

DEVELOPMENT RESEARCH UPTAKE IN SUB-SAHARAN AFRICA (DRUSSA)

PROCEEDINGS FROM CSIR-SCIENCE AND TECHNOLOGY POLICY RESEARCH
INSTITUTE AND MINISTRY OF FINANCE POLICY SYMPOSIUM 2

*Theme: The Energy (Power) Crises in Ghana and its impact on Economic
Activities’.*



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CSIR-STEPRI

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ACKNOWLEDGEMENT

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Finally, our sincere appreciation goes to the speakers Dr Charles Ackah (ISSER-University of Ghana) and Dr. J.K. KMr Ishmael Ackah (Africa Centre for Energy Policy) for their useful inputs and significant contributions that really enriched this Policy Symposium. To all the stakeholders who actively participated in this Policy Symposium, we say thank you for your contributions.

LIST OF ACRONYMS

ACU	Association of Commonwealth Universities
ACEP	Africa Center for Energy Policy
CSIR	Council for Scientific and Industrial Research
DFID	Department for International Development
DRUSSA	Development Research Uptake in Sub Saharan Africa
EU	European Union
GDP	Gross Domestic product
GoG	Government of Ghana
GIW	Ghana Institute of Welding
GSS	Ghana Statistical Service
ISSER	Institute of Statistical Social and Economic Research
LNG	Liquefied Natural Gas
MOF	Ministry of Finance
MOFA	Ministry of Food and Agriculture
MOTI	Ministry of Trade and Industry
SMEs	Small and Medium Enterprises
STEPRI	Science and Technology Policy Research Institute
VRA	Volta River Authority

Executive Summary

The Science and Technology Policy Research Institute (STEPRI) of the Council for Scientific and Industrial Research (CSIR) and the Ministry of Finance (MoF) organized a half day Policy Symposium on Thursday, 30th April, 2015 at the CSIR-STERPI auditorium in Accra. The theme for the symposium was “***The Energy (Power) Crises in Ghana and its impacts on Economic Activities***”. This policy symposium brought together a number of Senior Staff from the Ministry of Finance (MoF), Academics and Other Stakeholders to share knowledge on the theme for the occasion. It was generally acknowledged that the theme for the event was very appropriate given that many Ghanaian Entrepreneurs were crying for relieve and better opportunities to salvage their collapsing businesses.

The two presentations generally did well by pointing out the costs incurred by businesses as a result of the crises and the reality of the need for solution as soon as possible. Production lost by micro-scale industries as a result of the power crisis was estimated at approximately 2.1 million US dollars a day and about 670.1 million US dollars per year translating to 2% of national output. Considering the fact that energy (electricity) is the major driver of business growth and productivity, both presenters suggested that government in collaboration with the private sector should as a matter of necessity do their best to investment in the energy sector. They made the point that Ghana has the potential, and the capacity to produce and export power and therefore that should be our drive if the country is to succeed. A major suggestion that came up frequently was that the right priority, which demands seriousness and accountability, should be the focus for Ghana. It was pointed out that if hydro seems a challenge; the country can go for natural gas. This was made against the backdrop that It should be noted that although Liquefied Natural Gas (LNG) may be expensive, it is cheaper than the cost of ‘*dumsor*’.

Some other recommendations captured during the presentations and discussions include the need to:

- Consider the possibility of funding the power sector from the proceeds of oil production;
- have a new off taker: One such example is Nigeria, which as part of its current reform initiative has established the Nigerian Bulk Electricity Trading Company PLC (NBET);
- Import natural gas: Natural gas can be transported either through pipelines or as a Liquefied Natural Gas (LNG);
- Ensure Consumer Efficiency - Credit rating of consumers in Ghana is very low. Consumers do not pay their electricity bills regularly. Especially when there is *dumsor*;
- Reduce distributional losses/Operational efficiency performance must be curtailed at least to global benchmark of 15%. In the power sector, distributional and

transmission losses refer to the amounts of electricity injected into the transmission and distribution grids that are not paid for by users;

- Investment in waste to energy, solar and biogas: We can add all the 'DA's' ie SADA, MADA, FADA, WADA, etc into a transparent, accountable and 'corruption proof' Energy Development Authority as a starting point for development;
- Management of state utility companies should sign performance contracts;
- We should consider partial privatisation or division of ECG into smaller units;
- Standard offer approach is recommended;
- Ensure increase generation capacity and/or reduce transmission and distribution losses so as to improve the grid power; and
- Ensure improved quality and information sharing about the outages.

