WORKSHOP ON ADVOCACY TO PROVIDE A PLATFORM FOR THE WIDER STAKEHOLDER ENERGY COMMUNITY TO DISCUSS CRITICAL ISSUES IN THE LPG SECTOR

REPORT

ANGE HILL HOTEL, ACCRA. FEBRUARY 26, 2014

Contents

ACRONYMS

CEO	Chief Executive Officer
GCMC	Ghana Cylinder Manufacturing Company
GHACCO	Ghana Alliance for Clean Cookstoves
GACC	Global Alliance for Clean Cookstoves
GoG	Government of Ghana
ISO	International Standards Organization
SEA	Strategic Environmental Assessment
SNV	Netherlands Development Organization
UN	United Nations
MOEP	Ministry of Energy and Petroleum

INTRODUCTION

The Ghana Alliance for Clean Cookstoves and Fuels in collaboration with the Ministry of Energy and Petroleum and the Global Alliance for Clean Cookstoves organized a One-Day Workshop at the Ange Hill Hotel in Accra on advocacy for improved LPG dissemination in Ghana. It was coordinated by Anomena Ventures and attended by over one hundred producers, distributors and users (both industrial and domestic) of LPG from all over Ghana.

OBJECTIVES

The objectives of the workshop was to bring together producers, distributers and users of LPG to brainstorm on the challenges and opportunities in the LPG sector in Ghana as well as advocate for the use of LPG by creating an enabling environment for market actors to constructively interact with each other to begin a process of change in the LPG sector.

Specific objectives included:

- sharing knowledge and experiences in the promotion, use and distribution of LPG products;
- Discussing successes and challenges in LPG programmes in Ghana;
- Discussing recommendations and tools to improve policy and regulatory framework for LPG use in Ghana;
- Developing concrete recommendations for the advancement and more usage of LPG in Ghana;
- Forming an association of players in the LPG sector.

OPENING

The Workshop began with prayers by Mrs. Faustina Boakye, chairperson of the Ghana Alliance for Clean Cookstoves and Fuels. After the prayers, the chairperson for the function, Ms. Christine Asare, Director, Strategic Environmental assessment (SEA)/Legal of the Environmental Protection Agency (EPA) was introduced by Dr. Sabina Anokye Mensah, Chief Executive Officer

of Anomena Ventures. This was followed by self introduction of participants. The list of participants and the programme has been attached as Appendices 1 and 2 respectively.

In her opening remarks, the chairperson, Ms. Christine Asare congratulated the organizers for holding the event saying that advocacy is a very important tool in any developmental programme. According to her, it is even more important in the energy sector because deforestation is destroying our environment simply because people have to cut down trees for use as fuelwood. She expressed concern also about pollution and how this is affecting the environment and health of people especially women. She urged participants to take the workshop serious and come out with concrete proposals to promote LPG use in Ghana.

After her remarks, the welcome address was given by Mr. Kwasi Sarpong, West Africa Regional Representative for Global Alliance for Clean Cookstoves and Fuels. He gave a brief background of the Alliance since its formation in 2010. He stated that about four million people die of indoor air pollution annually throughout the world. In Ghana, the figure is about 40,000 people. Mr. Sarpong said these figures are worrisome and it is for this reason that the Alliance has raised 100 million US Dollars to promote use of cookstoves globally. He emphasized that Ghana has been chosen to be part of this project because the country has shown the desire and will to tackle pollution. He further stated that LPG plays an important role in energy security so the objective of the Alliance is to bring everybody on board to adopt clean cookstoves.

Contributing to the welcome address, Mrs. Faustina Boakye, Chairperson of the Ghana Alliance of Clean Cookstoves (GHACCO), said her organization is made up of fifty members with thirty being active. She explained that Membership is made up of producers, distributers, the media, academics, NGOs, civil society organizations, among others. The objective of GHACCO according to her was to bring together players in the clean stove production sector as well as those in climate change and energy sectors. She stated that LPG is the safest and best form of energy use and that should compel all to promote it. She expressed the hope that participants who are not yet members will join the association to enable them achieve the goal of enhancing the use of LPG. Dr. Sabina Anokye Mensah Chief Executive Officer of Anomena Ventures contributing to the welcome address stressed the importance of gender budgeting in the use of LPG in Ghana. Full text of the presentation is attached as appendix 12.

In a speech read on behalf of the Minister for Energy and Petroleum, the Deputy Director at the Petroleum Directorate of the Ministry, Mr. Kwame Bona Siriboe thanked Anomena Ventures and GHACCO for the immense interest they have shown in the need to promote the use of LPG in the country. This he indicated is in tandem with government's policy to improve access of LPG to about 50 percent in urban areas and 15 percent in rural areas. According to him, the

Ministry of Energy and Petroleum has since 1980 spearheaded the promotion of LPG as a cleaner safer and healthier form of cooking fuel for households. He enumerated a list of measures that the Ministry is undertaking in relation to the development of LPG infrastructure and distribution. Mr. Siriboe urged participants to take advantage of opportunities which will emerge in the LPG distribution project. The full text of Mr. Siriboe's address is attached as Appendix 3.

TECHNICAL PRESENTATIONS

Nine presentations were made by different experts in the field of LPG supply chain.

The first presentation was made by Mr. Kwabena A. Otu-Danquah, Head Renewable Energy, Energy Commission on the topic "Strategy for Increasing LPG Access and Adoption in Ghana".

He began with an outline of Government energy policy objectives and strategy as spelt out in 1989 with a target of reaching 50 percent of households and institutions by 2020. He touched on major issues and challenges confronting the sector rand strategies being adopted to overcome them. Strategies elaborated included: *i*nvestment in LPG dischage, storage and infrastructure to facilitate LPG supply*, development of n*ew LPG Supply and Distribution Business Model, establishment of attractive transportation and distribution margins and redirection of current subsidy on the consumption of LPG towards the facilitation and implementation of the "Cylinder re-circulation model", development and enforcement of clear standards, procedures and regulations to improve safety, promotion of public education. Full text of the presentation is attached as appendix 4.

The second presentation on the topic " LPG promotion in Rural Ghana: The Approach and Challenges" was made by Mr. Kwasi Twum Addo, Deputy Director, Petroleum Directorate, Ministry of Energy and Petroleum. The presentation was based on a study to identify the extent people in low income communities patronized LPG. Results of the study indicated that LPG consumption in the three northern regions was only 2 percent of the national total. A national reconnaissance survey was undertaken to pilot an effective distribution system. This was done with the collaboration of selected MMDAs at which GoG funded cylinders and cookstoves through the budgetary process. Full text of the presentation is attached as appendix 5.

Mr. Wisdom Ahiataku-Togobo, a Consultant made the third presentation on the topic "Main Cooking Fuels in Ghana: Issues and Challenges". Mr. Ahiataku-Togobo identified firewood as the main source of energy used in Ghana and argued that there is a strong linkage between poverty and the type of fuel used. According to him, the poor generally use firewood while the

rich go for cleaner fuels like LPG. Further, the presenter outlined some of the challenges in the use of LPG as accessibility; price uncertainty; subsidy challenges; safety concerns. He proposed a way forward to address some of the challenges. Full text of the presentation is attached as appendix 6.

Mr. Kwame Asamoah-Topen, President of the Gender and Energy Network made the fourth presentation "On the topic: Gender and the Energy Situation In Ghana" The presentation focused on the plight of women and their importance in society as far as energy issues are concerned because they do most of the domestic jobs: collecting firewood and carrying them over long distances, cooking, etc. according to him, this situation exposes women to high levels of pollution and other health hazards. He gave a background of the energy situation on Ghana, touching on current patterns of energy supply and consumption and also identified key energy and gender issues. The presenter provided recommendations to be implemented at the national, regional and local levels as a way of addressing problems identified. The full text of the presentation is attached as appendix 7.

The fifth presentation on the topic " Financial Viability Analysis of Institutions Switching From Fuelwood to LPG" was made by Lovans Owusu-Takyi, Associate Director, Renewable Energy, SNV. According to him his presentation was based on a research on the topic conducted by SNV in collaboration with Anomena Ventures. The presentation profiled the SNV (Netherlands Development Organization), its activities in the areas of agriculture, renewable energy, water, sanitation and agriculture. It also highlighted the roles of SNV in its programme areas which include advisory services, knowledge networking and evidence based advocacy. A list of SNV's projects and programmes in the cookstove sector were listed as well as projections into the future. The paper explained the concept of financial viability and gave several examples of expectations from both consumers and investors. The presentation concludes by emphasizing that it is financially attractive to switch from fuelwood to LPG and recommended thus. The full text of the presentation is attached as appendix 8.

A Presentation on the topic " The Role of Ghana Cylinder Manufacturing Company (GCMC) Limitedin Ensuring Clean Energy Use" was made by Mrs. Elisabeth Yawa Morny, the Chief Executive Officer of the GCMC limited. The presentation focused on the operations of GCMC,its corporate objectives, range of products and services stressing production of various types of cookstoves and LPG cookstoves. According to the presenter, the company is wholly owned by the GoG and the main manufacturer of LPG gas cylinders in the country for local consumption

and export as well. The company also imports LPG cylinder accessories like regulators, burners and low pressure LPG hoses. It also has the facility to test the safety of old cylinders. She later elaborated on the challenges facing the company to include high cost of LPG cylinders, intermittent LPG explosions as well as importation of used LPG cylinders. The full text of the presentation is attached as appendix 9..

The last presentation on the topic "The State of Ghana's Forests and the Use of LPG Gas" was made by Diana Viati, Assistant Regional Director of the Forestry Commission, Accra on behalf of Mrs. Edith Abruquah,Operations Manager, Forest Services Division, Accra. The presentation focused on the size of Ghana's forest cover dwelling on the degradation and depletion rates. It catalogued the drivers of deforestation and degradation which includes agricultural expansion, wood harvesting, population growth, mining and minerals exploitation, high dependence on charcoal and woodfuel, among others. Benefits from forests were also mentioned to include carbon sequestration, watershed management, timber products, etc. It concluded by suggesting measures to be adopted as a way of sustaining forests. Full text of the presentation is attached as appendix 10.

The last two presentations were made on the topic "LPG distribution in ghana: challenges and opportunities: and "Accelerating inclusive energy access solutions and policy through partnerships: the challenges in getting the issues recognized and the usage of civil society contribution" and was was made by Ms Sheila Addo from the National Petroleum Authority and Dr. Sabina Anokye Mensah, Chief Executive Officer Of Anomena Ventures. Details of their presentation has been attached at appendices 11 and 12 respectively.

