ENERGY COMMISSION

ANNUAL REPORTS FOR 2007 & 2008

AND AUDITED FINANCIAL STATEMENTS FOR 2007 & 2008

ENERGY COMMISSION

ANNUAL REPORT FOR 2007

AND AUDITED FINANCIAL STATEMENTS FOR 2007

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CHAIRMAN'S REMARKS

This report is being submitted to the Minister for Energy in accordance with the requirements of Section 50 of the Energy Commission Act, 1997 (Act 541) and covers the period from January to December, 2007. It also includes the audited financial statements for the period 1st January to 31st December 2007.

In 2007, having in mind the enormity of the task ahead of a sustainable energy supply system, the Commission planned to complete the following activities, among others:

1. Conduct Parliamentary and stakeholder consultations for the passage of draft regulations for the Natural Gas sector into law, following the completion of the Natural Gas Infrastructure Master Plan in 2006 and in anticipation of the arrival of natural gas from Nigeria by the end of the year;
2. Invite interested parties for consultations for the development of the Accra-Tema natural gas infrastructure network;
3. Establish standards for Solar Photovoltaic Systems, develop permit guidelines for the renewable energy sector and continue to collect wind speed data in selected parts of the country;
4. Develop and deploy off-grid solar lighting systems for demonstration and capacity building purposes;
5. Complete Household Energy Surveys and initiate wood fuel plantations in the northern parts of the country;
6. Prepare the National Electricity Grid Code and the Wholesale Electricity Supply Framework and regulations to set the stage for electricity production and trading in electricity by Independent Power Producers (IPPs). Following the establishment of the Ghana Grid Company, the Energy Commission was expected to pass legislation that would introduce and enforce technical rules for the system operation and the commercial and market operations of the wholesale market;
7. Conduct Industrial and Commercial Energy Surveys and compile national energy statistics; and
8. Complete and adopt a Human Resource Policy and Procedures Manual to streamline human resource issues at the Commission.

The year-old load shedding exercise that began in August 2006 abated gradually in the third quarter of 2007 and was officially declared over, at the end of September 2007.

This was achieved through a combination of supply side and demand side interventions, including the installation and operation of 126MW emergency power plants and the replacement of 6 million incandescent filament lamps with an equivalent number of energy saving compact fluorescent lamps, free-of-charge, to energy consumers, who were using incandescent lamps. Massive rainfalls boosted hydro power generation but also caused floods in certain parts of the country.

The Commission coordinated the procurement and distribution of 6 million Compact Fluorescent Lamps (CFLs) which is expected to reduce the lighting load by about 200MW and considerably ease the pressure on the energy generation facilities in the country. The lamps arrived in the last quarter of 2007 and deployment commenced in October. The full effect of the CFL injection on the national peak load is expected to be realized in the first quarter of 2008.

Although the efficient use of energy has been proven to be the cheapest and cleanest way of providing sustainable energy services, market imperfections and lack of consumer education, especially in developing countries such as Ghana, always mitigate against the deployment of energy efficient technologies. It is therefore necessary that targeted market transformation activities, backed by legislation and vigorous promotion exercises are undertaken to entrench the energy efficiency culture.

In November 2005 the first Energy Efficiency Standards and Labeling Regulations to be enacted in Africa, LI 1815, was passed by the Parliament of Ghana, under the Energy Commission Act, 1997 (Act 541). The regulation requires that all room air conditioners and compact fluorescent lamps manufactured or imported for use in Ghana meet minimum performance standards and be labeled accordingly. It has become imperative that these regulations are fully enforced. The Commission in the coming months will also develop similar regulations to improve the efficiency of other electrical appliances such as refrigerators/freezers, etc., based on standards established by the Ghana Standards Board for these appliances. It will be useful that government takes the issue of reducing the lighting load on the country's energy system seriously and take the next steps to prohibit the importation of inefficient lighting systems (such as the incandescent bulbs). Many countries, including Australia, the U. S. and Japan have taken this step over the last few years.

Several countries from the European Union have or are about to implement this policy initiative and many developing countries, including Ghana could become dumping grounds for obsolete technologies unless proactive steps are taken ahead of events in other countries that trade with Ghana. Ghana has no facilities for the manufacture of incandescent bulbs and so it should be easy to implement this policy initiative.

A nationwide survey initiated in 2006 and completed in 2007 established that the energy consumption of refrigerators/freezers in Ghana was much higher (in most cases more than two times higher) than the minimum performance levels allowed in the standards for the various sizes of refrigerators/freezers in the USA and Europe. It also established that the quantity of used and obsolete refrigerating appliances discarded in Europe and Asia and dumped onto the Ghanaian market is increasing as those countries take steps to phase out old, obsolete and environmentally harmful refrigerating equipment. It has also been established that refrigerating appliances discarded in Europe and imported into Ghana are not designed for the tropics and belong to the Extended Temperature (S) and Temperate (SN) climate classifications. They therefore tend to consume more energy when used in Ghana even when they are new. It is worth noting that market transformation in Europe and Asia in favour of more efficient appliances has led to the dumping of discarded equipment from these countries on developing countries in Africa through unsuspecting

businessmen who pick these appliances, sometimes for free and transport them to Africa for sale. The importation of used refrigerators into Ghana increased from 172,500 in 2005, through 195,000 in 2006 to 227,300 in 2007.

An earlier study conducted in 2003 by the Energy Foundation in Ghana established that over 94% of facilities (residential or otherwise) connected to the national grid has one or more refrigerating appliances. This means that refrigerating appliances, which incidentally operate 24hours a day contribute significantly to energy waste in Ghana.

The Energy Commission in collaboration with the Ghana Standards Board constituted a Technical Committee to prepare technical standards and test procedures for refrigerating appliances in Ghana. When completed the necessary legislation and market transformation schemes will be developed to phase out inappropriate and inefficient refrigerating appliances from the Ghanaian market.

Energy Efficiency Standards and Labels have been developed for Compact Fluorescent Lamps and air conditioners. The refrigerator efficiency standard and labels project, when implemented will therefore add to the list of appliances whose efficiency levels shall be known by consumers before they are purchased.

All organizations in charge of the education of the public on energy conservation will be expected to redouble their efforts to educate the public on energy efficiency and conservation measures.

As part of the strategies to support manpower development in the energy sector of the economy, and to provide a platform for the review and discussion of national energy issues, such as the Power Sector Reform, the Energy Commission began the revival of the biannual national energy symposia where issues and innovations in the energy sector are shared and discussed. The national energy symposium concept was conceived and developed by the Energy Research Group (ERG) in the mid 1980s as a platform to share and discuss pertinent energy issues particularly, renewable energy resources.

The 2007 National Energy Symposium was held in November under the theme “Energy Sector Reforms – Removal of Policy Implementation Barriers. A communiqué issued at the end of the symposium called for a speedy implementation of the reform programme.

Ghana's electricity sector has suffered from intermittent crises in supply as the growth in demand for electricity has grown considerably over the past decades, while the main hydro resources at the Akosombo and Kpong generating Plants have suffered from inadequate water inflows at different periods during the past two decades, 1983 – 2006. Consequently, concern has been expressed as to the most appropriate means of power generation that would be sustainable, of economic merit, and ensure energy supply security for the nation. Another school of thought is for the country to have an optimized technology for generating electricity. The two technologies that have not featured prominently in the planning and analysis of the energy situation in Ghana are coal and nuclear technologies.

The Commission was invited to participate in a study to examine the two technologies, assess their comparative advantages for the nation in terms of least cost, environment and financing, in order to arrive at a decision as to which of them could be implemented earlier.

The programme which involved desk top studies on the comparative merits of coal and nuclear power plants for Ghana was conducted by a Committee set up by His Excellency, President J.A Kufour under the chairmanship of Prof. Daniel Adzei Bekoe, Chairman of the Ghana Atomic Energy Commission (GAEC), who is also the Chairman of the Council of State, to look at the possibility of including nuclear power in Ghana's energy supply mix. The study was completed in December 2007 and a report is expected to be presented to Cabinet early in 2008.

It is worth noting that without the necessary regulations and procedures, efforts aimed at ensuring efficient, sustainable and reliable energy supply will not be achieved. The Commission in 2007 therefore focused on:

a. Review of permanent licences to be issued to service providers in the electricity supply industry;
b. Completion of the draft standard of performance regulations for electricity distribution and supply for consideration by Parliament; and
c. Development of rules and regulations for the establishment of the wholesale power supply market.
d. Development of draft National Grid Code for operations of the National Interconnected System (NIS) and legislation for enforcement; and
e. Public education on enacted legislations on Energy efficiency and labelling of electrical appliances (LI 1815) and Technical & Operational Rules for Electricity supply & distribution (LI 1816)

A draft Wiring Regulations, aimed at ensuring that electrical wiring activities are conducted by trained persons and with the right quality of materials in the right manner was completed. It is expected to be subjected to further review by the Commission's Electricity & Natural Gas Technical Committee to be followed by the drafting and enactment of a legislative instrument to be issued by the Minister for Energy under Section 56 of the Energy Commission Act (Act 541) to facilitate its enforcement.

In anticipation of the availability of natural gas from Nigeria in Ghana, the Commission prepared and facilitated passage of the following regulations by Parliament in 2007:

a. Natural Gas Distribution and Sale (Technical and Operational) Rules, 2007, LI 1911;
b. Natural Gas Distribution and Sale (Standards of Performance) Regulations, 2007, LI 1912; and
c. Natural Gas Transmission Utility (Technical and Operational) Rules, 2007, LI 1913.

Additionally, draft Rules and Regulations were submitted to the Attorney General's Department for review and for further discussions with stakeholders before being laid in Parliament for approval and passage into law. These were:

(i) Natural Gas Transmission Utility Standards of Performance Regulations; and
(ii) Natural Gas Occupational, Health and Safety (Standards and Procedures for Construction, Operation and Maintenance of Facilities) Regulations.

A draft Licensing Manual for the natural gas industry, which will serve as a guide for prospective Natural Gas Service Providers, namely the transmission utilities, distribution companies and wholesale suppliers was produced for stakeholder consideration.

Although Ghana is endowed with abundant renewable energy resources, the legal and regulatory frameworks which would stimulate the massive development of the country's renewable energy resources and adoption of renewable energy technologies through the injection of private capital into the sector are nonexistent.

The EC has initiated measures for the preparation of Renewable Energy Policy and Regulatory Framework and a Renewable Energy Law for Ghana. It is expected that a draft legislative framework and law would be completed by the end of 2008 to enable further stakeholder consultations.

To ensure high acceptability and quality of renewable energy services and systems in the country, the Energy Commission in collaboration with the Ghana Standards Board have developed draft National Standards for Biofuels and Solar Photovoltaic Systems. These are the Biodiesel fuel (B100), Bioalcohol-Ethanol (Ed75-Ed85) and Denatured fuel ethanol and the Solar PV Systems Specifications. The documents are currently being reviewed by local and international experts after which they would be gazetted and disseminated.

The wind speed measurement projects being carried out at four (4) sites continued during 2007 with collection of wind speed data. Analysis of the consolidated data (data collected in 2006 and 2007) indicate that there are sites in Ghana with favourable wind regimes for the development of grid connected wind farms.

The Commission will continue with its efforts to lay the foundations for the provision of adequate reliable and sustainable energy supply for national development.

Prof. A.K. Addae
Ag. Chairman

1.0 THE COMMISSION

1.1. Introduction

The Energy Commission is a statutory body corporate with perpetual succession and a common seal established by an Act of the Ghanaian Parliament, the Energy Commission Act, 1997 (Act 541). The Commission may sue and be sued in its corporate name.

The Energy commission consists of seven commissioners appointed by the President of Ghana acting in consultation with the Council of State of the Republic. In making the appointments, the President takes into consideration the knowledge, expertise and experience of the persons so appointed, and in particular, their knowledge in matters relevant to the functions of the Energy Commission.

The Executive Secretary is responsible for the administration of the Energy Commission and is required to ensure the implementation of the decisions of the Commission. He provides strategic and organizational leadership to build the Commission into a pre-eminent state agency for formulating and articulating national energy policies.

1.2 Membership of the Commission

The current composition of the Commission is as follows:

1.	Prof. A.K. Addae	Ag. Chairman
2.	Prof. F.K.A. Allotey	Commissioner
3.	Prof. F. O. Akuffo	Commissioner
4.	Mr. J. K. Hagan	Commissioner
5.	Mr. Seth Asante	Commissioner
6.	Dr. A. K. Ofosu Ahenkorah	Commissioner / Ag. Executive Secretary

1.3 Statutory Mandates

The statutory mandates of the Energy Commission include the following:

i. to serve as the Government's energy policy advisor by making national energy policy recommendations to the Minister of Energy;

ii. to advise the Ministry of Energy on national policies for the efficient, economic and safe supply of electricity and natural gas, having due regard to the national economy;

iii. to formulate national policies for the development and utilization of indigenous energy resources, in particular, renewable energy: solar, wind; biomass;

iv. prepare, review and update periodically indicative national plans to ensure that all reasonable demands are met;

v. to prescribe by legislative instruments standards of performance and technical and operational rules of practice for the supply, distribution, sale of electricity and natural gas to consumers by public utilities;

vi. to enforce the provisions of such legislative instruments uniformly throughout the country;

vii. to promote competition in the supply, marketing and sale of , renewable energy products and other forms of energy; and

viii. to promote energy efficiency and productive uses of electricity and natural gas.

The Commission has a professional and technical staff of forty-eight (48) persons. It is required by law to regulate, manage, and develop the utilization of energy resources in Ghana; to provide the legal, regulatory and supervisory framework for all providers of energy in the country: specifically by the granting of licenses for the transmission, wholesale, supply, distribution and sale of electricity and natural gas and related matters.

1.4 Mission, Vision and Values

The Energy Commission is fully committed to serving effectively and efficiently the national interest in the discharge of its statutory mandates and functions. The Commission is equally committed to accepting and dealing with the challenges that Ghana must meet head-on in its quest for a truly functioning competitive energy industry that creates affordable energy supplies, improves energy reliability, efficiency, and security, and above all, protects and enhances public safety, economic well-being, and environmental quality.

The Energy Commission welcomes investors, Ghanaian, African and foreign, in energy efficiency projects and programmes in a competitive market that would be efficient, effective and environmentally sound. As a one-stop regulatory body, the Energy Commission encourages building energy efficiency standards and insists on the use of energy efficient appliances as well as the development and deployment of alternative energy sources.

1.5 Structure

The organizational structure of the Commission comprises 3 main Directorates: the Natural Gas, Power and Renewable Energy Directorate; the Human Resources and Administration Directorate; and the Strategic Planning and Policy Directorate (which also includes the Social and Environmental Impact Assessment Division). Others include the Finance (Revenue and Accounts) and the Inspectorate Units.

1.6 Achievements

Within the ten years of its existence the Energy Commission has made significant contributions towards the development of a vibrant energy sector in the country. In 2007 the following were accomplished:

1) The Commission published The Strategic National Energy Plan, 2006 – 2020, the very first composite energy plan that covered all sectors of the economy and all available forms of energy;

2) The Commission established a licensing framework for service providers in the power and natural gas sectors;

3) A Classification and Permitting Framework for Bulk Customers of Electricity was developed and introduced.

4) The following licenses were developed:

    i. Thermal Generation License;
    ii. Electricity Transmission License;
    iii. Electricity Distribution and Sales License

5) The following regulations were developed, processed and passed by Parliament in 2007.

    a. Natural Gas Distribution and Sale (Technical and Operational) Rules, 2007, L.I. 1911;
    b. Natural Gas Distribution and Sale (Standards of Performance) Regulations, 2007, L.I. 1912; and
    c. Natural Gas Transmission Utility (Technical and Operational) Rules, 2007, L.I. 1913.

6) In addition to the above the Commission in 2007 developed the following Rules and Regulations and submitted them to Parliament and stakeholders for consultations and passage into law:

   a). Electricity Sale and Distribution (Standards of Performance) Regulations;

   b). Electricity Regulations, for wholesale electricity supply;

   c). Electricity Transmission (Technical, Operational Rules and Standards of Performance) Regulations.

7) The Commission successfully revived and organized the 2007 National Energy Symposium, ten years after the last one was held.

8) The first National Energy Statistics in ten years was prepared and published. The last one was prepared and published in 1997.

9) The Commission successfully coordinated the procurement, importation, transportation and distribution of 6 million Compact Fluorescent Lamps (CFLs) as a demand side response to the electricity shortages that hit Ghana from August 2006 to September 2007.

10) The Commission completed and put into operation a comprehensive Human Resource Policy and Procedures, to streamline human resource related issues in a transparent manner. The organizational structure of the Commission was re-aligned to the provisions of the Energy Commission act to streamline operations and to improve productivity. Three Directorates, namely Natural Gas, Power and Renewable Energy Directorate, Human Resource and Administration Directorate and the Strategic Planning and Policy Directorate were created. A Human Resource Manual was introduced to improve administrative effectiveness and transparency.

11) The Refrigerator Energy Efficiency Survey was completed. The results of the survey has provided the basis for the development of a comprehensive energy efficiency, labeling and market transformation programme to improve the energy efficiency of refrigerating appliances in Ghana to reduce energy waste in the country.

2.0 ACTIVITIES AND OPERATIONS

2.1 NATURAL GAS, POWER AND RENEWABLE ENERGY DIRECTORATE

2.1.0 Introduction

The Energy Commission has responsibility for matters relating to the development and regulation of the Natural Gas, Electricity and Renewable Energy supply industries in Ghana. This relates specifically to; licensing of service providers; elaboration of regulations and codes of practice, development and enforcement of standards and conduct of studies to determine the resource base of renewable energy forms, sources and potential in the country.

The Commission's mandate also includes inspection and monitoring of compliance with licensing terms and conditions, regulations, rules and codes of practice by energy service providers. The Natural Gas, Power and Renewable Energy Directorate is responsible for all activities of the Commission that relate to natural gas, electricity and renewable energy. The Directorate works directly with the Electricity and Natural Gas Technical Committee of the Commission.

2.1.1. Electricity and Natural Gas Technical Committee

The Electricity and Natural Gas Technical Committee set up in December 2005 successfully completed its second full year of service as an advisory body to the Commission on all technical matters related to the formulation, establishment and procedures for monitoring of rules and regulations for efficient development and operation of the domestic electricity and natural gas markets. The Technical Committee is made up of two sub-committees with responsibility for electricity and natural gas respectively.

2.2 NATURAL GAS

2.2.0 Introduction

The West African Gas Pipeline was scheduled to deliver the first free-flow of gas in April, 2007. Completion was rescheduled for November, 2007 but it is not yet clear when the first gas would be delivered. However, in view of the high expectation for the tremendous benefits that natural gas from Nigeria through the West African Gas Pipeline would contribute to the Ghanaian economy, the Energy Commission, which has the responsibility of developing, regulating, managing, monitoring and granting licenses for transmission, wholesale supply, distribution and sale of natural gas, has in the period under review, carried out some key activities for the realization of important objectives.

2.2.1 Natural Gas Rules and Regulations

The following regulations were prepared and passed by Parliament in 2007:

a. Natural Gas Distribution and Sale (Technical and Operational) Rules, 2007, L.I. 1911;
b. Natural Gas Distribution and Sale (Standards of Performance) Regulations, 2007, L.I. 1912; and
c). Natural Gas Transmission Utility (Technical and Operational) Rules, 2007, L.I. 1913.

The following additional draft Natural Gas Rules and Regulations were submitted to the Attorney General's Department for review and for further discussions with stakeholders before being laid in Parliament for approval and passage into law:

i. Natural Gas Transmission Utility (Standards of Performance) Regulations; and

ii. Natural Gas Occupational, Health and Safety (Standards and Procedures for Construction, Operation and Maintenance of Facilities) Regulations.

2.2.2 Development of Natural Gas Licensing Manual

A Natural Gas Licensing Manual was developed. This document will serve as a guide for licensing requirements for prospective Natural Gas Service Providers, namely the transmission utility, distribution companies and wholesale suppliers.

2.2.3. Regulating and Metering Stations at Takoradi and Tema

The progress of works at the Takoradi Regulating and Metering Station which will receive natural gas from Nigeria was 99.9% complete. The installation of a Chromatograph Analyzer will complete the construction of the Regulating and Metering Station which will be ready to receive the Nigerian natural gas. The installation is expected to be completed by mid-January 2008. The progress of construction works at the Tema Regulating and Metering Station was about 60% complete.

2.2.4. Seminar on Clean Development Mechanism (CDM) and Carbon Trading.

The Energy Commission in collaboration with the Environmental Protection Agency organized a seminar on Clean Development Mechanism (CDM) and Carbon Trading which sought to address the environmental and financial benefits that can accrue to industries that will switch to the use of natural gas as a replacement for liquid fuels in line with the provisions of the Kyoto Protocol. The Seminar provided the opportunity to stakeholders to understand CDM processes and the financial benefits that could accrue to industries, individuals and the nation as a whole.

2.3. POWER

The Electricity Sub-Committee of the Technical Committee in 2007 focused its deliberations on the following issues:

i) Completion of permanent licences to be issued to service providers in the electricity supply industry;

ii) Completion of the draft standard of performance regulations for electricity distribution and supply for consideration by Parliament; and

iii) Development of rules and regulations for the establishment of the wholesale power supply market.

2.3.1. Licensing

The Commission formally established the licensing framework as required under Act 541 to facilitate the issue of final licences to service providers engaged in the electricity supply and distribution industry in Ghana. Permanent licences were elaborated for the three segments of the industry and these are expected to be issued to both existing and new service providers engaged in the industry. One permanent Wholesale Supply Licence was issued to Cenpower Generation Limited of Ghana, an independent power producer, to construct and operate a 400MW thermal power plant at Kpone, near Tema. Three other wholesale supply applications were received from the VRA (126MW), Tema Osonor Power Plant Ltd (126MW) and Sunon Asogli Power Company Ltd (200MW), all seeking to build various sizes of power plants at Tema. It is anticipated that all existing service providers operating with provisional licences issued by the Commission will regularize their operations by securing permanent licences in the course of 2008.

2.3.2 Regulations, Rules & Standards

Activities undertaken during 2007 under this mandate of the EC included the following:

i. Completion of review of the draft Standards of Performance Regulations for Electricity Distribution & Supply;
ii. Completion of drafting of rules and regulations for wiring and electrical installations;
iii. Drafting of regulations for the establishment of the Wholesale Electricity Supply Market;
iv. Development of draft National Grid Code for operations of the National Interconnected System (NIS) and legislation for enforcement; and
v. Public education on enacted legislations on Energy Efficiency Standards and Labelling of Electrical Appliances (L.I. 1815) and Technical & Operational Rules for Electricity Supply & Distribution (L.I. 1816)

2.3.3 Standards of Performance Regulations for Electricity Distribution & Supply

Stakeholder consultations on the draft Standard of Performance Regulations were held during the first quarter of the year to discuss the proposed benchmarks and feasibility of its implementation,

given their potential impact on the finances and operations of the service providers. The draft regulations were updated following this activity and have since been forwarded to the Ministry of Energy and the Attorney General's office for further processing and enactment into law by Parliament.

2.3.4 Development of Wiring Regulations

The objective of this activity is for the establishment of a licensing and enforcement regime for electrical contractual services to curb the rampant incidence of electrical fires resulting mainly from substandard wiring practices.

A technical team of experts drawn from the industry was set up by the Commission to review and update the existing wiring standards and regulations. The Committee substantially completed its initial review and update work in December 2007. The draft Wiring Regulations is expected to be subjected to further review by the Commission's Electricity & Natural Gas Technical Committee to be followed by the drafting and enactment of a legislative instrument to be issued by the Minister for Energy under Section 56 of the Energy Commission Act, 1997 (Act 541), to facilitate its enforcement.

2.3.5 Rules and Regulations for the Establishment of Wholesale Electricity Market and Development of the National Grid Code and Electricity Market Rules

As required under section 56 of Act 541, the rules and regulations for the operation of the wholesale electricity supply market (WESM) are being developed with a view to enhancing transparency and promoting private participation in the sector. Whilst establishing the rules & regulations for the WESM, the EC is required under section 28 of the Act to develop the technical and operational rules of practice (i.e. the Grid Code) for the operation of the National Interconnected Transmission System (NITS). In this regard draft market rules to guide market operations and a draft Grid Code to guide technical operations of the NITS by the Electricity Transmission Utility have been developed for further consideration and adoption by stakeholders.

Meanwhile, draft legislations for the establishment of the wholesale electricity market and technical operations of the national interconnected system (NIS) to guide the Electricity Transmission Utility's operations were finalised and presented to the Ministry of Energy and the Attorney General's Office for further processing and enactment into law by Parliament.

2.3.6 Study of the Impact of Load Shedding Programme on the National Economy

The country embarked on a load-shedding exercise in August 2006 as a result of shortage in the supply of power. The exercise was implemented nationwide, and with the exception of some strategic installations, it affected all categories of consumers, residential, commercial and industrial.

The load shedding exercise which continued until the third quarter of 2007, was intended to lead to a reduction of about 300MW, about 21% of the then power demand. This study was therefore commissioned in mid-year 2007 to assess the full impact of the load-shedding programme on the national economy and to make recommendations as to how to minimize such impacts in the future. The preliminary findings of the study were presented at the National Energy Symposium held in November 2007. The final report is expected in 2008.

2.3.7 Inspection & Monitoring Compliance

The Takoradi Thermal Power Station Complex and the Osagyefo Power Barge, which is still docked at the Effasu berth, were visited to carry out routine inspection checks and compliance monitoring activities during the year. The TICO and TAPCO power plants were found to be in very good condition and operating within stipulated environmental limits as reported in their respective quarterly performance statistics submissions. Both plants reported high availability and capacity utilization factors during the period mainly because of low levels of water in the Akosombo reservoir which required that more power was produced from the thermal plants. Both power plants were found to have been configured to receive and run on natural gas fuel and were awaiting the delivery of Nigerian gas through the West Africa Gas Pipeline, when it is commissioned.

The Osagyefo Power Barge located at Effasu continued to receive good maintenance attention from the dedicated staff provided by VRA to keep the barge in good condition void of rust and undue deterioration arising from non-operation. In August 2007, the Ministry of Energy signed an agreement with Balkan Energy Ltd. to rehabilitate the plant on the barge and put it into service. When operational the plant is expected to add 125MW to the generation capacity of the country. The site for Cenpower generating plant was also visited to ascertain the progress of work. The land had been cleared and demarcated, ready for work to begin.

Air-conditioner and CFLs retail outlets in Accra were inspected to check the extent of compliance of the energy efficient and appliance labelling regime established under L.I .1815. It was found that importers had flouted the law with impunity and appropriate warning letters were issued to the defaulting retail outlets.

2.3.8 Managing the Power Crisis: The National Efficient Lighting Project (CFL Distribution)

As part of measures to mitigate the impact of the electricity shortage that hit the country in the latter part of 2006 through the first half of 2007, the Government of Ghana took a decision to replace 6 million incandescent filament lamps with an equal number of energy saving Compact Fluorescent Lamps (CFLs) within three (3) months. The Energy Commission was charged with the responsibility of coordinating the importation and transportation of the lamps to district and regional centers for distribution throughout the country. In all 5,921,000 CFLs and 155,500 T5 energy efficient fluorescent lamps were imported at an estimated total cost of about US$14.7million.

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2.3.7 Inspection & Monitoring Compliance

The Takoradi Thermal Power Station Complex and the Osagyefo Power Barge, which is still docked at the Effasu berth, were visited to carry out routine inspection checks and compliance monitoring activities during the year. The TICO and TAPCO power plants were found to be in very good condition and operating within stipulated environmental limits as reported in their respective quarterly performance statistics submissions. Both plants reported high availability and capacity utilization factors during the period mainly because of low levels of water in the Akosombo reservoir which required that more power was produced from the thermal plants. Both power plants were found to have been configured to receive and run on natural gas fuel and were awaiting the delivery of Nigerian gas through the West Africa Gas Pipeline, when it is commissioned.