Overall, the symposium was successful given the caliber of people who attended and the contributions that came on the floor for discussions.

1. INTRODUCTION

Development Research Uptake in the Sub-Saharan Africa (DRUSSA), is a project funded by DFID of United Kingdom. It seeks to strengthen research uptake capacity and participation in 24 Sub-Saharan Universities across twelve (12) countries in the sub region. DRUSSA aims at improving accessibility and utilization of locally relevant research to inform policy and practice in the sub region. In Ghana, the DRUSSA project is supporting three ministries including the Ministries of Trade and Industry, Finance and Food and Agriculture in three (3) different areas of capacity building in research evidence uptake in the selected Ministries. The three components of the project include capacity building in research uptake for the senior level staff of the selected Ministries, symposia organized for staff of the Ministries and their depart and Agencies on topical selected subjects of major relevance to policy and finally a fellowship programme, which seeks to place seasoned academics at the Ministries to help staff of the Ministries with research and policy activities.

In Ghana, the CSIR-Science and Technology Policy Research Institute (STEPRI) and the Institute for Statistical, Social, and Economic Research (ISSER) of the University of Ghana, are collaborating with the Association of Commonwealth Universities (ACU), to implement the various activities of DRUSSA.

As part of the series of six symposia slated to be organized for the ministry of finance under the project, the DRUSSA team looked at one of the major challenge in the country presently under the theme 'the energy crises in Ghana and its effects on business performances'. This report presents a brief of the proceedings for public consumption,.



Registration for the MOF Policy Symposium in progress

The current power disruptions to homes and industries have created lots of discussion and arguments in every corner of the Ghanaian society. The discomfort, frustrations and destruction of home appliances that comes with the power crises cannot be overemphasized. All manner of people including politicians, traders, civil servants, farmers and any other persons on the streets of Ghana is complaining about one problem or the other resulting from the crises. As the populace continues to shift blames from one onto one another, policy makers and politician seem not to be sure of when the crises is ending. This has engendered serious debates in every corner, with serious accusations or blame

game in the corridors of politicians. Generally while others blame the challenge on the reduced water levels of the Akosombo Dam, others place the challenge at the doorsteps of the government saying the government is not ready to spend the huge monies required to purchase fuel to run the systems. In all these, no one actually seems to be providing the needed answers to the problem on hand.

In collaboration with Ministry of Finance, this symposium was hosted to bring together all those who matter and are interested in the issue on the floor to dialogue and find possible solutions to the current crises. The day's activity was driven by available two main speakers on theme presented. After the presentations the various stakeholder groups present gave a brief situational analysis of the causes and effects of the power crisis economic activities in the country. The policy symposium attracted a total of 31 participants, 8 of who were females. (See appendix I and II for attendance and program line-up respectively).

2. OPENING

This symposium was officially opened by Prof. Dr John Kofi Baffoe, the Chief Technical Advisor for the Minister of Finance after a welcome address by Dr. George Owusu Essegbey, Director of CSIR-STEPRI. In his remarks, Dr John Baffoe thanked CSIR-STEPRI for hosting the policy symposium and also appreciated DFID and ACU for their funding and technical support respectively. He was so enthused particularly about the theme which he deemed very appropriate and a topical issue in Ghana.



Dr George O Essegbey (welcome Address) and Prof. Dr John K Baffoe delivering his remarks

The economic history of Ghana suggests that energy is not a new phenomenon in the country. The crisis has been persisting from one government to another due to challenges with supply capacity and ever increasing demand for energy. A long term solution is therefore needed to curb the challenge. As a government official, Prof. Baffoe acknowledged the fact that the impact of the energy crisis on economic activities in Ghana is enormous and therefore stakeholders need not politicize the issue. He urged all stakeholders present at the symposium to express their candid opinions about the situation and offer constructive and reasonable alternative solutions to help end the age-long problem. In addition to what the government is already doing, the chairman, Prof. Baffoe stressed the need for government to be more step up the game and be more committed to ending the energy crisis.

After the chairman's acceptance speech, the group went into the technical sessions which were preceded by presentations from two senior academics from the Institute of Statistical, Social and Economic Research of University of Ghana and Kwame Nkrumah University of Science and Technology, Kumasi. The presentations are summarized below.