QUESTIONS AND COMMENTS

Participants made some comments, discussions and questions. Below is a summary of these comments discussions and questions and the responses where necessary

- Comment by Alhaji Muntari Seidu, Gas stove manufacturer: Government must help producers by reducing cost of items. This will ultimately benefit the ordinary person. Due to high cost of things, manufacturers and producers of stoves are compelled to pass on these costs to the buyer.
- Comment by Lily Verstai, Tutor, Kumasi Senior High School; Gas User: The problem is how to use gas. Most gas accidents happen because users are rather careless on its usage. Another problem is that some cylinders are too old and need to be replaced to avoid leakages.

- Comment by Paul Tibir, National Service Person, Dormaa Ahenkro: Promoters of the use of LPG must collaborate with District Assemblies. The Assemblies can help a lot in the education of the public on the importance of LPG.
- Question from Esther Konadu, Tamale, User: People do not patronize LPG in Northern Ghana because firewood and charcoal are cheaper and in abundance as compared to gas.
  Response: There is the need to look at the total cost of using firewood and charcoal including the human health and environment cost. One can then realize that using LPG is cheaper .
- Comment by Keneth, Takoradi: Promotion of the use of LPG must begin at the primary school level. If it becomes successful the kids can then even go home and educate their parents.
- Michael Agyepong, Manufacturer, Takoradi: there is the need to have good shops to enable the training of experts. District Assemblies must help/support artisans to establish LPG businesses. Government must help reduce cost of LPG.
- Comment by Alhaji Muntari Seidu, Gas stove manufacturer: Sellers of cylinders and stoves must ensure that they do not sell bad products.
- Comment by Mrs. Yawa Morney, CEO, GCMC: Every cylinder has a life span of three years (ISO 22991). After this time anything can happen to the cylinder. He therefore advised that people send their cylinders to GCMC for testing and possible repairs.
- Comment by Kwame Buor, Kumasi: Cost of LPG goes up on a regular basis. There is the need to educate the public on this to avoid conflicts between buyers and sellers always.
- Comment by Elisabeth Doku, Yendi: I stopped using gas because it is not easily accessible. When my gas gets finished, I have to travel to Tamale to refill. Even there, I have to queue before getting my supply. Comparatively, when I use charcoal, I feel better and more secured. Besides, its cheaper.
- Comment by Tamakloe: Producers and regulators must collaborate to avoid production of substandard equipment.
  Response : There are no standards in Ghana as far as LPG is concerned. However a conference is being planned in April to address this problem.

SYNDICATE GROUP WORK

This session had three working groups: Producers; Users; Distributors. The qroups were to address two main issues:

- What are the Critical Areas that Advocacy Should Centre on?
- Suggestions and Recommendations for the Way Forward

Summary of the issues mentioned by the Groups is presented as table 1.

Table 1: Summary issues and recommendation by Groups

	Critical Areas	Way Forward
Group One: Producers	• Need to look at quality of products • Need to look at skills level of producers • Ensure price stability • Allow private sector to be involved in LPG sector • Absolute precaution must be taken when filling cylinders	• Government and private investors should be involved in providing the right tools for producing LPG stoves. • Training courses should be organized regularly to train artisans with the requisite skills to improve the quality of products and ensure that they comply to standards. • Banks and financial institutions provide long term loans to producers to enable them purchase raw materials. Government should provide incentives to reduce prices of materials. • Government should deregulate the LPG sector to allow the involvement of artisans. • Government should set up a monitoring body to oversee the filling of cylinders and also ensure that hose tips are of good standards. • There must be regular training of consumers safe use and handling of LPG cylinders and stoves.
Group Two: Distributors	• Tankers not supplying gas regularly • Poor road network and long distances which deter drivers • Poor communication about price changes causes conflicts • Need for professionals to educate people on cylinder maintenance • Institutions and companies should pay distributors promptly to keep them in business • Shortage of gas supply seriously affects business	• Government must subsidize and stabilize prices • Old cylinders must be withdrawn from the system. This must be done by the gas stations • Schools must employ experts to handle gas infrastructure • There must be education on the proper use of gas both at home and in school
Group Three: Users	A. Safety • improper positioning of the cylinder in homes. As a result of theft, cylinders are kept indoors which is dangerous • Regular checks on cylinders to ensure that there are no leakages • Cylinders must be kept outside in a well ventilated area • Cylinders must be	• Government and private investors should be involved in providing the right tools for producing LPG stoves • Training sessions should be organized to train artisans with the requisite skills to improve the quality of products • Financial institutions and banks should be involved through the provision of long term loans to producers to enable them purchase raw materials. • Government should provide tax incentives to reduce prices of raw materials • Government should deregulate the LPG sector to allow artisans to get involved • Government should set up monitoring bodies to oversee

	disconnected immediately after use • Meters should be installed on regulators to show volume of fuel left in the cylinder B. Health • Users of gas must be educated on its dangers	the filling of cylinders and also ensure that cylinder filling tips are of good standards • Consumers must be trained on the safe and handling of LPG cylinders and stoves

CLOSING REMARKS

The Workshop came to an end with brief remarks by Mr. Kwasi Sarpong, the West Africa Regional Representative of the Global Alliance of Clean Cookstoves and Fuels. He thanked participants for coming and actively participating in the workshop especially those who came from the regions. He indicated that GHACCO is in the process of appointing regional representatives in various regions in Ghana. He urged stakeholders to come together and by so doing make an impression to government in the course of their advocacy programmes. He was hopeful that by 2020, the vision of having 50 percent LPG penetration in Ghana would be achieved.

Contributing to the remarks, Mrs. Faustina Boakye, chairperson of GHACCO urged participants to join GHACCO either as an association or as individuals. She stated that GHACCO has a lot of benefits and potentials to be enjoyed by members adding that GHACCO is recognized by the World Bank and the UN among other prominent institutions. She wished participants a safe journey back home.

Closing prayer was said by Alhaji Seidu Muntari.

LIST OF ATTACHED PRESENTATIONS

APPENDIX 1: LIST OF PARTICIPANTS

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APPENDIX 2: PROGRAMME

TIME	ACTIVITY	RESPONSIBILITY
10 - 15	The Role Of LPG In Reducing Deforestation	Mrs. Edith Abruquah Director, Forestry Commission
10 - 20	Chairperson's Remarks & Opening of Workshop	Chairperson
10 - 25	Group Photographs	
10 - 25	Tea / Coffee / Cocoa Break	
10 - 40	SE4ALL in Ghana Action Plan on LPG	Dr. Essel Ben Hagan, Energy Consultant
11 - 15	Financial Viability of Switching from Fuel Wood to LPG	SNV - Ghana
11 - 30	The Role GCMC in ensuring Clean Cooking Environment	Elizabeth Morny, Chief Executive Officer Ghana Cylinder Manufacturing Company
11 - 45	LPG Distribution in Ghana, Challenges & Opportunities	Ms. Sheila Addo Planning & Research Manager National Petroleum Authority
12 - 00	LUNCH	
13 - 00	Remarks by UNDP, GIZ, US Embassy etc	
14 - 00	Working Group 1: Producer Working Group 2: Distributors Working Group 3: Users	
14 - 30	Group Report	Rapporteur from Groups
15 - 00	Formation of LPG Sectors Associations	Mr. Kwame Asamoah-Topen, President Gender and Energy Network, Ghana
15 - 15	Summary and Discussion of Workshop	
15 - 30	Closure of Workshop & Departure	

WORKSHOP BACKGROUND

The Ghana Alliance for Clean Cookstoves and Fuels in collaboration with the Ministry of Energy & Petroleum and the Global Alliance for Clean Cookstoves cordially invite you to the National LPG workshop on advocacy for improved LPG dissemination in Ghana. This event is being coordinated by ANOMENA Ventures.

The Ghana Alliance for clean cookstoves aims to strengthen local actors working in the cookstoves sector, support government to achieve its energy policy and climate change program goals and increase consumer awareness on the importance of fuel efficiency and clean cookstoves.

Like any other marketplace, true change and innovation occurs when there is genuine and consistent interaction between market participants (producers, artisans, distributors, commercial users, domestic users) and the national stakeholders.

The workshop will focus on clean energy use through the dissemination of LPG improved stoves as well as the formation of an association which, it is envisaged, could lead to the sensitisation of more LPG use to reduce the adverse effects of fuel wood use on climate change in Ghana.

WORKSHOP AIMS AND GOALS

The workshop aims at bringing producers, distributors and users of LPG products together to brainstorm on the challenges and opportunities in the Ghanaian LPG sector. The goal of this workshop is to advocate for the use of LPG by creating an enabling environment for market actors to constructively interact with each other and with stakeholders to begin the path to change.

Access to cleaner fuels, such as liquid petroleum gas (LPG), for domestic cooking and heating reduces women's exposure to harmful indoor air pollution. Time formerly spent in collecting biomass fuels could be devoted to increased education, literacy and income-generating activities.

APPENDIX 3: SPEECH BY MR. KWAME BONA SIRIBOE

SPEECH BY MR. KWAME BONA SIRIBOE, DEPUTY DIRECTOR AT THE PETROLEUM DIRECTORATE, MINISTRY OF ENERGY AND PETROLEUM ON BEHALF OF THE MINISTER AT A WORKSHOP ON LPG ADVOCACY, ORGANISED BY THE GHACCO IN COLLABORATION WITH ANOMENA VENTURES ON FEBRUARY 26, 2013.

Madam Chairperson, Distinguished invited Guests ,Ladies and Gentlemen

Let me first of all use this opportunity to thank the leadership of Anomena Ventures and the Ghana Alliance of Clean Cookstoves and Fuels for the immense interest they have shown in the need to promote Liquefied Petroleum Gas in Ghana. I must say this falls in line with government's policy of aggressively improving access to LPG to 50 percent in urban areas and up to 15 percent in rural areas in the shortest possible time as mentioned in the President's State of the Nation's address yesterday.

The Ministry of Energy and Petroleum has over the years spearheaded the promotion of the use LPG as a cleaner, safer and healthier form of cooking fuel for households. The Ministry began such serious efforts around the late 1980s and raised overall consumption from 5267mt in 1989 to about 32000mt in 1996. This promotion culminated in the setting up of the Ghana Cylinder Manufacturing Company to produce LPG cylinders and other related products and accessories for Ghana's growing demand.

The Ministry's initial promotion even though yielded good results, only impacted positively largely in urban areas especially Accra, Kumasi and Takoradi. Thie therefore necessitated the introduction of the Rural LPG Promotion Programme which is targeted at rural areas with low access to LPG to increase access levels in such areas. The Rural LPG Promotion Programme was launched at Garu in the Garu Tempane District of the Upper East Region in October 2013. 1500 pieces of 6kg cylinders and cookstoves produced by GCMC were distributed to communities in the district as a pilot project for the rural cylinder recirculation promotion programme.

