

**VOLTA RIVER AUTHORITY**

**50<sup>TH</sup> Annual Report**





***Excellence Through Commitment and Innovation***

*“If you are going to achieve excellence in big things, you develop the habit in little things. Excellence is not an exception, it is a prevailing attitude”*

**(Charles R. Swindoll, American Writer and Clergyman)**

**VOLTA RIVER AUTHORITY**

**50<sup>th</sup> ANNUAL REPORT  
& ACCOUNTS 2011**

## **Vision Statement**

**Setting the standard for public sector excellence in Africa**

## **VRA Mission Statement**

**The VRA exists to power economies and raise the living standards of the peoples of Ghana and West Africa. We generate reliable electricity in a safe manner to add economic, financial and social value to our operations and assets, customers and individuals.**

## **PROFILE OF THE VOLTA RIVER AUTHORITY**

The Volta River Authority (VRA) was established on April 26, 1961 under the Volta River Development Act, Act 46 of the Republic of Ghana, as a body corporate with the mandate to operate mainly as a power generation, transmission and distribution utility. In 2005, following the promulgation of a major amendment to the VRA Act in the context of the Ghana Government Power Sector Reforms, the VRA's mandate has now been largely restricted to generation of electricity. The amendment has a key function of creating the requisite environment to attract independent power producers (IPPs) onto the Ghana energy market.

The transmission function has been separated into an entity, designated Ghana Grid Company (GRIDCo). The VRA's distribution agency, the Northern Electricity Department (NED), is being operationalized as a full-fledged, independent distribution company designated the Northern Electricity Distribution Company Ltd. (NEDCO), wholly owned by the VRA.

### **Power Activities**

The Authority operates a total installed electricity generation capacity of 1,970MW. This is made up of two hydroelectric plants on the Volta River, with installed capacities of 1,020MW and 160MW at the Akosombo and Kpong Generating Stations respectively, and complemented by a 330MW Combined Cycle Thermal Plant at Aboadze, near Takoradi. A further 220MW Thermal Plant, Takoradi International Company (TICO) is owned as a joint venture with TAQA, from Abu Dhabi in the United Arab Emirates. This would be converted into a 330MW combined cycle plant and commissioned in 2014. Additional development of 132MW (T3) Magellan plant at the same site at Aboadze would be completed by the end of 2012.

The VRA has developed a number of plants in Tema. These include a 110MW Tema Thermal 1 Power Plant, an 80MW Mines Reserve Plant, both commissioned in 2008. A 50 MW Tema Thermal 2 Power Plant commissioned in 2010; and additional development of a 200MW Thermal Plant located at Kpone, near Tema, by 2014.

The VRA has a strong commitment to renewable energy development to protect the environment and public health and help reduce emissions that cause climate change, while ensuring a system of diversity and security in electricity supply. Renewable energy is economically competitive with the fuel fossils. Renewable resources would play an increasingly vital role in the power generation mix over the next century.

The VRA, through the Northern Electricity Distribution Company Ltd. (NEDCO), is the sole distributor of electricity in the Brong-Ahafo, Northern, Upper East, Upper West, and parts of Ashanti and Volta Regions of Ghana. Originally, NED was developed as an integral part of the larger Northern Electrification and System Reinforcement Project (NESRP) to extend the national electricity grid to northern Ghana. The new subsidiary company, NEDCO, has a customer population of nearly 400,000 and a load demand of about 130MW.

## **Customers**

The VRA's major bulk customer is the Electricity Company of Ghana (ECG). Power sold to ECG caters mainly for domestic, industrial and commercial concerns. Bulk sales are also made to a number of mining companies, including AngloGold Ashanti, Newmont Ghana Gold Ltd., Goldfields Ghana Ltd., Golden Star Resources Group. Others are Aluworks, Akosombo Textile Ltd., and Diamond Cement Ghana Ltd. International energy sales to neighbouring countries include Togo, Benin and Burkina Faso.

## **Links to Customers and Neighbouring Countries**

The VRA reaches its customers in Ghana and neighbouring countries through GRIDCo. GRIDCo's transmission system covers the entire country, and is also connected with the national electricity grids of Cote d'Ivoire, Compagnie Ivoirienne d'Electricité (CIE), Togo, Communauté Electrique du Benin (CEB), and Burkina Faso (SONABEL). These interconnections now serve as part of the arrangement under the West Africa Power Pool (WAPP).

## **Regional Cooperation**

The VRA is participating in the development of a power pooling mechanism to provide the West Africa sub-region increased accessibility, availability and affordability to electricity under the auspices of the Economic Community of West African States (ECOWAS). In this context, GRIDCo is building the Ghana component of a new 330kV transmission line, which starts from Aboadze to Tema, and then to Momehagou (Togo) under the West Africa Power Pool Project. The line is expected to be completed and commissioned in 2012.

The VRA is the major foundation customer of the West African Gas Pipeline Project (WAGP), which involves the construction of a 20 - inch 600km long natural gas transmission pipeline from Nigeria to Ghana and associated facilities to support the energy requirements of the West

Africa sub-region. The objective of the VRA's participation in the WAGP is to get natural gas from Nigeria to operate the thermal facilities, and thereby reduce significantly the cost of thermal generation, while increasing electricity availability, accessibility and affordability and protecting the environment. The project has been completed and gas is now being supplied to the VRA thermal facilities.

Recognizing the VRA's distinctive competencies in power system operations, the United Nations Development Programme (UNDP), appointed the VRA as the principal consulting agency for the implementation of an Emergency Power Programme (EPP) in Liberia after years of conflict. Consequently, the VRA embarked on a power construction scheme to restore power to Monrovia and other critical institutions.

The VRA is a founding member of the Union of Producers, Transporters and Distributors of Electric Power in Africa (UPDEA). UPDEA aims to promote the integration and development of the African power sector through active cooperation among its members and also between its members on one hand and all international power sector organizations and donors on the other hand. UPDEA is a permanent member of the Executive Council of the African Energy Commission and a preferred partner of the New Partnership for Africa's Development (NEPAD).

### **Commercialization Initiatives**

The Authority has also started turning its portfolio of non-power operations into progressively self-financing subsidiaries. These are the Hospital, School and Real Estate departments. The aim is to inject greater efficiency into the operations of these important but non-core activities of the VRA while the Authority focuses more effectively on power generation, and thereby enhance its competitive advantage in the West African sub-region.

The VRA continues to demonstrate its social responsiveness through various programmes designed to enhance the socio-economic and physical environment of the lakeside and downstream communities.

It includes annual commitment of the cedi equivalent of US\$500,000.00 to a Resettlement Trust Fund to support development initiatives in 52 resettlement towns. The fund has been used to support projects for environmental improvement, social welfare, public health, education, electricity, potable water supply and sanitation. In addition, VRA's Community

Development Initiative (CDI) programme introduced in 2003, as a framework for overall development of its communities, catered for requests for small projects.

The VRA runs hospitals in Accra, Akosombo and Aboadze, equipped with excellent facilities, and provides free specialist and general medical care to communities along the Volta Lake accessible only by boat, through its medical boat christened MV *ONIPA NUA*.

The Authority maintains a dredging programme at the estuary of the Volta River at Ada to reduce the incidence of Bilharzia, and to restore the ecosystem in the area. VRA also runs afforestation programmes aimed at reducing siltation of the Volta Lake through the restoration of permanent vegetative cover on the slopes bordering the Lake.

The VRA runs first and second cycle schools for children of staff and others living in Akosombo, Akuse and Aboadze. It also administers Local Authority functions in the Akosombo Township.

### **Relations with statutory regulatory bodies**

The relevant regulatory environment of the energy sub sector consists of the Ministry of Energy, Energy Commission, and the Public Utilities and Regulatory Commission (PURC).

- Ministry of Energy – Supervisory Ministry responsible for formulating, monitoring, and evaluating policies, programmes and projects for the energy sector.
- Public Utilities Regulatory Commission (PURC) – An independent regulatory commission with oversight responsibility for tariff and rate setting, and provision of the highest quality of electricity to consumers.
- Energy Commission - Provides advice to the Government of Ghana on energy planning and policy, conducts indicative planning/least cost expansion planning of wholesale supply of electricity, regulates licenses, establishes and monitors standards of performance as well as industry rules of practice for electric utilities.



## **SUBSIDIARY COMPANIES**

In fulfillment of its responsibility to provide facilities and assistance for the socio-economic development of the Volta Basin, the Authority currently operates two subsidiary companies: **Akosombo Hotels Limited** and the **Volta Lake Transport Company Limited**.

### **Akosombo Hotels Ltd**

The Akosombo Hotels Limited, incorporated in 1970, runs a three-star hotel, restaurant, modern conference/seminar facilities, pleasure activities, including cruising on the Lake by *MV Dodi Princess*, and promotes tourism.

### **Volta Lake Transport Company**

The Volta Lake Transport Company, incorporated in 1970, operates river transportation for passengers, bulk haulage of petroleum products and significant quantity of cement, and cross-lake ferry services along the Volta Lake.

### **Kpong Farms**

Kpong Farms Ltd, originally set up in 1982 as a resource centre of excellence for research into modern agricultural practices, played a significant role in the overall agricultural development of Ghana through activities in livestock, rice production, meat processing, and the cultivation of pawpaw for export as a foreign exchange earner. Local interns and expatriates from Egypt, Pakistan and the United States of America have also received attachment training at the Farms.

However, in recent years its operations have temporarily been halted due to the obsolete state of the Farm's equipment and facilities as well as liquidity constraints. The VRA is therefore seeking strategic investors in a joint venture partnership to transform the Farms into a profitable agribusiness.

## THE VOLTA RIVER AUTHORITY BOARD

The Members of the Board of the Volta River Authority as at 31st December 2011:

Chairman	Prof. Akilagpa Sawyerr <i>Professor/Lawyer</i>
Member	Kweku Andoh Awotwi <i>Chief Executive, Volta River Authority</i>
Member	Mr. Johnny Elvis Essilfi Turkson <i>Lawyer</i>
Member	Togbi Gbordzor III <i>Traditional Ruler/Civil Engineer</i>
Member	Alhaji Attah Nantogmah Mahamadu <i>Lawyer</i>
Member	Mrs. Marietta Brew Appiah-Opong <i>Lawyer</i>
Member	Hon. Rev. Dr. Joses Asare-Akoto <i>MP, Asuogyaman</i>
Member	Mr. Ahmed Yakubu Salifu <i>Freight Forwarder, Banker/Accountant</i>
Member	Mr. Danny Anang <i>Managing Director, Daben Cleansing Services</i>
<hr/>	
Secretary	Raymond John Lartey Volta River Authority

## **Principal Officers (VRA Management) as at 31<sup>st</sup> December, 2011:**

### **Office of the Chief Executive**

Chief Executive	-	Kweku Andoh Awotwi
Special Assistant to Chief Executive	-	Maj.(Rtd.) John B. Gyasi
Director, Audit	-	Ebenezer Tagoe
Director, Business Development & Sales	-	Bernard Kofi Ellis
Director, Corporate Planning	-	Edwin M. Gbekor
Director, Office of the Chief Executive	-	Ing. Theo Nii Okai
Board Secretary		John Raymond Lartey
Senior Manager, Public Relations Unit	-	Gertrude Koomson (Mrs.)