The Osagyefo Power Barge located at Effasu continued to receive good maintenance attention from the dedicated staff provided by VRA to keep the barge in good condition void of rust and undue deterioration arising from non-operation. In August 2007, the Ministry of Energy signed an agreement with Balkan Energy Ltd. to rehabilitate the plant on the barge and put it into service. When operational the plant is expected to add 125MW to the generation capacity of the country. The site for Cenpower generating plant was also visited to ascertain the progress of work. The land had been cleared and demarcated, ready for work to begin.

Air-conditioner and CFLs retail outlets in Accra were inspected to check the extent of compliance of the energy efficient and appliance labelling regime established under L.I .1815. It was found that importers had flouted the law with impunity and appropriate warning letters were issued to the defaulting retail outlets.

2.3.8 Managing the Power Crisis: The National Efficient Lighting Project (CFL Distribution)

As part of measures to mitigate the impact of the electricity shortage that hit the country in the latter part of 2006 through the first half of 2007, the Government of Ghana took a decision to replace 6 million incandescent filament lamps with an equal number of energy saving Compact Fluorescent Lamps (CFLs) within three (3) months. The Energy Commission was charged with the responsibility of coordinating the importation and transportation of the lamps to district and regional centers for distribution throughout the country. In all 5,921,000 CFLs and 155,500 T5 energy efficient fluorescent lamps were imported at an estimated total cost of about US$14.7million.

2.4 RENEWABLE ENERGY RESOURCES

2.4.0 Introduction

The EC is responsible for providing policy recommendations to government on matters related to renewable energy and its efficient utilization. The EC also oversees the development of regulations, codes and standards and licensing framework for the renewable energy market.

Activities undertaken during the period under review covered the following:

1. Renewable Energy Regulations
2. Development of Standards for Solar Systems and Permitting Manual
3. Off-grid Rural Electrification
4. Biofuels Programme
5. Wind Resource Measurement
6. Inspection, Licensing & Monitoring of Renewable Energy Service Providers
7. Pilot Mini-hydro Plant

2.4.1 Renewable Energy Regulations

Although Ghana is endowed with abundant renewable energy resources the legal and regulatory frameworks which will stimulate the massive development of the country's renewable energy resources and adoption of renewable energy technologies through the injection of private capital into the sector are non existent.

The EC has initiated measures for the preparation of Renewable Energy Policy and Regulatory Framework and a Renewable Energy Law for Ghana. The World Bank has expressed satisfaction with the EC moves and agreed to support the activity financially. It is expected that a draft legislative framework and law would be completed by the end of 2008 to enable further stakeholder consultations.

2.4.2 Standards for Biofuels and Solar Systems, and Permitting Manual

To ensure high acceptability and quality of renewable energy services and systems in the country, the Energy Commission in collaboration with the Ghana Standards Board drafted the National Standards for Biofuel and Solar Systems. These are the Biodiesel fuel (B100), Bioalcohol-Ethanol (Ed75-Ed85) and Denatured fuel ethanol and the Solar PV Systems Specifications.

The documents are currently been reviewed by local and international experts after which they would be gazetted and disseminated.

2.4.3 Off-Grid Rural Electrification Project

The EC continued its Off-Grid Rural Electrification Projects. Eighteen (18) solar systems comprising 15 solar streetlights and 3 school systems were installed at Moshiekrom, Nyame-Na-Ose, New Essilifikrom and Old Essilifikrom, all in the Central Region. The objective of the project

was to support the National Electrification Scheme, as well as promote Renewable Energy Systems for rural electrification.

The solar security light systems that were installed at Kubease and Atuna CEPS outposts and Daboro, Adenta and Ashiaman Police barriers in 2006 were also monitored. The results of the exercise revealed that all systems were functioning well. CEPS and the Police Service indicated that the solar security light systems were enhancing their work, especially in the night.

2.4.4 Biofuels Programme

During the period under review, KNUST and the Institute of Industrial Research of CSIR were contracted to conduct research into, and to establish the chemical composition and characteristics of biodiesel produced from soya beans and jatropha oil as diesel substitute for vehicle engines, corn mill engines, etc., and as kerosene substitute for lighting. The project is on-going.

A stakeholder list was compiled by follow-up trips to all private biofuels feedstock production and biodiesel generation sites to ascertain the core activities of the stakeholders on the levels of:

1. scale of production;
2. purpose of production eg, environmental as in the case of AngloGold and seeds production for export in the case of Jatropha Africa;
3. types of machines and equipment used, and;
4. project location and staff strength;

2.4.5 Wind Resource Measurements

The wind speed measurement projects being carried out at four (4) sites continued during 2007 with collection of wind speed data. Analysis of the consolidated data (data collected in 2006 and 2007) is presented in table 2.4.1.

Table.2.4.1: Annual average wind speeds at 50 m at Anloga, Amedzofe, Nkwanta and Kue

Location	Anloga	Amedzofe	Nkwanta	Kue
Hours of data collected, hrs	14,598	14,550	12,686	12,420
Percentage of data above 6m/s, %	65.68	30.80	14.80	5.70
Annual Average wind speed at 50m height, m/s	6.80	5.00	4.00	3.40

Figure 2.4.1 shows the monthly average wind speeds at the various sites.

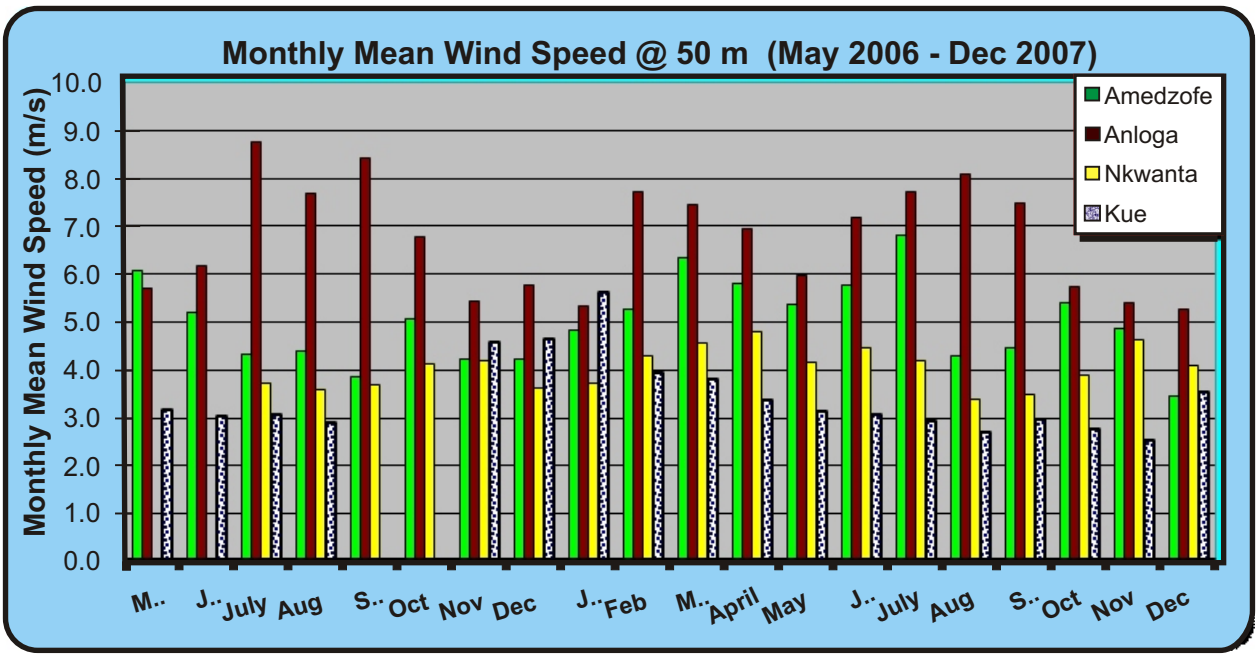
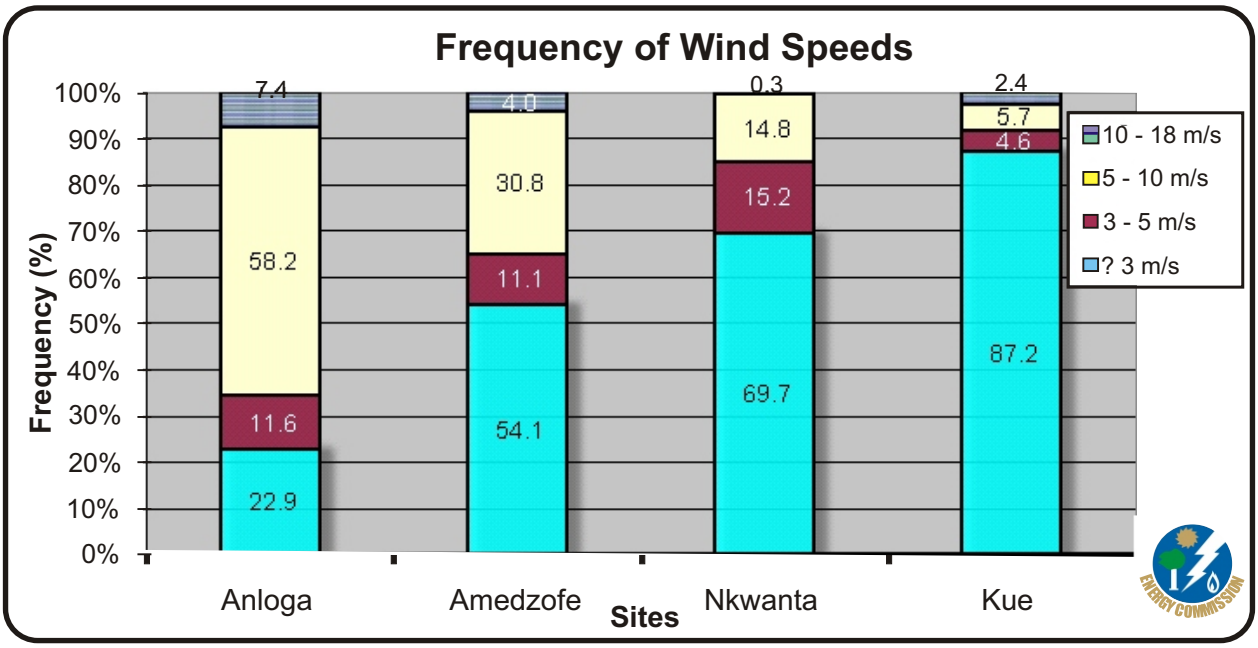


Figure 2.4.1: Monthly Mean Wind Speed for Amedzofe, Anloga, Nkwanta and Kue

Out of the 14,500 hours of data collected at each of the locations (Anloga, Amedzofe, Nkwanta and Kue), more than 65.6% were above 6 m/s at Anloga. In the case of the other locations more than 65.2%, 84.9% and 91.8% were below 6 m/s for Amedzofe, Nkwanta and Kue respectively. This suggests that the Anloga site has a favourable wind regime for the development of a grid connected wind farm.

The frequency of wind speeds at the 4 sites is shown in Figure 2.4.2 below:

Figure 2.4.2.: Frequency of Wind Speeds from May 2006 – December 2007



2.4.6. Inspection, Licensing and Monitoring of Renewable Energy Service Providers

During the period under review, the Commission granted 4 companies permit to export charcoal from wood waste generated by sawmills located in the Brong-Ahafo, Eastern and Western Regions.

Figure 2.4.3: Monitoring exercise being conducted by officials from the Forest Services Division, Environmental Protection Agency and Energy Commission.

Compliance monitoring was conducted on the production facilities of the charcoal exporters. The objective of the monitoring exercise was to ensure that the charcoal exporters comply fully with the permit conditions. The exercise confirmed that the source of wood for charcoal production was wood waste and off-cuts and that charcoal was produced using earth mounds and cylindrical metal kilns.

Data received from the Ministry of Trade, Industries & PSI indicated that 3,623 tonnes of charcoal was exported in 2007, representing an increase of 23.8% over the previous year. This increase was attributed to the export of carbonized coconut husk.

The Netherlands, United Kingdom, Belgium and Germany were the destinations of charcoal exported from Ghana. Figure 2.4.4 shows the charcoal export trend from 2000 to 2007.

Figure 2.4.4: Charcoal Export from 2000 to 2007, GCNet.

Three (3) companies, namely, Energea Ghana Ltd., Bioce Fuel Farm Ghana Ltd. and Greenfuel Biofuel Company Ltd. applied for permits to establish bio-diesel plants for the production of biodiesel.

3.0 STRATEGIC PLANNING AND POLICY DIRECTORATE

3.1.0 Introduction

The Energy Commission is required by law to prepare, review and update periodically indicative national plans to ensure that all reasonable demands for energy are met in a sustainable manner.

In fulfillment of this mandate, the Commission compiles and collates energy production, transportation, distribution and consumption data as well as economic and demographic data. The data is then used to develop and analyze viable policies that will ensure sufficient and sustainable energy to support the socio-economic development of the country. The impact of energy policies on the society and the environment is also analyzed to reduce negative impact of energy policy on the society and the environment. The Strategic Planning and Policy Directorate is made up of two divisions: Strategic Planning and Policy Division and Social and Environmental Impact Assessment Division.

3.2 STRATEGIC PLANNING AND POLICY DIVISION

3.2.1 Publication of Strategic National Energy Plan 2006 – 2020

The Strategic National Energy Plan (SNEP) is a comprehensive way of looking at the available energy sources and resources of the country and how to tap them economically and timely to ensure a secured and adequate energy supply for sustainable economic growth now and for the future. SNEP reports comprise a main report which outlines the policies and four appendices covering in detail the following:

i. Electricity Plan;
ii. Petroleum Plan;
iii. Renewable Energy and Woodfuel Plan; and
iv. Energy Demand Sectors

The publications were distributed to stakeholders and the public. All five volumes are available for download from the Energy Commission's website -*www.energycom.gov.gh.*

3.2.2 National Energy Statistics 2000 – 2005

National Energy Statistics is a statistical handbook of energy production, transportation, usage and losses in the country. This first edition contains figures for the years 2000 to 2005 in the areas of electricity, petroleum and renewable energy, including woodfuel sectors.

The handbook has been completed, printed and distributed to both stakeholders and the public. The National Energy Statistics for 2006 is attached to this report as **Appendix 1**.
Data for 2007 are being collected and compiled to enable an update of the handbook.

3.2.3 National Energy Data Processing and Information Centre (NEDPIC)

The Energy Commission is mandated under Act 541 to establish a comprehensive national energy database for effective energy planning and policy formulation to guide the management and the utilization of energy resources. The Commission has been without this facility since its creation and therefore began a procurement process to establish the Energy Data Processing and Information Centre. The centre is expected to be operational in 2009.

3.2.4 Industrial and commercial energy use survey

The industrial sector, especially the manufacturing sub-sector, is expected to lead in the rapid socio-economic transformation of the Ghanaian economy from a low-income to a middle-income country with US$1,000 per capital GNP by 2015. After a downward trend in annual growth from a peak of 6.4% in 1997 to 2.9% in 2001, the industrial sector has recovered steadily to growth rates of 4.7% in 2000 and 5.1% in 2003. The recovery is however not satisfactory when set against the government target of 12% annual growth by 2007. Unreliable energy supply has been listed as one of the obstacles to more rapid industrial growth. Diesel used for standby generation increased from about 37,000 tonnes in 2001 to over 80,000 tonnes in 2004. Diesel generation on the other hand costs more than twice the cost of grid electricity.

The objective of this survey is to use the data to compute the cost of un-served grid electricity (energy) in the country. Furthermore, whilst data on energy supply can easily be obtained from producers like VRA and Tema Oil Refinery, it is not so with data on energy generated and used by industries and commercial entities. The industries have to be visited for the data and then analyzed to establish the right economic sectoral consumption shares. The last time primary field data for industries and the commercial sector was collected was in 2001. The exercise would therefore present an opportunity to update the share of energy profiles in the industrial and commercial/services sector. The survey has commenced and is on-going.

3.2.5 IAEA-Ghana Capacity Building Project: Planning for Sustainable Development

The International Atomic Energy Agency (IAEA) is assisting Ghana to develop its energy planning capacity by training a core of Ghanaian energy professionals in IAEA energy modeling tools.

Some selected staff of the Commission and others from major stakeholder organisations were trained in the use of the Model for Energy Supply Strategy Alternatives and their General Environmental Impacts (MESSAGE Model) during the year. Two professionals from the Energy Commission and the Ghana Atomic Energy Commission benefited from a two-month intensive training held in South Africa and sponsored by the IAEA.

The project is on-going and a number of activities have been outlined to ensure successful execution of the project. The activities outlined include the following:

i. Workshop for the completion of the Wien Automatic System Planning Package (WASP IV) model analysis.
ii. Writing of Model for Analysis of Energy Demand (MAED) and WASP IV Reports
iii. Two-week National Training Workshop on the use of the MESSAGE model
iv. Workshop for the analysis of Ghana Reference Energy system using the MESSAGE model
v. Workshops for the presentation of MAED, WASP IV and MESSAGE model results to the National Steering Committee.

3.2.6 National Energy Symposium

As part of the strategies to support manpower development in the energy sector of the economy, the Energy Commission began the revival of the biannual national energy symposia where issues and innovations in the energy sector are shared and discussed. The national energy symposium concept was conceived and developed by the Energy Research Group (ERG) in the mid 1980s as a platform to share and discuss pertinent energy issues particularly, renewable energy resources. Even though the national energy symposia were being organized by ERG, most of the funding support was from the Energy Fund through the erstwhile National Energy Board (NEB) and later, from the Ministry of Energy.

The objective is to provide a platform for sharing information among energy researchers and practitioners and as well serve as an avenue to attract professionals to the energy sector. The revived National Energy Symposium was successfully held in November, 2007. A Symposium communiqué has been issued and is available at the Commission.

3.2.7 Climate Change Mitigation Assessment

This is a joint project with the Environmental Protection Agency (EPA). The UN Framework Convention on Climate Change (UNFCCC) requires Parties to the Convention to their national communications to outline GHG emissions sources and measures to combat the emissions. One of the key responses that countries can make is to adopt measures that can reduce atmospheric accumulation of Greenhouse Gases (GHG) and thereby delay the predicted impact of GHG on global climate. Such measures may either reduce GHG emissions (abatement) or increase terrestrial storage of carbon (sequestration). Because these measures can moderate GHG, they are termed “mitigation” options. A mitigation assessment involves a national-level analysis of the potential costs and impacts of various technologies and practices that have the capacity to mitigate climate change.

The project is on-going and the first draft report on the Energy Technology Assessment has been developed and submitted to the EPA for study.

3.2.8 Comparative Studies on Coal & Nuclear Power Generation in Ghana

Ghana's electricity sector has suffered from intermittent crises in supply as the growth in demand for electricity has grown considerably over the past decades, while the main hydro resources at the Akosombo and Kpong generating plants have suffered from inadequate water inflows at different periods during the past two decades 1983 – 2006. Consequently, concern has been expressed as to the most appropriate means of power generation that would be sustainable, ensure energy supply security for the nation and of economic merit. Another school of thought is for the country to have an optimized technology for generating electricity. The two technologies that have not featured prominently in the planning and analysis of the energy situation in Ghana are coal and nuclear technologies.

The Commission was invited to participate in a study to examine the two technologies, assess their comparative advantages for the nation in terms of least cost, environment and financing, as to which of them could be implemented earlier.

The programme which involved desk top studies on the comparative merits of coal and nuclear power plants for Ghana was conducted by a Committee set up by His Excellency, President J.A Kufour under the chairmanship Prof. Daniel Adzei Bekoe, Chairman of the Ghana Atomic Energy Commission (GAEC), who is also the Chairman of the Council of State, to look at the possibility of including nuclear power in Ghana's energy supply mix.
The study was completed in December 2007 and is expected to be presented to Cabinet early in 2008.

3.3 SOCIAL AND ENVIRONMENTAL IMPACT ASSESSMENT

3.3.0 Introduction

To enable the Commission improve the quality and coherence of the energy policy development process, it is required that all energy development activities undergo social, economic and environmental impact assessments.
The Social and Environmental Impact Assessment Division was created in 2007 to contribute to the Commission's work; by studying and making recommendations that will achieve sustainable energy development as well as maintaining a regulatory environment that ensures health and safety.
In 2007, the Social & Environmental Impact Assessment Unit carried out the following studies:

- Study of the Effects of the Upward Adjustment of Electricity Tariffs (a case for electricity consumers using back-up electric generators); and

- A Study of the Market for Imported Used Refrigerators and Freezers.

3.3.1 Study of the Effects of the Upward Electricity Tariff Adjustment

The objective of the survey was to evaluate consumer opinion on tariff increases for residential and non-residential customers and, in particular, customers using electricity generating sets as back up to grid electricity.

The survey found out the following:

- As a result of the load shedding exercise there was a 50% increase in the acquisition of electric generating sets among grid electricity users;
- Majority of grid electricity consumers using electric generating sets were spending GH¢ 0.35 kWh in generating their own electricity compared to the normal grid electricity tariff of GH¢ 0.07kWh;
- Over 70% of grid electricity consumers using back-up electric generating sets assessed the electricity crisis management programme as successful;
- 54% of residential customers accepted a general tariff increase, 43% rejected outright any increase and 3% were indifferent. Out of the 54%, 36% proposed a 10% increase and 14% proposed a 20% increase; the remaining 4% proposed an increase of not more than 1%.
- In the case of non-residential customers 66% supported a general increase in electricity tariff whiles 31% rejected outright any tariff increase and 3% were indifferent;
- Out of the 66%, who supported a general increase in tariffs, 27% accepted an increase of 20-30%. This represented the consumer group that responded positively to the 20-30% increase in tariff proposed by the PURC; and
- The Load Shedding Exercise brought with it an increase in energy efficiency and conservation awareness among all categories of grid electricity consumers.

The following three recommendations were made by the participants in the survey:

- A nationwide awareness programme on intended levels of tariff adjustment should be embarked on;
- A continually based national energy efficiency and conservation programme targeted at consumer awareness creation should be developed and implemented; and
- Funds should be raised to support the project on pre-paid meters. A good proportion of customers support the policy to change all credit meters to prepaid meters in order to improve the debt recovery rate of the Utilities

3.3.2 A Study of the Market for Imported Used Refrigerators and Freezers in Ghana

The objectives of the survey were to:

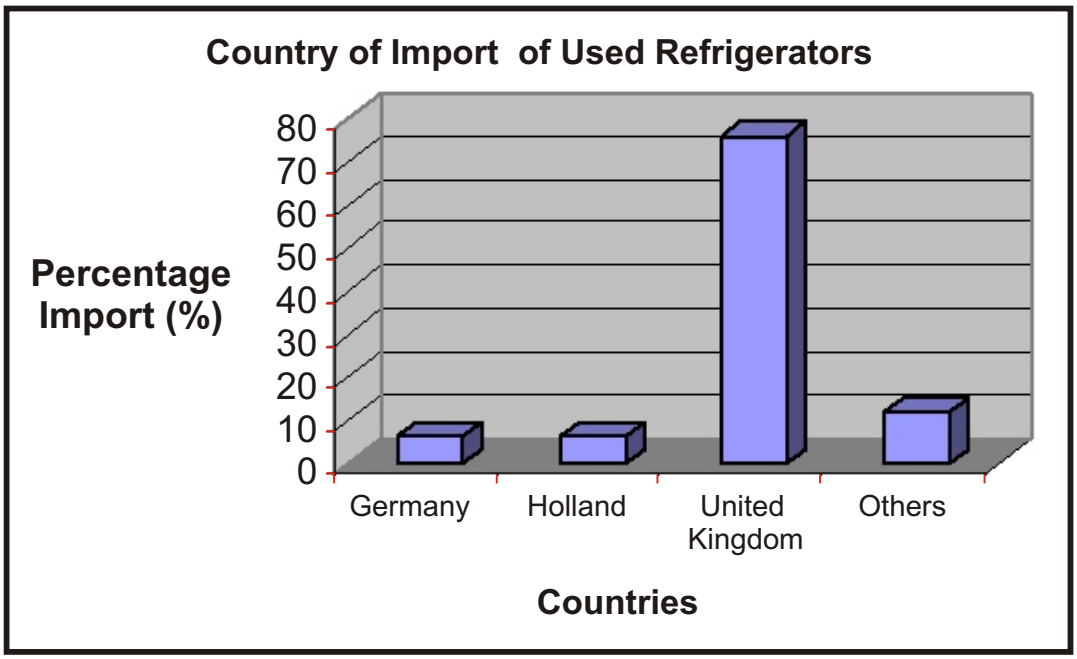
i) collect information on quantity and value of imported used refrigerators and freezers;
ii) identify the number of vendors involved in the importation of these fridges;
iii) examine the impact of a possible ban on the importation of used refrigerators; and
iv) assess the level of awareness among vendors on energy efficiency standards and appliance labelling.

The survey made the following findings:

- The official records by CEPS revealed that in 2006, 195,000 units of used refrigerators and freezers were imported into the country. However in the assessment of the vendors themselves it was revealed that the figure may be higher.; and

- Given the quantity of used refrigerators imported in 2006, 76% were from the UK, 6% each from Germany and Holland and the remaining 12% from other countries.

View chart below.



- The survey identified about 296 vendors of imported used refrigerators in the country;

- Out of this number 38% were located in Accra, 35% in Kumasi, 17% in Takoradi, 8% in Tema and 2% in Nkawkaw;

- The price of imported used refrigerators and freezers were found to be between 50% and 300% lower than the price of new models of the same brand;

- The survey revealed that 24% of the dealers favoured a ban on the importation of used refrigerators without any excuses; another 14 % also favoured the ban but were concerned about the possible job losses and financial constraints; whilst 48% rejected any ban for fear of losing their jobs and the remaining 14% were indifferent;

- On the issue of energy efficiency labelling, 91% of the vendors admitted that they had no knowledge of the subject, whilst 9% admitted that they were aware and knew what energy efficiency labelling was.

A follow-up activity revealed that the UK and many countries in the EU embarked on an exercise to get rid of inefficient refrigerators by the passage of legislation in 2004. This might have led to the dumping of the old refrigerators on the Ghanaian market.

4.0. HUMAN RESOURCES DEVELOPMENT AND ADMINISTRATION

4.1.0 Introduction

The Commission continued to spearhead its objective of efficient and effective people management and corporate governance to ensure increased productivity in the fulfillment of the Commission's statutory mandates.

4.1.1 Staff Training and Development

The Commission collaborated with relevant training/development institutions and universities and succeeded in training a total of 17 staff in various fields relevant to the development of the energy sector.

4.1.2. Human Resource Policy and Procedures

Human resource management hitherto had been practiced on ad hoc basis resulting in incidences of unfairness, inconsistencies and general apathy on the part of staff of the Commission. A directional guide was found in the provision of a Human Resource Policy and Procedures document. The objective of this activity was to restructure and streamline daily administration and human resource management. The new HR Policy and Procedures was approved for implementation in 2007.

4.1.3. Human Resource Management Computerization

Since its inception, the Commission has relied heavily on manual management of information, especially staff records, despite the many mix-ups, inaccuracies, omissions and loss of vital information associated with the manual system. The Commission therefore vigorously pursued an HR management computerization programme to forestall identified shortfalls of the old system of HR management through an automated HR management system. A few interrelated activities outlined to complete the process could not be undertaken because the provider's license expired. The Service Provider has, however, since agreed to re-activate at his own cost and get the project running.