3. PRESENTATIONS

3.1. Presentation on ‘Electricity insecurity and its Impact on Micro and Small Businesses in Ghana’ by Dr Charles Ackah, *Senior Research Fellow-ISSER, University of Ghana*



Dr Charles Ackah, on the Energy Crisis

According to Dr. Ackah, the electricity crisis in Ghana for nearly the last 3 years is unparalleled. The country is losing production worth about 2.1 million US dollars a day and about 670.1 million US dollars per year owing to the crisis alone. These figures are just for the micro industries. These translate to about 2% of national output. Results from this research revealed that the cost of electricity shortages in Ghana is about GHC 1,661 for micro enterprises and GHC 1,540 for small enterprises. According to him, microenterprises are losing about 18% of their sales while the small enterprises are losing about 32% of their sales. Also, about 80% of the micro and small businesses do not have generators with only 1.7% having one of their own. About 8 in every 10 firms do not use backup generator in Ghana. Moreover, most of those who use generator adopt the strategy of sharing with others. A higher proportion of men than women have their own generators. Among the micro firms, just as low as 1 in every 10 does operate a backup generator.

In his speech Dr Ackah made the point that the small businesses have become important today because today, around 90 million micro, small and medium sized enterprises provide over two-thirds of all jobs in the developing world (ODI, 2014). The poor quality of electricity supplies in developing countries is perceived to constrain their operations severely. According to the senior fellow, Voltage fluctuations and power outages can halt production, damage equipment and affect product quality. Total factor productivity, labour productivity, firm competitiveness, investment, employment and profits are all affected by electricity insecurity.

The data for the study was sourced from the Gender and Enterprise Development in Africa (GENDA) Survey (2014). This is a nationally representative survey of men and women owned non-farm enterprises. 1,250 micro and small firms were surveyed in total. However, in order to measure the economic effect of electricity shortage, the sample is limited only to firms that use electricity for service or production. This reduces the sample size to 347 firms. Out of this number, about one third of them indicate that the electricity supply is insufficient for their business.

Electricity was found to significantly affect a firm's output negatively while controlling for factors such as the manufacturing industry/sector, the size of the firm, age of the owner in years etc. Firms that do not have access to sufficient electricity have lower output/sales compared to those who have sufficient electricity. Specifically, the results indicate that not having sufficient electricity lowers firm's annual sales by about and 37-48%. The results indicate that firms that own or have access to standby generators do better than their counterparts without a generators. Also, having a generator cushions the firm against the negative effect of the power crises by around 41-52%.

In conclusion, stable and sufficient electricity supply is undoubtedly a key input to firm growth, expansion and development. In Ghana, electricity is the second most important constraint to firm's activity (World Bank, 2013). Unstable power supply results in much loss in output and sales. During periods of outages, many firms that do not have access to a backup system may shut down, downsize or perhaps change business line. The study also found that electricity exerts much significant effect on firm performance even after controlling for other factors like type of industry and size of the firm, education and gender of owner. Conscious efforts are therefore required on the part of government towards ensuring sustainable energy supply to businesses.

The study recommends that the best solution is to increase generation capacity and/or reduce transmission and distribution losses so as to improve the grid power. Also, if the quantity of electricity can't increase, improved quality and information about outages can help. The government should also support businesses to access renewable energy.

3.2. Presentation on 'The Energy Crises and Its Impact on Economic Growth in Ghana' by Ishmael Ackah from Africa Centre for Energy Policy (ACEP)



Dr. Ishmael Ackah of the Africa Centre for Energy Policy (ACEP)

Dr. Ackah Ismael from the African Center for Energy Policy gave the second presentation, according to him, for the last three decades (1970 to 2012), electricity generation in Ghana has more than quadrupled (World Bank, 2012). However, total electricity generated per capita has been relatively low as it falls below that of the Organization for Economic Co-operation and Development (OECD) countries by about 13 times, and 9 times lower than in the countries with transition economies (CET). Again, Gross Domestic Product (GDP) has merely doubled; implying a huge percentage of electricity generated has not been channeled into productive ventures, but rather has been wasted. The major load shedding era's were from 1983, 1997, 2003, 2007, 2010 and now (2015). These were attributed to the following; insufficient investment in new infrastructure (Adom et al., 20120); the failure of hydropower plants to supply adequate power due to perennial drought; spontaneous outages at the Vridi thermal plant in Cote d'Ivoire where Ghana imported an average amount of 674.8 GWh of electricity from 2000 to 2010 (Energy Commission, 2010).