Ladies and gentlemen, it might interest you to know that the Ministry intends embarking on the implementation of the initial phase of the rural cylinder recirculation programme by distributing 50000 pieces of 6kg cylinders and cook stoves in 10 low access districts in the country within 2014. To make the programme meaningful and to ensure that beneficiary districts have constant supply of LPG finally to prevent users from reverting back to wood fuels, the Ministry will also facilitate the setting up of 10 mini refill plant outlets in these low access districts.

The Ministry would replicate this programme in other selected low access rural districts nationwide in subsequent years. This programme is also intended to redirect subsidies removed from LPG to the intended beneficiaries. We strongly this initiative would bring up rural access levels towards the achievement of a total nationwide usage of 50 percent soon. The implementation of this programme would improve the quality of life of rural dwellers by

- Reducing drudgery and time wasted in fetching wood fuel;
- Save children time to attend school
- Augment Government's efforts at arresting deforestation in the country;
- Help reduce or eliminate health related problems associated with the use of woodfuel by rural dwellers which affect mostly women exposed to indoor smoke.

Madam chair, the Ministry is making serious efforts in increasing access and consumption in urban areas as well. As you well know, not too long ago, Ghana operated Cylinder Re-circulation Model where major Oil Marketing Companies owned cylinders and supplied LPG to consumers. This was popularly known as the Coca Cola Model. The Ministry is working with the National Petroleum Authority and other relevant stakeholders to come up with guidelines and regulations to reintroduce the Cylinder Re-circulation Model. This model will undoubtedly eliminate or reduce to very minimal levels the numerous health and LPG related challenges including fatal accidents that have been confronting the country recently.

Ladies and gentlemen, the Ministry is driving the development of infrastructure related to LPG discharge and distribution:

- The Ministry will facilitate the setting up of major refilling plants, vending points and distribution of bulk cylinders to increase LPG usage in urban communities.
- The Ministry in conjunction with Tema Oil Refinery and private sector is construction a 10 inch LPG pipeline from the Tema jetty to Tema Oil Refinery to add to the existing 6 inch pipeline. This will increase the rate of discharge of LPG from vessels to storage tanks.
- The Ministry is also facilitating the construction of LPG storage tanks to increase the nation's storage capacity to the required 100,000 tonnes storage in the long term.

We urge participants to be ready to take up this challenge and effectively position themselves to take advantage of the enormous opportunities that will emerge from these new policy initiatives and in the process create wealth and employment in the country.

Tremendous opportunities in the LPG sector includes construction of refilling plants especially in the rural communities; LPG transportation in the delivery of cylinders from

major refilling plants to retail outlets; investment into local manufacturing of cylinders and cook stoves and the setting up of retail and bulk distribution outlets for the supply of LPG.

I would like to thank the organizers once again for their bold initiative to strengthen local actors in the cook stoves sector and also to support Government to achieve its energy policy goals.

Thank you.

APPENDIX 4: STRATEGY FOR INCREASING LPG ACCESS IN GHANA

NATIONAL LPG WORKSHOP ON ADVOCACY FOR IMPROVED LPG DISSEMINATION IN GHANA

STRATEGY FOR INCREASING LPG ACCESS & ADOPTION IN GHANA

KWABENA A. OTU-DANQUAH
ENERGY COMMISSION

26TH FEBRUARY, 2014
ANGE HOTEL, ACCRA

Outline

- Introduction
- Government Policy Objective on LPG
- Issues and Challenges in the promotion of LPG
- LPG Promotion Strategy

Introduction

- The Government of Ghana in 1989 embarked on a major Liquefied Petroleum Gas (LPG) promotion exercise, which raised the percentage of households using LPG as main fuel for cooking to 18.0% in 2010.
- LPG is particularly used in the urban areas for domestic and commercial heating and cooking.
- Demand for LPG in the industrial and transportation sectors has also increased significantly in recent times.
- An important benefit of LPG use in cooking and heating is the substitution and therefore the reduction in the use of charcoal and firewood thus mitigating their negative environmental and health impacts.

Government Policy Objective

- The Ministry of Energy in 2010 outlined an Energy Policy and Energy Sector Strategy with a key policy objective to increase LPG access to households and public institutions from 9.5% in 2008 to at least 50% by 2020.

Major Issues and Challenges

- **Inadequate Production and Supply**
  - Maximum LPG production capacity of TOR is about 52,000 tonnes per year.
  - TOR supplied on the average, 44.4% of total national consumption between 2000 and 2010.
  - Constraints in discharge infrastructure for the importation of LPG
  - Unfavourable pricing policy. Subsidies on LPG are discouraging the importation, supply and distribution of LPG.
  - Inadequate funds for the importation of LPG to supplement local production from TOR.
- **Marketing, Distribution and Access** (storage, transportation, distribution retail outlets or filling stations)
  - The owners of filling stations find margins inadequate to cover the cost of investments and operations.
  - The three northern regions have the worst access rate to LPG filling stations with about one half of a million customers served by one filling station in the northern region far in excess of the national average of about 73,625 persons per filling station.

- **Inadequate LPG infrastructure**
- **Safety concerns** (explosions and fire during the transportation, discharge, storage and use of LPG) due to
  - Lack of regulations and safety standards to govern the industry;
  - Use of used imported equipment including trucks, tanks, pumps, dispensers and cylinders;
  - Use of sub-standard equipment including cookers, cylinders, hoses and regulators;
  - Lack of knowledge and skills with respect to the handling of LPG and associated equipment; and
  - Negligence on the part of persons using LPG or operating LPG equipment.

Strategies

- **Investment in LPG discharge and storage and infrastructure to facilitate LPG supply**
  - Invitation of the private sector to invest in LPG discharge and storage infrastructure by Government
  - either guarantee reasonable margins for storage facilities provided through private sector investment or make credit facilities available (Banking syndicate).
  - GOG has secured funding for BOST to construct an LPG terminal in the Western Region, which includes Bulk storage facilities as a hub for trans-shipment to other parts of the country.
- **New LPG Supply and Distribution Business Model**

  Attractive incentives for the purposes of implementing the "Cylinder re-circulation model" should trigger the following actions:
  - Private LPG retail/service companies re-introducing door to door marketing and distribution of filled LPG cylinders; and
  - Private investments to establish large LPG bottle refilling plants (one close to the Gas Processing Plant, one in Tema and eventually one each in Kumasi and Tamale) that are able to test, certify and refill LPG cylinders for the market.

- **NPA to establish attractive transportation and distribution margins and redirect the current subsidy on the consumption of LPG towards facilitating the implementation of the "Cylinder re-circulation model".**

  The redirected subsidies should be used for the following:
  - Domestic LPG equipment/appliances
  - GCMC and other cylinder manufacturers being assisted to manufacture smaller, portable and user-friendly cylinders (5kg and below), and provide these (about 500,000 cylinders per year) at a subsidized cost (using the current LPG subsidy) to LPG distribution franchise operators; and
  - Small and Medium Enterprises (SMEs) being assisted, with technical assistance from business development service providers like the National Board for Small-Scale Industries (NBSSI), to manufacture affordable single and twin burner stoves.
- **NPA to develop, monitor and enforce clear standards, procedures and regulations to improve safety.**
  - Teaming up with Ghana Standards Authority (GSA) to develop and introduce standards, regulations and certification of cookers;
  - Inspecting cylinders at the filling stations and retail outlets across the country;
  - Teaming up with DVLA and the Ghana Police Service to enforce the provisions in Road Transport Regulations, 2012, L.I. 2180 on installation of cylinders in vehicles and usage of LPG by motor vehicles.

- **NPA to promote public education in the LPG sub-sector.**
- **EC to provide effective leadership in data collection and policy studies.**
  - The EC will take responsibility for operationalising the Energy Access Data Task Force and special effort will be made for GSS to include "general usage" of LPG, in addition to "main usage", in future GLSS and PHCs.
- **Ministry of Energy to Chair a new Inter-Agency LPG Policy Monitoring Committee (PMC) with two additional Members, one each from NPA and EC, to review progress on all policy measures and report to the Minister of Energy on a quarterly basis.**
  - The primary purpose of this Inter-Agency LPG PMC will be to ensure sustained supply of LPG and eliminate perennial LPG shortages by monitoring all the policy measures spelt out in the National Energy Policy and the Energy Sector Strategy and Development Plan.
  - The PMC's will also ensure that projects underway to improve supply of LPG from TOR and imports are implemented on schedule.

THANK YOU!!!

APPENDIX 5: LPG PROMOTION IN RURAL GHANA: THE APPROACH AND CHALLENGES

MINISTRY OF ENERGY & PETROLEUM

LPG PROMOTION IN RURAL GHANA: THE APPROACH & CHALLENGES

A Presentation By

Kwasi Twum Addo

Deputy Director, Petroleum (HSSE)

OUTLINE

2

- THE CONCEPT & OBJECTIVES
- RECONNAISSANCE SURVEYS
- PLANNING THE PILOT(S)
- PROCURING THE CYLINDERS & COOKSTOVES
- IMPLEMENTING THE PILOT(S)
- SUSTAINING THE PROGRAMME
- RECOMMENDATIONS

THE CONCEPT & OBJECTIVES

- Identified issues: Poor patronage (extremely low usage), Environmental, Health, Drudgery with consequences on reduced agric yields, poverty and partial school attendance or absenteeism
- Identified low usage districts in NR, UER and UWR (less than 2% of national consumption).
- Low usage areas were envisaged as the best areas to bring up challenges to promotional effort
- Strategy was to secure supplies through dedicated transporters and dealers as an employment opportunity for the indigenes.
- Also, to provide free cylinders and cookstoves whilst the LPG is paid for by the consumer.

RECONNAISSANCE SURVEY

- Selection of districts using GSS data on poverty levels and usage of LPG (worst case districts were key beneficiaries and targeted for the survey)
- Survey was supported by local government representatives, information service, opinion leaders, health officials and assembly members
- Collated info on biodata on families (heads) and their economic activities, household size and location addresses
- Analysis of data collected informed the tracking system for monitoring the usage by the various housholds
- Was the LPG going to be patronised???