4.1.4 Selection and Recruitment of Staff

With the arrival of Natural Gas on the shores of Ghana, the Commission's mandate and responsibility regarding the development of regulations and the management of a natural gas secondary market became very important. This called for additional professional expertise to enhance the existing workforce and to beef up existing professional expertise for efficient and effective discharge of responsibilities.

4.1.5 Vehicle Management Computerization

Running costs of the Commission's official fleet of vehicles were noted to be soaring by the day due to age. Vehicle management computerization would help track causes and effects as well as offer possible remedies through effective monitoring. The objective of this activity is to automate vehicle management.

4.2 PUBLIC EDUCATION

4.2.0 Introduction

Public education in 2007 was concentrated on educating the general public on regulations that had been developed and passed by the Energy Commission. Specifically, the rights and responsibilities of citizens were highlighted.

4.2.1. Public Education on Ghana Energy Efficiency Standards and Appliance Labeling Programme

Ghana is operating a Mandatory Appliance Standards and Labelling regime under which importers and retailers of room air conditioners and compact fluorescent lamps (CFLs) are required to import and sell only products that meet minimum efficiency and performance standards as approved by the Ghana Standards Board, and are labeled accordingly. The programme is designed to ensure that only appliances that meet minimum energy efficiency standards enter the Ghanaian market. In accordance with the provisions of the Energy Efficiency Standards and Appliance Labelling (Non-ducted Air-conditioners and Self Ballasted Fluorescent Lamps) Regulations, 2005, (LI 1815) appliance manufacturers who export to Ghana and retailers who sell in Ghana are obliged to display a label which indicates the energy rating of the product before the first retail sale. To bring to the attention of the General Public the provisions of L.I 1815, the Commission embarked on a nationwide public education campaign to create awareness and to publicize the Legislative Instrument.

4.2.2. Interaction with CEPS Officers

To ensure that only the prescribed appliances enter the Ghanaian market an awareness programme was carried out among officers of the Customs, Excise and Preventive Service (CEPS). The motive for so doing, was that the Ghanaian ports of entry as the first point of entry for all goods into the country were manned by CEPS officers who therefore needed to be sensitized so as to take the appropriate actions to prevent the Ghanaian market from becoming a dumping ground for inefficient appliances that do not meet the standards set out in L.I. 1815. Officials of the Energy Commission met with officers of CEPS during the month of February, 2007 at the Kotoka International Airport, Tema Port, James Town, Aflao, Kumasi, Sunyani, Gonokrom, Bolga, Takoradi, Elubo and Headquarters with all sector commanders in attendance.

4.2.3 Public Awareness Campaign and Information Dissemination

Special Public education and awareness campaigns that were started in Takoradi, Kumasi and Tamale in June, 2006 were continued in the Brong-Ahafo, Ashanti, Central and Western Regions in May and June, 2007. Presenters from sixteen radio stations throughout the Region were in attendance. In Accra, the Commission had an interaction with leading Morning Show presenters and editors from some press houses as part of the public education on the L.I. 1815. Jingles on the L.I.1815 were produced in local languages such as Akan, Hausa, Ga and Ewe and aired on some radio stations in the country.

Various advertisements and public notices on the L.I. 1815 were carried in the Daily Graphic and Ghanaian Times in the course of the year. Some of the adverts and public notices were specifically targeted at importers of Air-conditioners and Compact Fluorescent Lamps, reminding them of the provisions of L.I.1815. One such advert reminded the general public of what to look for in an appliance label, whilst others cautioned importers who have attempted to deceive the public by affixing labels with the wrong information.

The Commission produced flyers on the L.I. 1815 and distributed them through the Ghanaian Times, Accra Daily Mail and Daily Guide Newspapers as pull-outs. In addition, the public were educated on the standards and labeling programme through the distribution of the flyers using the postal system. Copies of the flyers were posted to every postal box owner throughout the Country. Members of the general public who go to post offices throughout the country to do business are also given the flyers at the counters. The Ghana Post Company Limited is distributing 300,000 flyers on behalf of the Commission.

As part of the Public Education Campaign on the Energy Efficiency Standards and labeling programme, the Commission has produced Car-Stickers to be used as part of the campaign programme. The Car-Sticker programme will use the outfits of the Driver & Vehicle Licensing Authority (D.V.L.A) and the Ghana Private Road Transport Union (G.P.R.T.U).

5.0 INTERNATIONAL CO-OPERATION

5.1.1 World Energy Council (WEC) Reorganization Activities

The effort and drive to encourage energy affiliated agencies and institutions to subscribe to the membership of the Ghana Committee of the World Energy Council (WEC) which was formally established in 2005 continued.

The Commission participated in WEC Africa Regional forum in Gaborone, on the implementation of the Grand Inga Dam Project. Later in the year the Commission also participated in a workshop organized under the auspices of the WEC Africa on Power Generation Plant Performance Standards held in Windhoek, Namibia. However, the Commission could not participate in the World Energy Congress held in Rome, Italy due to other sub-regional engagements.

Appendix I

Audited Financial Statements for the Year Ended 31st December, 2007

Head Office	Frema House Plot No. 40 Spintex Road Accra
Bankers	Bank of Ghana Ecobank Ghana Limited Ghana Commercial Bank Limited Ghana International Bank plc
Auditors	State Enterprises Audit Corporation 4th Floor Republic House P. O. Box M.198 Accra

ENERGY COMMISSION

REPORT OF THE COMMISSIONERS

The Commission has the pleasure to present to the Honorable Minister of Energy the audited financial statements of the Commission for the year ended 31st December, 2007 and report as follows:

Principal Activities
The principal activities of the Commission include the regulation and management of the utilization of energy resources in Ghana and the co-ordination of policies relating to them.

In particular to:

- advise the Minister of Energy on national policies for the efficient, economical, and safe supply of electricity, natural gas, and petroleum products having due regar to the national economy;

- provide legal, regulatory and supervisory framework for providers of energy (i.e. licensing, monitoring compliance, prescription of rules and regulations by legislative instruments);

- recommend national policies for the development and utilization of indigenous energy resources.

The Commission is also responsible for the management and administration of the Energy Fund which for this purpose includes the Controller and Accountant-General or his representative.

Significant Achievements
Some of the significant achievements of the Commission during the year under review were:

(i) The publication of 'The Strategic National Energy Plan 2006 – 2020; being the very first energy plan that covered all sectors of the economy and all available forms of energy;

(ii) The development of legislative framework, rules and regulations for the various stakeholders in the energy sector;

(iii) The organization of National Energy Symposium, ten years after the last one was held;

(i) The preparation and publication of the National Energy Statistics, the last one was prepared and published in 1997; and

(v) The successful distribution of six million Compact Fluorescent Lamps (CFLs) as a demand Side response to the electricity shortage that hit Ghana from August 2006 to September 2007.

Results	**GH¢**
The Commission made an excess of income over expenditure of	140,202
To which is added the balance on Accumulated Fund Account brought forward of	185,022
To arrive at balance on Accumulated Fund Account carried forward of	325,224

BY ORDER OF THE COMMISSION

COMMISSIONER

COMMISSIONER

ENERGY COMMISSION

REPORT OF THE INDEPENDENT AUDITORS FOR THE YEAR ENDED 31ST DECEMBER, 2007

We have audited the financial statements of the Commission set out on pages 4 to 6 which have been prepared under the historical cost convention and on the basis of the accounting policies set out on page 7.

Respective responsibilities of the Commissioners and Auditors
The Commissioners are responsible for the preparation of the financial statements. It is our responsibility to form an independent opinion, based on our audit, on those statements and to report our opinion thereon.

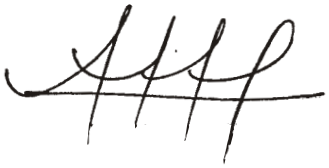
Basis of opinion
We conducted our audit in accordance with International Standards on Auditing. An audit includes examination, on test basis, of evidence relevant to the accounts and disclosures in the financial statements. It also includes an assessment of the significant estimates and judgements made by the Commissioners in the preparation of the financial statements, and of whether the accounting policies set out on page 7 are appropriate to the Commission's circumstances, consistently applied and adequately disclosed.

We planned and performed our audit so as to obtain all the information and explanations which we considered necessary in order to provide us with sufficient evidence to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or other irregularity or error.

In forming our opinion we also evaluated the overall adequacy of the presentation of information in the financial statements.

Opinion
In our opinion, proper records of account have been kept and the financial statements, which are in agreement therewith, give a true and fair view of the state of affairs of the Commission as at 31st December, 2007 and of its results and cash flows for the year then ended and comply, in all material respects, with the Energy Commission Act,
1997 (Act 541).

STATE ENTERPRISES AUDIT CORPORATION



(A.M. NYAMPONG)
AG. MANAGING DIRECTOR

4TH FLOOR, REPUBLIC HOUSE
KWAME NKRUMAH AVENUE
ACCRA

DATE: 20th November, 2009

Income and Expenditure Account
for the year ended 31st December, 2007

	Notes	2007	2006
Income		**GH¢**	**GH¢**
Revenue Grants	2	2,498,455	1,826,813
Other Income	3	289,623	125,068
		2,788,078	1,951,881
Deduct Expenditure			
Personnel Emoluments	4	639,604	502,468
Administrative and General expenses	5	982,855	940,853
Service Activity expenses	6	1,025,417	408,582
		2,647,876	1,851,903
Excess of income over expenditure transferred to Accumulated Fund Account		140,202	99,978

Accumulated Fund Account

for the year ended 31st December, 2007	**2007**	**2006**
	GH¢	**GH¢**
Balance as at 1st January	185,022	85,044
Excess of income over expenditure transferred from Income and Expenditure Account	140,202	99,978
Balance as at 31st December	325,224	185,022

The notes on pages 44 to 50 form an integral part of these financial statements.

Balance Sheet
as at 31st December, 2007

	Notes	2007 GH¢	2006 GH¢
Non-Current Assets			
Property, Plant and Equipment	7	197,643	171,600
Deferred Expenditure	8	141,773	283,546
Fixed Deposit Investment		550,270	431,800
		889,686	886,946
Current Assets			
Accounts Receivable	9	114,321	74,257
Prepayments	10	135,572	148,918
Cash and Bank balances	11	23,677	217,863
		273,570	441,038
Current Liabilities			
Accounts Payable	12	20,955	44,113
Bank Overdraft		27,931	1,954
		48,886	46,067
Net Current Assets		224,684	394,971
Total Net Assets Employed		1,114,370	1,281,917
Financed by:			
Capital Grant	13	300,816	665,095
Special Fund Account	14	488,330	431,800
Accumulated Fund Account		325,224	185,022
		1,114,370	1,281,917

.....
COMMISSIONER

.....
COMMISSIONER

The notes on pages 44 to 50 form an integral part of these financial statements.

Cash Flow Statement
for the year ended 31st December, 2007

	Notes	2007 GH¢	2006 GH¢
Net cash inflow/(outflow) into operating activities	15A	(220,096)	2,967
Investing Activities			
Interest received on fixed deposit		61,940	77,486
Payments towards purchase of property, plant and equipment		(127,259)	(23,081)
Increase in fixed deposit investment		(61,940)	-
Proceeds from disposal of vehicles		-	57,943
		(127,259)	112,348
Financing activities			
Capital grants received from Energy Fund		127,192	32,445
Net cash inflow/(outflow) in the year	15B	(220,163)	147,760
Cash and cash equivalents at 1st January		215,909	68,149
Cash and cash equivalents at 31st December		(4,254)	215,909

The notes on pages 44 to 50 form an integral part of these financial statements.

Notes to the Financial Statements for the year ended 31st December, 2007

Note 1: Accounting Policies

The following are the significant accounting policies adopted by the Commission in the preparation of the financial statements.

a) Basis of Accounting

The financial statements have been prepared under the historical cost convention.

b) Property, Plant and Equipment

Fixed assets are stated at the cost of purchase together with any incidental costs of acquisition.

Depreciation is charged on property, plant and equipment on a straight-line basis over the expected useful lives of the assets concerned.

The principal annual rates used for this purpose are:

Office furniture and fittings	-	12½%
Motor vehicles	-	25%
Plant, machinery and equipment	-	20%
Computers and accessories	-	33⅓%

c) Grants

(i) Deferred Credit

Grants received in the form of property, plant and equipment or for the purchase of property, plant and equipment are credited to a deferred credit account and amortized by equal installments over the expected useful lives of the related property, plant and equipment.

(ii) Revenue Grant

Revenue based grants are credited to the income and expenditure account as and when received and utilized.

d) Foreign Currency transactions

Transactions involving foreign currencies are translated into cedis at the exchange rates prevailing at the date of transaction. Monetary assets and liabilities are translated at the ruling rate at the balance sheet date. Exchange differences arising are dealt with in the income and expenditure account.

e) Debtors

Debtors are stated at book value. Specific provisions are made for debts considered doubtful.

Notes to the Financial Statements
for the year ended 31st December, 2007 (continued)

		2007 GH¢	2006 GH¢
Note 2:	**Revenue Grants**		
	Subvention from Government of Ghana	781,814	650,996
	Transfers from Energy Fund Account	1,225,169	762,050
	Capital Grant amortised	491,472	413,767
		2,498,455	1,826,813
Note 3:	**Other Income**		
	Interest on fixed deposit	105,961	77,486
	Receipts from National Petroleum Authority	171,917	-
	Profit on disposal of fixed assets	-	33,028
	Miscellaneous Income	11,745	14,554
		289,623	125,068
Note 4:	**Personnel Emoluments**		
	Gross pay	570,928	449,152
	Employer's SSNIT Contribution	68,676	53,316
		639,604	502,468
Note 5:	**Administrative and General Expenses**		
	Commissioners' Allowances	42,193	46,944
	Stationery and Printing	12,630	13,503
	Insurance	12,646	16,596
	Travelling and Transport	113,308	54,363
	Overtime and Honorarium	-	7,316
	Office Accommodation	189,293	157,897
	Audit Fees	13,800	12,650
	Telephone, Postage and Network services	24,544	6,402
	Training, Seminars and Conferences	152,523	138,888
	Rent - Residential Accommodation	-	900

Notes to the Financial Statements
for the year ended 31st December, 2007 (continued)

		2007 GH¢	2006 GH¢
Note 5:	**(continued)**		
	Repairs and Maintenance	28,380	64,999
	Medical	30,645	42,400
	Office Consumables	66,097	55,293
	Motor Vehicle Running expenses	40,279	27,877
	Advertising	369	494
	Depreciation charge	101,216	107,929
	Amortization of Deferred Expenditure	141,773	141,773
	Bank charges	680	1,505
	Water and Electricity	12,479	34,871
	Consultancy	-	8,255
		982,855	940,853
Note 6:	**Service Activity Expenses**		
	Renewable Energy Division	148,840	88,556
	Power Division	336,943	91,334
	Strategic Policy Planning Division	88,841	41,156
	Public Affairs Division1	30,051	30,660
	Natural Gas Division	111,392	156,875
	Compact Fluorescent Lamp (CFL) Replacement Project	199,179	-
	UNDP- Ghana Energy Development Assessment Project	10,171	-
		1,025,417	408,582

Notes to the Financial Statements
for the year ended 31st December, 2007 (continued)

Note 7: Property, Plant and Equipment

	Motor Vehicles	Fittings Furniture & Equipment	Computers and Accessories	Plant and Equipment	Total
	GH¢	GH¢	GH¢	GH¢	GH¢
Cost					
Balance at 1/1/2007	450,296	281,423	143,269	46,388	921,376
Additions in the year	89,838	33,421	4,000	-	127,259
Disposal	(20,439)	-	-	-	(20,439)
Balance at 31/12/2007	519,695	314,844	147,269	46,388	1,028,196
Depreciation					
Balance at 1/1/2007	441,694	136,535	133,944	37,603	749,776
Charge in the year	49,520	36,598	6,313	8,785	101,216
Disposal	(20,439)	-	-	-	(20,439)
Balance at 31/12/2007	470,775	173,133	140,257	46,388	830,553
Net Book Values					
At 31/12/2007	48,920	141,711	7,012	-	197,643
At 31/12/2006	8,602	144,888	9,324	8,785	171,600

		2007 GH¢	2008 GH¢
Note 8:	**Deferred Expenditure**		
	Balance at 1st January	283,546	425,319
	Less portion amortised in the year	(141,773)	(141,773)
	Balance at 31st December	141,773	283,546

This is in respect of the expenditure incurred in refurbishing the leasehold property, at Frema House, Plot 40, Spintex Road, Accra, being used as office accommodation of the Commission. The expenditure incurred is to be amortised over a five year period, commencing from the year ended 31st December, 2004.

Notes to the Financial Statements
for the year ended 31st December, 2007 (continued)

		2007 GH¢	2006 GH¢
Note 9:	**Accounts Receivable**		
	Staff Loans	6,496	11,832
	National Petroleum Authority	54,109	57,975
	Investment interest	44,022	
	Sundry Debtors	9,694	4,450
		114,321	74,257
Note 10:	**Prepayments**		
	Rent	130,748	145,710
	Insurance	4,824	3,208
		135,572	148,918
Note 11:	**Cash and Bank balances**		
	Bank Accounts	23,072	216,815
	Cash on Hand	605	1,048
		23,677	217,863
Note 12:	**Accounts Payable**		
	Audit fees	13,800	35,190
	Others	7,155	8,923
		20,955	44,113
Note 13:	**Capital Grant**		
	This is made up of transfers from the Energy Fund to finance capital expenditure of the commission		
	Balance at 1st January	665,096	1,046,418
	Add Grants received in the year	127,192	32,445
		792,288	1,078,863
	Less amount amortized in the year	(491,472)	(413,767)
	Balance at 31st December	300,816	665,096

Notes to the Financial Statements
for the year ended 31st December, 2007 (continued)

		2007	2006
		GH¢	GH¢
Note 14:	**Special Fund Account**		
	Balance at 1st January	431,800	431,800
	Increase in the year	56,530	-
		488,330	431,800

In accordance with Section 44 (2) of Energy Commission Act, 1997 (Act 541) a special fund has been set up with transfers from the Energy Fund Account to create an investment account to generate additional income to support the operations of the Commission

	2007	2006
	GH¢	GH¢
Note 15A:Reconciliation of excess of income over expenditure to net cashflow from operating activities		
Excess of income over expenditure for the year	140,202	99,978
Adjust for:		
Depreciation charge	101,216	107,929
Deferred expenditure amortised	141,773	141,773
Capital grants amortised	(491,472)	(413,767)
Profit on sale of vehicle	-	(33,029)
Interest on fixed deposit	(105,961)	(77,486)
(Increase)/Decrease in Accounts Receivable	3,958	(8,873)
Decrease in prepayments	13,346	164,869
Increase/(Decrease) in Accounts Payable	(23,158)	21,573
	(220,096)	2,967

Note 15B: Analysis of movements in cash and cash equivalents

	Balances at 31st December			Changes in the year	
	2005	2006	2007	2007	2006
	GH¢	GH¢	GH¢	GH¢	GH¢
Cash on Hand	1,144	1,049	605	(444)	(95)
Bank Accounts	67,005	216,815	23,072	(193,743)	149,810
Bank Overdraft	-	(1,955)	(27,931)	(25,976)	(1,955)
	68,149	215,909	(4,254)	(220,163)	147,760

ENERGY FUND

General Information

(i) Commissioners

Prof. A.K. Addae	-	Ag. Chairman
Prof. F.K.A. Allotey	-	Commissioner
Prof. F.O. Akuffo	-	Commissioner
Mr. J.K. Hagan	-	Commissioner
Mr. Seth Asante	-	Commissioner
Mr. C.T. Sottie	-	Commissioner {per S.43 (i) of the Energy Commission Act, 1997, Act 541} (Controller & Accountant-General)
Dr. A.K. Ofosu-Ahenkorah	-	Ag. Executive Secretary

(ii) Objectives of the Fund - Section 42, Act 541, 1997.

"Monies of the Fund shall be applied as follows -

(a) Promotion of energy efficiency and productive uses of electricity, natural gas and petroleum products;

(b) Promotion of projects for the development and utilisation of renewable energy resources, including solar energy;

(c) Human resource development in the energy sector; and

(d) Such other relevant purposes as may be determined by the Commission".

(iii) Head Office: Frema House
Plot No. 40
Spintex Road
Accra

(iv) Bankers: Bank of Ghana

(v) Auditors: State Enterprises Audit Corporation
4th Floor Republic House
P. O. Box M.198
Accra

Report of the Commissioners

The Commissioners have the pleasure of presenting the audited financial statements of the Energy Fund for the year ended 31st December, 2007.

	GH¢
During the year under review releases by the Controller and Accountant General's Department from the Petroleum Levy Account into the Energy Fund Account held at the Bank of Ghana amounted to	988,482
Added to this were:	
(i) Fees from Energy Service Providers of	14,540
(ii) Proceeds from sale of fixed assets of	33,326
Total inflow for the year amounted to	1,036,348
Balance at 1st January, 2007 on the Energy Fund Account was	583,354
Total amount available for disbursement in the year was	1,619,702
Deduct disbursement in the year of	(1,352,362)
Balance carried forward on the Energy Fund Account at 31st December, 2007 was	267,340

BY ORDER OF THE COMMISSION

..... **COMMISSIONER**

..... **COMMISSIONER**

REPORT OF THE INDEPENDENT AUDITORS

FOR THE YEAR ENDED 31ST DECEMBER, 2007

We have audited the financial statements of the Energy Fund set out on pages 4 to 6 which have been prepared under the historical cost convention and on the basis of the accounting policies set out on page 7.

Respective responsibilities of the Commissioners and Auditors
The Commissioners are responsible for the preparation of the financial statements. It is our responsibility to form an independent opinion, based on our audit, on those statements and to report our opinion thereon.

Basis of opinion
We conducted our audit in accordance with International Standards on Auditing. An audit includes examination, on test basis, of evidence relevant to the accounts and disclosures in the financial statements. It also includes an assessment of the significant estimates and judgments made by the Commissioners in the preparation of the financial statements, and of whether the accounting policies set out on page 7 are appropriate to the Energy Fund's circumstances, consistently applied and adequately disclosed.

We planned and performed our audit so as to obtain all the information and explanations which we considered necessary in order to provide us with sufficient evidence to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or other irregularity or error.

In forming our opinion we also evaluated the overall adequacy of the presentation of information in the financial statements.

Opinion
In our opinion, proper records of account have been kept and the financial statements, which are in agreement therewith, give a true and fair view of the state of affairs of the Energy Fund as at 31st December, 2007 and comply, in all material respects, with the Energy Commission Act, 1997 (Act 541).

STATE ENTERPRISES AUDIT CORPORATION

(A.M. NYAMPONG)
AG. MANAGING DIRECTOR
4TH FLOOR REPUBLIC HOUSE

KWAME NKRUMAH AVENUE

DATE: 20th November, 2009

Statement of Resources and Disbursements for the year ended 31st December, 2007

	Notes	2007 GH¢	2006 GH¢
Resources:			
Bank balance at 1st January		583,354	507,083
Add Receipts in the year:			
Releases by Controller and Accountant General's Department from Petroleum Levy Account		988,482	989,414
Fees from permits and licences issued to Energy Service Providers		14,540	10,560
Other Income	2	33,326	-
Total Resources available		1,619,702	1,507,057
Less Disbursements in the year:			
Capital expenditure of Energy Commission	3	127,192	32,445
Support for Energy Commission's operating expenditure		1,225,169	762,050
Transfers to Bui Dam Development Committee		-	23,200
Transfers to Public Utility Regulatory Committee (PURC)		-	50,000
Transfers to Ministry of Energy		-	56,000
Bank charges		1	8
Total disbursements		(1,352,362)	(923,703)
Bank balance at 31st December		267,340	583,354

The notes on pages 57 & 58 form an integral part of the financial statements.

ENERGY FUND

Balance Sheet
as at 31st December, 2007

	2007 GH¢	2006 GH¢
Current Assets		
Bank Balance	267,340	583,354
Represented by		
Energy Fund Account	267,340	583,354

BY ORDER OF THE COMMISSION

....

COMMISSIONER **COMMISSIONER**

The notes on pages 57 & 58form an integral part of the financial statements.

Statement of Movements on the Fund Account
for the year ended 31st December, 2007

	2007 GH¢	2006 GH¢
Balance as at 1st January	583,354	507,083
Add Inflows during the year	1,036,348	999,974
	1,619,702	1,507,057
Less Disbursements during the year	(1,352,362)	(923,703)
Balance as at 31st December	267,340	583,354

The notes on page 6 form an integral part of the financial statements.

Notes to the Financial Statements
for the year ended 31st December, 2007

Note 1: Accounting Policies

The following are the significant accounting policies adopted by the Commission in the preparation of the financial statements.

(a) Basis of accounting

The financial statements have been prepared under the historical cost convention.

(b) Resources

The income of the Energy Fund is derived from:

(i) Transfers from the Petroleum Levy Account into the Energy Fund Account by the Controller and Accountant-General's Department.

(ii) Fees from licences and permits issued to Energy Service Providers by the Energy Commission.

The above sources of income are accounted for on cash basis.

(c) Disbursements

These are accounted for on cash basis.

Note 2: Other Income

	2007 GH¢	2006 GH¢
Proceeds from disposal of vehicles	23,350	-
Donation received from UNDP for Strategic Policy Planning Division Project	9,232	-
Sale of licensing manuals	744	-
	33,326	-

Note 3: Capital Expenditure of the Energy Commission financed from the Energy Fund

Computers and Accessories	4,000	32,445
Motor Vehicles	89,837	-
Equipment	30,555	-
Furniture	2,800	-
	127,192	32,445

ENERGY COMMISSION

ANNUAL REPORT
FOR 2008

AND AUDITED
FINANCIAL STATEMENTS
FOR 2008

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CHAIRMAN'S REMARKS

This report is being submitted to the Minister for Energy in accordance with Section 50 of the Energy Commission Act, 1997 (Act 541)and covers the Commission's activities for the period 1st January, 2008 to 31st December, 2008. It also includes the audited financial statements for the same period. Some vital energy statistics for the years 2000 to 2008 are also included.

The Work Programme of the Energy Commission for 2008 covered the following:

a). to develop and facilitate the passage of wholesale electricity market regulations, national electricity grid code, standards of performance rules and wiring regulations;.

b). to facilitate the development of the first phase of the Secondary Gas Network and develop a Natural Gas Utilization Plan for the country;

c). to establish a National Energy and Data Processing and Information Centre facilitate energy planning and information dissemination, including the study of energy use patterns in the industrial, residential and commercial sector for effective energy planning;

d). to undertake a survey on the use of LPG in vehicles to assess its impact on the availability of LPG for domestic and commercial use;

e) to undertake a survey of the energy demand sectors of the economy such as the industrial and the service sectors in order to update the energy database of the Commission

f). to develop an automated Human Resources Management System;

g). to develop energy efficiency and conservation regulations for passage into law;

h). to conduct inspection and monitoring of electricity industry operations; and

i). to conduct public education activities on Legislative Instruments (L.I.s) on electricity and energy conservation.

The Power shortages experienced in 2006 and 2007 seem to be abating not because of significant improvements in supply capacity but because of the very good rains experienced in 2008. However, weaknesses in the distribution system are still posing challenges to the supply. Although about 1, 100 – 1, 350 MW of additional generation capacity is under construction and will be commissioned soon, we must always remember the experiences of the previous years and work towards the avoidance of a recurrence, through energy efficiency and conservation. This means that the energy efficiency measures that were initiated at the peak of the crisis must be strengthened and continued. The distribution of Compact Fluorescent Lamps resulted in peak savings of about 124 MW of electricity

and the equivalent of about 72.8 GWh of energy. About 112, 320 tonnes of carbon dioxide emissions were also avoided.

