Implementation Mechanism: As is the case with awareness and outreach, capacity building planning and implementation need to be based on careful analysis, effective coordination, ongoing monitoring and evaluation, and cross-organizational information sharing, if they are to contribute to the achievement of NEES objectives and targets. Currently, several capacity building efforts are undertaken with no overall strategy to guide them, and with little or no cross-organizational coordination, a fact which again leads to duplication of efforts and resource wastage. In addition, current capacity building efforts cannot serve to fill gaps in the energy efficiency manpower profile unless these gaps are assessed and efforts to fill them are carefully planned and coordinated. This is why it will be necessary for the EEC to either plan and coordinate capacity building activities in the field of energy efficiency or to delegate the executive responsibility for such coordination to one of its member organizations.

To this end, the capacity building planning and implementation mechanism again starts with assessing manpower needs in the area of energy efficiency. Needs assessments of current and target energy efficiency skills and expertise have to directly derive from core NEES policy and market initiatives in order to indicate the skilled manpower that will implement these core initiatives. As such, careful analyses and prioritization procedures, a key EEC function, should direct the nature and timing of capacity building activities in order to ensure their contribution to the implementation of core NEES policy and market initiatives.

The above needs assessment and prioritization activities will yield long-term national capacity building plans to fill determined gaps in the energy efficiency manpower profile. These long-term national plans will state the preliminary objectives of capacity building activities to be undertaken and relate those to NEES objectives and targets. Plans will also specify the target audiences for capacity building activities, and determine the overall resource framework required for implementing capacity building activities. Such long-term plans will facilitate the targeted funding of energy efficiency capacity building activities through donor agencies as well as national resources.

The above national-level needs assessment and planning activities will inform and be informed by organizational-level needs assessments and annual capacity building plans. These organizational plans will again be coordinated to ensure effective resource utilization and eliminate duplication of efforts.

Capacity building plans will form the basis for designing and implementing programs. Design and implementation may again be outsourced to specialized training providers until such a time when a core of energy efficiency training specialists is formulated. Program implementation will be systematically monitored by the outsourcing organizations to ensure

quality and target achievement. In addition, there will be a need for developing and implementing national-level energy efficiency certification programs.

Capacity building initiatives will be evaluated on an ongoing basis by the implementing organizations. In addition, national level evaluations of capacity building results will be undertaken in order to inform further capacity building planning activities and initiatives.

Capacity building data will again be maintained in a national database, to be updated and accessed by all stakeholder organizations. Again, such data will inform further needs assessments, planning, implementation and evaluation activities. The capacity building planning and implementation mechanism is captured in figure 3-5.