PLANNING THE PILOTS

- Selection of initial beneficiary districts: worst indicators received from the reconnaissance was the bench mark
- Selection of dealer and refilling point/warehouse
- Verification of financial capacity/investment plan of dealer and appropriateness of warehouse/refilling point
- Monitoring strategy: use of activity cards to record purchases
- Distribution of cylinders using motor kings
- Supply of LPG to be made on payment for order

PROCURING THE CYLINDERS AND COOKSTOVES

- Government of Ghana acceptance to fund the cylinders and cook stoves through budgeting process
- Obtaining approval from Public Procurement Authority for sole sourcing from Ghana Cylinder Manufacturing Company as a strategy to resuscitate GCMC and support its activities
- Payment Challenges encountered by GCMC
- Refilling of cylinders

IMPLEMENTING THE PILOT(S)

- Planning the launch with Ministry and District Assembly (to get serious consideration by the communities)
- Launch programme activities starts with complimentary speeches from Ministry and District Assembly
- Do some small educational session on dos and don'ts with the display of the cooker, cylinder, hose and regulator
- Demonstration of assembling the cylinder/hose/regulator to the cooker
- Demonstrate how to light the cook stove
- Demonstrate how to regulate the flame
- Cook a meal
- Distribute and register beneficiaries

SUSTAINING THE PROGRAMME

- The dealer is expected to ensure sustainability through the recouping and turnover of his investment
- For new sites: Annual support from GOG
- Development Partners support
- SE4All

POTENTIAL CHALLENGES

- FULL COST RECOVERY PRICING POLICY ON LPG
- ATTRACTIVENESS OF THE TURNOVER (IRR, NPV)
- MAINTENANCE

SUPPLIER (REFILLING PLANT)
DISTRIBUTOR (MOTOR KING)
CUSTOMER (COOK STOVE, REGULATOR, HOSE)
DEALER (CYLINDER)

WAY FORWARD

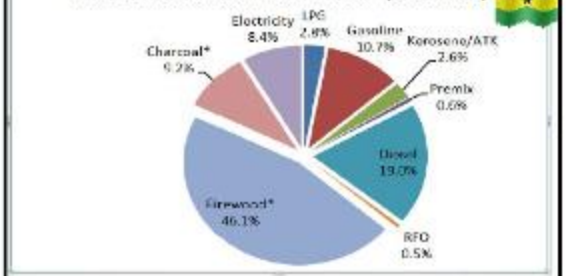
- MONITORING AND FEEDBACK (PROACTIVELY MANAGE ISSUES WITH DEALER & NPA)
- MINISTRY TO ADDRESS ISSUES THROUGH POLICY DIRECTIVES
- APPROPRIATE FUNDING SCHEMES TO BE IDENTIFIED
- "TARGETTED SUBSIDIES" USING RURAL AND COMMUNITY BANKS

APPENDIX 6: MAIN COOKING FUELS IN GHANA: ISSUES AND CHALLENGES

MAIN COOKING FUELS IN GHANA
ISSUES & CHALLENGES

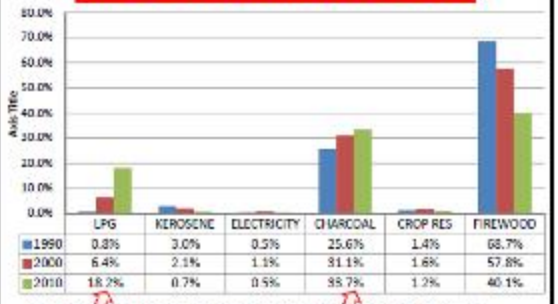
WISDOM AHIATAKU-TOGOBO
26th February, 2014

FINAL ENERGY CONSUMPTION IN 2011 - (8135.9 ktoe)



- More than 56% of final energy is used for cooking and heating.

SHARE OF MAIN COOKING FUELS IN GHANA



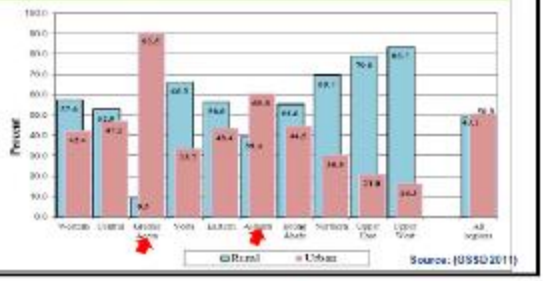
	LPG	KEROSENE	ELECTRICITY	CHARCOAL	CROP RES	FIREWOOD
1990	0.8%	3.0%	0.5%	25.6%	1.4%	68.7%
2000	6.4%	2.1%	1.1%	31.1%	1.6%	57.8%
2010	18.2%	0.7%	0.5%	33.7%	1.2%	40.1%

The increase in LPG and charcoal can be attributed the improving standard of living and urbanization.

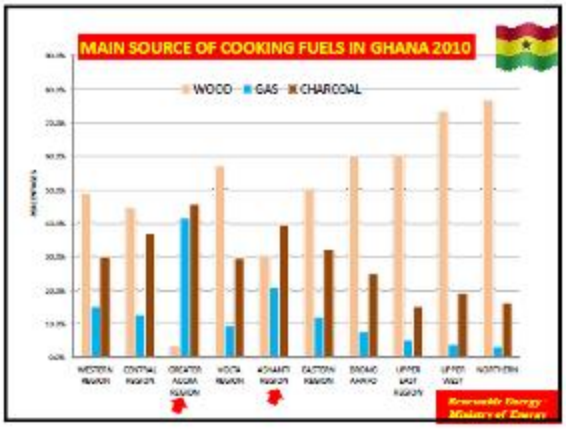
Source: GSSD

Population by type of Locality in Ghana (Urban & Rural)

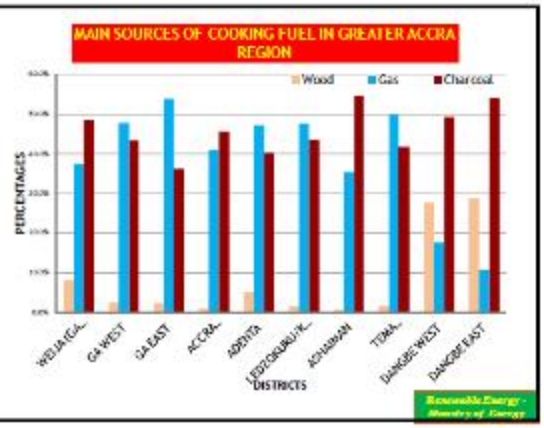
- Land Area: 238.5 km2 Population: 24,256,000 (2010)
  Urban: 50.9% Rural: 49.1%

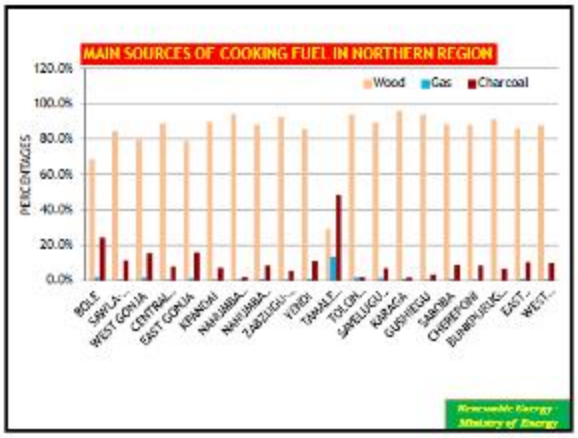


MAIN SOURCE OF COOKING FUELS IN GHANA 2010

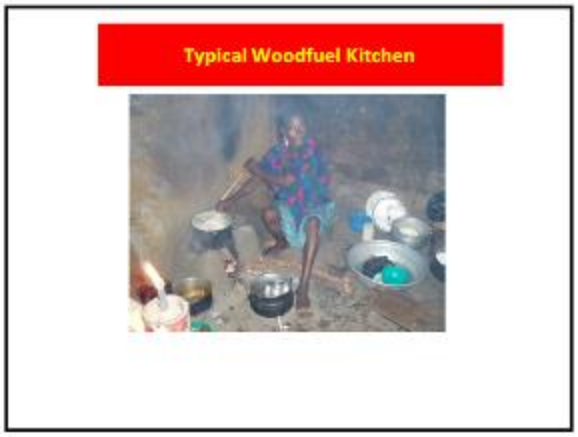


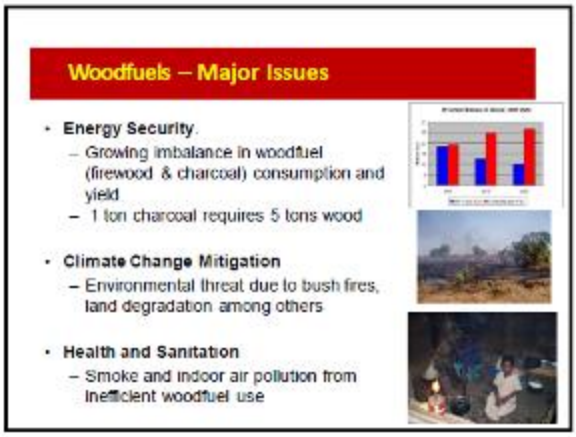
MAIN SOURCES OF COOKING FUEL IN GREATER ACCRA REGION



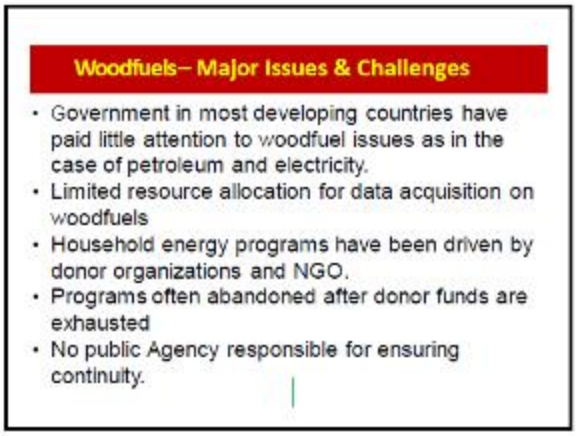

MAIN SOURCES OF COOKING FUEL IN NORTHERN REGION
Wood
Gas
Charcoal
PERCENTAGES
120.0%
100.0%
80.0%
60.0%
40.0%
20.0%
0.0%
BOLE
SAVELU...
WEST GONJA
CENTRAL...
EAST GONJA
KPANDAI
NANUMBA...
NANUMBA...
ZABZUGU...
YENDI
TAMALE...
TOLON...
SAVELUGU...
KARAGA
GUSHIEGU
SAGNERIGU
CHEREPONI
BUNBONJUK...
EAST...
WEST...
Renewable Energy
Ministry of Energy


2.7 billion people still rely on woodfuels for cooking and heating in the 21st Century
There is a relationship between living standards of people and type of cooking fuel
Source: Torres-Duque et al., 2008


Typical Woodfuel Kitchen


Woodfuels – Major Issues
Energy Security
Growing imbalance in woodfuel (firewood & charcoal) consumption and yield
1 ton charcoal requires 5 tons wood
Climate Change Mitigation
Environmental threat due to bush fires, land degradation among others
Health and Sanitation
Smoke and indoor air pollution from inefficient woodfuel use


Woodfuels– Major Issues & Challenges
Employment and Social Welfare
Woodfuel (firewood and charcoal) production are the main source of income for the poor majority in the dry seasons.
It is also the main source of revenue for most deprived districts.
Policy to regulate and license this activity has direct impact on the social livelihood of the poor.