Causes of the Electricity Crises

Low water levels - The shortage of water has resulted in only a 60% reservoir yield at Akosombo and Kpong. The minimum operating water level for the Akosombo Dam is pegged at 240 feet. The water level in December 2010 was 275.40 ft; it was 271.97 ft in December 2011; was 268.50 ft in December 2012; and was 257.80 ft in December 2013. From 1972-1997 Ghana relied solely on hydro-electric power and then went on to thermal. In post 2009, natural gas was added. The 2013 water level in the Akosombo Dam was higher than what was recorded in 2014.

Natural Gas and Light Crude Oil Supply Challenges- About 88% of gas demand in Ghana is from the power sector and the country currently needs about 191 million standard cubic feet per day (mmscfd) to power its thermal plants. This is projected by the Ministry of Energy to grow to 265 mmscfd in 2020 and 584 mmscfd by 2030. For example, only an average of 31 mmscfd of gas was delivered through the WAGP in 2013, down 25% from 2012. This is far below the contractually mandated quantity of 123 mmscfd per day to be supplied by the WAGP.

Non-Credibile Off-taker - ECG is the sole off-taker of electricity but its poor credit risk makes IPP's hesitant in investing in the power sector. An example is the VRA which has also indicated that the ECG owes it in excess of GH¢1billion, which is making it difficult for it to purchase crude oil to power its thermal plants. The ECG was indebted to Asogli by more than US\$21 million while they owe GRIDCO more than GH¢100 million. These debts are due to 3 reasons:

Inefficiencies at ECG - ECG bought a GH¢50,000 pick-up which got lost later (last seen on 19/02/2015). Also, 24,000 3-phase meters burnt/vanished in Ashanti Region ECG. Furthermore, the management of ECG awarded themselves a whopping 35% increase in salaries and allowances for the 2013 financial year.

Low Revenues - As at the end of October, 2014, the government total indebtedness to ECG was 1,247,597,280.51 representing 62% of ECG's total debt. About 51% of the ECG's customers are lifeline consumers, who account for 6% of energy consumption and 1% of sales. They are followed by residential consumers, who account for 34% of energy consumption and 36% of sales revenue. However, 56% of the ECG's revenues actually come from the 12% who are non-residential consumers, and not from the former two groups.

High technical and commercial losses - There is also the occurrence of high technical and commercial losses. Illegal connections are examples of these. In 1988 the technical losses recorded was 17% while in 2011 there was 25% losses. In 2014 the loss recorded was 19.7%. A loss of 21% is the standard according to PURC (Public Utility Regulatory Commission) but on the international market it is about 10%.

Other factors include the lack of maintenance and investments as well as the lackadaisical attitude towards the payment of tariffs.

Impact of the Electricity Crisis on the Economy

The World Bank, 2007 estimates that, power outages in Ghana lead to a loss in GDP by 1.8%. According to the Ghana Statistical Service (GSS), real GDP growth rate for 2014 was 4.2%,

compared to 7.3 percent recorded in 2013. The difference is mainly attributed to dumsor (light of). Ghanaian businesses lost about 6% of sales due to the cumulative effect of dumsor in 2014. Moreover, there was increased unemployment through low industrial output and increased cost of production. Between December and March, 2015 companies like Goldfields laid 700 workers off and partially attributes the decision to high operation cost as a result of dumsor; Coca Cola, 214 workers to be laid off by end of April 2015; Chocho Group of Companies has laid off 15 workers so far with more likely to be laid off.

The electricity crisis has also led to a reduction in the contribution of the manufacturing sector to GDP (from 6.78% 2010 to 5.78% 2013). A research conducted by ISSER about the ongoing power crisis has revealed that Ghana lost GHc 1 billion in 2014. Labour productivity has reduced and energy inefficiencies have increased. 'Dumsor' has led to the complete shutdown of some SMEs such as cold stores. Again, Chocho industry has announced its decision to close down by the end of the year if the power situation does not improve.

There is hope however, in the medium to long term. Ghana requires about \$4 billion in the electricity sector in the next ten years to make up for past investment deficits. In this regard a sum of \$498.2 million has been given by the MCC towards power in Ghana.