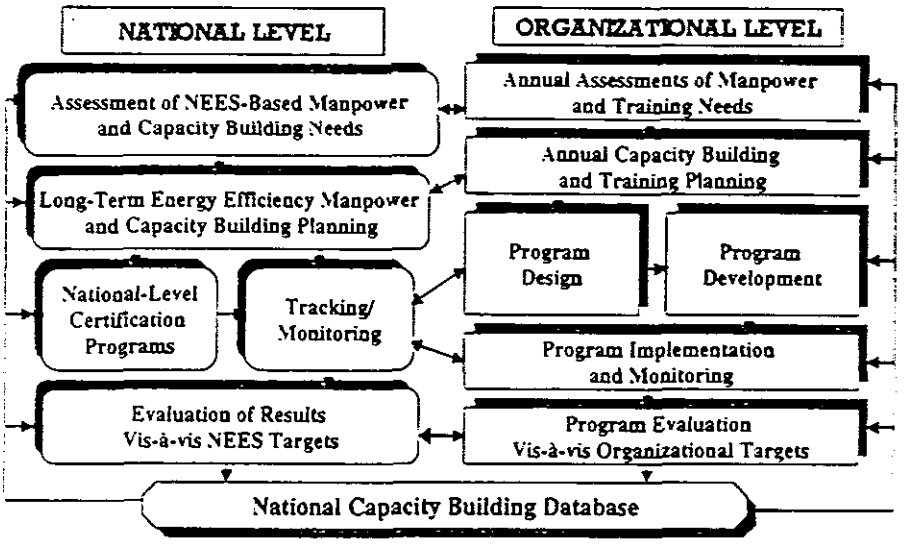

Figure 3-5: Capacity Building Planning and Implementation Mechanism

Recommended Capacity Building Activities: In light of the importance of increasing the capacity of stakeholders associated with the development of energy efficiency in order to establish a sustainable energy efficiency market in Egypt, it will be necessary to plan and implement targeted capacity building programs along the following principles:

Short- to medium-term programs to support core policy and market initiatives in the NEES by preparing skilled professionals that have the capacity to produce energy efficient goods, supply energy efficiency services, finance and manage energy efficiency projects, and create an enabling policy and regulatory environment for the energy efficiency field. These capacity building programs could include:

- Training programs on developing national and industry specific standards
- Technical programs for on-site energy production
- Training programs to facilitate the creation of public-private partnerships
- Training programs on financing energy efficiency projects
- Technology transfer programs to support the local manufacture of energy efficient products and equipment
- Training programs targeting the development of legal and business tools

- Training programs to strengthen local industry associations
- Energy efficiency certification programs (for individuals and organizations)

Long-term initiatives to sustain and strengthen energy efficiency capacity, include:

- Energy education programs in vocational/technical schools to develop skilled labor in the field of energy efficiency
- Energy studies at tertiary and post-graduate levels, to develop highly specialized energy efficiency engineers and professionals
- Establishing energy efficiency project development centers at a sectoral level
- Establishing an Egyptian Association of Energy Professionals to provide a forum for dialogue among energy efficiency engineers, managers, and other professionals

Recommended Implementation Tactics: The successful planning and implementation of capacity building activities will require carefully staged tactics and steps, as follows:

Steps to be initiated immediately (12 months)

- Develop capacity building needs assessment, planning, monitoring and evaluation systems to be utilized for national and organizational planning and implementation purposes.
- Develop a national capacity building database.

Steps to be considered for the short-term (24 months)

- Develop long-term national capacity building plans derived from NEES-based manpower needs assessments and prioritization.
- Introduce national energy efficiency certification program.
- Conduct/coordinate organizational needs assessments and capacity building programs.
- Monitor and evaluate capacity building programs.
- Develop a cadre of specialized energy efficiency trainers.

Steps to be developed in the long-term (5 Years+)

- Revise educational curricula for vocational, undergraduate and post-graduate levels.

3.3.3 Developing an Energy Efficiency Integrated Information System

Abstract: Although a significant amount of data on local energy use has been compiled by various organizations, comprehensive energy information is not always readily available to support decision-makers and end-users in the public and private sectors. An integrated information system will support planning and implementation of the NEES by ensuring availability of comprehensive information and by facilitating information exchanges among EEC organizations and stakeholders.

Description: The integrated information system would take the form of distributed information resources (e.g., electronic data, information processing tools, reference materials and reports, etc.), in which core functions, access, and security are clearly established in a series of bilateral and multilateral protocols. The "system" would therefore incorporate both sophisticated information technologies (IT) and more conventional information formats. The

protocol agreements would provide for core information system functions including, but would not be limited to, activities such as: data collection and compilation, analysis and validation, updates, dissemination and reporting, etc. Protocols would therefore be both IT-based and process-based. Figure 3-6, shown below, outlines a method for developing information systems and processes to support the NEES.