Measures regarding the standardization and labeling of CFLs and air conditioners have been taken and backed by appropriate laws. Additional measures regarding the legislation on standardization and labeling of refrigerators and freezers have also been developed. The importation and distribution of incandescent filament lamps and used appliances such as air conditioners, refrigerators and freezers which are heavy energy waste pipes have been prohibited by legislation. The challenge now is to launch a sustained education of the public on these matters and the need to sustain energy efficiency and conservation. In the coming years the Commission will cause to be enacted legislation that will guide on the importation, distribution, sale and use of other electrical appliances such as electric motors which are widely used in industry and other sectors.

Prof. A. K. Addae
Ag. Chairman

1.0 THE COMMISSION

1.1. Introduction

The Energy Commission is a statutory body corporate with perpetual succession and a common seal established by an Act of the Ghanaian Parliament, the Energy Commission Act, 1997 (Act 541). The Commission may sue and be sued in its corporate name.

The Energy Commission consists of a seven-member Board of Directors appointed by the President of Ghana acting in consultation with the Council of State of the Republic. In making the appointments, the President takes into consideration the knowledge, expertise and experience of the persons so appointed, and in particular, their knowledge in matters relevant to the functions of the Energy Commission.

The Executive Secretary is responsible for the administration of the Energy Commission and is required to ensure the implementation of the decisions of the Commission. He provides strategic and organizational leadership to build the Commission into a pre-eminent state agency for formulating and articulating national energy policies.

1.2 Membership of the Commission

The current composition of the Commission is as follows:

1.	Prof. A.K. Addae	Ag. Chairman
2.	Prof. F.K.A. Allotey	Commissioner
3.	Prof. F.O. Akuffo	Commissioner
4.	Mr. J.K. Hagan	Commissioner (Died in April 2008)
5.	Mr. Seth Asante	Commissioner
6.	Dr. A.K. Ofosu Ahenkorah	Commissioner/Executive Secretary

1.3 Statutory Mandates

The statutory mandates of the Energy Commission include the following:

2) to serve as the Government's energy policy advisor by making national energy policy recommendations to the Minister for Energy;

3) to advise the Ministry of Energy on national policies for the efficient, economic and safe supply of electricity and natural gas, having due regard to the national economy;

4) to formulate national policies for the development and utilization of indigenous energy resources, in particular, renewable energy: solar, wind; biomass;

5) to prepare, review and update periodically indicative national plans to ensure that all reasonable demands for energy are met;

6) to prescribe by legislative instruments standards of performance and technical and operational rules of practice for the supply, distribution, sale of electricity and natural gas to consumers by public utilities;

7) to enforce the provisions of such legislative instruments uniformly throughout the country;

8) to promote competition in the supply, marketing and sale of renewable energy products and other forms of energy; and,

9) to promote energy efficiency and productive uses of electricity and natural gas.

The Commission has a professional and technical staff of forty-three (43) persons.

It is required by law to regulate, manage, and develop the utilization of energy resources in Ghana; to provide the legal, regulatory and supervisory framework for all providers of energy in the country: specifically by the granting of licenses for the transmission, wholesale; supply, distribution and sale of electricity and natural gas and related matters.

1.4 Mission, Vision and Values

The Energy Commission is fully committed to serving effectively and efficiently the national interest in the discharge of its statutory mandates and functions. The Commission is equally committed to accepting and dealing with the challenges that Ghana must meet head--on in its quest for a truly functioning competitive energy industry that creates cost efficient energy supplies, improves energy reliability, efficiency, and security, and above all, protects and enhances public safety, economic well-being, and environmental quality.

The Energy Commission welcomes investors, Ghanaian, African and foreign, in effective and environmentally sound market competitive energy efficiency projects and programmes. As a one-stop regulatory body, the Energy Commission encourages building energy efficiency standards and insists on the use of energy efficient appliances as well as the development and deployment of alternative energy sources. The Commission is committed to building a low carbon energy economy in Ghana.

1.5 Structure of the Commission

The organizational structure of the Commission comprises 3 main Directorates: the Natural Gas, Power, Energy Efficiency and Climate Change and Renewable Energy Directorate; the Human Resources, Administration and Public Affairs Directorate; and the Strategic Planning and Policy Directorate (which also includes the Social and Environmental Impact Assessment Division). There are two units: the Finance and the Inspectorate Units, provide support services to the directorates.

1.6 Achievements of the Commission

Within the ten years of its existence the Energy Commission has made significant contributions towards the development of a vibrant energy sector in the country. In 2008 the following were accomplished:

(1) The Commission established a licensing framework for service providers in the natural gas sector.

(2) A Permitting Framework for Renewable Energy Service Providers was developed and introduced.

(3) A Classification and Permitting Framework for Bulk Customers of Electricity was developed and introduced.

(4) The following licenses were developed:
   i. Electricity Transmission License;

   ii. Electricity Distribution and Sale - License

(5) The following regulations were developed, processed and passed by Parliament in 2008.
   i) Energy Efficiency (Prohibition of Manufacture, Sale or Importation of Incandescent Filament Lamps and Used Air Conditioners, Used Refrigerators, Freezers and Refrigerator-Freezers) Regulations, 2008, LI 1932.

   ii) Electricity Transmission (Technical, Operational and Standards of Performance) Rules, 2008; LI 1934;

   iii) Electricity Supply and Distribution (Standards of Performance) Rules, 2008; LI 1935;

   iv) Natural Gas Transmission Utility (Standards of Performance) Regulations, 2008, LI 1936;

   v) Electricity Regulations, 2008; LI 1937.

2.0 NATURAL GAS, POWER AND RENEWABLE ENERGY DIRECTORATE

2.1 NATURAL GAS

2.1.0 Introduction

In view of the high expectations of the tremendous benefits that the natural gas from Nigeria through the West African Gas Pipeline and the recent oil and gas discovery in the country would contribute to the Ghanaian economy, the Commission vigorously pursued various programmes to realize some of its responsibilities of developing, regulating, managing, monitoring and granting licenses for transmission, wholesale supply, distribution and sale of natural gas. In the year under review, the following highlighted activities were undertaken:

1. Preparation of Natural Gas rules and regulations;
2. Updating of the Natural Gas Transmission and Distribution Infrastructure Plan for Ghana;
3. Developing Natural Gas Licensing Manual;
4. Preparation of Natural Gas Utilization Plan for Ghana;
5. Survey of natural gas potential consumers in the Western Region;

2.1.1 Preparation of Natural Gas Rules and Regulations

Two separate parliamentary/stakeholders' were organized in May and August 2008 to discuss the following draft documents:

a) Natural Gas Transmission Utility (Standards of Performance) Regulations;
b) Natural Gas Occupational, Health and Safety Regulations; and
c) Natural Gas Pipeline Safety Regulations.

Following the consultations with the Parliamentary Select Committee on Subsidiary Legislation and other stakeholders, the Natural Gas Transmission Utility (Standards of Performance) Regulations were laid before Parliament for approval. More detailed information needed to be sought for the remaining two draft subsidiary legislations and therefore could not be laid before Parliament before the latter finally recessed in December 2008.

2.1.2 Updating Natural Gas Transmission and Distribution Infrastructure Plan for Ghana

The 2006 edition of the Natural Gas Transmission and Distribution Infrastructure Plan for Ghana was updated in view of the recent oil and gas discoveries of the country. The update was completed in October 2008. The document configures both the national and regional pipeline systems for the secondary natural gas transmission and distribution infrastructure for the country.

2.1.3 Development of a Natural Gas Licensing Manual

The Commission has developed a Natural Gas Licensing Manual since November 2008. This Manual would serve as a guide for prospective Natural Gas Service Providers to meet specific requirements before they would be licensed as the Transmission Utility, a Distribution Company or a Wholesale Supplier.

Section 23 of the Energy Commission Act, (Act 541) stipulates that there should be only one Transmission Licensee to handle the transmission system.

2.1.4 Development of a Natural Gas Utilization Plan for Ghana

In October, the Commission initiated the preparation of a Natural Gas Utilization Plan for Ghana. The purpose of this document is to provide various ways by which natural gas could be used other than for the generation of power for the development and growth of the economy. The work is about 70% complete.

2.1.5 Survey of Natural Gas Potential Customers in the Western Region

A survey was conducted in the Western Region in May 2008 to identify potential natural Gas customers and estimate volumes of gas that would be in demand. The results of the survey would be used to plan the appropriate infrastructure for the Region.

2.2 POWER

2.2.0 Introduction

The Energy Commission has responsibility for matters relating to the development and regulation of the electricity supply industry in Ghana. Specifically, this relates to; licensing of electricity service providers; elaboration of regulations and codes of practice for the electricity supply and distribution industry; and inspection and monitoring of compliance with licensing terms and conditions, regulations, rules and codes of practice by electric power service providers.

The Electricity Sub-Committee of the Technical Committee set up in accordance with the provisions of Act 541 to serve as an advisory body on technical matters, during the year 2008 focused its deliberations on the following main issues:

i). Review of permanent licences for issue to service providers in the electricity supply industry;

ii). Completion of the draft standard of performance regulations for electricity distribution and supply for consideration by Parliament; and

iii). Development of rules and regulations for the establishment of wholesale power supply market.

2.2.1 Licensing

Two permanent wholesale supply licences were granted and issued to Tema Osonor Power Plant and Sunon Asogli Power, independent power producers, to construct and operate 126MW and 200MW thermal power plants at Tema and Kpone respectively. The Electricity Company of Ghana submitted an application for distribution licence whilst Trans Tema Power submitted an application for a wholesale supply licence. Those two applications were still being processed at the close of the year under review. It is still anticipated that all existing service providers operating with provisional licences issued by the Commission will regularize their operations securing permanent licences in the course of the year 2009.

The Energy Commission has established a Siting Committee to assist in the performance of its licensing mandate, particularly in respect of the siting of major energy infrastructure in accordance with the requirements of the Energy Commission Act, 1997 (Act 541).

Guidelines have also been developed to establish a transparent process for evaluation and assessment of proposals for the sitting of major energy infrastructure. The guidelines detail the information requirements expected to be provided by the relevant energy infrastructure proponents and the evaluation and assessment process to be undertaken by the Sitting Committee in the determination of the suitability and adequacy of the proposed site to accommodate the proposed energy infrastructure.

The Sitting Committee membership was drawn from the relevant departments and agencies such as Environmental Protection Agency (EPA), Geological Survey Department (GSD), Water Resources Commission, Town and Country Planning Dept, etc. who have a stake in the environment and natural resource utilisation.

2.2.2 Regulations, Rules & Standards

Legislation completed and passed by Parliament in 2008 included the following:

i. Electricity Transmission (Technical, Operational and Standards of Performance) Rules, 2008, LI 1934;
ii. Electricity Supply and Distribution (Standards of Performance) Rules, 2008, LI1935;
iii. Electricity Regulations, 2008, LI 1937;
iv. Energy Efficiency (Prohibition of Manufacture, Sale or Importation of Incandescent Filament Lamps and Used Air-Conditioners, Used Refrigerators, Freezers and Refrigerator-Freezers) Regulations, 2008, LI 1932

The Energy Efficiency of Refrigerating Appliances Regulations was laid in Parliament but could not attain the mandatory 21 sitting days before Parliament recessed on 6th January, 2009.

The following activities were also completed in the year under review:

i. Redrafting of rules and regulations for wiring and electrical installations;
ii. Drafting of regulations for the establishment of the Wholesale Electricity Supply Market;
iii. Development of draft National Grid Code for operations of the National Interconnected Transmission System (NITS) and legislation for enforcement.

2.2.3 Wiring Regulations

The objective of this activity is for the Commission to establish a licensing and enforcement regime for electrical contractual services as an attempt to curb the rampant incidence of electrical fires resulting mainly from substandard wiring practices.

A technical team of experts drawn from the industry was set up to review and update the existing regulations for enactment into a legislative instrument by the Minister for Energy under Section 56 of Act 541 and substantially completed its initial review work by December 2007. The draft Wiring Regulations is expected to be subjected to further review by the Commission's Electricity & Natural Gas Technical Committee. It is expected that the Committee will finish reviewing it in 2009 for passage into law.

2.2.4 Rules and Regulations for the Establishment of Wholesale Electricity Supply Market and Development of the National Grid Code

Draft regulations for the establishment of the wholesale electricity market and technical operations of the National Interconnected Transmission System (NITS) to guide the Electricity Transmission Utility's operations were finalised.

2.3. RENEWABLE ENERGY RESOURCES

2.3.0 Introduction

The Energy Commission is responsible for recommending plans and programmes for the exploration of renewable energy (RE) technologies/sources and promoting their development and utilisation as well as regulating the renewable energy sub sector. The Commission also monitors:

- compliance and enforcement of the rules and regulations by RE service providers and consumers; and
- effectiveness of the regulatory framework for RE service providers in terms of permitting, codes of practice and standards of performance.

The key areas of concern in respect of programmes and projects include solar, wind, small hydro resources, biofuels production and supply, and the promotion of renewable energy products and their efficient utilisation.

In the light of the above, the Commission undertook the following activities during the period under review:

1. Development of Renewable Energy Law;
2. Development of Standards for Solar Systems and Permitting Manual for Renewable Energy Service Providers;
3. Grid-connected solar systems;
4. Inspection, Licensing & Monitoring of Renewable Energy Service Providers; and
5. Energy Commission/UNDP Household Energy Programmed.

2.3.1 Renewable Energy Law

The Energy Commission in fulfillment of its mandates and in order that RE technologies make the expected impact on the country's energy system, is developing the rules and regulations that will facilitate the integration of renewable energy into the mainstream energy mix of the country, ensure transparency and a level playing field to stimulate investment in the Renewable Energy sub-sector.

In this regard, the Commission began the process of developing the policy, regulatory and legal framework, dubbed "the Renewable Energy Law", under the World Bank sponsored "Ghana Energy Development and Access Project".

2.3.2 Standards for Solar Systems and Permitting Manual

The Energy Commission in collaboration with the Ghana Standards Board completed the Draft Standards for Biofuels and Solar Systems during 2007. In 2008, the review process on the document was completed and the standard was gazette.

The biofuels standards which include the Biodiesel fuel (B100), Bioalcohol-Ethanol (Ed75-Ed85) and Denatured fuel ethanol standards were gazetted under the National Standards of Automotive Fuels.

The solar standards entitled 'Solar System Specifications' was gazetted under the National Standards of Electrotechnical Industry.

The draft Permitting Manual for the Renewable Energy industry was developed by the Commission and was subjected to a comprehensive review by the Electricity Sub-Committee of the Technical Committee on Electricity and Natural Gas. The Manual sets out the framework for permitting of service providers engaged in the Renewable Energy industry in Ghana. The Manual also provides guidance and direction to existing and prospective participants in the RE industry. It outlines the procedures for entry into and exit from the industry and the expected behaviour of industry players.

2.3.3 Grid-Connected Solar System

In the Commission's quest to ensure a reasonable contribution to the nation's electricity mix from Renewable Energy Sources, the Energy Commission with technical and financial assistance from the German Government/Companies installed a 4.25kWp solar PV grid connected system on its premises to supply power to the office. The objective for the installation of the system is to demonstrate the integration of the grid connected renewable energy technologies into the national grid. Within 8 months of operation, the system generated 4.5MWh of electricity, thus reducing the amount of electricity supplied from the grid to the office building. A carbon dioxide (CO_2) emission savings of 3,242kg was also made. The system which was donated to the Government of Ghana by the Government of West Rhine Westphalia of the Federal Republic of Germany is serving as a learning facility for power utilities, researchers and power regulators, to provide in-depth knowledge into the operation of grid-connected solar PV systems.

2.3.4 Inspection, Licensing and Monitoring of Renewable Energy Service Providers

Two out of seven companies that applied for permits to export charcoal were issued with the Charcoal Export Permits. The two companies are: Beetel Company Limited located at Akim Oda in the Eastern Region and Abil Trading Enterprise at Bomaa, Tano North District in the Brong Ahafo Region.

Information released by the Ministry of Trade, Industry and PSI showed that 3,170.40 tonnes of charcoal produced from sawmill waste was exported to Europe. The exports earned the country GH¢552,166.83 in foreign exchange in 2008. Quantities exported in 2003, 2004, 2005, 2006 and 2007 were 4,590 tonnes, 4,630 tonnes, 5,630 tonnes, 2,920 tonnes and 3,623 tonnes respectively

as shown below in Fig 1.

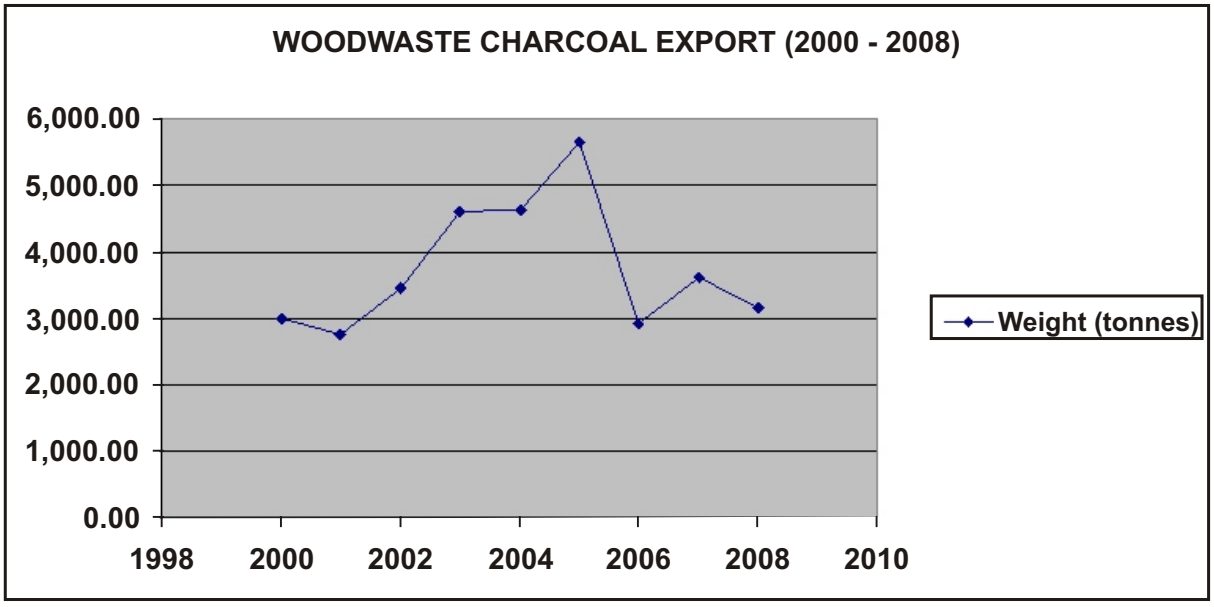

Fig. 1: Trend of charcoal exports from Ghana 2002 - 2008

The illustration indicates that there was a reduction in the quantity of charcoal exported during the year under review which might be due to the effective monitoring mechanism that has been employed by the Commission since 2005.

Greenfuel Biofuel Company Ltd. also applied for a permit to establish a plant for the production of biodiesel. The company is yet to satisfy all the requirements for the granting of permit.

Following discussions with the Customs, Excise and Preventive Service (CEPS) the Commission requested for the installation of a GCNet facility at its office to ensure effective monitoring and compliance of Solar Energy Standards, Energy Efficiency Standards and Labelling of Electrical Appliances, etc. A feasibility study for the installation of the systems was undertaken and it is expected that the system would be installed in 2009.

2.3.5 Energy Commission/UNDP Household Energy Programme

The Household Energy Project, which commenced in 2006 was completed in 2008.

The objectives of the project were: to create a policy environment to regulate the woodfuels sector; to encourage the efficient utilization of charcoal & firewood through improved woodstoves; to encourage the use of efficient charcoal production techniques; to encourage a shift to alternative cooking fuels such as LPG; to promote the establishment of woodfuel plantations; and to educate the public on effects of woodfuel smoke on the health of women.

The following were accomplished at the end of the project:

1. A Woodfuels policy was developed for incorporation in the Strategic National Energy Plan.;
2. Safety standards for LPG use in the household and commercial sectors in Ghana was developed and gazetted;
3. Woodfuels plantations were established and improved institutional woodstoves were introduced to selected basic schools that were benefiting from the school feeding programme in the Northern and Upper East regions
4. Men and women in three communities within the millennium village cluster were trained on the fabrication of improved mud stoves.
5. Awareness was created on the negative impacts of woodfuels on health

3.0 STRATEGIC PLANNING AND POLICY DIRECTORATE

3.1 STRATEGIC PLANNING AND POLICY

3.1.0 Introduction

The Energy Commission is required by law to prepare, review and update periodically indicative national energy plans to ensure that all reasonable demands for energy are met in a sustainable manner. During the year 2008, the Commission undertook the activities described below.

3.1.1 Implementation of National Energy Data Processing & Information Centre (NEDPIC)

Under the Energy Commission Law, Act 541, the Commission is mandated to establish a comprehensive national energy database for effective energy planning and policy formulation to guide the management and the utilization of energy resources.

To initiate the process of setting up the database and the information centre, a Consortium of consultants, Nykomb Energica Ltd & College of Engineering, KNUST, Kumasi was awarded the contract to assist the Commission in formulating a strategy for the establishment of a National Energy data Processing and Information Centre (NEDPIC).

The Consortium completed its work and submitted its final report by the end of the year. Among other indicators, the Consortium recommended various hard and software that are required to get the center established and functioning. It also recommended an implementation strategy for the setting up of NEDPIC. Management has proposed to allow the Consortium to also undertake the implementation exercise. To this effect, a draft Terms of Reference (TOR) have been submitted to the Consultant for study to enable it submit appropriate proposals.

3.1.2 National Energy Statistics

a. National Energy Statistics is a statistical handbook of energy production, transportation, losses and usage in the country. It covers electricity, petroleum and renewable energy, including woodfuels.

b. During the year 2008, the 2007 energy database was compiled. Details include:

i. Fuel Shares of national energy use;
ii. National energy resource and draft National Energy Balance for 2007; and
iii. Energy Supply and Usage

3.1.3 Industrial & Commercial Energy Survey of the Economy

The industrial sector, especially the manufacturing sub-sector, is expected to lead in the rapid socio-economic transformation of the Ghanaian economy from a low-income to a middle-income country with US$1,000 per capital GNP by 2015. Unreliable energy supply has been listed as one of the barriers to more rapid industrial growth.

The objective of this activity is to use the data to compute the cost of un-served grid electricity (energy) in the country. Furthermore, whilst data on energy supply can easily be obtained from producers like VRA and Tema Oil Refinery, it is not so with data on energy used by industries and commercial entities. The industries have to be visited for the data collection and then analyzed to establish the right economic sectoral consumption shares. The field data collection commenced in 2008 and is on-going. The exercise would thus also be used as an opportunity to update the share of energy profile in the industrial and commercial/services sector.

3.1.4 Survey of Energy use in Buildings

A considerable amount of energy is consumed in residential, office and commercial buildings for lighting, cooling and for operation of equipment and appliances. Up-to-date and detailed data on energy use in buildings for planning and energy conservation purposes is however very scanty.

While providing data on the energy intensities for identifiable activities within the buildings, the project was also expected to help compute energy use per unit area in commercial, industrial & residential buildings. The Division prepared detailed Survey Instruments (questionnaires) and administered them in hotels, hospitals, schools and colleges within the Greater Accra, Central and Western regions. Even though data retrieval from served institutions was extremely slow, quite a good amount of useful data has been gathered, especially in the Greater Accra region. This would be analyzed to obtain the desired indicators.

3.1.5 LPG Consumption Survey in the Regions

The project was meant to obtain primary data on LPG consumption in the country for planning and policy management. Survey was completed for Greater Accra, Volta and Eastern Regions. The survey was later extended to cover all the ten regions of the country.

The Commission collaborated with the EPA to undertake the computation of the Grid Emission factor for Ghana's electricity system

3.1.6 IAEA-Ghana Capacity Building Project for Sustainable Energy Development

The International Atomic Energy Agency (IAEA) has been assisting Ghana to develop energy planning capability by training a core of Ghanaian energy professionals in IAEA energy planning modeling tools.

Selected staff of the Commission and those of other major stakeholders continued to receive training in the use of the Model for Energy Supply Strategy Alternatives and their General Environmental Impacts (MESSAGE) planning model during the year. Two professionals from the Energy Commission and the Ghana Atomic Energy Commission benefited from intensive training held in South Africa and sponsored by the IAEA.

In addition, the Commission:

1. Organized a one week workshop on the use of the Wien Automatic System Planning Package (WASP IV) model for the development of a least cost electricity generation plan.

2. Undertook the review of peak electricity demand (an input for WASP IV model) using the Model for Analysis of Energy Demand (MAED model).

3. Undertook least cost electricity generation planning for 2009 – 2030 using WASP IV model.

4. Undertook the drafting and review of the Planning for Sustainable Energy Development study report.

5. The Division also organized a one-week workshop training on the LEAP planning model, and assisted in reviewing and evaluating the energy component of Long-term Planning for Ghana by the National Development Planning Commission (NDPC).

3.1.7 Climate Change Mitigation Strategy for Ghana

The issues of climate change are some of the most important subjects of international discussion in the world. Not only environmental NGOs, but scientists, politicians and representatives of governments, international institutions, business researchers and media take part in the debate.

The 14th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP14), along with the 4th Session of the Meeting of Parties to the Kyoto Protocol was held in Poznán, Poland on 1-12 December 2008. The Commission was represented at the Poznan Climate Change negotiations

3.2 SOCIAL AND ENVIRONMENTAL IMPACT ASSESSMENT

3.2.0 Introduction

Energy Commission conducts social and environmental impact assessments of all energy policies, programmes and projects and ensures the implementation of all social and environmental mitigation measures for all licensed energy service activities.

This responsibility is in line with section 2.2(b) of the Energy Commission Act 1997 (ACT 541) which mandates the Commission to advise the Minister of energy on national policies for the efficient, economical, and safe supply of energy products and services having due regard to the national economy.

Activities undertaken during the period under review includes the following:

1. Impact Assessment of Compact Fluorescent Lamps (CFLs) Exchange Programme;
2. The survey on Imported Used Refrigerators; and
3. Opinion Poll on Electricity Tariff Adjustments.

3.2.1 Distribution of Compact Fluorescent Lamps (CFLs)

Ghana experienced an acute power crisis from August 2006 to September 2007. To mitigate the effects of the crisis on the national economy, the Government approved a CFLs exchange programme which was intended to replace six million incandescent bulbs with CFLs for free. The CFLs programme was expected to achieve the following outputs:

- Peak Electricity demand reduction of about 200MW
- Stabilization of the grid electricity grid system
- Elimination of brownout and transformer overloads
- Reduction of diesel and other thermal generation to supplement hydro and other cheaper power generation options

Three agencies namely, the Ministry of Energy, the Energy Commission and the Energy Foundation were responsible for the implementation of the programme. The Commission coordinated the importation and distribution of the lamps throughout the country which was effectively implemented from August to December, 2007. Thereafter the Energy Commission conducted an impact assessment of the programme, an exercise which ended in October 2008.

The assessment mainly focused on:

- The coverage of the CFLs distribution among households in 138 districts of the country;
- The effect on electricity peak load;

- Savings on household income, investments and CO_2 emission reduction.
- The effectiveness of implementation strategy; and
- The perception of key stakeholders and households on the significance and expectations of the intervention.

The key findings of the assessment were the following:

- The assessment revealed that the exchange of six million CFLs for incandescent bulbs saved 124MW peak demand and 172.8GWh in energy.
- The country avoided emitting 112, 320 tonnes of carbon dioxide
- It was also revealed that from the period January to June 2008, each household in 25 districts, saved GH¢31.00 on electricity bills.
- The programme also contributed to a delay in thermal generation expansion investments of US$105 million and a reduction of 148, 000 barrels light crude oil for thermal electricity generation.
- Total electricity cost savings of US$33.3 million was realized during the year.
- The distribution of CFLs covered 137 districts out of a total of 138 districts in the country. The only district not covered was Bunkpurugu Yunyoo district which at that time was not connected to the national grid.
- Observations made with regards to the environment were the low level of education of households with regard to mercury contamination associated with lamp disposal and potential problems with broken bulbs and disposal problems.