Conclusion

Electricity is a serious business, a vital factor of production and a major source of pleasure. It therefore requires investment, competence and commitment. Ghana has the potential, the ideas, the capacity and the resources to produce and export power. However, what we need is setting the right priority, seriousness and accountability. It should be noted that though Liquefied Natural Gas (LNG) may be expensive, it is cheaper than the cost of 'dumsor'.

Recommendations

DR Ackah made the following recommendations to be considered as policy options for government and other stakeholders.

- Consider the possibility of funding the power sector from the proceeds of oil production;
- Need a new off taker: One such example is Nigeria, which as part of its current reform initiative has established the Nigerian Bulk Electricity Trading Company PLC (NBET);
- Importing natural gas: Natural gas is not made in Nigeria. Nigeria is just one of the countries that produce natural gas. However, natural gas can be transported either through pipelines or as a Liquefied Natural Gas (LNG);
- Consumer Efficiency - Credit rating of consumers in Ghana is very low. Consumers do not pay their electricity bills regularly. Especially when there is dumsor;

- Ghana needs an efficient PURC;
- Distributional losses/Operational efficiency performance must be curtailed at least to global benchmark of 15%. In the power sector, distributional and transmission losses refer to the amounts of electricity injected into the transmission and distribution grids that are not paid for by users;
- Ghana needs annual weather forecast for proper planning of Energy Supply;
- Investments in waste to energy, solar and biogas: We can add all the 'DA's' ie SADA, MADA, FADA, WADA, etc into a transparent, accountable and 'corruption proof' Energy Development Authority as a starting point for development;
- Management of state utility companies should sign performance contracts;
- We should consider partial privatisation or division of ECG into smaller units; and
- Standard offer approach is recommended: With this system, energy saved will be treated energy generated by customers.

4. DISCUSSIONS

4.1 Interactive Session

After the two presentations, the floor was opened for interactive session with the stakeholders. **Dr Baffoe – form MOF questioned the basis for using the Cobb Douglas Production Function** for the analysis on the impact of the energy crisis on Micro and Small Enterprises in Ghana. He also wanted some clarity on the substitution between generator and electricity in the model used, whether there was causality between electricity and generator. The presenter indicated that the assumptions underlying the analysis were reasonable assumption. That any profit maximizing firm will substitute generator with national grid with cost minimization in mind.

A contributor from PURC commented that ECG may be inefficient and the tariff system in use may not be realistic but PURC seeks to match quality of service with tariffs,

Eddie Addo Dankwa from MOFA wanted a clarification on the issue of inefficiencies with ECG. He wanted to find out if the problem was about ECG owing the power suppliers or inability to collect the tariffs. The question was whether privatization of ECG should be the panacea to operational inefficiencies.

From Dr Mohammed Amin Adam (ACEP), monitoring of quality of standards, studying tariff by PURC and comparative analysis among neighbouring countries indicate that Ghana's tariff system is competitive. However, there are problems associated with short term finance, micro-economic conditions, depreciating of the cedi as well as other factors associated with operations such as fuel switching which involved a lot of cost. Cost associated with waiting periods also affected the competitiveness of the tariffs - old plants, frequent breakdowns, no regular maintenance and no national standards associated with plants purchased into Ghana are all challenges limiting energy supply.

From the AGI representative, almost all SMEs work in the day / day shift. In Ghana the peak load is at night – run on day to do away with the night loads – 2 days in a week- the emphasis will be that the off peak demand is met at all times. Long term strategic plan (2004 -2020), but there were no evaluation or review, we need to have a plan for the DUMSOR. Make the plans available to the stakeholders and monitored closely- lack of planning and implementation of the plan

Joseph Assando from Energy Commission complained about the politics associated with the energy sector, existing marketing strategies and operational inefficiencies. He suggested that GoG looks at solar energy. According to him Ghana cannot leave VRA and ECG to fix power prices alone. There should be more private operators in the power supply and distribution systems. The market structure should be looked at critically. We need to open up the sector and the bidding systems – sole sourcing is not effective.



The floor opened for interactive discussions after the two presentations at the Policy Symposium

It was also pointed out that the competitiveness of domestic industries was severely affected by the energy crisis. The domestic industries were not able to compete with prices of imported prices. There was crowding out of domestic firms from the market place. Other externalities need to be considered as well.

According to the representative from Ghana Institute of Welders, there were issues STANDARDS/CODES particularly due to differences in the temperature conditions. Most Ghanaian engineers do not pay attention to standards when implementing National projects. He suggested that policy makers should look at alternative sources of power generation and ancillary machinery for emergencies.