Woodfuels– Major Issues & Challenges
Government in most developing countries have paid little attention to woodfuel issues as in the case of petroleum and electricity.
Limited resource allocation for data acquisition on woodfuels
Household energy programs have been driven by donor organizations and NGO.
Programs often abandoned after donor funds are exhausted
No public Agency responsible for ensuring continuity.

LPG fuel - Major Issues & Challenges

- Accessibility
  - Storage, Distribution and reliability.
  - High cost of the cooking device and accessories
- Fuel price uncertainty
- Subsidy challenges
  - benefits of fuel subsidies are hardly enjoyed by the target group as LPG is used by commercial vehicles and Kerosene adulterated with diesel and sold for the price of diesel
- resulting in scarcity of fuel for the targeted cooking group
- Safety concerns in the case of LPG

LPG fuel - Major Issues & Challenges

- Current retail model of LPG supply cannot ensure increased used of LPG through out the country
- Water dispenser / coca cola retail model need to be revisited for LPG distribution.

Way Forward – Cooking Fuels

- Ensure sustainable supply and access to cleaner cooking fuels such as LPG, etc affordable enduse devices
  - To encourage those that can afford to shift to cleaner fuels.
- The poor majority that cannot have access or afford cleaner fuels
  - should be encouraged to use the local energy resources in an efficient and sustainable manner using modern methods (improved technologies and techniques)

Create awareness on Health Impact of Woodfuel Smoke

Wayforward - Woodfuels

- Ensure sustainable management of the woodfuel supply chain
  - Promote energy efficiency in the production, conversion and utilization of traditional woodfuel. (charcoal, firewood & crop residue)
    - Tree planting/ reforestation
    - Improved charcoal production methods
    - Improved cookstoves
  - Undertake intensive awareness creation on the negative effect of smoke inhalation

Train rural women in the construction of improved stoves for households

Encourage use of open ventilated kitchens to reduce indoor air pollution in the kitchen

Way Forward for Ghana - LPG

- Total removal of subsidies on LPG and use funds to support LPG devices and accessories to make them and affordable.
- Improved LPG storage and distribution outlets nationwide.
- Implement program for promoting LPG use in the **domestic, commercial and public institutions** (such as schools)

Support training workshop on Fire prevention and basic fire fighting for LPG use

Conclusion

- Woodfuel will continue to be the dominant cooking fuel in the foreseeable future.
- MDG goal and the ECOWAS white paper for energy access (cooking fuel) is unachievable by 2015
- SE4ALL target for 2030 to switch from traditional fuel to cleaner fuels is attainable if:
  - Efforts are put in place to add value to our rich natural resource to improve income and living standard of households
  - There is extensive public awareness on the negative impact of traditional fuel on health and the environment
  - **Commitment of national government in the woodfuel sector.**

Thank You

watogobo@gmail.com

APPENDIX 7: GENDER AND ENERGY SITUATION IN GHANA

THE GENDER AND ENERGY SITUATION IN GHANA

By
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President Gender and Energy Network, Ghana.
Email katopen@hotmail.co.uk
Tel 0233 243 261 922/206710710

Outline

- Introduction:
- Background: Energy situation in Ghana
- Key Energy and Gender Issues
- Recommendations

Introduction

- This presentation reviews with particular reference to incorporating a gender perspective in the energy sector for sustainable development.
- Ghana is a signatory to international protocols and conventions on energy and gender
- It outlines the energy situation and efforts at engendering women's active role in the sector.

Background

- the current patterns of energy supply and consumption are unsustainable in socio-economic and environmental terms.
- Over the past decade, Ghana's energy supply and consumption patterns depicts the reliance and dominance on biomass and petroleum products as prime energy sources in the country.
- Records indicates that for some time, energy supply consumed from biomass alone, averaged 50-60%, petroleum products 27% and electricity nearly 9% for the same period.

- Against the backdrop of Ghana's quest to become a middle-income country by 2015, the energy needs of the country, all things being equal, are likely to increase.
- many people particularly women in rural households in Ghana still depend on traditional fuels like wood, charcoal and cow dung for cooking and other energy-intensive livelihood activities.
- most rural dwellers spend their time and physical strength to supply fuel for their households often at the expense of education, good health and opportunity to engage in more productive income generating activities.

- Women are the most affected as they bear the responsibility of meeting the energy needs of their various households. Meeting the energy needs of their households include harvesting wood fuel, carrying wood loads over long distances to their homes and using them to cook for their households leaving the women perpetually exposed to unhealthy smoke and heat.
- In rural communities, the statistics shows a decline in both access to electricity and the use of non-wood fuel in cooking.
- Given that majority (57%) of Ghanaians live in rural areas, the statistics show that many people especially women lack access to electricity and rely on biomass for cooking.

Key Energy and Gender Issues Identified

Key Energy Issues

- In the 1980s when Ghana suffered severe economic decline that also affected the generation of hydro-electric power, many activities have taken place within the country's energy sector in the form of reforms which were part of Ghana's Structural Adjustment Programmes (SAP).
- In 2001, an energy policy was developed as part of the Ghana Poverty Reduction Strategy (GPRS I) which was phased out by 2005. The Growth and Poverty Reduction Strategy 2006-2009 (GPRS II) and the Strategic National Energy Plan 2006-2020 (SNEP).
- Currently, the Ghana Shared Growth and Development Agenda (GSGDA) reviews the costing framework for the financing of programmes and projects under the GPRS II

Key Gender Issues

- as much as energy is used by all in various forms, women are the most important actors in the energy sector in terms of their contact, use and management of these energy sources.
- the most common energy sources are fuelwood, charcoal and cow dung.
- Fuelwood and charcoal account for more than 75 per cent of all energy requirements in the country and an even higher percentage of energy for household cooking and water heating in rural and urban areas alike

- Most of the fuelwood need for households is collected by women. It has been estimated that annual fuelwood consumption in the country as a whole is about 16 million m3 and this is expected to rise to 17 million m3 by the turn of the century.
- energy sources like shea butter oil are also very popular in the northern part of the country and used for lighting.
- The burden of meeting the energy needs of the household falls on the women.
- In their bid to ensure access to energy sources, women have to spend more time and physical energy in obtaining traditional fuels for their domestic purposes of heating, cooking and lighting. As these sources of energy become scarce, women have to cover longer distances.
- The use of LPG stoves will greatly be a source of relieve.

- As a result of national efforts to implement the Beijing Platform of Action, the Government of Ghana instituted some measures.
- One of these was the adoption of the Affirmative Action Policy Guidelines which call for an increase to 40 per cent of the representation of women in key positions in public service and in national executive or policy-making institutions.
- As regards energy, the Beijing Platform for Action called on governments to support the development of equal access for women to sustainable and affordable energy technologies, including renewable energy efficiency technologies, through participatory needs assessment, energy planning and policy formulation at local and national levels.
- Women on Energy related Boards: PURC, EC and EF

Recommendations

National Level

- active implementation of the affirmative action of appointing women (40% of all appointments) to key positions in public service and in national executive or policy-making institutions.
- In cases where there is a shortage of women with the requisite skills, the government in collaboration with relevant organisations like the civil society organisation can identify women who can be trained to represent the interest of women.

Regional Level

- an increment of women representation at the Regional Coordination Councils (RCC) is highly recommended. There is sufficient manpower among women who head district offices of decentralised departments and agencies who can be encouraged to shape energy-related policies at the regional level.

Local Level

- The energy needs of women at the local level are most profound as women are the main providers and users of energy. This requires that women must be involved in the selection, promotion and use of alternative energy resources that are more energy efficient and friendly.

APPENDIX 8: FINANCIAL VIABILITY ANALYSIS OF INSTITUTIONS SWITCHING FROM FUELWOOD TO LPG

FINANCIAL VIABILITY ANALYSIS OF INSTITUTIONS SWITCHING FROM FUELWOOD TO LPG

Lovans Owusu-Takyi
(Associate Advisor, Renewable Energy)

NATIONAL LPG WORKSHOP ON ADVOCACY
ANGE HILL HOTEL
26th February 2014

SNV

Connecting People's Capacities

INTRODUCING SNV GHANA (22 YEARS)

3 sectors
- Agriculture
- Renewable Energy
- Water, Sanitation and Hygiene

4 key success factors
- Inclusive development
- Systemic change
- Local ownership
- Contextualised solutions

3 roles
- Advisory services
- Knowledge networking
- Evidence Based Advocacy

SNV

Connecting People's Capacities

Renewable Energy Sector – 3 years in Ghana

- SNV Ghana is dedicated to a society in which all people, irrespective of race, class or gender, enjoy the freedom to pursue their own sustainable development.
- In the renewable energy field, SNV Ghana aims to **provide access to sustainable, clean and reliable energy sources for households and small enterprises,** and development of a vibrant renewable energy sector in an adequate enabling environment.
- This is done by focusing on four sub-sectors:
- biogas,
- biomass-fuelled improved cook stoves (ICS),
- solar energy and
- REDD+ (Reduced Emission from Deforestation and Forest Degradation).

SNV

Connecting People's Capacities

SNV Netherlands Development Organisation

- Committed to Poverty Reduction (reduction in energy expenditure by the energy poor)
- Bring expertise from our work in the over 30 countries in the world
- **Build Local capacity** in Ghana to be able to implement projects – working with local partners and experts in all our activities
- Improving the environment for sustainable development.

SNV

Connecting People's Capacities

Projects and Programs in cookstoves Sector

2013
- Fuelwood plantation in Paga area 4 hectares
- Energy Audits and Characterisation Studies
- Woodstoves festival – with EC to promote woodfuel stoves
- Energy analysis for Women and agro-processing groups (Shea butter producers, Rice Parboiling, Cassava processors (gari)
- Built improved Institutional woodstoves for processing groups

2015
- Energy Poverty and Gender in Agro-processing (600 improved woodstoves and fuelwood plantations)
- Improved Fish smoking – 400 Fish smoking stoves and Mangroves
- Promotion of Household Clean Cookstoves and Biomass Fuels
- Solar Lanterns for poor

SNV

Connecting People's Capacities

FUELWOOD USAGE – ADV AND DISADV

Advantages :
- **Widely available and easily collected** by the user;
- **Cheap fuel** when bought;
- Can be used on a cheap stove (three stone stove);
- **Easy to use and regulate** when using a three stone or tire rim stove.

