Final Evaluation of UNDP/GoG project

LPG Substitution for Wood Fuel

A Report by
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1.0 INTRODUCTION

1.1 Purpose of the Evaluation

The UNDP is undertaking this evaluation in tandem with its monitoring objectives with the view of assessing the project achievements and document project experience with respect to the project design, implementation, impact and especially to initiate a dialogue with the key stakeholders on the way forward.

Specifically, the objectives of this evaluation are to:

- Identify elements and characteristics of project design, implementation, government policy which have had an impact on project performance to date.
- Assess how the project has been implemented and if optimal use has been made of the human and material resources provided.
- Assess how gender sensitive the project has been.
- Assess the sustainability and replicability of the achievements of the project.
  To find out if the results are of any significance to the rest of the country, and how could the results be made more significant
- Analyze and document the roles played by different stakeholders in different parts of the project cycle and their impact on project performance. Examine the linkages between the project and related initiatives at the national level. In documenting the learning experience, attention should be paid to analyzing how the impacts/results could have been achieved more effectively or efficiently, and how any negative project impacts (if any) could be avoided in the future.
- Make specific recommendations regarding project management structures exit strategy, and the delivery mechanisms for post-project sustainability

1.2 Scope of Evaluation

The evaluation will cover the following aspects of the project:

1. Key constraints to the LPG market development in Ghana
2. Project structure, linkages to Government, private sector and other stakeholders
3. Operational efficiency of the project structure and the suitability of present staffing
4. Stakeholder involvement in project implementation
5. Delivery mechanism
6. Credit mechanisms
7. Targets and types of capacity building
8. Development of code of practice and equipment standards
9. Marketing and consumer awareness programs
10. Pilot nature of the project
11. The geographical/regional coverage of the project
12. Time and planned duration of the project.
1.3 **Issues to be addressed by the Evaluation.**

a. Assess the relevance of the project to the development priorities of Ghana
b. Analyze the effectiveness of the approaches used to carry out the activities
c. Assess the capacity and evaluate the adequacy of institutional arrangements for execution and implementation including monitoring and evaluation functions.
d. Analyze whether learning from operational experience on earlier projects is reflected in the implementation of the project.
e. Document the impact the project is beginning to have on the market for LP gas in Ghana.
f. In which ways can the structures and delivery mechanisms of the project be altered in order to accelerate implementation
g. Address the question of whether the design and implementation process are owned by the government.
h. Look at the linkages between the project and other related initiatives at the national level.
i. Whether the project is effective in the production or achievement of its outputs.
   - Are the outputs likely to achieve immediate objectives?
   - Are the effects of the project activities positive or negative with respect to target groups?
   - Are the results of any significance for the country or the region as a whole?
   - Could the results be made more significant?

1.4 **Sustainability**

Under the issue of sustainability of the project, the main focus here is the extent to which the project is supported by the government and the degree to which the project is integrated into national programme. The issue of sustainability is related to what happens post project, particularly the prospect of its being transformed into profit making oriented entity.

1.5 **Lessons learned**

The evaluation should look at the lessons learned from project development and implementation specifically in the area of:

a. How impacts/ results could have been achieved more effectively or efficiently
b. What should have been done differently in a similar project
c. What should not have been done because of its negative or insignificant impact on the overall objective of the projects.

This assignment is to be executed through the reviews of project agreement, detail work plans, progress reports and other relevant documents, meetings with stakeholders and field visits.
1.6 Evaluation Methodology

In line with the scope of work elaborated above, the evaluation was conducted in two phases. The first phase involved desk review of project document and other relevant documents like the report on steering committee meetings. The other phase involved field visit where field data was collected through informal participatory interviews from beneficiaries of the project as well as stakeholders in the management and implementation of the project. Some non beneficiaries of the project were also randomly selected and interviewed at the household, institutional and enterprise levels to sample their opinion and perception about the project. The Project Coordinator and a representative of the donor who is also a member of the steering committee were interviewed.

The objectives of the evaluation were not quantified and no hard targets were set but rather a qualitative assessment was made of the realization of the objectives.
2.0 THE PROJECT AND ITS DEVELOPMENT CONTEXT

2.1 Project Start and its Duration

The project was estimated to start in August 2003 for a duration of twelve months, but the project document was signed on 23\textsuperscript{rd} December 2003 between the funding agency UNDP and the Government of Ghana represented by the Ministry of Finance.

2.2 Problems the Project seeks to Address

The main problem that this project seeks to address is to minimize the phenomenon of desertification in the project area. The three northern regions which form the target area for the project lie south of the Sahara desert where there is ample evidence of desertification. This phenomenon of desertification has arisen in the project area as a result of multiplicity of factors that the project seeks to address. The project seeks to solve the following problems which are the fundamentals of the desertification phenomenon:

a. Unawareness of the rural people on the benefits of using LPG for cooking as compared with using firewood and charcoal.

b. The present and current low and non availability of LPG and LPG infrastructure or equipment and accessories in the rural northern regions.

c. The prevalent use of wood fuel and charcoal in boarding schools, bakeries and chop bars in Northern Ghana.

d. Unavailability of credit system to make conversion from firewood/charcoal usage to LPG usage.

2.3 Immediate and development objectives of the Project

The project was designed to mitigate the economic and social problems of environmental degradation and improvement of health of women and children who bear the brunt of the negative effects of indoor air pollution. The project also seeks to encourage and facilitate the use of LPG as a substitute for wood fuel and charcoal which are the main fuels for household, schools and small businesses. The project also seeks to introduce a cleaner form of energy for improvement in indoor air pollution.

The overall development objectives of the project are:

1. Economic/Poverty objective: To facilitate the utilization of LPG as a substitute for inefficient fuels like wood fuel and charcoal which are the main fuels for domestic use and small enterprises in rural Ghana, with the main aim of achieving overall medium term social and economic benefits.

2. Social objective: To reduce the burdensome and time consuming task of collecting wood fuel which affect women and children disproportionately.

3. Environment related health objective: To additionally and most importantly contribute to the improvement in the quality of indoor air. The negative effects of indoor air pollution cannot be under-estimated as this is
the major cause of millions of pre-mature deaths of women and children in developing countries.

4. Local and Global Environmental objective: To reduce the pressure on the local forest and savannah woodlands, which have become vulnerable to desertification, from fuel wood collection and also to reduce greenhouse emissions from the use of traditional biomass.

2.4 Main Stakeholders

The project, apart from the beneficiaries, had the following as the main stakeholders.