The representative from **PURC** made contributions on his organization's monitoring activities, feedbacks to utility consumers and compensations made in relation to power outages and damages. About the system losses he mentioned that last 2 years ECG was punished for not meeting the standards. He cited an example where investigations into a burnt house as a result of ECG operational inefficiencies. ECG was charged to build the house and ECG actually paid the amount involved.

A representative from Ghana National Association of garages complained about operating with obsolete machinery (special order for obsolete technology, old fridges) and why the switch from hydro to gas. He asked why not wind or solar and the need for more alternative sources of power generations.

Abdul Raham from VRA suggested that financing of alternative power generation is critical. The banks are not giving out loans any longer. There are too many debts: MMDAs owing

ECG and ECG in turn owing VRA. Potential private sector operators do not want to do business with VRA and power plants are very expensive and risky. ECG takes about 70% of the power generation. There is a need for a separate account for the tariffs which consist of distribution service charge plus production cost. With the current system, ECG takes all the tariffs before paying for the actual production cost due VRA. In the short term GoG needs to find a way of clearing the cost built up with ECG. This will encourage private sector participation. Regarding obsolete equipment, Abdul Raham mentioned that all turbines at Akosombo have been changed recently and so the equipment/machines are fairly new. Again reserve margins are factored into their planning schedules.

A representative from the Ghana Hairdressers Association stressed the need for energy for their economic activities. She complained that most times donor funds get into wrong hands for technical assistance. What they want is power and not technical expertise. She wanted to find out what measures are being implemented for the SMEs to access solar panels.

A contributor from **Ghana National Association of Garages** suggested that ECG should take up the issues with solar paneling.

From a submission by a **representative from Energy Commission**, the nation is working on 2000 households with solar program but the key issue is the high cost. According to him power generation from solar is the most expensive in the world. The nation is looking at cost competitive unit. Coal is the cheapest but having Energy- mix is imperative and we need to improve the system structure

Timber Market – Information from a different perspective, I wish ECG were here – fix the light so we can keep working

4.2 Reactions from the Presenters

The first presenter (Dr Charles Ackah from ISSER) associated himself with the concerns of the artisans and hairdressers. Some have gone for loans from the micro-financial institutions at high interest rates, their apprentices are not working and probably we should have a study on suicide in connection with *dumsor*. The negative effect of the energy crisis on students cannot be overemphasized. There are dead cases from the hospitals due to *dumsor*. There is huge youth unemployment, workers are being paid single spin salaries but are not working due to unreliable energy supply. Indeed back of the envelop calculation on losses is high. We need to deal with the energy situation –We need to do something about it. According to Dr Charles Ackah the current electricity tariffs in Ghana are competitive and actually unreasonable. The really challenge is how to reduce inefficiencies in power generation and distribution systems.

The second presenter (Ishmael Ackah from ACEP) associated himself with comments by the representative from VRA. He agreed that ECG should not take all the paid tariffs and also

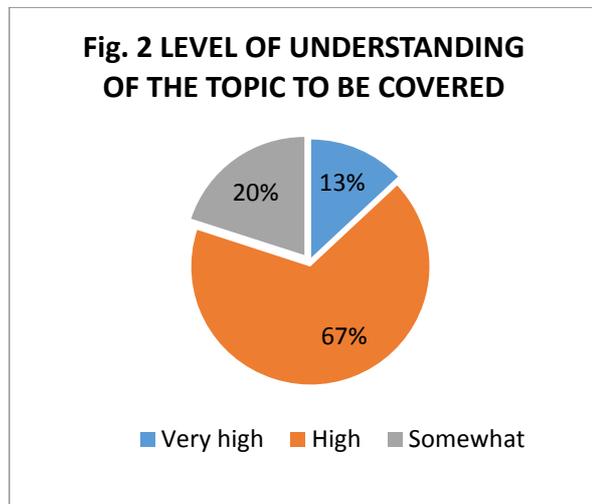
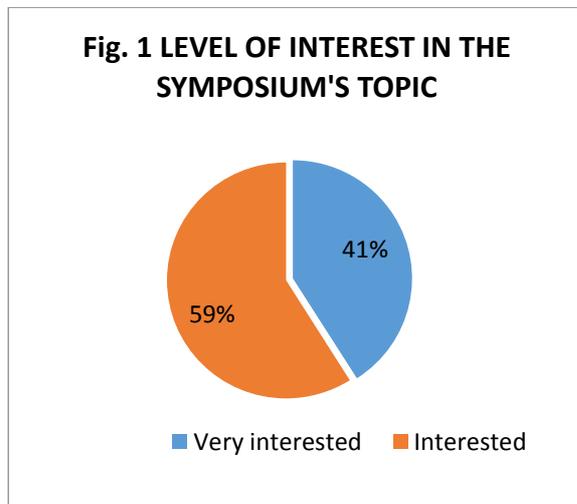
GoG should put in the necessary measures to clear its debt. He said that it is true that power generation from coal is the cheapest but we need to consider the standards. A case in point is the gas from Atuabo – now we cannot take the gas why because we do not have what it takes to perform. From his view point privatization of ECG is not the option but how to manage ECG. Solar is very expensive and as a country we should ask ourselves what are the necessary measures to help with the financing options. There are about 34 identified mini energy sites in Ghana –we need to attack the energy situation with all seriousness.