Challenges:
- **High Smoke Emission,** threat to human lives and the environment;
- **Inefficient** when used on a three stone or tire rim stove
- **Blackens** the cooking pot
- **Time consuming** during collection especially for women and young girls;
- Contribution to **deforestation.**

SNV

Connecting People's Capacities

LPG USAGE

Advantages

- **Clean:** LPG burns efficient, without producing smoke and with low pollutant emissions.
- **Portable:** Stored in pressured containers. can easy be transported to end-users;
- **Efficient:** LPG is extremely efficient in generating heat,
- **Multiple Uses:** LPG is an energy source capable of generating heat and power in internal combustion engines

Challenges

- **Safety :** LPG must be **handled carefully: LPG have exploded and resulted in serious damages to lives and property;**
- **LPG is highly inflammable;** Leakage of LPG can result in fires or explosions;
- **Unreliable Supplies** in Ghana,
- **High Initial Investment:** bottle and LPG stove.
- **contributes to global warming (fossil fuel)**

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Connecting People's Capacities

WHY THE NEED TO ENCOURAGE SWITCHING FROM FUELWOOD TO LPG

- Fuelwood and charcoal is a **major contributor to deforestation** especially used for **domestic, institutional cooking and industrial fuel.**
- The use of **efficient fuelwood stoves or switching** to use non-woody biomass fuels like LPG is a solution
- Ghana's policy **estimates 50% use of LPG for cooking by 2020**
- Households and institutions must **see switching to LPG usage as financially viable.**

SNV

Connecting People's Capacities

SNV SUPPORTS CLEAN FUELS AND COOKSTOVES

- Supports the adaptation of efficient and clean cooking stoves.
- End-user makes decisions to change
- SNV **provides factual information to enable end-users to make informed decisions** and government to make informed policies
- **Motivation to switch to LPG:** Environmental advantages not adequate, financial viability makes sense.

SNV

Connecting People's Capacities

3 STUDIES CONDUCTED BY SNV

- Financial Viability of households Switching from fuelwood and Charcoal to LPG
- Financial Viability of Institutions (street food Vendors) switching from fuelwood to LPG
- Financial Viability of Bakers switching from fuelwood to LPG

SNV

Connecting People's Capacities

The concept of financial Viability

- **SMEs & Investors** expect **return on their investment.**
- **Consumers** expects **value for money**
- **Renewable Energy technologies** should be able to provide **reasonable return on investment** in order to encourage **adoption**

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Methodology:

- **Comparative tests** was conducted in which the **same food (quantity and type) is prepared on both the woodfuel tire rim stove and LPG Stove.** Food prepared was porridge and Dough nuts (koose).
- Frying pans locally manufactured for doughnuts

Information collected included

- Fuel consumption - measured
- Cost of fuel used - calculated
- Time to cook the mean - measured
- Smoke production - observed
- Convenience of using the stove – assessed by interviews
- Taste of the meal prepared - assessed

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Methods used in assessing consumption of fuelwood and LPG




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Test Results for Institutional Cooking by Street Vendors

Item	Firewood – Tire Rim Stove	LPG – LPG Stove	Remarks
Total Cooking Time for the meal	140 minutes	130 minutes	Variance of 10 minutes
Fuel Consumption for the meal	28.0 kg of firewood	1.0 kg of LPG	Firewood/kg = GH¢ 0.161 LPG/kg = GH¢ 2.143
Cost of Fuel for the meal	GH¢ 4.508	GH¢ 2.143	
Smoke Production	Produces a lot of smoke	No smoke	Cooking location was within a planted canopy and smoke from the tire stove was a bother to user and the neighbourhood
Stove Stability	Stable	More Stable	There exist the possibility to stumble on protruding firewood from stove which could overturn cooking pot
Sooth on Pot	Sooth starts to appear on pot after about 5 minutes	No sooth on the pot	The difference in pot soothing was so significant between colour black (for firewood) and silver (for LPG)
Starting Fire	More difficult to start fire	Easy to start fire	5 minutes (min.) for the tire stove and 1 minute (max.) for LPG stove
Control of Fire	Difficult	Easy	More control was required on the fire on stove than on the LPG stove
Power	Easy to generate heat	Easier to generate heat	Heat stability from firewood was inconsistent. Heat from LPG was the most stable
Frequency of Adding Fuel	Some wood was added after fire was started	No fuel (LPG) added	For the tire rim stove, there was the need to fuel frequently until finish of cooking

Fuel Cost Savings

Item	Firewood – Tire Rim Stove	LPG – LPG Stove	Remarks
Fuel Consumption per Meal	28.0 kg of firewood	1.0 kg of LPG	Firewood/kg = GH¢ 0.161 LPG/kg = GH¢ 2.143
No. of Meals per Day	1 meal per days for vending		Cooks same food every day and cooks once a day
Fuel Cost per Day	GHc 4.508	GHc 2.143	(Now it is 2.740
No. of Cooking Days per Month	30		She cooks the same food every day
Fuel Consumption per Month	840.0 kg	30.0 kg	
Expenditure on Fuel per Month	GHc 135.24	GHc 64.29 (now 82.20)	Savings = GHc 70.95
No. of Cooking Days per Year	360		
Fuel Consumption per Year	10,080 kg	360 kg	
Expenditure on Fuel per Year	GHc 1622.88	GHc 771.48 (986.4)	Savings = GHc 851.40

Cost of Fuelwood, Tema July 2013

Stove	Tire Rim Stove
Fuel	Fuelwood
Unit	Bundle
Number of Units	1
Average Weight of unit	23.0 kg
Cost/Unit	GH¢ 3.70
Cost/kg	GH¢ 0.161

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Cost of LPG, LPG Stove and Accessories
Location: Tema, July 2013

Stove	LPG Stove (Institutional)
Fuel	LPG
Unit	15 kg Cylinder
Number of Units	1
Average Weight/unit	14.0 kg
LPG Cost/Unit	GH¢ 30.00
LPG Cost/kg	GH¢ 2.143 (Now GHC2.74)
Regulator	GH¢ 10.00
15 kg Cylinder	GH¢ 80.00
Coupling Pipe	GH¢ 10.00
LPG Stove/Burner	GH¢ 600.00

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Total Cost of Institutional LPG Stove and Accessories

#	Item	Cost per Unit	Number of Units	Total Cost
1	LPG Stove (2 burners)	GHc 800	1	GHc 800
2	Coupling Pipes	GHc 10	1	GHc 10
3	15 kg Cylinder	GHc 80	2	GHc 160
4	Regulator	GHc 10	1	GHc 10
	Total			**GHc 980**

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Analysis of Investment Cost of LPG Stove

- Initial investment of GHc 980
- fuel cost savings of **GHc 851.40 per year** (**GHc 70.95 per month**).
- Assuming **5 years** LPG operation without any additional cost,
- Financial Internal Rate of Return on Investment (FIRR) is **7.71% per month or 92.5% per year.**
- Switching is thus extremely viable.

Case 1: Consumer decisions

- If the cook has the money, the cook can choose to put the **money in the bank and earn interest** or she can **invest in the LPG stove**.
- Banking the money will **generate an interest of 2%** per year. Investing it in the LPG stove, the savings are equivalent to **7.71% interest per month** on her savings.
- This is a no brainer what the cook should do.

Case 2: Microfinance support

- The cook has 20% of the amount (GHc 196), and needs to borrow the rest (GHc 784). She has good collateral. Assuming she needs to get a **micro credit** with the highest interest rate of **5% per month**. The monthly interest is **GHc 39.20.**
- **She can pay this easily from the monthly fuel cost savings of GHc 70.95 per month.** The balance, she can use save to pay back the principle.
- In this case it will take **25 months to save** enough to pay back the loan (not considering interest on the savings).
- When the interest rate is a more reasonable 3.5%, she will have after **19 months** saved enough to pay back the loan.

Why financial Viable Projects are not happening in Ghana

- A street vendor cannot get a 25 or 19 month loan even when they can pay an annual interest rate of 60% to 42%.

Typical conditions for a loan of GHc 1,000 to GHc 1,500 are:

- 3.5 – 5% interest per month, Maximum duration 6 months
- 25% collateral that must be deposited by the bank providing the loan.
- Additional collateral may be required.

- Loans with a longer duration (up to 2 years) are only available for larger amounts (more than GHc 20,000). The conditions include: 3% interest per month, 25% collateral (as above)
- Fixed assets as collateral (value exceeding GHc 20,000)

Conclusions and Recommendations

- Switching from fuelwood to LPG appears to be **financially attractive** with an FIRR of 7.71% per month over a 5 year period. 9.86% with the current LPG gas price.
- Still, this financial attractive proposition **will not happen because street vendors** will not be able to get a credit for longer than 6 months.
- **Supplier credit will enable some street vendors to obtain an LPG stove.** However, the supplier will need a large amount of cash to do this on a meaningful scale.

Conclusions and Recommendations

- Switching from unsustainable grown fuelwood to LPG will net **avoid CO_2 emissions of 17.4 ton per year.**
- **LPG customers do not get the LPG amount they pay for.**
- Stricter controls needed to avoid windfall profits for the filling stations, and protect the customer
- Because of the use of large bottles, scales with an accuracy of 100 gram were used. This results in a significant error margin. It is recommended to confirm the results with smaller bottles so that more accurate measurements can be made.

Conclusions and Recommendations

- As gathered from the field, there are quite a significant number of institutions using charcoal for cooking in Ghana. The financial viability of switching to LPG is expected to be even higher than switching from fuelwood. It is recommended to carry out energy audits for these institutions.

THANK YOU

Lowusu-takyi@snvworld.org

APPENDIX 9: THE ROLE OF GCMC IN ENSURING CLEAN ENERGY USE

GHANA CYLINDER MANUFACTURING COMPANY (GCMC) LTD

THE ROLE OF GCMC IN ENSURING CLEAN ENERGY USE

By
ELIZABETH YAWA MORNY (MRS)
FEBRUARY 26, 2014

INTRODUCTION

- GCMC was incorporated under the Companies Code ,1963 (Act 179) as a private limited liability company on the 14th of May 1998.

INTRODUCTION

- The major purpose for its establishment was to promote wider usage of LPG as a substitute for charcoal and firewood and thereby curtail some of our health and environmental challenges of degradation, deforestation and desertification caused by excessive use of firewood which accounted for over 71% of energy consumed in the domestic sector.

OPERATIONS

- The company began production in the year 1998. It is 100% owned by the Government of Ghana. The total workforce of GCMC now stands at forty-two(42)

CORPORATE OBJECTIVES

- To manufacture safe and affordable LPG cylinders and associated products of the right sizes and specifications for the local market and for export.
- To fabricate LPG metal stoves, stoves accessories and metal ovens for the domestic and export market
- To make the use of LPG gas the preferred fuel for domestic use in order to curtail the depletion of our forests.