- Private Sector
- Public Sector Institutions
- NGO’s

2.4.1 The Private Sector

The Private Sector companies that were to collaborate with the project are:

1. Tropic Oil Ltd
2. Star Oil Ltd.

The role of these companies was to collaborate by contributing to sponsorship of entrepreneurs to operate and own the District level LPG depots, while most of the advocacy and awareness creation is done by the project.

2.4.2 Public Sector Institutions

The Public Sector Institutions that will collaborate with the Project are:

- Bulk Oil Storage and Transportation (BOST)
- Ghana Oil Company Ltd (GOIL)
- Ghana Information Services Department (GISD)

BOST and GOIL already have LPG storage depots in most of the regional capitals and will therefore be in a position to supply the district level depots with LPG. In addition these institutions have qualified staff who could provide training for the project LPG technicians and depot keepers.

The GISD also have office in every district in the country. These offices have vehicles, which are equipped with public address systems for information dissemination. GISD will collaborate by providing services for awareness creation and information dissemination.

2.4.3 Non Governmental Organizations (NGO’s)

The only NGO to collaborate in this project was New Energy.
New Energy is already operating in most of the rural parts of Northern Ghana in the area of renewable energy and bio-fuels such as Jatropha. In the past they have done information dissemination for RESPRO. New Energy will collaborate with RESPRO in the information dissemination.

2.5 Expected Results

The project is expected to deliver five outputs. The expected outputs and their related activities are as follows:

**Output 1:** Create public awareness on the advantages and the use of LPG

**Activities**

1.1 Develop advertisements and posters on the benefits of LPG utilization  
1.2 Conduct workshops and seminars to create public awareness  
1.3 Functioning Project Management Team

**Outcome 2:** Establishment of one main regional depot and at least twenty (20) 1,000 kg capacity depots for LPG in the district capitals and other bigger rural communities in Northern Ghana

**Activities**

2.1 Establish a regional Depot as the main center for distribution, testing and rating of cylinders  
2.2 Establishment of local depots to ease access to LPG and LPG equipment and accessories.

**Outcome 3:** Reduce Wood fuel consumption in boarding Schools, small enterprises and chop bars in Northern Ghana by 50%.

**Activities**

3.1 Put in place mechanisms for financing the conversion from wood fuel and Charcoal to LPG

**Outcome 4** Facilitate the provision of adequate LPG, LPG equipment, accessories and installation and maintenance services facilities for boarding schools, households, small enterprises and restaurants. Develop and facilitate the enforcement of standards and safety regulations for LPG distribution and use.

**Activities**

4.1 Rent a haulage truck for the delivery of LPG to the district and rural areas  
4.2 Purchase the first set of 1,000 kg capacity cylinders for setting up the depots as well as the purchase of first set of 2kg capacity end-user cylinders for use
in rural households to facilitate credit for conversion and reduce indoor air pollution.

4.3 Facilitate the conversion to LPG by purchase of the LPG cook stoves for sale in rural areas.

4.4 Review existing regulatory framework and relevant regulations to improve safety operations

4.5 Facilitate the development, formulation of appropriate standards for the manufacture and usage of LPG burners and other equipment

4.6 Lobby the Ministry of Energy for draft legislation on standards and safety to be submitted to Parliament for enactment.

Output 5

Establish the necessary and appropriate conditions with banks and other financial institutions for the provision of credit to entrepreneurs to facilitate the implementation of the LPG substitution in Northern Ghana

Activities

5.1 Organize twelve (12) seminars/workshops with entrepreneurs and rural banks to negotiate terms and conditions for establishing district and rural depots and seek partnerships in the implementation of the project

In summary the following shall constitute the expected results:

- Achieve at least 50% retrofit of the kitchen of presently forty (40) secondary and tertiary boarding schools in the Northern Ghana.
- Widespread usage of LPG in homes in Northern Ghana, especially in rural areas.
- Implementation of standards for LPG equipment and its usage.
- Establishment of one regional depot and facilitate the setting up of at least twenty (20) dealer outlets for LPG and LPG equipment sales and customer services.
- Establishment of a credit scheme with banks and other financial institutions for rural energy services.
3.0 FINDINGS AND CONCLUSION

The purpose of this evaluation is to assess the achievements of the project objectives and document project experience with respect to project design, implementation, and impact. The results of this evaluation will be used to initiate a dialogue with the key stakeholders and the way forward.

3.1 Project Formulation

The idea of the project was conceived and designed by the Ministry of Energy. It has been the idea of the ministry to combat desertification through the use of LPG. The idea of using LPG to solve the problem of desertification is appropriate because the use of LPG in the three northern regions will go a long way to reduce their dependence on bush and woodlands for their livelihood.

The project design is quite appropriate in creating the awareness of the health hazards involved in the smoke from using firewood and its effect to users especially at the institutional level and enterprise level. At the household level the use of LPG is well determined by the economy of the user. Once the economy of the individual improves, there is a greater tendency for the individual to shift from the use of firewood and charcoal to LP gas.

The project was designed at the ministry level and there were no baseline studies to assess the energy needs of the people. It is therefore difficult to measure the achievement of the project against the relevant targets set in the project document. In order to assess the performance of the project, the key identifiable indicators as established in the baseline studies could be a good material to use to evaluate the project.

Although the idea of promoting the use of LPG in the project areas was laudable, the idea was general, and there would have been the need to have spatial analysis done to select the target group based on their needs assessment. At the conceptualization stage, the project did not take into consideration the spatial nature of the population in the area as well as how to market the products. The project also did not take into consideration the nature of the product they were promoting, i.e. the type of cylinder and the type of stove and whether they met the needs of the target group.

3.1.1 Country Ownership/Driveness

The project was designed by the Government of Ghana through the Ministry of Energy and was implemented by the RESPRO, another government agency. There has been the idea from policy makers about the need to address the phenomenon of desertification, but the approach has differed from agency to agency. For instance officials from the Forestry and the Environmental Protection Sector believe that the problem of desertification should be addressed through the planting of trees. The question, however, as to whether plantations should be private or community owned, i.e. what strategy to adopt, has always remained unanswered. At the national level, the idea of wood fuel plantations has been
conceptualized but the implementation through a holistic approach remains a problem. The Government of Ghana in its development policy document, the Ghana Poverty Reduction Strategy Paper (GPRSP), recognizes the need to depart from the technical issues of delivering energy for the poor and concentrate on people centered approach to deliver energy services that meet the needs and aspirations of the poor in order to meet the objectives of the Millenium Development Goals (MDG). The Government of Ghana through the Ministry of Energy is developing a comprehensive policy to promote the use of LPG as a way to provide cleaner source of energy to improve the standard of living of the people.