5. EVALUATION AND CLOSING REMARKS

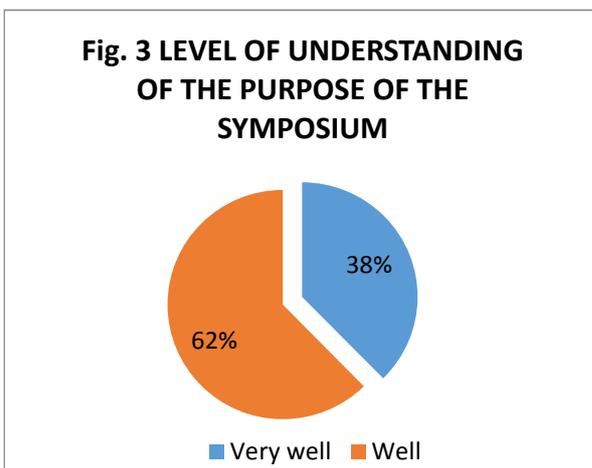
5.1 Evaluation

The policy symposium was evaluated by participants using a standardized pre and post symposium evaluation questionnaires. Figures 1-3 below give the pre-symposium evaluation regarding the following:

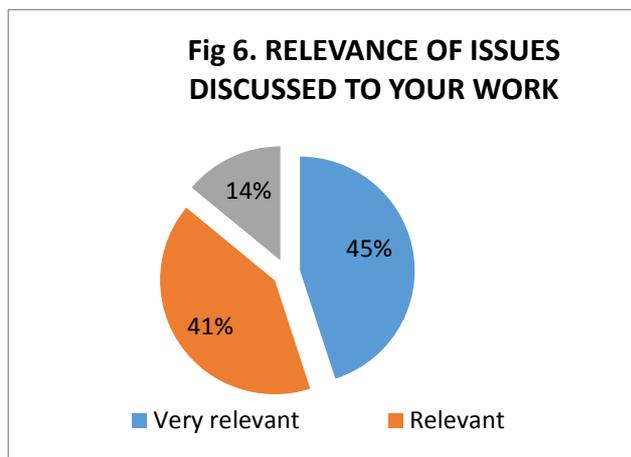
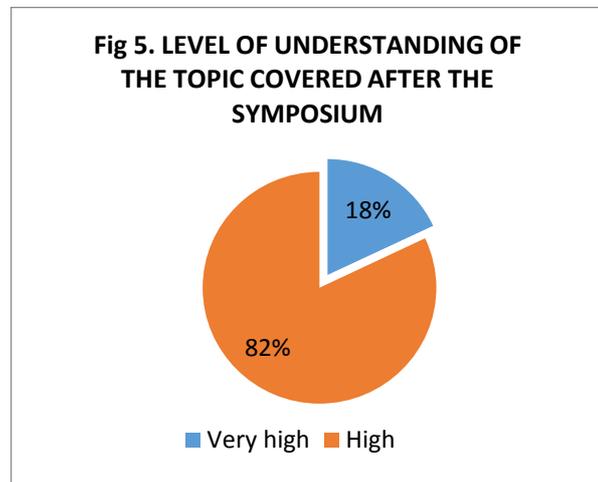
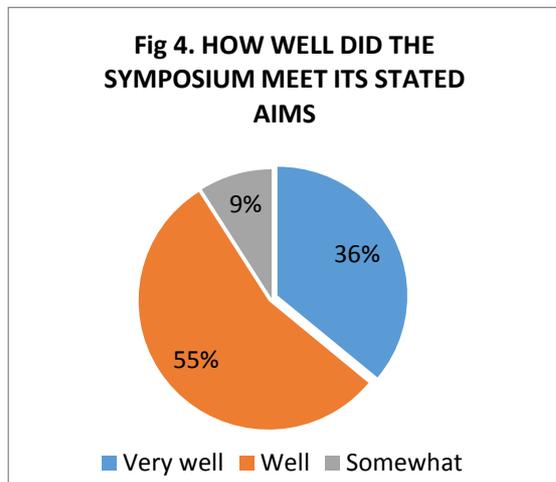
- Participants' level of interest in the topic (fig 1);
- Participants' level of understanding of the topics to be discussed (fig.2); and
- Level of understanding of the purpose of the policy symposium (fig.3).