### **Engineering and Operations Branch**

Deputy Chief Executive	-	Ing. Isaac Kirk Koffi
Director, Special Engineering Projects	-	Ing. Stephen Doku
Director, Technical Services	-	Ing. William Amuna
Director, Thermal Generation	-	Ing. Richard N.A. Badger
Director, Engineering Services	-	Ing. William Sam-Appiah
Director, Hydro Generation	-	Ing. Kwesi B. Amoako

### **Finance Branch**

Deputy Chief Executive	-	Alexandra Totoe (Ms.)
Director, Procurement	-	Ing. Richmond Evans Appiah
Finance	-	Samuel K. Gyawu
Director, Management Information Systems	-	Vacant

### **Services Branch**

Deputy Chief Executive	-	Maxwell E.Y. Odoom
Director, Legal Services	-	Angelina Mornah Domakyaareh (Mrs.)
Director, Human Resources	-	Isaac K. Aidoo
Director, Restructuring Task Force	-	Joseph W. Sutherland
Director, Health Services	-	Vacant
Director, Real Estate & Security	-	Seth Asante
Director, General Services	-	Abla Fiadjoe (Ms.)
Director, Environment & Sustainable Dev't	-	Patrick Okrah Kwakye
General Manager, VRA Schools	-	Arnold Seshie

**On Secondment:** Mrs. Harriet Wereko-Brobby is on secondment to the West African Gas Pipeline Project as General Manager, Corporate Affairs.

## **CHAIRMAN'S STATEMENT**

For the VRA, the year 2011 had two main features: on the one hand, very strong financial and operational performance by the Authority; on the other, worrying signals from the macro energy environment – for VRA, but also for the energy sector as a whole.

Let me start with the positive. Net Profit for VRA more than doubled, from GHS40.6 million in 2010 to GHS82.6 million in 2011, while, operating profit stood at GHS140.5 million, making this the third successive year with an operating profit, and the second year of triple-digit growth, (2009: GHS 11.3 million; 2010: GHS 53.3 million; 2011: GHS 140.5 million), altogether, a level of performance not seen in over two decades.

Revenue from the sale of electricity increased modestly, from GHS1.077 billion the previous year to GHS1.11 billion in 2011, while units of electricity sold increased marginally from 9,669 GWh in 2010 to 9,814 GWh in 2011. On the tariff side, the weighted average Bulk Generation Tariff (“BGT”) went up by 3%, ending the year at GHp 8.45/kWh, effective December 1, 2011.

Turning to generation and power supply, the Akosombo and Kpong plants combined to perform at 96.5% plant availability; the new Tema thermal plants posted over 80% plant availability; and the Takoradi gas turbines recorded 90% plant availability, the highest performance since the plant was put in service back in 1997. On the negative side, however, the Takoradi steam unit was out all year on repairs.

The arrival of gas from Nigeria made a significant contribution to the Authority's healthy results in 2011; but so did the range of management interventions that we have introduced. Together, these factors enabled us to post the best operational performance in recent memory - increasing total plant availability, thereby decreasing the unit cost of every kilowatt of electricity produced.

For the immediate future, the Authority has made a stable supply of gas to its thermal plants a key priority. We are, therefore, actively engaging with gas producers in Nigeria as well as the Ghana National Gas Company. In addition, we are approaching suppliers of non-conventional sources of gas, such as Liquefied Natural Gas (“LNG”), to determine whether these supply sources could be made economically feasible.

### **Financial Health**

Improved financial performance has meant a stronger balance sheet and increased liquidity. The Authority’s debt levels dropped to 7% in 2011, down from 22% just four years earlier. It was also better able to pay its bills timeously, with more cash on hand. Finally, the Authority has developed a hedging programme to ensure budget stability, which will start once the National Risk Management Committee (“NRMCM”), on which the Authority is represented, approves the programme and incorporates it into the larger Government framework.

### **Portfolio Growth**

While no new capacity was brought into service in 2011, a number of on-going projects are expected to add 500 MW in new capacity in the near future. These include:

- A 132MW (T3) (Magellan) plant at Aboadze, expected to be completed before the end of 2012;
- Conversion of the 220MW Thermal Plant, Takoradi International Company (“TICo”), into a 330MW combined cycle plant – we are in the process of raising finance for this, with construction expected to start in the second half of 2012;
- Development of 110MW renewable energy capacity - wind and solar – beginning with the construction of the first 2MW solar plant, and of one year of wind measurements, both to commence in 2012;
- Commencement of feasibility studies for the development of 140 MW of hydro dams at Pwalugu and Juale in the Northern Region.

## **Commercialization of Non-Power Generation Functions**

The year 2011 saw sharply improved performances in the Authority's non-power areas. Our operating subsidiaries, Akosombo Hotels Limited ("AHL") and Volta Lake Transport Company ("VLTC"), both recorded net profits: AHL for the first time in over ten years; VLTC for the first time in over twenty-four years. Key to this improved performance was the appointment of professional managers in 2010 and 2011, which has brought years of industry experience to turn these operations around.

To the same end, business plans have been, or are in process of being, developed for all the other areas: Kpong Farms Limited ("KFL"); the schools; the health services; and the real estate department. These business plans will serve as templates for the engagement of private investors that the Authority expects to partner with, as part of the on-going power sector reform.

Extensive staff sensitization was also undertaken as part of the transformation of the Northern Electricity Department (NED) into the Northern Electricity Distribution Company (NEDCo), a standalone, wholly-owned, subsidiary of VRA.

## **Performance Management: *The Balanced Scorecard***

The current Board inherited a system under which an annual bonus of a month's salary was automatically paid to staff at the end of each year. This has been replaced by a performance management system, with a built-in performance-related incentive scheme. The new system, the *Balanced Scorecard*, provides a framework for aligning individual performance with departmental and corporate goals, and assessing and rewarding performance accordingly. Launched in 2011 after a long period of preparation, the first year of the system has proved quite successful, already changing staff performance and motivation, despite the teething problems unavoidable at the start of a novel system.

## **Golden Anniversary: Fifty Years of the Volta River Authority**

The year 2011 marked the 50<sup>th</sup> anniversary of the establishment of the Volta River Authority. In this Golden Jubilee Year, celebrated under the theme, ***Excellence***

***through Commitment and Innovation***, we acknowledged and paid tribute to the men and women of the Authority, past and present, whose commitment and hard work account for the achievements and growth of the Authority through the years. I, therefore, take this opportunity to salute VRA management and staff down the years, and dedicate this Jubilee Year report to them.

## **THE CHALLENGES**

Despite the impressive financial and operational results outlined above, we had cause to be concerned in 2011 about several significant challenges within the Authority and in the power sector generally. Foremost among these, is the insufficient capacity reserve margin available in Ghana's electricity system. Over the last two years, the system capacity reserve margin has dwindled from about 15% to less than 5%, when an ideal level of reserve margin is over 20%. Ghana's rapid growth in electricity demand, at over 10% a year for the last three years, itself fueled by significant GDP growth, is largely responsible for eroding this reserve margin. However, the situation was compounded by the decision to jumpstart the aluminium sector by operating the VALCO plant during 2011, albeit at only 20% capacity, but requiring the baseloading of 70MW, further eroding the already limited reserves.

Unfortunately, growth in new capacity has not kept pace with demand. It has not helped that VRA's own steam turbine was down for repairs for the whole of 2011- that would have supplemented reserves by 110 MW. Nor has it helped that the completion of the Takoradi 3 project was delayed by over 6 months, because unanticipated variation orders were critically questioned by Parliament - that would have added a further 132 MW.

Several VRA and third party projects, though not intended to be completed in 2011, have been delayed for a variety of reasons. This is not surprising, as these capital-intensive projects, which typically cost not less than US\$100 million, and take 3-4 years to complete under the best of circumstances, typically take 5-7 years for all manner of reasons, despite the best of intentions.

At a more general level, in my Report last year, I drew attention to the need for

***“. . . the articulation of a holistic and realistic national energy strategy, followed by the decisive deployment of appropriate and adequate institutional and human resources in its implementation. This, we believe, will include, but transcend, the establishment of the appropriate regulatory framework and pricing regime to ensure the timely closing of the country’s energy generation capacity gap.***

***“While this calls for the concerted effort of all stakeholders, leadership remains inescapably with Government and the public agencies with responsibility for sectoral and cross-sectoral policy making.”***

Since then, have Independent Power Producers received appropriate guidance and clearly laid-out rules to encourage them to invest the large sums of money required? Have steps been taken to plug our leaky distribution sector to ensure that any generation investment, public or private, can be adequately and easily financed, in the expectation of a fair return on invested capital? Has the VRA received a cost-reflective tariff, transparently administered, in order that the Authority can become genuinely financially self-sustaining?

If these challenges are not addressed head-on, how can we be assured that the country’s anaemic energy capacity reserves will be brought up to industry standards to ensure sustainable provision in the coming years?

Unfortunately, this year, 2012, is reflecting some of our worst fears. Gas volumes from Nigeria fell by 45% in the first half of the year; and completely dried up in the second half of the year, the net result being the immediate reduction of 180 MW from the Sunon Asogli plant, and the subjection of VRA’s own plants to great stress, as they attempt to switch back and forth between the use of liquid fuels and natural gas. With an already razor-thin 5% reserve margin, the unsurprising result has been load-shedding for a portion of the population, causing much inconvenience and understandable dissatisfaction all round.

VRA’s 2011 gains, impressive as they appear, thus, remain fragile within a utility sector in need of substantial on-going reform, overhaul, and co-ordination. If I may anticipate next year’s report, a 100% increase in the use of crude oil during 2012, procured at twice the price of natural gas, with the PURC tariff remaining unchanged over the period, immediately reverses the gains the Authority made in 2011. Thus, the prospect



of a financially self-sustaining utility sector – not just the VRA - recedes from view, even as we recount the successes of 2011, even as the promise of the more abundant electricity future that we all wish for is put at serious risk.

## **CONCLUSION**

I have given a faithful account of the impressive results achieved by the VRA in 2011 and, indeed, throughout the tenure of the current Board. Yet, as signaled by the difficulties of 2012, as outlined above, these gains cannot be taken for granted. They remain extremely fragile, and need to be nurtured and protected.