The findings are further supported by the figures below:

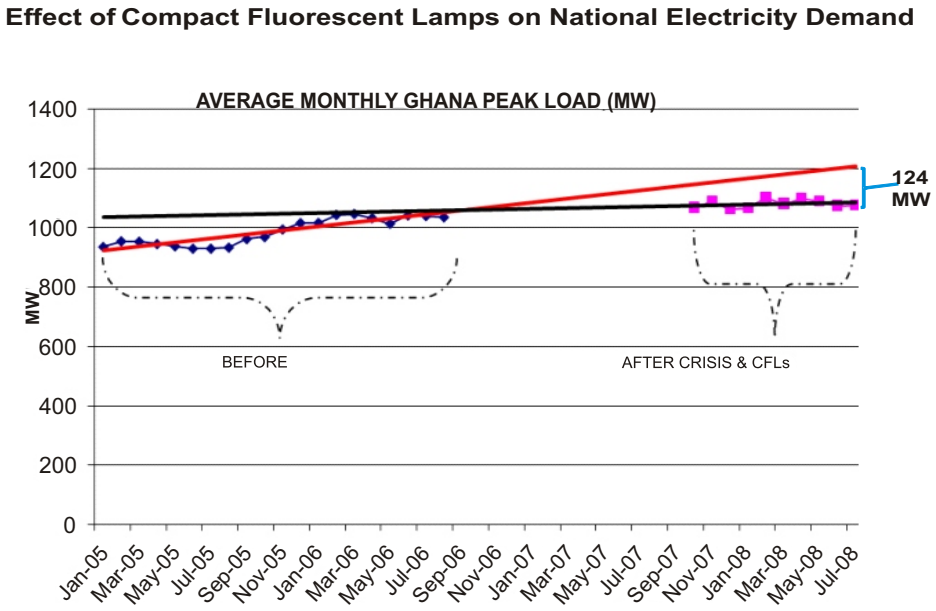

Fig1. Peak Electricity Savings

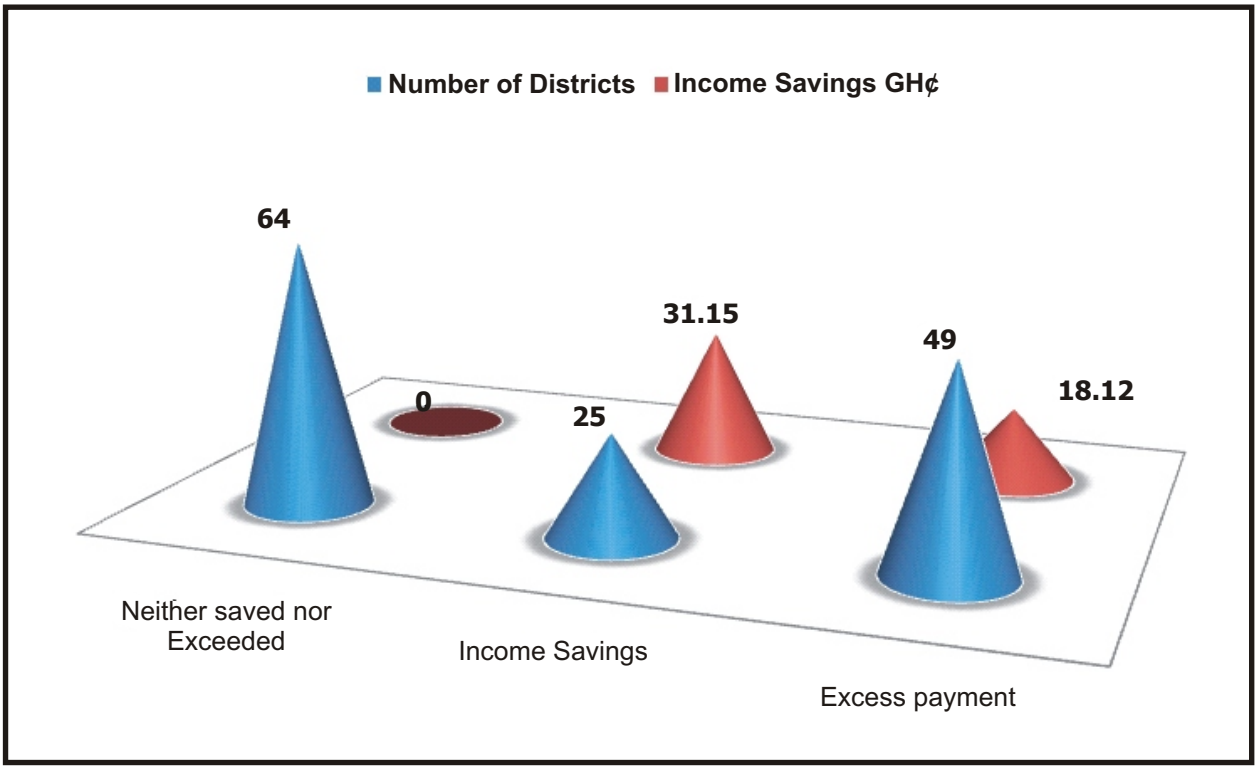

Fig. 2Net Household income savings (GH¢) By Districts

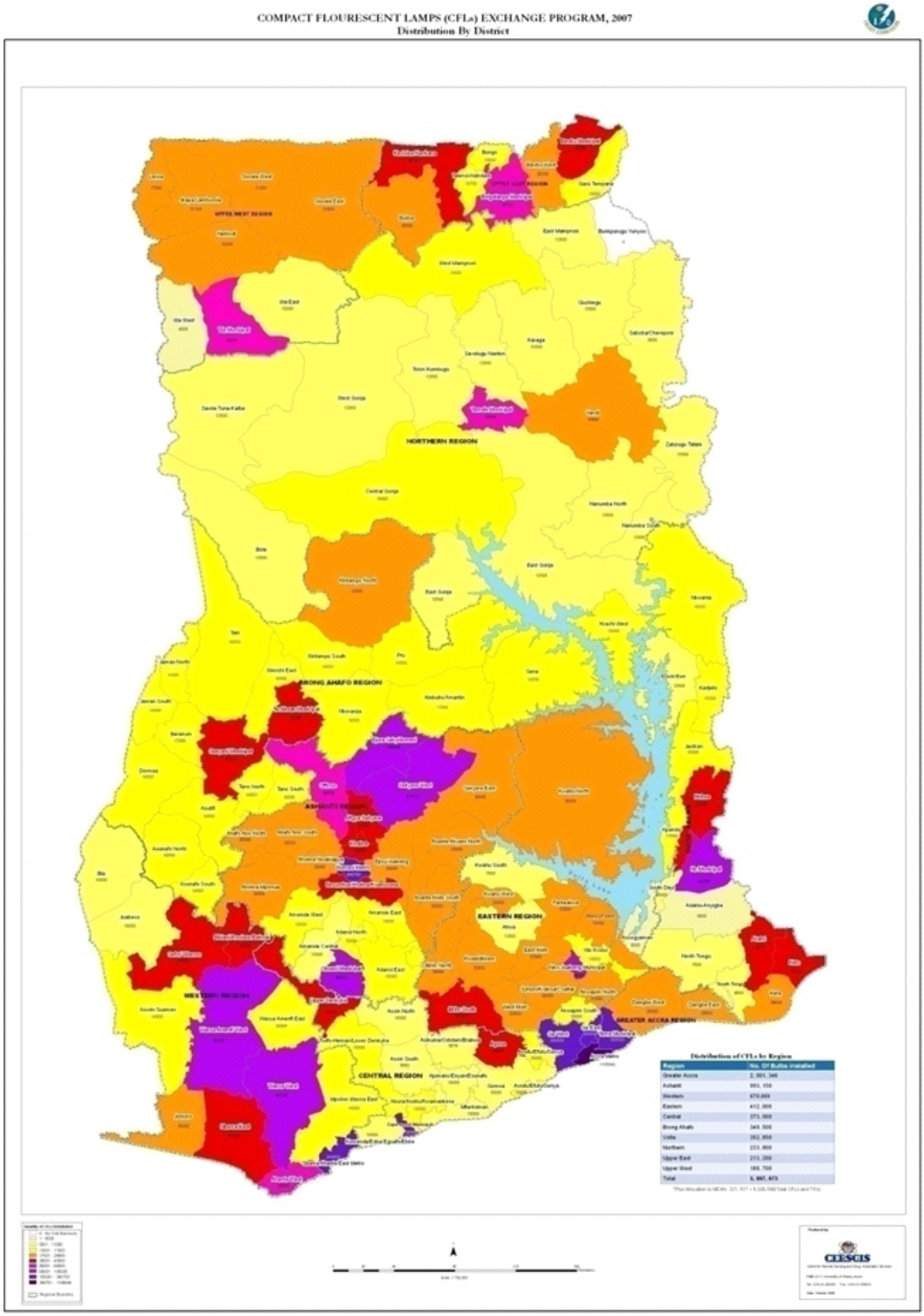

Fig3CFLs Exchange Programme Distribution by District

- In view of the savings and social benefits derived from the CFLs intervention, the report recommended an expansion of the CFLs exchange programme to further reduce the peak electricity supply and delay investments in thermal electricity generation.

- Furthermore, the report emphasized the need to involve major stakeholders and institutions in planning, coordination and implementation of future activities.

- The report also recommends an effective awareness creation on avoidance of mercury contamination for households especially women and children.

4.0 HUMAN RESOURCE, ADMINISTRATION & PUBLIC AFFAIRS DIRECTORATE

4.1.0 Introduction

The Human Resource and Administration (HR&A) Division provides support to the Commission in the areas of personnel administration; recruitment and selection; employee benefits and compensation; manpower planning and performance appraisals. The Division also oversees procurement of goods and services and is responsible for managing the Commission's fleet of vehicles and estates.

4.1.1 Internal Communication / Welfare Issues

To foster a sense of belonging and expose all staff to the Commission's activities, Management instituted the monthly divisional presentations where Division/Units take their turns to present their work programmes to the rest of staff. These meetings have provided the platform for a closer interaction between Divisions/Units and enabled the various units understand how their jobs contribute to the Commission's mandates.

4.1.2 French Language Refresher Course for Staff

The Commission organized for staff to improve their working knowledge in the French Language at the Commission's premises. In all a total of 36 staff members made up of 24 intermediate and 12 beginners signed up for the programme. Due to the inability of staff to make time from their normal jobs to attend the lessons the programme was modified to enable staff members continue their lessons at the Alliance Francais in Accra.

4.2 PUBLIC EDUCATION

4.2.1 Ghana Energy Efficiency Standards and Labelling Programme

During the year under review, the Commission took the public education on energy efficiency arising out of the Legislative Instrument 1815 to another level.

In the Commission's quest to reach to as many people as possible to educate them on the appliance labeling regime, Ghana Post was contracted to distribute fliers captioned "No Label, No Good", throughout the country via letter boxes.

An exercise to ascertain the extent of implementation of this activity was undertaken in Greater Accra, Ashanti, Central, Western and Brong-Ahafo Regions. This confirmed that out of 300,000 fliers distributed, at least 98% went to the targeted recipients - owners of letter boxes and visitors to the post-offices. It became clear from the exercise that, the level of the average Ghanaian's knowledge about the need to conserve energy is appreciable.

A car-sticker campaign which involved the distribution of car stickers was implemented during the year. The outfits of the Ghana Private Road Transport Union (GPRTU) and the Driver and Vehicle and Licensing Authority (DVLA) were used to distribute stickers and/or affix the stickers on both private and commercial vehicles. In all, over 300,000 car-stickers were distributed or affixed during the exercise.

5.0 INTERNATIONAL CO-OPERATION

5.1 World Energy Council (WEC) Reorganisation Activities

The effort and drive to encourage energy affiliated agencies and institutions to subscribe to the membership of the Ghana Committee of the World Energy Council (WEC) which was formally established in 2005 continued.

5.2 Study Tour of Agro Industries in Colombia

Under the auspices of the Government of Colombia, the United Nations Development Organisation for Industrial Development (UNIDO), organised a study tour of agro industries, with particular attention on biofuels in Colombia, South America, from 17 – 25 November 2008 for participants from five African countries, viz Cote d'Ivoire, Guinea, Liberia, Senegal and Ghana. Two delegates from the Energy Commission represented Ghana.

During interactions with organizations charged with the development of the Columbian biofuels programme, it was learnt that the Government of Colombia has set a target of 10% mandatory blend of biodiesel (B10) by the year 2010. As a result, the Government has introduced various incentives such as the provision of long-term loans, tax rebates, etc. which have led to commitment on the part of oil palm growers and palm oil producers and have also led to the formation of strategic alliances for the mutual benefit of the parties involved. These and other vibrant policy and regulatory regimes have resulted in for example, the establishment of 100,000-tonne-capacity biodiesel production plants in various parts of the country.

Further, the team learned that Columbia has invested extensively in research and techniques such as cloning are being used in Colombia for seed improvement and has resulted in positive social and environmental impacts in the oil palm business in Colombia.

Cooperation among developing countries specifically for the formulation of policy and regulations; research and development; knowledge and technology transfer for the development of biofuels for the benefit of developing countries is recommended.

Appendix II: Audited Financial Statements for the period ended 31st December, 2008

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ENERGY COMMISSION
GENERAL INFORMATION

Present Commissioners

Prof. Abeeku Brew-Hammond	Commissioner/Chairman	Appointed	26-6-2009
Mr. Charles Kofi Wayo	Commissioner	Appointed	26-6-2009
Mr. Winfred Nelson	Commissioner	Appointed	26-6-2009
Dr. S. Ohemeng Dapaah	Commissioner	Appointed	26-6-2009
Dr. Rudith King	Commissioner	Appointed	26-6-2009
Dr. Francis Bawaana Dakura	Commissioner	Appointed	26-6-2009
Dr. A.K. Ofosu-Ahenkorah	Commissioner	Appointed	4-5-2005

Immediate Past Commissioners

Prof. A.K. Addae	Ag. Chairman (4-05-2005)	Appointed	18-12-2001
Prof. F.K.A. Allotey	Commissioner	Re-appointed	18-12-2001
Prof. F.O. Akuffo	Commissioner	Appointed	18-12-2001
Mr. J.K. Hagan	Commissioner	Appointed	18-12-2001
		(Deceased	19-4-2008)
Mr. Seth Asante	Commissioner		
Dr. A.K. Ofosu-Ahenkorah	Commissioner/ Executive Secretary	Appointed	4-05-2005

Head Office

Frema House
Plot No. 40
Spintex Road
Accra

Bankers

Bank of Ghana
Ecobank Ghana Limited
Ghana Commercial Bank Limited
Ghana International Bank plc

Auditors

State Enterprises Audit Corporation
4th Floor Republic House
P. O. Box M.198
Accra

ENERGY COMMISSION

REPORT OF THE COMMISSIONERS

The Commission has the pleasure to present to the Honorable Minister of Energy the audited financial statements of the Commission for the year ended 31st December, 2008 and report as follows:

Principal Activities
The principal activities of the Commission include the regulation and management of the utilisation of energy resources in Ghana and the co-ordination of policies relating to them. In particular to:

- advise the Minister of Energy on national policies for the efficient, economical, and safe supply of electricity, natural gas, and petroleum products having due regard to the national economy;
- provide legal, regulatory and supervisory framework for providers of energy (i.e. licensing, monitoring compliance, prescription of rules and regulations by legislative instruments);
- recommend national policies for the development and utilization of indigenous energy resources.

The Commission is also responsible for the management and administration of the Energy Fund which for this purpose includes the Controller and Accountant-General or his representative.

Significant Achievements
Some of the significant achievements during the year under review were:

- Establishment of a Classification and Permitting Framework for bulk customers of electricity.
- Drawing up a licensing framework for service providers in the natural gas sector.
- Setting up standards for biofuel and photovoltaic systems.
- Establishing a Permitting Framework for Renewable Energy Service Providers.
- Establishment of procedures, guidelines and a Committee to guide the siting of energy infrastructure in Ghana.
- Developed licenses for Electricity Transmission; and Electricity Distribution and Sales industry.
- Configuration of the Natural Gas Plan for Ghana for both national and regional pipeline systems for the secondary natural gas transmission and distribution infrastructure, including its update to take into account the recent oil and gas discoveries of the country.
- Development of draft National Grid Code for operations of the National Interconnected Transmission System (NITS) and legislation for enforcement.

ENERGY COMMISSION

REPORT OF THE COMMISSIONERS (continued)

- The following Legislative Instruments were completed and passed by Parliament in 2008:-

  (i) LI 1932: Energy Efficiency (Prohibition of Manufacture, Sale or Importation of Incandescent Filament Lamps and Used Air-Conditioners, Used Refrigerators, Freezers and Refrigerator-Freezers) Regulations, (2008);

  (ii) LI 1934: Electricity Transmission (technical operational and standards of performance), (2008);

  (iii) LI 1935: Electricity Supply and Distribution (Standards of Performance) Rules, (2008);

  (iv) LI 1937: Electricity Regulations, (2008);

- Legislative Instrument on Energy Efficiency of Refrigerating Appliances Regulations could not be passed because it could not attain the mandatory 21 sitting days before Parliament recessed on 6th January, 2009;

- Update of the National Energy Statistics, a statistical handbook of energy production, transportation, losses and usage in the country, covering electricity, petroleum and renewable energy, including woodfuels.

- The Grid Emission factor for Ghana's electricity system was established to be 0.59kg/kWh.

- An assessment of the Impact of CFL on electricity system established that:

  (i) the exchange of six million CFLs for incandescent bulbs saved 124 MW peak demand and 172.8 Gwh in energy.

  (ii) The exercise enabled the country to avoid emitting 112,320 tonnes of carbon dioxide and resulted in saving direct electricity generation cost of US$33.3 million per annum as compared with Government of Ghana's investment of USD14.7 million that was put in.

Results	**GH¢**
The Commission made an excess of expenditure over income of	(207,736)
To which is added the balance on Accumulated Fund Account brought forward of	325,224
To arrive at balance on Accumulated Fund Account carried forward of	117,488

BY ORDER OF THE COMMISSION

…….. ……..

COMMISSIONER **COMMISSIONER**

ENERGY COMMISSION

REPORT OF THE INDEPENDENT AUDITORS FOR THE YEAR ENDED 31ST DECEMBER, 2008

We have audited the financial statements of the Commission set out on pages 5 to 7 which have been prepared under the historical cost convention and on the basis of the accounting policies set out on page 8.

Respective responsibilities of the Commissioners and Auditors
The Commissioners are responsible for the preparation of the financial statements. It is our responsibility to form an independent opinion, based on our audit, on those statements and to report our opinion thereon.

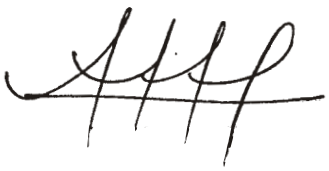
Basis of opinion
We conducted our audit in accordance with International Standards on Auditing. An audit includes examination, on test basis, of evidence relevant to the accounts and, disclosures in the Financial Statements. It also includes an assessment of the significant estimates and judgements made by the Commissioners in the preparation of the financial statements, and of whether the accounting policies set out on page 7 are appropriate to the Commission's circumstances, consistently applied and adequately disclosed.

We planned and performed our audit so as to obtain all the information and explanations which we considered necessary in order to provide us with sufficient evidence to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or other irregularity or error.

In forming our opinion we also evaluated the overall adequacy of the presentation of information in the Financial Statements.

Opinion
In our opinion, proper records of account have been kept and the financial statements, which are in agreement therewith, give a true and fair view of the state of affairs of the Commission as at 31st December, 2008 and of its results and cash flows for the year then ended and comply, in all material respects, with the Energy Commission Act, 1997 (Act 541).

STATE ENTERPRISES AUDIT CORPORATION



(A.M. NYAMPONG)
AG. MANAGING DIRECTOR

4TH FLOOR REPUBLIC HOUSE
KWAME NKRUMAH AVENUE

DATE: 20th November, 2009

ENERGY COMMISSION

Income and Expenditure Account for the year ended 31st December, 2008

	Notes	2008 GH¢	2007 GH¢
Income			
Revenue Grants	2	2,248,165	2,498,455
Other Income	3	247,406	289,623
		2,495,571	2,788,078
Deduct Expenditure			
Personnel Emoluments	4	775,199	639,604
Administrative and General expenses	5	1,112,180	982,855
Service Activity expenses	6	815,928	1,025,417
		2,703,307	2,647,876
(Excess of expenditure over income)/excess of income over expenditure transferred to			
Accumulated Fund Account		(207,736)	140,202

Accumulated Fund Account for the year ended 31st December, 2008

	2008 GH¢	2007 GH¢
Balance as at 1st January	325,224	185,022
(Excess of expenditure over income)/excess of income over expenditure transferred from		
Income and Expenditure Account	(207,736)	140,202
Balance as at 31st December	117,488	325,224

ENERGY COMMISSION

Balance Sheet
as at 31st December, 2008

	Notes	2008 GH¢	2007 GH¢
Non-Current Assets			
Property, Plant and Equipment	7	245,779	197,643
Deferred Expenditure	8	-	141,773
Fixed Deposit Investment		500,597	550,270
		746,376	889,686
Current Assets			
Accounts Receivable	9	38,312	114,321
Prepayments	10	161,513	135,572
Cash and Bank balances	11	65,423	23,677
		265,248	273,570
Current Liabilities			
Accounts Payable	12	145,089	20,955
Bank Overdraft		34,775	27,931
		179,864	48,886
Net Current Assets		85,384	224,684
Total Net Assets Employed		831,760	1,114,370
Financed by:			
Capital Grant	13	225,942	300,816
Special Fund Account	14	488,330	488,330
Accumulated Fund Account		117,488	325,224
		831,760	1,114,370

.....
COMMISSIONER

.....
COMMISSIONER

The notes on pages 92 to 98 form an integral part of these financial statements.

ENERGY COMMISSION

Cash Flow Statement
for the year ended 31st December, 2008

	Notes	2008 GH¢	2007 GH¢
Net cash outflow absorbed into operating activities	15A	(119,098)	(220,096)
Investing Activities			
Interest received on fixed deposit		104,327	61,940
Payments towards purchase of property, plant and equipment		(151,313)	(127,259)
(Increase)/Decrease in fixed deposit investment		49,673	(61,940)
		2,687	(127,259)
Financing activities			
Capital grants received from Energy Fund		151,313	127,192
Net cash inflow/(outflow) in the year	15B	34,902	(220,163)
Cash and cash equivalents at 1st January		(4,254)	215,909
Cash and cash equivalents at 31st December		30,648	(4,254)

The notes on pages 92 to 98 form an integral part of these financial statements.

ENERGY COMMISSION

Notes to the Financial Statements
for the year ended 31st December, 2008

Note 1: Accounting Policies

The following are the significant accounting policies adopted by the Commission in the preparation of the financial statements.

a) Basis of Accounting

The financial statements have been prepared under the historical cost convention.

b) Property, Plant and Equipment

Fixed assets are stated at the cost of purchase together with any incidental costs of acquisition.

Depreciation is charged on property, plant and equipment on a straight line basis over the expected useful lives of the assets concerned.

The principal annual rates used for this purpose are:

Office furniture and fittings	-	12½%
Motor vehicles	-	25%
Plant, machinery and equipment	-	20%
Computers and accessories	-	33 ⅓%

c) Grants

(i) Deferred Credit

Grants received in the form of property, plant and equipment or for the purchase of property, plant and equipment are credited to a deferred credit account and amortised by equal instalments over the expected useful lives of the related property, plant and equipment.

(ii) Revenue Grant

Revenue based grants are credited to the income and expenditure account as and when received and utilised.

d) Foreign Currency transactions

Transactions involving foreign currencies are translated into cedis at the exchange rates prevailing at the date of transaction. Monetary assets and liabilities are translated at the ruling rate at the balance sheet date. Exchange differences arising are dealt with in the income and expenditure account.

e) Debtors

Debtors are stated at book value. Specific provisions are made for debts considered doubtful.

ENERGY COMMISSION

Notes to the Financial Statements
for the year ended 31st December, 2008 (continued)

		2008	2007
		GH¢	GH¢
Note 2:	**Revenue Grants**		
	Subvention from Government of Ghana	823,528	781,814
	Transfers from Energy Fund Account	1,198,450	1,225,169
	Capital Grant amortised	226,187	491,472
		2,248,165	2,498,455
Note 3:	**Other Income**		
	Interest on fixed deposit	85,267	105,961
	Receipts from National Petroleum Authority	132,348	171,917
	Gain on Exchange	3,858	-
	Miscellanous Income	25,933	11,745
		247,406	289,623
Note 4:	**Personnel Emoluments**		
	Gross pay	695,671	570,928
	Employer's SSNIT Contribution	79,528	68,676
		775,199	639,604
Note 5:	**Administrative and General Expenses**		
	Commissioners' Allowances	58,396	42,193
	Stationery and Printing	18,101	12,630
	Insurance	16,530	12,646
	Travelling and Transport	163,260	105,490
	Overtime and Honorarium	18,182	7,818
	Office Accommodation	182,526	189,293
	Audit Fees	14,950	13,800
	Telephone, Postage and Network services	6,441	6,414
	Training, Seminars and Conferences	132,363	152,523
	Sanitation and Security Services	15,656	18,130

ENERGY COMMISSION

Notes to the Financial Statements

for the year ended 31st December, 2008 (continued)

	2008	2007
	GH¢	GH¢
Note5: (continued)		
Repairs and Maintenance	34,545	28,380
Medical	47,815	30,645
Office Consumables	60,451	66,097
Motor Vehicle Running expenses	63,496	40,279
Advertising	18,098	369
Depreciation charge	103,177	101,216
Amortisation of Deferred Expenditure	141,773	141,773
Bank charges	180	220
Water and Electricity	16,035	12,479
Legal charges	205	460
	1,112,180	982,855
Note6: Service Activity Expenses		
Renewable Energy Division	101,408	148,840
Power Division	255,407	336,943
Strategic Policy Planning Division	85,929	88,841
Public Affairs Division	60,545	130,051
Natural Gas Division	260,575	111,392
Compact Flourescent Lamp (CFL)		
Replacement Project	15,992	199,179
Social & Environmental Assessment	36,072	-
UNDP- Ghana Energy Development		
Assessment Project	-	10,171
	815,928	1,025,417

ENERGY COMMISSION

Notes to the Financial Statements for the year ended 31st December, 2008 (continued)

Note 7: Property, Plant and Equipment

	Motor Vehicles GH¢	Fittings Furniture & Equipment GH¢	Computers and Accessories GH¢	Plant and Equipment GH¢	Total GH¢
Cost					
Balance at 1/1/2008	519,695	314,844	147,269	46,388	1,028,196
Additions in the year	141,693	870	8,750	-	151,313
Balance at 31/12/2008	661,388	315,714	156,019	46,388	1,179,509
Depreciation					
Balance at 1/1/2008	470,775	173,133	140,257	46,388	830,553
Charge in the year	57,883	36,706	8,588	-	103,177
Balance at 31/12/2008	528,658	209,839	148,845	46,388	933,730
Net Book Values					
At 31/12/2008	132,730	105,875	7,174	-	245,779
At 31/12/2007	48,920	141,711	7,012	-	197,643

Note 8: Deferred Expenditure

Balance at 1st January	141,773	283,546
Less portion amortised in the year	(141,773)	(141,773)
Balance at 31st December	-	141,773

This is in respect of the expenditure incurred in refurbishing the leasehold property, at Frema House, Plot 40, Spintex Road, Accra, being used as office accommodation of the Commission. The expenditure incurred is to be amortised over a five year period, commencing from the year ended 31st December, 2004.