The pre-symposium evaluation results showed that participants were very enthused about the theme for the policy symposium. Indeed the Energy crisis and its effect on economic activities in Ghana was a topical issue. The level of understanding of the topic was very high for 13% and high for 67% of the participants. This is indicative of the high experts drawn from the various organizations in the energy sector for effective interactive session. The participants understood the purpose of the policy symposium – that is to deliberate on the energy crisis and come up with constructive submissions on possible solutions for policy considerations.



Comparative analysis of the pre symposium evaluation (figs 1-3) with the post symposium evaluation (fig. 4-6) showed a remarkable improvement in the level of understanding of the topics covered after the policy symposium. A baseline of 13% very high and 67 high pre-symposium level of understanding of topics increased in the post-symposium scenario (18% very high and 82% high).



About 36% and 55% of the participants indicated that the symposium actually met their expectations very well and well respectively. As depicted in figure 6, the issues discussed were very relevant to the participants' field of work. This also proved that the policy symposium attracted the relevant stakeholder groups in the energy sector although from the discussions ECG should have been invited as well.

5.2 Closing Remarks

Delivering the Chairman Remarks, Dr John Baffoe thank all the stakeholders who participated in the policy symposium for their contributions and patience. From his perspective what Ghanaians should know is that the energy crisis has been linkering on for a long time – as far back as when Akosombo was built – most governments or administrators were relying more on the demand side but currently the demand for power far exceeds supply due to high growing population and capacity issues. The current Government is committed to solve the energy crisis and is putting in a lot of efforts. From where he stands there is no time to make new promises.



Appendix I



Theme: ‘The Energy (Power) Crises in Ghana and its impact on Economic Activities’.

Venue: CSIR-STEPRI AUDITORIUM

Date: 30th April, 2015

ATTENDANCE SHEET

NO	NAME	INSTITUTION/ ORGANIZATION	E-MAIL/CONTACT	GENDER
1.	Robert Atsrim	ACEP	Atsrimrobert@gmail.com	Male
2.	Sara Calamassi	ACU	Saca.calamassi@acu.ac.uk	Female
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Appendix II



POLICY SYMPOSIUM

Theme: *The Energy Crises of Ghana and Its Impact on Economic Activities*

Date: 30th April, 2015 at 09:00 am

Venue: CSIR-STEPRI Auditorum

PROGRAMME

08:30am – 9:00am	Registration of Participants	All
09:00am - 9:30am	General Introduction	Facilitator/Dr. Richard Ampadu
9:30am - 10:00am	Opening:	
	<ul style="list-style-type: none">• Welcome Statement• Introduction of Chairman• Chairman's Remarks	<ul style="list-style-type: none">• Dr George Owusu Essegbey (Director-STEPRI)• Mrs Justina Onumah (STEPRI)• Chief Director, Ministry of Finance (MOF)
10:00am-10:30am	<ul style="list-style-type: none">• Presentation on The Energy Crises of and Its Impact on SMEs in Ghana• The Energy Crises of Ghana and Its Impact on Economic Activities.	<ul style="list-style-type: none">• Dr. Charles Ackah, Insitute of Statistical and Social Economic Research (ISSER)• Dr. Mohammed Amin Adam, Executive Director, Africa Centre of Energy Policy (ACEP)

10:30am –11:10noon

Facilitator/Dr. Richard Ampadu (STEPRI)

Questions and Answers

11:10am-12:10pm

Closing Remarks and The Way Forward

Chief Director, MOF

12:10-12:30