VRA must play its part in this process by raising its game at all levels of the organization, in both the power and non-power areas. For any effort by VRA to succeed, however, requires the formulation and better coordination of macro energy policy, as well as the firm and unwavering commitment and support from VRA's key stakeholders - its utility sector partners; its regulators; and above all, the government.

Ghana occupies a unique place on the energy map of the West African region. Recent finds of natural gas offshore have positioned the country to supply inexpensive gas-fired power to its neighbours on a large scale. But we will not be able to take advantage of these opportunities with a crippled and poorly-managed national electricity sector.

VRA has used the last 50 years to establish a firm foundation, and has generally served Ghana well. It is the dedication of its management and staff, now 3,010 strong, that made it possible for us to end 2011 with a strong balance sheet and cash position, and, despite all the challenges and the uncertainties in the current economic environment, has kept open real possibilities for continued success in the coming years.

I am deeply conscious of the fact VRA cannot succeed without the collective support and commitment of all our key stakeholders. We look forward to working with you to realize a brighter future for the VRA, the power sector, and for all of Ghana.

**Akilagpa Sawyerr**

# POWER OPERATIONS

## ***Generation portfolio***

### ***Growth Through Innovation, Demand Through Customer Partnerships and Operational Excellence***

The Volta Reservoir experienced continuous favourable hydrology during the year due to record inflows in the preceding year, recording the highest ever water level, and necessitating controlled releases of water downstream to safeguard the integrity of the dam structure. However, the Reservoir hydrology was moderated by near-normal rainfall during the year resulting in slightly below average inflow into the Volta Lake. Nonetheless, the VRA's operations remain exposed to unpredictable hydrological condition with about 70% of the Authority's generation still reliant on hydro generation. With increasing addition of thermal plants and the development of renewable energy in the generation portfolio in the short to medium term, the hydrological risk is set to be significantly moderated.

Thermal generation supply means that at peak times the VRA can strategically use its cost effective hydro generation complemented by gas-fired plants to earn higher yields. Furthermore, our hedging policy would enable us to hedge the purchase of crude oil, and thus help reduce volatility in oil prices and afford us the opportunity to effectively manage the Authority's large crude oil bills.

The net inflow into the Volta Lake during the 2011 flood season was 30,775 MCM (24.95 MAF). This was about 1% below the long-term average net inflow of 31, 010 MCM (25.14 MAF). The instantaneous inflow into the reservoir was 7,718<sup>3</sup>/s (272,727cfs. which occurred on September 24, 2011.

To achieve operational excellence, the VRA has created an *organizational excellence management system*, the Balanced Score – Card, comprising key business processes focused on cost control through innovation and technology, learning and growth to drive, continuously improve and measure performance. Thus, the Authority's success is driven by excellence, through commitment, and creating new opportunities for economic growth.

## **Hydrology Variability**

An important characteristic of the hydrology of the Volta basin is the variability from year to year. To illustrate this, the highest recorded annual inflow was 53.35 MAF recorded in 1989 while the lowest recorded annual inflow was 6.20 MAF recorded in 1983, that is, the maximum is more than 8 times as large as the minimum. The Volta Reservoir recorded the highest ever water level, peaking at 277.54ft on November 1, 2010.

In addition to the variability from year to year, the recorded inflows into the Volta River demonstrate that it is common to have wet and dry periods lasting for a couple of years.

### Hydrograph Pattern

The 2011 Inflow Hydrographs and monthly Net Inflow Comparison for 2011, 2010 and LTA are shown as figure 1 and 2 below:

**Figure 1: Volta Lake Hydrograph**

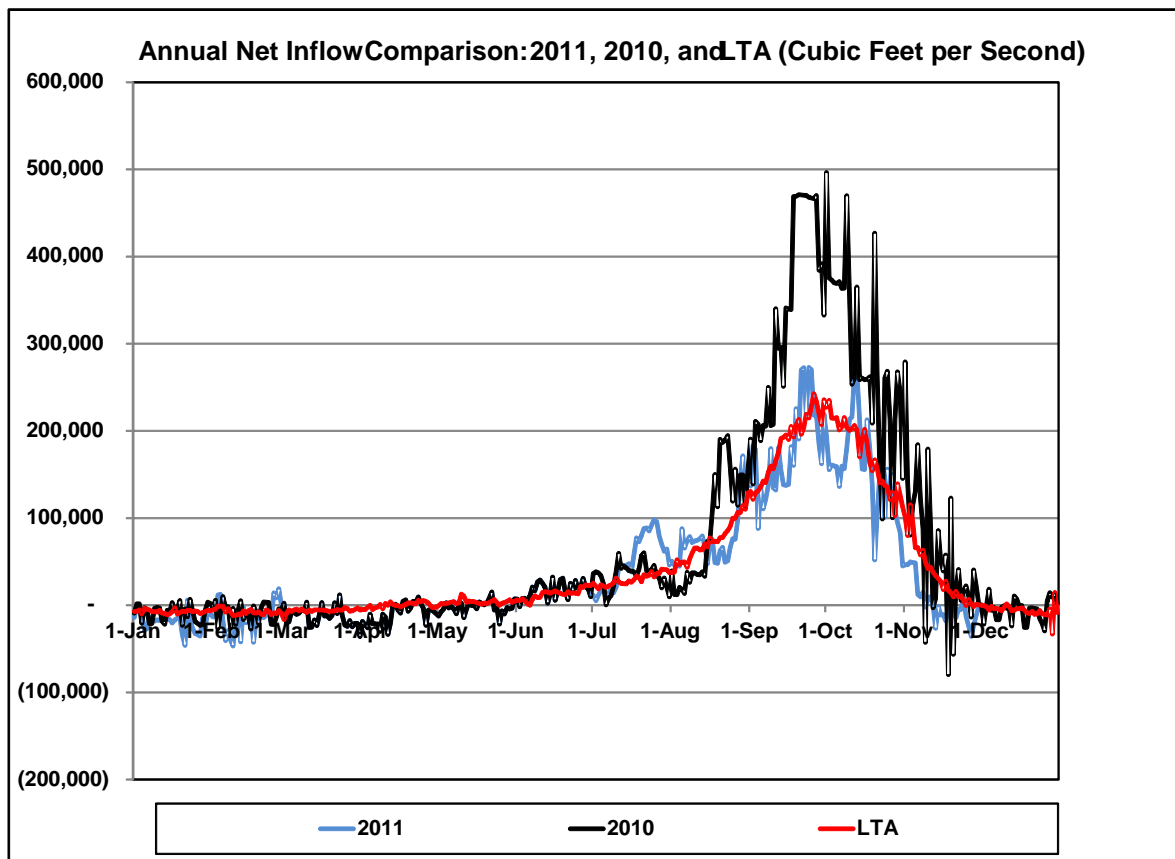
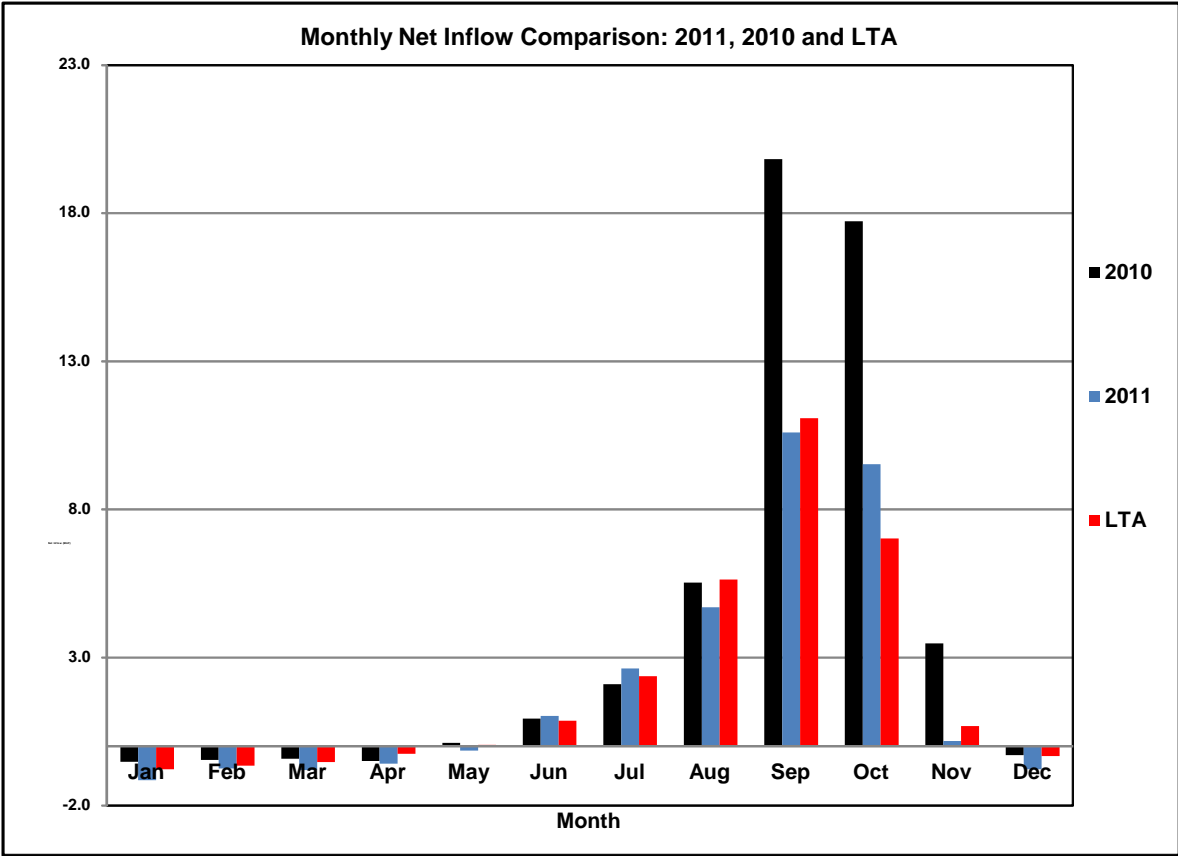