OBJECTIVES

- To retail liquefied Petroleum Gas.
- To enhance innovation in order to complement portfolio diversification;
- To carry out repairs and maintenance on old cylinders and stoves(refurbishment)

PRODUCTION CAPACITY

- GCMC has a potential capacity to produce 250,000 cylinders annually. Significantly, there are plans underway to raise the production capacity to between 500,000 – 1,000,000 cylinders per annum in the next seven years. Similarly, the company intends increasing the production of local stoves to meet the increasing demand.

RANGE OF PRODUCTS AND SERVICES

- Currently the company produces Liquefied Petroleum Gas(LPG) cylinders and table top gas stoves for the local market.
- The company also import for sale LPG cylinder accessories like Regulators, Burners and low pressure LPG hoses.
- Retailing of Liquefied Petroleum Gas
- GCMC has facilities to test the safety of old cylinders and also to refurbish such cylinders to ensure safety.
- Cylinder Sizes:14.5kg, 12.5kg and 6kg
- Regulators:YT-2C,GFZ8 and GF50.

VARIOUS SIZES OF LPG CYLINDERS

GCMC STOVES

- GCMC also appreciates the fact that ensuring the safe use of LPG is not limited to durable cylinders alone but also involves making available for users good cook stoves and cylinder accessories. In order to do this GCMC through innovation has the past five years been producing LPG stoves for the local market. These stoves are highly patronized because of their durability and design. GCMC stoves are designed and fabricated with precision and care, to meet the needs of the ordinary Ghanaian.

GCMC STOVES

- Currently GCMC produces two main types of stoves i.e. the double burner and the single burner stoves. The double burner otherwise known as the "Awarepa" stove is rectangular in shape and designed to suit the average Ghanaian house hold i.e. in terms of space.
- There are two shapes of the single burner stoves i.e. the square shape known as the Osugyeni and the circular shape known as the Obaasima.

GCMC STOVES

- Having been in this business for some time now, staff from GCMC have acquired the requisite technical know-how to design and fabricate cook stoves of different sizes and shapes on commercial bases. Currently GCMC produces an average of about 500 pieces of stoves per month depending on the market demand but depending on the demand conditions GCMC could substantially increase the number of cook stoves produced for the market.

RANGE OF LPG STOVES

PRODUCT STANDARDS

- GCMC products are certified by the Ghana Standards Authority and also ISO international standards(22991). GCMC cylinders and stoves are more durable and safe compared to other brands on the market

CHALLENGES

- High market prices of LPG cylinders and stoves as a result of increasing cost of production, high import duties, exchange rate fluctuation
- Intermittent LPG explosions
- Importation and sale of used cylinders in the country.
- Affordability of LPG

INTERVENTIONS PUT IN PLACE

- The skills of production and maintenance staff will be upgraded this year to increase productivity for cylinders and gas stoves.
- LPG filling station attendants in three regions will be trained to know how to properly handle cylinders; installation, fixing of equipment and accessories and detect faulty cylinders and refer them to GCMC. They will also be trained to acquire maintenance culture, fire prevention and management, and teach same to customers at point of purchase and refilling.

INTERVENTIONS

- AWARENESS CREATION- By the use of GTV Adult Education Programmes and radio stations

INTERVENTIONS

- GCMC is currently working on a Government Pilot project to produce LPG cylinders for distribution to the rural communities . This project is under the Government's revised National Energy Policy of 2012 which intends to increase access of households to LPG by 50% by 2020. The program has started in the Ganu Tempane District of the Upper East Region with cylinders and stoves on pilot basis.

INTERVENTIONS

- GCMC is also thinking of forming an Association of Cylinder and Stove manufacturers in Ghana and we are inviting Anomena Ventures, advocacy groups and development partners/donors to collaborate with us in supporting government to achieve renewable energy policy and climate change program goal and increase consumer awareness on the importance of fuel efficiency and clean cookstoves

A NEWLY INSTALLED LPG TANK

GHANA CYLINDER MANUFACTURING CO. (GCMC) LTD.

LPG FILLING POINT

THE NEW LPG FILLING POINT

GHANA CYLINDER MANUFACTURING CO. (GCMC) LTD.

THE END

- Thank you very much for your attention

THE WAY FORWARD FOR GCMC

GHANA CYLINDER MANUFACTURING CO. (GCMC) LTD.

TEL: 0302 811 720 / 666 E mail: gcmcgl966

APPENDIX 10: THE STATE OF GHANA'S FORESTS AND THE USE OF LPG GAS

THE STATE OF GHANA'S FOREST AND THE USE OF LPG GAS

EDITH ABRUQUAH (MRS)
OPERATIONS MANAGER, FSD

STATE OF GHANA'S FOREST

- The forest resource of Ghana are being depleted at an alarming rate.
- The country had an original forest cover of 8.2 million hectares at the beginning of the 20th century but it is estimated that, 1.6 million is remaining.
- Deforestation rate is 2% leading to an annual loss of around 135,000ha. Degradation is gradual which is incremental rather than dramatic.

- Emission data indicates that Ghana was a net sink up to around 2,000 due largely to high levels of carbon sequestration in the land use and forestry sector. Since then, deforestation, degradation and conversion of forest to other land use are the major cause for increases in emission in the land use and forestry sector.

The principal drivers of deforestation and degradation

- Agricultural expansion (50%)
- Wood harvesting (35%)
- Urban spiral and infrastructure development (10%)
- Mining and Mineral exploitation (5%)

Underlying causes include;

- Growing population in rural and urban areas(Ghana's population reached 24 million in 2010 and the population is projected to reach 31 million by 2025. The average annual growth is 24%)

- High demand for wood and wood products on both the local and international market
- Heavy dependence on charcoal and woodfuel for rural and urban energy.
- Limited technology development in farming systems i.e. continuous reliance on 'slash and burn' agriculture.

Direct benefits of the Forest

- Timber
- Non Timber Forest Products

Indirect benefits

- Watershed management
- Amelioration of the weather
- Clean air

Ways of Sustaining Forest

- Reforestation
- Wildlife Management
- Regulation of timber exploitation
- Use of improved kilns in manufacturing charcoal and use of improved stoves in cooking
- Promotion of the use of LPG

CONCLUSION

- It is imperative that the forest resources are sustained due to its abundant benefits. The use of LPG gas will no doubt contribute immensely in reducing the pressure on the forest resources. Indeed LPG gas is cleaner, environmentally friendly, convenient although the cost is rising. A cursory look at the balance shows that the advantages it provides will however ultimately out way the cost
- I therefore entreat all present to switch to the use of LPG to safe our forest for now and future generations

APPENDIX 11: LPG DISTRIBUTION IN GHANA: CHALLENGES & OPPORTUNITIES

Ms SHEILA ADDO of the NATIONAL PETROLEUM AUTHORITY.

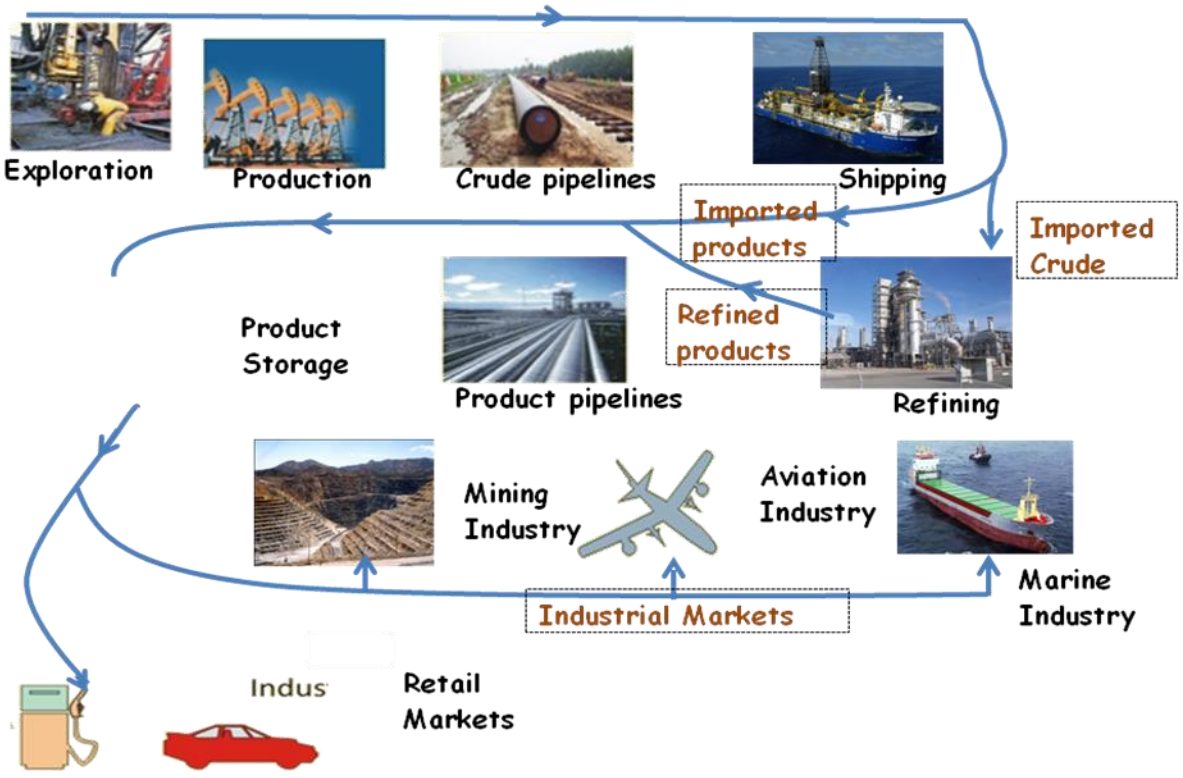
PRESENTATION OUTLINE

- Introduction
- Ghana LPG Supply Chain
- LPG consumption
- LPG Supply Challenges
- Planned Way Forward
- LPG Opportunities