3.1.2 Replication Approach

The LPG Substitution Project has demonstrated the benefits one derives from the use of LPG for cooking instead of using wood fuel. For the purpose of replication, there is a need to conduct baseline studies and evaluate the needs of the people as well as their cooking patterns in order to know the type of stove that will address or fit into their cooking style.

3.1.3 Other Aspects

A key problem in Northern Ghana is poverty. While the use of LP gas can address some of the health concerns in the region, the root cause of the problem, poverty, was not tackled. The people in the area, especially the poor, lack access to basic necessities in life. The concerns of the poor are to get access to basic necessities like good drinking water, access to good medical care and good schools for their children but not to spend money on something for which they can find an alternative. Thus, the poor have no money to spend on buying items like cylinder, stove, regulators, and hoses. Despite the fact that they travel long distances to fetch wood fuel to cater for their cooking fuel needs, this method will therefore continue be their staple source of energy for cooking in the future.

The project at its initial stage took the poverty nature of the people in the project area into consideration by planning to supply a 3 kg cylinder which was to cost 29,000 Cedis. However, the project did not take into consideration the erratic supply problem of LPG in the three northern regions. This again emphasizes the fact that a proper baseline study should have been undertaken together with a proper needs assessment before embarking on the project.

3.2 Project Implementation

3.2.1 Implementation Approach

The approach adopted was to create a system of LPG User Associations, which were formed during the implementation stage, and which played a key role in implementation. This strategy was not conceived as part of the implementation strategy and was not captured during the project formulation or design stage. The User Associations have helped to move the project to its current frontiers by liaising with the various users to promote the use of LPG in the various project areas through the aggregation of users under one umbrella to enhance smooth
The User Associations served as the operational center for information dissemination on all aspects of the project implementation. They did this by making announcements in churches, Police stations, hospitals and other important convergent points like the district offices of the Ghana Education Service (GES).

Even though the project was implemented through the LPG User Associations, the major stakeholders for the implementation were RESPRO, which is an implementation agency operating under the Ministry of Energy, and New Energy, which is a Non-Governmental Organization (NGO) with vast experience in the implementation of projects in the three northern regions. The Operational office of both RESPRO and New Energy are in Tamale with the Project Coordinator, Finance Associate and the Secretary stationed at the Ministry of Energy in Accra. The Project Coordinator although in Accra was constantly in touch with officials from New Energy and field officials from RESPRO in Tamale.

New Energy is headed by an Executive Director and ably supported by a Programme Manager and three field staffs for community sensitization and technical matters for this project. These field officers are supported by two RESPRO field staff stationed in Tamale. The field staffs of New Energy and RESPRO were the frontline staff who did the initial mobilization, sensitization and animation of the project objectives.

At the enterprise level, the chop bars and the restaurants were randomly selected based on their size and the number of customers they serve and their popularity within the project areas.

At the Boarding Schools level, the project approached the Regional Directors of Education in the various regions with the objective of the project. It is upon the recommendations of the Regional Directors that the various schools were chosen.

At the household level, an announcement was made through the local F.M. stations about the project. Those interested were invited to meet at the various district assemblies in order to be briefed about the objectives of the project.

### 3.2.2 Monitoring and Evaluation

At the project design and formulation stage no effective mechanism was put in place for monitoring and evaluating project activities. Although the main function of the steering committee was to ensure the smooth implementation of the project, there was - except for a provision with regard to delivery of quarterly progress reports to UNDP - no clear reporting structure and procedures under the management of the project for monitoring and evaluation. However, New Energy developed a monitoring structure where the status of the project was monitored and reported to the Project Coordinator.

The steering committee agreed to the amendment of implementation strategies where it was necessary to adapt the project to the realities on the ground. One example is the realization that people prefer a bigger LPG cylinder (14.5 kg instead of 3 kg) since the beneficiaries are aware of the erratic LPG supply in
their area. During the entire project life 10 steering committee meetings were held to discuss the progress of the project. It was on record that some members of the steering committee, including UNDP, went for a field visit to the various projects sites and were satisfied with the state of affairs and events on project implementation.

### 3.2.3 Stakeholder Participation

In carrying out this mandate, the project implementation team did not introduce new technologies, but rather built on what the people knew already. The strategy used required the participation of all concerned stakeholders in planning, implementation, monitoring. The project sought to create the necessary awareness on the use of LPG and its benefits including the reduction of health hazards accompanying the smoke that comes with the use of firewood for cooking.

The role played by New Energy can be qualified as outstanding. Household beneficiaries, institutional beneficiaries (chop bars and bakeries) and the heads and matrons of second cycle institutions - all point to the effective coordination they have had with New Energy in terms of the arrangement of LPG supply, the provision of technical support and the delivery of LPG accessories.

There was also a strong linkage between New Energy and the User Associations on the supply of LPG and the accompanying accessories. This linkage enhanced the smooth distribution of LPG as well as the provision of after sale support services.

It is noteworthy to mention that there was a strong communication link between the office of the Project Coordinator which was resided in Accra and New Energy/RESPRO in Tamale for effective project implementation.

### 3.2.4 Financial Planning

The mode of financial management employed by the project ensured transparency, flexibility and ownership of the project. The steering committee assessed and approved the project activities together with the accompanying budgets. To effect any payment, the Project Coordinator would initiate the payment by sending the invoice to the Ministry of Finance and Economic Planning for approval. Once payment is approved by the Ministry of Finance and Economic Planning, the invoice is sent to UNDP, the financing agency, for a cheque to be issued for payment.

### 3.2.5 Implementation Modalities

Clear observation of the professional background of the staff for the project indicated that the capacity and the institutional structure for the project implementation were appropriate. The steering committee, which had the oversight responsibility of project implementation, was made up of experienced members with diverse professional background and they represented different governmental agencies and different sector groups. The committee met regularly to provide clear directions for project implementation.
The Project Staff under the leadership of the Project Coordinator were highly qualified with diverse professional background. Counterpart staff from New Energy was equally qualified under the Executive Director who is an accomplished Energy Management and Development Consultant of international repute. The field staff comprised professional technicians engineers and a graduate Social Worker and a communication Specialist with vast field experience. The administrative and support staff consisting of a Development Expert, Accountant, Secretary and drivers complete the effective organizational structure of the project.

The Project Coordinator is a Professional Engineer of many years experience in energy management. In April 2005, the Project Coordinator resigned his position as a result of a new role he assumed at the Ministry of Energy but he decided to stay on board to manage the project till the final completion without any financial reward. Although this brought some administrative delays, personnel of the project collaborated so well that the partial absence of the Coordinator did not affect project implementation.