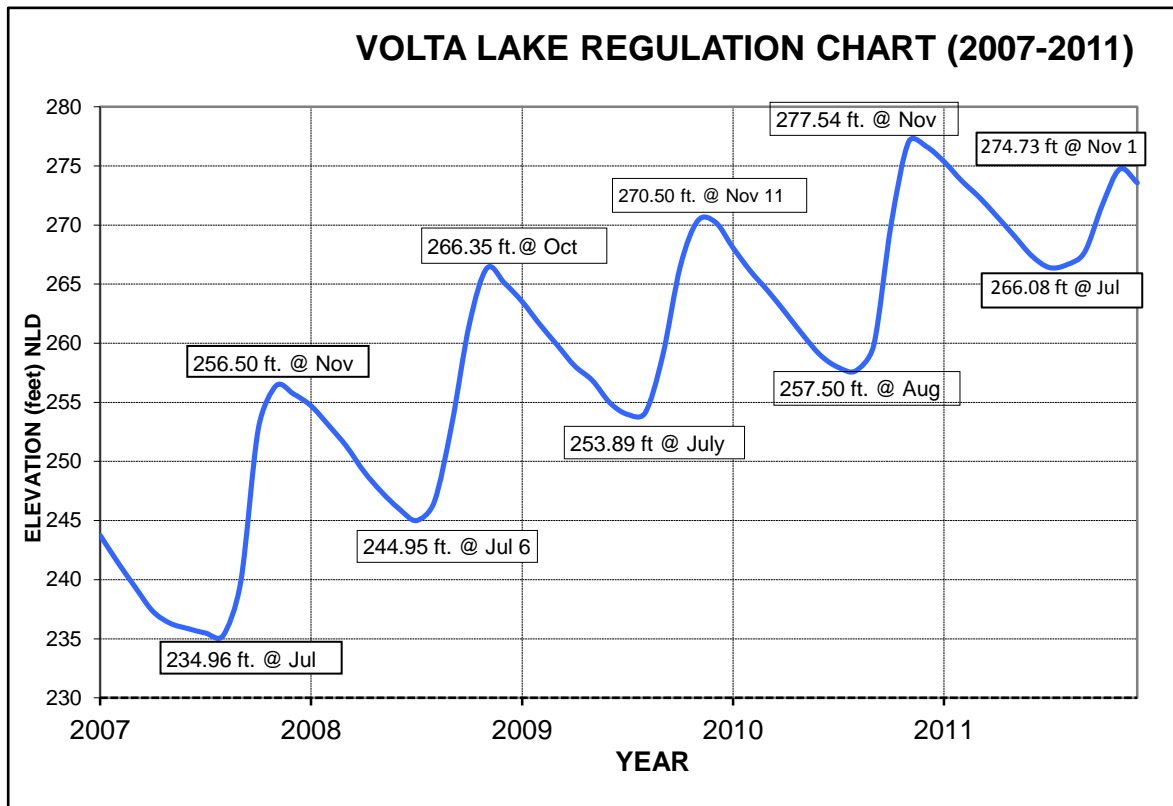
Figure 2: Monthly Net Inflow Comparison 2011, 2010 and LTA



## Volta Lake Regulation

The Volta Lake was regulated between elevations 83.95 m (275.37 ft.) at the beginning of the year (January 1, 2011), that was the maximum elevation attained, and 81.12 m (266.08 ft.), the minimum Lake elevation at the end of the dry season. The lowest Volta Lake elevation was recorded on July 11, 2011. This was a drop of 2.83 m (9.29 ft.) from the beginning of the year. The Volta Lake elevation at the end of the year was 82.92 m (271.92 ft.). The Volta Lake regulation chart for 2007 - 2011 is shown below as Figure 3.

Figure 3.



## Hydro Energy Generation

The total hydro generation from Akosombo GS and Kpong GS was 7,566 GWh. This was made up of 6,499 GWh and 1,067 GWh from Akosombo and Kpong plants respectively. This represents average draft rates of 17.81 GWh/day and 2.92 GWh/day from Akosombo and Kpong plants respectively. The total energy generation from Kpong GS was about 16% of Akosombo GS generation.

## Electricity Demand and Supply

### POWER SALES

Total energy sold in 2011 was 9,503.97 GWh. ECG is the largest customer of VRA and consumed about 6,034 GWh in 2011, representing 63.5% of the total energy sold. This consumption is a decrease of 10.8% over last year's consumption of 6,771GWh. The table below shows the consumption of the various categories of VRA customers.

### GHANA ENERGY SALES

#### GHANA SALES (LOCAL CURRENCY)

CUSTOMERS	2010			2011		
	Quantity (GWh)	Value (GH¢)	Value (US\$)	Quantity (GWh)	Value (GH¢)	Value (US\$)
ECG	6,771	590,534,478	-	6,034	493,463,861	-
MINES	1,243	17,239,759	129,811,394	1,301	6,768,988	164,440,777
AKOSOMBO TEXTILES	18	3,684,589	-	15	3,534,793	-
ALUWORKS	5	1,255,537	-	8	2,185,815	-
DIAMOND CEMENT	45	7,290,642	-	51	10,196,006	-
OTHERS	36		-	37		-
NED	645	56,455,440	-	729	59,375,886	-
<b>TOTAL</b>	<b>8,763</b>	<b>676,460,445</b>	<b>129,811,394</b>	<b>8,175</b>	<b>575,525,348</b>	<b>164,440,777</b>

### GHANA SALES (FOREIGN CURRENCY)

CUSTOMERS	2010		2011	
	Quantity (GWh)	Value (US\$)	Quantity (GWh)	Value (US\$)
VALCO	7	254,065	597	31,740,132
ILDC/EPC	39	5,027,129	39	4,848,456
GHANA FREE ZONES BOARD	-	-	8	1,114,374
<b>TOTAL</b>	<b>46</b>	<b>5,281,194</b>	<b>644</b>	<b>37,702,962</b>

### ENERGY IMPORTS & EXPORTS

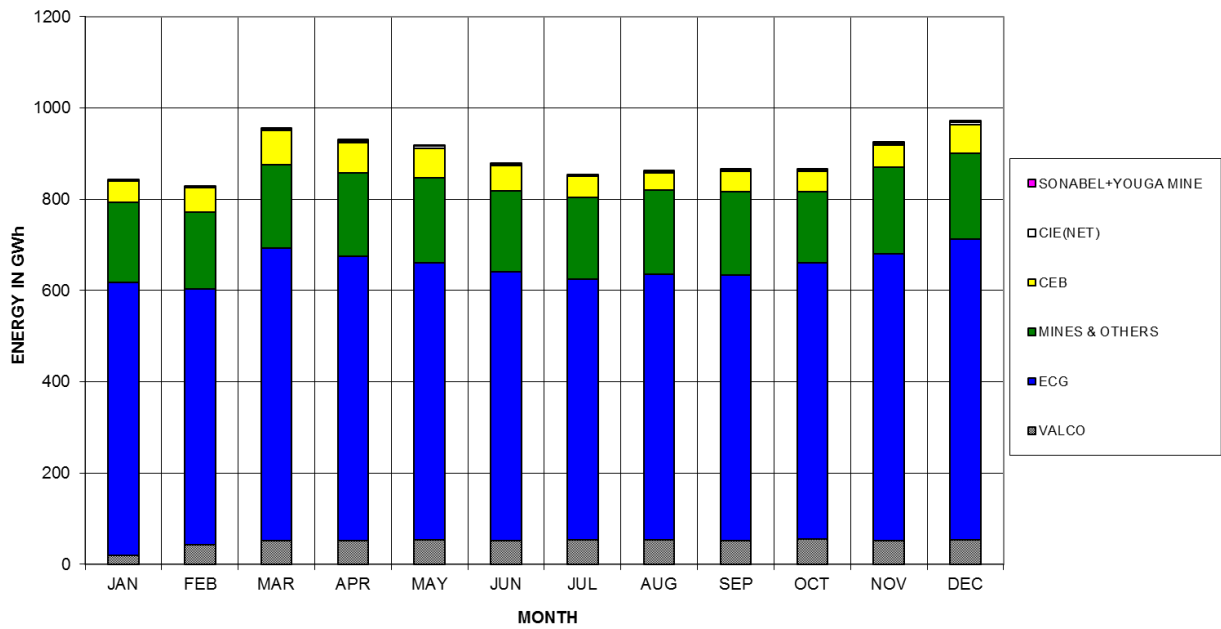
During the period under review, VRA exported 719.15 GWh and imported 79.83 GWh. The net balance in favour of VRA was 639.32 GWh and the net sales revenue in favour of VRA was **US\$.59, 803, 877.87**

		ENERGY (GWh)		SALE (US\$)	
		2010	2011	2010	2011
CIE	Import	106.27	79.83	12,007,985.33	9,579,188.82

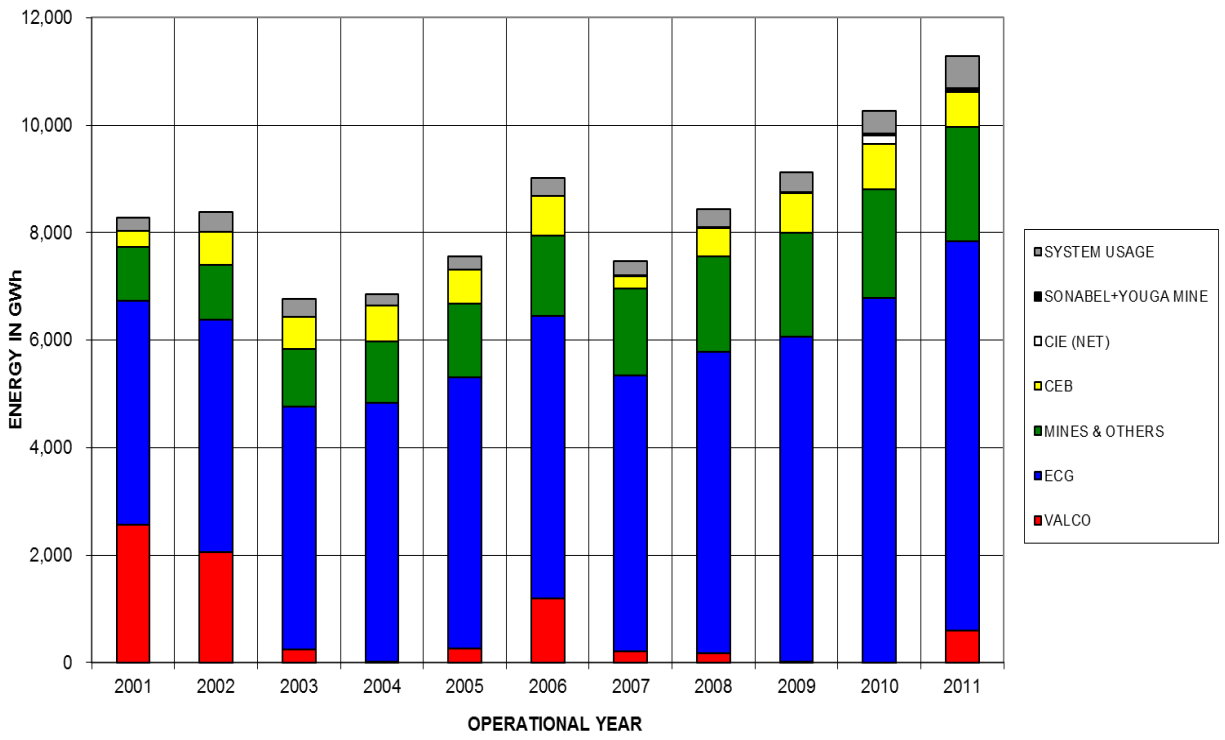
CEB	Export	810.87	647.18	92,962,591.12	60,804,239.43
SONABEL	Export	5.38	5.85	592,050.15	643,808.23
YOUGA MINE	Export	38.65	38.57	4,637,592.00	4,627,885.87
CIE	Export	147.58	27.56	20,442,747.76	3,307,133.17
<b>Total Export</b>		<b>1,002.47</b>	<b>719.15</b>	<b>118,634,981.03</b>	<b>69,383,066.70</b>