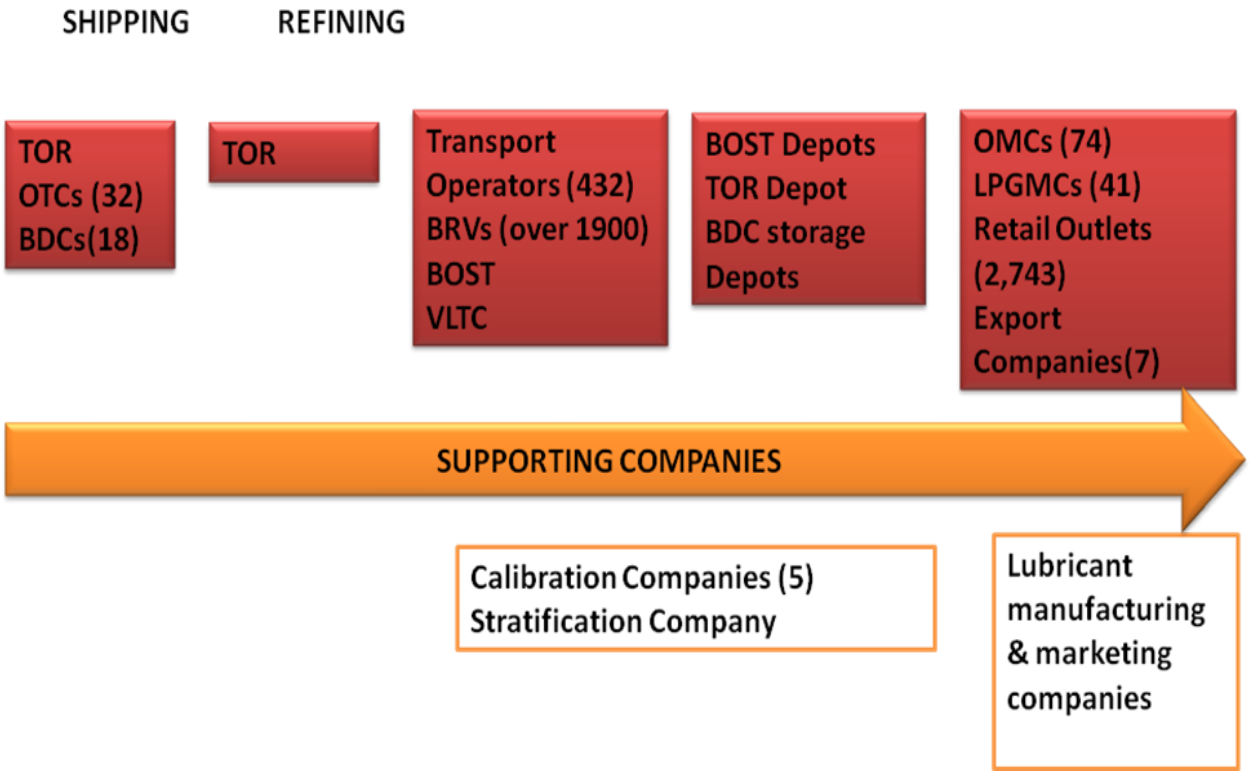
DOWNSTREAM REGULATOR

National Petroleum Authority **Instituted under NPA Act 2005, act 691 to regulate Downstream Service Providers .**

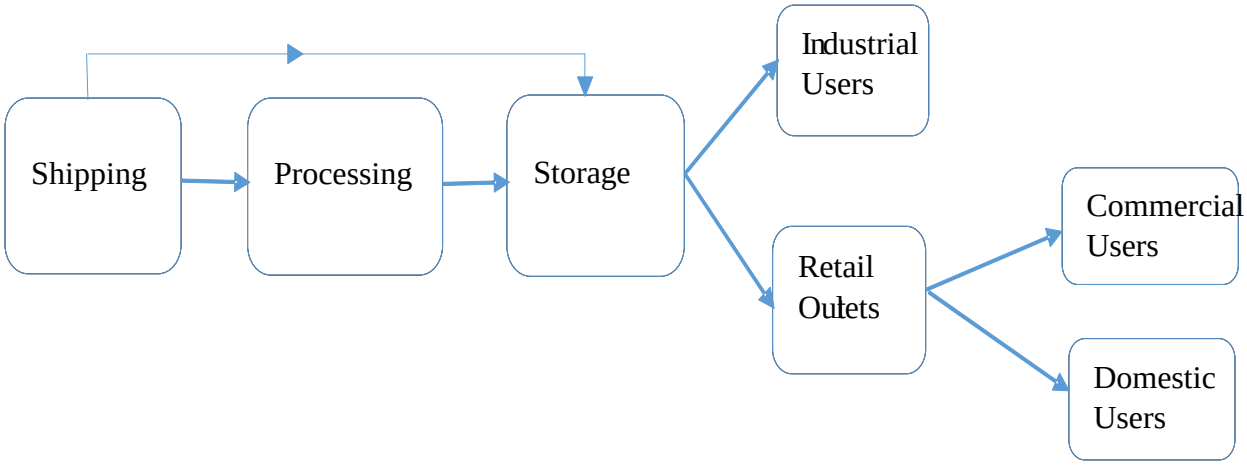
GHANA DOWNSTREAM CRUDE AND PRODUCTS SUPPLY CHAIN – NPA MANDATE



GHANA PETROLEUM DOWNSTREAM

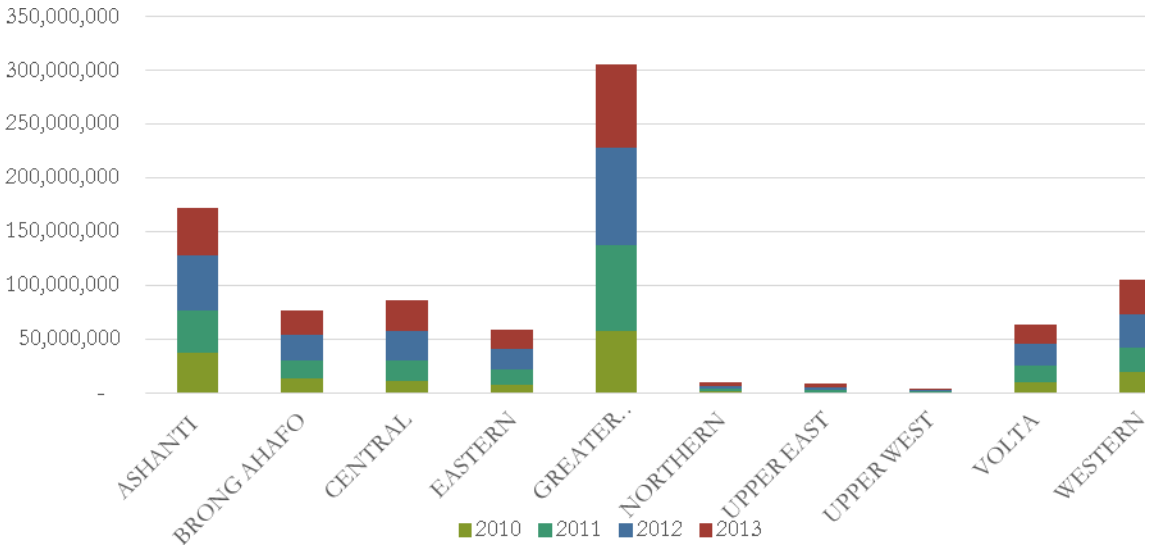


LPG SUPPLY CHAIN



NATIONAL LPG CONSUMPTION

REGIONAL LPG CONSUMPTION



SUPPLY CHALLENGES

- Storage Infrastructure Constraints
    - TOR: 7800Mt
    - Fuel Trade: 4000Mt
    - All located in Tema
- Weak Receiving facilities
    - 6 inch pipeline
    - Pumping rate of 60Mt -80Mt /hr
    - No Booster Pump
    - Poor Safety Standards (Refilling Outlets)
    - Unintended Consumers: Commercial Drivers
    - Slow Distribution facilities: few loading gantries

PLANNED WAY FORWARD

- Full Cost Recovery Pricing for LPG
- Rural LPG promotion Programme – Cylinder Recirculation Model
- Investment in New Port Infrastructure
- Investment in Storage Infrastructure especially inland

- Raise Safety Standards in the industry
- Encourage importation by road to serve Up North especially

APPENDIX 12: ACCELERATING INCLUSIVE ENERGY ACCESS SOLUTIONS AND POLICY THROUGH PARTNERSHIPS: THE CHALLENGES IN GETTING THE ISSUES RECOGNIZED AND THE USAGE OF CIVIL SOCIETY CONTRIBUTION:

DR. SABINA ANOKYE MENSAH, BIOCHEMIST, FOOD SCIENTIST, NATURAL RESOURCES AND ENVIRONMENT EXPERT, CHIEF EXECUTIVE OFFICER OF ANOMENA VENTURES, NATIONAL FOCAL PERSON, GENDER AND ENERGY NETWORK, GHANA, P. O. BOX CE12136, TEMA GHANA; Email: **sabinamensah@hotmail.com, gedaghana@hotmail.com**

BACKGROUND:

Sustainable Development requires a radical transformation of worlds energy system including the way energy is produced and used. Such a transformation requires strong leadership, carefully-designed policies, behaviour changes and large and small investments around the globe.

Governments committed themselves to the advancement of women since 1985 and to the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). The UN Conference on Environment and Development in 1992, Beijing Platform for Action 1995, The SADC Declaration on Gender and Development of 1998, The Millennium Development Goals of 2000, and more recently the SADC Protocol on gender.

INTRODUCTION:

Gender is considered a cross-cutting issue and one that requires special recognition in the context of achieving sustainable development. What poor people want on the agenda are the following objectives:

1. identification of gender gaps in energy poverty policies and the visibility of gender and energy issues to a wider audience in fora such as this.
2. Identification of linkages between gender and energy in sustainable development
3. Identification of tools/techniques for incorporating gender in energy policy
4. Examine monitoring arrangements and impact of policies and programmes that have incorporated gender perspectives.

LINKAGES BETWEEN GENDER AND ENERGY

Considering the linkage between gender and energy we can say that over two billion people rely on inferior fuels for energy and referring to feminisation of poverty i.e poverty has a woman's face in that of the total global population of the poor the majority are women. Women are major users or managers of household energy fuels. Women and girls still spend long hours every day collecting fuel wood, agricultural residues and dung and fetching water which all limits time for education and other tasks. Policies should be enacted such that women, girls, men and boys have time to engage in more productive activities such as income generating activities, agricultural production and education.

SOME SUGGESTED SOLUTIONS:

1. The interlinkages between gender, energy and poverty must be understood by all from a sustainable development perspective.
2. Promote gender planning, awareness and mainstreaming in energy-related organisations to develop long-term gender sensitive policies and programmes.
3. Understand the role of women in the informal sector and their contribution to the local economy especially in Africa.
4. The potential benefits arising from the use of modern energy technologies in the energy sector.
5. The limited availability of gender disaggregated data on energy development and use is a major factor against engendering energy policies.
6. Some investment funding must be allocated to non-conventional energy services used by the majority of rural women.
7. There must be adequate stakeholder consultation both in programme and policy development.
8. There must be adequate human resources and gender experts as well as budgetary allocation for gender mainstreaming because gender mainstreaming is resource intensive.

Gender roles are productive, reproductive, community management and community politics. Thus gender differences are socially determined and gender roles are assigned by society.

For further information contact:

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