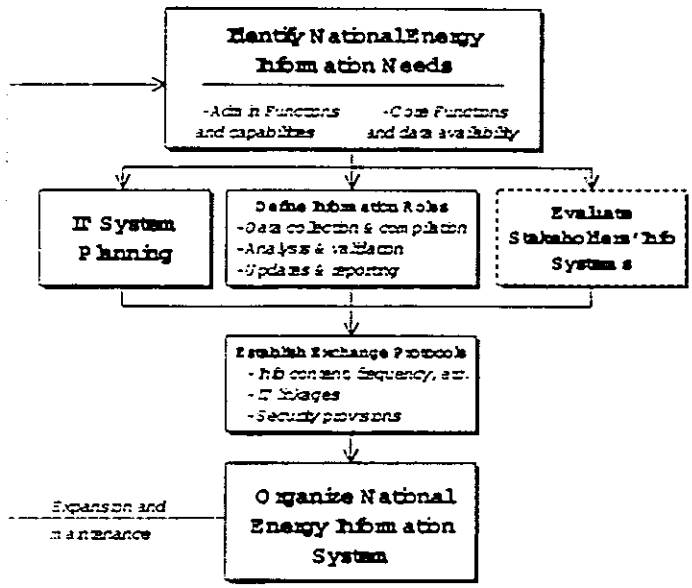

Figure 3-6: Developing an Integrated Information System

Steps to develop and organize an integrated national energy information system would focus on the following elements:

- Identifying information needs to supporting planning and implementation of a broad range of proposed and potential NEES initiatives. This would also require identifying needs, processes, and responsibilities to increase the accuracy of information (e.g. reconciling data discrepancies, improving forecasting techniques, etc.)
- Developing information sharing protocols among strategy stakeholders to ensure timely data exchange and security. Initial protocols would be based upon existing resources and would be modified as IT-based and other resources develop.
- In parallel with development of information exchange protocols, coordinating stakeholder IT development plans with the appropriate organizational roles and responsibilities
- Establishing a networked National Energy Information Center within an EEC member organization to support strategy implementation and development. The Center will serve as a repository for electronic and physical information resources, as well as a clearinghouse to direct stakeholders to energy information

Expected Results: Accurate, timely, and comprehensive information regarding the interactions of energy, economic, and environmental dynamics will enable successful NEES planning and implementation. The integrated energy information system will provide the

background information needed for successful awareness and outreach activities, as well as at least one means of exchanging that information through its embodiment as an IT network.

Resource Requirements: Copious amounts of energy information reside in archives and working information resources among the various stakeholders, allowing for an integrated system to be developed incrementally. Initial development need not require more than needs assessments and development of exchange protocols. Expansion of IT-based systems and protocols would likely require additions to organizational IT budgets, as well as significant capacity building support.

Section 4 IMPLEMENTATION TIMELINE

4.1 NEES IMPLEMENTATION CYCLE

The National Energy Efficiency Strategy, comprising multiple initiatives to meet its objectives and involving the efforts of numerous stakeholders, will necessarily require sustained activities over several years. As with any other public or private sector activities, implementation of strategy initiatives will be managed through a continuous cycle of planning, implementation, and monitoring. The evaluation of monitored achievements then feeds back into planning, where activities are revised and refined (see Figure 4-1).

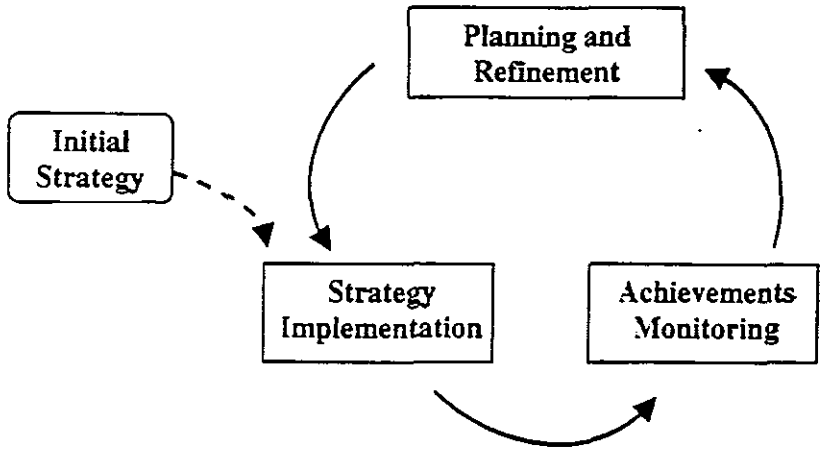

Figure 4-1 NEES Implementation Cycle

The implementation cycle begins, of course, with an initial strategy that is itself the product of intensive analysis and preparation. In the text below, Section 4.2 describes the stages of initial National Energy Efficiency Strategy development and finalization and Section 4.3 describes stages of the NEES implementation cycle.