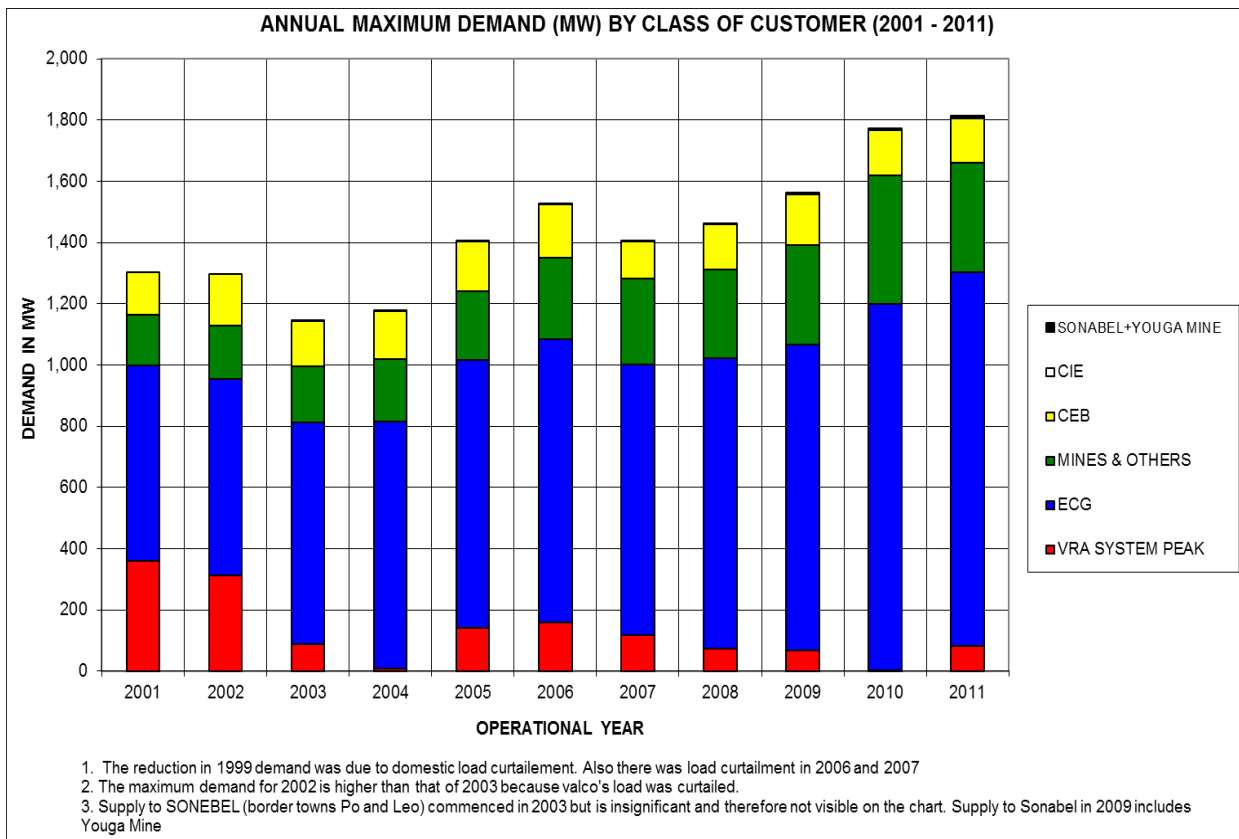
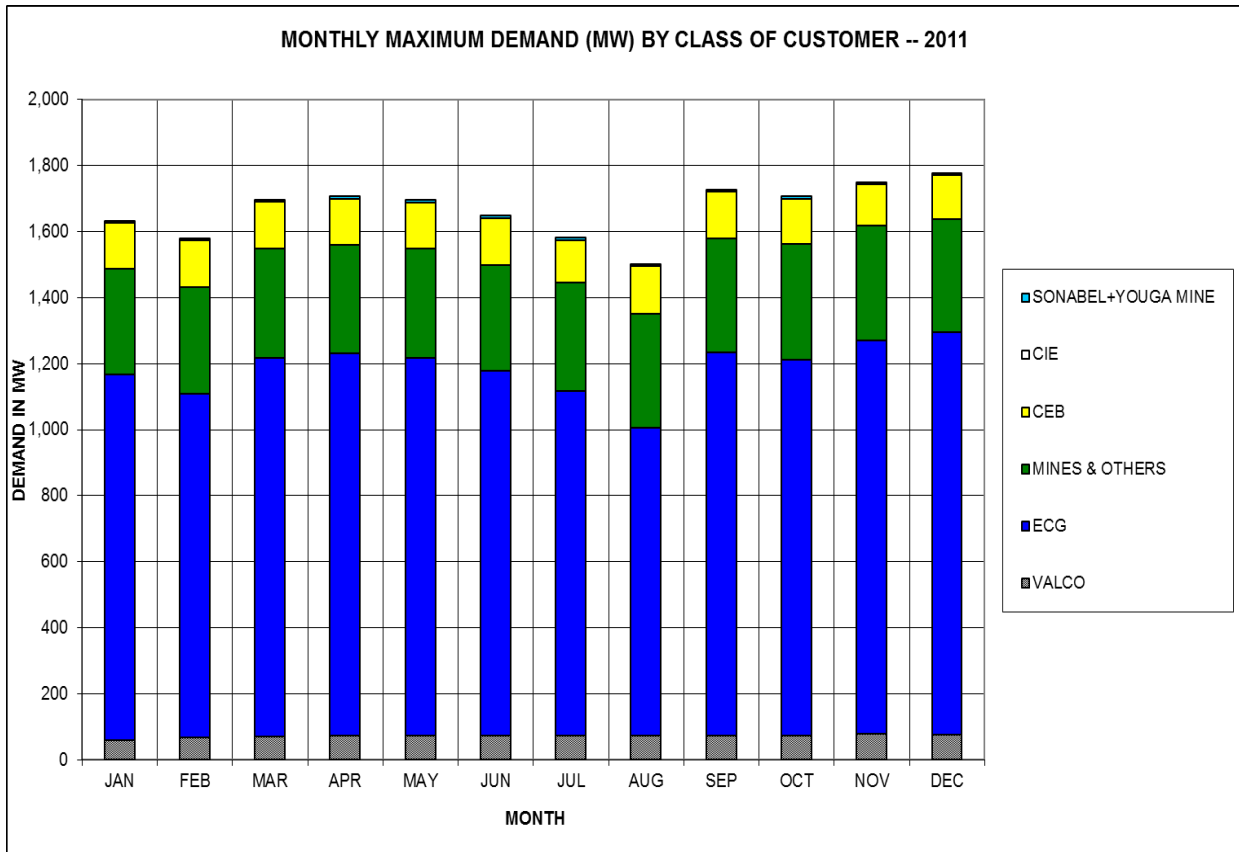


MONTHLY ENERGY CONSUMED (GWh) BY CLASS OF CUSTOMER) - 2011



**ANNUAL ENERGY CONSUMED (GWh) BY CLASS OF CUSTOMER  
2001 -- 2011**





## ELECTRICITY PRODUCTION

	2010	2011	Change
Total Energy Generation at Akosombo GS	5,960.686 GWh	6,498.891 GWh	9.0%
Total Energy Generation at Kpong GS	1,034.723 GWh	1,067.095 GWh	3.1%
Total Energy Generation at Takoradi Thermal GS	1,233.611 GWh	1,149.488 GWh	-6.8%
Total Energy Generation at Takoradi TICO Thermal GS	1,160.470 GWh	658.758 GWh	-43.2%
** Total Energy Generation at Emergency Diesel Station	.000 GWh	.000 GWh	0.0%
Total Energy Generation at Mines Reserve Power Station	19.735 GWh	12.772 GWh	-35.3%
Total Energy Generation at Tema Thermal 1 Power Station	591.127 GWh	561.684 GWh	-5.0%
Total Energy Generation at Tema Thermal 2 Power Station	28.138 GWh	50.436 GWh	79.2%
Total Energy Generation at Sunon-Asogli Power Station an IPP	137.827 GWh	1,224.170 GWh	788.2%
Total Energy Generated at all Generating stations <b>(A+B+C+D+E+F+G+H+I)</b>	10,166.317 GWh	11,223.294 GWh	10.4%
Energy imported from CIE for VRA use	106.526 GWh	80.931 GWh	-24.0%
Energy imported from CEB for VRA use	-	-	-
Total Energy Imported From CEB and CIE <b>(K+L)</b>	106.526 GWh	80.931 GWh	-24.0%
Total Energy Generated Plus Imports <b>(J+M)</b>	10,272.843 GWh	11,304.226 GWh	10.0%
Total Energy Used at all Generating Stations	40.471 GWh	24.150 GWh	-40.3%
Energy Input to Transmission Systems <b>(M-O-E)</b>	10,232.372 GWh	11,280.076 GWh	10.2%
Energy used in the Substations	4.986 GWh	5.276 GWh	5.8%
Energy Exported & Sold to CEB From VRA	845.275 GWh	646.356 GWh	-23.5%
*** Energy Exported & Sold to SONABEL From VRA	43.968 GWh	44.418 GWh	1.0%
Energy wheeled to CEB From CIE	34.426 GWh	84.217 GWh	144.6%
Energy Exported to CIE From VRA	147.029 GWh	7.202 GWh	-95.1%
Total Energy Exported and wheeled <b>(R+S+T+U)</b>	1,070.698 GWh	782.193 GWh	-26.9%
Total Consumption within Ghana (incl. VALCO)	8,811.105 GWh	9,994.346 GWh	13.4%
Total External Sales (CEB,CIE & SONABEL) <b>(R+S+U)</b>	1,036.272 GWh	697.976 GWh	-32.6%
Total Energy Billed <b>(W+X-E)</b>	9,847.377 GWh	10,692.322 GWh	8.6%
Transmission Losses <b>(P+T-Q-V-W+E)</b>	380.009 GWh	582.477 GWh	53.3%
Percentage of Transmission Losses <b>Z/(P-Q)*100</b>	3.7%	5.2%	39.0%

Maximum Peak Generated (MW)	1,505.9 MW	1,664.6 MW	10.5%
Average Demand <b>(N/8.76)</b> (MW)	1,172.7 MW	1,290.4 MW	10.0%
Load Factor <b>(AC/AB)</b>	77.9%	77.5%	-0.5%
Average plant discharge at Akosombo GS	1,201.85 cu.m/sec (42,468.27 cfs)	1,302.62 cu.m/sec (46,029.00 cfs)	8.4%

## Major System Disturbance

Only one major system disturbance occurred, and this signals a significant improvement in system security compared to the high incidence of system instability witnessed the previous year.