ENERGY COMMISSION

Notes to the Financial Statements
for the year ended 31st December, 2008 (continued)

		2008 GH¢	2007 GH¢
Note 9:	**Accounts Receivable**		
	Staff Loans	6,380	6,496
	National Petroleum Authority	-	54,109
	Investment Interest	24,961	44,022
	Sundry Debtors	6,971	9,694
		38,312	114,321
Note 10:	**Prepayments**		
	Rent	155,331	130,748
	Insurance	6,182	4,824
		161,513	135,572
Note 11:	**Cash and Bank balances**		
	Bank Accounts	65,221	23,072
	Cash on Hand	202	605
		65,423	23,677
Note 12:	**Accounts Payable**		
	Audit fees	14,950	13,800
	Deposits held (National Petroleum Authority)	121,451	-
	Others	8,688	7,155
		145,089	20,955
Note 13:	**Capital Grant**		
	This is made up of transfers from the Energy Fund to finance capital expenditure of the Commission		
	Balance at 1st January	300,816	665,096
	Add Grants received in the year	151,313	127,192
		452,129	792,288
	Less Amount amortized in the year	(226,187)	(491,472)
	Balance at 31st December	225,942	300,816

ENERGY COMMISSION

Notes to the Financial Statements
for the year ended 31st December, 2008 (continued)

		2008 GH¢	2007 GH¢
Note 14:	**Special Fund Account**		
	Balance at 1st January	488,330	431,800
	Increase in the year	-	56,530
		488,330	488,330

In accordance with Section 44 (2) of Energy Commission Act, 1997 (Act 541) a special fund has been set up with transfers from the Energy Fund Account to create an investment account to generate additional income to support the operations of the Commission.

		2008 GH¢	2007 GH¢
Note 15A:	**Reconciliation of excess of income over expenditure to net cashflow from operating activities**		
	Excess of income over expenditure/(excess of expenditure over income) for the year	(207,736)	140,202
	Adjust for:		
	Depreciation charge	103,177	101,216
	Deferred expenditure amortised	141,773	141,773
	Capital grants amortised	(226,187)	(491,472)
	Interest on fixed deposit	(85,267)	(105,961)
	Decrease in Accounts Receivable	56,948	3,958
	(Increase)/decrease in prepayments	(25,940)	13,346
	Increase/(Decrease) in Accounts Payable	124,134	(23,158)
		(119,098)	(220,096)

Note 15B: Analysis of movements in cash and cash equivalents

	Balances at 31st December			Changes in the year	
	2006 GH¢	**2007 GH¢**	**2008 GH¢**	**2008 GH¢**	**2007 GH¢**
Cash on Hand	1,049	605	202	(403)	(444)
Bank Accounts	216,815	23,072	65,221	42,149	(193,743)
Bank Overdraft	(1,955)	(27,931)	(34,775)	(6,844)	(25,976)
	215,909	(4,254)	30,648	34,902	(220,163)

ENERGY COMMISSION

ENERGY FUND

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ENERGY COMMISION

ENERGY FUND

(i) Present Commissioners

Prof. Abeeku Brew-Hammond	Commissioner/Chairman	Appointed	26-6-2009
Mr. Charles Kofi Wayo	Commissioner	Appointed	26-6-2009
Mr. Winfred Nelson	Commissioner	Appointed	26-6-2009
Dr. S. Ohemeng Dapaah	Commissioner	Appointed	26-6-2009
Dr. Rudith King	Commissioner	Appointed	26-6-2009
Dr. Francis Bawaana Dakura	Commissioner	Appointed	26-6-2009
Dr. A.K. Ofosu Ahenkorah	Commissioner/	Appointed	26-6-2009
	Executive Secretary	Appointed	4-5-2005
Mr. Ralph Tuffour (Controller & Accountant-General	Commissioner {per S.43 (i) of the Energy Commission Act, 1997, Act 541}		

(ii) Immediate Past Commissioners

Prof. A.K. Addae	Ag. Chairmam	Appointed	18-12-2001
Prof. F.K.A. Allotey	Commissioner	Re-appointed	18-12-2001
Prof. F.O. Akuffo	Commissioner	Appointed	18-12-2001
Mr. J.K. Hagan	Commissioner	Appointed	18-12-2001
		(Deceased	19-4-2008)
Mr. Seth Asante	Commissioner		18-12-2001
Dr. A.K. Ofosu-Ahenkorah	Executive Secretary	Appointed	4-5-2005
Mr. C.T. Sottie (Controller & Accountant-General)	Commissioner {per S.43 (i) of the Energy Commission Act, 1997, Act 541}		

(iii) Obectives of the Fund - Section 42, Act 541, 1997

"Monies of the Fund shall be applied as follows -

(a) promotion of energy efficiency and productive uses of electricity, natural gas and petroleum products;

(b) promotion of projects for the development and utilisation of renewable energy resources, including solar energy;

(c) human resource development in the energy sector; and

(d) such other relevant purposes as may be determined by the Commission".

(iv) Head Office: Frema House, Plot No. 40, Spintex Road, Accra.

(v) Bankers: Bank of Ghana

(vi) Auditors: State Enterprises Audit Corporation, 4th Floor Republic House, P. O. Box M.198, Accra.

ENERGY COMMISSION

ENERGY FUND

Report of the Commissioners

The Commissioners have the pleasure of presenting the audited financial statements of the Energy Fund for the year ended 31st December, 2008.

			GH¢
During the year under review releases by the Controller and Accountant General's Department from the Petroleum Levy Account into the Energy Fund Account held at the Bank of Ghana amounted to			910,152
Added to this were:			
(i)	Fees from Energy Service Providers of		120,496
(ii)	Proceeds from sale of Licensing Manuals		1,195
(iii)	Rent from sub-letting - part of Office Premises to	Receipts from National Petroleum Authority	50,400
Total inflow for the year amounted to			1,082,243
Balance at 1st January, 2008 on the Energy Fund Account was			267,340
Total amount available for disbursement in the year was			1,349,583
Deduct disbursement in the year of			(1,400,163)
Balance carried forward on the Energy Fund Account at 31st December, 2008 was			(50,580)*

**The overdrawn position on the Fund Account was as a result of delayed release of funds. The overdrawn position was reversed by 26th January, 2009.*

BY ORDER OF THE COMMISSION

..... **COMMISSIONER**

..... **COMMISSIONER**

ENERGY COMMISSION

ENERGY FUND

REPORT OF THE INDEPENDENT AUDITORS FOR THE YEAR ENDED 31ST DECEMBER, 2008

We have audited the financial statements of the Energy Fund set out on pages 4 to 6 which have been prepared under the historical cost convention and on the basis of the accounting policies set out on page 7.

Respective responsibilities of the Commissioners and Auditors
The Commissioners are responsible for the preparation of the financial statements. It is our responsibility to form an independent opinion, based on our audit, on those statements and to report our opinion thereon.

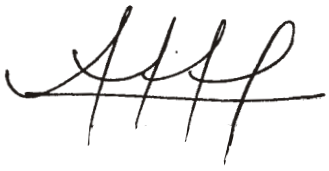
Basis of opinion
We conducted our audit in accordance with International Standards on Auditing. An audit includes examination, on test basis, of evidence relevant to the accounts and disclosures in the financial statements. It also includes an assessment of the significant estimates and judgements made by the Commissioners in the preparation of the financial statements, and of whether the accounting policies set out on page 7 are appropriate to the Energy Fund's circumstances, consistently applied and adequately disclosed.

We planned and performed our audit so as to obtain all the information and explanations which we considered necessary in order to provide us with sufficient evidence to give reasonable assurance that the financial statements are free from material misstatement, whether caused by fraud or other irregularity or error.

In forming our opinion we also evaluated the overall adequacy of the presentation of information in the financial statements.

Opinion
In our opinion, proper records of account have been kept and the financial statements, which are in agreement therewith, give a true and fair view of the state of affairs of the Energy Fund as at 31st December, 2008 and comply, in all material respects, with the Energy Commission Act, 1997 (Act 541).

STATE ENTERPRISES AUDIT CORPORATION



(A.M. NYAMPONG)
AG. MANAGING DIRECTOR

4TH FLOOR REPUBLIC HOUSE
KWAME NKRUMAH AVENUE

DATE: 20th November, 2009

ENERGY COMMISSION

ENERGY FUND

Statement of Resources and Disbursements for the year ended 31st December, 2008

	Notes	2008 GH¢	2007 GH¢
Resources:			
Bank balance at 1st January		267,340	583,354
Add Receipts in the year:			
Releases by Controller and Accountant General's Department from Petroleum levy Account		910,152	988,482
Fees from permits and licences issued to Energy Service Providers		120,496	14,540
Other Income	2	51,595	33,326
Total Resources available		1,349,583	1,619,702
Less Disbursements in the year:			
Capital expenditure of Energy Commission	3	151,313	127,192
Support for Energy Commission's operating expenditure		1,198,450	1,225,169
Withdrawal of receipts from National Petroleum Authority		50,400	-
Bank charges		-	1
Total disbursements		(1,400,163)	(1,352,362)
Bank balance at 31st December		(50,580)	267,340

The notes on page 106 form an integral part of the financial statements.

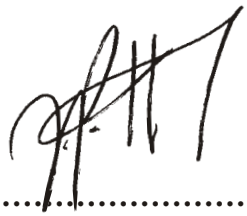
ENERGY COMMISSION

ENERGY FUND

Balance Sheet
as at 31st December, 2008

	2008 GH¢	2007 GH¢
Current Assets		
Bank Balance	(50,580)	267,340
Represented by		
Energy Fund Account	(50,580)	267,340

BY ORDER OF THE COMMISSION



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COMMISSIONER **COMMISSIONER**

The notes on page 106 form an integral part of the financial statements.

ENERGY COMMISSION

ENERGY FUND

Statement of Movements on the Fund Account for the year ended 31st December, 2008

	2008 GH¢	2007 GH¢
Balance as at 1st January	267,340	583,354
Add Inflows during the year	1,082,243	1,036,348
	1,349,583	1,619,702
Less Disbursements during the year	(1,400,163)	(1,352,362)
Balance as at 31st December	(50,580)	267,340

The notes on page 106 form an integral part of the financial statements.

ENERGY COMMISSION

ENERGY FUND

Notes to the Financial Statements
for the year ended 31st December, 2008

Note 1: Accounting Policies

The following are the significant accounting policies adopted by the Commission in the preparation of the financial statements.

(a) Basis of accounting
The financial statements have been prepared under the historical cost convention.

(b) Resources
The income of the Energy Fund is derived from:

(i) Transfers from the Petroleum Levy Account into the Energy Fund Account by the Controller and Accountant-General's Department.

(ii) Fees from licences and permits issued to Energy Service Providers by the Energy Commission.

The above sources of income are accounted for on cash basis.

(c) Disbursements
These are accounted for on cash basis.

Note 2: Other Income	**2008 GH¢**	**2007 GH¢**
Proceeds from disposal of vehicles	-	23,350
Receipts from National Petroleum Authority	50,400	-
Donation received from UNDP for Strategic Policy Planning Division Project	-	9,232
Sale of Licensing Manuals	1,195	744
	51,595	33,326

Note 3: Capital Expenditure of the Energy Commission financed from the Energy Fund		
Computers and Accessories	8,750	4,000
Motor Vehicles	141,693	89,837
Equipment	-	30,555
Furniture	870	2,800
	151,313	127,192

Appendix III: Energy Statistics 2000-2008

ENERGY STATISTICS 2000 - 2008

GHANA

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FOREWORD

This is the second publication of Energy Statistics by the Energy Commission. It provides data on Ghana's energy situation from 2000 to 2008.

This publication has been prepared with data provided by the Volta River Authority (VRA), National Petroleum Authority (NPA), Tema Oil Refinery (TOR), Public Utility Regulatory Commission (PURC), Electricity Company of Ghana (ECG), Northern Electricity Department (NED) and the Ghana Statistical Service (GSS). The cooperation and assistance of all these organizations are gratefully acknowledged.

It is hoped that the statistics contained in this publication will prove useful to a wide range of users including planners, policy makers, researchers and students.

We would appreciate very much any feedback by way of comments and suggestions from readers.

A.K. Ofosu-Ahenkorah, PhD
Executive Secretary

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Symbols & Abbreviations

ATK	Aviation Turbine Kerosene
BST	Bulk Supply Tariff
Bcf / scf	Billion Cubic Feet / standard cubic feet
Cal	Calories
DSC	Distribution Service Charge
ECG	Electricity Company of Ghana
GDP	Gross Domestic Product
GNPC	Ghana National Petroleum Corporation
Gwh	Gigawatt-hour
g / kg	Gramme / kilogramme
in / in2 / in3	Inch / inch squared / inch cubed
kJ / MJ / GJ	Kilojoule / Megajoule / Gigajoule
W / KW / MW / GW	Watt / Kilowatt / Megawatt / Gigawatt
Kwh	Kilowatt-hour
toe/ktoe	Tonnes of oil Equivalent/Kilotonnes of Oil Equivalent
LCO	Light Crude Oil
LPG	Liquefied Petroleum Gas
m / m2 / m3	metre / metre squared / metre cubed.
Min	Minimum
Max	Maximum
Mgh¢	Million Ghana cedis
MMBO or mmbo	Million barrels of oil
MBTU or mBTU	Thousand British Thermal Unit
MMBTU or mmBTU	Million British Thermal Unit
MSCF or mscf	Thousand Standard Cubic Feet
MMSCF or mmscf	Million Standard Cubic Feet
Mwh	Megawatt-hour
NED (VRA-NED)	Northern Electricity Department
NG	Natural Gas
NPA	National Petroleum Authority
RFO	Residual Fuel Oil
TAPCO	Takoradi Power Company Ltd
TICO	Takoradi International Company
TOE	Tonnes of Oil Equivalent
TOR	Tema Oil Refinery
TSC	Transmission Service Charge
VALCO	Volta Aluminium Company
VRA	Volta River Authority

Energy Conversion Factors

Crude Oil	1 Tonne	1.02 TOE
Gasoline:	1 Tonne	1.05 TOE
Kerosene:	1 Tonne	1.03 TOE
Jet Fuel:	1 Tonne	1.03 TOE
Diesel /Gas Oil:	1 Tonne	1.02 TOE
Residual Fuel Oil:	1 Tonne	0.97 TOE
LPG:	1 Tonne	1.08 TOE
Firewood*	1 Tonne	0.30 -0.36 TOE
Charcoal	1 Tonne	0.68 -0.74 TOE

Glossary

Conversion factors	Energy IntensityFactors used to convert quantities from original physical units into a common accounting unit for the purpose of aggregating different energy sources. The tonne of oil equivalent (toe) has been adopted as the accounting Unit.
Energy intensity	defined as the total energy consumed (toe) per unit of GDP (in constant 1993 prices)
Energy unit	Unit for energy
Final Energy Consumption	It is the energy consumed by the final user.
Installed Capacity	The nameplate capacity of a generator
Primary energy	Energy commodities that are either extracted or captured directly from natural resources such as crude oil, woodfuel etc.
Primary energy supply	The sum of all imported and locally available primary energy within a particular year
Secondary energy	Energy from all sources that result from transformation of primary sources. e.g Charcoal from woodfuel and gasoline from crude oil.
Secondary energy supply	The sum of all imported and locally available energy from secondary sources within a particular year

Section One

Selected Energy Indicators

Detail	Unit	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total Primary Energy Supply	*ktoe*	7,819.1	8,077.8	8,519.7	8,576.6	9,070.6	9,090.9	8,830.3	9,015.4	9,148.1
Total Secondary Energy Supply (net)	"	8,986.6	9,483.8	9,838.1	10,066.0	10,339.2	10,211.9	10,713.8	10,840.8	10,713.7
Electricity Generated (net)	GWh	7,695.0	8,019.0	7,830.0	6,236.0	6,252.0	6,964.0	8,305.0	7,167.0	8,059.8
Annual increase	*%*		4.2	-2.4	-20.4	0.3	11.4	19.3	-13.7	12.5
Production of Petroleum Product (net)	*kilotonnes*	1,499.9	1,639.6	1,660.4	1,669.7	1,796.7	1,581.2	1,924.2	2,091.5	1,848.2
Annual increase	*%*		9.3	1.3	0.6	7.6	-12.0	21.7	8.7	-11.6
Total Electricity Consumed	*GWh*	6,081.9	6,553.1	6,198.1	4,583.7	4,626.6	5,275.0	6,540.3	5,593.7	6,162.2
Annual increase	*%*		7.7	-5.4	-26.0	0.9	14.0	24.0	-14.5	10.2
Total Petroleum Product Consumed	*kilotonnes*	1,476.0	1,477.3	1,569.7	1,514.6	1,731.1	1,749.9	1,804.6	1,879.1	1,829.6
Annual increase	*%*		0.1	6.3	-3.5	14.3	1.1	3.1	4.1	-2.6
Total Energy Consumed	*ktoe*	7,034.3	9,440.5	9,831.2	9,874.3	10,279.8	10,385.6	10,608.4	10,638.2	10,715.2
Annual increase	*%*		34.2	4.1	0.4	4.1	1.0	2.1	0.3	0.7
GDP (Constant 1993 prices)	"	514.2	535.7	560.1	589.5	622.4	658.9	701.2	741.2	795.1
Population	*thousand*	18,912.0	19,370.0	19,830.0	20,310.0	20,800.0	21,130.0	21,810.0	22,340.0	22,600.0
Per capita consumption of net electricity generated	*kWh/capita*	406.9	414.0	394.9	307.0	300.6	329.6	380.8	320.8	356.6
Per capita consumption of electricity	*kWh/capita*	321.6	338.3	312.6	225.7	222.4	249.6	299.9	250.4	272.7
Per capita consumption of Petroleum Products	*tonnes/capita*	79.3	84.6	83.7	82.2	86.4	74.8	88.2	93.6	81.8
Per capital final energy consumption	*toe/capita*	0.37	0.49	0.50	0.49	0.49	0.49	0.49	0.48	0.47
Grid Emission Factor	tCO_2/MWh	-	-	-	-				0.575	0.563

Section Two
Primary Energy Supply

Table 2.1: Primary Energy Supply (Physical Unit, Kilotonnes & GWh)

Energy Source	2000	2001	2002	2003	2004	2005	2006	2007	2008
Imported									
Crude Oil for Refinery	1,131.8	1,262.9	1,179.4	1,406.2	1,813.5	1,645.5	962.2	1242.5	1396.7
Crude Oil for Electricity	153.1	275.9	601.6	527.6	163.4	322.0	750.6	811.2	579.1
Total	1,284.9	1,538.8	1,781.0	1,933.8	1,976.9	1,967.5	1,712.8	2,053.8	1,975.8
Local									
Hydro(GWh)	6,610	6,608	5,036	3,885	5,281	5,629	5,619	3,727	6,195
Woodfuel*	18,000.0	18,000.0	19,000.0	19,000.0	20,000.0	20,000.0	20,000.0	20,000.0	20,000.0

**Woodfuel data after 2005 was purely by projection*

Table 2.2: Primary Energy Supply (Energy Unit,ktoe)

Energy Source	2000	2001	2002	2003	2004	2005	2006	2007	2008
Imported									
Crude Oil for Refinery	1,154.5	1,288.1	1,203.0	1,434.3	1,849.7	1,678.4	981.4	1,267.4	1,424.6
Crude Oil for Electricity	156.2	281.4	613.7	538.2	166.7	328.4	765.6	827.5	590.7
Subtotal (Imported)	1,310.6	1,569.6	1,816.6	1,972.5	2,016.4	2,006.9	1,747.0	2,094.9	2,015.3
Local									
Hydro	568.5	568.3	433.1	334.1	454.2	484.1	483.2	320.5	532.8
Woodfuel*	5,940.0	5,940.0	6,270.0	6,270.0	6,600.0	6,600.0	6,600.0	6,600.0	6,600.0
Subtotal (Local)	6,508.5	6,508.3	6,703.1	6,604.1	7,054.2	7,084.1	7,083.2	6,920.5	7,132.8
Total(imported+Local)	7,819.1	8,077.8	8,519.7	8,576.6	9,070.6	9,090.9	8,830.3	9,015.4	9,148.1

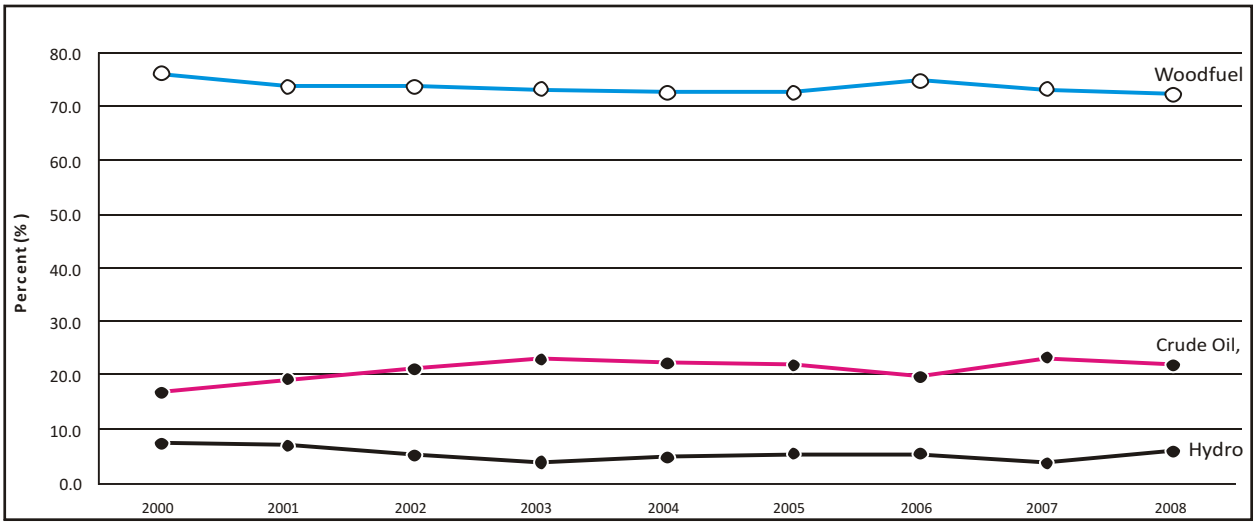
**Woodfuel data after 2005 was purely by projection*

Table 2.3: Share of Primary Energy Supply (%)

Energy Source	2000	2001	2002	2003	2004	2005	2006	2007	2008
Imported									
Crude Oil for Refinery	14.8	15.9	14.1	16.7	20.4	18.5	11.1	14.1	15.6
Crude Oil for Electricity	2.0	3.5	7.2	6.3	1.8	3.6	8.7	9.2	6.5
Subtotal (Imported)	16.8	19.4	21.3	23.0	22.2	22.1	19.8	23.2	22.0
Local									
Hydro	7.3	7.0	5.1	3.9	5.0	5.3	5.5	3.6	5.8
Woodfuel*	76.0	73.5	73.6	73.1	72.8	72.6	74.7	73.2	72.1
Subtotal (Local)	83.2	80.6	78.7	77.0	77.8	77.9	80.2	76.8	78.0
Total(imported+Local)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

**Woodfuel data after 2005 was purely by projection*

Figure 2.1: Trend in Primary Energy Supply



Section Three
Secondary Energy Supply

3.1 Secondary Energy Supply (Imported)

Table 3.1.1: Secondary Energy Supply (Imported) (Physical Unit, Kilotonnes & GWh)

Energy Source	2000	2001	2002	2003	2004	2005	2006	2007	2008
LPG	35.4	35.6	32.0	16.7	11.0	7.1	67.8	47.2	67.8
Gasoline	387.0	389.4	370.8	232.1	255.4	167.5	360.5	274.9	254.5
Kerosene	30.4	21.5	48.8	34.6	0.0	0.0	99.9	66.7	136.4
Gas Oil	363.2	354.3	298.0	285.7	313.1	403.7	780.0	806.9	579.0
RFO	0.3	147.0	77.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	**816.3**	**947.8**	**826.6**	**569.0**	**579.5**	**578.3**	**1,308.1**	**1,195.7**	**1,037.7**
Electricity(GWh)	864	462	1146	940	878	815	629	435	275

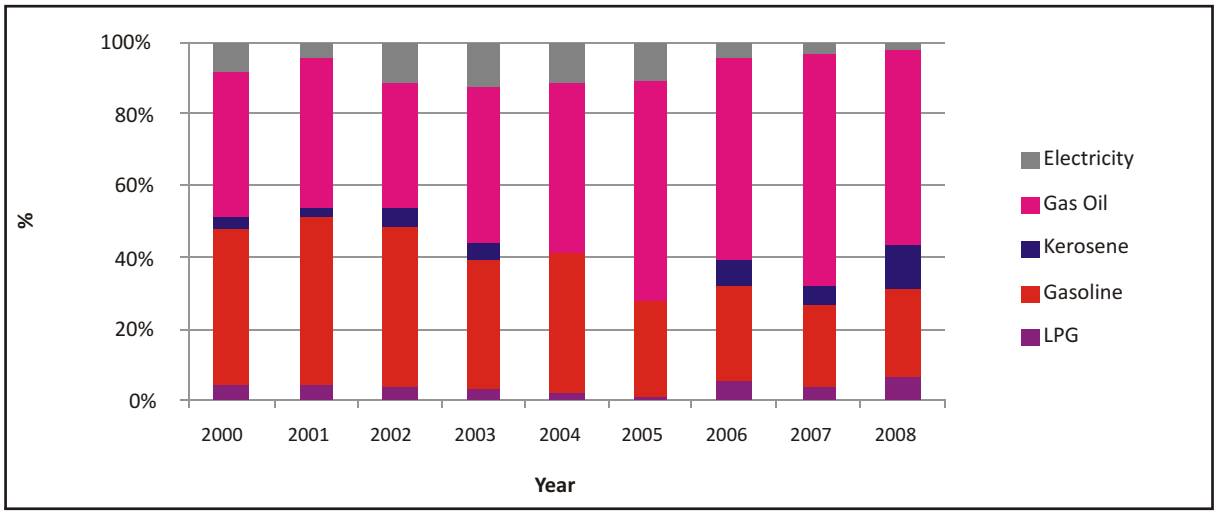
Table 3.1.2: Secondary Energy Supply (Imported), (Energy Unit, ktoe)

Energy Source	2000	2001	2002	2003	2004	2005	2006	2007	2008
LPG	38.3	38.4	34.5	18.0	11.9	7.6	73.2	51.0	73.2
Gasoline	406.3	408.9	389.4	243.7	268.1	175.9	378.5	288.6	267.2
Kerosene	31.4	22.2	50.2	35.6	0.0	0.0	102.9	68.7	140.5
Gas Oil	370.5	361.4	304.0	291.5	319.4	411.8	795.6	823.1	590.5
RFO	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal (Petroleum)	**846.7**	**831.0**	**778.2**	**588.7**	**599.4**	**595.3**	**1,350.2**	**1,231.4**	**1,071.5**
Electricity	74.3	39.7	98.6	80.8	75.5	70.1	54.1	37.4	23.6
Total	**921.0**	**870.7**	**876.8**	**669.6**	**674.9**	**665.4**	**1,404.3**	**1,268.8**	**1,095.1**

Table 3.1.3: Share in Secondary Energy Supply (Imported)