4.2 STRATEGY FINALIZATION

Development and finalization of the initial NEES is characterized by two distinct phases: *preparation*, in which stakeholders develop the initial strategy framework, and *adoption*, in which the initial strategy becomes embodied in coordinated stakeholder action plans.

- NEES Preparation Phase: Stakeholders develop strategy framework for achieving stated national objectives, conducts appropriate preliminary analyses, develops strategy concepts, and identify key priorities (e.g., target market sectors and end-use technologies). The EEC is presently nearing the end of the NEES framework development.
- Strategy Adoption: Beginning with approval of a well-stated strategy framework, the EEC works to formalize its planning and coordination functions (see also Section 3.1). In parallel, the EEC and its members will be developing and coordinating action plans consistent with the NEES framework, establishing measurable expectations, and mobilizing necessary resources. This step – development and coordination of action

plans – will require considerable analyses, discussion, and negotiation among all stakeholders and can be expected to require a further 9-12 months.

As the NEES is finalized, as a whole or in stages as coordinated action plans are finalized and adopted, stakeholders will be launching (or continuing) some of the identified high priority initiatives, which will lead the NEES into the implementation cycle.

4.3 IMPLEMENTATION TIMELINE

As characterized above, NEES activities will be conducted in a cyclical loop of planning, implementation, monitoring, and back to planning/revising. With each iteration of the implementation cycle, NEES activities will change and improve in response to changing market conditions. The implementation timeline can be characterized in several phases:

- Near term (first 1-2 years): NEES activities will concentrate on initiating (or continuing high priority, long lead-time activities. The development of such as codes and standards, for example, would be a high priority even though impacts would not be expected for several more years. Other high priorities would include:
  - Beginning capacity building and outreach activities
  - Initiating a dialog between public and private sectors to develop strategic partnerships
  - Completing analyses needed to support priority policy/regulatory changes
  - Launching systems for information exchange and monitoring
  - Continuing longer-term development and research activities (e.g., industry road mapping, financing vehicles, etc.)
- Medium term (years 2-5): During this period, the market would be characterized by increased awareness (consumer demand for EE goods and services) and increased capacity in delivery channels, operating in an environment where initial policy changes would be beginning to take effect. The NEES would encompass:
  - Broad implementation of fully developed initiatives
  - Continued development and expansion of cross-cutting initiatives (awareness, capacity building, info systems),
  - Realization of benefits from activities with short lead times. Procurement of EE resources, selected PPPs, fuel-switching to gas, and other initiatives, for example, could be achieving significant impacts.
  - Rollout of longer lead-time activities and initiatives.
  - analysis of monitoring results being incorporated into ongoing planning activities,
- Long term (years 5+): A broad spectrum of NEES activities would be in full-scale implementation and initiatives should be functioning smoothly. The ongoing cycle of planning, implementation, monitoring, and refinement would be well established. Market maturity would be considerably increased, and the NEES effects on accelerated EE technology deployment would be achieving significant benefits for the country.

Section 5 STAKEHOLDER ROLES AND RESPONSIBILITIES

The successful implementation of the NEES and its various recommendations and initiatives requires a clear definition of the roles and responsibilities of all stakeholders including the government, public sector, private sector, non-governmental organizations, and the EEC.

This may pose a challenge given the numerous stakeholders involved or influenced by the energy efficiency practice. Therefore, and to insure accountability to reaching the goals, and to minimize role ambiguity during the implementation period, each of the key stakeholders should assume either a primary or a supporting role in each of the 6 main implementation approaches described in Section 2.