## Strategic Focus

We are committed to the development and expansion of generating facilities to meet increasing demand and provide high-end service. In particular, investment in energy infrastructure development and energy services improvement such as the development of thermal plants, renewable energy resources, system security and improvement initiatives.

## EXPANDING ELECTRICITY ACCESSIBILITY AND AVAILABILITY

### Ghana Energy Development and Access programme (GEDAP) increases Electricity Availability in NED Areas

The Authority is committed to a programme designed to improve and enhance electricity accessibility and availability. Consequently, the VRA is expanding its power system. Notably, the Ghana Energy Development and Access Programme (GEDAP) is one of the initiatives to achieve the objectives of the power system development programme. This project, which is in two parts, involves the development of the Kumase Second Bulk Supply Point and distribution networks, funded by the African Development Bank.

Preparatory development work had been completed while supply and installation of plant and equipment is near completion. A sub-component of GEDAP, the NED Intensification Project, seeks to further improve access to electricity. Financed by the International Development Association (IDA) of the World Bank, the project is expected to improve the network operation by upgrading overloaded and undersized conductors and transformers. Supply and delivery of prepaid meters, which is a significant aspect of the programme had been completed.

## **Renewable Energy Development Seeks to Diversify Generation Portfolio**

We are committed to the development of renewable energy, in particular wind and solar energy in the generation mix to reduce dependence on fossil fuels while protecting the environment. Renewable energy is economically competitive with the fuel fossils. Renewable resources would play an increasingly vital role in the power generation mix over the next century. Hydroelectric power is currently the largest producer of renewable energy in Ghana. Hydro generation accounts for over 70% of the total system supply. Ghana needs energy that is secure, reliable, improves public health, protects the environment and addresses climate change, and provides technological leadership.

The development of renewable energy and energy efficiency marks a new era of energy exploration in Ghana. Development work is progressing steadily on a number of renewable energy projects including wind and solar power. For this purpose, a VRA technical team made two familiarization visits to Spain to study the development, design, operation and regulation of renewable energy.

### **Wind power development**

The objective of the Authority is to develop up to 150 MW of wind power at locations where these are practicable. We propose to develop the resource through a joint venture arrangement with an internationally reputable partner with expertise in that field.

The process of securing the services of a consultant to advise and assist the VRA with the development and design of its renewable project is in progress while arrangements for the selection of the joint venture partner are being made.

### **Solar Power Development**

The VRA is also planning to develop up to 10 MW of solar power generation in the next three years in the northern part of the country where the resource is abundant. The development of the required terms of reference for a feasibility study is in progress. Land for the project has been identified at three locations in the Upper East and West Regions.

## **Emission Credit Development**

The VRA is equally planning to identify projects whose carbon emission can be reduced to qualify the VRA to benefit from emission credits. Discussions were held with three identified institutions which had made unsolicited proposals to VRA to assist in the development and acquisition of emission credits. These projects include fuel switching of the Mines Reserve Plant, the fuel switch and expansion of the Takoradi plant, fuel switch at the 50 MW Tema thermal plant and the potential development of the Bonyere thermal plant.

## **Biomass Energy Development**

The Authority seeks to cooperate, facilitate and collaborate with private entities in the development of biomass energy. Though these are purely private projects, VRA/NEDCO are collaborating with the private sector in order to have economic, social and technical basis for the development of these renewable projects.

VRA/NEDCO are collaborating with three entities for the development of biomass related energy projects. These include a sugarcane/biogas to energy plant, a biomass (bamboo) to energy plant and a municipal waste to energy plant.

## **Development of 300MW Tema Thermal Power Project**

PB Power, an international engineering services company, which provides engineering services for projects associated with electricity generation, transmission and distribution is currently undertaking a feasibility study for expanding the 126MW Single Cycle Tema Thermal Plant (TT1PP) into a 330MW Combined Cycle Plant.

## **Development of Hydroelectric Projects**

We are developing hydroelectric plants on the White Volta and Oti rivers. The World Bank which is financing the projects is assisting in the review of the Terms of Reference of the feasibility studies as well as the Environmental and Social Impact Assessment (ESIA).

## **Load Forecast and Energy Supply Plan**

We prepared a Supply Plan to guide our operations. A projected demand of 11,630GWh was expected to be met by an annual hydro generation of 7,266GWh and a thermal generation of 4,364GWh. At the end of the year, a total hydro generation of about 7,566GWh (about 4%

above planned) was recorded while total thermal generation and imports for 2011 was 3,738GWh (about 14% below the projected).

## **Environmental Enhancement**

Environmental reviews with regard to stack emission, ambient air quality, liquid waste, solid waste, oil spill, fire preparedness, vehicular traffic and noise in the context of the operations of our thermal plants were within the EPA safety standards. A frame-work for the development of aquaculture on the Volta Lake was prepared to guide the VRA to ensure the sustainability of aquaculture development on the lake. Reforestation activities aimed at reducing siltation of the Volta Lake through the restoration of permanent vegetative cover bordering the slopes of the lake continued in the Volta Gorge Area. A total of 65,804 seedlings were planted under the project. A distance of 2,099.2 meters was cleared and a volume of 231,541 cubic meters of sand was yielded. The dredged sand was used to nourish and restore the ecology within the dredged banks of the communities along the river. Collaboration with CDDF to implement the community participatory concept of bilharzias control within the lakeside communities was reactivated. We collaborated with the Ghana Health Services in the treatment and control of Schistosomiasis. A general chemotherapy (treatment) was undertaken by the GHS in the 17 districts within the Upper and Lower Volta basin. This led to the creation of a platform of major stakeholders for collaborative effort to reduce the incidence of Bilharzia, and to restore the ecosystem in the area.

Twenty communities in the North Tongu and Dangme East districts in the Lower Volta area were mobilized and sensitized to undertake voluntary weeds clearing from their various shorelines and water fetching points. Herbicidal spraying of water hyacinth from Torgorme below the Kpong Dam through the Aklakpa river near Mepe, Tsetsekpo-Dugame areas near Mafi Adidome was undertaken. Mop up spraying and manual removal of re-growth was also undertaken between the Kpong Dam and Mafi Adidome Area to ensure all hyacinth growths are eradicated.

Submerged aquatic weeds from the Kpong wharf was removed. The VRA received a Memorandum of Understanding with EPA in which EPA will make available GH¢21,504 for the control of water hyacinth.

## **Plant Facilities**

The operational excellence of our hydro generating facilities was due to our maintenance culture which ensures optimum performance of our power equipment. The average unit availability attained at the Akosombo and Kpong Generating stations were 97.2% and 91.6% respectively. The annual plant combined availability and capacity utilization factors at the Takoradi Thermal Power Station were 90% and 62.36% respectively. We successfully carried out a mini-retrofit of Unit 4 of the Kpong Generating Station to ensure reliability and availability and operational excellence.



## **REVIEW OF POWER SUPPLY CONTRACTS/AGREEMENTS**

A review of Power Sales and Purchase Agreement (PSPA) between the VRA and the following customers are in progress:

### **AngloGold Ashanti (AGA)**

- Negotiation with AngloGold Ashanti (AGA) on a draft Term Sheet for power supply in respect of the new electricity market in Ghana would be concluded during the course of the year.

### **CEB**

- The Power Exchange Contract with CEB has been signed since May, 2011.

### **SOGEPE/CIE**

- A two - year Energy Exchange Agreement (EEA) with SOGEPE/CIE expired in 2010. There has also not been any import or export of electricity between the two Parties with the exception of inadvertent exchange of electricity between VRA and CIE from January to December, 2011. CIE has requested VRA to supply them with some electricity but VRA has expressed inadequate capacity to supply, hence no EEA has taken place to date.

### **Electricity Company of Ghana**

- Negotiation of the Power Sales and Purchase Agreement with ECG is almost completed except issues relating to interest payments and energy allocation under the new wholesale electricity market in Ghana in accordance with LI 1937, 2008. Few outstanding issues include some directives from the Energy Commission (EC) on the new wholesale electricity market.

### **Review of Old Power Sales and Purchase Agreement (PSPA)**

- Term Sheets had been submitted to the following customers for their review and comments: Akosombo Textiles Ltd and Owere Mines, Konongo.

### **Gold Fields Ghana Ltd (GFGL)**

- Negotiation of the Power Sales and Purchase Agreement with GFGL is completed except issues related to tariffs and the inclusion of the proposed additional clauses relating to regulation as directed by the Energy Commission.

### **Newmont Ghana Gold Ltd (NGGL)**

- A date is yet to be fixed for a meeting with NGGL to negotiate a draft PSPA.

### **Golden Star Resources (GSR)**

- Negotiation of the Term Sheet for supply of power to the three subsidiaries of GSR (Wassa Gold Mine, Bogoso and Prestea) is almost completed.

### **Free Zones Enclave (Enclave Power Company)**

- The Term Sheet for the supply of power to the Enclave Power Company (EPC) is almost completed. The outstanding issue relates to the applicable tariff to an electricity distribution utility in the Free Zones Enclave that will allow the Enclave Enterprises to pay same tariff levels as those Free Zone Enterprises outside the enclave.

### **Diamond Cement Ghana Ltd (DCGL) and Savanna Diamond Company Ltd (SDCL)**

- The PSPA with DCGL and SDCL respectively are completed with the exception of additional mandatory clauses proposed by the Energy Commission to be incorporated in all PSPA before execution.

### **SONABEL – Interconnection between Bolga and Ouaga**

- The draft Term Sheet with SONABEL on the Bolga Ouaga interconnection has already been signed.

## **NEW POWER SUPPLIES**

### **Perseus Mining Company Ltd (PMCL)**

- Negotiation of a draft Term Sheet with PMCL (formally known as Central Ashanti Gold Ltd) is completed and ready for execution with the exception of the additional mandatory clauses proposed by the Energy Commission and tariff with the Deregulated Mining Customers.

### **Adamus Resources Ltd (ARL)**

- Negotiation of a draft Term Sheet with ARL is completed and ready for execution except with issues on tariff for the Deregulated Mining Customers and the inclusion of the mandatory clauses by the Energy Commission.

### **Sentuo Steel Ltd (SSL)**

- An indicative Term Sheet has been submitted to SSL for comments

### **Keegan Gold Resources Ltd (KGRL)**

- A date for negotiation on a draft Term Sheet of KGRL is yet to be fixed.

## **REGULATION AND ELECTRICITY MARKET OPERATIONS**

A final report of a review of a draft Electricity Market Rules has been completed. Application of the rules would assist the Authority to play a critical role in the creation of a successful electricity market in Ghana beginning 2012.