Energy Source	2000	2001	2002	2003	2004	2005	2006	2007	2008
					%				
LPG	4.2	4.4	3.9	2.7	1.8	1.1	5.2	4.0	6.7
Gasoline	44.1	47.0	44.4	36.4	39.7	26.4	27.0	22.7	24.4
Kerosene	3.4	2.5	5.7	5.3	0.0	0.0	7.3	5.4	12.8
Gas Oil	40.2	41.5	34.7	43.5	47.3	61.9	56.7	64.9	53.9
RFO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal (Petroleum)	91.9	95.4	88.8	87.9	88.8	89.5	96.1	97.1	97.8
Electricity	8.1	4.6	11.2	12.1	11.2	10.5	3.9	2.9	2.2
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Fig 3.1.1: Trend in Secondary Energy (Imported)



3.2 Secondary Energy Supply (Local Production)

Table 3.2.1: Secondary Energy Supply (Local Production), (Physical Unit, kilotonnes & GWh)

	Unit	2000	2001	2002	2003	2004	2005	2006	2007	2008
LPG	*kilotonnes*	9.7	7.0	24.4	52.6	65.5	78.3	35.8	67.3	54.6
Gasoline	"	238.6	286.3	346.2	433.8	553.1	567.1	294.4	493.0	391.2
Kerosene	"	51.8	98.1	61.1	109.6	111.1	87.7	65.1	122.0	168.6
ATK	"	108.3	64.0	81.6	85.6	106.9	111.0	46.2	65.8	21.3
Gas Oil	"	358.1	353.5	446.5	506.6	568.4	406.3	294.2	398.2	360.5
RFO	"	261.9	261.1	195.7	163.5	199.1	206.4	155.5	48.7	225.4
Total	**"**	**1,028.4**	**1,069.9**	**1,155.4**	**1,351.8**	**1,604.0**	**1,456.8**	**891.3**	**1,194.9**	**1,221.5**
Firewood*	"	7,100.0	8,000.0	8,300.0	8,600.0	8,700.0	8,800.0	8,900.0	9,000.0	9,100.0
Charcoal*	"	6,250.0	6,500.0	6,750.0	7,000.0	7,150.0	7,150.0	7,160.0	7,180.0	7,200.0
Electricity	*GWh*	7,223.0	7,859.0	7,296.0	5,900.0	6,039.0	6,788.0	8,429.0	6,978.0	8,323.0

**Firewood & Charcoal data after 2005 are purely projections*

Table 3.2.2: Secondary Energy Supply (Local Production), (Energy Unit, ktoe)

Energy Source	2000	2001	2002	2003	2004	2005	2006	2007	2008
LPG	10.4	7.5	26.3	56.8	70.8	84.6	38.7	72.7	58.9
Gasoline	250.6	300.6	363.5	455.5	580.7	595.4	309.1	517.6	410.8
Kerosene	53.3	101.0	62.9	112.9	114.4	90.4	67.1	125.6	173.6
ATK	111.5	65.9	84.0	88.2	110.1	114.3	47.6	67.7	21.9
Gas Oil	365.3	360.5	455.5	516.7	579.7	414.4	300.0	406.2	367.7
RFO	254.1	253.2	189.8	158.6	193.1	200.2	150.9	47.2	218.7
Subtotal (Petroleum)	**1,045.2**	**1,088.8**	**1,182.0**	**1,388.7**	**1,648.9**	**1,499.3**	**913.4**	**1,237.1**	**1,251.6**
Firewood*	2,343.0	2,640.0	2,739.0	2,838.0	2,871.0	2,904.0	2,937.0	2,970.0	3,003.0
Charcoal*	4,437.5	4,615.0	4,792.5	4,970.0	5,076.5	5,076.5	5,083.6	5,097.8	5,112.0
Electricity	621.2	675.9	627.5	507.4	519.4	583.8	724.9	600.1	715.8
Subtotal (Non-petroleum)	**7,401.7**	**7,930.9**	**8,159.0**	**8,315.4**	**8,466.9**	**8,564.3**	**8,745.5**	**8,667.9**	**8,830.8**
Total(Local)	**8,446.9**	**9,019.7**	**9,341.0**	**9,704.1**	**10,115.7**	**10,063.6**	**9,658.9**	**9,905.0**	**10,082.4**

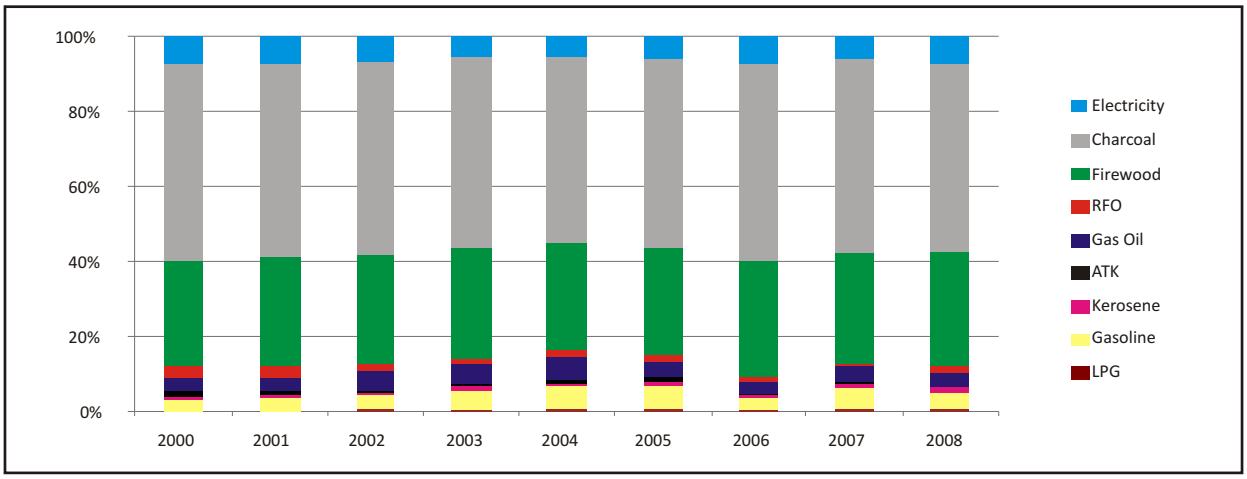
**Firewood & Charcoal data after 2005 are purely projections*

Table 3.2.3: Secondary Energy Supply (Local Production), (%)

Energy Source	2000	2001	2002	2003	2004	2005	2006	2007	2008
LPG	0.1	0.1	0.3	0.6	0.7	0.8	0.4	0.7	0.6
Gasoline	3.0	3.3	3.9	4.7	5.7	5.9	3.2	5.2	4.1
Kerosene	0.6	1.1	0.7	1.2	1.1	0.9	0.7	1.3	1.7
ATK	1.3	0.7	0.9	0.9	1.1	1.1	0.5	0.7	0.2
Gas Oil	4.3	4.0	4.9	5.3	5.7	4.1	3.1	4.1	3.6
RFO	3.0	2.8	2.0	1.6	1.9	2.0	1.6	0.5	2.2
Subtotal (Petroleum)	**12.4**	**12.1**	**12.7**	**14.3**	**16.3**	**14.9**	**9.5**	**12.5**	**12.4**
Firewood*	27.7	29.3	29.3	29.2	28.4	28.9	30.4	30.0	29.8
Charcoal*	52.5	51.2	51.3	51.2	50.2	50.4	52.6	51.5	50.7
Electricity	7.4	7.5	6.7	5.2	5.1	5.8	7.5	6.1	7.1
Subtotal (Non-petroleum)	**87.6**	**87.9**	**87.3**	**85.7**	**83.7**	**85.1**	**90.5**	**87.5**	**87.6**
Total(Local)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

**Firewood & Charcoal data after 2005 are purely projections*

Fig: 3.2.1: Trend in Share of Local Production of Secondary Energy Supply



3.3 Export of Energy Products

Table 3.3.1: Export of Energy Products (Physical Unit)

Energy Source	Unit	2000	2001	2002	2003	2004	2005	2006	2007	2008
LPG	*kilotonnes*	6.2	1.2	4.5	11.2	6.0	12.5	10.4	9.6	5.0
Gas Oil		0.6	1.0	1.9	12.0	42.4	37.7	66.1	52.7	88.4
RFO		190.7	215.7	151.7	89.4	168.9	162.8	45.9	26.2	148.4
Heavy Gasoline		97.1	126.7	129.2	103.0	146.5	161.9	99.8	133.7	73.0
GBS		50.2	33.5	34.3	33.7	18.7	37.1	39.1	44.3	57.1
ATK		0.0	0.0	0.0	0.8	0.0	0.1	0.4	2.5	0.3
Premium Gasoline		0.0	0.0	0.0	1.1	4.4	41.9	13.5	30.1	38.8
Total (Petroleum)		***344.8***	***378.0***	***321.6***	***251.1***	***386.8***	***453.9***	***275.2***	***299.1***	***411.0***
Charcoal		3.0	2.8	3.5	0.5	4.6	0.6	2.9	3.6	2.9
Electricity (GWh)	*GWh*	392	302	612	604	665	639	754	246	538

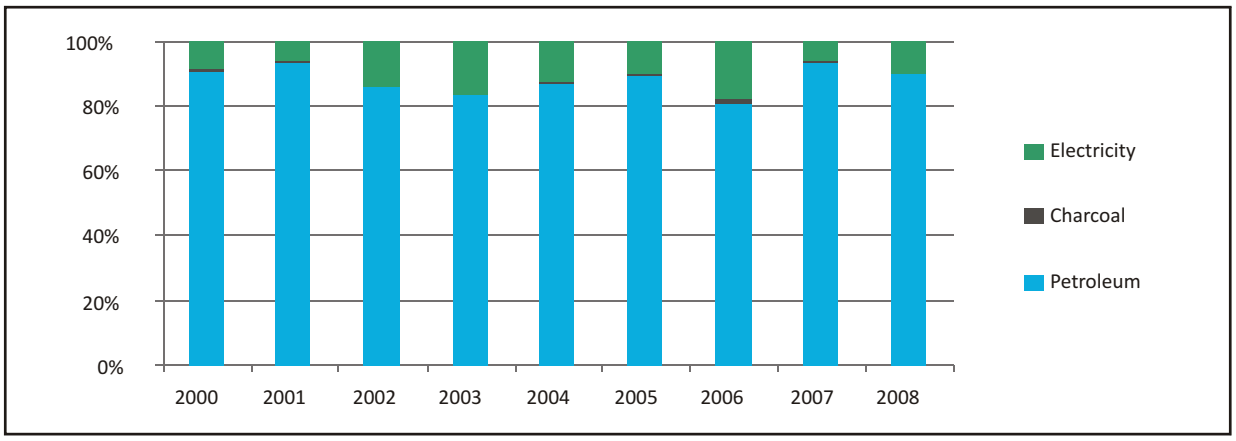
Table 3.3.2: Export of Energy Products (Energy Unit) (ktoe)

Energy Source	2000	2001	2002	2003	2004	2005	2006	2007	2008
LPG	6.7	1.3	4.8	12.1	6.5	13.5	11.3	10.4	5.4
Gas Oil	0.6	1.0	1.9	12.2	43.2	38.4	67.4	53.7	90.2
RFO	185.0	209.2	147.1	86.7	163.8	157.9	44.5	25.4	144.0
Heavy Gasoline	101.9	133.1	135.7	108.1	153.8	170.0	104.8	140.4	76.7
GBS	51.2	34.2	35.0	34.4	19.1	37.8	39.8	45.2	58.2
ATK	0.0	0.0	0.0	0.9	0.0	0.1	0.4	2.6	0.3
Premium Gasoline	0.0	0.0	0.0	1.1	4.6	44.0	14.2	31.6	40.7
Total (Petroleum)	***345.5***	***378.7***	***324.6***	***255.5***	***391.0***	***461.7***	***282.5***	***309.3***	***415.4***
Charcoal	2.1	2.0	2.5	0.3	3.3	0.4	2.1	2.6	2.1
Electricity	33.7	26.0	52.6	51.9	57.2	55.0	64.8	21.2	46.3
Total	**381.3**	**406.6**	**379.7**	**307.7**	**451.4**	**517.1**	**349.4**	**333.0**	**463.8**

Table 3.3.3: Share of Export of Energy Products (%)

Energy Source	2000	2001	2002	2003	2004	2005	2006	2007	2008
LPG	1.8	0.3	1.3	3.9	1.4	2.6	3.2	3.1	1.2
Gas Oil	0.2	0.2	0.5	4.0	9.6	7.4	19.3	16.1	19.4
RFO	48.5	51.4	38.8	28.2	36.3	30.5	12.7	7.6	31.0
Heavy Gasoline	26.7	32.7	35.7	35.1	34.1	32.9	30.0	42.2	16.5
GBS	13.4	8.4	9.2	11.2	4.2	7.3	11.4	13.6	12.6
ATK	0.0	0.0	0.0	0.3	0.0	0.0	0.1	0.8	0.1
Premium Gasoline	0.0	0.0	0.0	0.4	1.0	8.5	4.1	9.5	8.8
Total(Petroleum)	**90.6**	**93.1**	**85.5**	**83.0**	**86.6**	**89.3**	**80.8**	**92.9**	**89.6**
Charcoal	0.6	0.5	0.6	0.1	0.7	0.1	0.6	0.8	0.5
Electricity	8.8	6.4	13.9	16.9	12.7	10.6	18.6	6.4	10.0
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Fig 3.3.1: Trend in Share of Export of Energy Products



3.4 Plant Capacity and Generation

Table 3.4.1: Plant Capacity (2008)

Type	Plant Capacity (2008)	
	Installed	Percentage (%)
Hydro		
Akosombo	1,020	50.7
Kpong	160	8.0
Total	**1,180**	**58.7**
Thermal		
TAPCO	330	16.4
TICO	220	10.9
Mines Diesel Reserve Plant	80	4.0
Emergency Diesel Reserve Plant	126	6.3
Tema Diesel Reserve Plant	25	1.2
Tema Diesel Plant	30	1.5
Kumasi Reserve Plant	20	1.0
Total	**831**	**41.3**
Total (Hydro+Thermal)	**2,011**	**100**

Table 3.4.2: Installed Capacity Generation

Year	Installed Capacity (MW)	Electricity Generated (GWh)			Percentage (%)		
		Hydro	Thermal	Total	Hydro	Thermal	Total
2000	1,652	6,610	613	7,223	91.5	8.5	100
2001	1,551	6,608	1,251	7,859	84.1	15.9	100
2002	1,574	5,036	2,260	7,296	69.0	31.0	100
2003	1,582	3,885	2,015	5,900	65.8	34.2	100
2004	1,730	5,281	758	6,039	87.4	12.6	100
2005	1,730	5,629	1,159	6,788	82.9	17.1	100
2006	1,730	5,619	2,810	8,429	66.7	33.3	100
2007	1,935	3,727	3,251	6,978	53.4	46.6	100
2008	1,981	6,196	2,128	8,324	74.4	25.6	100

Figure 3.4.2: Trend in Shares of Plant Generation

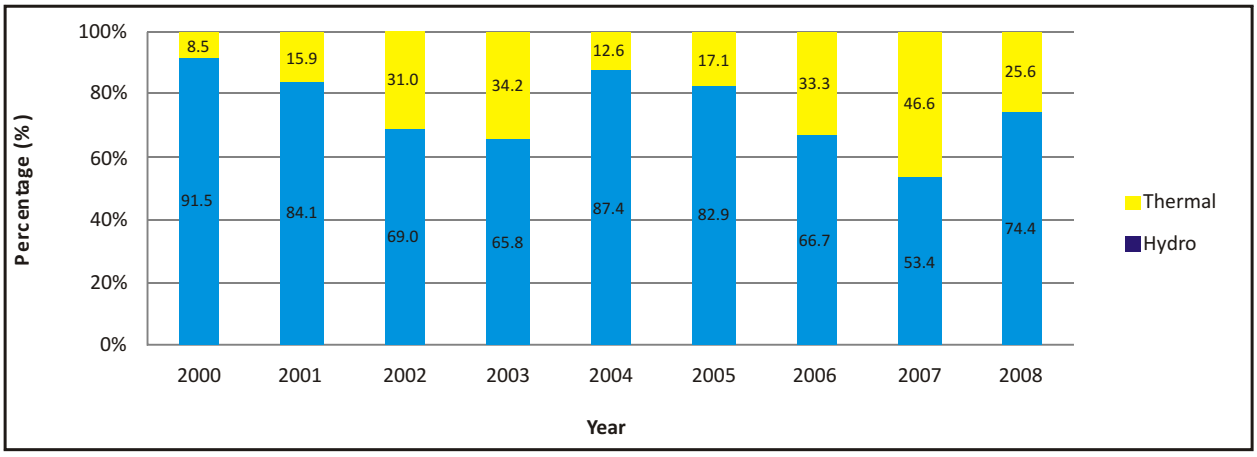


Table 3.4.3: Electricity Generated by Plant (GWh)

Plant	2000	2001	2002	2003	2004	2005	2006	2007	2008
	GWh								
Akosombo	5,557	5,524	4,178	3,210	4,404	4,718	4,690	3,104	5,254
Kpong	1,052	1,085	858	675	876	911	929	623	941
Tema Diesel Plant	0	0	23	19	0	0	0	0	0
Tapco	345	740	874	1,328	536	831	1,416	1,521	874
Tico	268	510	1,363	668	222	328	1,395	1,417	1,063
Tema Diesel Reserve Plant	0	0	0	0	0	0	0	162	85
Tema Diesel Emergency Reserve Plant	0	0	0	0	0	0	0	80	45
Kumasi Diesel Reserve Plant	0	0	0	0	0	0	0	33	16
Tema Mines Diesel Reserve Plant	0	0	0	0	0	0	0	38	46
Total	**7,223**	**7,859**	**7,296**	**5,900**	**6,039**	**6,788**	**8,429**	**6,978**	**8,323**

Table 3.4.4: Electricity Generated by Plant (%)

Plant	2000	2001	2002	2003	2004	2005	2006	2007	2008
	Percentage (%)								
Akosombo	76.9	70.3	57.3	54.4	72.9	69.5	55.6	44.5	63.1
Kpong	14.6	13.8	11.8	11.4	14.5	13.4	11.0	8.9	11.3
Tema Diesel	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0
Tapco	4.8	9.4	12.0	22.5	8.9	12.2	16.8	21.8	10.5
Tico	3.7	6.5	18.7	11.3	3.7	4.8	16.5	20.3	12.8
Tema Diesel Reserve Plant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	1.0
Tema Diesel Emergency Reserve.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.5
Kumasi DieselReserve Plant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.2
TemaDiesel Mines Reserve Plant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Table 3.4.5: Average Monthly Water Level (feet) in the Akosombo Dam 2003-2008

Month	2003			2004			2005		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
January	243.19	242.38	243.83	253.51	252.87	254.15	253.18	252.23	254.05
February	241.32	239.00	242.20	252.04	251.20	252.82	251.40	250.35	252.15
March	239.59	239.04	240.60	250.34	249.48	251.15	249.51	248.63	250.30
April	238.30	237.84	238.88	248.75	248.06	249.44	247.68	247.00	248.40
May	238.29	236.52	273.65	247.42	246.89	248.03	246.18	245.28	246.97
June	236.62	236.42	237.10	246.31	245.56	246.87	244.74	244.40	245.22
July	237.62	237.18	238.43	245.39	245.28	245.58	244.25	244.00	244.80
August	239.66	238.50	241.20	246.95	245.66	248.80	245.62	244.88	246.28
September	245.64	241.33	250.00	251.85	248.95	254.75	248.18	246.38	250.12
October	253.81	250.40	255.70	256.31	254.95	256.73	252.16	250.22	253.40
November	255.88	255.57	256.04	256.34	255.83	256.75	252.84	251.97	253.42
December	254.84	254.25	255.52	254.94	254.10	255.79	250.98	250.03	251.90

Month	2006			2007			2008		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
January	248.93	247.92	249.97	242.61	241.47	243.68	253.89	253.05	254.68
February	246.97	246.03	247.86	240.40	239.35	241.40	252.20	251.30	253.00
March	244.86	243.75	245.96	238.24	237.32	239.27	250.18	249.16	251.21
April	242.51	241.49	243.67	236.76	236.30	237.27	248.23	247.43	249.11
May	240.50	239.73	241.44	236.05	235.86	236.27	246.64	245.95	247.34
June	239.06	238.49	239.68	235.71	235.48	235.84	245.48	245.00	245.95
July	237.75	236.99	238.45	235.15	234.96	235.46	245.38	244.95	246.55
August	236.87	236.75	236.96	237.03	235.36	239.85	249.41	246.65	253.10
September	238.59	236.73	241.10	244.72	240.25	252.80	257.84	253.40	261.60
October	243.88	241.50	246.00	255.04	253.10	256.05	264.73	261.85	266.35
November	246.09	245.49	246.42	256.18	255.71	256.50	265.82	265.09	266.35
December	244.78	243.82	245.61	255.41	254.70	255.67	264.29	263.53	265.03

Fig 3.4.4 Trend in Water Level in the Akosombo Dam (ft), (2003 - 2008)

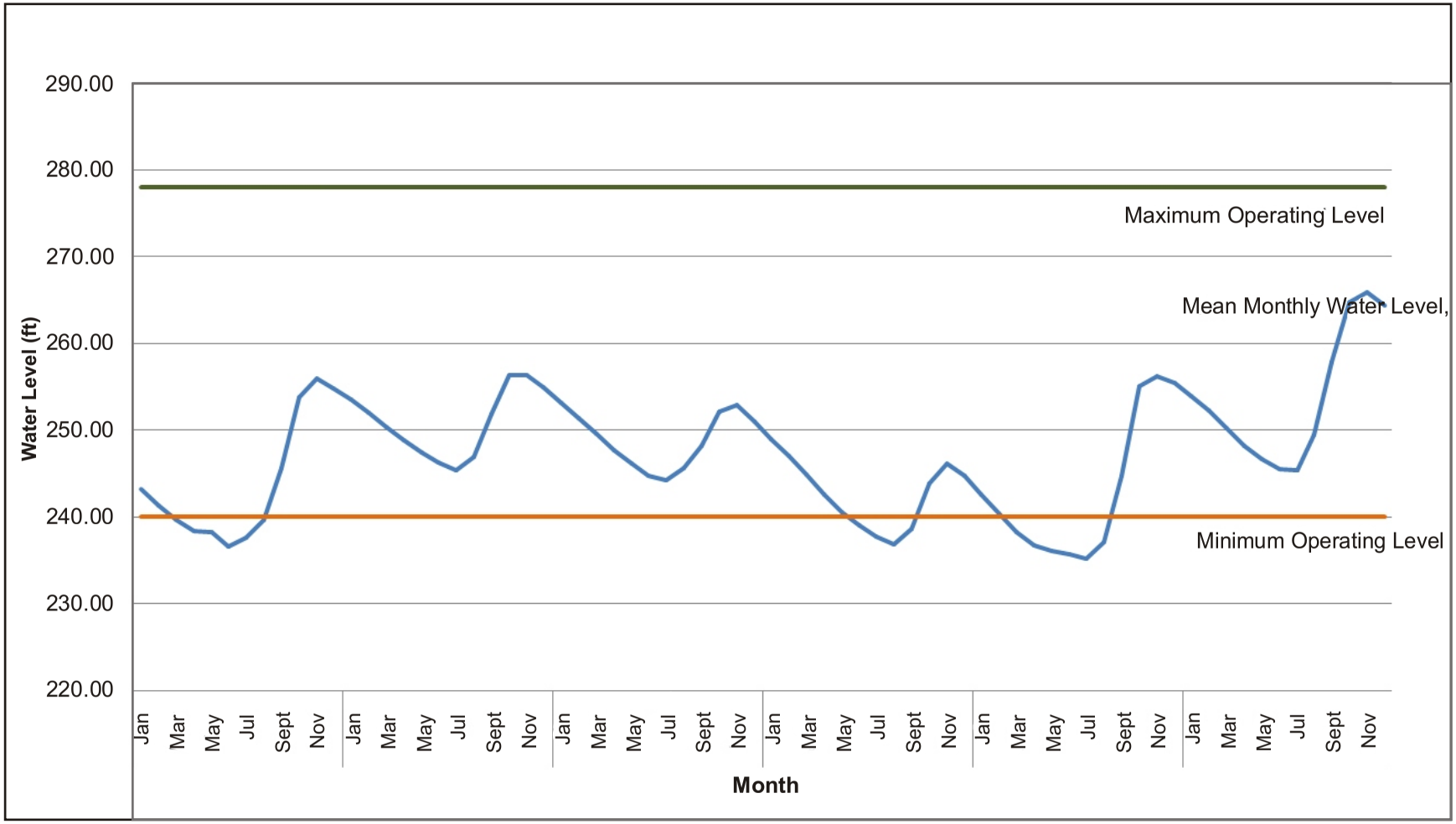


Table 3.4.7: Fuel Input for Electricity Generation (cubic metres)

Type of Fuel	2000	2001	2002	2003	2004	2005	2006	2007	2008
Light Crude Oil	186,134	358,388	700,517	601,872	222,356	327,793	835,514	900,074	608,593
Distillate Fuel Oil	7,001	17,219	2,211	1,336	1,127	925	935	6,672	1,433