Table 5-1 illustrates the proposed roles and responsibilities of all energy efficiency stakeholder groups. For each of the six strategy approaches, stakeholder groups' roles are classified as either a lead role or a support role. Clarity in role definition allows for a smooth communication and coordination between groups and focuses the accountability for results.

Table 5-1: Stakeholder Roles and Responsibilities

	Applying Regulation and Policy	Mobilizing Private Sector Resources	Integrating EE into Energy Planning	Increasing EE Awareness	Building Capacity	Integrating Information Systems
Government	●	●	◒	●	●	◒
Public Sector		◒		◒	◒	◒
Private Sector		●		◒	◒	◒
NGOs		◒		◒	◒	◒
EEC	◒	◒	●	●	●	●

KEY
● Leading Role
◒ Supporting Role

5.1 GOVERNMENT

Includes Government agencies and Ministries related to energy production, economic development, and environmental protection and energy planning.

Roles and Responsibilities: Because of their legislative and policy implementation role, government stakeholders are suited to carry the responsibility of creating an enabling environment for energy efficiency practices. They should provide overall guidance to the energy efficiency field to ensure its growth and development in support of national priorities. More importantly is the role of monitoring achievement and evaluation of market

development in a fashion that protects public interest while benefiting from the free and competitive market concept. In summary, Government stakeholders are expected to:

- Enact regulatory reforms and facilitate initiatives that create a competitive marketplace
- Continue ongoing energy tariff reforms
- Establish policies to encourage cost-effective on-site energy production
- Develop economic incentives to accelerate deployment of clean energy technologies
- Incorporate supply- and demand-side resources into energy planning activities
- Set minimum efficiency standards to govern equipment use and new construction
- Incorporate procurement policies for energy efficient and clean technologies in public buildings
- Expand outreach and energy efficiency awareness activities
- Build institutional capacity for energy efficiency practices
- Facilitate information exchange protocols among strategy stakeholders

5.2 PUBLIC SECTOR

Includes public entities that consume substantial amounts of energy, such as publicly owned industrial or commercial enterprises, hospitals, schools, and other public institutions.

Roles and Responsibilities: Public sector stakeholders can positively influence the demand on energy efficiency field through the following activities:

- Develop energy (or cost) savings targets for public sector facilities
- Adopt procurement practices that favor energy-efficient equipment
- Contract out services to the private sector through competitive bidding process
- Increase employee awareness regarding the benefits of energy efficiency
- Establish partnerships with the private sector

5.3 PRIVATE SECTOR

Private sector stakeholders include local industrial and commercial end-users, private energy distribution companies, energy products and service providers, and financial institutions.

Role and Responsibilities: the private sector can help stimulate the local market for energy services through a range of supply- and demand-side efforts, including:

- Supply energy efficiency services using innovative business approaches
- Provide a range of financing options for energy service projects
- Adopt voluntary guidelines that encourage the use of energy efficient equipment
- Participate in trade associations that advocate energy efficiency business interests
- Establish partnerships with the public sector

5.4 NON-GOVERNMENTAL ORGANIZATIONS (NGOS)

Includes NGOs that are non-profit organizations advocating sustainable energy use and helping to create a dialogue between local stakeholders and policy-makers.

Roles and Responsibilities: NGOs can help promote sustainable energy and social development through a range of non-profit programs, including:

- Demonstrate innovative models for sustainable energy use through cooperative programs with energy end-users
- Organize advocacy programs that provide policy-makers with information on key energy efficiency issues
- Facilitate energy efficiency education and awareness programs and act as a liaison between government and private entities
- Enhance the capacity of local organizations through mutual exchanges of energy efficiency information and expertise
- Participate in policy development

5.5 THE ENERGY EFFICIENCY COUNCIL (EEC)

The EEC is a consortium of public and private sector organizations that are associated with the generation, distribution, and use of energy committed to guide the energy efficiency practice in Egypt. The EEC was formed based on a "Cooperation Protocol" signed in 1999.