## **NATURAL GAS SUPPLY**

### **Nigeria Gas**

The commissioning of the Lagos Beach Compressors was completed during the year, and about 80 MMscf/day of gas is being supplied to Takoradi and Tema to run TTPS, TT1PP, TT2PP and the Asogli Plant. The official start date for gas supply from the WAGP to VRA would be January 1, 2012 and VRA is expected to receive a minimum supply of 80MMscf/day from the start date till February 2012 when the supply is expected to increase to 110MMscf/day. The contractual volume of 123MMscf/day is expected in February 2012.

As at the end of 2011, a total amount of 30,524,557.83 MMBtu of natural gas was delivered to Takoradi and Tema plants. The monthly distribution of gas supplied to Takoradi and Tema to operate the Thermal facilities are as follows;

Month	Consumption		
	Takoradi	Tema	Total
Jan	1,215,783.99	1,508,835.61	2,724,619.60
Feb	1,179,516.13	1,027,231.50	2,206,747.63
Mar	1,489,460.94	1,743,857.80	3,233,318.74
Apr	1,493,981.51	1,799,374.27	3,293,355.78
May	1,155,510.85	1,367,674.93	2,523,185.78
Jun	681,880.36	1,218,859.45	1,900,739.81
Jul	1,187,432.29	1,873,684.75	3,061,117.04
Aug	829,698.55	1,301,049.35	2,130,747.90
Sep	1,048,442.95	1,066,180.86	2,114,623.81
Oct	1,154,460.43	1,247,163.88	2,401,624.31
Nov	875,972.10	1,648,167.72	2,524,139.82
Dec	844,609.58	1,565,728.03	2,410,337.61
<b>Total</b>	<b>13,156,749.68</b>	<b>17,367,808.15</b>	<b>30,524,557.83</b>

Discussions are being held for additional gas supply of 30 MMscf/day from Nigeria, and this is expected to materialise next year.

#### **Gas Supply to Sunon-Asogli Power Limited (SAP)**

The VRA supplied all the natural gas needs of Sunon-Asogli during the year from the gas supplied from the WAGP.

#### **Ghana Gas**

Production of gas from the Jubilee oil and gas field started on December 15, 2010 using the Kwame Nkrumah Floating, Production, Storage and Offloading (FPSO) vessel. Initial oil production would reach 55,000 barrels per day by December 2010 and increase to 120,000 barrels per day during the first half of 2011, when additional wells are completed. The FPSO is capable of processing 120,000 b/d and 160 MMscfd of gas and storing up to 1.6 million bbl of crude. It is also capable of treating and injecting 232,000 b/d of water for reservoir pressure maintenance, and it can offload or re-inject 160 MMscfd of gas.

The FPSO requires 20 MMscfd of gas for its domestic power generation and by the Plan of Development, up to 30% of gas produced could be injected to enhance recovery. The remainder of the gas from the FPSO will be transported to shore for further processing into quality gas to fire power plants. The Field is expected to be equipped with a second FPSO with similar capacity by 2014 and invariably double the gas production. The gas from the Jubilee Oil and Gas Fields is a key requirement for VRA's thermal power plants

At present, natural gas from the Jubilee Fields is being used to fuel the FPSO and the remainder is being re-injected. The Ghana National Gas Company (GNGC) has acquired funding to complete the infrastructure to move the gas to the VRA Plants. VRA is in serious discussions with GNGC to initiate a gas supply agreement (GSA). GNGC is working towards building a gas processing facility at Domini, where commercial quantities of gas will be produced and piped to Aboadze and Tema, through the WAGP.

### **Liquefied Natural Gas (LNG)**

Based on VRA's projections, the demand for gas for power generation will outstrip gas available from the WAGP and the Jubilee Fields. Consequently, the VRA is seeking to secure alternative sources of supply both to meet growing demand as well as to reduce risk of supply disruptions. Degasification of Liquefied Natural Gas (LNG) has been considered as a viable option. It involves the transportation of LNG and its conversion into natural gas.

The concept is to deploy a floating LNG re-gasification vessel in either Takoradi or Tema for supply of gas. Considering the lack of expertise in the LNG technology, Gas Strategies, a consultant in UK was engaged to assist the VRA in the procurement of the technology.

A bidders conference is scheduled for January 2012, and bids are expected to be submitted by the middle of February 2012.

## **NON - CORE OPERATIONS**

### ***PERFORMANCE ENHANCEMENT***

#### **Human Resource Development**

##### ***“Growth and Learning and Value Creation”***

Through an intentional focus on human capital, the VRA is pursuing vigorously business development driven change management processes in order to increase productivity and efficiency in a competitive deregulated energy market, and thereby establish distinctive capabilities and excellence. Consequently, the human resource base has become crucial to the change processes. The keystone of our human resource development strategy is anchored on the “Learning and Growth” perspective of the Balanced Scorecard (BSC) approach to strategic management in the utility industry.

A high premium is therefore placed on the ability of the VRA to mobilize and sustain the process of change required to execute the strategy. In order to achieve success, the VRA’s culture, its leadership and its employees are aligned to corporate strategic goals while a congenial professional environment aimed at developing motivated, efficient and experienced human resources through strategic planning encourages employees to share knowledge to create the climate for action.

The Authority recognizes that the responsibility for managing change is with management and the executives who must manage change in a way that employees can cope with. In line with its “Learning and Growth” objectives, the VRA sponsored 4,183 employees who attended 407 courses locally and off-shore.

#### **Revision of Job Hierarchy and Reward Management System Review Project**

To streamline job cadres and eliminate redundant and obsolete jobs, the VRA has revised downward the current 132 job cadres to 126. The existing 550 positions were also reduced to 305 in line with job evaluation results.

We organized sensitization workshops on a new Reward Management System to obtain feedback from staff. A review of the reward system reflects the VRA’s new Reward Policy through increment, bonus, promotions, talent management, placement and recognition of critical/ scarce skills. The linkages between performance management and new job hierarchies

are to enhance salary administration. We completed work on the development of a broadband salary structure .

Staff strength for permanent staff stood at 3,010. Contract staff strength was 77.

## **Health and Safety**

As a “quality” organization, the VRA places a high premium on health and safety to help keep staff at work and reduce the costs of injuries, illness, property and equipment damage. Consequently, the VRA is committed to the highest health and safety standards. The VRA operates a definitive health and safety policy, which involves hazard and risk assessment and control, safe work procedures, worker competency and training, work site inspection emergency response plan, incident investigation, and monitoring and evaluation.

As a principle every employee accepts personal responsibility for his or her safety and health. which outlines a frame work for managing health and safety set out in the Authority’s Safety Manual. In order to make the health and safety policy effective, and enlist staff involvement and commitment, and build a ‘positive health and safety culture,’ safety meetings are held every week to afford the employees the opportunity to internalize safety principles and practices so that their observance could become second nature. Indeed, week-long activities are celebrated every year to:

- Assess the skills needed to carry out all task in safety.
- Provide the means to ensure that all employees, including managers, supervisors and temporary staff, are adequately instructed and trained.
- Ensure that people doing especially dangerous work have the necessary training, experience and other qualities to carry out the work safety.
- Arrange for access to sound advice and help
- Learn by example: demonstrate commitment and provide clear direction-let everyone know that health and safety is important.
- Ensure that managers, supervisors, and team leaders understand their responsibilities and have the time and resources to carry them out.
- Ensure everyone knows what they must do and how they will be held accountable.
- Provide information about hazards, risks prevention measures to employees.

The VRA is committed to prompt and supportive health care delivery system for its employees and their families as well as the communities in the areas of operation through corporate hospitals and clinics. The VRA operates three hospitals at Akosombo, Aboadze, and Accra and a clinic at Akuse. Staff members and their dependants at all VRA locations including the new subsidiary, NEDCO are also catered for by the Authority’s designated panel of doctors.

The VRA has a proactive, quality, health, safety and environment policy that focuses on people, property and the environment. Consequently, every employee is mandatorily required

to undergo medical examination during their annual vacation leave period. This health obligation forms part of the VRA's excellence management system.

Total outpatient attendance at the four health facilities was 195,937, 20.8% higher than the preceding year's figure of 162,149. Significant Increases were recorded in all the facilities due to expansion in specialist services.

Total number of admissions was 4,801, an increase of 8.4% compared to last year's figure of 4,428. The paying public constituted about 82.9% of the overall out-patient load and 98.8% for the in-patient load in all the medical facilities. Other cases were referred to selected hospitals including Korle Bu Teaching Hospital, 37 Military Hospital, St. Joseph's Hospital at Koforidua. The Operation Ghana Medical Mission Program continued through out the year.

Nursing is a rigorous discipline, which requires updated information on a regular basis to ensure best possible care is provided to patients. Consequently, we are establishing a Nursing Training School in Akosombo to enhance health delivery.

The Akosombo Hospital continued to support the training of medical professionals from medical schools, nursing training schools and other tertiary institutions.

## **MANAGEMENT INFORMATION SYSTEMS (MIS)**

### ***Cost Efficiency Perspective***

To ensure operational excellence, the VRA is building its Information and Communication Technology capability readiness in managing the shift from being production - driven towards becoming a value-driven organization, and creating value for its stakeholders. This strategic approach would assist the Authority manage its assets for higher return on investment, asset utilization, and higher productivity leading to a bigger share of the electricity market in West Africa.

Consequently, we have made significant investments in ICT equipment. We successfully completed the upgrade of the Human Resources and Management System (Oracle HRMS) and the upgrade/enhancement to ensure the efficiency of our business processes.

Notwithstanding a fire outbreak which completely destroyed the Authority's primary Data Centre, a temporary server room was quickly set up in Akosombo with minimal equipment to restore key corporate applications within five days, with the restoration of other ICT services later to bring ICT systems and services to normalcy across the entire organization. However, there were some connectivity challenges due to WAN bandwidth limitation with the key systems. To improve the speed of connectivity between Accra and Akosombo (temporary Data Centre), we installed two bandwidth optimization devices between the two locations culminating in a significant improvement in the speed of connectivity between Accra and Akosombo.



We engaged the services of three consulting groups, PWC, eSolutions, Oracle Consulting to assist the Authority to improve our internal business processes to enhance efficiency. We began work on the MIS Transformation Project (Enterprise Architecture Driven *Strategy, LANWAN 7 Data Centre Rehabilitation, MIS Organization Improvement, Service Desk & IT Process Improvement and Website & Intranet Build*). We also took the following actions:

- Upgraded the email system from 2007 to 2010 version; test Microsoft's system Centre Configuration Manager (SCCM) and System Centre Operations Manager (SCOM) and these tools were later used to help in the speedy deployment of the new corporate desktops.
- A proof of concept (POC) was carried out with Quintica using Riverbed WAN optimization devices on the Accra-Akosombo WAN link with positive results. The WAN optimization is to be implemented across the other WAN links to improve WAN network speeds of access.