The formation of the User Association provided the linkage between the project and the users. Some members of the User Association were trained as back up technicians by New Energy engineers to provide services such as fault detection and rectification, new installations and customer education at reasonable cost.

One indicator for assessing the efficiency of project implementation is the calculation of the variance between the agreed expenditure and the actual expenses. The variance gives an indication of whether the activity has been executed and how well it was executed, but there was no audit report or any report to make such reference from. It is the view of this evaluation that since the project did not handle and keep funds but only initiated payments and got them approved by the Ministry of Finance and Economic Planning for payment to be processed by UNDP, the project funds were well utilized for the intended purpose.

3.2.6 Problems Encountered During Project Implementation

Some of the problems encountered during project implementation were as follows:

i. There was lack of commitment by some of the stakeholders like Ghana Cylinder Manufacturing Company (GCMC) who were given the contract to manufacture the 3 kg cylinders but could not deliver. The project therefore had no alternative than to import cylinders from abroad and also purchase some from Sigma gas. This caused some delays in the implementation of the project.

ii. There was no baseline study with regard to cylinder capacity to ensure that the needs of the users were met. The project initially started with 3 kg cylinders with the view that it would be affordable to a lot of people without taking into consideration the erratic supply nature of LPG in the
three Northern Regions in Ghana. It was later found that the people preferred the 14.5 kg cylinder since that could take them far before the next consignment of LPG arrived.

iii. A project with twelve months duration only had to provide some infrastructure such as manufacture of cylinders and the building of a filling plant, which involved land acquisition, processing of documents at various institutions and agencies, organizing tenders and importation of materials if not found locally. All these processes require time to implement, so a lot of time was needed to acquire materials to put up the filling plants at Bawku and at Tamale.

iv. During the implementation of the project, some of the activities had to be changed or amended through the steering committee. For example, the purchase of an LPG truck had to be changed into hiring an LPG truck to be sending gas from the refinery to the project areas.

v. There was a sudden increase in the price of LPG in February 2004 by about 50%. This sudden price hike had a negative impact on the project as it lowered the enthusiasm with which most people embraced the project. As a result of the price increase, many of the beneficiaries went back to use wood fuel. While some started to use LPG as a complement to gas, others packed their LPG accessories and went back full scale to the use of wood fuel. It was also noted on the field that LPG is regarded as a by-product from the distillation of crude oil. This leads to the belief that LPG has no value for the refinery and therefore should be free or sold at a cheaper price. Most of the beneficiaries were surprised to hear that the price and the landed cost of LPG in the country are higher than that of premium gasoline and gas oil. It must be noted that the pricing issue cannot be resolved at project level because of the full cost recovery policy adopted by the government for the pricing of petroleum products in the country.

vi. The use of LPG has caught up well with the people in the three Northern Regions but the supply of LPG is seriously hampering the effort made so far.

vii. The project had no vehicle but had to rely on RESPRO vehicles. This situation sometimes affected the implementation of activities when the programme coincided with a RESPRO project activity. Moreover, RESPRO staff who were working on the LPG Substitution Project were not on the payroll of the project. Despite these logistics constraints the field team, both from RESPRO and New Energy, ensured that project activities were implemented as scheduled. As an evidence from the field, all beneficiaries point to New Energy as the source and anchor of the project.

viii. There were some delays in funds flow from the donor UNDP when they adopted a new accounting system called Atlas. This affected project activities for about two months in 2004.
3.3 RESULTS

3.3.1 Attainment of Outcomes/Achievement of objectives

A significant number of activities have been implemented under the project. However, it is important to assess the relevance of these activities towards achievement of the project objectives. As stated earlier the project seeks to reduce the rate of environmental degradation and improve the health of women and children who bear the brunt of the negative effects of indoor air pollution.

The project document defines five outputs and supporting activities towards the achievement of this objective. This section assesses the progress made towards these outputs and activities.

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<th>INTENDED OUTCOME 1</th>
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<td>Create public awareness on the advantages and the benefits in the use of LPG</td>
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Planned Activities

1.1.1 Distribute and explain posters to schools, chop bars restaurants and rural communities and the general public in all the 24 districts of northern Ghana.
1.1.2 Organize radio and T.V awareness programme.
1.2.1 Conduct a series of workshops and seminars in English and Local languages in all the 24 districts of Northern Ghana to educate the public and create the awareness and encourage the use and conversion to LPG
1.3.1 Provide leadership and support to project management
1.3.2 Make available working capital for initial purchases of LPG from the refinery for distribution in rural areas

Progress Made

Tremendous awareness has been created on the benefits of using LPG for cooking as against the use of wood fuel especially in the area of health. These were achieved through advertisements and posters that were printed and distributed to the districts where the project was being implemented like Tamale, Savelugu, Navrongo, Bawku and Tumu. Six workshops have been held in all the project areas with Medical Officers and Senior Fire Service officers as resource personnel. The Medical Officer informed the public about health hazards such as various eye diseases, upper respiratory diseases as well as miscarriage of pregnancies, not forgetting various skin diseases and body odour, all emanating from smoke generated by using wood fuel for cooking. The Fire Service personnel demonstrated how to detect gas leakages, its prevention and the various precautionary measures to prevent fire.

A Project Office has been set up and is operational in Accra with the Project Coordinator and his staff working together.
INTENDED OUTCOME 2

Establishment of one main regional depot and at least twenty (20) 1000kg capacity depots for LPG in the district capitals and other bigger rural communities in northern Ghana

Planned Activities

2.1.1 Acquire the equipment and premises to establish the regional depot.
Review/Update national standards specific to rating and maintenance of cylinders

2.2.1 Hold a series of meetings, seminars and negotiations with the private sector, NGO’s and end-user groups on mechanisms to finance the establishment of the depots and the purchase of end-user equipment

Progress Made

The programme added some strategic assets to the LPG distribution infrastructure in the project area. It was initially envisaged to put in place one Regional Depot in Tamale and 20 small distribution outlets of 1-ton capacity in various district and main population centers. According to Project Management, this strategy was subsequently modified in the light of a better understanding of how the LPG supply chain works. The idea of the regional depot in Tamale was scrapped because of the existence of a 44-ton capacity LPG storage tank in Tamale owned by GOIL which was under utilized. It also became evident that, such a regional depot could not service the 20 community based small storage tanks without the services of a mobile tanker. The 1-ton capacity was too small to meet the demand in any of the district capitals. Therefore the installation of twenty 1-ton distribution outlets was also scrapped. Instead a single 4.5-ton capacity distribution outlet was established in Bawku, and a second distribution outlet in Tamale belonging to Tropic Oil, was put into operation between December 2004 and October 2005. The added distribution assets have provided a platform for developing business models that will promote successful private sector involvement in LPG business in Northern Ghana.