Roles and Responsibilities: Representing most stakeholders from both the public and the private sector, the EEC is uniquely positioned to guide the adoption and implementation of the NEES by facilitating its initiatives and providing directions to local stakeholders. The EEC's role should be to:

- Oversee the direction and implementation of the NEES
- Monitor the results of strategy initiatives and refining future recommendations and expectations
- Coordinate all local energy efficiency-related programs (including donor activities)
- Manage the development of an integrated energy information system that builds upon the current IT systems used within EEC member organizations

Section 6 ACHIEVEMENTS MONITORING PLAN

A primary objective in the development of a monitoring plan will be to provide performance-based information to NEES decision-makers and stakeholders in a manner that will enhance ongoing strategy implementation. The achievements monitoring plan will consist of the following three elements:

- Indicators and targets
- Monitoring system
- Evaluation and feedback loop

6.1 PERFORMANCE INDICATORS AND TARGETS

Performance indicators will be used to measure progress towards achieving the objectives of the national strategy (i.e., indicators will be directly linked to NEES objectives). A series of indicators will be developed that measure (and to the extent possible quantify) the impact of energy use on economic development, environmental protection, and the utilization of natural resources. After a baseline analysis of current conditions is conducted, short- and long-term targets will be established for each indicator. Performance targets will be set at a challenging, but achievable levels.

6.2 MONITORING SYSTEM

A monitoring system will be established to collect information, analyze data, and disseminate results to NEES decision-makers and stakeholders. The NEES monitoring system will address the following items:

- Data sources and collection plan (compilation of performance indicators and targets)
- Frequency and schedule of data collection
- Identification of entities that will be responsible for carrying out monitoring activities

6.3 EVALUATION AND FEEDBACK CHANNELS

A central component of the monitoring system will be the creation of feedback channels that assist decision-makers in their evaluation of the success of different strategy elements. Feedback channels will provide a forum for testing different hypotheses and making any necessary adjustments to the strategy as it is being implemented.

Annex A: Quantitative Targets Methodology

The Quantitative Targets Working Group devised a methodology (illustrated in Figure A-1) for establishing quantitative performance targets for the National Energy Efficiency Strategy (NEES). The methodology considers two distinct phases of target setting and revision corresponding to NEES preparation and implementation, respectively.