Figure 3.4.5: Fuel Input for Electricity Generation

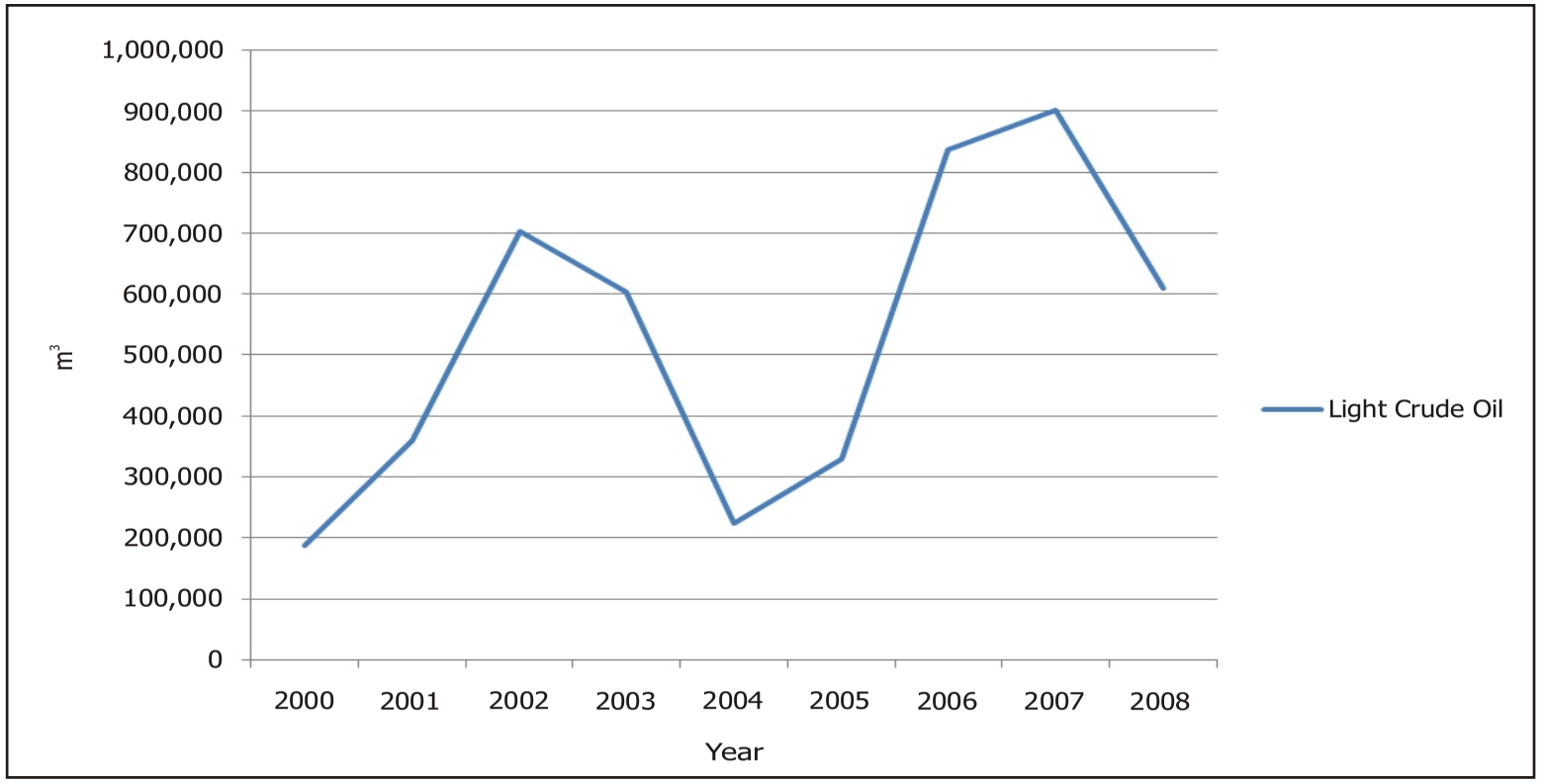
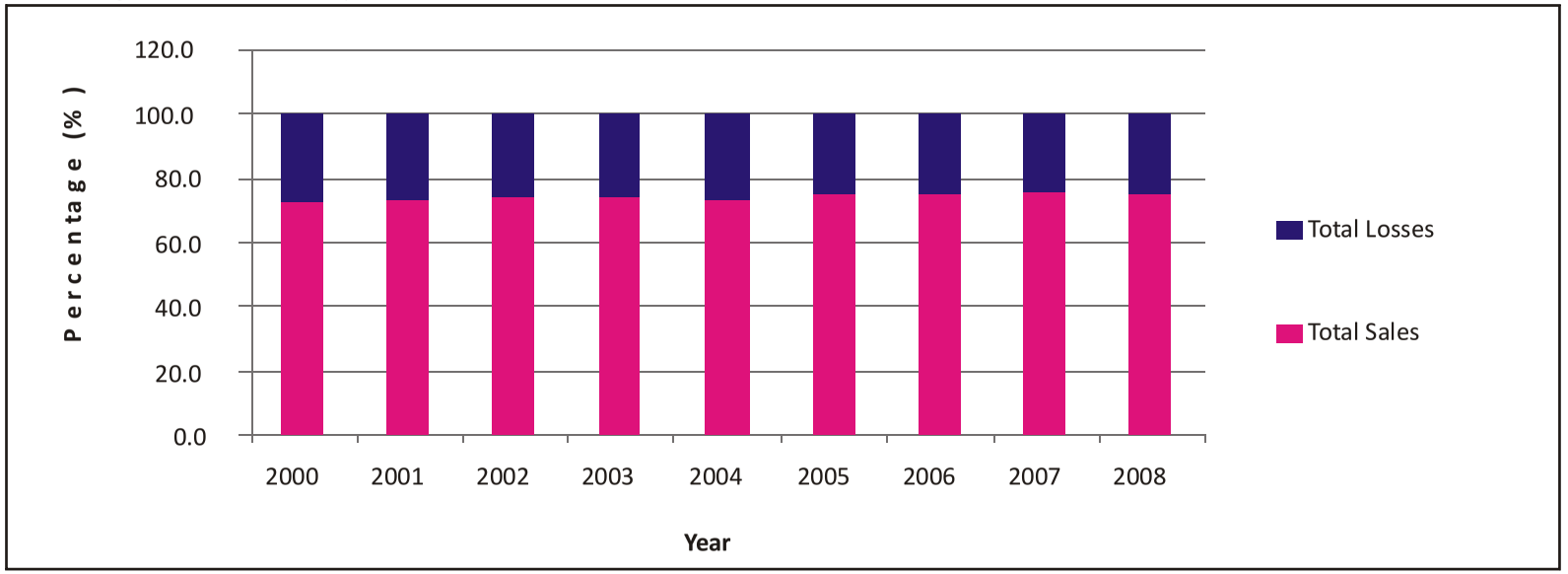


Table 3.4.8: Electricity Supplied and Sales to ECG and NED (GWh)

Details	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total Supplied (ECG & NED)	4,320	4,530	4,709	4,920	5,298	5,546	5,759	5,643	6,328
Total sales (ECG & NED)	3,142	3,330	3,465	3,626	3,865	4,127	4334	4,271	4,727
Total Losses*	1,178	1,200	1,244	1,294	1,433	1,419	1,425	1,372	1,601
Total Losses (%)	*27.3*	*26.5*	*26.4*	*26.3*	*27.0*	*25.6*	*24.7*	*24.3*	*25.3*

*Commercial and Technical Losses

Figure 3.4.6: Electricity Sales and Losses (ECG & NED)



3.5 Electricity Sales

Table 3.5.1: ECG Customer and Sales Profile

Group	2000	2001	2002	2003	2004	2005	2006	2007	2008
					Number of Consumers				
Residential/Non Residential	816,557	893,080	968,847	1,092,641	1,224,931	1,320,665	1,412,977	1,538,057	1,722,400
Industrial	768	800	827	853	879	930	987	1,024	1,136
Total	**817,325**	**893,880**	**969,674**	**1,093,494**	**1,225,810**	**1,321,595**	**1,413,964**	**1,539,081**	**1,723,536**
					Unit Sold (GWh)				
Residential/Non Residential	1,807	1,946	2,016	2,074	2,190	2,308.21	2,588.33	2,554.43	2834
Industrial	1,104	1,133	1,185	1,268	1,351	1,404	1,390	1,351	1,501
Total	**2,911**	**3,079**	**3,201**	**3,342**	**3,541**	**3,712**	**3,978**	**3,905**	**4,335**
Losses	***1,079***	***1,095***	***1,126***	***1,153***	***1,276***	***1,283***	***1,275***	***1,240***	***1,464***
					Average Number of Units per Consumer (kWh)				
Residential/Non Residential	2,213	2,179	2,081	1,898	1,788	1,748	1,832	1,661	1,645
Industrial	1,437,500	1,416,250	1,432,890	1,486,518	1,536,974	1,509,677	1,408,308	1,319,336	1,321,303

Table 3.5.2: NED Customer and Sales Profile

Group	2000	2001	2002	2003	2004	2005	2006	2007	2008
				Number of Consumers					
Residential	97,147	108,817	118,049	129,395	141,573	170,543	192,665	206,665	231,175
Non Residential	18,099	20,122	21,606	23,049	32,550	32,181	37,433	41,601	47,266
Industrial	27	28	27	27	23	34	28	31	31
Total	**115,273**	**128,967**	**139,682**	**152,471**	**174,146**	**202,758**	**230,126**	**248,297**	**278,472**
				Unit Sold (GWh)					
Residential	150	166	172	181	142	171	215	215	218
Non Residential	48	54	58	60	70	103	90	101	115
Industrial	33	30	35	43	53	50	51	50	59
Total	**231**	**250**	**265**	**284**	**265**	**324**	**356**	**366**	**392**
Losses	***29.9***	***29.6***	***30.7***	***33.2***	***32.8***	***27.21***	***29.6***	***26.5***	***26.5***
				Average Number of Units per Consumer (kWh)					
Residential	1,544	1,525	1,457	1,399	1,003	1,003	1,116	1,040	943
Non Residential	2,652	2,684	2,684	2,603	2,151	3,201	2,404	2,428	2,433
Industrial	1,222,222	1,071,429	1,296,296	1,592,593	2,304,348	1,470,588	1,823,214	1,610,968	1,906,452

Section Four

Final Energy Consumption

4.1 Final Electricity Consumption

Table 4.1.1: Final Electricity Consumption by Sector, (Physical Unit, GWh)

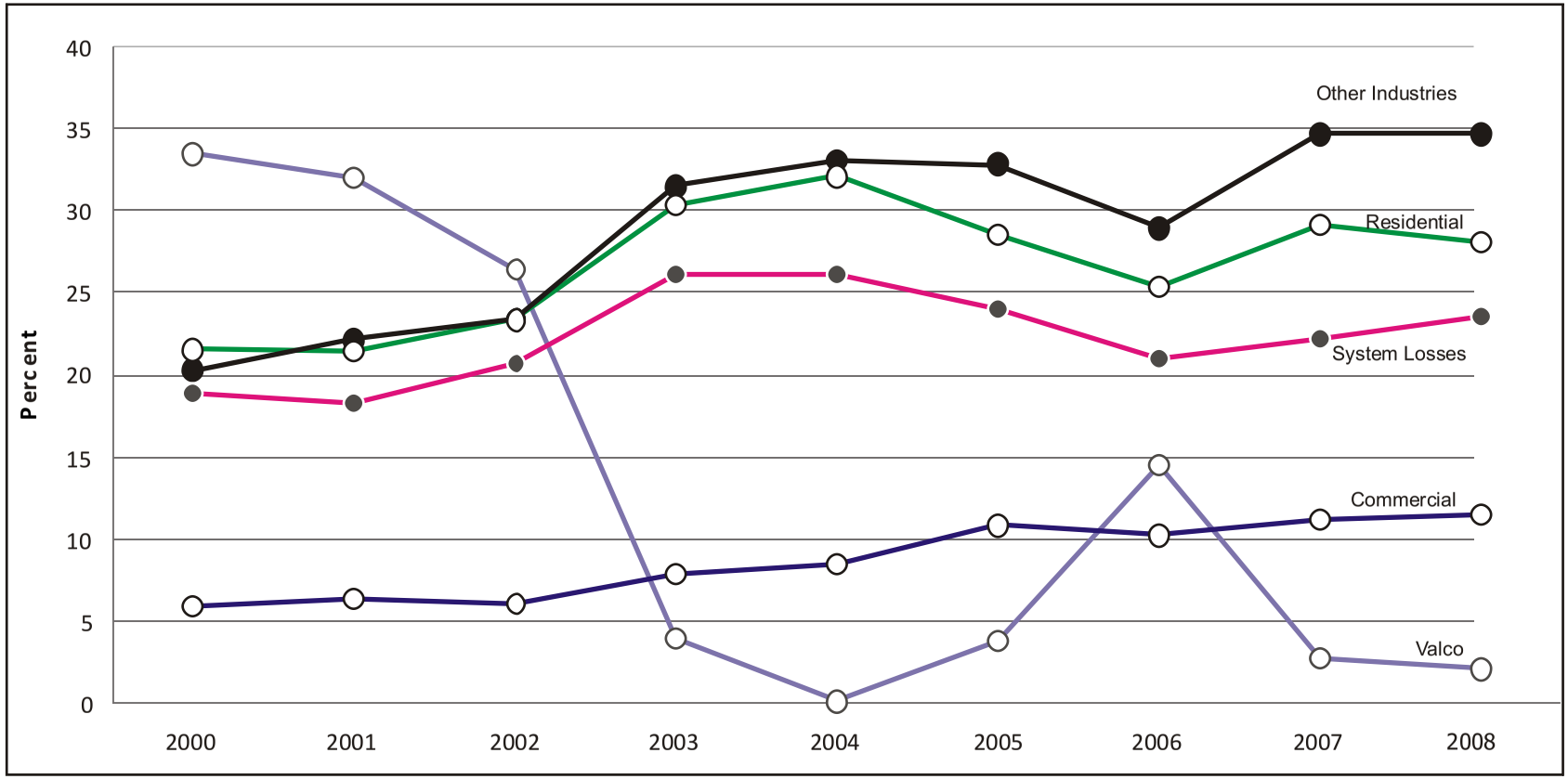
Sector		2000	2001	2002	2003	2004	2005	2006	2007	2008
Industries	VALCO	2,505	2,565	2,063	250	10	259	1,199	205	171
	Others	1,522	1,772	1,836	1,955	2,075	2,282	2,394	2,492	2,795
	Total	4,027	4,337	3,899	2,205	2,085	2,541	3,593	2,697	2,966
Non-residential		445	503	477	493	530	748	842	802	927
Residential		1,610	1,713	1,822	1,886	2,012	1,986	2,105	2,095	2,269
Total (with VALCO)		6,082	6,553	6,198	4,584	4,627	5,275	6,540	5,594	6,162
Total (excluding VALCO)		3,577	3,988	4,135	4,334	4,617	5,016	5,341	5,389	5,991
Distribution Losses		*1,178*	*1,200*	*1,244*	*1,294*	*1,433*	*1,419*	*1,425*	*1,370*	*1,601*
Transmission Losses		*229*	*259*	*368*	*333*	*205*	*249*	*318*	*230*	*303*
Total System Losses		1,407	1,459	1,612	1,627	1,638	1,668	1,743	1,600	1,904
Total (Consumption + System Losses)		7,489	8,012	7,810	6,211	6,265	6,943	8,283	7,194	8,066

* *Technical & Commercial losses*

Table 4.1.2: Share of Final Electricity Consumption by Sector (%)

Sector		2000	2001	2002	2003	2004	2005	2006	2007	2008
Industries	VALCO	33	32	26	4	0	4	14	3	2
	Others	20	22	24	31	33	33	29	35	35
Non-residential		6	6	6	8	8	11	10	11	11
Residential		21	21	23	30	32	29	25	29	28
Total System Losses		*19*	*18*	*21*	*26*	*26*	*24*	*21*	*22*	*24*
Total (Consumption + System Losses)		**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Figure 4.1.1: Trend in Electricity Consumption by Sector



4.2 Final Petroleum Consumption

Table 4.2.1: Final Petroleum Consumption, (Physical Unit, Kilotonnes)

Energy Type	2000	2001	2002	2003	2004	2005	2006	2007	2008
LPG	45.0	42.5	50.0	56.7	65.7	70.5	88.0	93.3	117.6
Gasoline	513.1	523.6	557.9	469.5	563.2	526.2	500.9	547.4	548.1
Kerosene	67.6	70.5	74.8	68.8	73.2	74.3	76.5	63.2	34.5
Premix	30.6	27.0	26.8	28.9	27.5	31.4	33.7	42.1	52.1
ATK	96.9	76.4	90.5	89.8	107.4	119.3	114.7	122.5	119.0
Gas Oil	665.8	685.4	717.8	755.3	848.9	880.4	934.0	956.2	907.4
RFO	57.1	52.0	51.9	45.7	45.2	47.8	56.8	54.5	50.9
Total	**1,476.0**	**1,477.3**	**1,569.7**	**1,514.6**	**1,731.1**	**1,749.9**	**1,804.6**	**1,879.1**	**1,829.6**

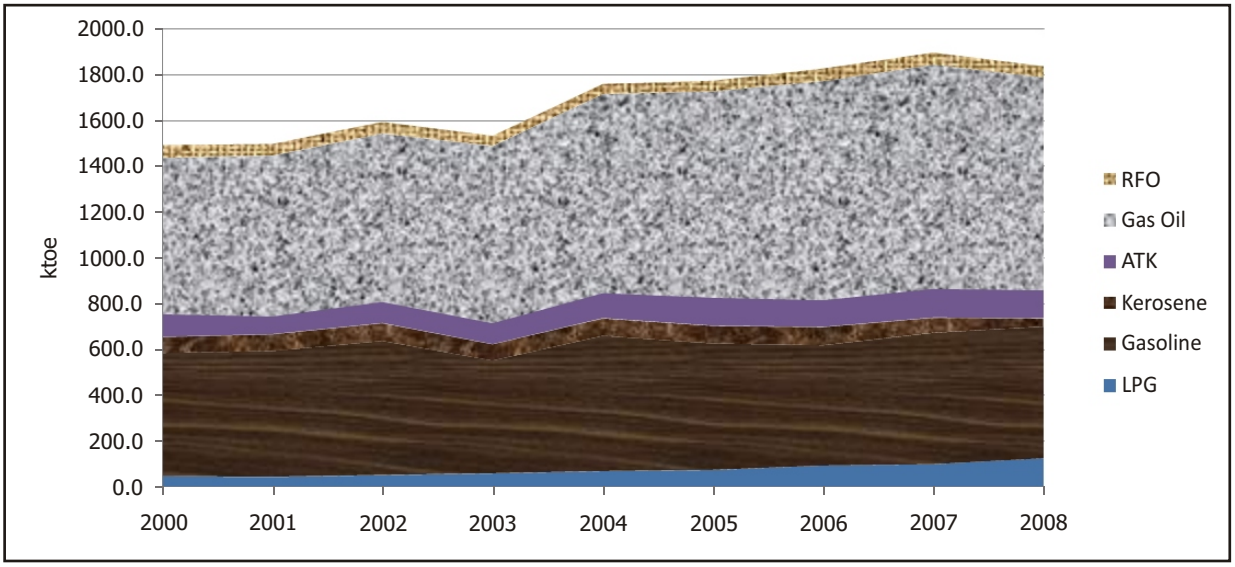
Table 4.2.2: Final Petroleum Consumption, (Energy Unit, ktoe)

Energy Type	2000	2001	2002	2003	2004	2005	2006	2007	2008
LPG	48.6	45.9	54.0	61.2	70.9	76.1	95.0	100.7	127.0
Gasoline	538.7	549.8	585.8	493.0	591.4	552.5	526.0	574.7	575.6
Kerosene	69.6	72.6	77.1	70.8	75.4	76.6	78.8	65.1	35.5
ATK	99.8	78.7	93.2	92.5	110.6	122.9	118.1	126.2	122.5
Gas Oil	679.1	699.1	732.2	770.4	865.9	898.0	952.7	975.3	925.5
RFO	55.3	50.4	50.3	44.3	43.9	46.4	55.1	52.8	49.3
Total	**1,491.2**	**1,496.5**	**1592.5**	**1,532.2**	**1,758.0**	**1,772.5**	**1,825.7**	**1,894.9**	**1,835.5**

Table 4.2.3: Share of Final Petroleum Consumption (%)

Energy Type	2000	2001	2002	2003	2004	2005	2006	2007	2008
LPG	3.0	2.9	3.2	3.7	3.8	4.0	4.9	5.0	6.4
Gasoline	34.8	35.4	35.5	31.0	32.5	30.1	27.8	29.1	30.0
Kerosene	4.6	4.8	4.8	4.5	4.2	4.2	4.2	3.4	1.9
Premix	2.1	1.8	1.7	1.9	1.6	1.8	1.9	2.2	2.8
ATK	6.6	5.2	5.8	5.9	6.2	6.8	6.4	6.5	6.5
Gas Oil	45.1	46.4	45.7	49.9	49.0	50.3	51.8	50.9	49.6
RFO	3.9	3.5	3.3	3.0	2.6	2.7	3.1	2.9	2.8
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Fig 4.2.1: Trend in Final Petroleum Consumption



4.3 Final Woodfuel Consumption

Table 4.3.1: Final Woodfuel Consumption, (Physical Unit, Kilotonnes)

Energy Type	2000	2001	2002	2003	2004	2005	2006	2007	2008
Firewood*	7,100.0	8,000.0	8,300.0	8,600.0	8,700.0	8,800.0	8,900.0	9,000.0	9,100.0
Charcoal*	3,600.0	6,500.0	6,800.0	7,000.0	7,200.0	7,200.0	7,230.0	7,260.0	7,300.0
Total(Woodfuel)	**10,700.0**	**14,500.0**	**15,100.0**	**15,600.0**	**15,900.0**	**16,000.0**	**16,130.0**	**16,260.0**	**16,400.0**

**Firewood & Charcoal data after 2005 are purely projections*

4.4Total Energy Consumption

Table 4.4.1: Total Energy Consumption (Physical Unit)

Energy Type	Unit	2000	2001	2002	2003	2004	2005	2006	2007	2008
Petroleum	Kilotonnes	1,476.0	1,477.3	1,569.7	1,514.6	1,731.1	1,749.9	1,804.6	1,879.1	1,829.6
Woodfuel	"	10,700.0	14,500.0	15,100.0	15,600.0	15,900.0	16,000.0	16,130.0	16,260.0	16,400.0
Electricity	GWh	7,488.9	8,012.1	7,810.1	6,210.7	6,264.6	6,943.0	8,283.3	7,193.7	8,066.2

Table 4.4.2: Total Energy Consumption (Energy Unit, ktoe)

Energy Type	2000	2001	2002	2003	2004	2005	2006	2007	2008
Petroleum	1,491.2	1,496.5	1,592.5	1,532.2	1,758.0	1,772.5	1,825.7	1,894.9	1,835.5
Woodfuel	4,899.0	7,255.0	7,567.0	7,808.0	7,983.0	8,016.0	8,070.3	8,124.6	8,186.0
Electricity	644.0	689.0	671.7	534.1	538.8	597.1	712.4	618.7	693.7
Total	**7,034.3**	**9,440.5**	**9,831.2**	**9,874.3**	**10,279.8**	**10,385.6**	**10,608.4**	**10,638.2**	**10,715.2**

Table 4.4.3: Share of Total Energy Consumption (%)

Energy Type	2000	2001	2002	2003	2004	2005	2006	2007	2008
Petroleum	21.2	15.9	16.2	15.5	17.1	17.1	17.2	17.8	17.1
Woodfuel	69.6	76.8	77.0	79.1	77.7	77.2	76.1	76.4	76.4
Electricity	9.2	7.3	6.8	5.4	5.2	5.7	6.7	5.8	6.5
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Section Five
Energy Prices

5.1 Crude Oil and Petroleum Prices

Table 5.1.1: Annual Average Crude Oil Prices (US$/barrel)

	Unit	2000	2001	2002	2003	2004	2005	2006	2007	2008
Crude Oil Price	US$/barrel	28.36	24.54	24.98	28.78	37.99	55.66	67.03	74.68	101.8
Annual Increase	%	59.52	-13.47	1.79	15.21	32.00	46.51	20.43	11.41	36.31

Source: British Petroleum

Figure 5.1.1: Trend in Crude Oil Prices

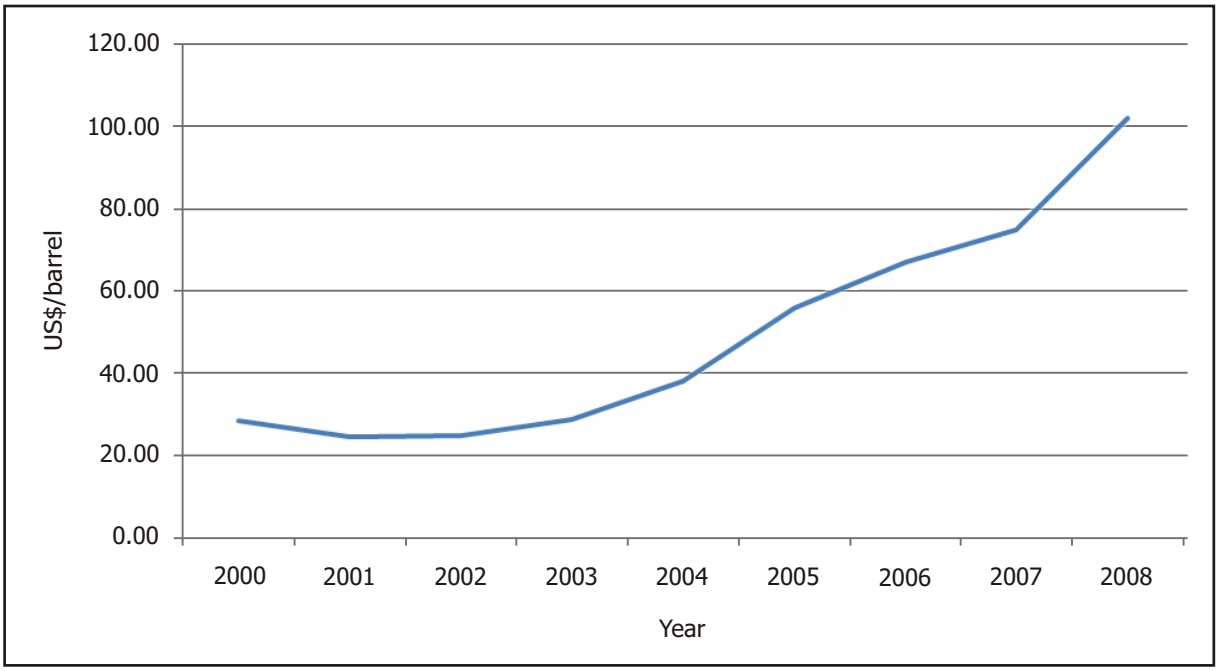
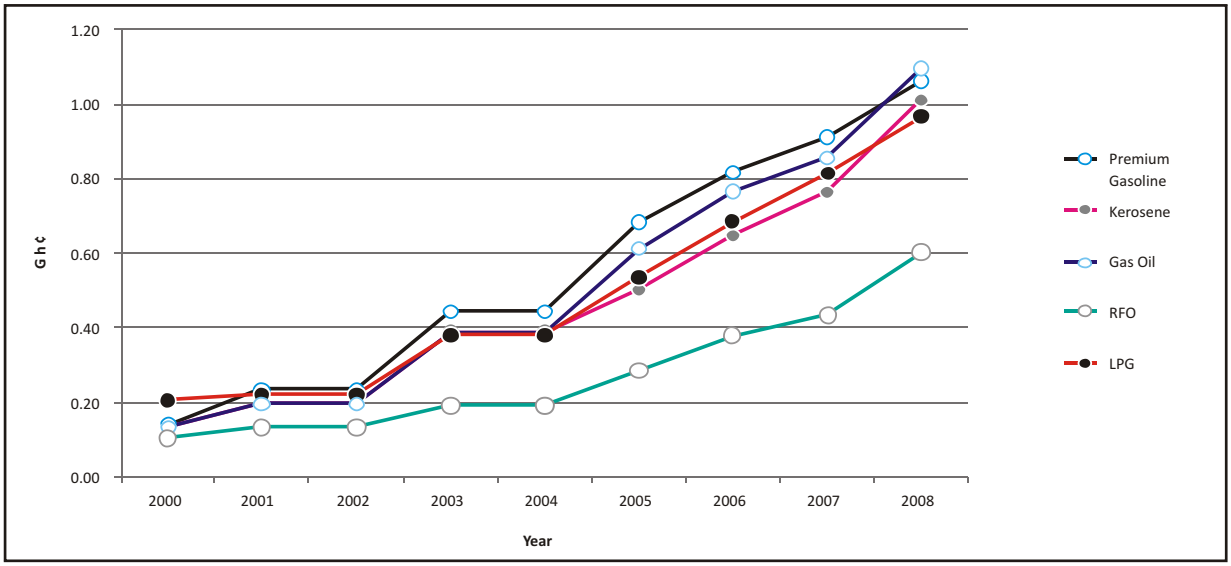


Table 5.1.2: Annual Average Local Petroleum Prices

Product	Unit	2000	2001	2002	2003	2004	2005	2006	2007	2008
Premium Gasoline	Gh¢/Litre	0.14	0.23	0.23	0.44	0.44	0.69	0.82	0.91	1.06
Kerosene	”	0.13	0.20	0.20	0.39	0.39	0.50	0.64	0.76	1.01
Gas Oil	”	0.13	0.20	0.20	0.39	0.39	0.61	0.77	0.85	1.10
RFO	”	0.10	0.13	0.13	0.19	0.19	0.28	0.38	0.43	0.60
LPG	Gh¢/kg	0.21	0.22	0.22	0.38	0.38	0.53	0.68	0.82	0.97

Figure 5.1.2: Trend in Local Petroleum Product Prices



5.2 Electricity Prices

Table 5.2.1: Electricity End User Tariff (Ghp/kWh)

Charges	2001	2002	2003	2004	2005	2006	2007	2008
BST	1.94	3.59	4.27	4.25	4.25	4.94	6.11	6.11
DSC	1.96	2.64	2.92	3.15	3.15	4.5	5.85	5.85
EUT	**3.9**	**6.23**	**7.19**	**7.4**	**7.4**	**9.44**	**11.96**	**11.96**

Fig 5.2.3: Trend in Electricity End User tariff