Despite the sensitization workshops held for private entrepreneurs, they have not been able make any commitment like investing in the establishment of district depots. However, Dell Oil Company, a new oil marketing company, has started to put up infrastructure like storage tanks in six districts in Northern Ghana, with two in each region.

In appreciation of the role played by the LPG User Association in facilitating and promoting the use of LPG in the district, the District Assembly has promised to give land to the User Association in Bawku to build their own filling plant.
INTENDED OUTCOME 3
Reduce Firewood consumption in boarding schools, small enterprises and chop bars in Northern Ghana by 50%

Planned Activities

3.1.1 Organize meetings with and negotiate appropriate conditions with banks and other financial institutions for the provision of credit to entrepreneurs to facilitate the implementation of the LPG substitution in Northern Ghana.

3.1.2 Training workshops with officials of Ministry of Education, Heads of Schools to promote interest in LPG use in boarding schools.

Progress Made

Under the project, three institutional kitchens of boarding schools were converted to the use of LPG. A significant number of chop bars had their kitchen converted to use LPG. Some are still using LPG whilst majority has packed their accessories because they consider the current price of LPG as expensive compared with woodfuel. The project has consistently been supplying LPG to the User Association in all operating districts. Series of training workshops were organized for Head of second cycle schools and their matrons on safe use of LPG. All in all, an end-user training programme comprising the following elements was designed and implemented:

a. 8 Model Kitchens for chop bars.

b. 3 Institutional kitchens for boarding schools.

c. 45 female and 3 male commercial food vendors trained

d. Over 600 household users trained

e. Implemented a point of sale advice on proper handling of cylinders and use of gas in the home and business.

INTENDED OUTCOME 4
To facilitate the provisions of adequate Liquefied petroleum Gas (LPG), LPG equipment, accessories and installation and maintenance service facilities for boarding schools, households, small enterprises and restaurants. Develop and facilitate the enforcement of standards and safety regulations for LPG distribution and use.

Planned Activities

2.0.1 Rent a haulage truck for delivery of LPG to the district and rural depots.
2.0.2 Purchase the first set of 1000 kg capacity cylinders for setting up the depots and purchase the first set of 2kg capacity end-user cylinders for use in rural households and to facilitate credit for conversion and reduce indoor air pollution.

2.0.3 Facilitate the conversion to LPG by the purchase of the LPG cook stove for sale in rural areas. The use of cleaner energy will greatly reduce indoor air pollution in homes and chop bars

4.2.1 Review existing regulatory framework, revise relevant regulations to improve safety in operations, capacity building for regulatory bodies, industry and associations, facilitate the development, formulation of appropriate standards for the manufacture and usage of LPG burners and other equipment. Facilitate the development of safety regulations. Also lobby the Ministry of Energy for draft legislation on standards and safety to be submitted to Parliament for enactment.

Progress Made

The project initiated work on the development of safety regulations. A draft Standards and Safety Regulations and LPG Code of Practice for Filling and Handling was completed. The project organized a national stakeholder’s workshop involving all the regulatory agencies: Energy Commission, Ghana Standards Board, Fire Service, Cylinder manufacturers, LPG filling plant operators, Appliance manufacturers, and selected end-users. The initiative was well received by stakeholders, however, a close look at the Code of Practice indicates that it concentrated mainly on safety at the filling plant level. More work is needed to codify what is good practice at the household and enterprise level.

Five new cooker designs and mini cylinders (3kg) were introduced to the project clients. The designs were arrived at after consultation with a cross section of housewives and commercial food vendors in the project area. These appliances were designed and produced by competent local artisans. Users have reported generally positive experiences with the cookers, which are not only inexpensive, but are easy to maintain and well adapted to the preparation of local cuisine which is often done in pots with rounded bottoms. Even though these cookers appear very popular and well adapted to local needs, there is no evidence that these appliances have been tested and certified by any regulatory agency, such as the Ghana Standards Board. The 3kg cylinders were introduced to address the high cost of outlay for larger cylinders which tends to present problems to lower income clients. At the time of the evaluation less than 50% of the 3kg cylinders had been purchased by clients, even though there was a 50% subsidy on the price. Most clients actually prefer the standard 14.5kg cylinder. Because clients have grown used to irregular supplies they are prepared to invest in stocking gas for at least one month whenever there is gas for sale.
INTENDED OUTCOME 5

Establish the necessary and appropriate conditions with banks and other financial institutions for the provision of credit to entrepreneurs to facilitate the implementation of the LPG substitution in Northern Ghana

Planned Activities

5.1.1 Organize twelve (12) seminars/workshops with entrepreneurs and rural banks to negotiate terms and conditions for establishing district and rural depots and seek partnerships in the implementation of project and make follow-ups on project activities.

Progress Made

This outcome was not achieved because most banks and financial institutions do not have any dedicated products and services to the LPG industry especially the three northern regions.

3.3.2 Summary of Results

The following constitutes the summary of the results of the LPG substitution project:

a. User Associations: The project successfully implemented a community capacity building strategy which resulted in the formation of three User Associations covering six Districts with a total membership of over 500. The LPG User Associations have become an integral part of the supply chain for LPG to members and non-members alike, and provide an effective forum for delivering relevant product information in a cost-effective manner to clients. An assessment of the value-added by the LPG User Association, which function more like a consumer cooperatives indicates that the members were well organized with elected leaders and were:

- Actively organizing their members to obtain LPG products and services from suppliers
- Improving their bargaining power and reducing the cost of accessing the products and services.
- Increasing their confidence in the handling of LPG through their participation organized end-user training sessions by the project.

At the time of the evaluation, it was established that all the three User Associations were active, and they meet once a month and have kept active communication link with the project through New Energy.

b. The formation of User Association in every project area enhanced the achievement of the various intended outcome. The User Associations helped to
aggregate the users as well as the potential users on all issues concerning the project. The level of collaboration between association and the project is strong.

c. **Awareness campaign:** A public awareness and Communication plan was well thought out and executed. This was done through a variety of media: workshops, door to door campaigns, model kitchens, demonstration centers, radio discussion and advertising programme. The project was successful in raising the level of awareness of the benefits of LPG as cooking fuel. The target audience for the awareness campaigns included the following groups:

- Households, i.e. for domestic uses
- Commercial food vendors (chop bars)
- Bakeries
- Shea butter producers
- Boarding schools

d. **End-user training:** Designed and implemented an end-user training programme for:

- 8 Model kitchens for chop bars
- 3 Institutional kitchens for boarding schools
- 45 female and 3 male commercial food vendors trained
- Over 600 household users trained
- Implemented a point of sale advice on proper handling of cylinders and the use of gas and the home and business.