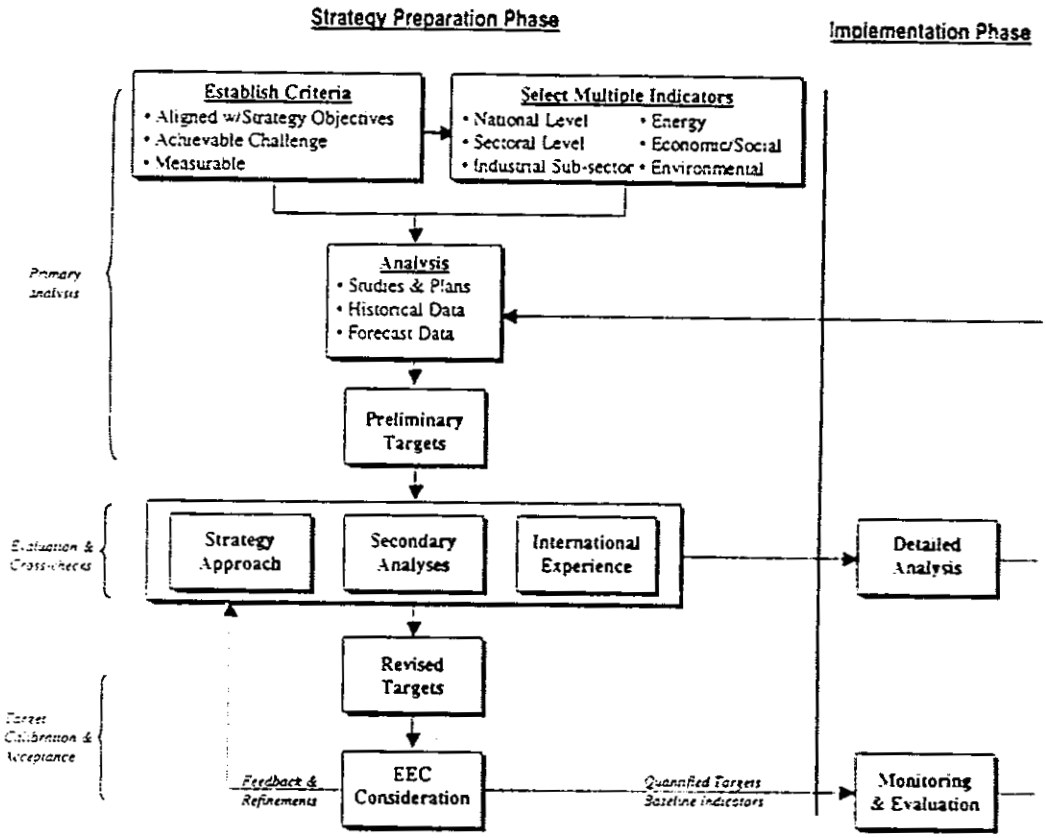

Figure A-1: Developing Quantitative Targets

In the NEES preparation phase, the Group's methodology includes three distinct stages in the process of setting quantitative targets, including the following:

- Preliminary analyses, which consider available information
- Evaluation and cross-checks, which consider additional analyses
- Target calibration and acceptance, which establish means for refining targets

In the preliminary analyses, the Working Group established criteria for targets to ensure that the target would serve the goals of the NEES.

Annex B: (next annex)

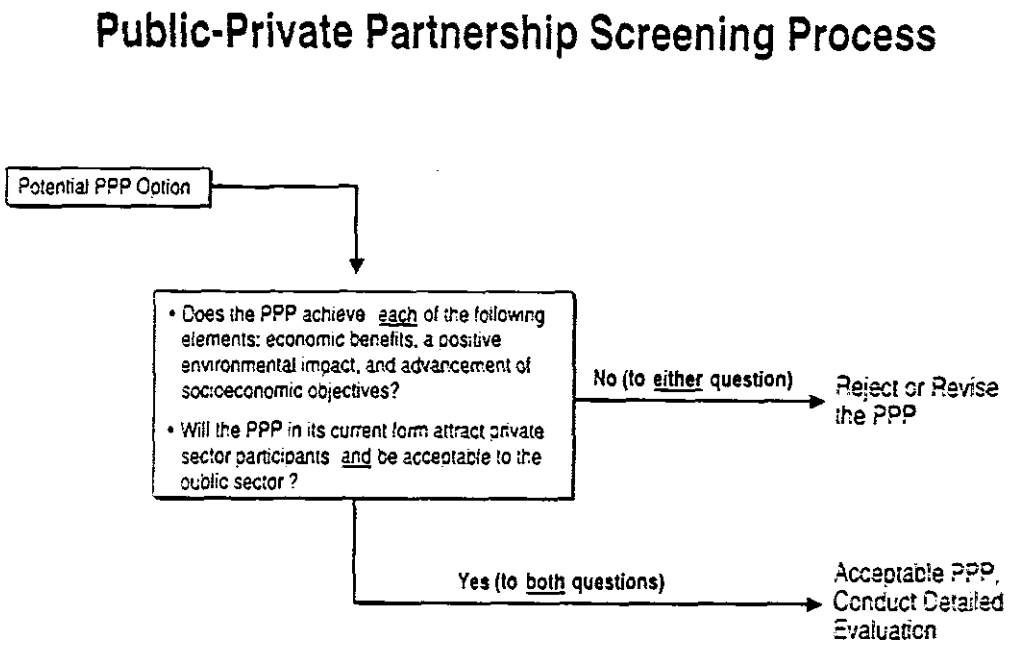

Figure 1-B: Public-Private Partnership Screening Tool