### **Portfolio Diversification of Non-Core Functions in Real Estate, Hospital and Schools**

The VRA is taking steps to convert the non-power operations in the areas of Real Estate, Hospital and Schools into progressively self-financing subsidiaries. This will assist to inject greater efficiency in the running of a significant chunk of non-power activities by exposing them to open market forces. These initiatives are designed to position the VRA to focus more effectively on power generation as its core activity and assist the VRA to achieve competitive advantage in the West African sub-region.

The Authority, through the Akosombo Management Committee (AMC), continued to perform Local Authority functions in accordance with Executive Instrument 42 which defines the VRA's obligations towards the Akosombo Town. The AMC collected through the Local Authority activities an amount of GH¢106,769.41 while non-local Authority activities yielded GH¢1,420,654.72 bringing the total revenue generated during the period to GH¢1,527,424.13. The Local Authority component will be shared equally by the Authority and the Asuogyaman District Assembly in accordance with the existing agreement.

In Akuse township, operations from the Club Complex yielded a revenue of GH¢31,303.49 while the Mess Hall and guest houses realized a revenue of GH¢31,687.77 and GH¢117,449.90 respectively.

In Aboadze, township operations from guest houses yielded an amount of GH¢81,889.00 while the restaurant operations realized a gross profit of GH¢213,451.69. Swimming pool, Service charges, rental and rent receivables also realized a revenue of GH¢5,568, GH¢11,647.00 and GH¢14,160.00 respectively.

In Accra/Tema Estates, the Head Office canteen and cash sales realized a revenue of GH¢31,744.96 and GH¢14,160.00 respectively.

At Akosombo, the trading outlets at Maritime club, swimming pool, community centre and Dobson club house realized a total amount of GH¢24,793.45

The Maritime Club, guest houses, mess halls and other trading outlets generated a gross revenue of GH¢452,427.30 during the year.

## **ESTABLISHMENT OF CENTRE OF EXCELLENCE**

As a learning organization, we are setting up a Centre of Excellence Academy to build capacity training and adapt state – of – the - art technologies and expand our frontiers of knowledge so that we can remain competitive. A Director has been appointed for the purpose to lead the realization of this vision.

## **SUBSIDIARIES**

### **COMMERCIALIZATION INITIATIVES**

#### **OPERATIONALIZATION OF NEDCO**

We are implementing a business strategy designed to achieve economic efficiency with strong emphasis on innovative technology of the NEDCO and creating new opportunities for economic growth. Consequently, NEDCO is being operationalized as a full-fledged, independent distribution company, wholly owned by the VRA.

Accordingly, a Managing Director, has been appointed for NEDCO while a Board has been installed.

NEDCO's power purchase from the VRA during the year was 728,568,954kWh, an increase of 13.2% from the previous year's figure of 643,824kWh, out of which 519,099,450kWh was sold, representing an increase of 11.5% over the previous year's figure of 465,422,896kWh. Billed revenue was GH¢125,142,914 and billed revenue collection amounted to GH¢97,008,124 representing 77% collection rate. Accounts receivable stood at GH¢95,367,695 with a receivable lag of 325 days.

Customer population stood at 380,046. The average growth of customers was 11% increase over the previous year's figure. NEDCO recorded 20.2% distribution loss, worsening from 19.6% the previous year. Total revenue collection was GH¢87,280,275 while total expenditure stood at GH¢15,408,392.70.

A total of 5,177 SHEP connections were completed during the year. One thousand and eighty-seven spans of low voltage network were upgraded. HV/LV networks were extended by about

132km. while 14,226 new services excluding NEP/SHEP were made to the existing network. A total of 1,231 interconnections and 309 illegal connections were detected and removed from the network in various areas. A total of 3,059 meters were installed in various areas for flat-rate customers.

### **Akosombo Hotels Ltd**

The Akosombo Hotels Ltd., incorporated in 1970, is a 3-star luxury hotel with 35 rooms, including four suites and a privilege house, a discotheque, pleasure activities, including cruising on the lake by MV Dodi Princess, a swimming pool, two luxurious conference halls and a double tennis court and golf course, located on a hilltop overlooking the Akosombo hydro-electric Dam. The VRA has also commercialized its Executive Yacht, previously used exclusively by the Presidency of the Republic of Ghana and the VRA Executive. It has a living room, a conference hall with LCD TV/DVD and mini-cocktail in the living room. The Executive yacht is ideal for meetings in a congenial environment, family, couple on honey moon, executive/fishing groups, etc. The cruising facilities which have also been commercialized include: a 4-person capacity speed boat, and a 4-15 passenger conference research boat, MV Tilapia.

Operational performance for 2010 was marked by a stronger result with total revenue 57.49% higher. Real value for total revenue for 2011 was GH¢3,315,823 compared to GH¢2,105,367 in 2010. Occupancy for 2011 was 61% compared to 59% in 2010. Direct operating result for 2011 was GH¢930,706 compared to GH¢330,175 in 2010. Direct operating cost for 2011 was GH¢2,385,117 compared to GH¢1,775,192 in 2010. Net operating profit before depreciation for 2011 was GH¢503,471 compared to a net loss of GH¢225,326 in 2010. Depreciation for the period 2011 was GH¢208,811 compared to GH¢198,280 in 2010. Net operating profit after depreciation for 2011 was GH¢294,660 compared to a net loss of GH¢423,606 in 2010. Property, plant and equipment for 2011 was GH¢3,487,914 compared to GH¢3,541,413 in 2010.

### **FINANCIAL OUTLOOK**

The Hotel will be stepping up its marketing drive and pursue programme activities and strategies expected to yield 19% growth in revenue and 10% reduction in cost. Our management operations systems are expected to yield an average year end occupancy of 70% to further turn around the fortunes of the Hotel.

### **Volta Lake Transport Company**

The Volta Lake Transport Company, incorporated in 1970, operates river transportation for passengers, bulk haulage of petroleum products and significant quantity of cement, and cross-lake ferry services along the Volta Lake.

The company recorded a net profit of GH¢1,961,758 after charging annual depreciation of GH¢178,462 compared to a net loss of GH¢986,293 in 2010.

VLTC's remarkable performance was due to relatively regular supply of liquid cargo by the Bulk Oil Storage and Transportation Company Ltd. (BOST) for transportation to Buipe as well as prudent financial management practices. The company transported liquid cargo of 64,759.9 tonnes, an increase of 74.7%.

With regard to transportation of solid cargo, VLTC transported 76,178.8 tonnes compared to 86,471 tonnes transported in 2010 representing 83.6% of a target of 91,144 tonnes. Out of this figure, 65,430.6 represents volumes of cement transported during the year. The company also transported 581,974 passengers or 102.3% of a target of 553,356 and 117.1% of the previous year's figure of 483,249.

### **Millennium Challenge Ghana Programme- Transportation Project**

Under the Transportation project of the Millennium Challenge Ghana Project, the company benefitted from the under listed projects some of which have been completed and handed over to the company:

- Construction of two (2) new double – ended Ro – Ro vehicle/ pedestrian ferries. One (1) has been completed and christened and the other one is almost completed.
- Rehabilitation of the VLTC floating dock at Akosombo to enhance VLTC's future construction, repair and maintenance capabilities. This project has been completed
- Rehabilitation of the landing facilities at Adawso and Ekyi Amanfrom to increase ferry and vehicle handling capacities of the landing stages. These facilities are almost completed.
- Rehabilitation and extension of the ferry terminals at Adawso and Eky Amanfrom including all-weather protection and adequate sanitation facilities to accommodate additional ferry and passenger traffic. It has been completed and handed over to the company.

- Extraction of tree stumps from the crossing route between Adawso and Ekye Aman from to eliminate navigation and safety hazards during low water level condition. This has been completed but is yet to be handed over to the company.

### **Appointment of Ag. Managing Director**

Mr. Martin Exley Hiles was appointed Ag. Managing Director of VLTC effective January 4, 2011, after the termination of the appointment of Mr. K. Osei Sarpong

A Fellow of the Chartered Institute of Logistics and Transport, Mr. Hiles, an English man with cross cultural experience in Western and Southern Regions of Africa, has an outstanding track record in management and international logistics.

### **Kpong Farms Limited**

Incorporated in 1982, Kpong Farms Ltd. (KFL) was designed to serve as a resource *centre of excellence* for training in modern agricultural practices. KFL has been a leader in process innovation in the planning and implementation of agricultural operations. KFL has introduced a number of groundbreaking innovations. The most prominent of this is a soya bean processing technology known as “Extruding” has been introduced into the country by the Farm. The technology involves the processing of soya bean into Full Fat Soya (FFS), an important ingredient for livestock feed which is in high demand. KFL has also demonstrated the possibilities of irrigation for all-year cereal production. KFL has cut a niche for itself in particular the production of livestock, rice and poultry. But lately due to liquidity concerns, KPF is no longer operational. The VRA is therefore seeking strategic investors in a joint venture arrangement to transform the operations of Kpong Farms Ltd into a profitable agribusiness.

## **CORPORATE RESPONSIBILITY**

The Authority celebrated its 50<sup>th</sup> anniversary with symposia, exhibitions and media publicity and non-denominational church service during the year. The VRA used the occasion to highlight its achievements and challenges, to generate nation-wide interest in its work and objectives and focused on strategies to renew its strength and create new opportunities for economic growth.

The VRA considers its corporate responsibility as a business imperative. Indeed for us in the VRA corporate responsibility is not a moral obligation but a standard practice. We believe that our right to exist depends on our responsiveness to the external environment. The Authority

believes that when an active interest is taken in the well-being of the communities, a number of long-term benefits of community support, loyalty, and goodwill is gained.

The VRA's aim is to have a positive impact on the people, culture and communities in which the Authority operates, and to contribute to the growth and development of the economy. For this reason, the VRA has had a long history and tradition of engagement in corporate social investment. The Authority's community investment initiatives help build capacity and stimulate economic development.

The VRA is sensitive to its reputation and strives on a continuing basis to meet commitments to customers, the business community and communities in which its operations are integrated. As a socially responsible corporate citizen, the VRA is a signatory to the UN Global Compact, and reports compliance with the Compact's set of core values in the areas of human rights, labour standards, the environment and anti-corruption.

In consonance with the VRA's values and principles, the following social investments were undertaken:

- Sponsored a number of national priority programmes such as rural electrification projects, health, water resources, education, capacity building, culture, community development and governance, and made various donations to governmental and non-governmental organizations. By the end of 2010, the VRA had committed over GH¢200,000.00 in sponsorships, donations and philanthropy.
- Continued to commit the cedi equivalent of US\$500,000 to the VRA Resettlement Fund to support projects for environmental improvement, social welfare, public health, education, electricity, potable water supply and sanitation.