The core message focused on demonstrating the health benefits, convenience, safety, and even cost effectiveness of using LPG for cooking. At the time of this evaluation, it was evident that users were better informed of the hidden cost of fuel wood in terms of their health and therefore their decision to choose any fuel for cooking was based on facts. About 90% of the members of the LPG User Associations indicated that notwithstanding the higher cost of LPG compared with wood fuel, they would prefer to use LPG provided it was made available. The users were more confident in the handling of LPG and were not scared about using the fuel. Users had also become aware of the impact of high wood fuel consumption on the environment, particularly the effects of deforestation on agricultural productivity.

At the time of the evaluation, a cross section of the user reported positively on the convenience of cooking with LPG, were convinced about the hazards of wood fuel smoke to their health, and commercial food vendors reported time savings of up to about 2 hours in the preparation of meals. Commercial food vendors also reported a reduction in the amount of water (very scarce commodity) needed for washing and cleaning cooking utensils, because using LPG for cooking is much cleaner.

e. **LPG Appliances Distribution Programme:** To reduce the first cost barrier’ in the transition from wood fuel to LPG, the project implemented an innovative appliance distribution programme. Clients were required to purchase on their own, at least one 14.5 kg cylinder to qualify to receive a second cylinder plus
accessories and a single burner cooker free of charge. This programme ensured that a targeted subsidy of about 60% of the capital cost of conversion from wood fuel to LPG was channeled to project participants on a first come first served basis. In all a total of 182 household clients and 86 commercial clients benefited from the appliance distribution programme.

f. **LPG Distribution Infrastructure:** The programme added some strategic assets to the LPG distribution infrastructure in the project area. Noteworthy to mention are a single 4.5-ton capacity distribution outlet, which was established in Bawku, and a second distribution outlet in Tamale belonging to Tropic Oil, which was put into operation between December 2004 and October 2005. The added distribution assets have provided a platform for developing business models that will promote successful private sector involvement in LPG business in Northern Ghana.

g. **LPG Delivery:** The project was successful in organizing the delivery of LPG to the clients in the project area. Before the project intervention, LPG supply in the region was erratic, less than 10 tons per month on the average was sold by GOIL, the only retail outlet. As a result of the project intervention, the supply of LPG was increased to 24 tons per month on the average.

h. **Cooker Design:** Five new cooker designs and mini cylinders (3 Kg) were introduced to the project clients. The designs were arrived at after consultation with a cross section of housewives and commercial food vendors in the project area. These appliances were designed and produced by competent local artisans. Users reported generally positive experiences with the cookers, which were not inexpensive, but were easy to maintain. Although the appliances were well adapted to the users, there was no evidence that the appliances have been tested and certified by any regulatory agency like the Ghana Standard Board. At the time of the evaluation, less than 50% of the 3kg cylinders had been purchased by the clients, even though there was a 50% subsidy on the price. Most clients prefer the 14.5 kg cylinder.

i. **Safety Standards:** The project initiated work on the development of safety regulations. A draft *Standard and Safety regulations and LPG Code of Practice for filling and Handling* was completed. The project organized a national stakeholders workshop involving all regulatory agencies: Energy commission, Ghana Standard Board, Fire Service, Cylinder manufacturers, LPG filling plant operators, Appliance manufacturers and selected end-users. The initiative was well received by stake-holders, however a critical look at the Code of Practice indicates that it concentrated mainly on safety at the filling plant level. More work is needed to codify what is good practice at the household, enterprise and transportation levels.

### 3.3.3 Summary of Challenges

a. In explaining the objectives of the project to the people, the real price of LPG and the petroleum pricing policy in the country were not fully explained to the beneficiaries. It was observed that LPG was regarded as a by-product from the
refinery. Therefore, to most users, the product should be sold at a price lower than the current price.

b. The usage of LPG was different among the household sector on one hand and that of chop bars and the boarding schools on the other hand. At the household level, users knew the benefits of using LPG in terms of cleanliness, time saving and convenience and were not sensitive to price hikes. On the other hand, the owners of the chop bars and the restaurants as well as the matrons in the various boarding schools, because they do not work as cooks themselves, do not care much about the health effect of the smoke on the cooks they employ. The matrons and the chop bar owners regard the red eye, frequent coughing of the cooks as normal to any user of fire wood.

c. Despite the conversion of the kitchens of some educational institutions and chop bars to the use LPG, the institutions still use wood fuel to complement LPG. The reason for this attitude is that the use of LPG depends on the number of people they cook for, and the type of food one is cooking. For example, at Gowrie Secondary Technical School, preparing a popular local food like Tuo Zaafi (TZ) for a population of about 800 students using a 60 gallon capacity cooking pot requires a bigger space for three cooks and a careful control of the temperature to ensure that the food is evenly cooked. This requires a special stove to support the size and the base of the cooking pot. Apart from this, they also get credit facility for late payment by the wood fuel suppliers whilst, in the case of LPG, payment is demanded as soon as the product is supplied. This situation sometimes puts pressure on the financial resources of the school since they depend on government subsidies or grants which in most cases arrive late.

d. The project has whipped up the appetite for the use of LPG and through the User Association, a lot of potential users have registered, but there are no cylinders and accessories to cater for the ever increasing demand as the project has ended.

e. The project did not have monitoring and evaluation plan at the design stage, which spells out concrete quantitative indicators to be monitored. The project also did not put in place a monitoring schedule involving all stakeholders especially the users of LPG to monitor project performance towards the achievement of project objectives.

f. The project design was not based on a baseline study establishing the real needs assessment of the users in terms of the type of stoves and capacity of gas cylinders users were interested in. The project initially brought in 3 kg cylinders with the view that it would be affordable to the people. However, during implementation, it was realized that the people were concerned about the erratic supply of LPG in the region and therefore preferred the 14.5 kg cylinder. This led to the withdrawal of the 3kg cylinder from supply. They were replaced with 14.5 kg cylinders.

g. Most of the users at the enterprise level, especially the chop bar owners, do not take into consideration the cost of healthcare emanating from the smoke
when comparing the price of LPG with woodfuel. For example the cost of treating a simple eye disease like conjunctivitis ranges between €400,000.00 and €500,000.00 or the cost of treatment for infections in the lung or any upper respiratory disease, which ranges from €600,000.00 to €700,000.00. Every worker in such environment is at risk of developing a terminal disease like tuberculosis. The Chop bar owners and the matrons in the educational institutions do not take the health hazards of the smoke into account when costing their inputs. They also do not recognize the percentage and the significance of LPG fuel in their cost structure. See Appendix C

h. The project assumed to be targeting the poor, but this was not the case because the poor cannot afford the high initial upfront cost of LPG accessories and the LPG. The rural poor also cannot afford the cost of refilling the cylinder. Therefore, for the purpose of cooking, the rural poor will continue to collect wood freely in the bush and the forest.

i. The project implementation suffered some level of delays because of the need to build some infrastructure like LPG filling plants. The building of such infrastructure takes time, since it involves land acquisition and processing, conducting tenders and award of contract. There were some delays in the release of funds from UNDP due to changing of accounting software at UNDP in early 2004 and this as well caused some delays in implementing some project activities.

h. The linkage between the project and the District Assemblies in the various districts was weak although Government is supposed to be represented at the district level as it is represented at the steering committee at the national level. Strong linkage with the district assembly would likely promote decentralization.

3.4 Summary of Findings

The LPG Substitution project was implemented with the view of solving an energy related environmental problem through the process of popularizing the use of LPG in households, large kitchens in institutions like boarding schools and small scale enterprises like chop bars and restaurants. The project had as one of its objectives to create the necessary awareness with regard to the health implication of the smoke that comes from the use of wood fuel for cooking and the development and promotion of LPG dissemination process in Northern Ghana as an alternative fuel for cooking.

The project duration, although short, has contributed to convincing the people in Northern Ghana the relevance of using LPG as an alternative fuel to solve both health and environmental problems and the necessity to fully integrate the use of LPG as a strategy in reducing poverty in northern Ghana. Thus, overall the full potential of using LPG for cooking has been revealed to the beneficiaries within this short period of the project, despite some wrong perceptions about the risk of LPG usage.
The project has also made significant improvement in LPG supply by frequently sending tankers to complement the supply by the only filling plant operated by GOIL with a limited capacity of 44-tons. The operation of the Tropic Gas filling plant by the project also improved the distribution of LPG in the project areas, especially Tamale.

The need to use LPG for cooking has caught up well in all the project areas, but for a district capital like Savelugu, the problem of transporting cylinders to Tamale, a distance of 15 kilometers at a cost of 25,000.00 Cedis per 14.5 kg cylinder, is having a negative impact on the use of LPG. The same problem exists at Navrongo where users have to travel to Bolgatanga for refilling.

3.5 Sustainability

The LPG Substitution Project has demonstrated the technical, economic and social feasibility of reducing health hazard of smoke from the use of wood fuel for cooking, as well as the improvement of in-door air quality for women when LPG is used for cooking.

Ownership of the project by the people is essential in ensuring sustainability. This has been promoted through the formation of the User Associations and the constant dialogue with the private sector to encourage them to enter into the retail of LPG and LPG equipment and accessories since the project has created a market opportunity.

The User Associations are well organized with high enthusiasm and making the delivery of LPG to remote locations more predictable and efficient.

There is strong evidence on the ground that some new oil marketing companies like Del Oil and others are putting up infrastructure of 20 MT capacity filling plants in six districts in the northern regions. There was also evidence during the field visit that some companies have applied to the National Petroleum Authority for license to construct and operate LPG filling plants in the northern regions of Ghana.

With the emergence of these new oil marketing companies and their enthusiasm and plans in getting into the operation of supply and distribution of LPG in Northern Ghana, there is hope that the erratic supply problem of LPG, which has contributed to less usage of the product in the region, will be reduced if not eradicated. These developments show that the private sector is gradually entering the LPG business. Every encouragement should be given to them to do business in the sector.

The Government of Ghana has also demonstrated its commitment of ensuring that fuel of all types including LPG is well distributed at a unified price throughout the country. This is done through the Unified Petroleum Price Fund (UPPF), which is a margin on the petroleum price build-up meant to compensate transporters who haul petroleum products to long destinations. This margin was increased by 20%
in November 2005. Therefore, there is enough incentive for transporters to transport LPG to Northern Ghana.

3.6 Contribution to Upgrading Skills of National Staff

The implementation of the project has upgraded the skills of the staff under the RESPRO project to diversify their knowledge in the implementation of other energy related projects in their area of operation. This has increased their knowledge in project management. However, the bulk of the implementation activities were performed by the staff from New Energy.

4.0 RECOMMENDATIONS

Based on the findings of this evaluation of the LPG Substitution for Wood fuel in Boarding Schools, Homes and Small Enterprises Project, the following recommendations show actions to be put in place both by the Government and the Project.

a. The LPG User Associations should be encouraged at all cost to continue to play their useful role of linking users and potential users to the project and to further play an advocacy role. It is recommended that the Associations get registered as a identifiable bodies or associations.

b. In future, any information dissemination about the use of LPG should include the current petroleum pricing policy of full cost recovery under import parity pricing methodology. This should include the functions of the National Petroleum Authority, the statutory organization with the mandate to review petroleum prices in the country. It should also be recognized that LPG is not a by-product from the refinery, it is actually a major product from the refinery with a high value.

c. Baseline studies should be conducted and the needs assessment properly evaluated and incorporated into the design of the project in order to enhance implementation.

d. The implementation of the project of this nature, which requires the provision of infrastructure, should be changed to a programme with a minimum duration of three years.

e. The Government of Ghana should develop a special programme like Presidential Special Initiative on the use of LPG in Northern Ghana. The initiative should provide a sustainable scheme that will address all the constraints limiting the use of LPG in Northern Ghana. This may include special tax rebate for entrepreneurs who provide LPG services in the three northern regions.

f. Government should look at the promotion of LPG in the three Northern Regions as solving a health and environmental problems which could finally lead to poverty alleviation. Reduction in hospital attendance by women will give them enough time to attend to other social and economic activities. This will further
reduce the extent to which people are felling commercial trees like Dawadawa and Sheanut trees.

g. Future projects should identify credible and responsible partners in their area operation with the capacity and capability to assist in implementing project activities for full realization of project objectives as exemplified by the role New Energy played in this project.

h. The need to design effective and sustainable monitoring schemes for efficient management and evaluation of project outcomes. This can be achieved through first, training the users like say the user association in participatory monitoring and evaluation and assigning roles to them. Second the project should set up monitoring indicators and developing monitoring and evaluation systems through the use of appropriate tools for dialogue and partnership among project groups. Finally the project should develop a comprehensive plan to measure changes in project areas and activities on sustainable basis.

i. There is the need for government to enforce the standards, safety and the code of practice in the LPG industry to promote the use of the product and also reduce the perception that the product is dangerous to use.

j. For sustainable exit strategy, the Government of Ghana should continue to support the project by working effectively with New Energy to continue to create the awareness programme and provide monitoring and evaluation reports. These reports should form the basis of developing a road map for the expansion of the LPG Substitution Project in other parts of Northern Ghana. These activities could be supported and funded from the Energy Fund in the Petroleum Price Build-Up. Currently the fund is managed by the Energy Commission and is meant for funding research activities in the energy sector.

5.0 LESSONS LEARNED

The implementation of the LPG Substitution Project has unearthed certain important lessons which need to be considered as part of the strategies for successful implementation of future projects of this nature. Among the lessons learnt are:

- The priorities of energy use have shifted over the years to encompass energy security, environmental market liberalization and equity concerns. The resultant complexities require that project implementation should be conducted in such a manner to bring about desirable changes in perceptions, policies, strategies and actions on the ground.

- Effective partnerships and networking linkages established and nurtured by an institution are the key criteria for success. Partnerships and networks require the nucleus of able leadership and an institutional effort as the driving force. There is a need for a committed organization that is able to bridge perceptional gaps.
• Irregular supply of LPG to the northern regions has been identified as the major barrier to the success of this project.

• Most household users who converted to gas are still using it, and more and more households are converting. Many chop bars which converted initially have relapsed to using fuel wood. This was triggered by the 50% increase in the price of LPG in February, 2005. All the schools that have their kitchens converted to gas are still using gas with more schools coming on board for advice and services.

• LPG tanker delivery directly to end-users cylinders in remote locations without access to gas filling stations has proven to be a cost-effective and reliable component in the supply chain. For safety reasons, the approach adopted was not to carry out door to door sales using the tanker service, as done in places like Accra and Kumasi. Instead, some well secured and designated sales points were selected for sales under controlled environments in conjunction with the User Associations.

• Unethical practices of under-filling of cylinders appear to be widespread, thus increasing the cost of LPG to users significantly.

• There was one minor fire accident during the project. The client was able to control the fire quickly, without injury to any staff and only minor damage to the equipment, thanks to the safety training users had under the project.

• The desire for convenience and timesaving is important and critical to office workers, teachers and nurses. The availability of subsidized equipment from the project has encouraged this category of LPG users to rapidly switch from fuel wood and charcoal to LPG for these categories of LPG users.

• Social and educational status as well as the income level appears to be the main driving force for switching from the use of fuel wood to LPG. It was realized during the field visit that educated, middle to high-income groups were interested in the use of LPG whilst average households still regard the fuel to be too expensive.

• Economy, availability and cost of alternative fuels are some of the factors that drive the adoption of LPG for cooking. It was also observed from the field visit that the comparative cost of energy for cooking by using LPG in commercial kitchens in the chop bar business increases by 37 – 168 % for the same volume of cooking, depending on the cost of fuel wood in the locality, which varies widely. However, the daily cost of production analysis undertaken by the project has shown that the total cost of energy input per day is generally well below 10% of overall inputs for chop bars. See appendix C.
6.0 EVALUATION REPORT ANNEXES

ANNEX A – EVALUATION TERMS OF REFERENCE
ANNEX B - LIST OF PERSONS MET
ANNEX C - COMPARATIVE COST OF FUEL WOOD AND LPG
ANNEX B

LIST OF PERSONS MET

1. Augustine Ayirezang - Secretary of Navrongo User Association
2. Patricia Ayiko - Treasurer Navrongo Users Association
4. Mrs Rose Adama - Chairperson Navrongo User Association
5. Samuel Adjei - Chef, Tietaal Restaurant Bolga
6. Rose Awiah - Proprietor Perseverance Spot, Navrongo
7. Adwoa Mansah - Cook, Perseverance Spot, Navrongo
8. Abena Mensah - Cook, Perseverance Spot, Navrongo
9. George Salifu - Cook, Navrongo Secondary School
10. Dorothy - Domestic Bursar, Navrongo Secondary School
11. Abubakari Seidu - Domestic User Bawku
12. Musah Salifu - Manager, Total Filling Station Bawku
13. Musah Ibrahim - LPG filling Plant Operator
14. Faustina Akunaba - Proprietor Club 92 Restaurant
15. Daniel Aboko - Member Bawku Users Association
16. Kate Akanwenba - Member Bawku Users Association
17. Thomas Ananbiak - Executive Bawku Users Association
18. Aaron Abdulai - Chairman, Bawku Users Association
19. Helen Abugri - Member of Bawku Users Association/Non LPG User
20. Alice Mbugri - Member of Bawku Users Association
21. Julian Mbugri - Member of Bawku Users Association
22. Eric Kariyama - Member of Bawku Users Association
23. Eric Aboya - Secretary Bawku Users Association
24. Fati Dinko - Proprietor Shalom Restaurant Bawku
25. Didacus Afrega - Headmaster, Gowrie Sec/Tech School
26. Osman Goma - Asst Headmaster, Gowrie Sec/Tech
27. Janet Anaba - Matron, Gowrie Sec/Tech
28. Immaculate Atoriyah - Headmistress, Savelugu School for the Deaf
29. Agnes Addai - Matron Savelugu School for the Deaf
30. Ahmed Issah - Accountant Savelugu school for the Deaf
31. Beatrice adabuga - Executive, Savelugu users Association
32. Hajia Adamu Abdulai - Executive Savelugu Users Association
33. Alhassan Salifu - Member Savelugu Users Association
34. Fatoma Yafo - Tea Seller, Member Savelugu Users Association
35. Raymond Narke - Director Mangoase Chop bar
36. Millicent Atsunyo - Proprietor mangoase Chop bar
37. Hajia Ayishatu Alhassan Proprietor, Ayi food Complex
38. Alhassan Kassim - Manager, Ibrahim Distribution Company
39. Eric Opoku - LPG Marketing Officer, GOIL Tamale
40. Kadijah Aziz - Proprietor Kadijah Bakery
41. Clement Abavannah - Project Coordinator
42. Madeleine Bolliger Klah – UNDP/Member Steering Committee
43. Amadu Mahama - New Energy
44. Abdulai Wumbei - New Energy
45. Thomas Sayibu Imoro New Energy